passion
for precision

fraisa

High-performance milling tools



2025 (2)


passion
for precision
fraisa

NEW PRODUCTS

Fall 2025



End milling tools for steel, stainless steel, titanium and nickel
Finishing, cylindrical

Short version

N° 8358 **new!** **E-Cut**



Performance **P** | Roughing, Finishing | d_1 1 – 16 | r | Rm < 850-1500 HRC < 24-48 | Inox Stainless | V

Normal version

N° 8360 / 8460 **new!** **E-Cut**



Performance **P** | Roughing, Finishing | d_1 3 – 20 | r | Rm < 850-1500 HRC < 24-48 | Inox Stainless | VII

Medium length version

N° 8370 **new!** **E-Cut**



Performance **P** | Roughing, Finishing | d_1 3 – 20 | r | Rm < 850-1500 HRC < 24-48 | Inox Stainless | IX

End milling tools for 3D machining
Ball nose

Tolerance r ±0.005

N° 7570 **new!** **Sphericut**



Performance **P** | 3xd | PF | F | d_1 1 – 16 | Rm < 850 HRC < 24 | XI

End milling tools for aluminium and copper
Smooth-edged, cylindrical

Normal version

N° 8565 / 8665 **MFC Alu**



$l_2 = 2.2xd_1$ $l_3 = 3.0xd_1$

Performance **P** | Roughing HPC, Roughing HDC, Finishing | d_1 4 – 20 | r | Al Aluminium Alloy | XIII

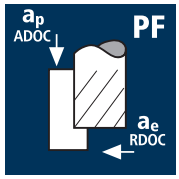
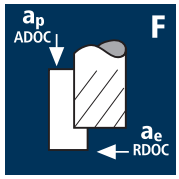
Medium length version

N° 8575 / 8675 **MFC Alu**



$l_2 = 3.7xd_1$ $l_3 = 4.5xd_1$

Performance **P** | Roughing HPC, Roughing HDC, Finishing | d_1 4 – 20 | r | Al Aluminium Alloy | XV

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	2.00	4	136	0.032	3.000	0.040	21645	2771
		3.00	5	136	0.039	4.500	0.060	14430	2814
		4.00	5	136	0.046	6.000	0.060	10823	2489
		5.00	5	136	0.051	7.500	0.100	8658	2208
		6.00	6	136	0.056	9.000	0.100	7215	2424
		8.00	6	136	0.065	12.000	0.160	5411	2110
		10.00	7	136	0.072	15.000	0.160	4329	2182
		12.00	7	136	0.079	18.000	0.240	3608	1995
		16.00	8	136	0.091	24.000	0.240	2706	1970
	Steel 850 - 1100 N/mm²	2.00	4	120	0.032	3.000	0.040	19099	2445
		3.00	5	120	0.039	4.500	0.060	12732	2483
		4.00	5	120	0.046	6.000	0.060	9549	2196
		5.00	5	120	0.051	7.500	0.100	7639	1948
		6.00	6	120	0.056	9.000	0.100	6366	2139
		8.00	6	120	0.065	12.000	0.160	4775	1862
		10.00	7	120	0.072	15.000	0.160	3820	1925
		12.00	7	120	0.079	18.000	0.240	3183	1760
		16.00	8	120	0.091	24.000	0.240	2387	1738
	Steel 1100 - 1300 N/mm²	2.00	4	104	0.032	3.000	0.040	16552	2119
		3.00	5	104	0.039	4.500	0.060	11035	2152
		4.00	5	104	0.046	6.000	0.060	8276	1903
		5.00	5	104	0.051	7.500	0.100	6621	1688
		6.00	6	104	0.056	9.000	0.100	5517	1854
		8.00	6	104	0.065	12.000	0.160	4138	1614
		10.00	7	104	0.072	15.000	0.160	3310	1668
		12.00	7	104	0.079	18.000	0.240	2759	1526
		16.00	8	104	0.091	24.000	0.240	2069	1506
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	4	54	0.032	3.000	0.040	8594	1100
		3.00	5	54	0.039	4.500	0.060	5730	1117
		4.00	5	54	0.046	6.000	0.060	4297	988
		5.00	5	54	0.051	7.500	0.100	3438	877
		6.00	6	54	0.056	9.000	0.100	2865	963
		8.00	6	54	0.065	12.000	0.160	2149	838
		10.00	7	54	0.072	15.000	0.160	1719	866
		12.00	7	54	0.079	18.000	0.240	1432	792
		16.00	8	54	0.091	24.000	0.240	1074	782
	Steel < 850 N/mm²	2.00	4	170	0.023	3.000	0.020	27056	2489
		3.00	5	170	0.028	4.500	0.030	18038	2525
		4.00	5	170	0.032	6.000	0.030	13528	2164
		5.00	5	170	0.036	7.500	0.050	10823	1948
		6.00	6	170	0.040	9.000	0.050	9019	2165
		8.00	6	170	0.046	12.000	0.080	6764	1867
		10.00	7	170	0.051	15.000	0.080	5411	1932
		12.00	7	170	0.056	18.000	0.120	4509	1768
		16.00	8	170	0.065	24.000	0.120	3382	1759
	Steel 850 - 1100 N/mm²	2.00	4	150	0.023	3.000	0.020	23873	2196
		3.00	5	150	0.028	4.500	0.030	15915	2228
		4.00	5	150	0.032	6.000	0.030	11937	1910
		5.00	5	150	0.036	7.500	0.050	9549	1719
		6.00	6	150	0.040	9.000	0.050	7958	1910
		8.00	6	150	0.046	12.000	0.080	5968	1647
		10.00	7	150	0.051	15.000	0.080	4775	1705
		12.00	7	150	0.056	18.000	0.120	3979	1560
		16.00	8	150	0.065	24.000	0.120	2984	1552
	Steel 1100 - 1300 N/mm²	2.00	4	130	0.023	3.000	0.020	20690	1903
		3.00	5	130	0.028	4.500	0.030	13793	1931
		4.00	5	130	0.032	6.000	0.030	10345	1655
		5.00	5	130	0.036	7.500	0.050	8276	1490
		6.00	6	130	0.040	9.000	0.050	6897	1655
		8.00	6	130	0.046	12.000	0.080	5173	1428
		10.00	7	130	0.051	15.000	0.080	4138	1477
		12.00	7	130	0.056	18.000	0.120	3448	1352
		16.00	8	130	0.065	24.000	0.120	2586	1345
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	4	90	0.023	3.000	0.020	14324	1318
		3.00	5	90	0.028	4.500	0.030	9549	1337
		4.00	5	90	0.032	6.000	0.030	7162	1146
		5.00	5	90	0.036	7.500	0.050	5730	1031
		6.00	6	90	0.040	9.000	0.050	4775	1146
		8.00	6	90	0.046	12.000	0.080	3581	988
		10.00	7	90	0.051	15.000	0.080	2865	1023
		12.00	7	90	0.056	18.000	0.120	2387	936
		16.00	8	90	0.065	24.000	0.120	1790	931

Cylindrical/Square end mills E-Cut

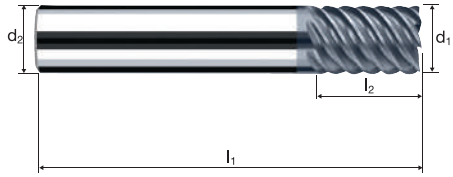
Finishing, short version

Performance **P**

$l_2=1.5xd_1$

HM MG10 | λ **55°** γ **10°**

new!



Roughing

Finishing

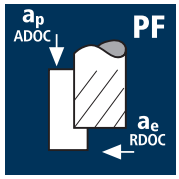
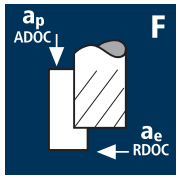
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8358** ø-Code **100**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r	z		POLYCHROM **P8358**
100	1.00	6.00	50	1.50	8.07	0.050	4		●
140	2.00	6.00	50	3.00	9.46	0.050	4		●
180	3.00	6.00	50	4.50	10.45	0.050	5		●
220	4.00	6.00	50	6.00	12.04	0.100	5		●
260	5.00	6.00	51	7.50	13.37	0.100	5		●
300	6.00	6.00	51	9.00	-	0.100	6		●
391	8.00	8.00	55	12.00	-	0.150	6		●
450	10.00	10.00	63	15.00	-	0.200	7		●
501	12.00	12.00	73	18.00	-	0.200	7		●
610*	16.00	16.00	85	24.00	-	0.200	8		●

* with chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	3.00	5	128	0.036	6.600	0.060	13581	2445
		4.00	5	128	0.041	9.000	0.060	10186	2088
		5.00	5	128	0.046	11.000	0.100	8149	1874
		6.00	6	128	0.050	13.500	0.100	6791	2037
		8.00	6	128	0.058	18.000	0.160	5093	1772
		10.00	7	128	0.065	22.000	0.160	4074	1854
		12.00	7	128	0.071	27.000	0.240	3395	1687
		16.00	8	128	0.082	36.000	0.240	2546	1670
		20.00	8	128	0.092	44.000	0.300	2037	1499
	Steel 850 - 1100 N/mm²	3.00	5	116	0.036	6.600	0.060	12308	2215
		4.00	5	116	0.041	9.000	0.060	9231	1892
		5.00	5	116	0.046	11.000	0.100	7385	1699
		6.00	6	116	0.050	13.500	0.100	6154	1846
		8.00	6	116	0.058	18.000	0.160	4615	1606
		10.00	7	116	0.065	22.000	0.160	3692	1680
		12.00	7	116	0.071	27.000	0.240	3077	1529
		16.00	8	116	0.082	36.000	0.240	2308	1514
		20.00	8	116	0.092	44.000	0.300	1846	1359
	Steel 1100 - 1300 N/mm²	3.00	5	100	0.036	6.600	0.060	10610	1910
		4.00	5	100	0.041	9.000	0.060	7958	1631
		5.00	5	100	0.046	11.000	0.100	6366	1464
		6.00	6	100	0.050	13.500	0.100	5305	1592
		8.00	6	100	0.058	18.000	0.160	3979	1385
		10.00	7	100	0.065	22.000	0.160	3183	1448
		12.00	7	100	0.071	27.000	0.240	2653	1319
		16.00	8	100	0.082	36.000	0.240	1989	1305
		20.00	8	100	0.092	44.000	0.300	1592	1172
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	5	51	0.036	6.600	0.060	5411	974
		4.00	5	51	0.041	9.000	0.060	4058	832
		5.00	5	51	0.046	11.000	0.100	3247	747
		6.00	6	51	0.050	13.500	0.100	2706	812
		8.00	6	51	0.058	18.000	0.160	2029	706
		10.00	7	51	0.065	22.000	0.160	1623	738
		12.00	7	51	0.071	27.000	0.240	1353	672
		16.00	8	51	0.082	36.000	0.240	1015	666
		20.00	8	51	0.092	44.000	0.300	812	598
	Steel < 850 N/mm²	3.00	5	160	0.025	6.600	0.030	16977	2122
		4.00	5	160	0.029	9.000	0.030	12732	1846
		5.00	5	160	0.033	11.000	0.050	10186	1681
		6.00	6	160	0.036	13.500	0.050	8488	1833
		8.00	6	160	0.041	18.000	0.080	6366	1566
		10.00	7	160	0.046	22.000	0.080	5093	1640
		12.00	7	160	0.051	27.000	0.120	4244	1515
		16.00	8	160	0.059	36.000	0.120	3183	1502
		20.00	8	160	0.065	44.000	0.150	2546	1324
	Steel 850 - 1100 N/mm²	3.00	5	145	0.025	6.600	0.030	15385	1923
		4.00	5	145	0.029	9.000	0.030	11539	1673
		5.00	5	145	0.033	11.000	0.050	9231	1523
		6.00	6	145	0.036	13.500	0.050	7692	1661
		8.00	6	145	0.041	18.000	0.080	5769	1419
		10.00	7	145	0.046	22.000	0.080	4615	1486
		12.00	7	145	0.051	27.000	0.120	3846	1373
		16.00	8	145	0.059	36.000	0.120	2885	1362
		20.00	8	145	0.065	44.000	0.150	2308	1200
	Steel 1100 - 1300 N/mm²	3.00	5	125	0.025	6.600	0.030	13263	1658
		4.00	5	125	0.029	9.000	0.030	9947	1442
		5.00	5	125	0.033	11.000	0.050	7958	1313
		6.00	6	125	0.036	13.500	0.050	6631	1432
		8.00	6	125	0.041	18.000	0.080	4974	1224
		10.00	7	125	0.046	22.000	0.080	3979	1281
		12.00	7	125	0.051	27.000	0.120	3316	1184
		16.00	8	125	0.059	36.000	0.120	2487	1174
		20.00	8	125	0.065	44.000	0.150	1989	1034
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	5	85	0.025	6.600	0.030	9019	1127
		4.00	5	85	0.029	9.000	0.030	6764	981
		5.00	5	85	0.033	11.000	0.050	5411	893
		6.00	6	85	0.036	13.500	0.050	4509	974
		8.00	6	85	0.041	18.000	0.080	3382	832
		10.00	7	85	0.046	22.000	0.080	2706	871
		12.00	7	85	0.051	27.000	0.120	2255	805
		16.00	8	85	0.059	36.000	0.120	1691	798
		20.00	8	85	0.065	44.000	0.150	1353	704

Cylindrical/Square end mills E-Cut

Finishing, chip breaker, normal version, short neck

Performance **P**

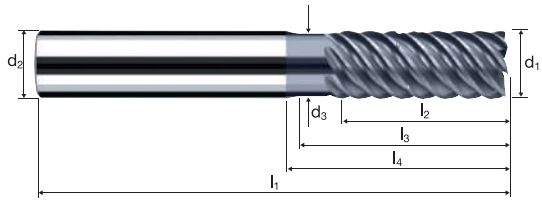
$l_2=2.2xd_1$

$l_3=3.0xd_1$

new!

HM MG10 | λ 55° γ 10°

r



Roughing

Finishing

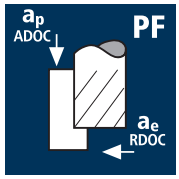
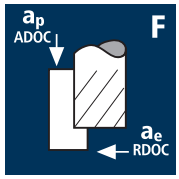
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8460** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8460	POLYCHROM P8360
180*	3.00	6.00	2.80	54	6.60	9.00	12.33	0.050	5		●
220*	4.00	6.00	3.70	54	9.00	12.00	14.54	0.100	5		●
260*	5.00	6.00	4.60	57	11.00	15.00	16.72	0.100	5		●
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.100	6		●
391	8.00	8.00	7.40	63	18.00	24.00	26.37	0.150	6		●
450	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	7		●
501	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	7		●
610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.200	8		●
682	20.00	20.00	19.00	115	44.00	60.00	64.77	0.250	8		●

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	3.00	5	104	0.030	11.100	0.060	11035	1655
		4.00	5	104	0.034	15.000	0.060	8276	1407
		5.00	5	104	0.038	18.500	0.100	6621	1258
		6.00	6	104	0.042	22.500	0.100	5517	1390
		8.00	6	104	0.048	30.000	0.160	4138	1192
		10.00	7	104	0.054	37.000	0.160	3310	1251
		12.00	7	104	0.059	45.000	0.240	2759	1139
		16.00	8	104	0.069	60.000	0.240	2069	1142
		20.00	8	104	0.077	74.000	0.300	1655	1019
	Steel 850 - 1100 N/mm²	3.00	5	92	0.030	11.100	0.060	9762	1464
		4.00	5	92	0.034	15.000	0.060	7321	1245
		5.00	5	92	0.038	18.500	0.100	5857	1113
		6.00	6	92	0.042	22.500	0.100	4881	1230
		8.00	6	92	0.048	30.000	0.160	3661	1054
		10.00	7	92	0.054	37.000	0.160	2928	1107
		12.00	7	92	0.059	45.000	0.240	2440	1008
		16.00	8	92	0.069	60.000	0.240	1830	1010
		20.00	8	92	0.077	74.000	0.300	1464	902
	Steel 1100 - 1300 N/mm²	3.00	5	80	0.030	11.100	0.060	8488	1273
		4.00	5	80	0.034	15.000	0.060	6366	1082
		5.00	5	80	0.038	18.500	0.100	5093	968
		6.00	6	80	0.042	22.500	0.100	4244	1069
		8.00	6	80	0.048	30.000	0.160	3183	917
		10.00	7	80	0.054	37.000	0.160	2546	962
		12.00	7	80	0.059	45.000	0.240	2122	876
		16.00	8	80	0.069	60.000	0.240	1592	879
		20.00	8	80	0.077	74.000	0.300	1273	784
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	5	42	0.030	11.100	0.060	4456	668
		4.00	5	42	0.034	15.000	0.060	3342	568
		5.00	5	42	0.038	18.500	0.100	2674	508
		6.00	6	42	0.042	22.500	0.100	2228	561
		8.00	6	42	0.048	30.000	0.160	1671	481
		10.00	7	42	0.054	37.000	0.160	1337	505
		12.00	7	42	0.059	45.000	0.240	1114	460
		16.00	8	42	0.069	60.000	0.240	836	461
		20.00	8	42	0.077	74.000	0.300	668	411
	Steel < 850 N/mm²	3.00	5	130	0.021	11.100	0.030	13793	1448
		4.00	5	130	0.024	15.000	0.030	10345	1241
		5.00	5	130	0.027	18.500	0.050	8276	1117
		6.00	6	130	0.030	22.500	0.050	6897	1241
		8.00	6	130	0.034	30.000	0.080	5173	1055
		10.00	7	130	0.039	37.000	0.080	4138	1130
		12.00	7	130	0.042	45.000	0.120	3448	1014
		16.00	8	130	0.049	60.000	0.120	2586	1014
		20.00	8	130	0.055	74.000	0.150	2069	910
	Steel 850 - 1100 N/mm²	3.00	5	115	0.021	11.100	0.030	12202	1281
		4.00	5	115	0.024	15.000	0.030	9151	1098
		5.00	5	115	0.027	18.500	0.050	7321	988
		6.00	6	115	0.030	22.500	0.050	6101	1098
		8.00	6	115	0.034	30.000	0.080	4576	934
		10.00	7	115	0.039	37.000	0.080	3661	999
		12.00	7	115	0.042	45.000	0.120	3050	897
		16.00	8	115	0.049	60.000	0.120	2288	897
		20.00	8	115	0.055	74.000	0.150	1830	805
	Steel 1100 - 1300 N/mm²	3.00	5	100	0.021	11.100	0.030	10610	1114
		4.00	5	100	0.024	15.000	0.030	7958	955
		5.00	5	100	0.027	18.500	0.050	6366	859
		6.00	6	100	0.030	22.500	0.050	5305	955
		8.00	6	100	0.034	30.000	0.080	3979	812
		10.00	7	100	0.039	37.000	0.080	3183	869
		12.00	7	100	0.042	45.000	0.120	2653	780
		16.00	8	100	0.049	60.000	0.120	1989	780
		20.00	8	100	0.055	74.000	0.150	1592	700
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	5	70	0.021	11.100	0.030	7427	780
		4.00	5	70	0.024	15.000	0.030	5570	668
		5.00	5	70	0.027	18.500	0.050	4456	602
		6.00	6	70	0.030	22.500	0.050	3714	669
		8.00	6	70	0.034	30.000	0.080	2785	568
		10.00	7	70	0.039	37.000	0.080	2228	608
		12.00	7	70	0.042	45.000	0.120	1857	546
		16.00	8	70	0.049	60.000	0.120	1393	546
		20.00	8	70	0.055	74.000	0.150	1114	490

Cylindrical/Square end mills E-Cut

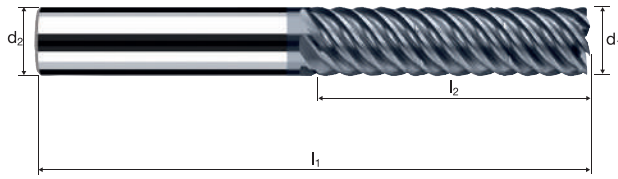
Finishing, chip breaker, medium version

Performance **P**

$l_2=3.7xd_1$

HM MG10 | λ **55°** γ **10°**

new!



Roughing

Finishing

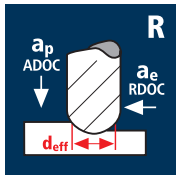
ReTool®

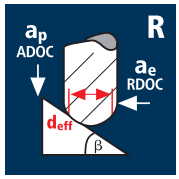
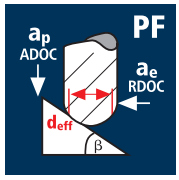
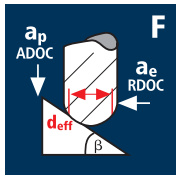
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8370** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r	z	POLYCHROM P8370
180*	3.00	6.00	57	11.10	17.05	0.050	5	●
220*	4.00	6.00	60	15.00	21.04	0.100	5	●
260	5.00	6.00	63	18.50	24.37	0.100	5	●
300	6.00	6.00	63	22.50	-	0.100	6	●
391	8.00	8.00	72	30.00	-	0.150	6	●
450	10.00	10.00	84	37.00	-	0.200	7	●
501	12.00	12.00	100	45.00	-	0.200	7	●
610	16.00	16.00	120	60.00	-	0.200	8	●
682	20.00	20.00	140	74.00	-	0.250	8	●

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Steel < 850 N/mm²	1.00	2	101	0.045	0.18	0.20	0.77	41841	3766	0.1
		2.00	2	183	0.077	0.28	0.40	1.39	41969	6463	0.7
		3.00	2	238	0.096	0.36	0.60	1.95	38855	7460	1.6
		4.00	2	238	0.115	0.48	0.80	2.60	29141	6702	2.6
		5.00	2	238	0.128	0.60	1.00	3.25	23313	5968	3.6
		6.00	2	238	0.138	0.72	1.20	3.90	19427	5362	4.6
		8.00	2	238	0.169	0.96	1.60	5.20	14571	4925	7.6
		10.00	2	238	0.192	1.20	2.00	6.50	11656	4476	10.7
		12.00	2	238	0.199	1.44	2.40	7.80	9714	3866	13.4
	Steel 850 - 1100 N/mm²	1.00	2	101	0.041	0.18	0.20	0.77	41840	3430	0.1
		2.00	2	183	0.070	0.28	0.40	1.39	41970	5875	0.7
		3.00	2	221	0.088	0.36	0.60	1.95	36080	6350	1.4
		4.00	2	221	0.105	0.48	0.80	2.60	27060	5685	2.2
		5.00	2	221	0.117	0.60	1.00	3.25	21650	5065	3.1
		6.00	2	221	0.126	0.72	1.20	3.90	18040	4545	4.0
		8.00	2	221	0.155	0.96	1.60	5.20	13530	4195	6.5
		10.00	2	221	0.176	1.20	2.00	6.50	10825	3810	9.2
		12.00	2	221	0.183	1.44	2.40	7.80	9020	3300	11.4

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
	Steel < 850 N/mm²	1.00	2	130	0.056	0.18	0.18	0.99	41992	4703	30°
		2.00	2	253	0.096	0.28	0.28	1.92	41900	8045	30°
		3.00	2	285	0.120	0.36	0.36	2.83	32072	7697	30°
		4.00	2	285	0.144	0.48	0.48	3.77	24054	6928	30°
		5.00	2	285	0.160	0.60	0.60	4.71	19243	6158	30°
		6.00	2	285	0.173	0.72	0.72	5.66	16036	5548	30°
		8.00	2	285	0.211	0.96	0.96	7.54	12027	5075	30°
		10.00	2	285	0.240	1.20	1.20	9.43	9622	4619	30°
		12.00	2	285	0.249	1.44	1.44	11.31	8018	3993	30°
	Steel 850 - 1100 N/mm²	1.00	2	130	0.051	0.18	0.18	0.99	41992	4283	30°
		2.00	2	253	0.088	0.28	0.28	1.92	41900	7374	30°
		3.00	2	265	0.110	0.36	0.36	2.83	29822	6561	30°
		4.00	2	265	0.131	0.48	0.48	3.77	22366	5860	30°
		5.00	2	265	0.146	0.60	0.60	4.71	17893	5225	30°
		6.00	2	265	0.158	0.72	0.72	5.66	14911	4712	30°
		8.00	2	265	0.194	0.96	0.96	7.54	11183	4339	30°
		10.00	2	265	0.220	1.20	1.20	9.43	8947	3937	30°
		12.00	2	265	0.229	1.44	1.44	11.31	7455	3414	30°
	Steel < 850 N/mm²	1.00	2	129	0.071	0.09	0.09	0.98	41706	5922	45°
		2.00	2	255	0.123	0.14	0.14	1.94	41885	10304	45°
		3.00	2	342	0.154	0.18	0.18	2.87	37874	11665	45°
		4.00	2	342	0.185	0.24	0.24	3.83	28405	10510	45°
		5.00	2	342	0.205	0.30	0.30	4.79	22724	9317	45°
		6.00	2	342	0.222	0.36	0.36	5.75	18937	8408	45°
		8.00	2	342	0.271	0.48	0.48	7.66	14203	7698	45°
		10.00	2	342	0.308	0.60	0.60	9.58	11362	6999	45°
		12.00	2	342	0.319	0.72	0.72	11.50	9468	6041	45°
	Steel 850 - 1100 N/mm²	1.00	2	129	0.065	0.09	0.09	0.98	41706	5422	45°
		2.00	2	255	0.112	0.14	0.14	1.94	41885	9382	45°
		3.00	2	318	0.141	0.18	0.18	2.87	35216	9931	45°
		4.00	2	318	0.168	0.24	0.24	3.83	26412	8874	45°
		5.00	2	318	0.187	0.30	0.30	4.79	21130	7903	45°
		6.00	2	318	0.203	0.36	0.36	5.75	17608	7149	45°
		8.00	2	318	0.249	0.48	0.48	7.66	13206	6577	45°
		10.00	2	318	0.282	0.60	0.60	9.58	10565	5959	45°
		12.00	2	318	0.294	0.72	0.72	11.50	8804	5177	45°
	Steel < 850 N/mm²	1.00	2	119	0.058	0.03	0.09	0.91	41812	4850	45°
		2.00	2	226	0.078	0.03	0.12	1.72	41932	6541	45°
		3.00	2	340	0.098	0.05	0.15	2.59	41725	8178	45°
		4.00	2	340	0.117	0.05	0.18	3.39	31961	7479	45°
		5.00	2	340	0.137	0.05	0.21	4.17	25963	7114	45°
		6.00	2	340	0.150	0.05	0.23	4.94	21893	6568	45°
		8.00	2	340	0.182	0.08	0.28	6.67	16227	5907	45°
		10.00	2	340	0.202	0.08	0.31	8.22	13170	5321	45°
		12.00	2	340	0.221	0.10	0.34	9.89	10947	4839	45°
	Steel 850 - 1100 N/mm²	1.00	2	119	0.058	0.03	0.09	0.91	41812	4850	45°
		2.00	2	226	0.078	0.03	0.12	1.72	41932	6541	45°
		3.00	2	320	0.098	0.05	0.15	2.59	39271	7697	45°
		4.00	2	320	0.117	0.05	0.18	3.39	30081	7039	45°
		5.00	2	320	0.137	0.05	0.21	4.17	24436	6695	45°
		6.00	2	320	0.150	0.05	0.23	4.94	20606	6182	45°
		8.00	2	320	0.182	0.08	0.28	6.67	15273	5559	45°
		10.00	2	320	0.202	0.08	0.31	8.22	12395	5008	45°
		12.00	2	320	0.221	0.10	0.34	9.89	10303	4554	45°

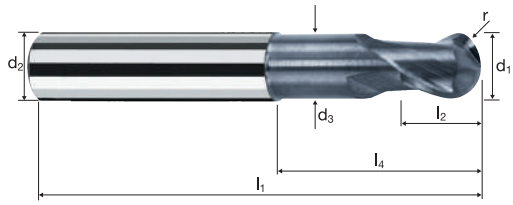
Ball nose end mills Sphericut

Tolerance r ±0.005, 3xd

Performance **P**

HM MG10 | λ **30°** γ **5°**

new!

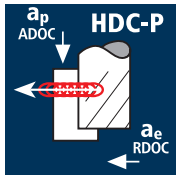
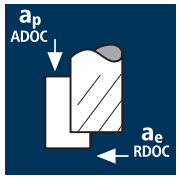
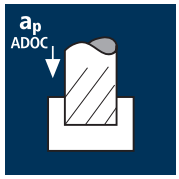


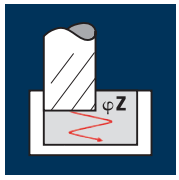
ReTool®

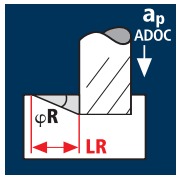
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34**

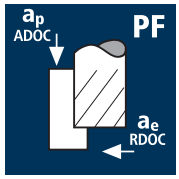
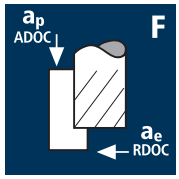
Example: **Order-N°.** Coating **K** Article-N°. **7570** ø-Code **100**

Ø Code	d1	d2 h6	d3	l1	l2	l3	l4	r ±0.005	z	MULTICHROM K7570
100	1.00	6.00	0.95	57	1.50	3.00	13.08	0.500	2	●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	1.000	2	●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	1.500	2	●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	2.000	2	●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	2.500	2	●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	2	●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	2	●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	2	●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	2	●
610	16.00	16.00	15.00	92	17.00	42.13	43.00	8.000	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	4.00	4	523	0.053	9.000	1.400	41620	8823	111.2
		5.00	4	523	0.071	11.000	1.750	33295	9456	182.0
		6.00	4	523	0.090	13.500	2.100	27745	9988	283.2
		8.00	4	523	0.127	18.000	2.800	20810	10571	532.8
		10.00	4	523	0.167	22.000	3.500	16650	11122	856.4
		12.00	4	523	0.200	27.000	4.200	13875	11100	1258.7
		16.00	4	523	0.213	36.000	5.600	10405	8865	1787.2
		20.00	4	523	0.250	44.000	7.000	8325	8325	2564.1
	Wrought aluminium Construction aluminium	4.00	4	528	0.062	6.000	1.600	42015	10420	100.0
		5.00	4	550	0.078	7.500	2.000	35015	10925	163.9
		6.00	4	550	0.093	9.000	2.400	29180	10855	234.5
		8.00	4	600	0.124	12.000	3.200	23875	11842	454.7
		10.00	4	600	0.155	15.000	4.000	19100	11842	710.5
		12.00	4	600	0.186	18.000	4.800	15915	11841	1023.1
		16.00	4	600	0.198	24.000	6.400	11935	9472	1454.9
		20.00	4	600	0.233	30.000	8.000	9550	8882	2131.7
	Wrought aluminium Construction aluminium	4.00	4	384	0.036	6.000	4.000	30560	4401	105.6
		5.00	4	384	0.045	7.500	5.000	24445	4400	165.0
		6.00	4	384	0.053	9.000	6.000	20370	4318	233.2
		8.00	4	384	0.071	12.000	8.000	15280	4340	416.6
		10.00	4	384	0.089	15.000	10.000	12225	4352	652.8
		12.00	4	384	0.107	18.000	12.000	10185	4359	941.5
		16.00	4	384	0.114	16.000	16.000	7640	3484	891.9
		20.00	4	384	0.134	20.000	20.000	6110	3275	1310.0

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
	Wrought aluminium Construction aluminium	4.00	4	528	0.062	9.000	3.600	42015	10420	10.0°
		5.00	4	550	0.078	11.000	4.500	35015	10925	10.0°
		6.00	4	550	0.093	13.500	5.400	29180	10855	10.0°
		8.00	4	600	0.124	18.000	7.200	23875	11842	10.0°
		10.00	4	600	0.155	22.000	9.000	19100	11842	10.0°
		12.00	4	600	0.186	27.000	10.800	15915	11841	10.0°
		16.00	4	600	0.198	36.000	14.400	11935	9472	10.0°
		20.00	4	600	0.233	44.000	18.000	9550	8882	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φR [°]
	Wrought aluminium Construction aluminium	4.00	4	384	0.036	6.000	4.000	30560	4401	10.0°
		5.00	4	384	0.045	7.500	5.000	24445	4400	10.0°
		6.00	4	384	0.053	9.000	6.000	20370	4318	10.0°
		8.00	4	384	0.071	12.000	8.000	15280	4340	10.0°
		10.00	4	384	0.089	15.000	10.000	12225	4352	10.0°
		12.00	4	384	0.107	18.000	12.000	10185	4359	10.0°
		16.00	4	384	0.114	16.000	16.000	7640	3484	10.0°
		20.00	4	384	0.134	20.000	20.000	6110	3275	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Wrought aluminium Construction aluminium	4.00	4	473	0.046	9.000	0.100	37640	6926
		5.00	4	473	0.051	11.000	0.160	30110	6142
		6.00	4	473	0.056	13.500	0.160	25095	5621
		8.00	4	473	0.065	18.000	0.200	18820	4893
		10.00	4	473	0.073	22.000	0.200	15055	4396
		12.00	4	473	0.080	27.000	0.240	12545	4014
		16.00	4	473	0.092	36.000	0.240	9410	3463
		20.00	4	473	0.103	44.000	0.300	7530	3102
	Wrought aluminium Construction aluminium	4.00	4	525	0.030	9.000	0.060	41780	5014
		5.00	4	525	0.034	11.000	0.100	33425	4546
		6.00	4	525	0.037	13.500	0.100	27850	4122
		8.00	4	525	0.043	18.000	0.140	20890	3593
		10.00	4	525	0.048	22.000	0.140	16710	3208
		12.00	4	525	0.053	27.000	0.170	13925	2952
		16.00	4	525	0.061	36.000	0.170	10445	2549
		20.00	4	525	0.068	44.000	0.200	8355	2273

Cylindrical/Square end mills MFC Alu

Smooth-edged, chip breaker, normal version, short neck
High-performance penetration edge, central air/cooling channel

Performance **P**

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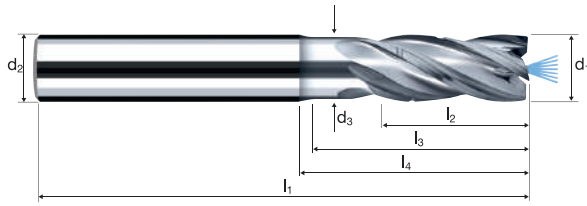
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HM
MG10

λ **30°**
γ **20°**

r

G 2.5



Roughing HPC

Roughing HDC

Finishing

ReTool®

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

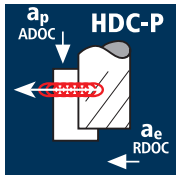
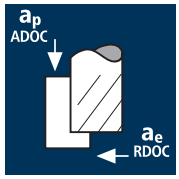
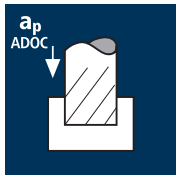
Cu Copper

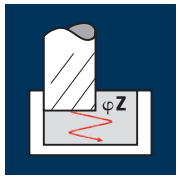
Plastic Thermoplast

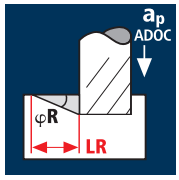
Example: **Order-N°.** Coating **8665** ø-Code **220**

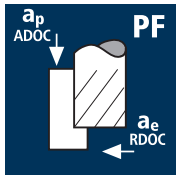
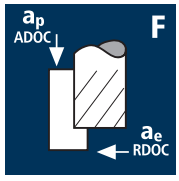
	Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	8665	8565
new!	**220***	4.00	6.00	3.70	54	9.00	12.00	14.54	0.050	4	●	
new!	**260***	5.00	6.00	4.60	57	11.00	15.00	16.72	0.100	4	●	
	300*	6.00	6.00	5.50	57	13.50	18.00	19.85	0.100	4	●	
	391*	8.00	8.00	7.40	63	18.00	24.00	26.37	0.150	4	●	
	450*	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	4	●	
	501*	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	4	●	
	610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.200	4	●	
	682	20.00	20.00	19.00	115	44.00	60.00	64.77	0.250	4	●	

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	4.00	4	521	0.042	15.000	1.000	41460	6965	104.5
		5.00	4	521	0.057	18.500	1.250	33170	7563	174.9
		6.00	4	521	0.071	22.500	1.500	27640	7850	264.9
		8.00	4	521	0.101	30.000	2.000	20730	8375	502.5
		10.00	4	521	0.132	37.000	2.500	16585	8757	810.0
		12.00	4	521	0.159	45.000	3.000	13820	8790	1186.7
		16.00	4	521	0.169	60.000	4.000	10365	7007	1681.7
		20.00	4	521	0.198	74.000	5.000	8290	6566	2429.4
	Wrought aluminium Construction aluminium	4.00	4	523	0.047	6.000	1.600	41620	7825	75.1
		5.00	4	523	0.059	7.500	2.000	33295	7858	117.9
		6.00	4	523	0.071	9.000	2.400	27745	7880	170.2
		8.00	4	570	0.094	12.000	3.200	22680	8528	327.5
		10.00	4	570	0.118	15.000	4.000	18145	8564	513.8
		12.00	4	570	0.141	18.000	4.800	15120	8528	736.8
		16.00	4	570	0.188	24.000	5.200	11340	8528	1064.3
		20.00	4	570	0.221	30.000	6.500	9070	8018	1563.5
	Wrought aluminium Construction aluminium	4.00	4	295	0.024	6.000	4.000	23475	2254	54.1
		5.00	4	295	0.030	7.500	5.000	18780	2254	84.5
		6.00	4	328	0.036	9.000	6.000	17400	2506	135.3
		8.00	4	328	0.059	12.000	8.000	13050	3080	295.7
		10.00	4	328	0.074	15.000	10.000	10440	3090	463.5
		12.00	4	328	0.088	18.000	12.000	8700	3062	661.4
		16.00	4	328	0.117	16.000	16.000	6525	3054	781.8
		20.00	4	328	0.138	20.000	20.000	5220	2881	1152.4

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
	Wrought aluminium Construction aluminium	4.00	4	523	0.047	15.000	3.600	41620	7825	10.0°
		5.00	4	523	0.059	18.500	4.500	33295	7858	10.0°
		6.00	4	523	0.071	22.500	5.400	27745	7880	10.0°
		8.00	4	570	0.094	30.000	7.200	22680	8528	10.0°
		10.00	4	570	0.118	37.000	9.000	18145	8564	10.0°
		12.00	4	570	0.141	45.000	10.800	15120	8528	10.0°
		16.00	4	570	0.188	60.000	14.400	11340	8528	10.0°
		20.00	4	570	0.221	74.000	18.000	9070	8018	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φR [°]
	Wrought aluminium Construction aluminium	4.00	4	295	0.024	6.000	4.000	23475	2254	10.0°
		5.00	4	295	0.030	7.500	5.000	18780	2254	10.0°
		6.00	4	328	0.036	9.000	6.000	17400	2506	10.0°
		8.00	4	328	0.059	12.000	8.000	13050	3080	10.0°
		10.00	4	328	0.074	15.000	10.000	10440	3090	10.0°
		12.00	4	328	0.088	18.000	12.000	8700	3062	10.0°
		16.00	4	328	0.117	16.000	16.000	6525	3054	10.0°
		20.00	4	328	0.138	20.000	20.000	5220	2881	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Wrought aluminium Construction aluminium	4.00	4	426	0.046	15.000	0.100	33900	6238
		5.00	4	426	0.051	18.500	0.160	27120	5532
		6.00	4	426	0.056	22.500	0.160	22600	5062
		8.00	4	426	0.065	30.000	0.200	16950	4407
		10.00	4	426	0.073	37.000	0.200	13560	3960
		12.00	4	426	0.080	45.000	0.240	11300	3616
		16.00	4	426	0.092	60.000	0.240	8475	3119
		20.00	4	426	0.103	74.000	0.300	6780	2793
	Wrought aluminium Construction aluminium	4.00	4	473	0.030	15.000	0.060	37640	4517
		5.00	4	473	0.034	18.500	0.100	30110	4095
		6.00	4	473	0.037	22.500	0.100	25095	3714
		8.00	4	473	0.043	30.000	0.140	18820	3237
		10.00	4	473	0.048	37.000	0.140	15055	2891
		12.00	4	473	0.053	45.000	0.170	12545	2660
		16.00	4	473	0.061	60.000	0.170	9410	2296
		20.00	4	473	0.068	74.000	0.200	7530	2048

Cylindrical/Square end mills MFC Alu

Smooth-edged, chip breaker, medium version, short neck
High-performance penetration edge, central air/cooling channel

Performance **P**

$l_2=3.7xd_1$

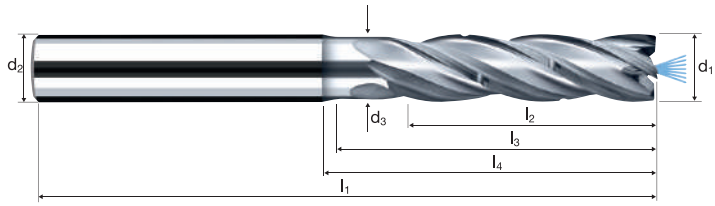
$l_3=4.5xd_1$

HM
MG10

λ **30°**
γ **20°**

r

G 2.5



Roughing HPC

Roughing HDC

Finishing

ReTool®

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

Cu Copper

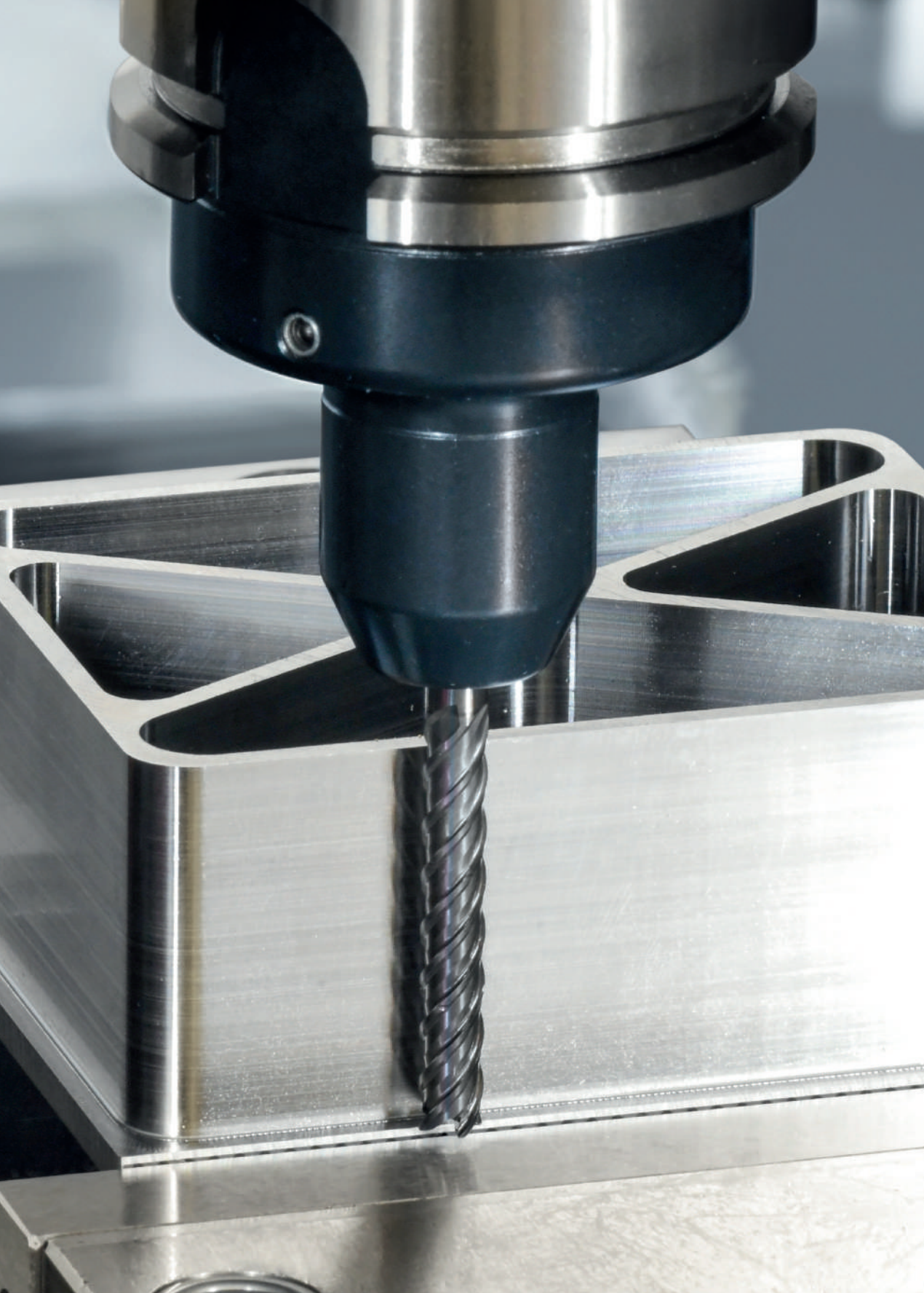
Plastic Thermoplast

Example: **Order-N°.** Coating Article-N°. ø-Code **8675** **220**

	Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	8675	8575
new!	**220***	4.00	6.00	3.70	60	15.00	18.00	20.54	0.050	4	●	
new!	**260**	5.00	6.00	4.60	63	18.50	22.50	24.22	0.100	4	●	
	300	6.00	6.00	5.50	65	22.50	27.00	28.85	0.100	4	●	
	391	8.00	8.00	7.40	76	30.00	36.00	38.37	0.150	4	●	
	450	10.00	10.00	9.20	90	37.00	45.00	48.01	0.200	4	●	
	501	12.00	12.00	11.00	105	45.00	54.00	57.71	0.200	4	●	
	610	16.00	16.00	15.00	125	60.00	72.00	76.27	0.200	4	●	
	682	20.00	20.00	19.00	145	74.00	90.00	94.77	0.250	4	●	

* without chip breaker


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Hohe Dynamik 2.5%
Aktionen
Zurück

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- Long-term goal: To reduce the ecological footprint to net zero


Free Cooling

Replace edition 2025



End milling tools for steel, stainless steel, titanium and nickel
19 – 321
I

End milling tools for 3D machining
323 – 563
II

End milling tools for aluminium and copper
565 – 667
III

End milling tools for graphite
669 – 737
IV

End milling tools with special forms
739 – 763
V

Indexable insert milling tools
767 – 815
VI

Information
ToolSchool recommends
Symbols / Formulas / Abbreviations
818 – 849
i

INDEX
850 – 856
INDEX


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End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Normal version

N° 8504 / 8604 		**HX**	X-Generation X	Roughing HPC Roughing HDC Finishing	d_1 3 – 20 r	HRC 48- >60	HSS		37
N° 8500 / 8600 		**NX**	X-Generation X	Roughing HPC Roughing HDC Finishing	d_1 4 – 20 r	Rm 850-1500 HRC 24-48	HRC 48-56	Ti Titanium	39
N° 15222 / 15322 		**NX**	X-Generation X	Roughing HPC Roughing HDC Finishing	d_1 3 – 20 45°	Rm 850-1500 HRC 24-48	HRC 48-56	Ti Titanium	41
N° 8700 / 8800 		**ZX**	X-Generation X	Roughing Finishing	d_1 3 – 20 r	Ni-/Mn-Alloys	Ti Titanium		43
N° 8705 / 8805 		**ZX**	X-Generation X	Roughing Finishing	d_1 6 – 20 r	Ni-/Mn-Alloys	Ti Titanium		45
N° 8506 / 8606 		**SX**	X-Generation X	Roughing HPC Roughing HDC Finishing	d_1 3 – 20 r	Inox Stainless			47
N° 8508 / 8608 		**SX**	X-Generation X	Roughing HPC Roughing HDC Finishing	d_1 6 – 20 r	Inox Stainless	Ni Nickel Alloy		49
N° 8101 / 8201 		**MFC**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 4 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti	51
N° 8102 / 8202 		**MFC**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 4 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti	53
N° 8105 / 8205 		**MFC**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 6 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti	55
N° 8100 / 8200 		**NVDS**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 4 – 20 r	Rm <850-1300 HRC <24-42	Inox Stainless	Ti Titanium	57
N° 8304 / 8404 		**NVS**	Performance P	Roughing Finishing	d_1 2 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless		59
N° 15207 / 15307 		**NVD**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 3 – 20 45°	Rm <850-1300 HRC <24-42	Inox Stainless	Ti Titanium	61
N° 8330 / 8430 	new!	**SteelCut**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 3 – 20 r	Rm <850 HRC <24			63
l_1 = 2.2xd, l_1 = 3.0xd,									
N° 8300 / 8400 		**E-Cut**	Performance P	Roughing HPC Roughing HDC Finishing	d_1 1 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless		65

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Normal version

N° 8305 / 8405 **E-Cut** 	Performance P	Roughing HPC Roughing HDC Finishing	d, 4 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless		67
N° 8306 / 8406 **new!** **E-Cut**  l_2 = 2.2xd, l_3 = 3.0xd,	Performance P	Roughing Finishing	d, 2 – 16 r	Rm <850-1100 HRC <24-34	Inox Stainless	Ti Titanium	69
N° 5255 / 5355 	Performance P	Roughing Finishing	d, 3 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless	Ti Titanium	71
N° 8303 / 8403 **E-Cut** 	Performance P	Roughing HPC Roughing HDC Finishing	d, 1 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless		73
N° 46200 / 46300 	Favora® F	Roughing HPC Roughing HDC Finishing	d, 1 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless		75
N° 45270 / 45370 **new!**  l_2 = 2.2xd, l_3 = 3.0xd,	Favora® F	Roughing HPC Roughing HDC Finishing	d, 6 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless		77
N° 45225 / 45325 ToolSchool 	Favora® F	Roughing HPC Roughing HDC Finishing	d, 6 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless		79
N° 45217 / 45317 ToolSchool 	Favora® F	Roughing Finishing	d, 1 – 25 45°	Rm <850-1100 HRC <24-34	Inox Stainless		81
N° 45255 / 45355 	Favora® F	Roughing Finishing	d, 3 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless	Ti Titanium	83
N° 45233 / 45333 	Favora® F	Roughing Finishing	d, 2 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless		85
N° 0111 	HSS	Roughing Finishing	d, 2 – 40 90°	Rm <850-1100 HRC <24-34			89
N° 0781 	HSS	Roughing Finishing	d, 2 – 25 90°	Rm <850-1100 HRC <24-34			93

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Normal version with neck

N° 15242 / 15342



N° 5225 / 5325



NX

X-Generation **X**	Roughing / Finishing	d, 4 – 20, 45°	**Rm** 850-1500 **HRC** 24-48	**HRC** 48-56	**Ti** Titanium	97
Performance **P**	Roughing / Finishing	d, 3 – 20, 45°	**Rm** <850-1300 **HRC** <24-42	**Inox** Stainless		99

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Medium length version

N° 8514 / 8614 	HX	X-Generation X	Roughing HPC Roughing HDC Finishing	d, 3 – 20 r	HRC 48- >60	HSS			101
N° 15223 / 15323 	NX	X-Generation X	Roughing HPC Roughing HDC Finishing	d, 4 – 20 45°	Rm 850-1500 HRC 24-48	HRC 48-56	Ti Titanium		103
N° 8516 / 8616 	SX	X-Generation X	Roughing HPC Roughing HDC Finishing	d, 3 – 20 r	Inox Stainless				105
N° 8518 / 8618 	SX	X-Generation X	Roughing HPC Roughing HDC Finishing	d, 6 – 20 r	Inox Stainless	Ni Nickel Alloy			107
N° 8111 / 8211 	MFC	Performance P	Roughing HPC Roughing HDC Finishing	d, 4 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti		109
N° 8112 / 8212 	MFC	Performance P	Roughing HPC Roughing HDC Finishing	d, 4 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti		111
N° 8115 / 8215 	MFC	Performance P	Roughing HPC Roughing HDC Finishing	d, 6 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti		113
N° 15210 / 15310 	NVD	Performance P	Roughing HPC Roughing HDC Finishing	d, 6 – 20 45°	Rm <850-1300 HRC <24-42	Inox Stainless	Ti Titanium		115
N° 15208 / 15308 	NVD	Performance P	Roughing HPC Roughing HDC Finishing	d, 4 – 20 45°	Rm <850-1300 HRC <24-42	Inox Stainless	Ti Titanium		117
N° 8340 / 8440 **new!** 	SteelCut	Performance P	Roughing HPC Roughing HDC Finishing	d, 3 – 20 r	Rm <850 HRC <24				119
l_2 = 3.7xd, l_2 = 4.5xd,									
N° 8310 / 8410 	E-Cut	Performance P	Roughing HPC Roughing HDC Finishing	d, 2 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless			121
N° 8315 / 8415 	E-Cut	Performance P	Roughing HPC Roughing HDC Finishing	d, 4 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless			123
N° 8313 / 8413 	E-Cut	Performance P	Roughing HPC Roughing HDC Finishing	d, 2 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless			125
N° 46210 / 46310 		Favora® F	Roughing HPC Roughing HDC Finishing	d, 2 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless			127
N° 45280 / 45380 **new!** 		Favora® F	Roughing HPC Roughing HDC Finishing	d, 6 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless			129
l_2 = 3.7xd,									

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Medium length version

N° 45226 / 45326 ToolSchool



N° 45234 / 45334



Favora® F	Roughing HPC Roughing HDC Finishing	d_1 6 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless			131
Favora® F	Roughing Finishing	d_1 3 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless			133

Medium length version with neck

N° 15259 / 15359 **NX**



N° 15225 / 15325



N° 15299 / 15399



N° 45282 / 45382 **new!**



l_2 = 2.2xd, l_3 = 4.5xd,

X-Generation X	Roughing Finishing	d_1 4 – 16 45°	Rm 850-1500 HRC 24-48	HRC 48-56	Ti Titanium		135
Performance P	Roughing Finishing	d_1 6 – 16 45°	Rm <850-1300 HRC <24-42				137
Performance P	Roughing Finishing	d_1 3 – 16 45°	Rm <850-1300 HRC <24-42				139
Favora® F	Roughing HPC Roughing HDC Finishing	d_1 6 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless			141

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Long version

N° 45223 / 45323 ToolSchool



Favora® F	Roughing Finishing	d, 6 – 20 45°	Rm <850-1100 HRC <24-34	Inox Stainless			143

N° 0201



HSS	Roughing Finishing	d, 2 – 40 90°	Rm <850-1100 HRC <24-34				145

5.2xd version

N° 8121 / 8221



MFC	Performance P	Roughing HPC Roughing HDC Finishing	d, 6 – 20 r	Rm <850-1500 HRC <24-48	HRC 48-56	Inox / Ti	147

N° 8320 / 8420



E-Cut	Performance P	Roughing HPC Roughing HDC Finishing	d, 3 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless		149

N° 8323 / 8423



E-Cut	Performance P	Roughing HPC Roughing HDC Finishing	d, 3 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless		151

N° 46220 / 46320



Favora® F	Roughing HPC Roughing HDC Finishing	d, 3 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless			153

6.3xd version

N° 8122 / 8222



MFC	Performance P	Roughing HPC Roughing HDC Finishing	d, 6 – 20 r	Rm <850-1500 HRC <24-48	Inox Stainless	Ti Titanium	155

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Short version

N° 5249 / 5349 ToolSchool		HX	X-Generation X	Roughing Finishing	d_1 1 – 16 45°	Rm 1300-1500 HRC 42-48	HRC 48-60		157
N° 5213 / 5313 ToolSchool		SX	X-Generation X	Roughing Finishing	d_1 3 – 16 45°	Inox Stainless			159
N° 8308 / 8408	new!	E-Cut	Performance P	Roughing Finishing	d_1 3 – 16 r	Rm <850-1500 HRC <24-38	Inox Stainless		161
		$l_2 = 1.5xd_1$							
N° 8309 / 8409	new!	E-Cut	Performance P	Roughing Finishing	d_1 1 – 10 r	Rm <850-1500 HRC <24-38	Inox Stainless		163
		$l_2 = 1.5xd_1$							
N° 5229 / 5329 ToolSchool			Performance P	Roughing Finishing	d_1 3 – 16 45°	Rm <850-1100 HRC <24-34	Inox Stainless		165
N° 5036			Performance P	Roughing Finishing	d_1 1.5 – 10 90°	Rm <850-1100 HRC <24-34	Inox Stainless		167
N° 45268 / 45368	new!		Favora® F	Roughing HPC Roughing HDC Finishing	d_1 6 – 20 r	Rm <850-1100 HRC <24-34	Inox Stainless		169
		$l_2 = 1.5xd_1$							
N° 0701			HSS	Roughing Finishing	d_1 1 – 25 90°	Rm <850-1100 HRC <24-34			171

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, with corner radius

Normal version

N° 8507 / 8607



HX

X-Generation **X**

Roughing HPC
Roughing HDC
Finishing

r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0

HRC 48- >60 | **HSS** | | 175

N° 15268 / 15368



NX

X-Generation **X**

Roughing
Finishing

r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5, 4.0

Rm 850-1500 **HRC** 24-48 | **HRC** 48-56 | **Ti** Titanium | 179

N° 8720 / 8820



ZX

X-Generation **X**

Roughing
Finishing

r 0.4, 0.5, 0.8, 1.0, 1.5, 2.0, 2.5, 4.0

Ni-/Mn- Alloys | **Ti** Titanium | | 183

N° 8107 / 8207



MFC

Performance **P**

Roughing HPC
Roughing HDC
Finishing

r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5

Rm < 850-1500 **HRC** < 24-48 | **HRC** 48-56 | **Inox** / **Ti** | 189

N° 8307 / 8407



E-Cut

Performance **P**

Roughing HPC
Roughing HDC
Finishing

r 0.2, 0.5, 0.8, 1.0, 1.5, 2.0, 2.5, 4.0

Rm < 850-1500 **HRC** < 24-48 | **Inox** Stainless | | 193

l_2 = 2.2xd, l_3 = 3.0xd,

N° 46207 / 46307



Favora® **F**

Roughing HPC
Roughing HDC
Finishing

r 0.5, 1.0, 2.0

Rm < 850-1100 **HRC** < 24-34 | **Inox** Stainless | | 199

l_2 = 2.2xd, l_3 = 3.0xd,

N° 45219 / 45319 ToolSchool



Favora® **F**

Roughing
Finishing

r 0.2, 0.5, 0.8, 1.0, 1.5, 2.0, 2.5, 4.0

Rm < 850-1100 **HRC** < 24-34 | **Inox** Stainless | | 201

Medium length version

N° 8517 / 8617



HX

X-Generation **X**

Roughing HPC
Roughing HDC
Finishing

r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0

HRC 48- >60 | **HSS** | | 207

N° 8117 / 8217



MFC

Performance **P**

Roughing HPC
Roughing HDC
Finishing

r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5

Rm < 850-1500 **HRC** < 24-48 | **HRC** 48-56 | **Inox** / **Ti** | 211

End milling tools for steel, stainless steel, titanium and nickel
Profiled, cylindrical

Normal version

N° 8302 / 8402 	**SupraCarb®**	Performance **P**	Roughing / Finishing	d_1 4 – 20, r	**Rm** <850-1100 **HRC** <24-34	**Inox** Stainless		215
N° 15236 / 15336 	**SupraCarb®**	Performance **P**	Roughing / Finishing	d_1 3 – 20, 45°	**Rm** <850-1100 **HRC** <24-34	**Inox** Stainless		217
N° 45371 		Favora® **F**	Roughing / Finishing	d_1 3 – 20, 45°	**Rm** <850-1100 **HRC** <24-34			219
N° 0541 		**HSS**	Roughing / Finishing	d_1 6 – 25, 45°	**Rm** <850-1300 **HRC** <24-42	**Inox** Stainless		221
N° 0612 		**HSS**	Roughing / Finishing	d_1 5 – 40, 45°	**Rm** <850-1100 **HRC** <24-34			223

End milling tools for steel, stainless steel, titanium and nickel
Profiled, cylindrical

Medium length version

N° 15238 / 15338



SupraCarb®

Performance **P**

Roughing
Finishing
d, 6 – 20
45°

Rm <850-1100 **HRC** <24-34

Inox Stainless

227

N° 0651



HSS

Roughing
Finishing
d, 5 – 32
45°

Rm <850-1100 **HRC** <24-34

229

Medium length version with neck

N° 15239 / 15339



SupraCarb®

Performance **P**

Roughing
Finishing
d, 6 – 20
45°

Rm <850-1100 **HRC** <24-34

Inox Stainless

231

End milling tools for steel, stainless steel, titanium and nickel
Profiled, cylindrical

Short version

N° 15260 / 15360



SupraCarb®

Performance **P**

Roughing
Finishing

d_1 3 – 16

45°

Rm <850-1100 **HRC** <24-34

Inox Stainless

233

Long version

N° 15248 / 15348



SupraCarb®

Performance **P**

Roughing
Finishing

d_1 6 – 20

45°

Rm <850-1100 **HRC** <24-34

Inox Stainless

235

N° 0666



HSS

Roughing
Finishing

d_1 6 – 40

45°

Rm <850-1100 **HRC** <24-34

237

Extra-long version with neck

N° 0622



HSS

Roughing
Finishing

d_1 6 – 25

45°

Rm 850-1300 **HRC** 24-42

239

End milling tools for steel, stainless steel, titanium and nickel
Finishing, cylindrical

Normal version

N° 15250



MulticutXF — X-Generation — Roughing, Finishing — d, 3 – 20 — 45° — Rm <850-1500 HRC <24-48 — HRC 48-60 — Inox Stainless — 241

N° 8301 / 8401



E-Cut — Performance — Roughing, Finishing — d, 3 – 20 — r — Rm <850-1500 HRC <24-48 — Inox Stainless — 243

Medium length version

N° 15251



MulticutXF — X-Generation — Roughing, Finishing — d, 3 – 20 — 45° — Rm 850-1500 HRC 24-48 — HRC 48-60 — Inox Stainless — 245

N° 8311



E-Cut — Performance — Roughing, Finishing — d, 3 – 20 — r — Rm <850-1500 HRC <24-48 — Inox Stainless — 247

Long version

N° 15254



MulticutXF — X-Generation — Roughing, Finishing — d, 6 – 20 — 45° — Rm 850-1500 HRC 24-48 — HRC 48-60 — Inox Stainless — 249

5.2xd version

N° 8521



MulticutXF — X-Generation — Roughing, Finishing — d, 6 – 20 — 45° — Rm 850-1500 HRC 24-48 — HRC 48-60 — Inox Stainless — 251

N° 8321



E-Cut — Performance — Roughing, Finishing — d, 6 – 20 — r — Rm <850-1500 HRC <24-48 — Inox Stainless — 253

6.3xd version

N° 8322



E-Cut — Performance — Roughing, Finishing — d, 6 – 20 — r — Rm <850-1500 HRC <24-48 — Inox Stainless — 255

End milling tools for steel, stainless steel, titanium and nickel
Face finishing, cylindrical

Normal version

N° 8502



NX

X-Generation **X**

Roughing
Finishing
d, 3 – 16

Rm 1300-1500 **HRC** 42-48

HRC 48-56

Inox / **Ti**

257

End milling tools for steel, stainless steel, titanium and nickel
Micro, cylindrical

Shank ø 6mm

N° 6500 	MicroX	X-Generation X	1xd	d, 0.1 – 2.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	259
N° 6501 	MicroX	X-Generation X	2xd	d, 0.1 – 2.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	261
N° 6502 	MicroX	X-Generation X	3xd	d, 0.1 – 3.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	263
N° 6503 	MicroX	X-Generation X	4xd	d, 0.1 – 2.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	265
N° 6504 	MicroX	X-Generation X	5xd	d, 0.1 – 3.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	267
N° 6505 	MicroX	X-Generation X	6xd	d, 0.2 – 2.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	269
N° 6506 	MicroX	X-Generation X	8xd	d, 0.2 – 3.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	271
N° 6508 	MicroX	X-Generation X	10xd	d, 0.2 – 3.0 	Rm 850-1500 HRC 24-48	HRC 48-60	Ti Titanium	273

End milling tools for steel, stainless steel, titanium and nickel
Micro, cylindrical

Shank ø 4mm

N° 6800 	**Microcut**	Performance **P**	**1xd**	d_1 0.2 – 2.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	275
N° 6802 	**Microcut**	Performance **P**	**3xd**	d_1 0.2 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	277
N° 6804 	**Microcut**	Performance **P**	**5xd**	d_1 0.2 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	279
N° 6807 	**Microcut**	Performance **P**	**8xd**	d_1 0.5 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	281
N° 6809 	**Microcut**	Performance **P**	**10xd**	d_1 0.5 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	283
N° 6810 	**Microcut**	Performance **P**	**12xd**	d_1 1.0 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	285
N° 6811 	**Microcut**	Performance **P**	**15xd**	d_1 1.0 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	287
N° 6812 	**Microcut**	Performance **P**	**20xd**	d_1 1.0 – 3.0 	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	289

End milling tools for steel, stainless steel, titanium and nickel
Micro, cylindrical

Shank ø 3mm

N° 5712 	**Microcut**	Performance **P**	**3xd**	d, 0.2 – 3.0  45°	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless	**Ti** Titanium	291
N° 15752 	**Microcut**	Performance **P**	**3xd**	d, 0.5 – 3.0  90°	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless	**Ti** Titanium	293
N° 5714 	**Microcut**	Performance **P**	**5xd**	d, 0.5 – 3.0  45°	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless	**Ti** Titanium	295
N° 15754 	**Microcut**	Performance **P**	**5xd**	d, 0.5 – 3.0  90°	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless	**Ti** Titanium	297
N° 5716 	**Microcut**	Performance **P**	**8xd**	d, 0.5 – 3.0  45°	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless	**Ti** Titanium	299
N° 45710 		Favora® **F**	**3xd**	d, 0.3 – 3.0  90°	**Rm** <850-1100 **HRC** <24-34			301
N° 45713 		Favora® **F**	**3xd**	d, 0.4 – 2.9  90°	**Rm** <850 **HRC** <24	**Inox** Stainless	**CuZn Gold Pl**	305

End milling tools for steel, stainless steel, titanium and nickel
Smooth-edged, cylindrical

Short-shank version

N° 15232



N° 5236 / 5336



N° 5335



N° 5237 / 5337



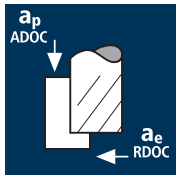
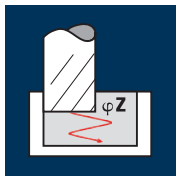
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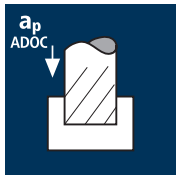
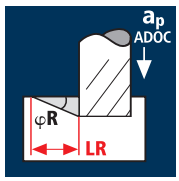


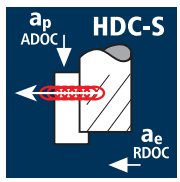
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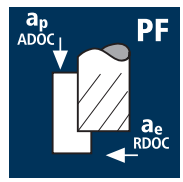


Favora® F	Roughing / Finishing; d_1 1.5 – 10; 90°	Rm <850-1100 HRC <24-34	Inox Stainless	Al CuZn Gold	309
Favora® F	Roughing / Finishing; d_1 1.5 – 10; 90°	Rm <850-1100 HRC <24-34	Inox Stainless		311
Favora® F	Roughing / Finishing; d_1 2 – 10; 45°	Rm <850-1100 HRC <24-34	Inox Stainless		313
Favora® F	Roughing / Finishing; d_1 3 – 10; 90°	Rm <850-1300 HRC <24-42	Inox Stainless		315
HSS	Roughing / Finishing; d_1 1.5 – 10; 90°	Rm <850 HRC <24			317
HSS	Roughing / Finishing; d_1 2 – 10; 90°	Rm <850 HRC <24			321

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Hardened tool steel 52 - 56 HRC	3.00	4	60	0.012	4.500	1.800	6365	306	2.5	5.0°
		4.00	4	60	0.017	6.000	2.400	4775	325	4.7	5.0°
		5.00	4	60	0.022	7.500	3.000	3820	336	7.6	5.0°
		6.00	4	60	0.027	9.000	3.600	3185	344	11.1	5.0°
		8.00	4	60	0.035	12.000	4.800	2385	334	19.2	5.0°
		10.00	4	60	0.045	15.000	6.000	1910	344	30.9	5.0°
		12.00	4	60	0.055	18.000	7.200	1590	350	45.3	5.0°
		16.00	4	60	0.065	24.000	9.600	1195	311	71.6	5.0°
		20.00	4	60	0.080	30.000	12.000	955	306	110.0	5.0°
	Hardened tool steel > 60 HRC	3.00	4	25	0.006	3.750	1.800	2655	64	0.4	3.0°
		4.00	4	25	0.008	5.000	2.400	1990	64	0.8	4.0°
		5.00	4	25	0.010	6.250	3.000	1590	64	1.2	5.0°
		6.00	4	25	0.012	7.500	3.600	1325	64	1.7	5.0°
		8.00	4	25	0.015	10.000	4.800	995	60	2.9	5.0°
		10.00	4	25	0.020	12.500	6.000	795	64	4.8	5.0°
		12.00	4	25	0.025	15.000	7.200	665	67	7.2	5.0°
		16.00	4	25	0.030	20.000	9.600	495	59	11.4	5.0°
		20.00	4	25	0.035	25.000	12.000	400	56	16.8	3.0°
	High speed steel, hardened 64 - 70 HRC	3.00	4	15	0.005	3.000	0.750	1590	32	0.1	3.0°
		4.00	4	15	0.009	4.000	1.000	1195	43	0.2	4.0°
		5.00	4	15	0.012	5.000	1.250	955	46	0.3	5.0°
		6.00	4	15	0.009	6.000	3.600	795	29	0.6	5.0°
		8.00	4	15	0.012	8.000	4.800	595	29	1.1	5.0°
		10.00	4	15	0.015	10.000	6.000	475	29	1.7	5.0°
		12.00	4	15	0.018	12.000	7.200	400	29	2.5	5.0°
		16.00	4	15	0.023	16.000	9.600	300	28	4.2	5.0°
		20.00	4	15	0.025	20.000	12.000	240	24	5.8	3.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Hardened tool steel 52 - 56 HRC	3.00	4	50	0.013	3.000	3.000	5305	276	2.5	5.0°	34.3
		4.00	4	50	0.017	4.000	4.000	3980	271	4.3	5.0°	45.7
		5.00	4	50	0.022	5.000	5.000	3185	280	7.0	5.0°	57.2
		6.00	4	50	0.027	6.000	6.000	2655	287	10.3	5.0°	68.6
		8.00	4	50	0.035	8.000	8.000	1990	279	17.8	5.0°	91.4
		10.00	4	50	0.045	10.000	10.000	1590	286	28.6	5.0°	114.3
		12.00	4	50	0.055	12.000	12.000	1325	292	42.0	5.0°	137.2
		16.00	4	50	0.080	8.000	16.000	995	318	40.8	5.0°	91.4
		20.00	4	50	0.095	10.000	20.000	795	302	60.4	5.0°	114.3
	Hardened tool steel > 60 HRC	3.00	4	20	0.007	3.000	3.000	2120	59	0.5	3.0°	57.2
		4.00	4	20	0.010	4.000	4.000	1590	64	1.0	4.0°	57.2
		5.00	4	20	0.013	5.000	5.000	1275	66	1.7	5.0°	57.2
		6.00	4	20	0.016	6.000	6.000	1060	68	2.4	5.0°	68.6
		8.00	4	20	0.021	8.000	8.000	795	67	4.3	5.0°	91.4
		10.00	4	20	0.026	10.000	10.000	635	66	6.6	5.0°	114.3
		12.00	4	20	0.032	12.000	12.000	530	68	9.8	5.0°	137.2
		16.00	4	20	0.050	8.000	16.000	400	80	10.2	5.0°	91.4
		20.00	4	20	0.060	10.000	20.000	320	77	15.4	3.0°	190.8
	High speed steel, hardened 64 - 70 HRC	3.00	4	10	0.004	1.500	3.000	1060	17	0.1	3.0°	28.6
		4.00	4	10	0.006	2.000	4.000	795	19	0.2	4.0°	28.6
		5.00	4	10	0.008	3.750	5.000	635	20	0.4	5.0°	42.9
		6.00	4	10	0.009	4.500	6.000	530	19	0.5	5.0°	51.4
		8.00	4	10	0.012	6.000	8.000	400	19	0.9	5.0°	68.6
		10.00	4	10	0.015	7.500	10.000	320	19	1.4	5.0°	85.7
		12.00	4	10	0.020	9.000	12.000	265	21	2.3	5.0°	102.9
		16.00	4	10	0.030	8.000	16.000	200	24	3.1	5.0°	91.4
		20.00	4	10	0.035	10.000	20.000	160	22	4.5	3.0°	190.8





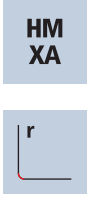
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills HX

Smooth-edged, normal version, short neck
High-performance penetration edge

HM XA

λ 45°
γ -10°



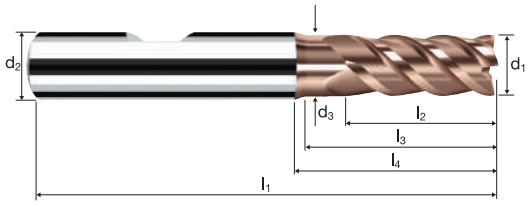












Roughing HPC



Roughing HDC



Finishing



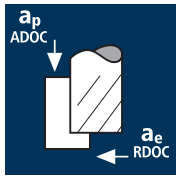
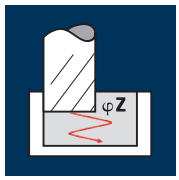
ReTool®

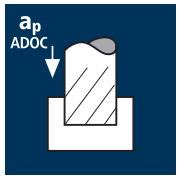
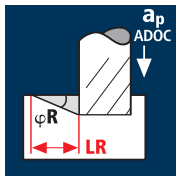
HRC 48-56 | **HRC 56-60** | **HRC > 60** | **HSS**

Example: **Order-N°.** Coating **H** | Article-N°. **8604** | ø-Code **180**



Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	DURO-Si H8604	DURO-Si H8504
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.100	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.150	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	38.00	48.23	53.00	0.200	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm²	4.00	4	150	0.030	6.000	1.600	11935	1432	13.7	20.0°
		5.00	4	150	0.035	7.500	2.000	9550	1337	20.1	20.0°
		6.00	4	150	0.040	9.000	2.400	7960	1274	27.5	20.0°
		8.00	4	150	0.050	12.000	3.200	5970	1194	45.8	20.0°
		10.00	4	150	0.065	15.000	4.000	4775	1242	74.5	20.0°
		12.00	4	150	0.075	18.000	4.800	3980	1194	103.2	20.0°
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9	20.0°
		20.00	4	150	0.100	30.000	8.000	2385	954	229.0	20.0°
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.030	6.000	1.600	9150	1098	10.5	17.5°
		5.00	4	115	0.035	7.500	2.000	7320	1025	15.4	17.5°
		6.00	4	115	0.040	9.000	2.400	6100	976	21.1	17.5°
		8.00	4	115	0.050	12.000	3.200	4575	915	35.1	17.5°
		10.00	4	115	0.065	15.000	4.000	3660	952	57.1	17.5°
		12.00	4	115	0.075	18.000	4.800	3050	915	79.1	17.5°
		16.00	4	115	0.085	24.000	6.400	2290	779	119.6	17.5°
		20.00	4	115	0.100	30.000	8.000	1830	732	175.7	17.5°
	Hardened tool steel 52 - 56 HRC	4.00	4	50	0.015	6.000	1.600	3980	239	2.3	15.0°
		5.00	4	50	0.020	7.500	2.000	3185	255	3.8	15.0°
		6.00	4	50	0.025	9.000	2.400	2655	266	5.7	15.0°
		8.00	4	50	0.030	12.000	3.200	1990	239	9.2	15.0°
		10.00	4	50	0.035	15.000	4.000	1590	223	13.4	15.0°
		12.00	4	50	0.045	18.000	4.800	1325	239	20.6	15.0°
		16.00	4	50	0.055	24.000	6.400	995	219	33.6	15.0°
		20.00	4	50	0.070	30.000	8.000	795	223	53.4	15.0°
	Titanium alloys >300 HB [Ti6Al4V]	4.00	4	60	0.020	6.000	1.600	4775	382	3.7	12.0°
		5.00	4	60	0.025	7.500	2.000	3820	382	5.7	12.0°
		6.00	4	60	0.030	9.000	2.400	3185	382	8.3	12.0°
		8.00	4	60	0.040	12.000	3.200	2385	382	14.7	12.0°
		10.00	4	60	0.045	15.000	4.000	1910	344	20.6	12.0°
		12.00	4	60	0.055	18.000	4.800	1590	350	30.2	12.0°
		16.00	4	60	0.065	24.000	6.400	1195	311	47.7	12.0°
		20.00	4	60	0.080	30.000	8.000	955	306	73.3	12.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm²	4.00	4	120	0.025	5.000	4.000	9550	955	19.1	32.0°	8.0
		5.00	4	120	0.025	6.250	5.000	7640	764	23.9	32.0°	10.1
		6.00	4	120	0.030	7.500	6.000	6365	764	34.4	32.0°	12.0
		8.00	4	120	0.040	10.000	8.000	4775	764	61.1	32.0°	16.0
		10.00	4	120	0.050	12.500	10.000	3820	764	95.5	32.0°	20.0
		12.00	4	120	0.055	15.000	12.000	3185	701	126.1	32.0°	24.0
		16.00	4	120	0.065	20.000	16.000	2385	620	198.4	32.0°	32.0
		20.00	4	120	0.075	25.000	20.000	1910	573	286.5	32.0°	40.0
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.025	5.000	4.000	7160	716	14.3	28.0°	9.4
		5.00	4	90	0.025	6.250	5.000	5730	573	17.9	28.0°	11.8
		6.00	4	90	0.030	7.500	6.000	4775	573	25.8	28.0°	14.1
		8.00	4	90	0.040	10.000	8.000	3580	573	45.8	28.0°	18.8
		10.00	4	90	0.050	12.500	10.000	2865	573	71.6	28.0°	23.5
		12.00	4	90	0.055	15.000	12.000	2385	525	94.4	28.0°	28.2
		16.00	4	90	0.065	20.000	16.000	1790	465	148.9	28.0°	37.6
		20.00	4	90	0.075	25.000	20.000	1430	429	214.5	28.0°	47.0
	Hardened tool steel 52 - 56 HRC	4.00	4	40	0.010	5.000	4.000	3185	127	2.5	24.0°	11.2
		5.00	4	40	0.015	6.250	5.000	2545	153	4.8	24.0°	14.2
		6.00	4	40	0.020	7.500	6.000	2120	170	7.6	24.0°	16.8
		8.00	4	40	0.025	10.000	8.000	1590	159	12.7	24.0°	22.5
		10.00	4	40	0.025	12.500	10.000	1275	128	15.9	24.0°	28.1
		12.00	4	40	0.035	15.000	12.000	1060	148	26.7	24.0°	33.7
		16.00	4	40	0.040	20.000	16.000	795	127	40.7	24.0°	44.9
		20.00	4	40	0.055	25.000	20.000	635	140	69.9	24.0°	56.2
	Titanium alloys >300 HB [Ti6Al4V]	4.00	4	50	0.015	5.000	4.000	3980	239	4.8	19.0°	14.5
		5.00	4	50	0.020	6.250	5.000	3185	255	8.0	19.0°	18.3
		6.00	4	50	0.025	7.500	6.000	2655	266	11.9	19.0°	21.8
		8.00	4	50	0.030	10.000	8.000	1990	239	19.1	19.0°	29.0
		10.00	4	50	0.035	12.500	10.000	1590	223	27.8	19.0°	36.3
		12.00	4	50	0.040	15.000	12.000	1325	212	38.2	19.0°	43.6
		16.00	4	50	0.050	20.000	16.000	995	199	63.7	19.0°	58.1
		20.00	4	50	0.060	25.000	20.000	795	191	95.4	19.0°	72.6

Cylindrical/Square end mills NX

Smooth-edged, normal version, short neck
High-performance penetration edge

X-Generation

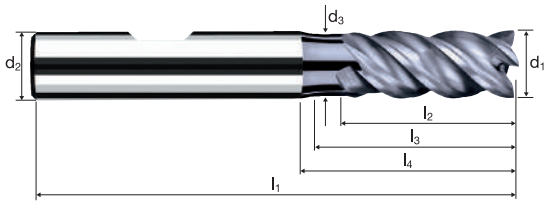
I

HM
MG10

λ 45°
γ -20°

r

Vario



Roughing HPC

Roughing HDC

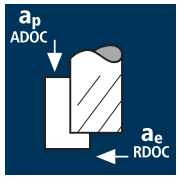
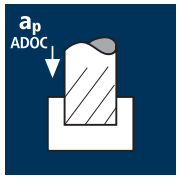
Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** | Article-N°. **8600** | ø-Code **220**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8600	POLYCHROM P8500
220	4.00	6.00	3.70	57	8.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	10.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	12.00	18.15	20.00	0.100	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	4.00	4	150	0.030	6.000	1.600	11935	1432	13.7
		5.00	4	150	0.035	7.500	2.000	9550	1337	20.1
		6.00	4	150	0.040	9.000	2.400	7960	1274	27.5
		8.00	4	150	0.050	12.000	3.200	5970	1194	45.8
		10.00	4	150	0.065	15.000	4.000	4775	1242	74.5
		12.00	4	150	0.075	18.000	4.800	3980	1194	103.2
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9
		20.00	4	150	0.100	30.000	8.000	2385	954	229.0
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.030	6.000	1.600	9150	1098	10.5
		5.00	4	115	0.035	7.500	2.000	7320	1025	15.4
		6.00	4	115	0.040	9.000	2.400	6100	976	21.1
		8.00	4	115	0.050	12.000	3.200	4575	915	35.1
		10.00	4	115	0.065	15.000	4.000	3660	952	57.1
		12.00	4	115	0.075	18.000	4.800	3050	915	79.1
		16.00	4	115	0.085	24.000	6.400	2290	779	119.6
		20.00	4	115	0.100	30.000	8.000	1830	732	175.7
	Hardened tool steel 52 - 56 HRC	4.00	4	50	0.015	6.000	1.600	3980	239	2.3
		5.00	4	50	0.020	7.500	2.000	3185	255	3.8
		6.00	4	50	0.025	9.000	2.400	2655	266	5.7
		8.00	4	50	0.030	12.000	3.200	1990	239	9.2
		10.00	4	50	0.035	15.000	4.000	1590	223	13.4
		12.00	4	50	0.045	18.000	4.800	1325	239	20.6
		16.00	4	50	0.055	24.000	6.400	995	219	33.6
		20.00	4	50	0.070	30.000	8.000	795	223	53.4
	Titanium alloys >300 HB [Ti6Al4V]	4.00	4	60	0.020	6.000	1.600	4775	382	3.7
		5.00	4	60	0.025	7.500	2.000	3820	382	5.7
		6.00	4	60	0.030	9.000	2.400	3185	382	8.3
		8.00	4	60	0.040	12.000	3.200	2385	382	14.7
		10.00	4	60	0.045	15.000	4.000	1910	344	20.6
		12.00	4	60	0.055	18.000	4.800	1590	350	30.2
		16.00	4	60	0.065	24.000	6.400	1195	311	47.7
		20.00	4	60	0.080	30.000	8.000	955	306	73.3
	Steel 850 - 1100 N/mm²	4.00	4	120	0.025	5.000	4.000	9550	955	19.1
		5.00	4	120	0.025	6.250	5.000	7640	764	23.9
		6.00	4	120	0.030	7.500	6.000	6365	764	34.4
		8.00	4	120	0.040	10.000	8.000	4775	764	61.1
		10.00	4	120	0.050	12.500	10.000	3820	764	95.5
		12.00	4	120	0.055	15.000	12.000	3185	701	126.1
		16.00	4	120	0.065	20.000	16.000	2385	620	198.4
		20.00	4	120	0.075	25.000	20.000	1910	573	286.5
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.025	5.000	4.000	7160	716	14.3
		5.00	4	90	0.025	6.250	5.000	5730	573	17.9
		6.00	4	90	0.030	7.500	6.000	4775	573	25.8
		8.00	4	90	0.040	10.000	8.000	3580	573	45.8
		10.00	4	90	0.050	12.500	10.000	2865	573	71.6
		12.00	4	90	0.055	15.000	12.000	2385	525	94.4
		16.00	4	90	0.065	20.000	16.000	1790	465	148.9
		20.00	4	90	0.075	25.000	20.000	1430	429	214.5
	Hardened tool steel 52 - 56 HRC	4.00	4	40	0.010	5.000	4.000	3185	127	2.5
		5.00	4	40	0.015	6.250	5.000	2545	153	4.8
		6.00	4	40	0.020	7.500	6.000	2120	170	7.6
		8.00	4	40	0.025	10.000	8.000	1590	159	12.7
		10.00	4	40	0.025	12.500	10.000	1275	128	15.9
		12.00	4	40	0.035	15.000	12.000	1060	148	26.7
		16.00	4	40	0.040	20.000	16.000	795	127	40.7
		20.00	4	40	0.055	25.000	20.000	635	140	69.9
	Titanium alloys >300 HB [Ti6Al4V]	4.00	4	50	0.015	5.000	4.000	3980	239	4.8
		5.00	4	50	0.020	6.250	5.000	3185	255	8.0
		6.00	4	50	0.025	7.500	6.000	2655	266	11.9
		8.00	4	50	0.030	10.000	8.000	1990	239	19.1
		10.00	4	50	0.035	12.500	10.000	1590	223	27.8
		12.00	4	50	0.040	15.000	12.000	1325	212	38.2
		16.00	4	50	0.050	20.000	16.000	995	199	63.7
		20.00	4	50	0.060	25.000	20.000	795	191	95.4

Cylindrical/Square end mills NX

Smooth-edged, normal version

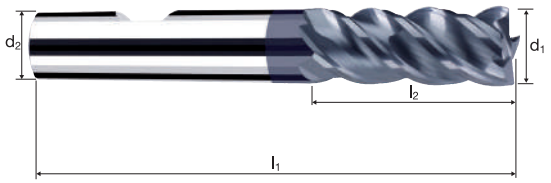
X-Generation X

HM MG10

λ 45°
γ -20°

45°

Vario



Roughing HPC

Roughing HDC

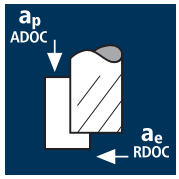
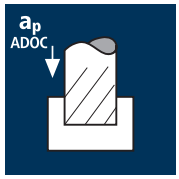
Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15322** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z		POLYCHROM P15322	P15222
180	3.00	6.00	57	8.00	15.56	0.05	4			●
220	4.00	6.00	57	8.00	14.59	0.05	4			●
260	5.00	6.00	57	10.00	14.72	0.10	4			●
300	6.00	6.00	57	12.00	-	0.10	4			●
391	8.00	8.00	63	19.00	-	0.10	4			●
450	10.00	10.00	72	23.00	-	0.15	4			●
501	12.00	12.00	83	27.00	-	0.15	4			●
610	16.00	16.00	92	32.00	-	0.15	4			●
682	20.00	20.00	104	39.00	-	0.15	4			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Nickel-based alloys annealed Rm <1000 N/mm² [Inconel 718]	3.00	4	35	0.010	5.400	1.800	3715	149	1.4
		4.00	4	35	0.015	7.200	2.400	2785	167	2.9
		5.00	4	35	0.020	9.000	3.000	2230	178	4.8
		6.00	4	35	0.020	10.800	3.600	1855	148	5.8
		8.00	4	35	0.030	14.400	4.800	1395	167	11.6
		10.00	4	35	0.035	18.000	6.000	1115	156	16.9
		12.00	4	35	0.045	21.600	7.200	930	167	26.0
		16.00	4	35	0.050	28.800	9.600	695	139	38.4
		20.00	4	35	0.060	36.000	12.000	555	133	57.5
	Nickel-based alloys precipitation hardened Rm >1000 N/mm² [Inconel 718]	3.00	4	25	0.010	5.400	1.800	2655	106	1.0
		4.00	4	25	0.010	7.200	2.400	1990	80	1.4
		5.00	4	25	0.015	9.000	3.000	1590	95	2.6
		6.00	4	25	0.015	10.800	3.600	1325	80	3.1
		8.00	4	25	0.025	14.400	4.800	995	100	6.9
		10.00	4	25	0.030	18.000	6.000	795	95	10.3
		12.00	4	25	0.035	21.600	7.200	665	93	14.5
		16.00	4	25	0.040	28.800	9.600	495	79	21.9
		20.00	4	25	0.050	36.000	12.000	400	80	34.6
	Manganese steel Mn >5% [1.3964 / Nitronic] [1.3401 / X120Mn12]	3.00	4	40	0.010	5.400	1.800	4245	170	1.7
		4.00	4	40	0.015	7.200	2.400	3185	191	3.3
		5.00	4	40	0.020	9.000	3.000	2545	204	5.5
		6.00	4	40	0.020	10.800	3.600	2120	170	6.6
		8.00	4	40	0.030	14.400	4.800	1590	191	13.2
		10.00	4	40	0.035	18.000	6.000	1275	179	19.3
		12.00	4	40	0.045	21.600	7.200	1060	191	29.7
		16.00	4	40	0.050	28.800	9.600	795	159	44.0
		20.00	4	40	0.060	36.000	12.000	635	152	65.8
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	50	0.015	5.400	1.800	5305	318	3.1
		4.00	4	50	0.020	7.200	2.400	3980	318	5.5
		5.00	4	50	0.030	9.000	3.000	3185	382	10.3
		6.00	4	50	0.035	10.800	3.600	2655	372	14.5
		8.00	4	50	0.045	14.400	4.800	1990	358	24.8
		10.00	4	50	0.055	18.000	6.000	1590	350	37.8
		12.00	4	50	0.065	21.600	7.200	1325	345	53.6
		16.00	4	50	0.070	28.800	9.600	995	279	77.0
		20.00	4	50	0.085	36.000	12.000	795	270	116.8
	PM high-speed steel annealed [Böhler S390] [ASP 2023]	3.00	4	80	0.010	5.400	1.800	8490	340	3.3
		4.00	4	80	0.015	7.200	2.400	6365	382	6.6
		5.00	4	80	0.020	9.000	3.000	5095	408	11.0
		6.00	4	80	0.020	10.800	3.600	4245	340	13.2
		8.00	4	80	0.030	14.400	4.800	3185	382	26.4
		10.00	4	80	0.035	18.000	6.000	2545	356	38.5
		12.00	4	80	0.045	21.600	7.200	2120	382	59.3
		16.00	4	80	0.050	28.800	9.600	1590	318	87.9
		20.00	4	80	0.060	36.000	12.000	1275	306	132.2
	Titanium alloys >300 HB [Ti6Al4V]	3.00	4	70	0.010	5.400	1.800	7425	297	2.9
		4.00	4	70	0.015	7.200	2.400	5570	334	5.8
		5.00	4	70	0.015	9.000	3.000	4455	267	7.2
		6.00	4	70	0.020	10.800	3.600	3715	297	11.6
		8.00	4	70	0.025	14.400	4.800	2785	279	19.2
		10.00	4	70	0.035	18.000	6.000	2230	312	33.7
		12.00	4	70	0.040	21.600	7.200	1855	297	46.2
		16.00	4	70	0.045	28.800	9.600	1395	251	69.4
		20.00	4	70	0.055	36.000	12.000	1115	245	106.0
	Nickel-based alloys annealed Rm <1000 N/mm² [Inconel 718]	3.00	4	25	0.010	4.200	3.000	2655	106	1.3
		4.00	4	25	0.010	5.600	4.000	1990	80	1.8
		5.00	4	25	0.015	7.000	5.000	1590	95	3.3
		6.00	4	25	0.015	8.400	6.000	1325	80	4.0
		8.00	4	25	0.025	11.200	8.000	995	100	8.9
		10.00	4	25	0.030	14.000	10.000	795	95	13.4
		12.00	4	25	0.035	16.800	12.000	665	93	18.8
		16.00	4	25	0.040	22.400	16.000	495	79	28.4
		20.00	4	25	0.050	28.000	20.000	400	80	44.8
	Nickel-based alloys precipitation hardened Rm >1000 N/mm² [Inconel 718]	3.00	4	20	0.005	4.200	3.000	2120	42	0.5
		4.00	4	20	0.010	5.600	4.000	1590	64	1.4
		5.00	4	20	0.010	7.000	5.000	1275	51	1.8
		6.00	4	20	0.015	8.400	6.000	1060	64	3.2
		8.00	4	20	0.020	11.200	8.000	795	64	5.7
		10.00	4	20	0.020	14.000	10.000	635	51	7.1
		12.00	4	20	0.025	16.800	12.000	530	53	10.7
		16.00	4	20	0.030	22.400	16.000	400	48	17.2
		20.00	4	20	0.040	28.000	20.000	320	51	28.7

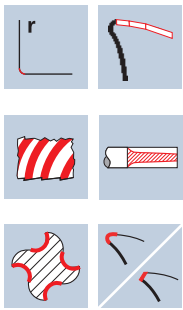
Cylindrical/Square end mills ZX

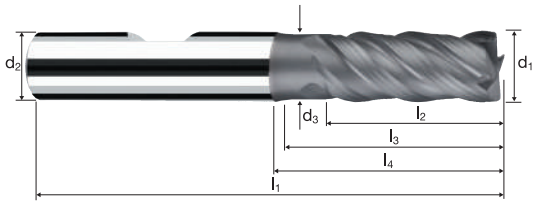
Smooth-edged, normal version, short neck

X-Generation

I

HM MG10 | λ 40° γ 5°





Roughing

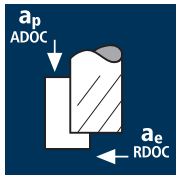
Finishing

ReTool®

Inox Stainless | **Ti** Titanium | **Nickel-Alloys Mangan-Steels HSS**

Example: **Order-N°.** Coating **P** Article-N°. **8800** ø-Code **180**

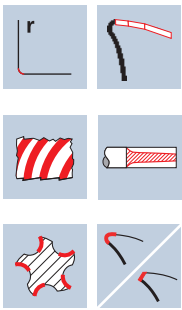
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8800	POLYCHROM P8700
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.100	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.150	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.150	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.300	4		●
682	20.00	20.00	19.00	104	38.00	48.23	53.00	0.300	4		●

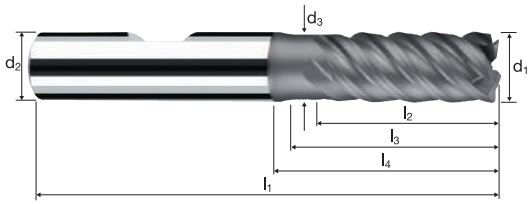
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Nickel-based alloys annealed Rm <1000 N/mm² [Inconel 718]	6.00	5	45	0.020	10.800	1.200	2385	239	3.1
		8.00	5	45	0.030	14.400	1.600	1790	269	6.2
		10.00	5	45	0.035	18.000	2.000	1430	250	9.0
		12.00	5	45	0.045	21.600	2.400	1195	269	13.9
		16.00	5	45	0.050	28.800	3.200	895	224	20.6
		20.00	5	45	0.060	36.000	4.000	715	215	30.9
	Nickel-based alloys precipitation hardened Rm >1000 N/mm² [Inconel 718]	6.00	5	30	0.015	10.800	1.200	1590	119	1.5
		8.00	5	30	0.025	14.400	1.600	1195	149	3.4
		10.00	5	30	0.030	18.000	2.000	955	143	5.2
		12.00	5	30	0.035	21.600	2.400	795	139	7.2
		16.00	5	30	0.040	28.800	3.200	595	119	11.0
		20.00	5	30	0.050	36.000	4.000	475	119	17.1
	Manganese steel Mn >5% [1.3964 / Nitronic] [1.3401 / X120Mn12]	6.00	5	50	0.020	10.800	1.200	2655	266	3.4
		8.00	5	50	0.030	14.400	1.600	1990	299	6.9
		10.00	5	50	0.035	18.000	2.000	1590	278	10.0
		12.00	5	50	0.045	21.600	2.400	1325	298	15.5
		16.00	5	50	0.050	28.800	3.200	995	249	22.9
		20.00	5	50	0.060	36.000	4.000	795	239	34.3
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	6.00	5	60	0.035	10.800	1.200	3185	557	7.2
		8.00	5	60	0.045	14.400	1.600	2385	537	12.4
		10.00	5	60	0.055	18.000	2.000	1910	525	18.9
		12.00	5	60	0.065	21.600	2.400	1590	517	26.8
		16.00	5	60	0.070	28.800	3.200	1195	418	38.6
		20.00	5	60	0.085	36.000	4.000	955	406	58.4
	PM high-speed steel annealed [Böhler S390] [ASP 2023]	6.00	5	90	0.020	10.800	1.200	4775	478	6.2
		8.00	5	90	0.030	14.400	1.600	3580	537	12.4
		10.00	5	90	0.035	18.000	2.000	2865	501	18.1
		12.00	5	90	0.045	21.600	2.400	2385	537	27.8
		16.00	5	90	0.050	28.800	3.200	1790	448	41.2
		20.00	5	90	0.060	36.000	4.000	1430	429	61.8
	Titanium alloys >300 HB [Ti6Al4V]	6.00	5	85	0.020	10.800	1.200	4510	451	5.8
		8.00	5	85	0.025	14.400	1.600	3380	423	9.7
		10.00	5	85	0.035	18.000	2.000	2705	473	17.0
		12.00	5	85	0.040	21.600	2.400	2255	451	23.4
		16.00	5	85	0.045	28.800	3.200	1690	380	35.0
		20.00	5	85	0.055	36.000	4.000	1355	373	53.7

Cylindrical/Square end mills ZX

Smooth-edged, normal version, short neck

HM MG10 | λ 40° γ 5°





Roughing

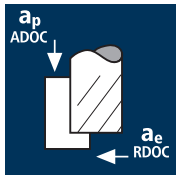
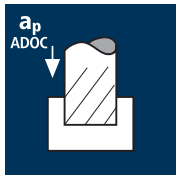
Finishing

ReTool®

Inox Stainless | **Ti** Titanium | **Nickel-Alloys Mangan-Steels HSS**

Example: **Order-N°.** Coating **P** | Article-N°. **8805** | ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8805	POLYCHROM P8705
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.150	5		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	5		●
450	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	5		●
501	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	5		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.300	5		●
682	20.00	20.00	19.00	104	38.00	48.23	53.00	0.300	5		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	96	0.015	3.750	1.200	10185	611	2.7
		4.00	4	96	0.020	5.000	1.600	7640	611	4.9
		5.00	4	80	0.023	6.250	3.250	5095	469	9.5
		6.00	4	80	0.027	9.000	3.900	4245	459	16.1
		8.00	4	80	0.036	12.000	5.200	3185	459	28.6
		10.00	4	80	0.045	15.000	6.500	2545	458	44.7
		12.00	4	80	0.054	18.000	7.800	2120	458	64.3
		16.00	4	80	0.064	20.000	10.400	1590	407	84.7
		20.00	4	80	0.080	25.000	13.000	1275	408	132.6
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	65	0.014	3.750	1.200	6895	386	1.7
		4.00	4	65	0.018	5.000	1.600	5175	373	3.0
		5.00	4	59	0.023	6.250	3.250	3755	346	7.0
		6.00	4	59	0.027	9.000	3.900	3130	338	11.9
		8.00	4	59	0.036	12.000	5.200	2350	338	21.1
		10.00	4	59	0.045	15.000	6.500	1880	338	33.0
		12.00	4	59	0.054	18.000	7.800	1565	338	47.5
		16.00	4	59	0.064	20.000	10.400	1175	301	62.6
		20.00	4	59	0.080	25.000	13.000	940	301	97.8
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	48	0.014	3.750	1.200	5095	285	1.3
		4.00	4	48	0.018	5.000	1.600	3820	275	2.2
		5.00	4	44	0.020	6.250	3.250	2800	224	4.6
		6.00	4	44	0.024	9.000	3.900	2335	224	7.9
		8.00	4	44	0.032	12.000	5.200	1750	224	14.0
		10.00	4	44	0.040	15.000	6.500	1400	224	21.8
		12.00	4	44	0.048	18.000	7.800	1165	224	31.4
		16.00	4	44	0.056	20.000	10.400	875	196	40.8
		20.00	4	44	0.070	25.000	13.000	700	196	63.7
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	122	0.020	3.750	1.200	12945	1036	4.7
		4.00	4	122	0.026	5.000	1.600	9710	1010	8.1
		5.00	4	102	0.030	6.250	3.250	6495	779	15.8
		6.00	4	102	0.036	9.000	3.900	5410	779	27.3
		8.00	4	102	0.048	12.000	5.200	4060	780	48.6
		10.00	4	102	0.060	15.000	6.500	3245	779	75.9
		12.00	4	102	0.072	18.000	7.800	2705	779	109.4
		16.00	4	102	0.088	20.000	10.400	2030	715	148.6
		20.00	4	102	0.110	25.000	13.000	1625	715	232.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	70	0.009	2.250	3.000	7425	267	1.8
		4.00	4	70	0.012	3.000	4.000	5570	267	3.2
		5.00	4	70	0.015	6.250	5.000	4455	267	8.4
		6.00	4	70	0.022	9.000	6.000	3715	327	17.7
		8.00	4	70	0.029	12.000	8.000	2785	323	31.0
		10.00	4	70	0.036	15.000	10.000	2230	321	48.2
		12.00	4	70	0.043	18.000	12.000	1855	319	68.9
		16.00	4	70	0.051	20.000	16.000	1395	285	91.1
		20.00	4	70	0.064	25.000	20.000	1115	285	142.7
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	52	0.008	2.250	3.000	5515	177	1.2
		4.00	4	52	0.011	3.000	4.000	4140	182	2.2
		5.00	4	52	0.015	6.250	5.000	3310	199	6.2
		6.00	4	52	0.022	9.000	6.000	2760	243	13.1
		8.00	4	52	0.029	12.000	8.000	2070	240	23.0
		10.00	4	52	0.036	15.000	10.000	1655	238	35.7
		12.00	4	52	0.043	18.000	12.000	1380	237	51.3
		16.00	4	52	0.051	20.000	16.000	1035	211	67.6
		20.00	4	52	0.064	25.000	20.000	830	213	106.3
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	39	0.008	2.250	3.000	4140	133	0.9
		4.00	4	39	0.011	3.000	4.000	3105	137	1.6
		5.00	4	39	0.013	6.250	5.000	2485	129	4.0
		6.00	4	39	0.019	9.000	6.000	2070	157	8.5
		8.00	4	39	0.026	12.000	8.000	1550	161	15.5
		10.00	4	39	0.032	15.000	10.000	1240	159	23.8
		12.00	4	39	0.038	18.000	12.000	1035	157	34.0
		16.00	4	39	0.045	20.000	16.000	775	140	44.6
		20.00	4	39	0.056	25.000	20.000	620	139	69.5
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	89	0.009	2.250	3.000	9445	340	2.3
		4.00	4	89	0.012	3.000	4.000	7080	340	4.1
		5.00	4	89	0.015	5.000	5.000	5665	340	8.5
		6.00	4	89	0.022	7.500	6.000	4720	415	18.7
		8.00	4	89	0.029	10.000	8.000	3540	411	32.8
		10.00	4	89	0.036	12.500	10.000	2835	408	51.0
		12.00	4	89	0.043	15.000	12.000	2360	406	73.1
		16.00	4	89	0.053	16.000	16.000	1770	375	96.1
		20.00	4	89	0.066	20.000	20.000	1415	374	149.4

Cylindrical/Square end mills SX

Smooth-edged, normal version, short neck

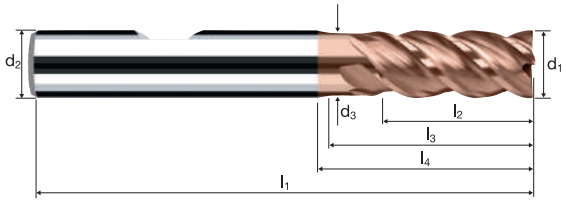
X-Generation X

I

HM MG10 | λ 43° γ 3°

r

Vario



Roughing HPC | Roughing HDC | Finishing

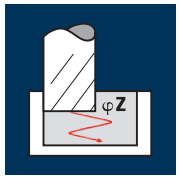
ReTool®

Rm < 850 **HRC** < 24 | **Inox** Stainless | **Ti** Titanium | Nickel-Alloys Mangan-Steels HSS

Example: **Order-N°.** Coating **H** Article-N°. **8606** ø-Code **180**

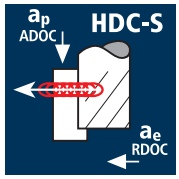
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	DURO-Si H8606	DURO-Si H8506
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.050	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.150	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	38.00	48.23	53.00	0.250	4		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] S	6.00	6	80	0.022	16.000	5.400	4245	560	5.0°
	8.00	6	80	0.029	21.000	7.200	3185	554	5.0°
	10.00	7	80	0.031	25.000	9.000	2545	552	5.0°
	12.00	7	80	0.037	31.000	10.800	2120	549	5.0°
	16.00	8	80	0.038	36.000	14.400	1590	483	5.0°
	20.00	8	80	0.048	46.000	18.000	1275	490	5.0°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] S	6.00	6	60	0.022	16.000	5.400	3185	420	5.0°
	8.00	6	60	0.029	21.000	7.200	2385	415	5.0°
	10.00	7	60	0.031	25.000	9.000	1910	415	5.0°
	12.00	7	60	0.037	31.000	10.800	1590	412	5.0°
	16.00	8	60	0.038	36.000	14.400	1195	363	5.0°
	20.00	8	60	0.048	46.000	18.000	955	367	5.0°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] S	6.00	6	45	0.019	16.000	5.400	2385	272	5.0°
	8.00	6	45	0.026	21.000	7.200	1790	279	5.0°
	10.00	7	45	0.027	25.000	9.000	1430	270	5.0°
	12.00	7	45	0.033	31.000	10.800	1195	276	5.0°
	16.00	8	45	0.034	36.000	14.400	895	243	5.0°
	20.00	8	45	0.042	46.000	18.000	715	240	5.0°
Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718] S	6.00	6	15	0.010	16.000	5.400	795	48	3.0°
	8.00	6	15	0.013	21.000	7.200	595	46	3.0°
	10.00	7	15	0.014	25.000	9.000	475	47	3.0°
	12.00	7	15	0.016	31.000	10.800	400	45	3.0°
	16.00	8	15	0.017	36.000	14.400	300	41	3.0°
	20.00	8	15	0.019	46.000	18.000	240	37	3.0°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] S	6.00	6	122	0.050	16.000	0.600	6470	1941	18.6
	8.00	6	122	0.074	21.000	0.800	4855	2156	36.2
	10.00	7	115	0.082	25.000	1.000	3660	2101	52.5
	12.00	7	115	0.094	31.000	1.200	3050	2007	74.7
	16.00	8	109	0.109	36.000	1.600	2170	1892	109.0
	20.00	8	109	0.110	46.000	2.000	1735	1527	140.5
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] S	6.00	6	90	0.050	16.000	0.600	4775	1433	13.8
	8.00	6	90	0.074	21.000	0.800	3580	1590	26.7
	10.00	7	84	0.082	25.000	1.000	2675	1536	38.4
	12.00	7	84	0.094	31.000	1.200	2230	1467	54.6
	16.00	8	80	0.109	36.000	1.600	1590	1387	79.9
	20.00	8	80	0.110	46.000	2.000	1275	1122	103.2
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] S	6.00	6	71	0.045	16.000	0.600	3765	1017	9.8
	8.00	6	71	0.067	21.000	0.800	2825	1136	19.1
	10.00	7	68	0.073	25.000	1.000	2165	1106	27.7
	12.00	7	68	0.083	31.000	1.200	1805	1049	39.0
	16.00	8	64	0.098	36.000	1.600	1275	1000	57.6
	20.00	8	64	0.102	46.000	2.000	1020	832	76.6
Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718] S	6.00	6	33	0.044	16.000	0.300	1750	462	2.2
	8.00	6	33	0.062	21.000	0.400	1315	489	4.1
	10.00	7	32	0.071	25.000	0.500	1020	507	6.3
	12.00	7	32	0.077	31.000	0.600	850	458	8.5
	16.00	8	30	0.091	36.000	0.800	595	433	12.5
	20.00	8	30	0.090	46.000	1.000	475	342	15.7

Cylindrical/Square end mills SX

Smooth-edged, chip breaker, normal version
High-performance penetration edge, central air/cooling channel

HM MG10 | λ **55°** γ **10°**

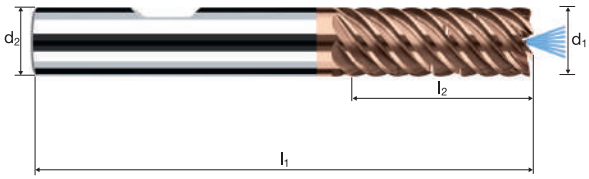












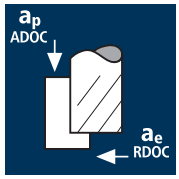
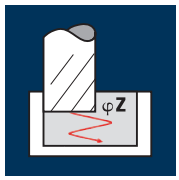
Roughing HPC | Roughing HDC | Finishing

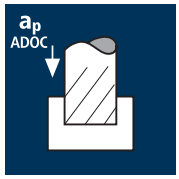
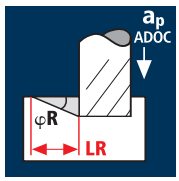
ReTool®

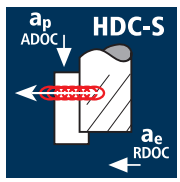
Inox Stainless | **Ti** Titanium | **Nickel-Alloys**

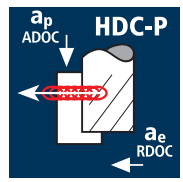
Example: **Order-N°.** Coating **S** | Article-N°. **8608** | ø-Code **300**

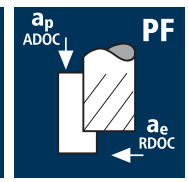
Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z	DURO-XI S8608	DURO-XI S8508
300	6.00	6.00	57	16.00	0.100	6		●
391	8.00	8.00	63	21.00	0.150	6		●
450	10.00	10.00	72	25.00	0.200	7		●
501	12.00	12.00	83	31.00	0.200	7		●
610	16.00	16.00	92	36.00	0.200	8		●
682	20.00	20.00	104	46.00	0.250	8		●

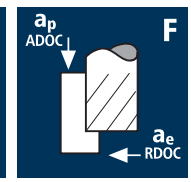
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	4.00	4	150	0.030	7.200	1.600	11935	1432	16.5	18.0°
		5.00	4	150	0.035	9.000	2.000	9550	1337	24.1	18.0°
		6.00	4	150	0.040	10.800	2.400	7960	1274	33.0	18.0°
		8.00	4	150	0.050	14.400	3.200	5970	1194	55.0	18.0°
		10.00	4	150	0.065	18.000	4.000	4775	1242	89.4	18.0°
		12.00	4	150	0.075	21.600	4.800	3980	1194	123.8	18.0°
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9	18.0°
		20.00	4	150	0.100	30.000	8.000	2385	954	229.0	18.0°
	Steel 1100 - 1300 N/mm² P P	4.00	4	115	0.025	7.200	1.600	9150	915	10.5	15.0°
		5.00	4	115	0.030	9.000	2.000	7320	878	15.8	15.0°
		6.00	4	115	0.035	10.800	2.400	6100	854	22.1	15.0°
		8.00	4	115	0.045	14.400	3.200	4575	824	37.9	15.0°
		10.00	4	115	0.055	18.000	4.000	3660	805	58.0	15.0°
		12.00	4	115	0.065	21.600	4.800	3050	793	82.2	15.0°
		16.00	4	115	0.075	24.000	6.400	2290	687	105.5	15.0°
		20.00	4	115	0.090	30.000	8.000	1830	659	158.1	15.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	90	0.020	7.200	1.600	7160	573	6.6	12.0°
		5.00	4	90	0.025	9.000	2.000	5730	573	10.3	12.0°
		6.00	4	90	0.030	10.800	2.400	4775	573	14.9	12.0°
		8.00	4	90	0.035	14.400	3.200	3580	501	23.1	12.0°
		10.00	4	90	0.045	18.000	4.000	2865	516	37.1	12.0°
		12.00	4	90	0.055	21.600	4.800	2385	525	54.4	12.0°
		16.00	4	90	0.065	24.000	6.400	1790	465	71.5	12.0°
		20.00	4	90	0.080	30.000	8.000	1430	458	109.8	12.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	4.00	4	120	0.020	6.000	4.000	9550	764	18.3	20.0°	16.5
		5.00	4	120	0.023	7.500	5.000	7640	703	26.4	20.0°	20.6
		6.00	4	120	0.026	9.000	6.000	6365	662	35.7	20.0°	24.7
		8.00	4	120	0.033	12.000	8.000	4775	630	60.5	20.0°	33.0
		10.00	4	120	0.042	15.000	10.000	3820	642	96.3	20.0°	41.2
		12.00	4	120	0.049	18.000	12.000	3185	624	134.8	20.0°	49.5
		16.00	4	120	0.055	24.000	16.000	2385	525	201.5	20.0°	54.9
		20.00	4	120	0.065	25.000	20.000	1910	497	248.3	20.0°	68.7
	Steel 1100 - 1300 N/mm² P P	4.00	4	90	0.016	6.000	4.000	7160	458	11.0	20.0°	16.5
		5.00	4	90	0.020	7.500	5.000	5730	458	17.2	20.0°	20.6
		6.00	4	90	0.023	9.000	6.000	4775	439	23.7	20.0°	24.7
		8.00	4	90	0.029	12.000	8.000	3580	415	39.9	20.0°	33.0
		10.00	4	90	0.036	15.000	10.000	2865	413	61.9	20.0°	41.2
		12.00	4	90	0.042	18.000	12.000	2385	401	86.6	20.0°	49.5
		16.00	4	90	0.049	24.000	16.000	1790	351	134.7	20.0°	54.9
		20.00	4	90	0.058	25.000	20.000	1430	332	165.9	20.0°	68.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	70	0.013	6.000	4.000	5570	290	7.0	14.0°	24.1
		5.00	4	70	0.016	7.500	5.000	4455	285	10.7	14.0°	30.1
		6.00	4	70	0.020	9.000	6.000	3715	297	16.0	14.0°	36.1
		8.00	4	70	0.023	12.000	8.000	2785	256	24.6	14.0°	48.1
		10.00	4	70	0.029	15.000	10.000	2230	259	38.8	14.0°	60.2
		12.00	4	70	0.036	18.000	12.000	1855	267	57.7	14.0°	72.2
		16.00	4	70	0.042	24.000	16.000	1395	234	90.0	14.0°	80.2
		20.00	4	70	0.052	25.000	20.000	1115	232	116.0	14.0°	100.3









Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

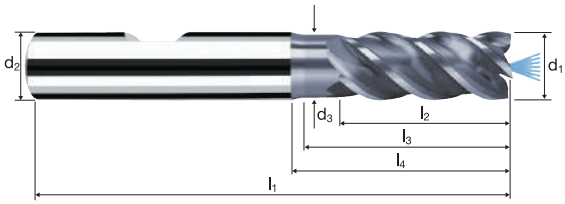
Cylindrical/Square end mills MFC

Smooth-edged, normal version, short neck
High-performance penetration edge, central air/cooling channel

HM MG10 | λ 45° γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

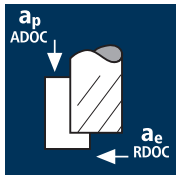
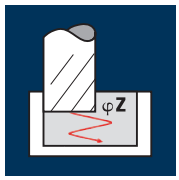
ReTool®

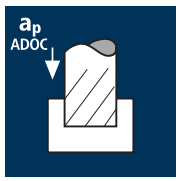
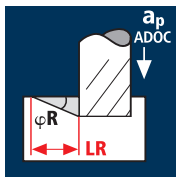
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

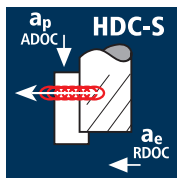
Example: **Order-N°.** Coating **P** | Article-N°. **8201** | ø-Code **220**

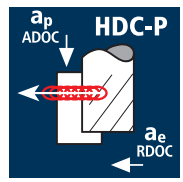
Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8201	POLYCHROM P8101
220	4.00	6.00	3.70	57	8.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	10.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	12.00	18.15	20.00	0.100	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
503*	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
612*	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	4		●
684*	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	4		●

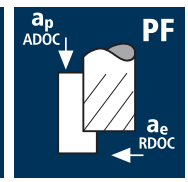
* with chip breaker

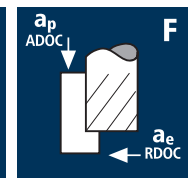
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm²	4.00	4	150	0.030	7.200	1.600	11935	1432	16.5	18.0°
		5.00	4	150	0.035	9.000	2.000	9550	1337	24.1	18.0°
		6.00	4	150	0.040	10.800	2.400	7960	1274	33.0	18.0°
		8.00	4	150	0.050	14.400	3.200	5970	1194	55.0	18.0°
		10.00	4	150	0.065	18.000	4.000	4775	1242	89.4	18.0°
		12.00	4	150	0.075	21.600	4.800	3980	1194	123.8	18.0°
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9	18.0°
		20.00	4	150	0.100	30.000	8.000	2385	954	229.0	18.0°
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.025	7.200	1.600	9150	915	10.5	15.0°
		5.00	4	115	0.030	9.000	2.000	7320	878	15.8	15.0°
		6.00	4	115	0.035	10.800	2.400	6100	854	22.1	15.0°
		8.00	4	115	0.045	14.400	3.200	4575	824	37.9	15.0°
		10.00	4	115	0.055	18.000	4.000	3660	805	58.0	15.0°
		12.00	4	115	0.065	21.600	4.800	3050	793	82.2	15.0°
		16.00	4	115	0.075	24.000	6.400	2290	687	105.5	15.0°
		20.00	4	115	0.090	30.000	8.000	1830	659	158.1	15.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	90	0.020	7.200	1.600	7160	573	6.6	12.0°
		5.00	4	90	0.025	9.000	2.000	5730	573	10.3	12.0°
		6.00	4	90	0.030	10.800	2.400	4775	573	14.9	12.0°
		8.00	4	90	0.035	14.400	3.200	3580	501	23.1	12.0°
		10.00	4	90	0.045	18.000	4.000	2865	516	37.1	12.0°
		12.00	4	90	0.055	21.600	4.800	2385	525	54.4	12.0°
		16.00	4	90	0.065	24.000	6.400	1790	465	71.5	12.0°
		20.00	4	90	0.080	30.000	8.000	1430	458	109.8	12.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm²	4.00	4	120	0.021	6.000	4.000	9550	802	19.3	20.0°	16.5
		5.00	4	120	0.025	7.500	5.000	7640	764	28.7	20.0°	20.6
		6.00	4	120	0.028	9.000	6.000	6365	713	38.5	20.0°	24.7
		8.00	4	120	0.035	12.000	8.000	4775	669	64.2	20.0°	33.0
		10.00	4	120	0.046	15.000	10.000	3820	703	105.4	20.0°	41.2
		12.00	4	120	0.053	18.000	12.000	3185	675	145.8	20.0°	49.5
		16.00	4	120	0.059	24.000	16.000	2385	563	216.2	20.0°	54.9
		20.00	4	120	0.070	25.000	20.000	1910	535	267.4	20.0°	68.7
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.018	6.000	4.000	7160	516	12.4	20.0°	16.5
		5.00	4	90	0.021	7.500	5.000	5730	481	18.0	20.0°	20.6
		6.00	4	90	0.025	9.000	6.000	4775	478	25.8	20.0°	24.7
		8.00	4	90	0.032	12.000	8.000	3580	458	44.0	20.0°	33.0
		10.00	4	90	0.039	15.000	10.000	2865	447	67.0	20.0°	41.2
		12.00	4	90	0.046	18.000	12.000	2385	439	94.8	20.0°	49.5
		16.00	4	90	0.053	24.000	16.000	1790	380	145.7	20.0°	54.9
		20.00	4	90	0.063	25.000	20.000	1430	360	180.2	20.0°	68.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	70	0.014	6.000	4.000	5570	312	7.5	14.0°	24.1
		5.00	4	70	0.018	7.500	5.000	4455	321	12.0	14.0°	30.1
		6.00	4	70	0.021	9.000	6.000	3715	312	16.9	14.0°	36.1
		8.00	4	70	0.025	12.000	8.000	2785	279	26.7	14.0°	48.1
		10.00	4	70	0.032	15.000	10.000	2230	285	42.8	14.0°	60.2
		12.00	4	70	0.039	18.000	12.000	1855	289	62.5	14.0°	72.2
		16.00	4	70	0.046	24.000	16.000	1395	257	98.6	14.0°	80.2
		20.00	4	70	0.056	25.000	20.000	1115	250	124.9	14.0°	100.3









Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

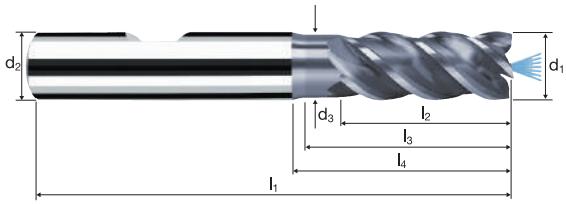
Cylindrical/Square end mills MFC

Smooth-edged, normal version, short neck
High-performance penetration edge, central air/cooling channel

HM MG10 | λ 45° γ 0°

r

Vario



Roughing HPC | Roughing HDC | Finishing

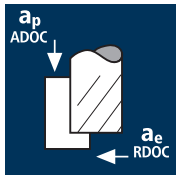
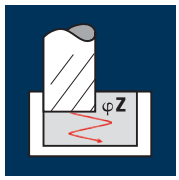
ReTool®

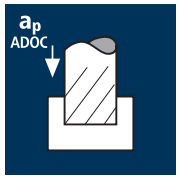
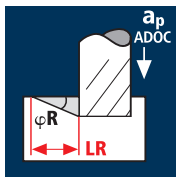
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

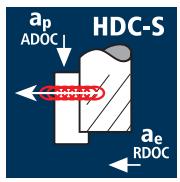
Example: **Order-N°.** Coating **P** Article-N°. **8202** ø-Code **220**

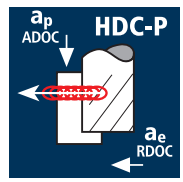
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260	5.00	6.00	4.60	57	10.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	12.00	18.15	20.00	0.100	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
612*	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	4		●
684*	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	4		●

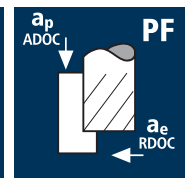
* with chip breaker

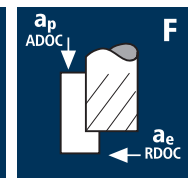
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	6.00	5	150	0.040	10.800	2.100	7960	1592	36.1	10.0°
		8.00	5	150	0.050	14.400	2.800	5970	1493	60.2	12.0°
		10.00	5	150	0.065	18.000	3.500	4775	1552	97.8	12.0°
		12.00	5	150	0.075	21.600	4.200	3980	1493	135.4	12.0°
		16.00	5	150	0.085	24.000	5.600	2985	1269	170.5	12.0°
		20.00	5	150	0.100	30.000	7.000	2385	1193	250.4	12.0°
	Steel 1100 - 1300 N/mm² P P	6.00	5	115	0.035	10.800	2.100	6100	1068	24.2	10.0°
		8.00	5	115	0.045	14.400	2.800	4575	1029	41.5	11.0°
		10.00	5	115	0.055	18.000	3.500	3660	1007	63.4	11.0°
		12.00	5	115	0.065	21.600	4.200	3050	991	89.9	11.0°
		16.00	5	115	0.075	24.000	5.600	2290	859	115.4	11.0°
		20.00	5	115	0.090	30.000	7.000	1830	824	172.9	11.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	6.00	5	90	0.030	10.800	2.100	4775	716	16.2	8.0°
		8.00	5	90	0.035	14.400	2.800	3580	627	25.3	8.0°
		10.00	5	90	0.045	18.000	3.500	2865	645	40.6	8.0°
		12.00	5	90	0.055	21.600	4.200	2385	656	59.5	8.0°
		16.00	5	90	0.065	24.000	5.600	1790	582	78.2	8.0°
		20.00	5	90	0.080	30.000	7.000	1430	572	120.1	8.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	6.00	5	120	0.024	6.000	6.000	6365	764	27.5	12.0°	28.2
		8.00	5	120	0.030	8.000	8.000	4775	716	45.8	12.0°	37.6
		10.00	5	120	0.039	10.000	10.000	3820	745	74.5	12.0°	47.0
		12.00	5	120	0.045	12.000	12.000	3185	717	103.2	12.0°	56.5
		16.00	5	120	0.051	16.000	16.000	2385	608	155.7	12.0°	75.3
		20.00	5	120	0.060	20.000	20.000	1910	573	229.2	12.0°	94.1
	Steel 1100 - 1300 N/mm² P P	6.00	5	90	0.021	6.000	6.000	4775	501	18.1	12.0°	28.2
		8.00	5	90	0.027	8.000	8.000	3580	483	30.9	12.0°	37.6
		10.00	5	90	0.033	10.000	10.000	2865	473	47.3	12.0°	47.0
		12.00	5	90	0.039	12.000	12.000	2385	465	67.0	12.0°	56.5
		16.00	5	90	0.045	16.000	16.000	1790	403	103.1	12.0°	75.3
		20.00	5	90	0.054	20.000	20.000	1430	386	154.4	12.0°	94.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	6.00	5	70	0.018	6.000	6.000	3715	334	12.0	12.0°	28.2
		8.00	5	70	0.021	8.000	8.000	2785	292	18.7	12.0°	37.6
		10.00	5	70	0.027	10.000	10.000	2230	301	30.1	12.0°	47.0
		12.00	5	70	0.033	12.000	12.000	1855	306	44.1	12.0°	56.5
		16.00	5	70	0.039	16.000	16.000	1395	272	69.6	12.0°	75.3
		20.00	5	70	0.048	20.000	20.000	1115	268	107.0	12.0°	94.1









Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills MFC

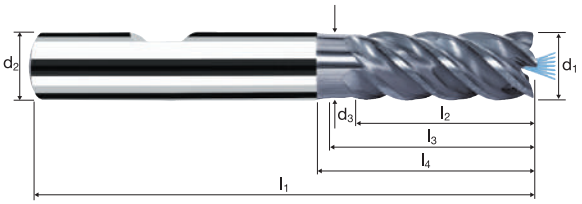
Smooth-edged, normal version, short neck
High-performance penetration edge, central air/cooling channel

HM MG10

λ 45°
γ 0°

r

Vario



Roughing HPC

Roughing HDC

Finishing

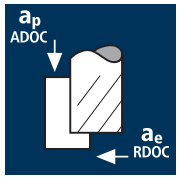
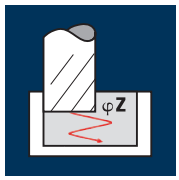
ReTool®

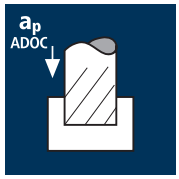
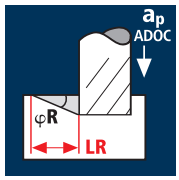
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8205** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8205	POLYCHROM P8105
300	6.00	6.00	5.50	57	12.00	18.15	20.00	0.100	5		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	5		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	5		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	5		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	5		●
612*	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	5		●
682	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	5		●
684*	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	5		●

* with chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	4.00	4	180	0.035	6.000	1.600	14325	2006	19.3	20.0°
		5.00	4	180	0.040	7.500	2.000	11460	1834	27.5	20.0°
		6.00	4	180	0.050	9.000	2.400	9550	1910	41.3	20.0°
		8.00	4	180	0.060	12.000	3.200	7160	1718	66.0	20.0°
		10.00	4	180	0.075	15.000	4.000	5730	1719	103.1	20.0°
		12.00	4	180	0.085	18.000	4.800	4775	1624	140.3	20.0°
		16.00	4	180	0.095	24.000	6.400	3580	1360	209.0	20.0°
		20.00	4	180	0.110	30.000	8.000	2865	1261	302.5	20.0°
	Steel 850 - 1100 N/mm²	4.00	4	150	0.030	6.000	1.600	11935	1432	13.7	18.0°
		5.00	4	150	0.035	7.500	2.000	9550	1337	20.1	18.0°
		6.00	4	150	0.040	9.000	2.400	7960	1274	27.5	18.0°
		8.00	4	150	0.050	12.000	3.200	5970	1194	45.8	18.0°
		10.00	4	150	0.065	15.000	4.000	4775	1242	74.5	18.0°
		12.00	4	150	0.075	18.000	4.800	3980	1194	103.2	18.0°
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9	18.0°
		20.00	4	150	0.100	30.000	8.000	2385	954	229.0	18.0°
	Cold work tool steel (12% Cr) high alloyed [1.2379]	4.00	4	70	0.030	6.000	1.600	5570	668	6.4	12.0°
		5.00	4	70	0.035	7.500	2.000	4455	624	9.4	12.0°
		6.00	4	70	0.040	9.000	2.400	3715	594	12.8	12.0°
		8.00	4	70	0.050	12.000	3.200	2785	557	21.4	12.0°
		10.00	4	70	0.060	15.000	4.000	2230	535	32.1	12.0°
		12.00	4	70	0.075	18.000	4.800	1855	557	48.1	12.0°
		16.00	4	70	0.085	24.000	6.400	1395	474	72.9	12.0°
		20.00	4	70	0.095	30.000	8.000	1115	424	101.7	12.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	90	0.020	6.000	1.600	7160	573	5.5	12.0°
		5.00	4	90	0.025	7.500	2.000	5730	573	8.6	12.0°
		6.00	4	90	0.030	9.000	2.400	4775	573	12.4	12.0°
		8.00	4	90	0.035	12.000	3.200	3580	501	19.2	12.0°
		10.00	4	90	0.045	15.000	4.000	2865	516	30.9	12.0°
		12.00	4	90	0.055	18.000	4.800	2385	525	45.3	12.0°
		16.00	4	90	0.065	24.000	6.400	1790	465	71.5	12.0°
		20.00	4	90	0.080	30.000	8.000	1430	458	109.8	12.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel < 850 N/mm²	4.00	4	145	0.025	5.000	4.000	11540	1154	23.1	32.0°	8.0
		5.00	4	145	0.030	6.250	5.000	9230	1108	34.6	32.0°	10.1
		6.00	4	145	0.040	7.500	6.000	7690	1230	55.4	32.0°	12.0
		8.00	4	145	0.045	10.000	8.000	5770	1039	83.1	32.0°	16.0
		10.00	4	145	0.055	12.500	10.000	4615	1015	126.9	32.0°	20.0
		12.00	4	145	0.065	15.000	12.000	3845	1000	179.9	32.0°	24.0
		16.00	4	145	0.070	20.000	16.000	2885	808	258.5	32.0°	32.0
		20.00	4	145	0.085	25.000	20.000	2310	785	392.7	32.0°	40.0
	Steel 850 - 1100 N/mm²	4.00	4	120	0.020	5.000	4.000	9550	764	15.3	29.0°	9.0
		5.00	4	120	0.025	6.250	5.000	7640	764	23.9	29.0°	11.4
		6.00	4	120	0.030	7.500	6.000	6365	764	34.4	29.0°	13.5
		8.00	4	120	0.040	10.000	8.000	4775	764	61.1	29.0°	18.0
		10.00	4	120	0.050	12.500	10.000	3820	764	95.5	29.0°	22.6
		12.00	4	120	0.055	15.000	12.000	3185	701	126.1	29.0°	27.1
		16.00	4	120	0.065	20.000	16.000	2385	620	198.4	29.0°	36.1
		20.00	4	120	0.075	25.000	20.000	1910	573	286.5	29.0°	45.1
	Cold work tool steel (12% Cr) high alloyed [1.2379]	4.00	4	55	0.025	5.000	4.000	4375	438	8.8	19.0°	14.5
		5.00	4	55	0.025	6.250	5.000	3500	350	10.9	19.0°	18.3
		6.00	4	55	0.030	7.500	6.000	2920	350	15.8	19.0°	21.8
		8.00	4	55	0.040	10.000	8.000	2190	350	28.0	19.0°	29.0
		10.00	4	55	0.045	12.500	10.000	1750	315	39.4	19.0°	36.3
		12.00	4	55	0.055	15.000	12.000	1460	321	57.8	19.0°	43.6
		16.00	4	55	0.065	20.000	16.000	1095	285	91.1	19.0°	58.1
		20.00	4	55	0.070	25.000	20.000	875	245	122.5	19.0°	72.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	70	0.015	5.000	4.000	5570	334	6.7	14.0°	20.1
		5.00	4	70	0.020	6.250	5.000	4455	356	11.1	14.0°	25.3
		6.00	4	70	0.025	7.500	6.000	3715	372	16.7	14.0°	30.1
		8.00	4	70	0.025	10.000	8.000	2785	279	22.3	14.0°	40.1
		10.00	4	70	0.035	12.500	10.000	2230	312	39.0	14.0°	50.1
		12.00	4	70	0.040	15.000	12.000	1855	297	53.4	14.0°	60.2
		16.00	4	70	0.050	20.000	16.000	1395	279	89.3	14.0°	80.2
		20.00	4	70	0.060	25.000	20.000	1115	268	133.8	14.0°	100.3

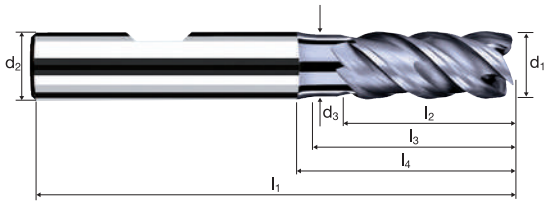
Cylindrical/Square end mills NVDS

Smooth-edged, normal version, short neck
High-performance penetration edge

HM MG10 | λ 45° γ 0°

r

Vario



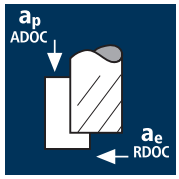
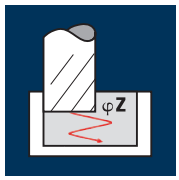
Roughing HPC | Roughing HDC | Finishing

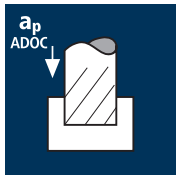
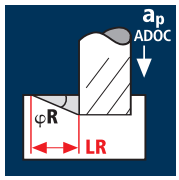
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** | Article-N°. **8200** | ø-Code **220**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8200	POLYCHROM P8100
220	4.00	6.00	3.70	57	8.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	10.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	12.00	18.15	20.00	0.100	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	39.00	48.23	53.00	0.200	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	4	150	0.018	4.500	1.200	15915	1146	6.2	16.0°
		4.00	4	150	0.020	6.000	1.600	11935	955	9.2	16.0°
		5.00	4	150	0.028	7.500	2.000	9550	1070	16.0	16.0°
		6.00	4	150	0.035	9.000	2.400	7960	1114	24.1	16.0°
		8.00	4	150	0.045	12.000	3.200	5970	1075	41.3	16.0°
		10.00	4	150	0.060	15.000	4.000	4775	1146	68.8	16.0°
		12.00	4	150	0.065	18.000	4.800	3980	1035	89.4	16.0°
		16.00	4	150	0.075	24.000	6.400	2985	896	137.5	16.0°
		20.00	4	150	0.090	30.000	8.000	2385	859	206.1	16.0°
	Steel 850 - 1100 N/mm²	3.00	4	125	0.015	4.500	1.200	13265	796	4.3	15.0°
		4.00	4	125	0.018	6.000	1.600	9945	716	6.9	15.0°
		5.00	4	125	0.024	7.500	2.000	7960	764	11.5	15.0°
		6.00	4	125	0.030	9.000	2.400	6630	796	17.2	15.0°
		8.00	4	125	0.040	12.000	3.200	4975	796	30.6	15.0°
		10.00	4	125	0.055	15.000	4.000	3980	876	52.5	15.0°
		12.00	4	125	0.060	18.000	4.800	3315	796	68.7	15.0°
		16.00	4	125	0.070	24.000	6.400	2485	696	106.9	15.0°
		20.00	4	125	0.080	30.000	8.000	1990	637	152.8	15.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	85	0.013	4.500	1.200	9020	469	2.5	9.0°
		4.00	4	85	0.016	6.000	1.600	6765	433	4.2	9.0°
		5.00	4	85	0.020	7.500	2.000	5410	433	6.5	9.0°
		6.00	4	85	0.025	9.000	2.400	4510	451	9.7	9.0°
		8.00	4	85	0.035	12.000	3.200	3380	473	18.2	9.0°
		10.00	4	85	0.045	15.000	4.000	2705	487	29.2	9.0°
		12.00	4	85	0.050	18.000	4.800	2255	451	39.0	9.0°
		16.00	4	85	0.060	24.000	6.400	1690	406	62.3	9.0°
		20.00	4	85	0.070	30.000	8.000	1355	379	91.1	9.0°
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	45	0.013	4.500	1.200	4775	248	1.3	7.0°
		4.00	4	45	0.016	6.000	1.600	3580	229	2.2	7.0°
		5.00	4	45	0.020	7.500	2.000	2865	229	3.4	7.0°
		6.00	4	45	0.025	9.000	2.400	2385	239	5.2	7.0°
		8.00	4	45	0.035	12.000	3.200	1790	251	9.6	7.0°
		10.00	4	45	0.045	15.000	4.000	1430	257	15.4	7.0°
		12.00	4	45	0.050	18.000	4.800	1195	239	20.6	7.0°
		16.00	4	45	0.060	24.000	6.400	895	215	33.0	7.0°
		20.00	4	45	0.070	30.000	8.000	715	200	48.0	7.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel < 850 N/mm²	3.00	4	120	0.014	1.800	3.000	12730	713	3.8	26.0°	3.7
		4.00	4	120	0.018	2.800	4.000	9550	688	7.7	26.0°	5.7
		5.00	4	120	0.022	4.000	5.000	7640	672	13.4	26.0°	8.2
		6.00	4	120	0.028	6.000	6.000	6365	713	25.7	26.0°	12.3
		8.00	4	120	0.036	8.000	8.000	4775	688	44.0	26.0°	16.4
		10.00	4	120	0.048	10.000	10.000	3820	733	73.3	26.0°	20.5
		12.00	4	120	0.052	12.000	12.000	3185	663	95.4	26.0°	24.6
		16.00	4	120	0.060	16.000	16.000	2385	572	146.5	26.0°	32.8
		20.00	4	120	0.072	20.000	20.000	1910	550	220.0	26.0°	41.0
	Steel 850 - 1100 N/mm²	3.00	4	100	0.011	1.800	3.000	10610	467	2.5	24.0°	4.0
		4.00	4	100	0.014	2.800	4.000	7960	446	5.0	24.0°	6.3
		5.00	4	100	0.020	4.000	5.000	6365	509	10.2	24.0°	9.0
		6.00	4	100	0.024	6.000	6.000	5305	509	18.3	24.0°	13.5
		8.00	4	100	0.032	8.000	8.000	3980	509	32.6	24.0°	18.0
		10.00	4	100	0.044	10.000	10.000	3185	561	56.1	24.0°	22.5
		12.00	4	100	0.048	12.000	12.000	2655	510	73.4	24.0°	27.0
		16.00	4	100	0.056	16.000	16.000	1990	446	114.1	24.0°	35.9
		20.00	4	100	0.064	20.000	20.000	1590	407	162.8	24.0°	44.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	70	0.010	1.800	3.000	7425	297	1.6	11.0°	9.3
		4.00	4	70	0.013	2.800	4.000	5570	290	3.2	11.0°	14.4
		5.00	4	70	0.016	4.000	5.000	4455	285	5.7	11.0°	20.6
		6.00	4	70	0.020	6.000	6.000	3715	297	10.7	11.0°	30.9
		8.00	4	70	0.028	8.000	8.000	2785	312	20.0	11.0°	41.2
		10.00	4	70	0.036	10.000	10.000	2230	321	32.1	11.0°	51.4
		12.00	4	70	0.040	12.000	12.000	1855	297	42.7	11.0°	61.7
		16.00	4	70	0.048	16.000	16.000	1395	268	68.6	11.0°	82.3
		20.00	4	70	0.056	20.000	20.000	1115	250	99.9	11.0°	102.9
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	35	0.010	1.800	3.000	3715	149	0.8	10.0°	10.2
		4.00	4	35	0.013	2.800	4.000	2785	145	1.6	10.0°	15.9
		5.00	4	35	0.016	4.000	5.000	2230	143	2.9	10.0°	22.7
		6.00	4	35	0.020	6.000	6.000	1855	148	5.3	10.0°	34.0
		8.00	4	35	0.028	8.000	8.000	1395	156	10.0	10.0°	45.4
		10.00	4	35	0.036	10.000	10.000	1115	161	16.1	10.0°	56.7
		12.00	4	35	0.040	12.000	12.000	930	149	21.4	10.0°	68.1
		16.00	4	35	0.048	16.000	16.000	695	133	34.2	10.0°	90.7
		20.00	4	35	0.056	20.000	20.000	555	124	49.7	10.0°	113.4

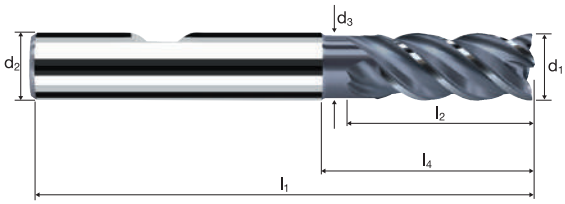
Cylindrical/Square end mills NVS

Smooth-edged, normal version, short neck
High-performance penetration edge

HM MG10 | λ **45°** γ **15°**

r

Vario



Roughing

Finishing

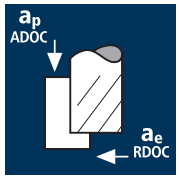
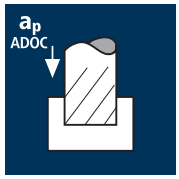
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Copper Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8404** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8404	POLYCHROM P8304
140	2.00	6.00	1.90	57	7.00	10.00	18.31	0.050	4		●
160	2.50	6.00	2.30	57	8.00	10.00	17.56	0.050	4		●
178*	3.00	3.00	2.80	45	8.00	13.56	14.00	0.050	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.050	4		●
200	3.50	6.00	3.20	57	8.00	14.00	19.88	0.050	4		●
218*	4.00	4.00	3.70	50	11.00	15.47	16.00	0.100	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.100	4		●
240	4.50	6.00	4.10	57	12.00	16.00	20.20	0.100	4		●
258*	5.00	5.00	4.60	50	13.00	15.40	16.00	0.100	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	4		●
280	5.50	6.00	5.00	57	13.00	20.00	22.52	0.100	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.100	4		●
331	7.00	8.00	6.40	63	16.00	24.00	27.64	0.100	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.150	4		●
420	9.00	10.00	8.20	72	19.00	26.00	30.02	0.200	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.200	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.200	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.200	4		●

* without clamping flat

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	4.00	4	180	0.035	6.000	1.600	14325	2006	19.3
		5.00	4	180	0.040	7.500	2.000	11460	1834	27.5
		6.00	4	180	0.050	9.000	2.400	9550	1910	41.3
		8.00	4	180	0.060	12.000	3.200	7160	1718	66.0
		10.00	4	180	0.075	15.000	4.000	5730	1719	103.1
		12.00	4	180	0.085	18.000	4.800	4775	1624	140.3
		16.00	4	180	0.095	24.000	6.400	3580	1360	209.0
		20.00	4	180	0.110	30.000	8.000	2865	1261	302.5
	Steel 850 - 1100 N/mm²	4.00	4	150	0.030	6.000	1.600	11935	1432	13.7
		5.00	4	150	0.035	7.500	2.000	9550	1337	20.1
		6.00	4	150	0.040	9.000	2.400	7960	1274	27.5
		8.00	4	150	0.050	12.000	3.200	5970	1194	45.8
		10.00	4	150	0.065	15.000	4.000	4775	1242	74.5
		12.00	4	150	0.075	18.000	4.800	3980	1194	103.2
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9
		20.00	4	150	0.100	30.000	8.000	2385	954	229.0
	Cold work tool steel (12% Cr) high alloyed [1.2379]	4.00	4	70	0.030	6.000	1.600	5570	668	6.4
		5.00	4	70	0.035	7.500	2.000	4455	624	9.4
		6.00	4	70	0.040	9.000	2.400	3715	594	12.8
		8.00	4	70	0.050	12.000	3.200	2785	557	21.4
		10.00	4	70	0.060	15.000	4.000	2230	535	32.1
		12.00	4	70	0.075	18.000	4.800	1855	557	48.1
		16.00	4	70	0.085	24.000	6.400	1395	474	72.9
		20.00	4	70	0.095	30.000	8.000	1115	424	101.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	90	0.020	6.000	1.600	7160	573	5.5
		5.00	4	90	0.025	7.500	2.000	5730	573	8.6
		6.00	4	90	0.030	9.000	2.400	4775	573	12.4
		8.00	4	90	0.035	12.000	3.200	3580	501	19.2
		10.00	4	90	0.045	15.000	4.000	2865	516	30.9
		12.00	4	90	0.055	18.000	4.800	2385	525	45.3
		16.00	4	90	0.065	24.000	6.400	1790	465	71.5
		20.00	4	90	0.080	30.000	8.000	1430	458	109.8
	Steel < 850 N/mm²	4.00	4	145	0.025	5.000	4.000	11540	1154	23.1
		5.00	4	145	0.030	6.250	5.000	9230	1108	34.6
		6.00	4	145	0.040	7.500	6.000	7690	1230	55.4
		8.00	4	145	0.045	10.000	8.000	5770	1039	83.1
		10.00	4	145	0.055	12.500	10.000	4615	1015	126.9
		12.00	4	145	0.065	15.000	12.000	3845	1000	179.9
		16.00	4	145	0.070	20.000	16.000	2885	808	258.5
		20.00	4	145	0.085	25.000	20.000	2310	785	392.7
	Steel 850 - 1100 N/mm²	4.00	4	120	0.020	5.000	4.000	9550	764	15.3
		5.00	4	120	0.025	6.250	5.000	7640	764	23.9
		6.00	4	120	0.030	7.500	6.000	6365	764	34.4
		8.00	4	120	0.040	10.000	8.000	4775	764	61.1
		10.00	4	120	0.050	12.500	10.000	3820	764	95.5
		12.00	4	120	0.055	15.000	12.000	3185	701	126.1
		16.00	4	120	0.065	20.000	16.000	2385	620	198.4
		20.00	4	120	0.075	25.000	20.000	1910	573	286.5
	Cold work tool steel (12% Cr) high alloyed [1.2379]	4.00	4	55	0.025	5.000	4.000	4375	438	8.8
		5.00	4	55	0.025	6.250	5.000	3500	350	10.9
		6.00	4	55	0.030	7.500	6.000	2920	350	15.8
		8.00	4	55	0.040	10.000	8.000	2190	350	28.0
		10.00	4	55	0.045	12.500	10.000	1750	315	39.4
		12.00	4	55	0.055	15.000	12.000	1460	321	57.8
		16.00	4	55	0.065	20.000	16.000	1095	285	91.1
		20.00	4	55	0.070	25.000	20.000	875	245	122.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	70	0.015	5.000	4.000	5570	334	6.7
		5.00	4	70	0.020	6.250	5.000	4455	356	11.1
		6.00	4	70	0.025	7.500	6.000	3715	372	16.7
		8.00	4	70	0.025	10.000	8.000	2785	279	22.3
		10.00	4	70	0.035	12.500	10.000	2230	312	39.0
		12.00	4	70	0.040	15.000	12.000	1855	297	53.4
		16.00	4	70	0.050	20.000	16.000	1395	279	89.3
		20.00	4	70	0.060	25.000	20.000	1115	268	133.8

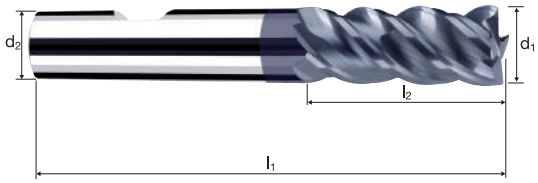
Cylindrical/Square end mills NVD

Smooth-edged, normal version

HM MG10 | λ 45° γ 0°

45°

Vario



Roughing HPC | Roughing HDC | Finishing

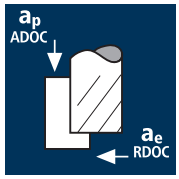
ReTool®

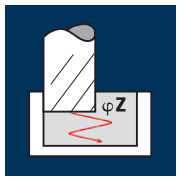
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **Inox Stainless** | **Ti Titanium** | **GG(G) Tool Steel Nickel-Alloys**

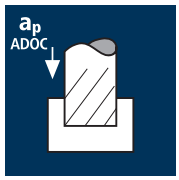
Example: **Order-N°.** Coating **P** Article-N°. **15307** ø-Code **180**

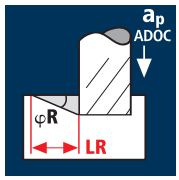
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P15307	POLYCHROM P15207
180	3.00	6.00	57	8.00	15.56	0.05	4		●
220	4.00	6.00	57	8.00	14.59	0.05	4		●
260	5.00	6.00	57	10.00	14.72	0.10	4		●
300	6.00	6.00	57	12.00	-	0.10	4		●
391	8.00	8.00	63	19.00	-	0.10	4		●
450	10.00	10.00	72	23.00	-	0.15	4		●
501	12.00	12.00	83	27.00	-	0.15	4		●
610	16.00	16.00	92	32.00	-	0.15	4		●
682	20.00	20.00	104	39.00	-	0.15	4		●

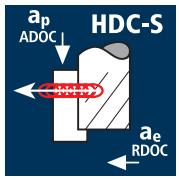
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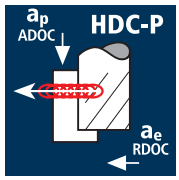


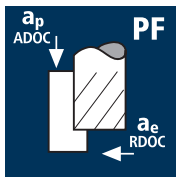


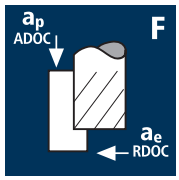








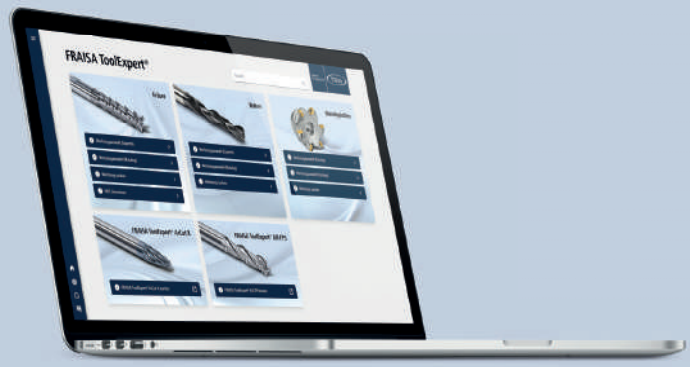




Cutting data SteelCut

Always up to date

The new cylindrical high-performance **SteelCut** end mill has been developed for HPC and HDC rough machining of soft, unalloyed and low- alloyed steels. The latest cutting data for the SteelCut tools can be found in our cutting data calculator ToolExpert®.



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Cylindrical/Square end mills SteelCut

Smooth-edged, normal version, short neck

l_2=2.2xd_1

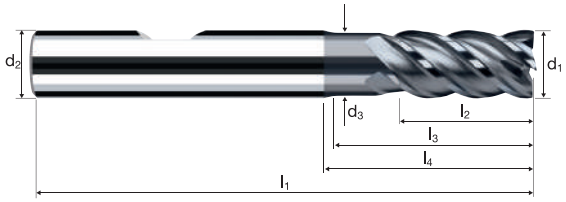
l_3=3.0xd_1

HM MG10 | λ 43° γ 4°

r

Vario

new!



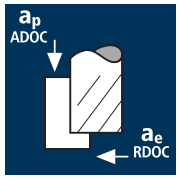
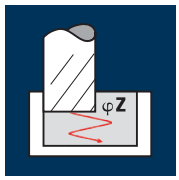
Roughing HPC | Roughing HDC | Finishing

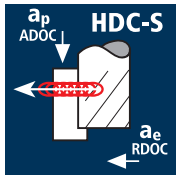
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Inox** Stainless

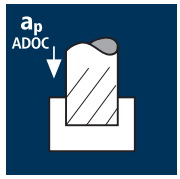
Example: **Order-N°.** Coating **K** Article-N°. **8430** ø-Code **180**

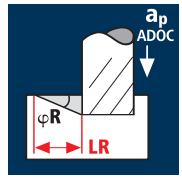
Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	MULTICHROM K8430	MULTICHROM K8330
180	3.00	6.00	2.80	54	6.60	9.00	12.33	0.050	4		●
220	4.00	6.00	3.70	54	9.00	12.00	14.54	0.050	4		●
260	5.00	6.00	4.60	57	11.00	15.00	16.72	0.100	4		●
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.100	4		●
391	8.00	8.00	7.40	63	18.00	24.00	26.37	0.150	4		●
450	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	4		●
501	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	4		●
610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.200	4		●
682	20.00	20.00	19.00	115	44.00	60.00	64.77	0.250	4		●

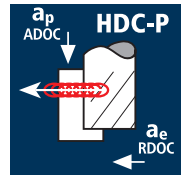
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	4	155	0.024	3.750	1.200	16445	1579	7.1	1.5°
		4.00	4	155	0.034	5.000	1.600	12335	1678	13.4	1.5°
		5.00	4	155	0.042	6.250	2.000	9870	1658	20.7	1.5°
		6.00	4	155	0.045	9.000	2.400	8225	1481	32.0	1.5°
		8.00	4	155	0.060	12.000	3.200	6165	1480	56.8	1.5°
		10.00	4	155	0.075	15.000	4.000	4935	1481	88.8	1.5°
		12.00	4	155	0.084	18.000	4.800	4110	1381	119.3	1.5°
		16.00	4	155	0.096	24.000	6.400	3085	1185	182.0	1.5°
		20.00	4	155	0.110	30.000	8.000	2465	1085	260.3	1.5°
	Steel 850 - 1100 N/mm²	3.00	4	140	0.022	3.750	1.200	14855	1307	5.9	2.0°
		4.00	4	140	0.030	5.000	1.600	11140	1337	10.7	2.0°
		5.00	4	140	0.037	6.250	2.000	8915	1319	16.5	2.0°
		6.00	4	140	0.039	9.000	2.400	7425	1158	25.0	2.0°
		8.00	4	140	0.052	12.000	3.200	5570	1159	44.5	2.0°
		10.00	4	140	0.065	15.000	4.000	4455	1158	69.5	2.0°
		12.00	4	140	0.078	18.000	4.800	3715	1159	100.1	2.0°
		16.00	4	140	0.088	24.000	6.400	2785	980	150.6	2.0°
		20.00	4	140	0.100	30.000	8.000	2230	892	214.1	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	90	0.014	3.750	1.200	9550	535	2.4	1.5°
		4.00	4	90	0.018	5.000	1.600	7160	516	4.1	1.5°
		5.00	4	90	0.023	6.250	2.000	5730	527	6.6	1.5°
		6.00	4	90	0.027	9.000	2.400	4775	516	11.1	1.5°
		8.00	4	90	0.036	12.000	3.200	3580	516	19.8	1.5°
		10.00	4	90	0.045	15.000	4.000	2865	516	30.9	1.5°
		12.00	4	90	0.054	18.000	4.800	2385	515	44.5	1.5°
		16.00	4	90	0.056	24.000	6.400	1790	401	61.6	1.5°
		20.00	4	90	0.070	30.000	8.000	1430	400	96.1	1.5°

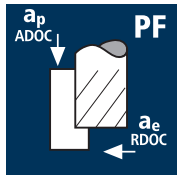
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	270	0.054	8.000	0.300	28650	6188	14.9
		4.00	4	270	0.073	11.000	0.400	21485	6274	27.6
		5.00	4	270	0.092	13.000	0.500	17190	6326	41.1
		6.00	4	270	0.112	13.000	0.600	14325	6418	50.1
		8.00	4	270	0.150	19.000	0.800	10745	6447	98.0
		10.00	4	270	0.185	23.000	1.000	8595	6360	146.3
		12.00	4	270	0.223	27.000	1.200	7160	6387	206.9
		16.00	4	270	0.245	32.000	1.600	5370	5263	269.4
		20.00	4	270	0.307	40.000	2.000	4295	5274	421.9
	Steel 850 - 1100 N/mm²	3.00	4	216	0.054	8.000	0.300	22920	4951	11.9
		4.00	4	216	0.073	11.000	0.400	17190	5020	22.1
		5.00	4	216	0.092	13.000	0.500	13750	5060	32.9
		6.00	4	216	0.112	13.000	0.600	11460	5134	40.0
		8.00	4	216	0.150	19.000	0.800	8595	5157	78.4
		10.00	4	216	0.185	23.000	1.000	6875	5088	117.0
		12.00	4	216	0.223	27.000	1.200	5730	5111	165.6
		16.00	4	216	0.245	32.000	1.600	4295	4209	215.5
		20.00	4	216	0.307	40.000	2.000	3440	4224	337.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	132	0.038	8.000	0.225	14005	2129	3.8
		4.00	4	132	0.053	11.000	0.300	10505	2227	7.3
		5.00	4	132	0.066	13.000	0.375	8405	2219	10.8
		6.00	4	132	0.080	13.000	0.450	7005	2242	13.1
		8.00	4	132	0.106	19.000	0.600	5250	2226	25.4
		10.00	4	132	0.133	23.000	0.750	4200	2234	38.5
		12.00	4	132	0.159	27.000	0.900	3500	2226	54.1
		16.00	4	132	0.173	32.000	1.200	2625	1817	69.8
		20.00	4	132	0.222	40.000	1.500	2100	1865	111.9

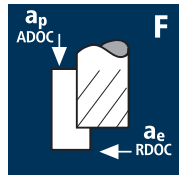
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**











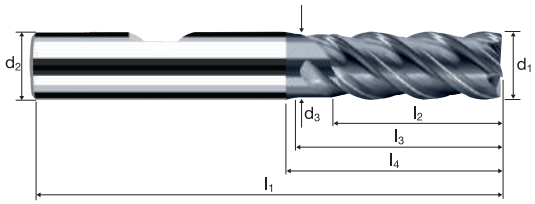
Cylindrical/Square end mills E-Cut

Smooth-edged, normal version, short neck

HM MG10 | λ 45° γ 10°

r

Vario



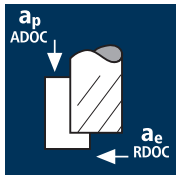
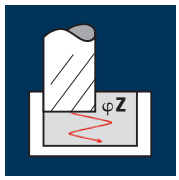
Roughing HPC | Roughing HDC | Finishing

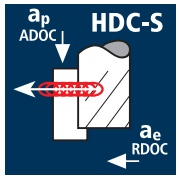
ReTool®

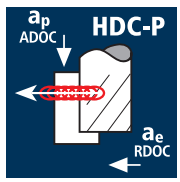
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

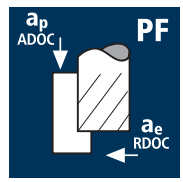
Example: **Order-N°.** Coating **P** Article-N°. **8400** ø-Code **100**

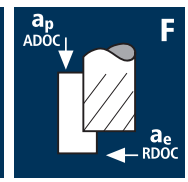
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8400	POLYCHROM P8300
100	1.00	6.00	0.95	57	3.00	5.00	14.82	0.050	4		●
140	2.00	6.00	1.90	57	5.00	8.00	16.05	0.050	4		●
160	2.50	6.00	2.30	57	7.00	10.00	17.30	0.050	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.050	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.100	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
570	14.00	14.00	13.00	83	28.00	32.97	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	40.00	48.23	53.00	0.250	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	4.00	5	165	0.040	6.000	1.200	13130	2626	18.9	1.0°
		5.00	5	165	0.049	7.500	1.500	10505	2574	29.0	1.0°
		6.00	5	165	0.051	9.000	1.800	8755	2233	36.2	1.0°
		8.00	5	165	0.069	12.000	2.400	6565	2265	65.2	1.0°
		10.00	5	165	0.085	15.000	3.000	5250	2231	100.4	1.0°
		12.00	5	165	0.096	18.000	3.600	4375	2100	136.1	1.0°
		16.00	5	165	0.111	24.000	4.800	3285	1823	210.0	1.0°
		20.00	5	165	0.127	30.000	6.000	2625	1667	300.0	1.0°
	Steel 850 - 1100 N/mm²	4.00	5	150	0.035	6.000	1.200	11935	2089	15.0	1.5°
		5.00	5	150	0.042	7.500	1.500	9550	2006	22.6	1.5°
		6.00	5	150	0.045	9.000	1.800	7960	1791	29.0	1.5°
		8.00	5	150	0.060	12.000	2.400	5970	1791	51.6	1.5°
		10.00	5	150	0.074	15.000	3.000	4775	1767	79.5	1.5°
		12.00	5	150	0.089	18.000	3.600	3980	1771	114.8	1.5°
		16.00	5	150	0.102	24.000	4.800	2985	1522	175.4	1.5°
		20.00	5	150	0.115	30.000	6.000	2385	1371	246.9	1.5°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	5	95	0.020	6.000	1.200	7560	756	5.4	1.0°
		5.00	5	95	0.026	7.500	1.500	6050	787	8.8	1.0°
		6.00	5	95	0.031	9.000	1.800	5040	781	12.7	1.0°
		8.00	5	95	0.042	12.000	2.400	3780	794	22.9	1.0°
		10.00	5	95	0.051	15.000	3.000	3025	771	34.7	1.0°
		12.00	5	95	0.062	18.000	3.600	2520	781	50.6	1.0°
		16.00	5	95	0.064	24.000	4.800	1890	605	69.7	1.0°
		20.00	5	95	0.080	30.000	6.000	1510	604	108.7	1.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	4.00	5	243	0.073	11.000	0.400	19335	7057	31.1
		5.00	5	243	0.092	13.000	0.500	15470	7116	46.3
		6.00	5	243	0.112	13.000	0.600	12890	7218	56.3
		8.00	5	243	0.150	19.000	0.800	9670	7253	110.2
		10.00	5	243	0.185	23.000	1.000	7735	7155	164.6
		12.00	5	243	0.223	27.000	1.200	6445	7186	232.8
		16.00	5	243	0.245	32.000	1.600	4835	5923	303.3
		20.00	5	243	0.307	40.000	2.000	3865	5933	474.6
	Steel 850 - 1100 N/mm²	4.00	5	195	0.073	11.000	0.400	15520	5665	24.9
		5.00	5	195	0.092	13.000	0.500	12415	5711	37.1
		6.00	5	195	0.112	13.000	0.600	10345	5793	45.2
		8.00	5	195	0.150	19.000	0.800	7760	5820	88.5
		10.00	5	195	0.185	23.000	1.000	6205	5740	132.0
		12.00	5	195	0.223	27.000	1.200	5175	5770	187.0
		16.00	5	195	0.245	32.000	1.600	3880	4753	243.4
		20.00	5	195	0.307	40.000	2.000	3105	4766	381.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	5	135	0.070	11.000	0.200	10745	3761	8.3
		5.00	5	135	0.088	13.000	0.250	8595	3782	12.3
		6.00	5	135	0.106	13.000	0.300	7160	3795	14.8
		8.00	5	135	0.141	19.000	0.400	5370	3786	28.8
		10.00	5	135	0.176	23.000	0.500	4295	3780	43.5
		12.00	5	135	0.211	27.000	0.600	3580	3777	61.2
		16.00	5	135	0.229	32.000	0.800	2685	3074	78.7
		20.00	5	135	0.295	40.000	1.000	2150	3171	126.9







Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills E-Cut

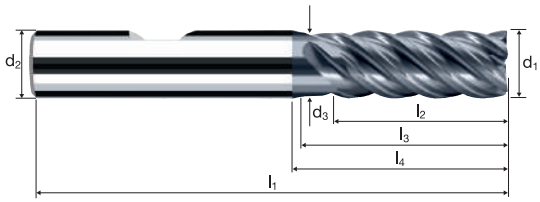
Smooth-edged, normal version, short neck

HM MG10

λ 45°
γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

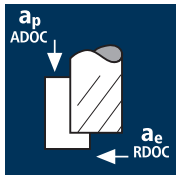
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Rm** 1300-1500 **HRC** 42-48 | **HRC** 48-56 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8405** ø-Code **220**

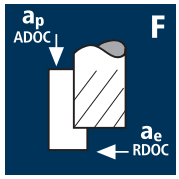
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8405	POLYCHROM P8305
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	5		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	5		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.100	5		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	5		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	5		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	5		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	5		●
682	20.00	20.00	19.00	104	40.00	48.23	53.00	0.250	5		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel < 850 N/mm²	2.00	4	140	0.007	3.000	0.300	22280	624	0.6
	3.00	4	140	0.010	4.500	0.450	14855	594	1.2
	4.00	4	140	0.015	6.000	0.600	11140	668	2.4
	5.00	4	140	0.015	7.500	0.750	8915	535	3.0
	6.00	4	140	0.020	9.000	0.900	7425	594	4.8
	8.00	4	140	0.025	12.000	1.200	5570	557	8.0
	10.00	4	140	0.035	15.000	1.500	4455	624	14.0
	12.00	4	140	0.040	18.000	1.800	3715	594	19.2
	16.00	4	140	0.055	24.000	2.400	2785	613	35.3
Steel 850 - 1100 N/mm²	2.00	4	100	0.007	3.000	0.300	15915	446	0.4
	3.00	4	100	0.010	4.500	0.450	10610	424	0.9
	4.00	4	100	0.015	6.000	0.600	7960	478	1.7
	5.00	4	100	0.015	7.500	0.750	6365	382	2.1
	6.00	4	100	0.020	9.000	0.900	5305	424	3.4
	8.00	4	100	0.025	12.000	1.200	3980	398	5.7
	10.00	4	100	0.035	15.000	1.500	3185	446	10.0
	12.00	4	100	0.040	18.000	1.800	2655	425	13.8
	16.00	4	100	0.055	24.000	2.400	1990	438	25.2
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	4	90	0.007	3.000	0.300	14325	401	0.4
	3.00	4	90	0.010	4.500	0.450	9550	382	0.8
	4.00	4	90	0.015	6.000	0.600	7160	430	1.5
	5.00	4	90	0.015	7.500	0.750	5730	344	1.9
	6.00	4	90	0.020	9.000	0.900	4775	382	3.1
	8.00	4	90	0.025	12.000	1.200	3580	358	5.2
	10.00	4	90	0.035	15.000	1.500	2865	401	9.0
	12.00	4	90	0.040	18.000	1.800	2385	382	12.4
	16.00	4	90	0.055	24.000	2.400	1790	394	22.7
Titanium alloys >300 HB [Ti6Al4V]	2.00	4	75	0.007	3.000	0.300	11935	334	0.3
	3.00	4	75	0.010	4.500	0.450	7960	318	0.6
	4.00	4	75	0.015	6.000	0.600	5970	358	1.3
	5.00	4	75	0.015	7.500	0.750	4775	287	1.6
	6.00	4	75	0.020	9.000	0.900	3980	318	2.6
	8.00	4	75	0.025	12.000	1.200	2985	299	4.3
	10.00	4	75	0.035	15.000	1.500	2385	334	7.5
	12.00	4	75	0.040	18.000	1.800	1990	318	10.3
	16.00	4	75	0.055	24.000	2.400	1490	328	18.9

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	
Steel < 850 N/mm²	2.00	4	160	0.021	4.400	0.020	25465	2139	
	3.00	4	160	0.025	6.600	0.030	16975	1698	
	4.00	4	160	0.029	9.000	0.030	12730	1477	
	5.00	4	160	0.033	11.000	0.050	10185	1344	
	6.00	4	160	0.036	13.500	0.050	8490	1223	
	8.00	4	160	0.041	18.000	0.080	6365	1044	
	10.00	4	160	0.046	22.000	0.080	5095	937	
	12.00	4	160	0.051	27.000	0.120	4245	866	
	16.00	4	160	0.059	36.000	0.120	3185	752	
Steel 850 - 1100 N/mm²	2.00	4	145	0.021	4.400	0.020	23075	1938	
	3.00	4	145	0.025	6.600	0.030	15385	1539	
	4.00	4	145	0.029	9.000	0.030	11540	1339	
	5.00	4	145	0.033	11.000	0.050	9230	1218	
	6.00	4	145	0.036	13.500	0.050	7690	1107	
	8.00	4	145	0.041	18.000	0.080	5770	946	
	10.00	4	145	0.046	22.000	0.080	4615	849	
	12.00	4	145	0.051	27.000	0.120	3845	784	
	16.00	4	145	0.059	36.000	0.120	2885	681	
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	4	85	0.021	4.400	0.020	13530	1137	
	3.00	4	85	0.025	6.600	0.030	9020	902	
	4.00	4	85	0.029	9.000	0.030	6765	785	
	5.00	4	85	0.033	11.000	0.050	5410	714	
	6.00	4	85	0.036	13.500	0.050	4510	649	
	8.00	4	85	0.041	18.000	0.080	3380	554	
	10.00	4	85	0.046	22.000	0.080	2705	498	
	12.00	4	85	0.051	27.000	0.120	2255	460	
	16.00	4	85	0.059	36.000	0.120	1690	399	
Titanium alloys >300 HB [Ti6Al4V]	2.00	4	80	0.021	4.400	0.020	12730	1069	
	3.00	4	80	0.025	6.600	0.030	8490	849	
	4.00	4	80	0.029	9.000	0.030	6365	738	
	5.00	4	80	0.033	11.000	0.050	5095	673	
	6.00	4	80	0.036	13.500	0.050	4245	611	
	8.00	4	80	0.041	18.000	0.080	3185	522	
	10.00	4	80	0.046	22.000	0.080	2545	468	
	12.00	4	80	0.051	27.000	0.120	2120	432	
	16.00	4	80	0.059	36.000	0.120	1590	375	

Cylindrical/Square end mills E-Cut

Smooth-edged, normal version, short neck

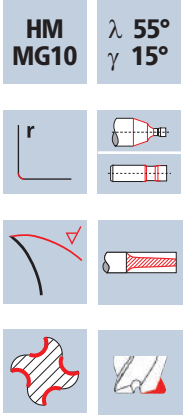
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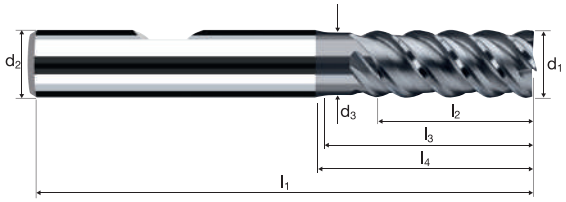
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HM MG10

λ 55°
γ 15°

new!





Roughing

Finishing

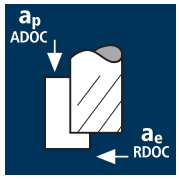
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G)** Gold / Platinum

Example: **Order-N°.** Coating **K** Article-N°. **8406** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	MULTICHROM K8406	MULTICHROM K8306
140	2.00	6.00	1.90	51	4.40	6.00	10.18	0.050	4		●
180	3.00	6.00	2.80	54	6.60	9.00	12.33	0.050	4		●
220	4.00	6.00	3.70	54	9.00	12.00	14.54	0.050	4		●
260	5.00	6.00	4.60	57	11.00	15.00	16.72	0.100	4		●
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.100	4		●
391	8.00	8.00	7.40	63	18.00	24.00	26.37	0.100	4		●
450	10.00	10.00	9.20	74	22.00	30.00	33.01	0.150	4		●
501	12.00	12.00	11.00	85	27.00	36.00	39.71	0.150	4		●
610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.150	4		●

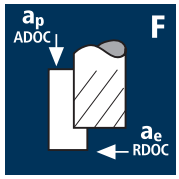
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel < 850 N/mm²								
2.00	4	140	0.007	3.000	0.300	22280	624	0.6
3.00	4	140	0.010	4.500	0.450	14855	594	1.2
4.00	4	140	0.015	6.000	0.600	11140	668	2.4
5.00	4	140	0.015	7.500	0.750	8915	535	3.0
6.00	4	140	0.020	9.000	0.900	7425	594	4.8
8.00	4	140	0.025	12.000	1.200	5570	557	8.0
10.00	4	140	0.035	15.000	1.500	4455	624	14.0
12.00	4	140	0.040	18.000	1.800	3715	594	19.2
16.00	4	140	0.055	24.000	2.400	2785	613	35.3
Steel 850 - 1100 N/mm²								
2.00	4	100	0.007	3.000	0.300	15915	446	0.4
3.00	4	100	0.010	4.500	0.450	10610	424	0.9
4.00	4	100	0.015	6.000	0.600	7960	478	1.7
5.00	4	100	0.015	7.500	0.750	6365	382	2.1
6.00	4	100	0.020	9.000	0.900	5305	424	3.4
8.00	4	100	0.025	12.000	1.200	3980	398	5.7
10.00	4	100	0.035	15.000	1.500	3185	446	10.0
12.00	4	100	0.040	18.000	1.800	2655	425	13.8
16.00	4	100	0.055	24.000	2.400	1990	438	25.2
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
2.00	4	90	0.007	3.000	0.300	14325	401	0.4
3.00	4	90	0.010	4.500	0.450	9550	382	0.8
4.00	4	90	0.015	6.000	0.600	7160	430	1.5
5.00	4	90	0.015	7.500	0.750	5730	344	1.9
6.00	4	90	0.020	9.000	0.900	4775	382	3.1
8.00	4	90	0.025	12.000	1.200	3580	358	5.2
10.00	4	90	0.035	15.000	1.500	2865	401	9.0
12.00	4	90	0.040	18.000	1.800	2385	382	12.4
16.00	4	90	0.055	24.000	2.400	1790	394	22.7
Titanium alloys >300 HB [Ti6Al4V]								
2.00	4	75	0.007	3.000	0.300	11935	334	0.3
3.00	4	75	0.010	4.500	0.450	7960	318	0.6
4.00	4	75	0.015	6.000	0.600	5970	358	1.3
5.00	4	75	0.015	7.500	0.750	4775	287	1.6
6.00	4	75	0.020	9.000	0.900	3980	318	2.6
8.00	4	75	0.025	12.000	1.200	2985	299	4.3
10.00	4	75	0.035	15.000	1.500	2385	334	7.5
12.00	4	75	0.040	18.000	1.800	1990	318	10.3
16.00	4	75	0.055	24.000	2.400	1490	328	18.9

Application



Material

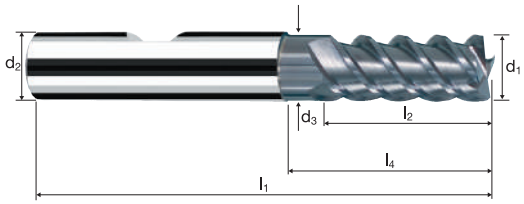
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	
Steel < 850 N/mm²								
2.00	4	160	0.021	4.400	0.020	25465	2139	
3.00	4	160	0.025	6.600	0.030	16975	1698	
4.00	4	160	0.029	9.000	0.030	12730	1477	
5.00	4	160	0.033	11.000	0.050	10185	1344	
6.00	4	160	0.036	13.500	0.050	8490	1223	
8.00	4	160	0.041	18.000	0.080	6365	1044	
10.00	4	160	0.046	22.000	0.080	5095	937	
12.00	4	160	0.051	27.000	0.120	4245	866	
16.00	4	160	0.059	36.000	0.120	3185	752	
Steel 850 - 1100 N/mm²								
2.00	4	145	0.021	4.400	0.020	23075	1938	
3.00	4	145	0.025	6.600	0.030	15385	1539	
4.00	4	145	0.029	9.000	0.030	11540	1339	
5.00	4	145	0.033	11.000	0.050	9230	1218	
6.00	4	145	0.036	13.500	0.050	7690	1107	
8.00	4	145	0.041	18.000	0.080	5770	946	
10.00	4	145	0.046	22.000	0.080	4615	849	
12.00	4	145	0.051	27.000	0.120	3845	784	
16.00	4	145	0.059	36.000	0.120	2885	681	
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
2.00	4	85	0.021	4.400	0.020	13530	1137	
3.00	4	85	0.025	6.600	0.030	9020	902	
4.00	4	85	0.029	9.000	0.030	6765	785	
5.00	4	85	0.033	11.000	0.050	5410	714	
6.00	4	85	0.036	13.500	0.050	4510	649	
8.00	4	85	0.041	18.000	0.080	3380	554	
10.00	4	85	0.046	22.000	0.080	2705	498	
12.00	4	85	0.051	27.000	0.120	2255	460	
16.00	4	85	0.059	36.000	0.120	1690	399	
Titanium alloys >300 HB [Ti6Al4V]								
2.00	4	80	0.021	4.400	0.020	12730	1069	
3.00	4	80	0.025	6.600	0.030	8490	849	
4.00	4	80	0.029	9.000	0.030	6365	738	
5.00	4	80	0.033	11.000	0.050	5095	673	
6.00	4	80	0.036	13.500	0.050	4245	611	
8.00	4	80	0.041	18.000	0.080	3185	522	
10.00	4	80	0.046	22.000	0.080	2545	468	
12.00	4	80	0.051	27.000	0.120	2120	432	
16.00	4	80	0.059	36.000	0.120	1590	375	

Cylindrical/Square end mills

Smooth-edged, normal version, short neck

HM MG10 | λ 55° γ 15°

45°



Roughing

Finishing

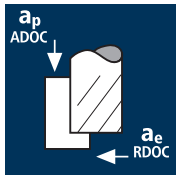
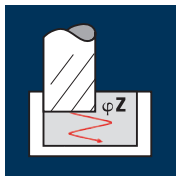
ReTool®

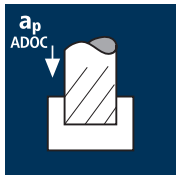
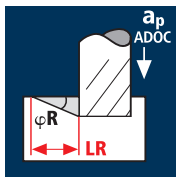
Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G)** Gold / Platinum

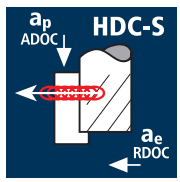
Example: **Order-N°.** Coating **P** Article-N°. **5355** ø-Code **180**

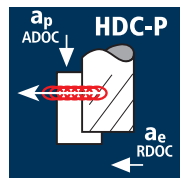
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P5355	POLYCHROM P5255
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.05	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.05	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.10	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.10	4		●
331*	7.00	8.00	-	63	16.00	-	20.02	0.10	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.10	4		●
420*	9.00	10.00	-	72	19.00	-	23.02	0.15	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.15	4		●
470*	11.00	12.00	-	83	26.00	-	30.52	0.15	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.15	4		●
570	14.00	14.00	13.00	83	26.00	36.13	37.00	0.15	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.15	4		●
640	18.00	18.00	17.00	92	32.00	42.13	43.00	0.15	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.15	4		●

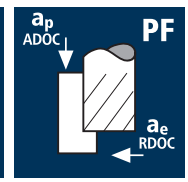
* without short neck

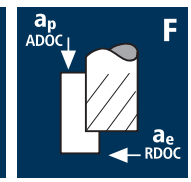
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	3	145	0.021	3.750	1.950	15385	969	7.1	2.0°
		4.00	3	145	0.030	5.000	2.600	11540	1039	13.5	2.0°
		5.00	3	145	0.038	6.250	3.250	9230	1052	21.4	2.0°
		6.00	3	145	0.041	9.000	3.900	7690	946	33.2	2.0°
		8.00	3	145	0.054	12.000	5.200	5770	935	58.3	2.0°
		10.00	3	145	0.068	15.000	6.500	4615	942	91.8	2.0°
		12.00	3	145	0.076	18.000	7.800	3845	877	123.1	2.0°
		16.00	3	145	0.086	24.000	10.400	2885	744	185.8	2.0°
		20.00	3	145	0.099	30.000	13.000	2310	686	267.6	2.0°
	Steel 850 - 1100 N/mm²	3.00	3	130	0.020	3.750	1.950	13795	828	6.1	3.0°
		4.00	3	130	0.027	5.000	2.600	10345	838	10.9	3.0°
		5.00	3	130	0.033	6.250	3.250	8275	819	16.6	3.0°
		6.00	3	130	0.035	9.000	3.900	6895	724	25.4	3.0°
		8.00	3	130	0.047	12.000	5.200	5175	730	45.5	3.0°
		10.00	3	130	0.059	15.000	6.500	4140	733	71.4	3.0°
		12.00	3	130	0.070	18.000	7.800	3450	725	101.7	3.0°
		16.00	3	130	0.079	24.000	10.400	2585	613	152.9	3.0°
		20.00	3	130	0.099	30.000	13.000	2070	615	239.8	3.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	80	0.014	3.750	1.950	8490	357	2.6	2.0°
		4.00	3	80	0.018	5.000	2.600	6365	344	4.5	2.0°
		5.00	3	80	0.025	6.250	3.250	5095	382	7.8	2.0°
		6.00	3	80	0.027	9.000	3.900	4245	344	12.1	2.0°
		8.00	3	80	0.036	12.000	5.200	3185	344	21.5	2.0°
		10.00	3	80	0.045	15.000	6.500	2545	344	33.5	2.0°
		12.00	3	80	0.054	18.000	7.800	2120	343	48.2	2.0°
		16.00	3	80	0.056	24.000	10.400	1590	267	66.7	2.0°
		20.00	3	80	0.070	30.000	13.000	1275	268	104.4	2.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]
	Steel < 850 N/mm²	3.00	3	123	0.017	3.000	3.000	13050	666	6.0	2.0°
		4.00	3	123	0.024	5.000	4.000	9790	705	14.1	2.0°
		5.00	3	123	0.030	6.250	5.000	7830	705	22.0	2.0°
		6.00	3	123	0.033	9.000	6.000	6525	646	34.9	2.0°
		8.00	3	123	0.043	12.000	8.000	4895	632	60.6	2.0°
		10.00	3	123	0.054	15.000	10.000	3915	634	95.1	2.0°
		12.00	3	123	0.061	18.000	12.000	3265	598	129.1	2.0°
		16.00	3	123	0.069	24.000	16.000	2445	506	194.3	2.0°
		20.00	3	123	0.079	30.000	20.000	1960	465	278.7	2.0°
	Steel 850 - 1100 N/mm²	3.00	3	111	0.016	3.000	3.000	11775	565	5.1	2.0°
		4.00	3	111	0.022	5.000	4.000	8835	583	11.7	2.0°
		5.00	3	111	0.026	6.250	5.000	7065	551	17.2	2.0°
		6.00	3	111	0.028	9.000	6.000	5890	495	26.7	2.0°
		8.00	3	111	0.038	12.000	8.000	4415	503	48.3	2.0°
		10.00	3	111	0.047	15.000	10.000	3535	498	74.8	2.0°
		12.00	3	111	0.056	18.000	12.000	2945	495	106.9	2.0°
		16.00	3	111	0.063	24.000	16.000	2210	418	160.4	2.0°
		20.00	3	111	0.079	30.000	20.000	1765	418	251.0	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	68	0.011	3.000	3.000	7215	238	2.1	2.0°
		4.00	3	68	0.014	5.000	4.000	5410	227	4.5	2.0°
		5.00	3	68	0.020	6.250	5.000	4330	260	8.1	2.0°
		6.00	3	68	0.022	9.000	6.000	3610	238	12.9	2.0°
		8.00	3	68	0.029	12.000	8.000	2705	235	22.6	2.0°
		10.00	3	68	0.036	15.000	10.000	2165	234	35.1	2.0°
		12.00	3	68	0.043	18.000	12.000	1805	233	50.3	2.0°
		16.00	3	68	0.045	24.000	16.000	1355	183	70.2	2.0°
		20.00	3	68	0.056	30.000	20.000	1080	181	108.8	2.0°









Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

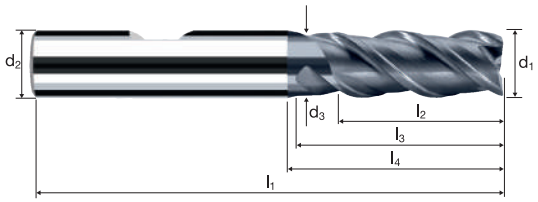
Cylindrical/Square end mills E-Cut

Smooth-edged, normal version, short neck

HM MG10 | λ 45° γ 10°

r

Vario



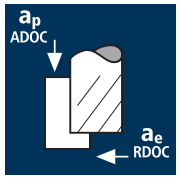
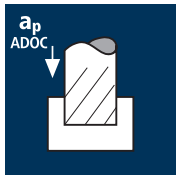
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8403** ø-Code **100**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8403	POLYCHROM P8303
100	1.00	6.00	0.95	57	3.00	5.00	14.82	0.050	3		●
140	2.00	6.00	1.90	57	5.00	8.00	16.05	0.050	3		●
160	2.50	6.00	2.30	57	7.00	10.00	17.30	0.050	3		●
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.050	3		●
200	3.50	6.00	3.20	57	9.00	14.00	19.69	0.050	3		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	3		●
240	4.50	6.00	4.10	57	12.00	17.00	21.14	0.100	3		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	3		●
280	5.50	6.00	5.00	57	13.00	18.00	20.59	0.100	3		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.100	3		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	3		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	3		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	3		●
570	14.00	14.00	13.00	83	28.00	32.97	37.00	0.200	3		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	3		●
682	20.00	20.00	19.00	104	40.00	48.23	53.00	0.250	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	140	0.022	3.750	1.200	14855	1307	5.9
		4.00	4	140	0.031	5.000	1.600	11140	1381	11.1
		5.00	4	140	0.038	6.250	2.000	8915	1355	16.9
		6.00	4	140	0.041	9.000	2.400	7425	1218	26.3
		8.00	4	140	0.054	12.000	3.200	5570	1203	46.2
		10.00	4	140	0.068	15.000	4.000	4455	1212	72.7
		12.00	4	140	0.076	18.000	4.800	3715	1129	97.6
		16.00	4	140	0.086	24.000	6.400	2785	958	147.1
		20.00	4	140	0.099	30.000	8.000	2230	883	211.9
	Steel 850 - 1100 N/mm²	3.00	4	120	0.020	3.750	1.200	12730	1018	4.6
		4.00	4	120	0.025	5.000	1.600	9550	955	7.6
		5.00	4	120	0.033	6.250	2.000	7640	1009	12.6
		6.00	4	120	0.035	9.000	2.400	6365	891	19.2
		8.00	4	120	0.047	12.000	3.200	4775	898	34.5
		10.00	4	120	0.059	15.000	4.000	3820	902	54.1
		12.00	4	120	0.070	18.000	4.800	3185	892	77.1
		16.00	4	120	0.079	24.000	6.400	2385	754	115.8
		20.00	4	120	0.090	30.000	8.000	1910	688	165.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	80	0.012	3.750	1.200	8490	408	1.8
		4.00	4	80	0.016	5.000	1.600	6365	407	3.3
		5.00	4	80	0.020	6.250	2.000	5095	408	5.1
		6.00	4	80	0.024	9.000	2.400	4245	408	8.8
		8.00	4	80	0.032	12.000	3.200	3185	408	15.7
		10.00	4	80	0.041	15.000	4.000	2545	417	25.0
		12.00	4	80	0.049	18.000	4.800	2120	416	35.9
		16.00	4	80	0.050	24.000	6.400	1590	318	48.8
		20.00	4	80	0.063	30.000	8.000	1275	321	77.1
	Cast iron (lamellar / spheroidal)	3.00	4	155	0.020	3.750	1.200	16445	1316	5.9
		4.00	4	155	0.029	5.000	1.600	12335	1431	11.4
		5.00	4	155	0.034	6.250	2.000	9870	1342	16.8
		6.00	4	155	0.038	9.000	2.400	8225	1250	27.0
		8.00	4	155	0.050	12.000	3.200	6165	1233	47.3
		10.00	4	155	0.063	15.000	4.000	4935	1244	74.6
		12.00	4	155	0.076	18.000	4.800	4110	1249	107.9
		16.00	4	155	0.086	24.000	6.400	3085	1061	163.0
		20.00	4	155	0.099	30.000	8.000	2465	976	234.3
	Steel < 850 N/mm²	3.00	4	105	0.011	2.250	3.000	11140	490	3.3
		4.00	4	105	0.016	4.000	4.000	8355	535	8.6
		5.00	4	105	0.019	5.000	5.000	6685	508	12.7
		6.00	4	105	0.027	7.500	6.000	5570	602	27.1
		8.00	4	105	0.035	10.000	8.000	4180	585	46.8
		10.00	4	105	0.044	12.500	10.000	3340	588	73.5
		12.00	4	105	0.049	15.000	12.000	2785	546	98.3
		16.00	4	105	0.056	20.000	16.000	2090	468	149.8
		20.00	4	105	0.064	25.000	20.000	1670	428	213.8
	Steel 850 - 1100 N/mm²	3.00	4	90	0.010	2.250	3.000	9550	382	2.6
		4.00	4	90	0.013	4.000	4.000	7160	372	6.0
		5.00	4	90	0.017	5.000	5.000	5730	390	9.7
		6.00	4	90	0.023	7.500	6.000	4775	439	19.8
		8.00	4	90	0.031	10.000	8.000	3580	444	35.5
		10.00	4	90	0.038	12.500	10.000	2865	436	54.4
		12.00	4	90	0.046	15.000	12.000	2385	439	79.0
		16.00	4	90	0.051	20.000	16.000	1790	365	116.9
		20.00	4	90	0.058	25.000	20.000	1430	332	165.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	60	0.006	2.250	3.000	6365	153	1.0
		4.00	4	60	0.008	4.000	4.000	4775	153	2.4
		5.00	4	60	0.010	5.000	5.000	3820	153	3.8
		6.00	4	60	0.016	7.500	6.000	3185	204	9.2
		8.00	4	60	0.021	10.000	8.000	2385	200	16.0
		10.00	4	60	0.027	12.500	10.000	1910	206	25.8
		12.00	4	60	0.032	15.000	12.000	1590	204	36.6
		16.00	4	60	0.033	20.000	16.000	1195	158	50.5
		20.00	4	60	0.041	25.000	20.000	955	157	78.3
	Cast iron (lamellar / spheroidal)	3.00	4	116	0.010	2.250	3.000	12310	492	3.3
		4.00	4	116	0.015	4.000	4.000	9230	554	8.9
		5.00	4	116	0.017	5.000	5.000	7385	502	12.6
		6.00	4	116	0.025	7.500	6.000	6155	616	27.7
		8.00	4	116	0.033	10.000	8.000	4615	609	48.7
		10.00	4	116	0.041	12.500	10.000	3690	605	75.7
		12.00	4	116	0.049	15.000	12.000	3075	603	108.5
		16.00	4	116	0.056	20.000	16.000	2310	517	165.6
		20.00	4	116	0.064	25.000	20.000	1845	472	236.2

Cylindrical/Square end mills

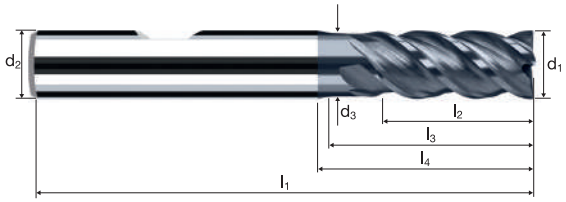
Smooth-edged, normal version, short neck

Favora® F

HM MG10	λ 43° γ 6°

r

Vario



Roughing HPC | Roughing HDC | Finishing

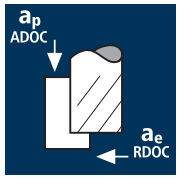
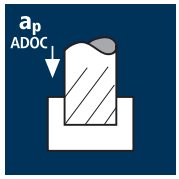
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **46300** ø-Code **100**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P46300	POLYCHROM P46200
100	1.00	6.00	0.95	57	3.00	7.00	16.82	0.050	4		●
140	2.00	6.00	1.90	57	5.00	10.00	18.05	0.050	4		●
178*	3.00	3.00	-	45	8.00	-	-	0.050	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.050	4		●
218*	4.00	4.00	-	50	11.00	-	-	0.100	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	4		●
258*	5.00	5.00	-	50	13.00	-	-	0.100	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.150	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
570	14.00	14.00	13.00	83	28.00	32.97	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
682	20.00	20.00	19.00	104	40.00	48.23	53.00	0.250	4		●

* without clamping flat, without short neck

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	140	0.041	9.000	2.400	7427	1218	26.3
		8.00	4	140	0.054	12.000	3.200	5570	1203	46.2
		10.00	4	140	0.068	15.000	4.000	4456	1212	72.7
		12.00	4	140	0.076	18.000	4.800	3714	1129	97.5
		16.00	4	140	0.086	24.000	6.400	2785	958	147.2
		20.00	4	140	0.099	30.000	8.000	2228	882	211.8
	Steel 850 - 1100 N/mm²	6.00	4	120	0.035	9.000	2.400	6366	891	19.3
		8.00	4	120	0.047	12.000	3.200	4775	898	34.5
		10.00	4	120	0.059	15.000	4.000	3820	901	54.1
		12.00	4	120	0.070	18.000	4.800	3183	891	77.0
		16.00	4	120	0.079	24.000	6.400	2387	754	115.9
		20.00	4	120	0.090	30.000	8.000	1910	688	165.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	80	0.024	9.000	2.400	4244	407	8.8
		8.00	4	80	0.032	12.000	3.200	3183	407	15.6
		10.00	4	80	0.041	15.000	4.000	2546	418	25.1
		12.00	4	80	0.049	18.000	4.800	2122	416	35.9
		16.00	4	80	0.050	24.000	6.400	1592	318	48.9
		20.00	4	80	0.063	30.000	8.000	1273	321	77.0
	Cast iron (lamellar / spheroidal)	6.00	4	155	0.038	9.000	2.400	8223	1250	27.0
		8.00	4	155	0.050	12.000	3.200	6167	1233	47.4
		10.00	4	155	0.063	15.000	4.000	4934	1243	74.6
		12.00	4	155	0.076	18.000	4.800	4112	1250	108.0
		16.00	4	155	0.086	24.000	6.400	3084	1061	162.9
		20.00	4	155	0.099	30.000	8.000	2467	977	234.5
	Steel < 850 N/mm²	6.00	4	105	0.027	7.500	6.000	5570	602	27.1
		8.00	4	105	0.035	10.000	8.000	4178	585	46.8
		10.00	4	105	0.044	12.500	10.000	3342	588	73.5
		12.00	4	105	0.049	15.000	12.000	2785	546	98.3
		16.00	4	105	0.056	20.000	16.000	2089	468	149.7
		20.00	4	105	0.064	25.000	20.000	1671	428	213.9
	Steel 850 - 1100 N/mm²	6.00	4	90	0.023	7.500	6.000	4775	439	19.8
		8.00	4	90	0.031	10.000	8.000	3581	444	35.5
		10.00	4	90	0.038	12.500	10.000	2865	435	54.4
		12.00	4	90	0.046	15.000	12.000	2387	439	79.1
		16.00	4	90	0.051	20.000	16.000	1790	365	116.9
		20.00	4	90	0.058	25.000	20.000	1432	332	166.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	60	0.016	7.500	6.000	3183	204	9.2
		8.00	4	60	0.021	10.000	8.000	2387	201	16.0
		10.00	4	60	0.027	12.500	10.000	1910	206	25.8
		12.00	4	60	0.032	15.000	12.000	1592	204	36.7
		16.00	4	60	0.033	20.000	16.000	1194	158	50.4
		20.00	4	60	0.041	25.000	20.000	955	157	78.3
	Cast iron (lamellar / spheroidal)	6.00	4	116	0.025	7.500	6.000	6154	615	27.7
		8.00	4	116	0.033	10.000	8.000	4615	609	48.7
		10.00	4	116	0.041	12.500	10.000	3692	606	75.7
		12.00	4	116	0.049	15.000	12.000	3077	603	108.6
		16.00	4	116	0.056	20.000	16.000	2308	517	165.4
		20.00	4	116	0.064	25.000	20.000	1846	473	236.3

Cylindrical/Square end mills

Smooth-edged, normal version, short neck

Favora® F

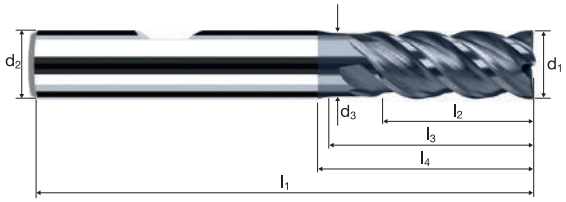
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HM MG10

λ 43°
γ 3°

new!



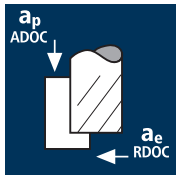
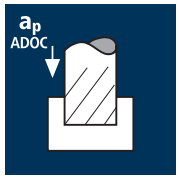
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G)** Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **45370** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P45370	POLYCHROM P45270
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.150	4		●
391	8.00	8.00	7.40	63	18.00	24.00	26.37	0.150	4		●
450	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	4		●
501	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	4		●
610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.200	4		●
682	20.00	20.00	19.00	115	44.00	60.00	64.77	0.250	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	140	0.041	9.000	2.400	7425	1203	26.0
		8.00	4	140	0.054	12.000	3.200	5570	1203	46.2
		10.00	4	140	0.068	15.000	4.000	4455	1203	72.2
		12.00	4	140	0.076	18.000	4.800	3715	1123	97.1
		16.00	4	140	0.086	24.000	6.400	2785	963	147.8
		20.00	4	140	0.099	30.000	8.000	2230	883	211.9
	Steel 850 - 1100 N/mm²	6.00	4	125	0.035	9.000	2.400	6630	931	20.1
		8.00	4	125	0.047	12.000	3.200	4975	931	35.8
		10.00	4	125	0.059	15.000	4.000	3980	931	55.9
		12.00	4	125	0.070	18.000	4.800	3315	931	80.4
		16.00	4	125	0.079	24.000	6.400	2485	787	120.9
		20.00	4	125	0.090	30.000	8.000	1990	716	171.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	80	0.024	9.000	2.400	4245	413	8.9
		8.00	4	80	0.032	12.000	3.200	3185	413	15.9
		10.00	4	80	0.041	15.000	4.000	2545	412	24.7
		12.00	4	80	0.049	18.000	4.800	2120	412	35.6
		16.00	4	80	0.050	24.000	6.400	1590	321	49.2
		20.00	4	80	0.063	30.000	8.000	1275	321	77.1
	Cast iron (lamellar / spheroidal)	6.00	4	155	0.038	9.000	2.400	8225	1244	26.9
		8.00	4	155	0.050	12.000	3.200	6165	1243	47.7
		10.00	4	155	0.063	15.000	4.000	4935	1244	74.6
		12.00	4	155	0.076	18.000	4.800	4110	1243	107.4
		16.00	4	155	0.086	24.000	6.400	3085	1066	163.8
		20.00	4	155	0.099	30.000	8.000	2465	976	234.3
	Steel 500 - 850 N/mm²	6.00	4	110	0.026	7.500	6.000	5835	607	27.3
		8.00	4	110	0.035	10.000	8.000	4375	613	49.0
		10.00	4	110	0.044	12.500	10.000	3500	616	77.0
		12.00	4	110	0.049	15.000	12.000	2920	572	103.0
		16.00	4	110	0.056	20.000	16.000	2190	491	157.0
		20.00	4	110	0.064	25.000	20.000	1750	448	224.0
	Steel 850 - 1100 N/mm²	6.00	4	100	0.023	7.500	6.000	5305	488	22.0
		8.00	4	100	0.030	10.000	8.000	3980	478	38.2
		10.00	4	100	0.038	12.500	10.000	3185	484	60.5
		12.00	4	100	0.046	15.000	12.000	2655	489	87.9
		16.00	4	100	0.051	20.000	16.000	1990	406	129.9
		20.00	4	100	0.059	25.000	20.000	1590	375	187.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	65	0.016	7.500	6.000	3450	221	9.9
		8.00	4	65	0.021	10.000	8.000	2585	217	17.4
		10.00	4	65	0.026	12.500	10.000	2070	215	26.9
		12.00	4	65	0.032	15.000	12.000	1725	221	39.7
		16.00	4	65	0.033	20.000	16.000	1295	171	54.7
		20.00	4	65	0.041	25.000	20.000	1035	170	84.9
	Cast iron (lamellar / spheroidal)	6.00	4	125	0.025	7.500	6.000	6630	663	29.8
		8.00	4	125	0.033	10.000	8.000	4975	657	52.5
		10.00	4	125	0.041	12.500	10.000	3980	653	81.6
		12.00	4	125	0.049	15.000	12.000	3315	650	116.9
		16.00	4	125	0.056	20.000	16.000	2485	557	178.1
		20.00	4	125	0.064	25.000	20.000	1990	509	254.7

Cylindrical/Square end mills

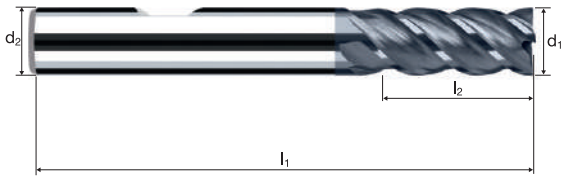
Smooth-edged, normal version

Favora® F

HM MG10 | λ 43° γ 3°

45°

Vario



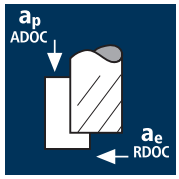
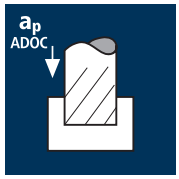
Roughing HPC | Roughing HDC | Finishing

ToolSchool P45270 / P45370

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **45325** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z	POLYCHROM P45325	POLYCHROM P45225
300	6.00	6.00	57	13.00	0.10	4		●
391	8.00	8.00	63	19.00	0.10	4		●
450	10.00	10.00	72	22.00	0.15	4		●
501	12.00	12.00	83	26.00	0.15	4		●
610	16.00	16.00	92	32.00	0.15	4		●
682	20.00	20.00	104	38.00	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	150	0.015	4.500	0.750	15915	955	3.2
		4.00	4	150	0.020	6.000	1.200	11935	955	6.9
		5.00	4	150	0.025	7.500	1.750	9550	955	12.5
		6.00	4	150	0.030	9.000	2.400	7960	955	20.6
		8.00	4	150	0.040	12.000	3.200	5970	955	36.7
		10.00	4	150	0.050	15.000	4.000	4775	955	57.3
		12.00	4	150	0.060	18.000	4.800	3980	955	82.5
		16.00	4	150	0.075	24.000	6.400	2985	896	137.5
		20.00	4	150	0.095	30.000	8.000	2385	906	217.5
	Steel 850 - 1100 N/mm²	3.00	4	120	0.015	4.500	0.750	12730	764	2.6
		4.00	4	120	0.020	6.000	1.200	9550	764	5.5
		5.00	4	120	0.025	7.500	1.750	7640	764	10.0
		6.00	4	120	0.030	9.000	2.400	6365	764	16.5
		8.00	4	120	0.040	12.000	3.200	4775	764	29.3
		10.00	4	120	0.050	15.000	4.000	3820	764	45.8
		12.00	4	120	0.060	18.000	4.800	3185	764	66.0
		16.00	4	120	0.075	24.000	6.400	2385	716	109.9
		20.00	4	120	0.095	30.000	8.000	1910	726	174.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	80	0.010	4.500	0.750	8490	340	1.1
		4.00	4	80	0.015	6.000	1.200	6365	382	2.7
		5.00	4	80	0.020	7.500	1.750	5095	408	5.3
		6.00	4	80	0.025	9.000	2.400	4245	425	9.2
		8.00	4	80	0.030	12.000	3.200	3185	382	14.7
		10.00	4	80	0.040	15.000	4.000	2545	407	24.4
		12.00	4	80	0.050	18.000	4.800	2120	424	36.6
		16.00	4	80	0.060	24.000	6.400	1590	382	58.6
		20.00	4	80	0.075	30.000	8.000	1275	383	91.8
	Cast iron (lamellar / spheroidal)	3.00	4	135	0.015	4.500	0.750	14325	860	2.9
		4.00	4	135	0.020	6.000	1.200	10745	860	6.2
		5.00	4	135	0.025	7.500	1.750	8595	860	11.3
		6.00	4	135	0.030	9.000	2.400	7160	859	18.6
		8.00	4	135	0.040	12.000	3.200	5370	859	33.0
		10.00	4	135	0.050	15.000	4.000	4295	859	51.5
		12.00	4	135	0.060	18.000	4.800	3580	859	74.2
		16.00	4	135	0.085	24.000	6.400	2685	913	140.2
		20.00	4	135	0.105	30.000	8.000	2150	903	216.7
	Steel < 850 N/mm²	3.00	4	125	0.010	1.800	3.000	13265	531	2.9
		4.00	4	125	0.015	2.800	4.000	9945	597	6.7
		5.00	4	125	0.020	4.000	5.000	7960	637	12.7
		6.00	4	125	0.025	6.000	6.000	6630	663	23.9
		8.00	4	125	0.030	8.000	8.000	4975	597	38.2
		10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.045	12.000	12.000	3315	597	85.9
		16.00	4	125	0.055	8.000	16.000	2485	547	70.0
		20.00	4	125	0.070	10.000	20.000	1990	557	111.4
	Steel 850 - 1100 N/mm²	3.00	4	95	0.010	1.800	3.000	10080	403	2.2
		4.00	4	95	0.015	2.800	4.000	7560	454	5.1
		5.00	4	95	0.020	4.000	5.000	6050	484	9.7
		6.00	4	95	0.025	6.000	6.000	5040	504	18.1
		8.00	4	95	0.030	8.000	8.000	3780	454	29.0
		10.00	4	95	0.040	10.000	10.000	3025	484	48.4
		12.00	4	95	0.045	12.000	12.000	2520	454	65.3
		16.00	4	95	0.055	8.000	16.000	1890	416	53.2
		20.00	4	95	0.070	10.000	20.000	1510	423	84.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	65	0.008	1.300	3.000	6895	221	0.9
		4.00	4	65	0.010	2.000	4.000	5175	207	1.7
		5.00	4	65	0.015	2.800	5.000	4140	248	3.5
		6.00	4	65	0.020	4.200	6.000	3450	276	7.0
		8.00	4	65	0.025	8.000	8.000	2585	259	16.5
		10.00	4	65	0.030	10.000	10.000	2070	248	24.8
		12.00	4	65	0.040	12.000	12.000	1725	276	39.7
		16.00	4	65	0.045	8.000	16.000	1295	233	29.8
		20.00	4	65	0.055	10.000	20.000	1035	228	45.5
	Cast iron (lamellar / spheroidal)	3.00	4	115	0.010	1.800	3.000	12200	488	2.6
		4.00	4	115	0.015	2.800	4.000	9150	549	6.1
		5.00	4	115	0.025	4.000	5.000	7320	732	14.6
		6.00	4	115	0.025	6.000	6.000	6100	610	22.0
		8.00	4	115	0.035	8.000	8.000	4575	641	41.0
		10.00	4	115	0.040	10.000	10.000	3660	586	58.6
		12.00	4	115	0.050	12.000	12.000	3050	610	87.8
		16.00	4	115	0.065	8.000	16.000	2290	595	76.2
		20.00	4	115	0.080	10.000	20.000	1830	586	117.1

Cylindrical/Square end mills

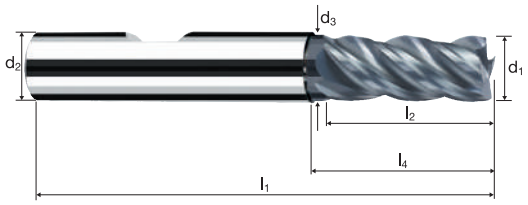
Smooth-edged, normal version, short neck

Favora® F

HM MG10 | λ 40° γ 6°

45°

Vario



Roughing

Finishing

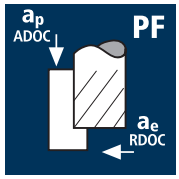
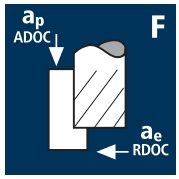
ToolSchool P46200 / P46300 K8330 / K8430

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **45317** ø-Code **100**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P45317	POLYCHROM P45217
100	1.00	6.00	0.95	57	5.00	7.00	17.08	0.04	4		●
140	2.00	6.00	1.90	57	7.00	10.00	18.31	0.05	4		●
178*	3.00	3.00	-	45	8.00	-	-	0.05	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.05	4		●
218*	4.00	4.00	-	50	11.00	-	-	0.05	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.05	4		●
258*	5.00	5.00	-	50	13.00	-	-	0.10	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.10	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.10	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.10	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.15	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.15	4		●
570	14.00	14.00	13.00	83	26.00	36.13	37.00	0.15	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.15	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.15	4		●
772	25.00	25.00	24.00	121	45.00	63.13	64.00	0.20	4		●

* without clamping flat, without short neck

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel < 850 N/mm²	4.00	4	140	0.015	6.000	1.000	11140	668
		6.00	4	140	0.020	9.000	1.500	7425	594
		8.00	4	140	0.025	12.000	2.000	5570	557
		10.00	4	140	0.035	15.000	2.500	4455	624
		12.00	4	140	0.040	18.000	3.000	3715	594
		14.00	4	140	0.045	21.000	3.500	3185	573
		16.00	4	140	0.055	24.000	4.000	2785	613
		18.00	4	140	0.060	27.000	4.500	2475	594
		20.00	4	140	0.065	30.000	5.000	2230	580
	Steel 850 - 1100 N/mm²	4.00	4	120	0.015	6.000	1.000	9550	573
		6.00	4	120	0.020	9.000	1.500	6365	509
		8.00	4	120	0.025	12.000	2.000	4775	478
		10.00	4	120	0.035	15.000	2.500	3820	535
		12.00	4	120	0.040	18.000	3.000	3185	510
		14.00	4	120	0.045	21.000	3.500	2730	491
		16.00	4	120	0.055	24.000	4.000	2385	525
		18.00	4	120	0.060	27.000	4.500	2120	509
		20.00	4	120	0.065	30.000	5.000	1910	497
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	90	0.015	6.000	1.000	7160	430
		6.00	4	90	0.020	9.000	1.500	4775	382
		8.00	4	90	0.025	12.000	2.000	3580	358
		10.00	4	90	0.035	15.000	2.500	2865	401
		12.00	4	90	0.040	18.000	3.000	2385	382
		14.00	4	90	0.045	21.000	3.500	2045	368
		16.00	4	90	0.055	24.000	4.000	1790	394
		18.00	4	90	0.060	27.000	4.500	1590	382
		20.00	4	90	0.065	30.000	5.000	1430	372
	Titanium alloys >300 HB [Ti6Al4V]	4.00	4	50	0.015	6.000	1.000	3980	239
		6.00	4	50	0.020	9.000	1.500	2655	212
		8.00	4	50	0.025	12.000	2.000	1990	199
		10.00	4	50	0.035	15.000	2.500	1590	223
		12.00	4	50	0.040	18.000	3.000	1325	212
		14.00	4	50	0.045	21.000	3.500	1135	204
		16.00	4	50	0.055	24.000	4.000	995	219
		18.00	4	50	0.060	27.000	4.500	885	212
		20.00	4	50	0.065	30.000	5.000	795	207
	Steel < 850 N/mm²	4.00	4	150	0.010	6.000	0.100	11935	477
		6.00	4	150	0.015	9.000	0.100	7960	478
		8.00	4	150	0.025	12.000	0.150	5970	597
		10.00	4	150	0.030	15.000	0.150	4775	573
		12.00	4	150	0.035	18.000	0.200	3980	557
		14.00	4	150	0.040	21.000	0.200	3410	546
		16.00	4	150	0.045	24.000	0.250	2985	537
		18.00	4	150	0.050	27.000	0.250	2655	531
		20.00	4	150	0.055	30.000	0.300	2385	525
	Steel 850 - 1100 N/mm²	4.00	4	140	0.010	6.000	0.100	11140	446
		6.00	4	140	0.015	9.000	0.100	7425	446
		8.00	4	140	0.025	12.000	0.150	5570	557
		10.00	4	140	0.030	15.000	0.150	4455	535
		12.00	4	140	0.035	18.000	0.200	3715	520
		14.00	4	140	0.040	21.000	0.200	3185	510
		16.00	4	140	0.045	24.000	0.250	2785	501
		18.00	4	140	0.050	27.000	0.250	2475	495
		20.00	4	140	0.055	30.000	0.300	2230	491
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	100	0.010	6.000	0.100	7960	318
		6.00	4	100	0.015	9.000	0.100	5305	318
		8.00	4	100	0.025	12.000	0.150	3980	398
		10.00	4	100	0.030	15.000	0.150	3185	382
		12.00	4	100	0.035	18.000	0.200	2655	372
		14.00	4	100	0.040	21.000	0.200	2275	364
		16.00	4	100	0.045	24.000	0.250	1990	358
		18.00	4	100	0.050	27.000	0.250	1770	354
		20.00	4	100	0.055	30.000	0.300	1590	350
	Titanium alloys >300 HB [Ti6Al4V]	4.00	4	60	0.010	6.000	0.100	4775	191
		6.00	4	60	0.015	9.000	0.100	3185	191
		8.00	4	60	0.025	12.000	0.150	2385	239
		10.00	4	60	0.030	15.000	0.150	1910	229
		12.00	4	60	0.035	18.000	0.200	1590	223
		14.00	4	60	0.040	21.000	0.200	1365	218
		16.00	4	60	0.045	24.000	0.250	1195	215
		18.00	4	60	0.050	27.000	0.250	1060	212
		20.00	4	60	0.055	30.000	0.300	955	210

Cylindrical/Square end mills

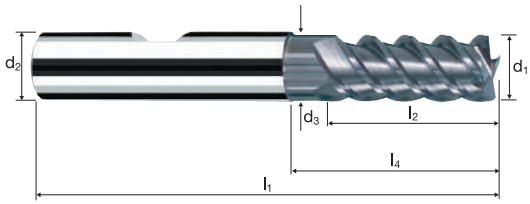
Smooth-edged, normal version, short neck

Favora® F

HM MG10	λ 55° γ 15°









Roughing



Finishing

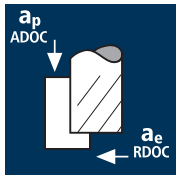
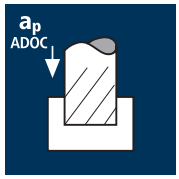


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **45355** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P45355	POLYCHROM P45255
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.05	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.05	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.10	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.10	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.10	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.15	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.15	4		●
570	14.00	14.00	13.00	83	26.00	36.13	37.00	0.15	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.15	4		●
640	18.00	18.00	17.00	92	32.00	42.13	43.00	0.15	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	2.00	3	150	0.005	3.000	1.300	23875	358	1.4
		3.00	3	150	0.010	4.500	1.950	15915	478	4.2
		4.00	3	150	0.015	6.000	2.600	11935	537	8.4
		5.00	3	150	0.020	7.500	3.250	9550	573	14.0
		6.00	3	150	0.020	9.000	3.900	7960	478	16.8
		7.00	3	150	0.025	10.500	4.550	6820	512	24.4
		8.00	3	150	0.030	12.000	5.200	5970	537	33.5
		9.00	3	150	0.030	13.500	5.850	5305	478	37.7
		10.00	3	150	0.035	15.000	6.500	4775	501	48.9
	Steel 850 - 1100 N/mm²	2.00	3	110	0.005	3.000	1.300	17505	263	1.0
		3.00	3	110	0.010	4.500	1.950	11670	350	3.1
		4.00	3	110	0.015	6.000	2.600	8755	394	6.1
		5.00	3	110	0.020	7.500	3.250	7005	420	10.2
		6.00	3	110	0.020	9.000	3.900	5835	350	12.3
		7.00	3	110	0.025	10.500	4.550	5000	375	17.9
		8.00	3	110	0.030	12.000	5.200	4375	394	24.6
		9.00	3	110	0.030	13.500	5.850	3890	350	27.6
		10.00	3	110	0.035	15.000	6.500	3500	368	35.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	80	0.005	3.000	1.300	12730	191	0.7
		3.00	3	80	0.010	4.500	1.950	8490	255	2.2
		4.00	3	80	0.010	6.000	2.600	6365	191	3.0
		5.00	3	80	0.015	7.500	3.250	5095	229	5.6
		6.00	3	80	0.015	9.000	3.900	4245	191	6.7
		7.00	3	80	0.020	10.500	4.550	3640	218	10.4
		8.00	3	80	0.020	12.000	5.200	3185	191	11.9
		9.00	3	80	0.025	13.500	5.850	2830	212	16.8
		10.00	3	80	0.025	15.000	6.500	2545	191	18.6
	Cast iron (lamellar / spheroidal)	2.00	3	130	0.005	3.000	1.300	20690	310	1.2
		3.00	3	130	0.010	4.500	1.950	13795	414	3.6
		4.00	3	130	0.015	6.000	2.600	10345	466	7.3
		5.00	3	130	0.020	7.500	3.250	8275	497	12.1
		6.00	3	130	0.020	9.000	3.900	6895	414	14.5
		7.00	3	130	0.025	10.500	4.550	5910	443	21.2
		8.00	3	130	0.030	12.000	5.200	5175	466	29.1
		9.00	3	130	0.030	13.500	5.850	4600	414	32.7
		10.00	3	130	0.035	15.000	6.500	4140	435	42.4
	Steel < 850 N/mm²	2.00	3	120	0.005	2.800	2.000	19100	287	1.6
		3.00	3	120	0.010	4.200	3.000	12730	382	4.8
		4.00	3	120	0.015	5.600	4.000	9550	430	9.6
		5.00	3	120	0.015	7.000	5.000	7640	344	12.0
		6.00	3	120	0.020	8.400	6.000	6365	382	19.2
		7.00	3	120	0.025	9.800	7.000	5455	409	28.1
		8.00	3	120	0.025	11.200	8.000	4775	358	32.1
		9.00	3	120	0.030	12.600	9.000	4245	382	43.3
		10.00	3	120	0.030	14.000	10.000	3820	344	48.1
	Steel 850 - 1100 N/mm²	2.00	3	85	0.005	2.800	2.000	13530	203	1.1
		3.00	3	85	0.010	4.200	3.000	9020	271	3.4
		4.00	3	85	0.015	5.600	4.000	6765	304	6.8
		5.00	3	85	0.015	7.000	5.000	5410	244	8.5
		6.00	3	85	0.020	8.400	6.000	4510	271	13.6
		7.00	3	85	0.025	9.800	7.000	3865	290	19.9
		8.00	3	85	0.025	11.200	8.000	3380	254	22.7
		9.00	3	85	0.030	12.600	9.000	3005	271	30.7
		10.00	3	85	0.030	14.000	10.000	2705	244	34.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	65	0.005	2.800	2.000	10345	155	0.9
		3.00	3	65	0.005	4.200	3.000	6895	103	1.3
		4.00	3	65	0.010	5.600	4.000	5175	155	3.5
		5.00	3	65	0.010	7.000	5.000	4140	124	4.3
		6.00	3	65	0.015	8.400	6.000	3450	155	7.8
		7.00	3	65	0.015	9.800	7.000	2955	133	9.1
		8.00	3	65	0.020	11.200	8.000	2585	155	13.9
		9.00	3	65	0.020	12.600	9.000	2300	138	15.6
		10.00	3	65	0.025	14.000	10.000	2070	155	21.7
	Cast iron (lamellar / spheroidal)	2.00	3	110	0.005	2.800	2.000	17505	263	1.5
		3.00	3	110	0.010	4.200	3.000	11670	350	4.4
		4.00	3	110	0.015	5.600	4.000	8755	394	8.8
		5.00	3	110	0.015	7.000	5.000	7005	315	11.0
		6.00	3	110	0.020	8.400	6.000	5835	350	17.6
		7.00	3	110	0.025	9.800	7.000	5000	375	25.7
		8.00	3	110	0.025	11.200	8.000	4375	328	29.4
		9.00	3	110	0.030	12.600	9.000	3890	350	39.7
		10.00	3	110	0.030	14.000	10.000	3500	315	44.1

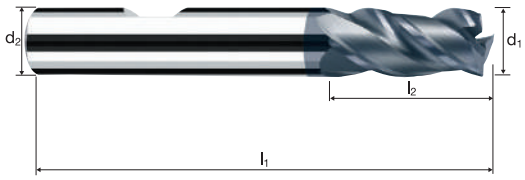
Cylindrical/Square end mills

Smooth-edged, normal version

HM MG10 | λ 40° γ 6°

45°

Vario



Roughing

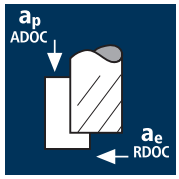
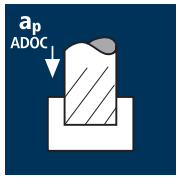
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **45333** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z		POLYCHROM P45333	POLYCHROM P45233
140	2.00	6.00	54	6.00	15.32	0.05	3			●
160	2.50	6.00	54	6.00	14.89	0.05	3			●
180	3.00	6.00	57	7.00	14.96	0.05	3			●
200	3.50	6.00	57	7.00	14.02	0.05	3			●
220	4.00	6.00	57	8.00	14.59	0.05	3			●
240	4.50	6.00	57	8.00	13.66	0.10	3			●
260	5.00	6.00	57	10.00	14.72	0.10	3			●
280	5.50	6.00	57	10.00	13.79	0.10	3			●
300	6.00	6.00	57	10.00	-	0.10	3			●
322	6.50	8.00	63	13.00	18.66	0.10	3			●
331	7.00	8.00	63	13.00	17.72	0.10	3			●
362	7.50	8.00	63	16.00	19.79	0.10	3			●
391	8.00	8.00	63	16.00	-	0.10	3			●
410	8.50	10.00	72	16.00	21.66	0.15	3			●
420	9.00	10.00	72	16.00	20.72	0.15	3			●
430	9.50	10.00	72	19.00	22.79	0.15	3			●
450	10.00	10.00	72	19.00	-	0.15	3			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	11.00	3	150	0.040	16.500	7.150	4340	521	61.4
		12.00	3	150	0.045	18.000	7.440	3980	537	72.0
		13.00	3	150	0.045	19.500	7.800	3675	496	75.5
		14.00	3	150	0.050	21.000	8.120	3410	512	87.2
		15.00	3	150	0.055	22.500	8.400	3185	526	99.3
		16.00	3	150	0.055	24.000	8.800	2985	493	104.0
		20.00	3	150	0.070	30.000	11.000	2385	501	165.3
	Steel 850 - 1100 N/mm²	11.00	3	110	0.040	16.500	7.150	3185	382	45.1
		12.00	3	110	0.045	18.000	7.440	2920	394	52.8
		13.00	3	110	0.045	19.500	7.800	2695	364	55.3
		14.00	3	110	0.050	21.000	8.120	2500	375	63.9
		15.00	3	110	0.055	22.500	8.400	2335	385	72.8
		16.00	3	110	0.055	24.000	8.800	2190	361	76.3
		20.00	3	110	0.070	30.000	11.000	1750	368	121.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	11.00	3	80	0.030	16.500	7.150	2315	208	24.6
		12.00	3	80	0.030	18.000	7.440	2120	191	25.6
		13.00	3	80	0.035	19.500	7.800	1960	206	31.3
		14.00	3	80	0.035	21.000	8.120	1820	191	32.6
		15.00	3	80	0.040	22.500	8.400	1700	204	38.6
		16.00	3	80	0.040	24.000	8.800	1590	191	40.3
		20.00	3	80	0.055	30.000	11.000	1275	210	69.4
	Cast iron (lamellar / spheroidal)	11.00	3	130	0.040	16.500	7.150	3760	451	53.2
		12.00	3	130	0.045	18.000	7.440	3450	466	62.4
		13.00	3	130	0.045	19.500	7.800	3185	430	65.4
		14.00	3	130	0.050	21.000	8.120	2955	443	75.6
		15.00	3	130	0.055	22.500	8.400	2760	455	86.1
		16.00	3	130	0.055	24.000	8.800	2585	427	90.1
		20.00	3	130	0.070	30.000	11.000	2070	435	143.5
	Steel < 850 N/mm²	11.00	3	120	0.035	15.400	11.000	3470	364	61.7
		12.00	3	120	0.040	16.200	12.000	3185	382	74.3
		13.00	3	120	0.040	17.030	13.000	2940	353	78.1
		14.00	3	120	0.045	17.990	14.000	2730	369	92.8
		15.00	3	120	0.050	18.750	15.000	2545	382	107.4
		16.00	3	120	0.050	19.200	16.000	2385	358	109.9
		20.00	3	120	0.065	22.000	20.000	1910	373	163.9
	Steel 850 - 1100 N/mm²	11.00	3	85	0.035	15.400	11.000	2460	258	43.8
		12.00	3	85	0.040	16.200	12.000	2255	271	52.6
		13.00	3	85	0.040	17.030	13.000	2080	250	55.3
		14.00	3	85	0.045	17.990	14.000	1935	261	65.8
		15.00	3	85	0.050	18.750	15.000	1805	271	76.2
		16.00	3	85	0.050	19.200	16.000	1690	254	77.9
		20.00	3	85	0.065	22.000	20.000	1355	264	116.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	11.00	3	65	0.025	15.400	11.000	1880	141	23.9
		12.00	3	65	0.030	16.200	12.000	1725	155	30.2
		13.00	3	65	0.030	17.030	13.000	1590	143	31.7
		14.00	3	65	0.035	17.990	14.000	1480	155	39.1
		15.00	3	65	0.035	18.750	15.000	1380	145	40.8
		16.00	3	65	0.040	19.200	16.000	1295	155	47.7
		20.00	3	65	0.045	22.000	20.000	1035	140	61.5
	Cast iron (lamellar / spheroidal)	11.00	3	110	0.035	15.400	11.000	3185	334	56.6
		12.00	3	110	0.040	16.200	12.000	2920	350	68.1
		13.00	3	110	0.040	17.030	13.000	2695	323	71.6
		14.00	3	110	0.045	17.990	14.000	2500	338	85.0
		15.00	3	110	0.050	18.750	15.000	2335	350	98.5
		16.00	3	110	0.050	19.200	16.000	2190	329	100.9
		20.00	3	110	0.065	22.000	20.000	1750	341	150.2

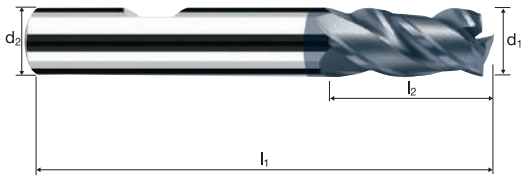
Cylindrical/Square end mills

Smooth-edged, normal version

HM MG10 | λ 40° γ 6°

45°

Vario



Roughing

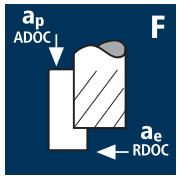
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **45333** ø-Code **470**

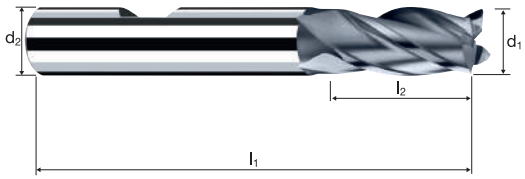
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z		POLYCHROM P45333	POLYCHROM P45233
470	11.00	12.00	83	22.00	27.22	0.15	3			●
501	12.00	12.00	83	22.00	-	0.15	3			●
540	13.00	14.00	83	22.00	27.22	0.15	3			●
570	14.00	14.00	83	22.00	-	0.15	3			●
581	15.00	16.00	92	26.00	31.22	0.15	3			●
610	16.00	16.00	92	26.00	-	0.15	3			●
682	20.00	20.00	104	32.00	-	0.15	3			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel 500 - 850 N/mm²	3.00	4	58	0.010	4.500	0.100	6155	246
		4.00	4	58	0.010	6.000	0.100	4615	185
		5.00	4	58	0.015	7.500	0.150	3690	221
		6.00	4	58	0.015	9.000	0.150	3075	185
		8.00	4	58	0.025	12.000	0.200	2310	231
		10.00	4	58	0.030	15.000	0.250	1845	221
		12.00	4	58	0.035	18.000	0.300	1540	216
		14.00	4	58	0.040	21.000	0.350	1320	211
		16.00	4	58	0.045	24.000	0.400	1155	208
	Steel 850 - 1100 N/mm²	3.00	4	54	0.010	4.500	0.100	5730	229
		4.00	4	54	0.010	6.000	0.100	4295	172
		5.00	4	54	0.015	7.500	0.150	3440	206
		6.00	4	54	0.015	9.000	0.150	2865	172
		8.00	4	54	0.025	12.000	0.200	2150	215
		10.00	4	54	0.030	15.000	0.250	1720	206
		12.00	4	54	0.035	18.000	0.300	1430	200
		14.00	4	54	0.040	21.000	0.350	1230	197
		16.00	4	54	0.045	24.000	0.400	1075	194
	Steel 1100 - 1300 N/mm²	3.00	4	42	0.010	4.500	0.100	4455	178
		4.00	4	42	0.010	6.000	0.100	3340	134
		5.00	4	42	0.015	7.500	0.150	2675	161
		6.00	4	42	0.015	9.000	0.150	2230	134
		8.00	4	42	0.025	12.000	0.200	1670	167
		10.00	4	42	0.030	15.000	0.250	1335	160
		12.00	4	42	0.035	18.000	0.300	1115	156
		14.00	4	42	0.040	21.000	0.350	955	153
		16.00	4	42	0.045	24.000	0.400	835	150
	Cold work tool steel (12%Cr) high alloyed [1.2379]	3.00	4	30	0.010	4.500	0.100	3185	127
		4.00	4	30	0.010	6.000	0.100	2385	95
		5.00	4	30	0.015	7.500	0.150	1910	115
		6.00	4	30	0.015	9.000	0.150	1590	95
		8.00	4	30	0.025	12.000	0.200	1195	120
		10.00	4	30	0.030	15.000	0.250	955	115
		12.00	4	30	0.035	18.000	0.300	795	111
		14.00	4	30	0.040	21.000	0.350	680	109
		16.00	4	30	0.045	24.000	0.400	595	107
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	26	0.010	4.500	0.100	2760	110
		4.00	4	26	0.010	6.000	0.100	2070	83
		5.00	4	26	0.015	7.500	0.150	1655	99
		6.00	4	26	0.015	9.000	0.150	1380	83
		8.00	4	26	0.025	12.000	0.200	1035	104
		10.00	4	26	0.030	15.000	0.250	830	100
		12.00	4	26	0.035	18.000	0.300	690	97
		14.00	4	26	0.040	21.000	0.350	590	94
		16.00	4	26	0.045	24.000	0.400	515	93
	Cast iron (lamellar / spheroidal)	3.00	4	50	0.010	4.500	0.100	5305	212
		4.00	4	50	0.010	6.000	0.100	3980	159
		5.00	4	50	0.015	7.500	0.150	3185	191
		6.00	4	50	0.015	9.000	0.150	2655	159
		8.00	4	50	0.025	12.000	0.200	1990	199
		10.00	4	50	0.030	15.000	0.250	1590	191
		12.00	4	50	0.035	18.000	0.300	1325	186
		14.00	4	50	0.040	21.000	0.350	1135	182
		16.00	4	50	0.045	24.000	0.400	995	179
	Wrought aluminium Construction aluminium	3.00	4	100	0.010	4.500	0.100	10610	424
		4.00	4	100	0.010	6.000	0.100	7960	318
		5.00	4	100	0.015	7.500	0.150	6365	382
		6.00	4	100	0.015	9.000	0.150	5305	318
		8.00	4	100	0.025	12.000	0.200	3980	398
		10.00	4	100	0.030	15.000	0.250	3185	382
		12.00	4	100	0.035	18.000	0.300	2655	372
		14.00	4	100	0.040	21.000	0.350	2275	364
		16.00	4	100	0.045	24.000	0.400	1990	358
	Unalloyed copper	3.00	4	80	0.010	4.500	0.100	8490	340
		4.00	4	80	0.010	6.000	0.100	6365	255
		5.00	4	80	0.015	7.500	0.150	5095	306
		6.00	4	80	0.015	9.000	0.150	4245	255
		8.00	4	80	0.025	12.000	0.200	3185	319
		10.00	4	80	0.030	15.000	0.250	2545	305
		12.00	4	80	0.035	18.000	0.300	2120	297
		14.00	4	80	0.040	21.000	0.350	1820	291
		16.00	4	80	0.045	24.000	0.400	1590	286

Cylindrical/Square end mills

Smooth-edged, normal version

HSS-E Co8	λ 30° γ 8°
90°	



Roughing

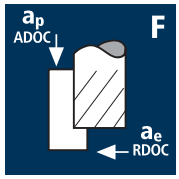
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0111** ø-Code **140**

Ø Code	d_1 k10	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0111
140	2.00	6.00	51	7.00	15.00	3		●
160	2.50	6.00	52	8.00	16.00	3		●
180	3.00	6.00	52	8.00	16.00	4		●
200	3.50	6.00	54	10.00	18.00	4		●
220	4.00	6.00	55	11.00	19.00	4		●
240	4.50	6.00	55	11.00	19.00	4		●
260	5.00	6.00	57	13.00	21.00	4		●
280	5.50	6.00	57	13.00	21.00	4		●
300	6.00	6.00	57	13.00	-	4		●
342	7.00	10.00	66	16.00	26.00	4		●
391	8.00	10.00	69	19.00	29.00	4		●
420	9.00	10.00	69	19.00	29.00	4		●
450	10.00	10.00	72	22.00	-	4		●
470	11.00	12.00	79	22.00	34.00	4		●
501	12.00	12.00	83	26.00	-	4		●
570	14.00	12.00	83	26.00	-	4		●
581	15.00	12.00	83	26.00	-	4		●
610	16.00	16.00	92	32.00	-	4		●
640	18.00	16.00	92	32.00	-	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel 500 - 850 N/mm²	20.00	4	58	0.055	30.000	0.500	925	204
		22.00	5	58	0.065	33.000	0.550	840	273
		24.00	5	58	0.070	36.000	0.600	770	270
		25.00	5	58	0.070	37.500	0.650	740	259
		28.00	5	58	0.080	42.000	0.700	660	264
		30.00	5	58	0.085	45.000	0.750	615	261
		32.00	6	58	0.090	48.000	0.800	575	311
		36.00	6	58	0.105	54.000	0.900	515	325
		40.00	6	58	0.115	60.000	1.000	460	317
	Steel 850 - 1100 N/mm²	20.00	4	54	0.055	30.000	0.500	860	189
		22.00	5	54	0.065	33.000	0.550	780	254
		24.00	5	54	0.070	36.000	0.600	715	250
		25.00	5	54	0.070	37.500	0.650	690	242
		28.00	5	54	0.080	42.000	0.700	615	246
		30.00	5	54	0.085	45.000	0.750	575	244
		32.00	6	54	0.090	48.000	0.800	535	289
		36.00	6	54	0.105	54.000	0.900	475	299
		40.00	6	54	0.115	60.000	1.000	430	297
	Steel 1100 - 1300 N/mm²	20.00	4	42	0.055	30.000	0.500	670	147
		22.00	5	42	0.065	33.000	0.550	610	198
		24.00	5	42	0.070	36.000	0.600	555	194
		25.00	5	42	0.070	37.500	0.650	535	187
		28.00	5	42	0.080	42.000	0.700	475	190
		30.00	5	42	0.085	45.000	0.750	445	189
		32.00	6	42	0.090	48.000	0.800	420	227
		36.00	6	42	0.105	54.000	0.900	370	233
		40.00	6	42	0.115	60.000	1.000	335	231
	Cold work tool steel (12%Cr) high alloyed [1.2379]	20.00	4	30	0.055	30.000	0.500	475	105
		22.00	5	30	0.065	33.000	0.550	435	141
		24.00	5	30	0.070	36.000	0.600	400	140
		25.00	5	30	0.070	37.500	0.650	380	133
		28.00	5	30	0.080	42.000	0.700	340	136
		30.00	5	30	0.085	45.000	0.750	320	136
		32.00	6	30	0.090	48.000	0.800	300	162
		36.00	6	30	0.105	54.000	0.900	265	167
		40.00	6	30	0.115	60.000	1.000	240	166
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	20.00	4	26	0.055	30.000	0.500	415	91
		22.00	5	26	0.065	33.000	0.550	375	122
		24.00	5	26	0.070	36.000	0.600	345	121
		25.00	5	26	0.070	37.500	0.650	330	116
		28.00	5	26	0.080	42.000	0.700	295	118
		30.00	5	26	0.085	45.000	0.750	275	117
		32.00	6	26	0.090	48.000	0.800	260	140
		36.00	6	26	0.105	54.000	0.900	230	145
		40.00	6	26	0.115	60.000	1.000	205	142
	Cast iron (lamellar / spheroidal)	20.00	4	50	0.055	30.000	0.500	795	175
		22.00	5	50	0.065	33.000	0.550	725	236
		24.00	5	50	0.070	36.000	0.600	665	233
		25.00	5	50	0.070	37.500	0.650	635	222
		28.00	5	50	0.080	42.000	0.700	570	228
		30.00	5	50	0.085	45.000	0.750	530	225
		32.00	6	50	0.090	48.000	0.800	495	267
		36.00	6	50	0.105	54.000	0.900	440	277
		40.00	6	50	0.115	60.000	1.000	400	276
	Wrought aluminium Construction aluminium	20.00	4	100	0.055	30.000	0.500	1590	350
		22.00	5	100	0.065	33.000	0.550	1445	470
		24.00	5	100	0.070	36.000	0.600	1325	464
		25.00	5	100	0.070	37.500	0.650	1275	446
		28.00	5	100	0.080	42.000	0.700	1135	454
		30.00	5	100	0.085	45.000	0.750	1060	451
		32.00	6	100	0.090	48.000	0.800	995	537
		36.00	6	100	0.105	54.000	0.900	885	558
		40.00	6	100	0.115	60.000	1.000	795	549
	Unalloyed copper	20.00	4	80	0.055	30.000	0.500	1275	281
		22.00	5	80	0.065	33.000	0.550	1155	375
		24.00	5	80	0.070	36.000	0.600	1060	371
		25.00	5	80	0.070	37.500	0.650	1020	357
		28.00	5	80	0.080	42.000	0.700	910	364
		30.00	5	80	0.085	45.000	0.750	850	361
		32.00	6	80	0.090	48.000	0.800	795	429
		36.00	6	80	0.105	54.000	0.900	705	444
		40.00	6	80	0.115	60.000	1.000	635	438

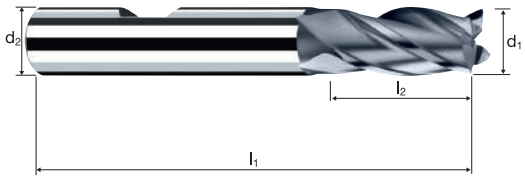
Cylindrical/Square end mills

Smooth-edged, normal version

HSS-E Co8

λ 30°
γ 8°

90°



Roughing

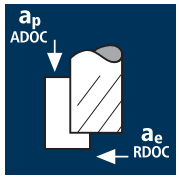
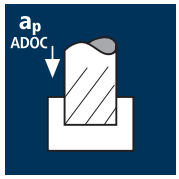
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0111** ø-Code **682**

Ø Code	d_1 k10	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0111
682	20.00	20.00	104	38.00	-	4		●
710	22.00	20.00	104	38.00	-	5		●
741	24.00	25.00	121	45.00	65.00	5		●
772	25.00	25.00	121	45.00	-	5		●
800	28.00	25.00	121	45.00	-	5		●
810	30.00	25.00	121	45.00	-	5		●
832	32.00	32.00	133	53.00	-	6		●
860	36.00	32.00	133	53.00	-	6		●
881	40.00	32.00	143	63.00	-	6		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	3.00	3	58	0.010	4.500	0.200	6155	185	0.2
		4.00	3	58	0.010	6.000	0.300	4615	139	0.2
		5.00	3	58	0.015	7.500	0.350	3690	166	0.4
		6.00	3	58	0.020	9.000	0.400	3075	185	0.7
		8.00	3	58	0.025	12.000	0.550	2310	173	1.1
		10.00	3	58	0.030	15.000	0.700	1845	166	1.7
		12.00	3	58	0.045	18.000	0.850	1540	208	3.2
		14.00	3	58	0.055	21.000	1.000	1320	218	4.6
		16.00	3	58	0.060	24.000	1.100	1155	208	5.5
	Steel 850 - 1100 N/mm²	3.00	3	52	0.010	4.500	0.200	5515	166	0.1
		4.00	3	52	0.010	6.000	0.300	4140	124	0.2
		5.00	3	52	0.015	7.500	0.350	3310	149	0.4
		6.00	3	52	0.020	9.000	0.400	2760	166	0.6
		8.00	3	52	0.025	12.000	0.550	2070	155	1.0
		10.00	3	52	0.030	15.000	0.700	1655	149	1.6
		12.00	3	52	0.045	18.000	0.850	1380	186	2.9
		14.00	3	52	0.055	21.000	1.000	1180	195	4.1
		16.00	3	52	0.060	24.000	1.100	1035	186	4.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	26	0.010	4.500	0.200	2760	83	0.1
		4.00	3	26	0.010	6.000	0.300	2070	62	0.1
		5.00	3	26	0.015	7.500	0.350	1655	75	0.2
		6.00	3	26	0.020	9.000	0.400	1380	83	0.3
		8.00	3	26	0.025	12.000	0.550	1035	78	0.5
		10.00	3	26	0.030	15.000	0.700	830	75	0.8
		12.00	3	26	0.045	18.000	0.850	690	93	1.4
		14.00	3	26	0.055	21.000	1.000	590	97	2.0
		16.00	3	26	0.060	24.000	1.100	515	93	2.4
	Cast iron (lamellar / spheroidal)	3.00	3	45	0.010	4.500	0.200	4775	143	0.1
		4.00	3	45	0.010	6.000	0.300	3580	107	0.2
		5.00	3	45	0.015	7.500	0.350	2865	129	0.3
		6.00	3	45	0.020	9.000	0.400	2385	143	0.5
		8.00	3	45	0.025	12.000	0.550	1790	134	0.9
		10.00	3	45	0.030	15.000	0.700	1430	129	1.4
		12.00	3	45	0.045	18.000	0.850	1195	161	2.5
		14.00	3	45	0.055	21.000	1.000	1025	169	3.6
		16.00	3	45	0.060	24.000	1.100	895	161	4.3
	Steel 500 - 850 N/mm²	3.00	3	54	0.010	1.500	3.000	5730	172	0.8
		4.00	3	54	0.010	2.000	4.000	4295	129	1.0
		5.00	3	54	0.015	2.500	5.000	3440	155	1.9
		6.00	3	54	0.020	3.000	6.000	2865	172	3.1
		8.00	3	54	0.025	4.000	8.000	2150	161	5.2
		10.00	3	54	0.030	5.000	10.000	1720	155	7.7
		12.00	3	54	0.045	6.000	12.000	1430	193	13.9
		14.00	3	54	0.055	7.000	14.000	1230	203	19.9
		16.00	3	54	0.065	8.000	16.000	1075	210	26.8
	Steel 850 - 1100 N/mm²	3.00	3	50	0.010	1.500	3.000	5305	159	0.7
		4.00	3	50	0.010	2.000	4.000	3980	119	1.0
		5.00	3	50	0.015	2.500	5.000	3185	143	1.8
		6.00	3	50	0.020	3.000	6.000	2655	159	2.9
		8.00	3	50	0.025	4.000	8.000	1990	149	4.8
		10.00	3	50	0.030	5.000	10.000	1590	143	7.2
		12.00	3	50	0.045	6.000	12.000	1325	179	12.9
		14.00	3	50	0.055	7.000	14.000	1135	187	18.4
		16.00	3	50	0.065	8.000	16.000	995	194	24.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	23	0.010	1.500	3.000	2440	73	0.3
		4.00	3	23	0.010	2.000	4.000	1830	55	0.4
		5.00	3	23	0.015	2.500	5.000	1465	66	0.8
		6.00	3	23	0.020	3.000	6.000	1220	73	1.3
		8.00	3	23	0.025	4.000	8.000	915	69	2.2
		10.00	3	23	0.030	5.000	10.000	730	66	3.3
		12.00	3	23	0.045	6.000	12.000	610	82	5.9
		14.00	3	23	0.055	7.000	14.000	525	87	8.5
		16.00	3	23	0.065	8.000	16.000	460	90	11.5
	Cast iron (lamellar / spheroidal)	3.00	3	40	0.010	1.500	3.000	4245	127	0.6
		4.00	3	40	0.010	2.000	4.000	3185	96	0.8
		5.00	3	40	0.015	2.500	5.000	2545	115	1.4
		6.00	3	40	0.020	3.000	6.000	2120	127	2.3
		8.00	3	40	0.025	4.000	8.000	1590	119	3.8
		10.00	3	40	0.030	5.000	10.000	1275	115	5.7
		12.00	3	40	0.045	6.000	12.000	1060	143	10.3
		14.00	3	40	0.055	7.000	14.000	910	150	14.7
		16.00	3	40	0.065	8.000	16.000	795	155	19.8

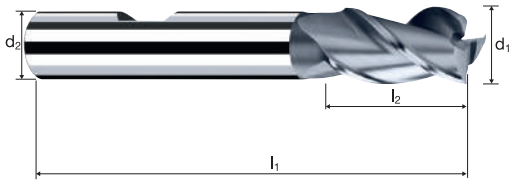
Cylindrical/Square end mills

Smooth-edged, normal version

HSS-E Co8

λ 40°
γ 12°

90°



Roughing

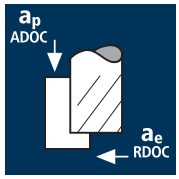
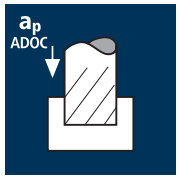
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0781** ø-Code **140**

Ø Code	d_1 k10	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0781
140	2.00	6.00	51	7.00	15.00	3		●
160	2.50	6.00	52	8.00	16.00	3		●
180	3.00	6.00	52	8.00	16.00	3		●
200	3.50	6.00	54	10.00	18.00	3		●
220	4.00	6.00	55	11.00	19.00	3		●
240	4.50	6.00	55	11.00	19.00	3		●
260	5.00	6.00	57	13.00	21.00	3		●
280	5.50	6.00	57	13.00	21.00	3		●
300	6.00	6.00	57	13.00	-	3		●
322	6.50	10.00	66	16.00	26.00	3		●
342	7.00	10.00	66	16.00	26.00	3		●
391	8.00	10.00	69	19.00	29.00	3		●
420	9.00	10.00	69	19.00	29.00	3		●
450	10.00	10.00	72	22.00	-	3		●
470	11.00	12.00	79	22.00	-	3		●
501	12.00	12.00	83	26.00	-	3		●
540	13.00	12.00	83	26.00	-	3		●
570	14.00	12.00	83	26.00	-	3		●
581	15.00	12.00	83	26.00	-	3		●
610	16.00	16.00	92	32.00	-	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	18.00	3	58	0.070	27.000	1.250	1025	215	7.3
		20.00	3	58	0.080	30.000	1.400	925	222	9.3
		22.00	3	58	0.085	33.000	1.550	840	214	11.0
		25.00	3	58	0.100	37.500	1.750	740	222	14.6
	Steel 850 - 1100 N/mm²	18.00	3	52	0.070	27.000	1.250	920	193	6.5
		20.00	3	52	0.080	30.000	1.400	830	199	8.4
		22.00	3	52	0.085	33.000	1.550	750	191	9.8
		25.00	3	52	0.100	37.500	1.750	660	198	13.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	18.00	3	26	0.070	27.000	1.250	460	97	3.3
		20.00	3	26	0.080	30.000	1.400	415	100	4.2
		22.00	3	26	0.085	33.000	1.550	375	96	4.9
		25.00	3	26	0.100	37.500	1.750	330	99	6.5
	Cast iron (lamellar / spheroidal)	18.00	3	45	0.070	27.000	1.250	795	167	5.6
		20.00	3	45	0.080	30.000	1.400	715	172	7.2
		22.00	3	45	0.085	33.000	1.550	650	166	8.5
		25.00	3	45	0.100	37.500	1.750	575	173	11.3
	Steel 500 - 850 N/mm²	18.00	3	54	0.070	9.000	18.000	955	201	32.5
		20.00	3	54	0.080	10.000	20.000	860	206	41.3
		22.00	3	54	0.085	11.000	22.000	780	199	48.1
		25.00	3	54	0.100	12.500	25.000	690	207	64.7
	Steel 850 - 1100 N/mm²	18.00	3	50	0.070	9.000	18.000	885	186	30.1
		20.00	3	50	0.080	10.000	20.000	795	191	38.2
		22.00	3	50	0.085	11.000	22.000	725	185	44.7
		25.00	3	50	0.100	12.500	25.000	635	191	59.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	18.00	3	23	0.070	9.000	18.000	405	85	13.8
		20.00	3	23	0.080	10.000	20.000	365	88	17.5
		22.00	3	23	0.085	11.000	22.000	335	85	20.7
		25.00	3	23	0.100	12.500	25.000	295	89	27.7
	Cast iron (lamellar / spheroidal)	18.00	3	40	0.070	9.000	18.000	705	148	24.0
		20.00	3	40	0.080	10.000	20.000	635	152	30.5
		22.00	3	40	0.085	11.000	22.000	580	148	35.8
		25.00	3	40	0.100	12.500	25.000	510	153	47.8

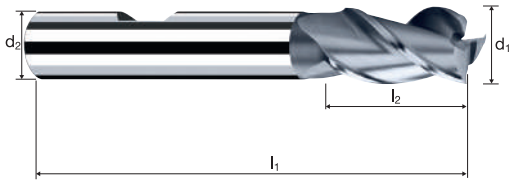
Cylindrical/Square end mills

Smooth-edged, normal version

HSS-E Co8

λ 40°
γ 12°

90°



Roughing

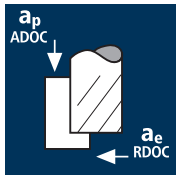
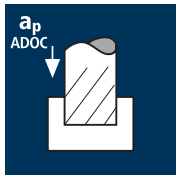
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0781** ø-Code **640**

Ø Code	d_1 k10	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0781
640	18.00	16.00	92	32.00	-	3		●
682	20.00	20.00	104	38.00	-	3		●
710	22.00	20.00	104	38.00	-	3		●
772	25.00	25.00	121	45.00	-	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	4.00	4	150	0.030	4.000	2.600	11935	1432	14.9
		5.00	4	150	0.040	5.000	3.250	9550	1528	24.8
		6.00	4	150	0.045	6.000	3.900	7960	1433	33.5
		8.00	4	150	0.060	8.000	5.200	5970	1433	59.6
		10.00	4	150	0.075	10.000	6.500	4775	1433	93.1
		12.00	4	150	0.090	12.000	7.800	3980	1433	134.1
		16.00	4	150	0.100	16.000	10.400	2985	1194	198.7
		20.00	4	150	0.125	20.000	13.000	2385	1193	310.1
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.025	4.000	2.600	9150	915	9.5
		5.00	4	115	0.035	5.000	3.250	7320	1025	16.7
		6.00	4	115	0.040	6.000	3.900	6100	976	22.8
		8.00	4	115	0.055	8.000	5.200	4575	1007	41.9
		10.00	4	115	0.065	10.000	6.500	3660	952	61.9
		12.00	4	115	0.080	12.000	7.800	3050	976	91.4
		16.00	4	115	0.090	16.000	10.400	2290	824	137.2
		20.00	4	115	0.110	20.000	13.000	1830	805	209.4
	Hardened tool steel 52 - 56 HRC	4.00	4	50	0.015	4.000	2.600	3980	239	2.5
		5.00	4	50	0.020	5.000	3.250	3185	255	4.1
		6.00	4	50	0.020	6.000	3.900	2655	212	5.0
		8.00	4	50	0.025	8.000	5.200	1990	199	8.3
		10.00	4	50	0.035	10.000	6.500	1590	223	14.5
		12.00	4	50	0.040	12.000	7.800	1325	212	19.8
		16.00	4	50	0.050	16.000	10.400	995	199	33.1
		20.00	4	50	0.060	20.000	13.000	795	191	49.6
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	60	0.015	4.000	1.600	4775	287	1.8
		5.00	4	60	0.020	5.000	2.000	3820	306	3.1
		6.00	4	60	0.020	6.000	2.300	3185	255	3.5
		8.00	4	60	0.025	8.000	3.100	2385	239	5.9
		10.00	4	60	0.035	10.000	3.900	1910	267	10.4
		12.00	4	60	0.040	12.000	4.700	1590	254	14.3
		16.00	4	60	0.050	16.000	6.200	1195	239	23.7
		20.00	4	60	0.060	20.000	7.800	955	229	35.8
	Steel 850 - 1100 N/mm²	4.00	4	120	0.020	3.600	4.000	9550	764	11.0
		5.00	4	120	0.025	4.500	5.000	7640	764	17.2
		6.00	4	120	0.035	5.400	6.000	6365	891	28.9
		8.00	4	120	0.045	7.200	8.000	4775	860	49.5
		10.00	4	120	0.055	9.000	10.000	3820	840	75.6
		12.00	4	120	0.065	10.800	12.000	3185	828	107.3
		16.00	4	120	0.075	14.400	16.000	2385	716	164.9
		20.00	4	120	0.095	18.000	20.000	1910	726	261.3
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.020	3.600	4.000	7160	573	8.2
		5.00	4	90	0.025	4.500	5.000	5730	573	12.9
		6.00	4	90	0.035	5.400	6.000	4775	669	21.7
		8.00	4	90	0.045	7.200	8.000	3580	644	37.1
		10.00	4	90	0.055	9.000	10.000	2865	630	56.7
		12.00	4	90	0.065	10.800	12.000	2385	620	80.4
		16.00	4	90	0.075	14.400	16.000	1790	537	123.7
		20.00	4	90	0.095	18.000	20.000	1430	543	195.6
	Hardened tool steel 52 - 56 HRC	4.00	4	40	0.015	3.600	4.000	3185	191	2.8
		5.00	4	40	0.020	4.500	5.000	2545	204	4.6
		6.00	4	40	0.025	5.400	6.000	2120	212	6.9
		8.00	4	40	0.030	7.200	8.000	1590	191	11.0
		10.00	4	40	0.040	9.000	10.000	1275	204	18.4
		12.00	4	40	0.045	10.800	12.000	1060	191	24.7
		16.00	4	40	0.050	14.400	16.000	795	159	36.6
		20.00	4	40	0.065	18.000	20.000	635	165	59.4
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	50	0.020	3.600	4.000	3980	318	4.6
		5.00	4	50	0.025	4.500	5.000	3185	319	7.2
		6.00	4	50	0.030	5.400	6.000	2655	319	10.3
		8.00	4	50	0.040	7.200	8.000	1990	318	18.3
		10.00	4	50	0.050	9.000	10.000	1590	318	28.6
		12.00	4	50	0.060	10.800	12.000	1325	318	41.2
		16.00	4	50	0.070	14.400	16.000	995	279	64.2
		20.00	4	50	0.085	18.000	20.000	795	270	97.3

Cylindrical/Square end mills NX

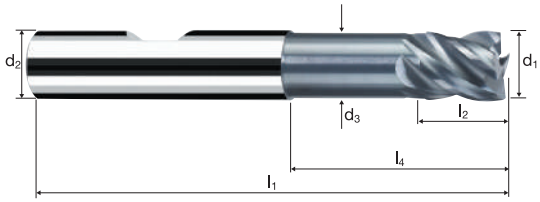
Smooth-edged, normal version, neck

HM MG10

λ 45°
γ -20°

45°

Vario



Roughing

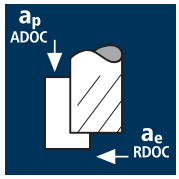
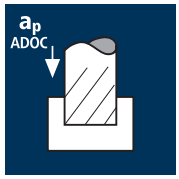
Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15342** ø-Code **220**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15342	POLYCHROM P15242
220	4.00	6.00	3.70	57	6.00	16.00	20.95	0.05	4		●
260	5.00	6.00	4.60	57	8.00	18.00	21.27	0.10	4		●
300	6.00	6.00	5.50	57	9.00	19.34	20.00	0.10	4		●
391	8.00	8.00	7.40	63	12.00	25.29	26.00	0.10	4		●
450	10.00	10.00	9.20	72	15.00	30.20	31.00	0.15	4		●
501	12.00	12.00	11.00	83	18.00	36.13	37.00	0.15	4		●
610	16.00	16.00	15.00	92	24.00	42.13	43.00	0.15	4		●
682	20.00	20.00	19.00	104	30.00	52.13	53.00	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	170	0.020	3.000	1.400	18040	1443	6.1
		4.00	4	170	0.030	4.000	1.800	13530	1624	11.7
		5.00	4	170	0.040	5.000	2.300	10825	1732	19.9
		6.00	4	170	0.050	6.000	2.700	9020	1804	29.2
		8.00	4	170	0.065	8.000	3.600	6765	1759	50.7
		10.00	4	170	0.080	10.000	4.500	5410	1731	77.9
		12.00	4	170	0.095	12.000	5.400	4510	1714	111.1
		16.00	4	170	0.125	16.000	7.200	3380	1690	194.7
		20.00	4	170	0.155	20.000	9.000	2705	1677	301.9
	Steel 850 - 1100 N/mm²	3.00	4	140	0.020	3.000	1.400	14855	1188	5.0
		4.00	4	140	0.030	4.000	1.800	11140	1337	9.6
		5.00	4	140	0.040	5.000	2.300	8915	1426	16.4
		6.00	4	140	0.050	6.000	2.700	7425	1485	24.1
		8.00	4	140	0.065	8.000	3.600	5570	1448	41.7
		10.00	4	140	0.080	10.000	4.500	4455	1426	64.2
		12.00	4	140	0.095	12.000	5.400	3715	1412	91.5
		16.00	4	140	0.125	16.000	7.200	2785	1393	160.4
		20.00	4	140	0.155	20.000	9.000	2230	1383	248.9
	Cold work tool steel (12%Cr) high alloyed [1.2379]	3.00	4	70	0.020	3.000	1.400	7425	594	2.5
		4.00	4	70	0.030	4.000	1.800	5570	668	4.8
		5.00	4	70	0.035	5.000	2.300	4455	624	7.2
		6.00	4	70	0.045	6.000	2.700	3715	669	10.8
		8.00	4	70	0.060	8.000	3.600	2785	668	19.2
		10.00	4	70	0.070	10.000	4.500	2230	624	28.1
		12.00	4	70	0.085	12.000	5.400	1855	631	40.9
		16.00	4	70	0.110	16.000	7.200	1395	614	70.7
		20.00	4	70	0.140	20.000	9.000	1115	624	112.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	90	0.015	3.000	1.400	9550	573	2.4
		4.00	4	90	0.020	4.000	1.800	7160	573	4.1
		5.00	4	90	0.025	5.000	2.300	5730	573	6.6
		6.00	4	90	0.030	6.000	2.700	4775	573	9.3
		8.00	4	90	0.040	8.000	3.600	3580	573	16.5
		10.00	4	90	0.050	10.000	4.500	2865	573	25.8
		12.00	4	90	0.060	12.000	5.400	2385	572	37.1
		16.00	4	90	0.080	16.000	7.200	1790	573	66.0
		20.00	4	90	0.100	20.000	9.000	1430	572	103.0
	Steel < 850 N/mm²	3.00	4	135	0.015	2.400	3.000	14325	860	6.2
		4.00	4	135	0.020	3.200	4.000	10745	860	11.0
		5.00	4	135	0.030	4.000	5.000	8595	1031	20.6
		6.00	4	135	0.040	4.800	6.000	7160	1146	33.0
		8.00	4	135	0.050	6.400	8.000	5370	1074	55.0
		10.00	4	135	0.065	8.000	10.000	4295	1117	89.3
		12.00	4	135	0.075	9.600	12.000	3580	1074	123.7
		16.00	4	135	0.075	8.000	16.000	2685	806	103.1
		20.00	4	135	0.095	10.000	20.000	2150	817	163.4
	Steel 850 - 1100 N/mm²	3.00	4	105	0.015	2.400	3.000	11140	668	4.8
		4.00	4	105	0.020	3.200	4.000	8355	668	8.6
		5.00	4	105	0.030	4.000	5.000	6685	802	16.0
		6.00	4	105	0.040	4.800	6.000	5570	891	25.7
		8.00	4	105	0.050	6.400	8.000	4180	836	42.8
		10.00	4	105	0.065	8.000	10.000	3340	868	69.5
		12.00	4	105	0.075	9.600	12.000	2785	836	96.2
		16.00	4	105	0.075	8.000	16.000	2090	627	80.3
		20.00	4	105	0.095	10.000	20.000	1670	635	126.9
	Cold work tool steel (12%Cr) high alloyed [1.2379]	3.00	4	55	0.015	2.400	3.000	5835	350	2.5
		4.00	4	55	0.020	3.200	4.000	4375	350	4.5
		5.00	4	55	0.030	4.000	5.000	3500	420	8.4
		6.00	4	55	0.035	4.800	6.000	2920	409	11.8
		8.00	4	55	0.045	6.400	8.000	2190	394	20.2
		10.00	4	55	0.055	8.000	10.000	1750	385	30.8
		12.00	4	55	0.060	9.600	12.000	1460	350	40.4
		16.00	4	55	0.075	8.000	16.000	1095	329	42.0
		20.00	4	55	0.095	10.000	20.000	875	333	66.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	75	0.015	2.400	3.000	7960	478	3.4
		4.00	4	75	0.015	3.200	4.000	5970	358	4.6
		5.00	4	75	0.025	4.000	5.000	4775	478	9.6
		6.00	4	75	0.030	4.800	6.000	3980	478	13.8
		8.00	4	75	0.040	6.400	8.000	2985	478	24.5
		10.00	4	75	0.050	8.000	10.000	2385	477	38.2
		12.00	4	75	0.050	9.600	12.000	1990	398	45.8
		16.00	4	75	0.065	8.000	16.000	1490	387	49.6
		20.00	4	75	0.080	10.000	20.000	1195	382	76.5

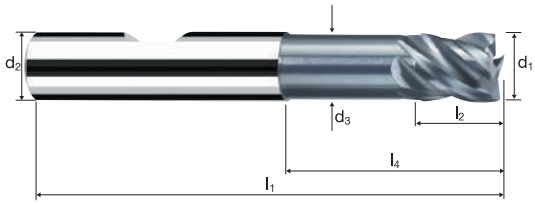
Cylindrical/Square end mills

Smooth-edged, normal version, neck

HM MG10 | λ 40° γ 0°

45°

Vario



Roughing

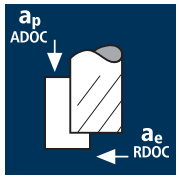
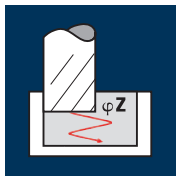
Finishing

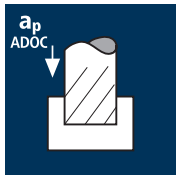
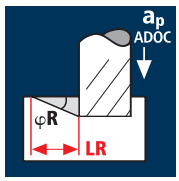
ReTool®

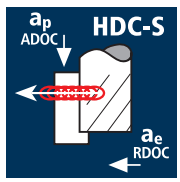
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

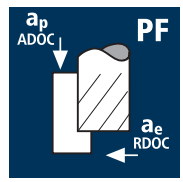
Example: **Order-N°.** Coating **P** Article-N°. **5325** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P5325	POLYCHROM P5225
180	3.00	6.00	2.80	57	4.00	14.00	20.63	0.05	4		●
220	4.00	6.00	3.70	57	5.00	16.00	20.95	0.05	4		●
260	5.00	6.00	4.60	57	6.00	18.00	21.27	0.10	4		●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	0.10	4		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	0.10	4		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	0.15	4		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	0.15	4		●
610	16.00	16.00	15.00	92	17.00	42.13	43.00	0.15	4		●
682	20.00	20.00	19.00	104	21.00	52.13	53.00	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Hardened tool steel 52 - 56 HRC	3.00	4	60	0.009	3.000	1.800	6365	229	1.2	5.0°
		4.00	4	60	0.013	4.000	2.400	4775	248	2.4	5.0°
		5.00	4	60	0.017	5.000	3.000	3820	260	3.9	5.0°
		6.00	4	60	0.021	7.500	3.600	3185	268	7.2	5.0°
		8.00	4	60	0.028	10.000	4.800	2385	267	12.8	5.0°
		10.00	4	60	0.035	12.500	6.000	1910	267	20.1	5.0°
		12.00	4	60	0.042	15.000	7.200	1590	267	28.8	5.0°
		16.00	4	60	0.050	20.000	9.600	1195	239	45.9	5.0°
		20.00	4	60	0.060	25.000	12.000	955	229	68.8	5.0°
	Hardened tool steel > 60 HRC	3.00	4	25	0.004	3.000	1.800	2655	43	0.2	3.0°
		4.00	4	25	0.006	4.000	2.400	1990	48	0.5	4.0°
		5.00	4	25	0.008	5.000	3.000	1590	51	0.8	5.0°
		6.00	4	25	0.009	6.000	3.600	1325	48	1.0	5.0°
		8.00	4	25	0.011	8.000	4.800	995	44	1.7	5.0°
		10.00	4	25	0.015	10.000	6.000	795	48	2.9	5.0°
		12.00	4	25	0.018	12.000	7.200	665	48	4.1	5.0°
		16.00	4	25	0.023	16.000	9.600	495	46	7.0	5.0°
		20.00	4	25	0.025	20.000	12.000	400	40	9.6	3.0°
	High speed steel, hardened 64 - 70 HRC	3.00	4	15	0.005	2.250	0.450	1590	32	0.0	3.0°
		4.00	4	15	0.006	3.000	0.600	1195	29	0.1	4.0°
		5.00	4	15	0.008	3.750	0.750	955	31	0.1	5.0°
		6.00	4	15	0.006	4.500	3.600	795	19	0.3	5.0°
		8.00	4	15	0.008	6.000	4.800	595	19	0.5	5.0°
		10.00	4	15	0.010	7.500	6.000	475	19	0.9	5.0°
		12.00	4	15	0.012	9.000	7.200	400	19	1.2	5.0°
		16.00	4	15	0.016	12.000	9.600	300	19	2.2	5.0°
		20.00	4	15	0.020	15.000	12.000	240	19	3.5	3.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Hardened tool steel 52 - 56 HRC	3.00	4	50	0.010	3.000	3.000	5305	212	1.9	5.0°	34.3
		4.00	4	50	0.013	4.000	4.000	3980	207	3.3	5.0°	45.7
		5.00	4	50	0.017	5.000	5.000	3185	217	5.4	5.0°	57.2
		6.00	4	50	0.021	6.000	6.000	2655	223	8.0	5.0°	68.6
		8.00	4	50	0.028	8.000	8.000	1990	223	14.3	5.0°	91.4
		10.00	4	50	0.035	10.000	10.000	1590	223	22.3	5.0°	114.3
		12.00	4	50	0.042	12.000	12.000	1325	223	32.1	5.0°	137.2
		16.00	4	50	0.064	8.000	16.000	995	255	32.6	5.0°	91.4
		20.00	4	50	0.075	10.000	20.000	795	239	47.7	5.0°	114.3
	Hardened tool steel > 60 HRC	3.00	4	20	0.004	3.000	3.000	2120	34	0.3	3.0°	57.2
		4.00	4	20	0.006	4.000	4.000	1590	38	0.6	4.0°	57.2
		5.00	4	20	0.008	5.000	5.000	1275	41	1.0	5.0°	57.2
		6.00	4	20	0.009	6.000	6.000	1060	38	1.4	5.0°	68.6
		8.00	4	20	0.011	8.000	8.000	795	35	2.2	5.0°	91.4
		10.00	4	20	0.015	10.000	10.000	635	38	3.8	5.0°	114.3
		12.00	4	20	0.020	12.000	12.000	530	42	6.1	5.0°	137.2
		16.00	4	20	0.032	8.000	16.000	400	51	6.6	5.0°	91.4
		20.00	4	20	0.040	10.000	20.000	320	51	10.2	3.0°	190.8
	High speed steel, hardened 64 - 70 HRC	3.00	4	10	0.003	1.500	3.000	1060	13	0.1	3.0°	28.6
		4.00	4	10	0.004	2.000	4.000	795	13	0.1	4.0°	28.6
		5.00	4	10	0.005	2.500	5.000	635	13	0.2	5.0°	28.6
		6.00	4	10	0.006	3.000	6.000	530	13	0.2	5.0°	34.3
		8.00	4	10	0.008	4.000	8.000	400	13	0.4	5.0°	45.7
		10.00	4	10	0.010	5.000	10.000	320	13	0.6	5.0°	57.2
		12.00	4	10	0.012	6.000	12.000	265	13	0.9	5.0°	68.6
		16.00	4	10	0.016	8.000	16.000	200	13	1.6	5.0°	91.4
		20.00	4	10	0.020	10.000	20.000	160	13	2.6	3.0°	190.8





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

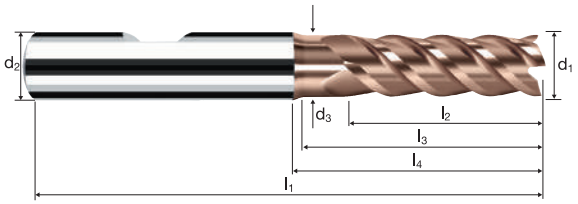
Cylindrical/Square end mills HX

Smooth-edged, medium version, short neck
High-performance penetration edge

HM XA

λ 45°
γ -10°

r



Roughing HPC

Roughing HDC

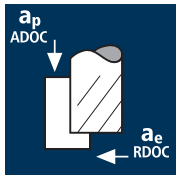
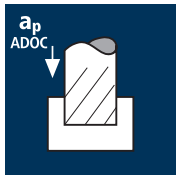
Finishing

ReTool®

HRC 48-56 | **HRC 56-60** | **HRC > 60** | **HSS**

Example: **Order-N°.** Coating **H** Article-N°. **8614** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	DURO-Si H8614	DURO-Si H8514
180	3.00	6.00	2.80	63	11.00	18.00	24.37	0.100	4		●
220	4.00	6.00	3.70	63	13.00	22.00	26.82	0.100	4		●
260	5.00	6.00	4.60	63	16.00	24.00	27.27	0.100	4		●
300	6.00	6.00	5.50	63	21.00	25.34	26.00	0.150	4		●
391	8.00	8.00	7.40	72	31.00	34.79	35.50	0.150	4		●
450	10.00	10.00	9.20	84	37.00	42.20	43.00	0.200	4		●
501	12.00	12.00	11.00	97	44.00	50.13	51.00	0.200	4		●
610	16.00	16.00	15.00	108	53.00	58.13	59.00	0.200	4		●
682	20.00	20.00	19.00	122	62.00	70.13	71.00	0.200	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.025	7.200	0.800	9150	915	5.3
		5.00	4	115	0.035	9.000	1.000	7320	1025	9.2
		6.00	4	115	0.040	10.800	1.200	6100	976	12.6
		8.00	4	115	0.055	14.400	1.600	4575	1007	23.2
		10.00	4	115	0.065	18.000	2.000	3660	952	34.3
		12.00	4	115	0.080	21.600	2.400	3050	976	50.6
		16.00	4	115	0.090	28.800	3.200	2290	824	76.0
		20.00	4	115	0.110	36.000	4.000	1830	805	115.9
	Steel 1300 - 1500 N/mm²	4.00	4	80	0.025	7.200	0.800	6365	637	3.7
		5.00	4	80	0.030	9.000	1.000	5095	611	5.5
		6.00	4	80	0.035	10.800	1.200	4245	594	7.7
		8.00	4	80	0.045	14.400	1.600	3185	573	13.2
		10.00	4	80	0.060	18.000	2.000	2545	611	22.0
		12.00	4	80	0.070	21.600	2.400	2120	594	30.8
		16.00	4	80	0.080	28.800	3.200	1590	509	46.9
		20.00	4	80	0.100	36.000	4.000	1275	510	73.4
	Hardened tool steel 52 - 56 HRC	4.00	4	50	0.015	7.200	0.800	3980	239	1.4
		5.00	4	50	0.020	9.000	1.000	3185	255	2.3
		6.00	4	50	0.020	10.800	1.200	2655	212	2.8
		8.00	4	50	0.025	14.400	1.600	1990	199	4.6
		10.00	4	50	0.035	18.000	2.000	1590	223	8.0
		12.00	4	50	0.040	21.600	2.400	1325	212	11.0
		16.00	4	50	0.050	28.800	3.200	995	199	18.3
		20.00	4	50	0.060	36.000	4.000	795	191	27.5
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	60	0.015	7.200	0.800	4775	287	1.7
		5.00	4	60	0.020	9.000	1.000	3820	306	2.8
		6.00	4	60	0.020	10.800	1.200	3185	255	3.3
		8.00	4	60	0.025	14.400	1.600	2385	239	5.5
		10.00	4	60	0.035	18.000	2.000	1910	267	9.6
		12.00	4	60	0.040	21.600	2.400	1590	254	13.2
		16.00	4	60	0.050	28.800	3.200	1195	239	22.0
		20.00	4	60	0.060	36.000	4.000	955	229	33.0
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.015	6.000	4.000	7160	430	10.3
		5.00	4	90	0.015	7.500	5.000	5730	344	12.9
		6.00	4	90	0.020	9.000	6.000	4775	382	20.6
		8.00	4	90	0.025	12.000	8.000	3580	358	34.4
		10.00	4	90	0.035	15.000	10.000	2865	401	60.2
		12.00	4	90	0.040	18.000	12.000	2385	382	82.4
		16.00	4	90	0.050	24.000	16.000	1790	358	137.5
		20.00	4	90	0.060	30.000	20.000	1430	343	205.9
	Steel 1300 - 1500 N/mm²	4.00	4	65	0.010	6.000	4.000	5175	207	5.0
		5.00	4	65	0.015	7.500	5.000	4140	248	9.3
		6.00	4	65	0.020	9.000	6.000	3450	276	14.9
		8.00	4	65	0.025	12.000	8.000	2585	259	24.8
		10.00	4	65	0.030	15.000	10.000	2070	248	37.3
		12.00	4	65	0.035	18.000	12.000	1725	242	52.2
		16.00	4	65	0.045	24.000	16.000	1295	233	89.5
		20.00	4	65	0.055	30.000	20.000	1035	228	136.6
	Hardened tool steel 52 - 56 HRC	4.00	4	40	0.010	4.000	4.000	3185	127	2.0
		5.00	4	40	0.010	5.000	5.000	2545	102	2.5
		6.00	4	40	0.015	6.000	6.000	2120	127	4.6
		8.00	4	40	0.020	8.000	8.000	1590	127	8.1
		10.00	4	40	0.025	10.000	10.000	1275	128	12.8
		12.00	4	40	0.025	12.000	12.000	1060	106	15.3
		16.00	4	40	0.030	16.000	16.000	795	95	24.4
		20.00	4	40	0.040	20.000	20.000	635	102	40.6
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	50	0.010	6.000	4.000	3980	159	3.8
		5.00	4	50	0.015	7.500	5.000	3185	191	7.2
		6.00	4	50	0.020	9.000	6.000	2655	212	11.5
		8.00	4	50	0.025	12.000	8.000	1990	199	19.1
		10.00	4	50	0.030	15.000	10.000	1590	191	28.6
		12.00	4	50	0.035	18.000	12.000	1325	186	40.1
		16.00	4	50	0.045	24.000	16.000	995	179	68.8
		20.00	4	50	0.055	30.000	20.000	795	175	104.9

Cylindrical/Square end mills NX

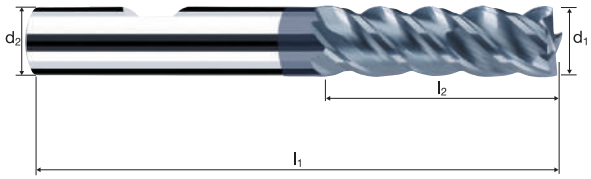
Smooth-edged, medium version

X-Generation

HM MG10 | λ 45° γ -20°

45°

Vario



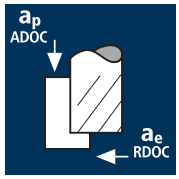
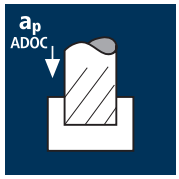
Roughing HPC | Roughing HDC | Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** | Article-N°. **15323** | ø-Code **220**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z		POLYCHROM P15323	POLYCHROM P15223
220	4.00	6.00	63	13.00	19.59	0.05	4			●
260	5.00	6.00	63	16.00	20.72	0.10	4			●
300	6.00	6.00	63	21.00	-	0.10	4			●
391	8.00	8.00	72	31.00	-	0.10	4			●
450	10.00	10.00	84	37.00	-	0.15	4			●
501	12.00	12.00	97	44.00	-	0.15	4			●
610	16.00	16.00	108	53.00	-	0.15	4			●
682	20.00	20.00	122	62.00	-	0.15	4			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	86	0.013	3.750	1.200	9125	475	2.1
		4.00	4	86	0.017	5.000	1.600	6845	466	3.7
		5.00	4	72	0.020	6.250	3.250	4585	367	7.5
		6.00	4	72	0.024	9.000	3.900	3820	367	12.9
		8.00	4	72	0.032	12.000	5.200	2865	367	22.9
		10.00	4	72	0.041	15.000	6.500	2290	376	36.6
		12.00	4	72	0.049	18.000	7.800	1910	374	52.6
		16.00	4	72	0.058	20.000	10.400	1430	332	69.0
		20.00	4	72	0.072	25.000	13.000	1145	330	107.2
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	58	0.013	3.750	1.200	6155	320	1.4
		4.00	4	58	0.017	5.000	1.600	4615	314	2.5
		5.00	4	53	0.020	6.250	3.250	3375	270	5.5
		6.00	4	53	0.024	9.000	3.900	2810	270	9.5
		8.00	4	53	0.032	12.000	5.200	2110	270	16.9
		10.00	4	53	0.041	15.000	6.500	1685	276	26.9
		12.00	4	53	0.049	18.000	7.800	1405	275	38.7
		16.00	4	53	0.058	20.000	10.400	1055	245	50.9
		20.00	4	53	0.072	25.000	13.000	845	243	79.1
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	44	0.012	3.750	1.200	4670	224	1.0
		4.00	4	44	0.015	5.000	1.600	3500	210	1.7
		5.00	4	40	0.018	6.250	3.250	2545	183	3.7
		6.00	4	40	0.022	9.000	3.900	2120	187	6.5
		8.00	4	40	0.029	12.000	5.200	1590	184	11.5
		10.00	4	40	0.036	15.000	6.500	1275	184	17.9
		12.00	4	40	0.043	18.000	7.800	1060	182	25.6
		16.00	4	40	0.050	20.000	10.400	795	159	33.1
		20.00	4	40	0.061	25.000	13.000	635	155	50.3
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	110	0.017	3.750	1.200	11670	794	3.6
		4.00	4	110	0.023	5.000	1.600	8755	806	6.4
		5.00	4	92	0.027	6.250	3.250	5855	632	12.8
		6.00	4	92	0.033	9.000	3.900	4880	644	22.6
		8.00	4	92	0.043	12.000	5.200	3660	630	39.3
		10.00	4	92	0.054	15.000	6.500	2930	633	61.7
		12.00	4	92	0.065	18.000	7.800	2440	634	89.1
		16.00	4	92	0.079	20.000	10.400	1830	578	120.3
		20.00	4	92	0.097	25.000	13.000	1465	568	184.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	63	0.007	2.250	3.000	6685	187	1.3
		4.00	4	63	0.009	3.000	4.000	5015	181	2.2
		5.00	4	63	0.013	6.250	5.000	4010	209	6.5
		6.00	4	63	0.019	9.000	6.000	3340	254	13.7
		8.00	4	63	0.026	12.000	8.000	2505	261	25.0
		10.00	4	63	0.032	15.000	10.000	2005	257	38.5
		12.00	4	63	0.039	18.000	12.000	1670	261	56.3
		16.00	4	63	0.046	20.000	16.000	1255	231	73.9
		20.00	4	63	0.058	25.000	20.000	1005	233	116.6
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	46	0.007	2.250	3.000	4880	137	0.9
		4.00	4	46	0.009	3.000	4.000	3660	132	1.6
		5.00	4	46	0.013	6.250	5.000	2930	152	4.8
		6.00	4	46	0.019	9.000	6.000	2440	185	10.0
		8.00	4	46	0.026	12.000	8.000	1830	190	18.3
		10.00	4	46	0.032	15.000	10.000	1465	188	28.1
		12.00	4	46	0.039	18.000	12.000	1220	190	41.1
		16.00	4	46	0.046	20.000	16.000	915	168	53.9
		20.00	4	46	0.058	25.000	20.000	730	169	84.7
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	35	0.006	2.250	3.000	3715	89	0.6
		4.00	4	35	0.008	3.000	4.000	2785	89	1.1
		5.00	4	35	0.012	6.250	5.000	2230	107	3.3
		6.00	4	35	0.017	9.000	6.000	1855	126	6.8
		8.00	4	35	0.023	12.000	8.000	1395	128	12.3
		10.00	4	35	0.029	15.000	10.000	1115	129	19.4
		12.00	4	35	0.034	18.000	12.000	930	127	27.3
		16.00	4	35	0.040	20.000	16.000	695	111	35.6
		20.00	4	35	0.049	25.000	20.000	555	109	54.4
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	81	0.007	2.250	3.000	8595	241	1.6
		4.00	4	81	0.009	3.000	4.000	6445	232	2.8
		5.00	4	81	0.014	5.000	5.000	5155	289	7.2
		6.00	4	81	0.020	7.500	6.000	4295	344	15.5
		8.00	4	81	0.026	10.000	8.000	3225	335	26.8
		10.00	4	81	0.032	12.500	10.000	2580	330	41.3
		12.00	4	81	0.039	15.000	12.000	2150	335	60.4
		16.00	4	81	0.047	16.000	16.000	1610	303	77.5
		20.00	4	81	0.058	20.000	20.000	1290	299	119.7

Cylindrical/Square end mills SX

Smooth-edged, medium version, short neck

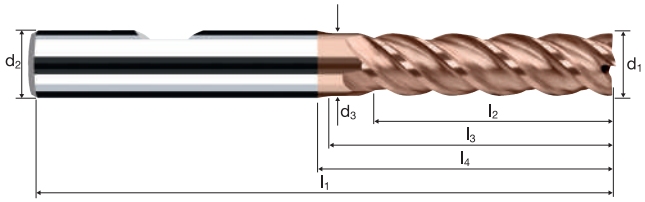
X-Generation

HM MG10

λ 43°
γ 3°

r

Vario



Roughing HPC | Roughing HDC | Finishing

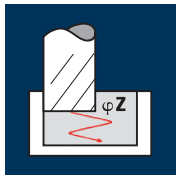
ReTool®

Rm <850 HRC <24							**Inox** Stainless	**Ti** Titanium	Nickel-Alloys Mangan-Steels Tool Steel

Example: **Order-N°.** Coating **H** | Article-N°. **8616** | ø-Code **180**

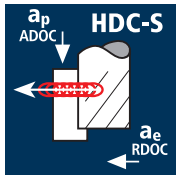
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	DURO-Si H8616	DURO-Si H8516
180	3.00	6.00	2.80	63	11.00	18.00	24.37	0.050	4		●
220	4.00	6.00	3.70	63	13.00	22.00	26.82	0.100	4		●
260	5.00	6.00	4.60	63	16.00	24.00	27.27	0.100	4		●
300	6.00	6.00	5.50	63	21.00	25.34	26.00	0.150	4		●
391	8.00	8.00	7.40	72	31.00	34.79	35.50	0.150	4		●
450	10.00	10.00	9.20	84	37.00	42.20	43.00	0.200	4		●
501	12.00	12.00	11.00	97	44.00	50.13	51.00	0.200	4		●
610	16.00	16.00	15.00	108	53.00	58.13	59.00	0.200	4		●
682	20.00	20.00	19.00	122	62.00	70.13	71.00	0.250	4		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	70	0.019	22.000	5.400	3715	424	4.0°
	8.00	6	70	0.026	31.000	7.200	2785	435	4.0°
	10.00	7	70	0.028	39.000	9.000	2230	437	4.0°
	12.00	7	70	0.033	46.000	10.800	1855	429	4.0°
	16.00	8	70	0.035	53.000	14.400	1395	391	4.0°
	20.00	8	70	0.043	63.000	18.000	1115	384	4.0°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	6.00	6	55	0.019	22.000	5.400	2920	333	4.0°
	8.00	6	55	0.026	31.000	7.200	2190	342	4.0°
	10.00	7	55	0.028	39.000	9.000	1750	343	4.0°
	12.00	7	55	0.033	46.000	10.800	1460	337	4.0°
	16.00	8	55	0.035	53.000	14.400	1095	307	4.0°
	20.00	8	55	0.043	63.000	18.000	875	301	4.0°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	6.00	6	40	0.017	22.000	5.400	2120	216	4.0°
	8.00	6	40	0.023	31.000	7.200	1590	219	4.0°
	10.00	7	40	0.025	39.000	9.000	1275	223	4.0°
	12.00	7	40	0.029	46.000	10.800	1060	215	4.0°
	16.00	8	40	0.030	53.000	14.400	795	191	4.0°
	20.00	8	40	0.037	63.000	18.000	635	188	4.0°
Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	6.00	6	20	0.009	22.000	5.400	1060	57	2.0°
	8.00	6	20	0.012	31.000	7.200	795	57	2.0°
	10.00	7	20	0.012	39.000	9.000	635	53	2.0°
	12.00	7	20	0.015	46.000	10.800	530	56	2.0°
	16.00	8	20	0.016	53.000	14.400	400	51	2.0°
	20.00	8	20	0.017	63.000	18.000	320	44	2.0°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	133	0.042	22.000	0.450	7055	1778	17.6
	8.00	6	133	0.058	31.000	0.600	5290	1841	34.2
	10.00	7	126	0.061	39.000	0.750	4010	1712	50.1
	12.00	7	126	0.073	46.000	0.900	3340	1707	70.7
	16.00	8	119	0.086	53.000	1.200	2365	1627	103.5
	20.00	8	119	0.094	63.000	1.500	1895	1425	134.7
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	6.00	6	98	0.042	22.000	0.450	5200	1310	13.0
	8.00	6	98	0.058	31.000	0.600	3900	1357	25.2
	10.00	7	92	0.061	39.000	0.750	2930	1251	36.6
	12.00	7	92	0.073	46.000	0.900	2440	1247	51.6
	16.00	8	87	0.086	53.000	1.200	1730	1190	75.7
	20.00	8	87	0.094	63.000	1.500	1385	1042	98.4
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	6.00	6	78	0.038	22.000	0.450	4140	944	9.3
	8.00	6	78	0.053	31.000	0.600	3105	987	18.4
	10.00	7	74	0.054	39.000	0.750	2355	890	26.0
	12.00	7	74	0.065	46.000	0.900	1965	894	37.0
	16.00	8	70	0.078	53.000	1.200	1395	871	55.4
	20.00	8	70	0.086	63.000	1.500	1115	767	72.5
Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	6.00	6	41	0.048	22.000	0.150	2175	626	2.1
	8.00	6	41	0.064	31.000	0.200	1630	626	3.9
	10.00	7	39	0.069	39.000	0.250	1240	599	5.8
	12.00	7	39	0.080	46.000	0.300	1035	580	8.0
	16.00	8	37	0.094	53.000	0.400	735	553	11.7
	20.00	8	37	0.101	63.000	0.500	590	477	15.0

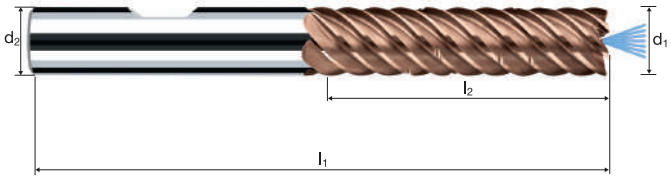
Cylindrical/Square end mills SX

Smooth-edged, chip breaker, medium version
High-performance penetration edge, central air/cooling channel

HM MG10

λ 55°
γ 10°

r



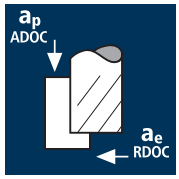
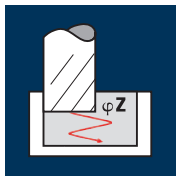
Roughing HPC | Roughing HDC | Finishing

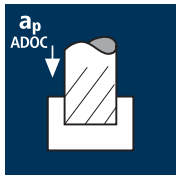
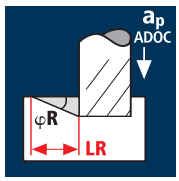
ReTool®

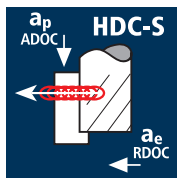
Inox Stainless | **Ti** Titanium | **Nickel-Alloys**

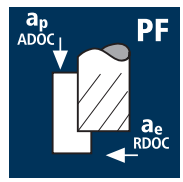
Example: **Order-N°.** Coating **S** | Article-N°. **8618** | ø-Code **300**

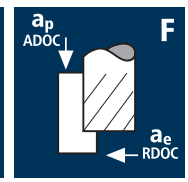
Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z	DURO-XI S8618	DURO-XI S8518
300	6.00	6.00	63	22.00	0.100	6		●
391	8.00	8.00	72	31.00	0.150	6		●
450	10.00	10.00	84	39.00	0.200	7		●
501	12.00	12.00	97	46.00	0.200	7		●
610	16.00	16.00	108	53.00	0.200	8		●
682	20.00	20.00	122	63.00	0.250	8		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	4.00	4	135	0.026	8.000	1.200	10745	1118	10.7	12.0°
		5.00	4	135	0.030	10.000	1.500	8595	1031	15.5	12.0°
		6.00	4	135	0.034	12.000	1.800	7160	974	21.0	12.0°
		8.00	4	135	0.043	16.000	2.400	5370	924	35.5	12.0°
		10.00	4	135	0.055	20.000	3.000	4295	945	56.7	12.0°
		12.00	4	135	0.064	24.000	3.600	3580	917	79.2	12.0°
		16.00	4	135	0.072	25.600	4.800	2685	773	95.0	12.0°
		20.00	4	135	0.085	32.000	6.000	2150	731	140.4	12.0°
	Steel 1100 - 1300 N/mm² P P	4.00	4	105	0.021	8.000	1.200	8355	702	6.7	12.0°
		5.00	4	105	0.026	10.000	1.500	6685	695	10.4	12.0°
		6.00	4	105	0.030	12.000	1.800	5570	668	14.4	12.0°
		8.00	4	105	0.038	16.000	2.400	4180	635	24.4	12.0°
		10.00	4	105	0.047	20.000	3.000	3340	628	37.7	12.0°
		12.00	4	105	0.055	24.000	3.600	2785	613	52.9	12.0°
		16.00	4	105	0.064	25.600	4.800	2090	535	65.7	12.0°
		20.00	4	105	0.077	32.000	6.000	1670	514	98.8	12.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	80	0.017	8.000	1.200	6365	433	4.2	8.0°
		5.00	4	80	0.021	10.000	1.500	5095	428	6.4	8.0°
		6.00	4	80	0.026	12.000	1.800	4245	442	9.5	8.0°
		8.00	4	80	0.030	16.000	2.400	3185	382	14.7	8.0°
		10.00	4	80	0.038	20.000	3.000	2545	387	23.2	8.0°
		12.00	4	80	0.047	24.000	3.600	2120	399	34.4	8.0°
		16.00	4	80	0.055	25.600	4.800	1590	350	43.0	8.0°
		20.00	4	80	0.068	32.000	6.000	1275	347	66.6	8.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	4.00	4	110	0.017	6.000	4.000	8755	595	14.3	12.0°	28.2
		5.00	4	110	0.020	7.500	5.000	7005	560	21.0	12.0°	35.3
		6.00	4	110	0.022	9.000	6.000	5835	514	27.7	12.0°	42.3
		8.00	4	110	0.028	12.000	8.000	4375	490	47.0	12.0°	56.5
		10.00	4	110	0.036	15.000	10.000	3500	504	75.6	12.0°	70.6
		12.00	4	110	0.042	18.000	12.000	2920	491	106.0	12.0°	84.7
		16.00	4	110	0.047	24.000	16.000	2190	412	158.1	12.0°	112.9
		20.00	4	110	0.055	30.000	20.000	1750	385	231.0	12.0°	141.1
	Steel 1100 - 1300 N/mm² P P	4.00	4	85	0.014	6.000	4.000	6765	379	9.1	12.0°	28.2
		5.00	4	85	0.017	7.500	5.000	5410	368	13.8	12.0°	35.3
		6.00	4	85	0.020	9.000	6.000	4510	361	19.5	12.0°	42.3
		8.00	4	85	0.025	12.000	8.000	3380	338	32.4	12.0°	56.5
		10.00	4	85	0.031	15.000	10.000	2705	335	50.3	12.0°	70.6
		12.00	4	85	0.036	18.000	12.000	2255	325	70.1	12.0°	84.7
		16.00	4	85	0.042	24.000	16.000	1690	284	109.0	12.0°	112.9
		20.00	4	85	0.050	30.000	20.000	1355	271	162.6	12.0°	141.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	65	0.011	6.000	4.000	5175	228	5.5	12.0°	28.2
		5.00	4	65	0.014	7.500	5.000	4140	232	8.7	12.0°	35.3
		6.00	4	65	0.017	9.000	6.000	3450	235	12.7	12.0°	42.3
		8.00	4	65	0.020	12.000	8.000	2585	207	19.9	12.0°	56.5
		10.00	4	65	0.025	15.000	10.000	2070	207	31.1	12.0°	70.6
		12.00	4	65	0.031	18.000	12.000	1725	214	46.2	12.0°	84.7
		16.00	4	65	0.036	24.000	16.000	1295	187	71.6	12.0°	112.9
		20.00	4	65	0.044	30.000	20.000	1035	182	109.3	12.0°	141.1







Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills MFC

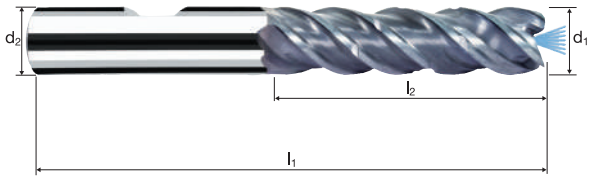
Smooth-edged, chip breaker, medium version
High-performance penetration edge, central air/cooling channel

HM MG10

λ **45°**
γ **10°**

r

Vario



Roughing HPC | Roughing HDC | Finishing

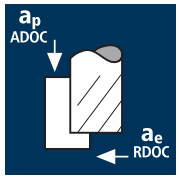
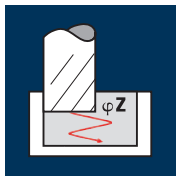
ReTool®

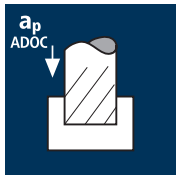
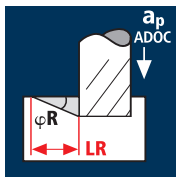
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

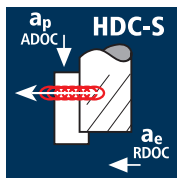
Example: **Order-N°.** Coating **P** Article-N°. **8211** ø-Code **220**

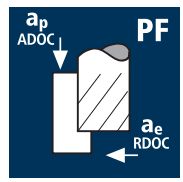
Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r	z	POLYCHROM P8211	POLYCHROM P8111
220*	4.00	6.00	63	13.00	19.59	0.100	4		●
260*	5.00	6.00	63	16.00	20.72	0.100	4		●
300	6.00	6.00	63	21.00	-	0.100	4		●
391	8.00	8.00	72	31.00	-	0.150	4		●
450	10.00	10.00	84	37.00	-	0.200	4		●
501	12.00	12.00	97	44.00	-	0.200	4		●
610	16.00	16.00	108	53.00	-	0.200	4		●
682	20.00	20.00	122	62.00	-	0.200	4		●

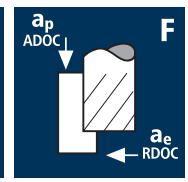
* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm²	4.00	4	135	0.026	8.000	1.200	10745	1118	10.7	12.0°
		5.00	4	135	0.030	10.000	1.500	8595	1031	15.5	12.0°
		6.00	4	135	0.034	12.000	1.800	7160	974	21.0	12.0°
		8.00	4	135	0.043	16.000	2.400	5370	924	35.5	12.0°
		10.00	4	135	0.055	20.000	3.000	4295	945	56.7	12.0°
		12.00	4	135	0.064	24.000	3.600	3580	917	79.2	12.0°
		16.00	4	135	0.072	25.600	4.800	2685	773	95.0	12.0°
		20.00	4	135	0.085	32.000	6.000	2150	731	140.4	12.0°
	Steel 1100 - 1300 N/mm²	4.00	4	105	0.021	8.000	1.200	8355	702	6.7	12.0°
		5.00	4	105	0.026	10.000	1.500	6685	695	10.4	12.0°
		6.00	4	105	0.030	12.000	1.800	5570	668	14.4	12.0°
		8.00	4	105	0.038	16.000	2.400	4180	635	24.4	12.0°
		10.00	4	105	0.047	20.000	3.000	3340	628	37.7	12.0°
		12.00	4	105	0.055	24.000	3.600	2785	613	52.9	12.0°
		16.00	4	105	0.064	25.600	4.800	2090	535	65.7	12.0°
		20.00	4	105	0.077	32.000	6.000	1670	514	98.8	12.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	80	0.017	8.000	1.200	6365	433	4.2	8.0°
		5.00	4	80	0.021	10.000	1.500	5095	428	6.4	8.0°
		6.00	4	80	0.026	12.000	1.800	4245	442	9.5	8.0°
		8.00	4	80	0.030	16.000	2.400	3185	382	14.7	8.0°
		10.00	4	80	0.038	20.000	3.000	2545	387	23.2	8.0°
		12.00	4	80	0.047	24.000	3.600	2120	399	34.4	8.0°
		16.00	4	80	0.055	25.600	4.800	1590	350	43.0	8.0°
		20.00	4	80	0.068	32.000	6.000	1275	347	66.6	8.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm²	4.00	4	110	0.017	6.000	4.000	8755	595	14.3	12.0°	28.2
		5.00	4	110	0.020	7.500	5.000	7005	560	21.0	12.0°	35.3
		6.00	4	110	0.022	9.000	6.000	5835	514	27.7	12.0°	42.3
		8.00	4	110	0.028	12.000	8.000	4375	490	47.0	12.0°	56.5
		10.00	4	110	0.036	15.000	10.000	3500	504	75.6	12.0°	70.6
		12.00	4	110	0.042	18.000	12.000	2920	491	106.0	12.0°	84.7
		16.00	4	110	0.047	24.000	16.000	2190	412	158.1	12.0°	112.9
		20.00	4	110	0.055	30.000	20.000	1750	385	231.0	12.0°	141.1
	Steel 1100 - 1300 N/mm²	4.00	4	85	0.014	6.000	4.000	6765	379	9.1	12.0°	28.2
		5.00	4	85	0.017	7.500	5.000	5410	368	13.8	12.0°	35.3
		6.00	4	85	0.020	9.000	6.000	4510	361	19.5	12.0°	42.3
		8.00	4	85	0.025	12.000	8.000	3380	338	32.4	12.0°	56.5
		10.00	4	85	0.031	15.000	10.000	2705	335	50.3	12.0°	70.6
		12.00	4	85	0.036	18.000	12.000	2255	325	70.1	12.0°	84.7
		16.00	4	85	0.042	24.000	16.000	1690	284	109.0	12.0°	112.9
		20.00	4	85	0.050	30.000	20.000	1355	271	162.6	12.0°	141.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	65	0.011	6.000	4.000	5175	228	5.5	12.0°	28.2
		5.00	4	65	0.014	7.500	5.000	4140	232	8.7	12.0°	35.3
		6.00	4	65	0.017	9.000	6.000	3450	235	12.7	12.0°	42.3
		8.00	4	65	0.020	12.000	8.000	2585	207	19.9	12.0°	56.5
		10.00	4	65	0.025	15.000	10.000	2070	207	31.1	12.0°	70.6
		12.00	4	65	0.031	18.000	12.000	1725	214	46.2	12.0°	84.7
		16.00	4	65	0.036	24.000	16.000	1295	187	71.6	12.0°	112.9
		20.00	4	65	0.044	30.000	20.000	1035	182	109.3	12.0°	141.1







Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

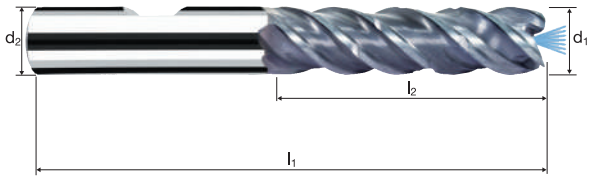
Cylindrical/Square end mills MFC

Smooth-edged, chip breaker, medium version
High-performance penetration edge, central air/cooling channel

HM MG10 | λ 45° γ 0°

r

Vario



Roughing HPC | Roughing HDC | Finishing

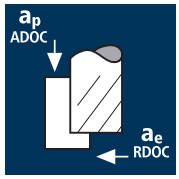
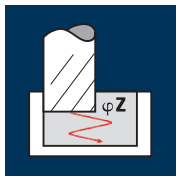
ReTool®

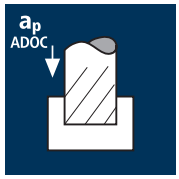
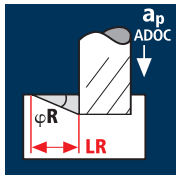
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

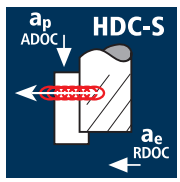
Example: **Order-N°.** Coating **P** Article-N°. **8212** ø-Code **220**

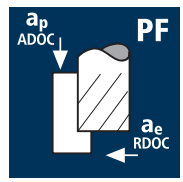
Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r	z	POLYCHROM P8212	POLYCHROM P8112
220*	4.00	6.00	63	13.00	19.59	0.100	4		●
260*	5.00	6.00	63	16.00	20.72	0.100	4		●
300	6.00	6.00	63	21.00	-	0.100	4		●
391	8.00	8.00	72	31.00	-	0.150	4		●
450	10.00	10.00	84	37.00	-	0.200	4		●
501	12.00	12.00	97	44.00	-	0.200	4		●
610	16.00	16.00	108	53.00	-	0.200	4		●
682	20.00	20.00	122	62.00	-	0.200	4		●

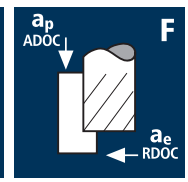
* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	6.00	5	135	0.034	12.000	1.500	7160	1217	21.9	10.0°
		8.00	5	135	0.043	16.000	2.000	5370	1155	36.9	12.0°
		10.00	5	135	0.055	20.000	2.500	4295	1181	59.1	12.0°
		12.00	5	135	0.064	24.000	3.000	3580	1146	82.5	12.0°
		16.00	5	135	0.072	25.600	4.000	2685	967	99.0	12.0°
		20.00	5	135	0.085	32.000	5.000	2150	914	146.2	12.0°
	Steel 1100 - 1300 N/mm² P P	6.00	5	105	0.030	12.000	1.500	5570	836	15.0	10.0°
		8.00	5	105	0.038	16.000	2.000	4180	794	25.4	12.0°
		10.00	5	105	0.047	20.000	2.500	3340	785	39.2	12.0°
		12.00	5	105	0.055	24.000	3.000	2785	766	55.1	12.0°
		16.00	5	105	0.064	25.600	4.000	2090	669	68.5	12.0°
		20.00	5	105	0.077	32.000	5.000	1670	643	102.9	12.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	6.00	5	80	0.026	12.000	1.500	4245	552	9.9	8.0°
		8.00	5	80	0.030	16.000	2.000	3185	478	15.3	8.0°
		10.00	5	80	0.038	20.000	2.500	2545	484	24.2	8.0°
		12.00	5	80	0.047	24.000	3.000	2120	498	35.9	8.0°
		16.00	5	80	0.055	25.600	4.000	1590	437	44.8	8.0°
		20.00	5	80	0.068	32.000	5.000	1275	434	69.4	8.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	6.00	5	110	0.020	6.000	6.000	5835	584	21.0	10.0°	34.0
		8.00	5	110	0.026	8.000	8.000	4375	569	36.4	10.0°	45.4
		10.00	5	110	0.033	10.000	10.000	3500	578	57.8	10.0°	56.7
		12.00	5	110	0.038	12.000	12.000	2920	555	79.9	10.0°	68.1
		16.00	5	110	0.043	16.000	16.000	2190	471	120.6	10.0°	90.7
		20.00	5	110	0.051	20.000	20.000	1750	446	178.5	10.0°	113.4
	Steel 1100 - 1300 N/mm² P P	6.00	5	85	0.018	6.000	6.000	4510	406	14.6	10.0°	34.0
		8.00	5	85	0.023	8.000	8.000	3380	389	24.9	10.0°	45.4
		10.00	5	85	0.028	10.000	10.000	2705	379	37.9	10.0°	56.7
		12.00	5	85	0.033	12.000	12.000	2255	372	53.6	10.0°	68.1
		16.00	5	85	0.038	16.000	16.000	1690	321	82.2	10.0°	90.7
		20.00	5	85	0.046	20.000	20.000	1355	312	124.7	10.0°	113.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	6.00	5	65	0.016	6.000	6.000	3450	276	9.9	10.0°	34.0
		8.00	5	65	0.018	8.000	8.000	2585	233	14.9	10.0°	45.4
		10.00	5	65	0.023	10.000	10.000	2070	238	23.8	10.0°	56.7
		12.00	5	65	0.028	12.000	12.000	1725	242	34.8	10.0°	68.1
		16.00	5	65	0.033	16.000	16.000	1295	214	54.7	10.0°	90.7
		20.00	5	65	0.041	20.000	20.000	1035	212	84.9	10.0°	113.4







Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills MFC

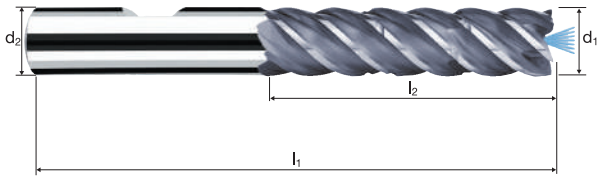
Smooth-edged, chip breaker, medium version
High-performance penetration edge, central air/cooling channel

HM MG10

λ 45°
γ 0°

r

Vario



Roughing HPC

Roughing HDC

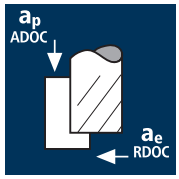
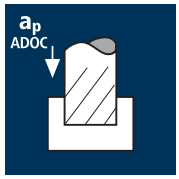
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8215** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z		POLYCHROM P8215	POLYCHROM P8115
300	6.00	6.00	63	21.00	0.100	5			●
391	8.00	8.00	72	31.00	0.150	5			●
450	10.00	10.00	84	37.00	0.200	5			●
501	12.00	12.00	97	44.00	0.200	5			●
610	16.00	16.00	108	53.00	0.200	5			●
682	20.00	20.00	122	62.00	0.200	5			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	180	0.040	10.800	1.200	9550	1528	19.8
		8.00	4	180	0.050	14.400	1.600	7160	1432	33.0
		10.00	4	180	0.065	18.000	2.000	5730	1490	53.6
		12.00	4	180	0.075	21.600	2.400	4775	1433	74.3
		16.00	4	180	0.085	28.800	3.200	3580	1217	112.2
		20.00	4	180	0.105	36.000	4.000	2865	1203	173.3
	Steel 850 - 1100 N/mm²	6.00	4	140	0.040	10.800	1.200	7425	1188	15.4
		8.00	4	140	0.050	14.400	1.600	5570	1114	25.7
		10.00	4	140	0.065	18.000	2.000	4455	1158	41.7
		12.00	4	140	0.075	21.600	2.400	3715	1115	57.8
		16.00	4	140	0.085	28.800	3.200	2785	947	87.3
		20.00	4	140	0.105	36.000	4.000	2230	937	134.9
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	70	0.035	10.800	1.200	3715	520	6.7
		8.00	4	70	0.045	14.400	1.600	2785	501	11.5
		10.00	4	70	0.060	18.000	2.000	2230	535	19.3
		12.00	4	70	0.070	21.600	2.400	1855	519	26.9
		16.00	4	70	0.080	28.800	3.200	1395	446	41.1
		20.00	4	70	0.100	36.000	4.000	1115	446	64.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	85	0.025	10.800	1.200	4510	451	5.8
		8.00	4	85	0.030	14.400	1.600	3380	406	9.3
		10.00	4	85	0.040	18.000	2.000	2705	433	15.6
		12.00	4	85	0.050	21.600	2.400	2255	451	23.4
		16.00	4	85	0.055	28.800	3.200	1690	372	34.3
		20.00	4	85	0.070	36.000	4.000	1355	379	54.6
	Steel < 850 N/mm²	6.00	4	145	0.020	8.100	6.000	7690	615	29.9
		8.00	4	145	0.025	10.800	8.000	5770	577	49.9
		10.00	4	145	0.035	13.500	10.000	4615	646	87.2
		12.00	4	145	0.040	16.200	12.000	3845	615	119.6
		16.00	4	145	0.050	19.200	16.000	2885	577	177.3
		20.00	4	145	0.060	24.000	20.000	2310	554	266.1
	Steel 850 - 1100 N/mm²	6.00	4	105	0.020	8.100	6.000	5570	446	21.7
		8.00	4	105	0.025	10.800	8.000	4180	418	36.1
		10.00	4	105	0.035	13.500	10.000	3340	468	63.1
		12.00	4	105	0.040	16.200	12.000	2785	446	86.6
		16.00	4	105	0.050	19.200	16.000	2090	418	128.4
		20.00	4	105	0.060	24.000	20.000	1670	401	192.4
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	55	0.020	8.100	6.000	2920	234	11.4
		8.00	4	55	0.025	10.800	8.000	2190	219	18.9
		10.00	4	55	0.030	13.500	10.000	1750	210	28.4
		12.00	4	55	0.035	16.200	12.000	1460	204	39.7
		16.00	4	55	0.045	19.200	16.000	1095	197	60.5
		20.00	4	55	0.055	24.000	20.000	875	193	92.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	65	0.015	8.100	6.000	3450	207	10.1
		8.00	4	65	0.020	10.800	8.000	2585	207	17.9
		10.00	4	65	0.025	13.500	10.000	2070	207	27.9
		12.00	4	65	0.030	16.200	12.000	1725	207	40.2
		16.00	4	65	0.035	19.200	16.000	1295	181	55.7
		20.00	4	65	0.045	24.000	20.000	1035	186	89.4

Cylindrical/Square end mills NVD

Smooth-edged, chip breaker, medium version

HM MG10 | λ 45° γ 0°



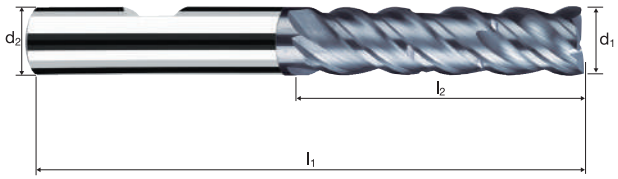












Roughing HPC



Roughing HDC



Finishing



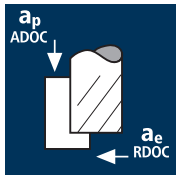
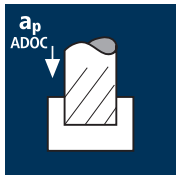
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **15310** ø-Code **300**



Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z		POLYCHROM P15310	POLYCHROM P15210
300	6.00	6.00	63	21.00	0.10	4		●	
391	8.00	8.00	72	31.00	0.10	4		●	
450	10.00	10.00	84	37.00	0.15	4		●	
501	12.00	12.00	97	44.00	0.15	4		●	
610	16.00	16.00	108	53.00	0.15	4		●	
682	20.00	20.00	122	62.00	0.15	4		●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	4.00	4	180	0.025	7.200	0.800	14325	1433	8.3
		5.00	4	180	0.030	9.000	1.000	11460	1375	12.4
		6.00	4	180	0.040	10.800	1.200	9550	1528	19.8
		8.00	4	180	0.050	14.400	1.600	7160	1432	33.0
		10.00	4	180	0.065	18.000	2.000	5730	1490	53.6
		12.00	4	180	0.075	21.600	2.400	4775	1433	74.3
		16.00	4	180	0.085	28.800	3.200	3580	1217	112.2
		20.00	4	180	0.105	36.000	4.000	2865	1203	173.3
	Steel 850 - 1100 N/mm²	4.00	4	140	0.025	7.200	0.800	11140	1114	6.4
		5.00	4	140	0.030	9.000	1.000	8915	1070	9.6
		6.00	4	140	0.040	10.800	1.200	7425	1188	15.4
		8.00	4	140	0.050	14.400	1.600	5570	1114	25.7
		10.00	4	140	0.065	18.000	2.000	4455	1158	41.7
		12.00	4	140	0.075	21.600	2.400	3715	1115	57.8
		16.00	4	140	0.085	28.800	3.200	2785	947	87.3
		20.00	4	140	0.105	36.000	4.000	2230	937	134.9
	Cold work tool steel (12%Cr) high alloyed [1.2379]	4.00	4	70	0.025	7.200	0.800	5570	557	3.2
		5.00	4	70	0.030	9.000	1.000	4455	535	4.8
		6.00	4	70	0.035	10.800	1.200	3715	520	6.7
		8.00	4	70	0.045	14.400	1.600	2785	501	11.5
		10.00	4	70	0.060	18.000	2.000	2230	535	19.3
		12.00	4	70	0.070	21.600	2.400	1855	519	26.9
		16.00	4	70	0.080	28.800	3.200	1395	446	41.1
		20.00	4	70	0.100	36.000	4.000	1115	446	64.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	85	0.020	7.200	0.800	6765	541	3.1
		5.00	4	85	0.020	9.000	1.000	5410	433	3.9
		6.00	4	85	0.025	10.800	1.200	4510	451	5.8
		8.00	4	85	0.030	14.400	1.600	3380	406	9.3
		10.00	4	85	0.040	18.000	2.000	2705	433	15.6
		12.00	4	85	0.050	21.600	2.400	2255	451	23.4
		16.00	4	85	0.055	28.800	3.200	1690	372	34.3
		20.00	4	85	0.070	36.000	4.000	1355	379	54.6
	Steel < 850 N/mm²	4.00	4	145	0.015	5.400	4.000	11540	692	15.0
		5.00	4	145	0.015	6.750	5.000	9230	554	18.7
		6.00	4	145	0.020	8.100	6.000	7690	615	29.9
		8.00	4	145	0.025	10.800	8.000	5770	577	49.9
		10.00	4	145	0.035	13.500	10.000	4615	646	87.2
		12.00	4	145	0.040	16.200	12.000	3845	615	119.6
		16.00	4	145	0.050	19.200	16.000	2885	577	177.3
		20.00	4	145	0.060	24.000	20.000	2310	554	266.1
	Steel 850 - 1100 N/mm²	4.00	4	105	0.015	5.400	4.000	8355	501	10.8
		5.00	4	105	0.015	6.750	5.000	6685	401	13.5
		6.00	4	105	0.020	8.100	6.000	5570	446	21.7
		8.00	4	105	0.025	10.800	8.000	4180	418	36.1
		10.00	4	105	0.035	13.500	10.000	3340	468	63.1
		12.00	4	105	0.040	16.200	12.000	2785	446	86.6
		16.00	4	105	0.050	19.200	16.000	2090	418	128.4
		20.00	4	105	0.060	24.000	20.000	1670	401	192.4
	Cold work tool steel (12%Cr) high alloyed [1.2379]	4.00	4	55	0.010	5.400	4.000	4375	175	3.8
		5.00	4	55	0.015	6.750	5.000	3500	210	7.1
		6.00	4	55	0.020	8.100	6.000	2920	234	11.4
		8.00	4	55	0.025	10.800	8.000	2190	219	18.9
		10.00	4	55	0.030	13.500	10.000	1750	210	28.4
		12.00	4	55	0.035	16.200	12.000	1460	204	39.7
		16.00	4	55	0.045	19.200	16.000	1095	197	60.5
		20.00	4	55	0.055	24.000	20.000	875	193	92.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	65	0.010	5.400	4.000	5175	207	4.5
		5.00	4	65	0.010	6.750	5.000	4140	166	5.6
		6.00	4	65	0.015	8.100	6.000	3450	207	10.1
		8.00	4	65	0.020	10.800	8.000	2585	207	17.9
		10.00	4	65	0.025	13.500	10.000	2070	207	27.9
		12.00	4	65	0.030	16.200	12.000	1725	207	40.2
		16.00	4	65	0.035	19.200	16.000	1295	181	55.7
		20.00	4	65	0.045	24.000	20.000	1035	186	89.4

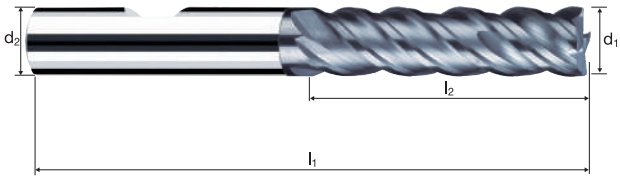
Cylindrical/Square end mills NVD

Smooth-edged, medium version

HM MG10 | λ 45° γ 0°

45°

Vario



Roughing HPC | Roughing HDC | Finishing

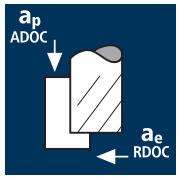
ReTool®

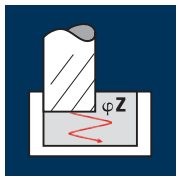
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

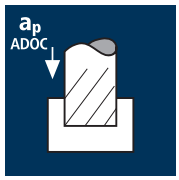
Example: **Order-N°.** Coating **P** Article-N°. **15308** ø-Code **220**

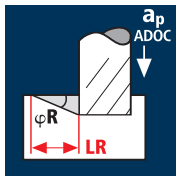
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P15308	POLYCHROM P15208
220	4.00	6.00	63	13.00	19.59	0.05	4		●
260	5.00	6.00	63	16.00	20.72	0.10	4		●
300	6.00	6.00	63	21.00	-	0.10	4		●
391	8.00	8.00	72	31.00	-	0.10	4		●
450	10.00	10.00	84	37.00	-	0.15	4		●
501	12.00	12.00	97	44.00	-	0.15	4		●
610	16.00	16.00	108	53.00	-	0.15	4		●
682	20.00	20.00	122	62.00	-	0.15	4		●

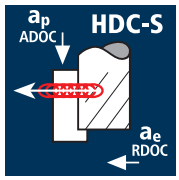
Application

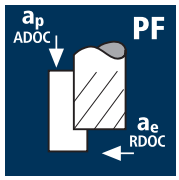


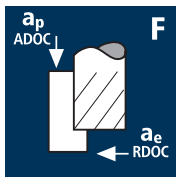








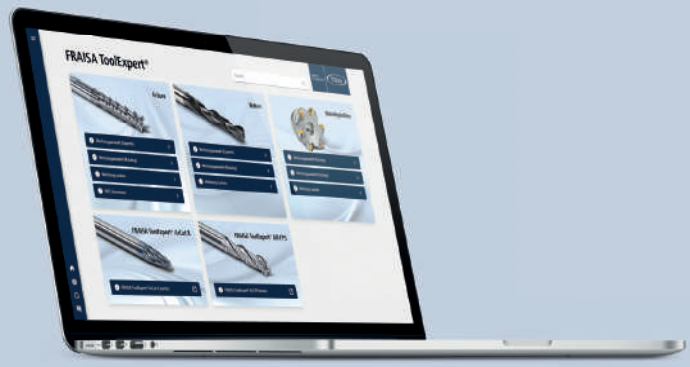




Cutting data SteelCut

Always up to date

The new cylindrical high-performance **SteelCut** end mill has been developed for HPC and HDC rough machining of soft, unalloyed and low- alloyed steels. The latest cutting data for the SteelCut tools can be found in our cutting data calculator ToolExpert®.



Scan this QR code to start

Cylindrical/Square end mills SteelCut

Smooth-edged, chip breaker, medium version, short neck

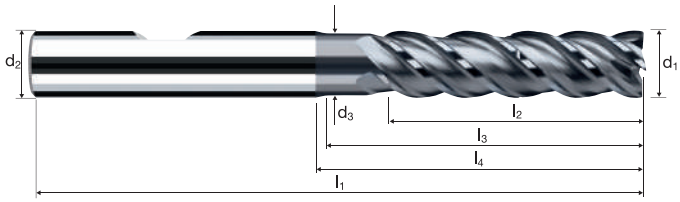
Performance **P**

$l_2=3.7xd_1$

$l_3=4.5xd_1$

HM MG10 | λ 43° γ 4°

new!



Roughing HPC | Roughing HDC | Finishing

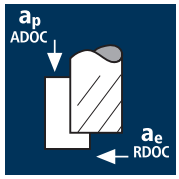
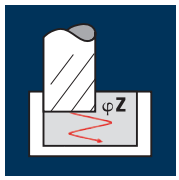
ReTool®

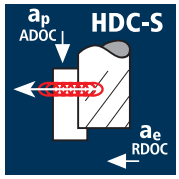
Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Inox** Stainless

Example: **Order-N°.** Coating **K** Article-N°. **8440** ø-Code **180**

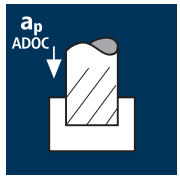
Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	MULTICHROM K8440	MULTICHROM K8340
180*	3.00	6.00	2.80	57	11.10	13.50	16.83	0.050	4		●
220*	4.00	6.00	3.70	60	15.00	18.00	20.54	0.050	4		●
260	5.00	6.00	4.60	63	18.50	22.50	24.22	0.100	4		●
300	6.00	6.00	5.50	65	22.50	27.00	28.85	0.100	4		●
391	8.00	8.00	7.40	76	30.00	36.00	38.37	0.150	4		●
450	10.00	10.00	9.20	90	37.00	45.00	48.01	0.200	4		●
501	12.00	12.00	11.00	105	45.00	54.00	57.71	0.200	4		●
610	16.00	16.00	15.00	125	60.00	72.00	76.27	0.200	4		●
682	20.00	20.00	19.00	145	74.00	90.00	94.77	0.250	4		●

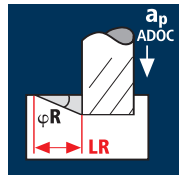
* without chip breaker

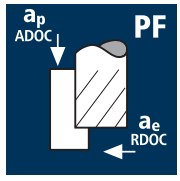
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	4	130	0.020	3.750	1.200	13795	1104	5.0	1.5°
		4.00	4	130	0.030	5.000	1.600	10345	1241	9.9	1.5°
		5.00	4	130	0.037	6.250	2.000	8275	1225	15.3	1.5°
		6.00	4	130	0.038	9.000	2.400	6895	1048	22.6	1.5°
		8.00	4	130	0.051	12.000	3.200	5175	1056	40.5	1.5°
		10.00	4	130	0.064	15.000	4.000	4140	1060	63.6	1.5°
		12.00	4	130	0.072	18.000	4.800	3450	994	85.8	1.5°
		16.00	4	130	0.086	24.000	6.400	2585	889	136.6	1.5°
		20.00	4	130	0.099	30.000	8.000	2070	820	196.7	1.5°
	Steel 850 - 1100 N/mm²	3.00	4	120	0.019	3.750	1.200	12730	968	4.4	2.0°
		4.00	4	120	0.026	5.000	1.600	9550	993	7.9	2.0°
		5.00	4	120	0.032	6.250	2.000	7640	978	12.2	2.0°
		6.00	4	120	0.033	9.000	2.400	6365	840	18.1	2.0°
		8.00	4	120	0.044	12.000	3.200	4775	840	32.3	2.0°
		10.00	4	120	0.055	15.000	4.000	3820	840	50.4	2.0°
		12.00	4	120	0.066	18.000	4.800	3185	841	72.6	2.0°
		16.00	4	120	0.079	24.000	6.400	2385	754	115.8	2.0°
		20.00	4	120	0.090	30.000	8.000	1910	688	165.0	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	75	0.012	3.750	1.200	7960	382	1.7	1.5°
		4.00	4	75	0.016	5.000	1.600	5970	382	3.1	1.5°
		5.00	4	75	0.020	6.250	2.000	4775	382	4.8	1.5°
		6.00	4	75	0.023	9.000	2.400	3980	366	7.9	1.5°
		8.00	4	75	0.031	12.000	3.200	2985	370	14.2	1.5°
		10.00	4	75	0.038	15.000	4.000	2385	363	21.8	1.5°
		12.00	4	75	0.046	18.000	4.800	1990	366	31.6	1.5°
		16.00	4	75	0.050	24.000	6.400	1490	298	45.8	1.5°
		20.00	4	75	0.063	30.000	8.000	1195	301	72.3	1.5°

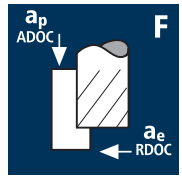
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	243	0.031	11.000	0.300	25785	3197	10.6
		4.00	4	243	0.042	13.000	0.400	19335	3248	16.9
		5.00	4	243	0.052	16.000	0.500	15470	3218	25.7
		6.00	4	243	0.063	21.000	0.600	12890	3248	40.9
		8.00	4	243	0.085	31.000	0.800	9670	3288	81.5
		10.00	4	243	0.105	37.000	1.000	7735	3249	120.2
		12.00	4	243	0.126	44.000	1.200	6445	3248	171.5
		16.00	4	243	0.138	53.000	1.600	4835	2669	226.3
		20.00	4	243	0.174	62.000	2.000	3865	2690	333.6
	Steel 850 - 1100 N/mm²	3.00	4	195	0.031	11.000	0.300	20690	2566	8.5
		4.00	4	195	0.042	13.000	0.400	15520	2607	13.6
		5.00	4	195	0.052	16.000	0.500	12415	2582	20.7
		6.00	4	195	0.063	21.000	0.600	10345	2607	32.8
		8.00	4	195	0.085	31.000	0.800	7760	2638	65.4
		10.00	4	195	0.105	37.000	1.000	6205	2606	96.4
		12.00	4	195	0.126	44.000	1.200	5175	2608	137.7
		16.00	4	195	0.138	53.000	1.600	3880	2142	181.6
		20.00	4	195	0.174	62.000	2.000	3105	2161	268.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	132	0.022	11.000	0.225	14005	1232	3.1
		4.00	4	132	0.030	13.000	0.300	10505	1261	4.9
		5.00	4	132	0.038	16.000	0.375	8405	1278	7.7
		6.00	4	132	0.045	21.000	0.450	7005	1261	11.9
		8.00	4	132	0.060	31.000	0.600	5250	1260	23.4
		10.00	4	132	0.075	37.000	0.750	4200	1260	35.0
		12.00	4	132	0.090	44.000	0.900	3500	1260	49.9
		16.00	4	132	0.098	53.000	1.200	2625	1029	65.4
		20.00	4	132	0.126	62.000	1.500	2100	1058	98.4

Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**









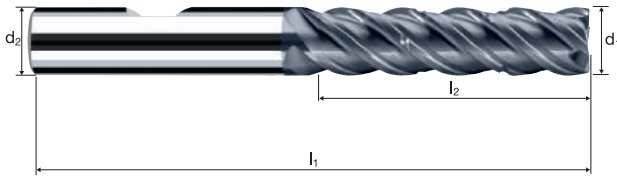
Cylindrical/Square end mills E-Cut

Smooth-edged, chip breaker, medium version

HM MG10 | λ 45° γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

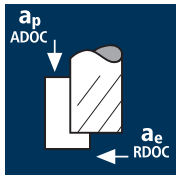
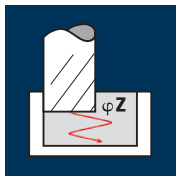
ReTool®

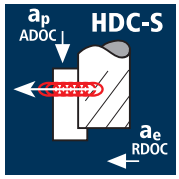
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox Stainless** | **Ti Titanium** | **GG(G) Tool Steel**

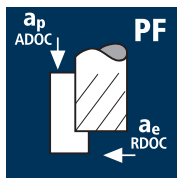
Example: **Order-N°.** Coating **P** Article-N°. **8410** ø-Code **140**

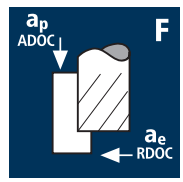
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P8410	POLYCHROM P8310
140*	2.00	6.00	63	7.00	17.12	0.050	4		●
180*	3.00	6.00	63	11.00	20.26	0.050	4		●
220*	4.00	6.00	63	13.00	21.39	0.100	4		●
260*	5.00	6.00	63	16.00	23.52	0.100	4		●
300	6.00	6.00	63	21.00	-	0.100	4		●
391	8.00	8.00	72	31.00	-	0.150	4		●
450	10.00	10.00	84	37.00	-	0.200	4		●
501	12.00	12.00	97	44.00	-	0.200	4		●
610	16.00	16.00	108	53.00	-	0.200	4		●
682	20.00	20.00	122	62.00	-	0.250	4		●

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	4.00	5	140	0.034	6.000	1.200	11140	1894	13.6	1.0°
		5.00	5	140	0.042	7.500	1.500	8915	1872	21.1	1.0°
		6.00	5	140	0.043	9.000	1.800	7425	1596	25.9	1.0°
		8.00	5	140	0.058	12.000	2.400	5570	1615	46.5	1.0°
		10.00	5	140	0.073	15.000	3.000	4455	1626	73.2	1.0°
		12.00	5	140	0.084	18.000	3.600	3715	1560	101.1	1.0°
		16.00	5	140	0.098	24.000	4.800	2785	1365	157.2	1.0°
		20.00	5	140	0.115	30.000	6.000	2230	1282	230.8	1.0°
	Steel 850 - 1100 N/mm²	4.00	5	130	0.030	6.000	1.200	10345	1552	11.2	1.5°
		5.00	5	130	0.036	7.500	1.500	8275	1490	16.8	1.5°
		6.00	5	130	0.038	9.000	1.800	6895	1310	21.2	1.5°
		8.00	5	130	0.051	12.000	2.400	5175	1320	38.0	1.5°
		10.00	5	130	0.064	15.000	3.000	4140	1325	59.6	1.5°
		12.00	5	130	0.076	18.000	3.600	3450	1311	85.0	1.5°
		16.00	5	130	0.091	24.000	4.800	2585	1176	135.5	1.5°
		20.00	5	130	0.104	30.000	6.000	2070	1076	193.8	1.5°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	5	80	0.018	6.000	1.200	6365	573	4.1	1.0°
		5.00	5	80	0.024	7.500	1.500	5095	611	6.9	1.0°
		6.00	5	80	0.027	9.000	1.800	4245	573	9.3	1.0°
		8.00	5	80	0.036	12.000	2.400	3185	573	16.5	1.0°
		10.00	5	80	0.043	15.000	3.000	2545	547	24.6	1.0°
		12.00	5	80	0.053	18.000	3.600	2120	562	36.4	1.0°
		16.00	5	80	0.058	24.000	4.800	1590	461	53.1	1.0°
		20.00	5	80	0.073	30.000	6.000	1275	465	83.8	1.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	4.00	5	230	0.035	13.000	0.400	18305	3203	16.7
		5.00	5	230	0.044	16.000	0.500	14640	3221	25.8
		6.00	5	230	0.054	21.000	0.600	12200	3294	41.5
		8.00	5	230	0.072	31.000	0.800	9150	3294	81.7
		10.00	5	230	0.089	37.000	1.000	7320	3257	120.5
		12.00	5	230	0.107	44.000	1.200	6100	3264	172.3
		16.00	5	230	0.118	53.000	1.600	4575	2699	228.9
		20.00	5	230	0.148	62.000	2.000	3660	2708	335.8
	Steel 850 - 1100 N/mm²	4.00	5	185	0.035	13.000	0.400	14720	2576	13.4
		5.00	5	185	0.044	16.000	0.500	11775	2591	20.7
		6.00	5	185	0.054	21.000	0.600	9815	2650	33.4
		8.00	5	185	0.072	31.000	0.800	7360	2650	65.7
		10.00	5	185	0.089	37.000	1.000	5890	2621	97.0
		12.00	5	185	0.107	44.000	1.200	4905	2624	138.6
		16.00	5	185	0.118	53.000	1.600	3680	2171	184.1
		20.00	5	185	0.148	62.000	2.000	2945	2179	270.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	5	142	0.034	13.000	0.200	11300	1921	5.0
		5.00	5	142	0.042	16.000	0.250	9040	1898	7.6
		6.00	5	142	0.051	21.000	0.300	7535	1921	12.1
		8.00	5	142	0.068	31.000	0.400	5650	1921	23.8
		10.00	5	142	0.085	37.000	0.500	4520	1921	35.5
		12.00	5	142	0.101	44.000	0.600	3765	1901	50.2
		16.00	5	142	0.110	53.000	0.800	2825	1554	65.9
		20.00	5	142	0.142	62.000	1.000	2260	1605	99.5





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

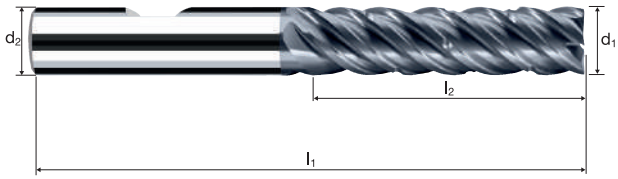
Cylindrical/Square end mills E-Cut

Smooth-edged, chip breaker, medium version

HM MG10 | λ 45° γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

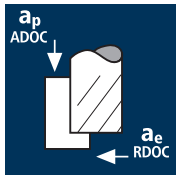
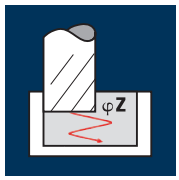
ReTool®

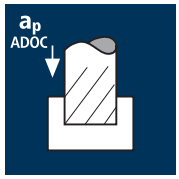
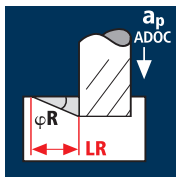
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox Stainless** | **Ti Titanium** | **GG(G) Tool Steel**

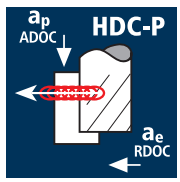
Example: **Order-N°.** Coating **P** Article-N°. **8415** ø-Code **220**

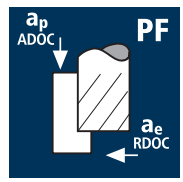
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P8415	POLYCHROM P8315
220*	4.00	6.00	63	13.00	21.39	0.100	5		●
260*	5.00	6.00	63	16.00	23.52	0.100	5		●
300	6.00	6.00	63	21.00	-	0.100	5		●
391	8.00	8.00	72	31.00	-	0.150	5		●
450	10.00	10.00	84	37.00	-	0.200	5		●
501	12.00	12.00	97	44.00	-	0.200	5		●
610	16.00	16.00	108	53.00	-	0.200	5		●
682	20.00	20.00	122	62.00	-	0.250	5		●

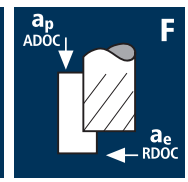
* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	3	120	0.018	3.750	1.950	12730	687	5.0	2.0°
		4.00	3	120	0.027	5.000	2.600	9550	774	10.1	2.0°
		5.00	3	120	0.033	6.250	3.250	7640	756	15.4	2.0°
		6.00	3	120	0.034	9.000	3.900	6365	649	22.8	2.0°
		8.00	3	120	0.046	12.000	5.200	4775	659	41.1	2.0°
		10.00	3	120	0.058	15.000	6.500	3820	665	64.8	2.0°
		12.00	3	120	0.065	18.000	7.800	3185	621	87.2	2.0°
		16.00	3	120	0.077	24.000	10.400	2385	551	137.5	2.0°
		20.00	3	120	0.089	30.000	13.000	1910	510	198.9	2.0°
	Steel 850 - 1100 N/mm²	3.00	3	110	0.017	3.750	1.950	11670	595	4.4	3.0°
		4.00	3	110	0.023	5.000	2.600	8755	604	7.9	3.0°
		5.00	3	110	0.029	6.250	3.250	7005	609	12.4	3.0°
		6.00	3	110	0.030	9.000	3.900	5835	525	18.4	3.0°
		8.00	3	110	0.040	12.000	5.200	4375	525	32.8	3.0°
		10.00	3	110	0.050	15.000	6.500	3500	525	51.2	3.0°
		12.00	3	110	0.059	18.000	7.800	2920	517	72.6	3.0°
		16.00	3	110	0.071	24.000	10.400	2190	467	116.4	3.0°
		20.00	3	110	0.081	30.000	13.000	1750	425	165.9	3.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	70	0.012	3.750	1.950	7425	267	2.0	2.0°
		4.00	3	70	0.016	5.000	2.600	5570	267	3.5	2.0°
		5.00	3	70	0.020	6.250	3.250	4455	267	5.4	2.0°
		6.00	3	70	0.023	9.000	3.900	3715	256	9.0	2.0°
		8.00	3	70	0.031	12.000	5.200	2785	259	16.2	2.0°
		10.00	3	70	0.038	15.000	6.500	2230	254	24.8	2.0°
		12.00	3	70	0.046	18.000	7.800	1855	256	35.9	2.0°
		16.00	3	70	0.050	24.000	10.400	1395	209	52.2	2.0°
		20.00	3	70	0.063	30.000	13.000	1115	211	82.2	2.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]
	Steel < 850 N/mm²	3.00	3	106	0.013	3.000	3.000	11245	439	3.9	2.0°
		4.00	3	106	0.019	5.000	4.000	8435	481	9.6	2.0°
		5.00	3	106	0.023	6.250	5.000	6750	466	14.6	2.0°
		6.00	3	106	0.027	9.000	6.000	5625	456	24.6	2.0°
		8.00	3	106	0.037	12.000	8.000	4220	468	45.0	2.0°
		10.00	3	106	0.046	15.000	10.000	3375	466	69.9	2.0°
		12.00	3	106	0.052	18.000	12.000	2810	438	94.7	2.0°
		16.00	3	106	0.062	24.000	16.000	2110	393	150.7	2.0°
		20.00	3	106	0.071	30.000	20.000	1685	359	215.3	2.0°
	Steel 850 - 1100 N/mm²	3.00	3	97	0.012	3.000	3.000	10290	370	3.3	2.0°
		4.00	3	97	0.016	5.000	4.000	7720	371	7.4	2.0°
		5.00	3	97	0.020	6.250	5.000	6175	371	11.6	2.0°
		6.00	3	97	0.024	9.000	6.000	5145	370	20.0	2.0°
		8.00	3	97	0.032	12.000	8.000	3860	371	35.6	2.0°
		10.00	3	97	0.040	15.000	10.000	3090	371	55.6	2.0°
		12.00	3	97	0.047	18.000	12.000	2575	363	78.4	2.0°
		16.00	3	97	0.057	24.000	16.000	1930	330	126.7	2.0°
		20.00	3	97	0.065	30.000	20.000	1545	301	180.8	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	62	0.008	3.000	3.000	6580	158	1.4	2.0°
		4.00	3	62	0.011	5.000	4.000	4935	163	3.3	2.0°
		5.00	3	62	0.014	6.250	5.000	3945	166	5.2	2.0°
		6.00	3	62	0.018	9.000	6.000	3290	178	9.6	2.0°
		8.00	3	62	0.025	12.000	8.000	2465	185	17.8	2.0°
		10.00	3	62	0.030	15.000	10.000	1975	178	26.7	2.0°
		12.00	3	62	0.037	18.000	12.000	1645	183	39.4	2.0°
		16.00	3	62	0.040	24.000	16.000	1235	148	56.9	2.0°
		20.00	3	62	0.050	30.000	20.000	985	148	88.7	2.0°







Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

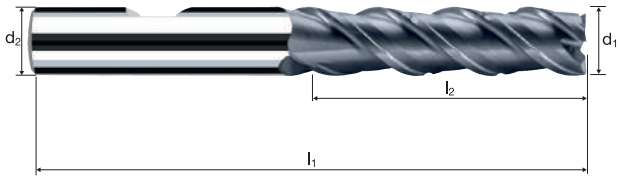
Cylindrical/Square end mills E-Cut

Smooth-edged, chip breaker, medium version

HM MG10 | λ 45° γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

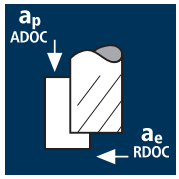
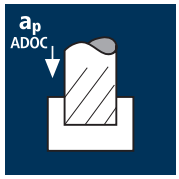
ReTool®

Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox Stainless** | **Ti Titanium** | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8413** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P8413	POLYCHROM P8313
140*	2.00	6.00	63	7.00	17.12	0.050	3		●
180*	3.00	6.00	63	11.00	20.26	0.050	3		●
220*	4.00	6.00	63	13.00	21.39	0.100	3		●
260*	5.00	6.00	63	16.00	23.52	0.100	3		●
300	6.00	6.00	63	21.00	-	0.100	3		●
391	8.00	8.00	72	31.00	-	0.150	3		●
450	10.00	10.00	84	37.00	-	0.200	3		●
501	12.00	12.00	97	44.00	-	0.200	3		●
610	16.00	16.00	108	53.00	-	0.200	3		●
682	20.00	20.00	122	62.00	-	0.250	3		●

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Steel 500 - 850 N/mm²	3.00	4	115	0.018	3.750	1.200	12200	878	4.0
		4.00	4	115	0.027	5.000	1.600	9150	988	7.9
		5.00	4	115	0.033	6.250	2.000	7320	966	12.1
		6.00	4	115	0.034	9.000	2.400	6100	830	17.9
		8.00	4	115	0.046	12.000	3.200	4575	842	32.3
		10.00	4	115	0.058	15.000	4.000	3660	849	50.9
		12.00	4	115	0.065	18.000	4.800	3050	793	68.5
		16.00	4	115	0.077	24.000	6.400	2290	705	108.3
		20.00	4	115	0.089	30.000	8.000	1830	652	156.4
	Steel 850 - 1100 N/mm²	3.00	4	105	0.017	3.750	1.200	11140	758	3.4
		4.00	4	105	0.023	5.000	1.600	8355	769	6.1
		5.00	4	105	0.029	6.250	2.000	6685	776	9.7
		6.00	4	105	0.030	9.000	2.400	5570	668	14.4
		8.00	4	105	0.040	12.000	3.200	4180	669	25.7
		10.00	4	105	0.050	15.000	4.000	3340	668	40.1
		12.00	4	105	0.059	18.000	4.800	2785	657	56.8
		16.00	4	105	0.071	24.000	6.400	2090	594	91.2
		20.00	4	105	0.081	30.000	8.000	1670	541	129.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	70	0.011	3.750	1.200	7425	327	1.5
		4.00	4	70	0.014	5.000	1.600	5570	312	2.5
		5.00	4	70	0.018	6.250	2.000	4455	321	4.0
		6.00	4	70	0.021	9.000	2.400	3715	312	6.7
		8.00	4	70	0.028	12.000	3.200	2785	312	12.0
		10.00	4	70	0.034	15.000	4.000	2230	303	18.2
		12.00	4	70	0.041	18.000	4.800	1855	304	26.3
		16.00	4	70	0.046	24.000	6.400	1395	257	39.4
		20.00	4	70	0.057	30.000	8.000	1115	254	61.0
	Cast iron (lamellar / spheroidal)	3.00	4	130	0.017	3.750	1.200	13795	938	4.2
		4.00	4	130	0.025	5.000	1.600	10345	1035	8.3
		5.00	4	130	0.030	6.250	2.000	8275	993	12.4
		6.00	4	130	0.032	9.000	2.400	6895	883	19.1
		8.00	4	130	0.043	12.000	3.200	5175	890	34.2
		10.00	4	130	0.054	15.000	4.000	4140	894	53.7
		12.00	4	130	0.064	18.000	4.800	3450	883	76.3
		16.00	4	130	0.077	24.000	6.400	2585	796	122.3
		20.00	4	130	0.089	30.000	8.000	2070	737	176.9
	Steel 500 - 850 N/mm²	3.00	4	92	0.008	2.250	3.000	9760	312	2.1
		4.00	4	92	0.012	4.000	4.000	7320	351	5.6
		5.00	4	92	0.015	5.000	5.000	5855	351	8.8
		6.00	4	92	0.020	7.500	6.000	4880	390	17.6
		8.00	4	92	0.028	10.000	8.000	3660	410	32.8
		10.00	4	92	0.035	12.500	10.000	2930	410	51.3
		12.00	4	92	0.039	15.000	12.000	2440	381	68.5
		16.00	4	92	0.046	20.000	16.000	1830	337	107.7
		20.00	4	92	0.053	25.000	20.000	1465	311	155.3
	Steel 850 - 1100 N/mm²	3.00	4	84	0.008	2.250	3.000	8915	285	1.9
		4.00	4	84	0.010	4.000	4.000	6685	267	4.3
		5.00	4	84	0.013	5.000	5.000	5350	278	7.0
		6.00	4	84	0.018	7.500	6.000	4455	321	14.4
		8.00	4	84	0.024	10.000	8.000	3340	321	25.6
		10.00	4	84	0.030	12.500	10.000	2675	321	40.1
		12.00	4	84	0.035	15.000	12.000	2230	312	56.2
		16.00	4	84	0.043	20.000	16.000	1670	287	91.9
		20.00	4	84	0.049	25.000	20.000	1335	262	130.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	56	0.005	2.250	3.000	5940	119	0.8
		4.00	4	56	0.006	4.000	4.000	4455	107	1.7
		5.00	4	56	0.008	5.000	5.000	3565	114	2.9
		6.00	4	56	0.013	7.500	6.000	2970	154	6.9
		8.00	4	56	0.017	10.000	8.000	2230	152	12.1
		10.00	4	56	0.020	12.500	10.000	1785	143	17.9
		12.00	4	56	0.025	15.000	12.000	1485	149	26.7
		16.00	4	56	0.028	20.000	16.000	1115	125	40.0
		20.00	4	56	0.034	25.000	20.000	890	121	60.5
	Cast iron (lamellar / spheroidal)	3.00	4	104	0.008	2.250	3.000	11035	353	2.4
		4.00	4	104	0.011	4.000	4.000	8275	364	5.8
		5.00	4	104	0.014	5.000	5.000	6620	371	9.3
		6.00	4	104	0.019	7.500	6.000	5515	419	18.9
		8.00	4	104	0.026	10.000	8.000	4140	431	34.4
		10.00	4	104	0.032	12.500	10.000	3310	424	53.0
		12.00	4	104	0.038	15.000	12.000	2760	420	75.5
		16.00	4	104	0.046	20.000	16.000	2070	381	121.9
		20.00	4	104	0.053	25.000	20.000	1655	351	175.5

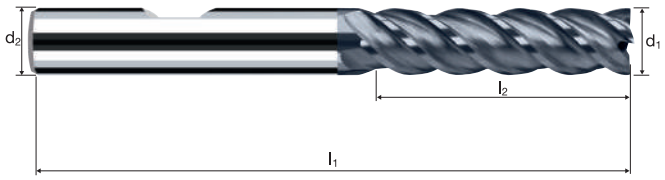
Cylindrical/Square end mills

Smooth-edged, medium version

HM MG10 | λ 43° γ 6°

r

Vario



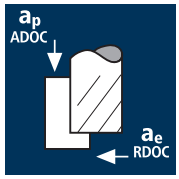
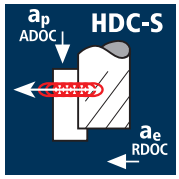
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **46310** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P46310	P46210
140	2.00	6.00	63	12.00	21.42	0.050	4		●
160	2.50	6.00	63	12.00	20.49	0.050	4		●
180	3.00	6.00	63	13.00	20.56	0.050	4		●
220	4.00	6.00	63	13.00	18.89	0.100	4		●
260	5.00	6.00	63	16.00	20.02	0.100	4		●
300	6.00	6.00	63	21.00	-	0.150	4		●
391	8.00	8.00	72	31.00	-	0.150	4		●
450	10.00	10.00	84	37.00	-	0.200	4		●
501	12.00	12.00	97	44.00	-	0.200	4		●
570	14.00	14.00	102	48.00	-	0.200	4		●
610	16.00	16.00	108	53.00	-	0.200	4		●
682	20.00	20.00	122	62.00	-	0.250	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	115	0.034	9.000	2.400	6101	830	17.9
		8.00	4	115	0.046	12.000	3.200	4576	842	32.3
		10.00	4	115	0.058	15.000	4.000	3661	849	51.0
		12.00	4	115	0.065	18.000	4.800	3050	793	68.5
		16.00	4	115	0.077	24.000	6.400	2288	705	108.2
		20.00	4	115	0.089	30.000	8.000	1830	652	156.4
	Steel 850 - 1100 N/mm²	6.00	4	105	0.030	9.000	2.400	5570	668	14.4
		8.00	4	105	0.040	12.000	3.200	4178	668	25.7
		10.00	4	105	0.050	15.000	4.000	3342	668	40.1
		12.00	4	105	0.059	18.000	4.800	2785	657	56.8
		16.00	4	105	0.071	24.000	6.400	2089	593	91.1
		20.00	4	105	0.081	30.000	8.000	1671	541	129.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	70	0.021	9.000	2.400	3714	312	6.7
		8.00	4	70	0.028	12.000	3.200	2785	312	12.0
		10.00	4	70	0.034	15.000	4.000	2228	303	18.2
		12.00	4	70	0.041	18.000	4.800	1857	305	26.3
		16.00	4	70	0.046	24.000	6.400	1393	256	39.4
		20.00	4	70	0.057	30.000	8.000	1114	254	61.0
	Cast iron (lamellar / spheroidal)	6.00	4	130	0.032	9.000	2.400	6897	883	19.1
		8.00	4	130	0.043	12.000	3.200	5173	890	34.2
		10.00	4	130	0.054	15.000	4.000	4138	894	53.6
		12.00	4	130	0.064	18.000	4.800	3448	883	76.3
		16.00	4	130	0.077	24.000	6.400	2586	797	122.4
		20.00	4	130	0.089	30.000	8.000	2069	737	176.8
	Steel 500 - 850 N/mm²	6.00	4	198	0.052	22.500	0.600	10504	2185	29.5
		8.00	4	198	0.069	30.000	0.800	7878	2174	52.2
		10.00	4	198	0.087	37.000	1.000	6303	2193	81.2
		12.00	4	198	0.105	45.000	1.200	5252	2206	119.1
		16.00	4	198	0.116	60.000	1.600	3939	1828	175.5
		20.00	4	198	0.145	74.000	2.000	3151	1828	270.5
	Steel 850 - 1100 N/mm²	6.00	4	175	0.052	22.500	0.600	9284	1931	26.1
		8.00	4	175	0.069	30.000	0.800	6963	1922	46.1
		10.00	4	175	0.087	37.000	1.000	5570	1939	71.7
		12.00	4	175	0.105	45.000	1.200	4642	1950	105.3
		16.00	4	175	0.116	60.000	1.600	3482	1615	155.1
		20.00	4	175	0.145	74.000	2.000	2785	1615	239.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	119	0.041	22.500	0.450	6313	1035	10.5
		8.00	4	119	0.054	30.000	0.600	4735	1023	18.4
		10.00	4	119	0.068	37.000	0.750	3788	1030	28.6
		12.00	4	119	0.081	45.000	0.900	3157	1023	41.4
		16.00	4	119	0.088	60.000	1.200	2367	833	60.0
		20.00	4	119	0.113	74.000	1.500	1894	856	95.0
	Cast iron (lamellar / spheroidal)	6.00	4	230	0.057	22.500	0.600	12202	2782	37.6
		8.00	4	230	0.076	30.000	0.800	9151	2782	66.8
		10.00	4	230	0.094	37.000	1.000	7321	2753	101.9
		12.00	4	230	0.113	45.000	1.200	6101	2758	148.9
		16.00	4	230	0.125	60.000	1.600	4576	2288	219.6
		20.00	4	230	0.157	74.000	2.000	3661	2299	340.2

Cylindrical/Square end mills

Smooth-edged, chip breaker, medium version

Favora® F

$l_2=3.7xd_1$

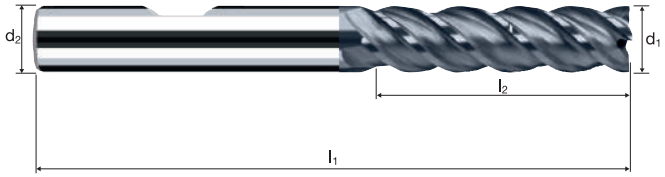
HM MG10

λ 43°
γ 3°

new!

r

Vario



Roughing HPC

Roughing HDC

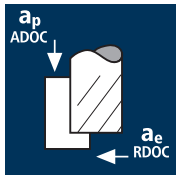
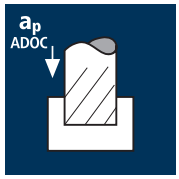
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **45380** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z		POLYCHROM P45380	P45280
300	6.00	6.00	63	22.50	0.150	4		●	
391	8.00	8.00	72	30.00	0.150	4		●	
450	10.00	10.00	84	37.00	0.200	4		●	
501	12.00	12.00	100	45.00	0.200	4		●	
610	16.00	16.00	120	60.00	0.200	4		●	
682	20.00	20.00	140	74.00	0.250	4		●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	120	0.034	9.000	2.400	6365	877	18.9
		8.00	4	120	0.046	12.000	3.200	4775	877	33.7
		10.00	4	120	0.057	15.000	4.000	3820	877	52.6
		12.00	4	120	0.064	18.000	4.800	3185	819	70.7
		16.00	4	120	0.073	24.000	6.400	2385	701	107.6
		20.00	4	120	0.084	30.000	8.000	1910	643	154.3
	Steel 850 - 1100 N/mm²	6.00	4	105	0.030	9.000	2.400	5570	665	14.4
		8.00	4	105	0.040	12.000	3.200	4180	665	25.5
		10.00	4	105	0.050	15.000	4.000	3340	664	39.9
		12.00	4	105	0.060	18.000	4.800	2785	665	57.4
		16.00	4	105	0.067	24.000	6.400	2090	563	86.4
		20.00	4	105	0.077	30.000	8.000	1670	511	122.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	70	0.021	9.000	2.400	3715	307	6.6
		8.00	4	70	0.028	12.000	3.200	2785	307	11.8
		10.00	4	70	0.034	15.000	4.000	2230	307	18.4
		12.00	4	70	0.041	18.000	4.800	1855	307	26.5
		16.00	4	70	0.043	24.000	6.400	1395	239	36.7
		20.00	4	70	0.054	30.000	8.000	1115	239	57.3
	Cast iron (lamellar / spheroidal)	6.00	4	130	0.032	9.000	2.400	6895	886	19.1
		8.00	4	130	0.043	12.000	3.200	5175	887	34.1
		10.00	4	130	0.054	15.000	4.000	4140	887	53.2
		12.00	4	130	0.064	18.000	4.800	3450	887	76.6
		16.00	4	130	0.073	24.000	6.400	2585	759	116.6
		20.00	4	130	0.084	30.000	8.000	2070	697	167.2
	Steel 500 - 850 N/mm²	6.00	4	95	0.022	7.500	6.000	5040	444	20.0
		8.00	4	95	0.030	10.000	8.000	3780	454	36.3
		10.00	4	95	0.037	12.500	10.000	3025	448	56.0
		12.00	4	95	0.042	15.000	12.000	2520	423	76.2
		16.00	4	95	0.048	20.000	16.000	1890	363	116.1
		20.00	4	95	0.055	25.000	20.000	1510	332	166.1
	Steel 850 - 1100 N/mm²	6.00	4	85	0.019	7.500	6.000	4510	343	15.4
		8.00	4	85	0.026	10.000	8.000	3380	352	28.1
		10.00	4	85	0.032	12.500	10.000	2705	346	43.3
		12.00	4	85	0.039	15.000	12.000	2255	352	63.3
		16.00	4	85	0.044	20.000	16.000	1690	297	95.2
		20.00	4	85	0.050	25.000	20.000	1355	271	135.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	55	0.013	7.500	6.000	2920	152	6.8
		8.00	4	55	0.018	10.000	8.000	2190	158	12.6
		10.00	4	55	0.022	12.500	10.000	1750	154	19.3
		12.00	4	55	0.027	15.000	12.000	1460	158	28.4
		16.00	4	55	0.028	20.000	16.000	1095	123	39.2
		20.00	4	55	0.035	25.000	20.000	875	123	61.3
	Cast iron (lamellar / spheroidal)	6.00	4	105	0.021	7.500	6.000	5570	468	21.1
		8.00	4	105	0.028	10.000	8.000	4180	468	37.5
		10.00	4	105	0.035	12.500	10.000	3340	468	58.5
		12.00	4	105	0.042	15.000	12.000	2785	468	84.2
		16.00	4	105	0.048	20.000	16.000	2090	401	128.4
		20.00	4	105	0.055	25.000	20.000	1670	367	183.7

Cylindrical/Square end mills

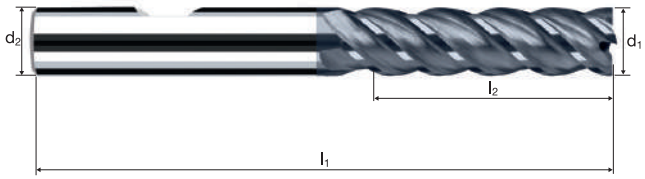
Smooth-edged, medium version

HM
MG10

λ **43°**
γ **3°**

45°

Vario



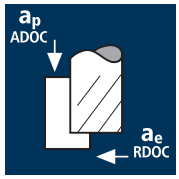
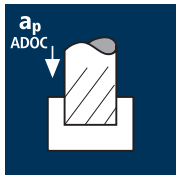
Roughing HPC | Roughing HDC | Finishing

ToolSchool P45280 / P45380

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G)** **Tool Steel** **Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **45326** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z	POLYCHROM P45326	POLYCHROM P45226
300	6.00	6.00	63	21.00	0.10	4		●
391	8.00	8.00	72	31.00	0.10	4		●
450	10.00	10.00	84	37.00	0.15	4		●
501	12.00	12.00	97	44.00	0.15	4		●
610	16.00	16.00	108	53.00	0.15	4		●
682	20.00	20.00	122	62.00	0.15	4		●

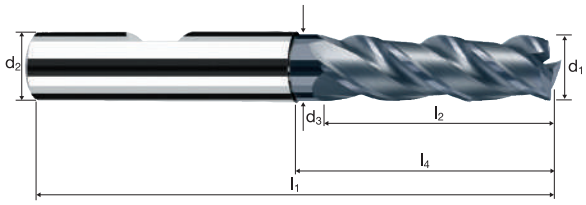
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	3	150	0.010	4.500	1.800	15915	478	3.9
		4.00	3	150	0.015	6.000	2.400	11935	537	7.7
		5.00	3	150	0.015	7.500	3.000	9550	430	9.7
		6.00	3	150	0.020	9.000	3.600	7960	478	15.5
		8.00	3	150	0.025	12.000	4.800	5970	448	25.8
		10.00	3	150	0.030	15.000	6.000	4775	430	38.7
		12.00	3	150	0.040	18.000	7.200	3980	478	61.9
		16.00	3	150	0.050	24.000	8.400	2985	448	90.3
		20.00	3	150	0.065	30.000	10.500	2385	465	146.5
	Steel 850 - 1100 N/mm²	3.00	3	110	0.010	4.500	1.800	11670	350	2.8
		4.00	3	110	0.015	6.000	2.400	8755	394	5.7
		5.00	3	110	0.015	7.500	3.000	7005	315	7.1
		6.00	3	110	0.020	9.000	3.600	5835	350	11.3
		8.00	3	110	0.025	12.000	4.800	4375	328	18.9
		10.00	3	110	0.030	15.000	6.000	3500	315	28.4
		12.00	3	110	0.040	18.000	7.200	2920	350	45.4
		16.00	3	110	0.050	24.000	8.400	2190	329	66.2
		20.00	3	110	0.065	30.000	10.500	1750	341	107.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	80	0.005	4.500	1.800	8490	127	1.0
		4.00	3	80	0.010	6.000	2.400	6365	191	2.8
		5.00	3	80	0.010	7.500	3.000	5095	153	3.4
		6.00	3	80	0.015	9.000	3.600	4245	191	6.2
		8.00	3	80	0.020	12.000	4.800	3185	191	11.0
		10.00	3	80	0.025	15.000	6.000	2545	191	17.2
		12.00	3	80	0.030	18.000	7.200	2120	191	24.7
		16.00	3	80	0.040	24.000	8.400	1590	191	38.5
		20.00	3	80	0.045	30.000	10.500	1275	172	54.2
	Cast iron (lamellar / spheroidal)	3.00	3	130	0.010	4.500	1.800	13795	414	3.4
		4.00	3	130	0.015	6.000	2.400	10345	466	6.7
		5.00	3	130	0.015	7.500	3.000	8275	372	8.4
		6.00	3	130	0.020	9.000	3.600	6895	414	13.4
		8.00	3	130	0.025	12.000	4.800	5175	388	22.4
		10.00	3	130	0.030	15.000	6.000	4140	373	33.5
		12.00	3	130	0.040	18.000	7.200	3450	414	53.7
		16.00	3	130	0.050	24.000	8.400	2585	388	78.2
		20.00	3	130	0.065	30.000	10.500	2070	404	127.2
	Steel < 850 N/mm²	3.00	3	120	0.010	2.000	3.000	12730	382	2.3
		4.00	3	120	0.015	3.100	4.000	9550	430	5.3
		5.00	3	120	0.015	4.400	5.000	7640	344	7.6
		6.00	3	120	0.020	7.800	6.000	6365	382	17.9
		8.00	3	120	0.025	10.400	8.000	4775	358	29.8
		10.00	3	120	0.025	13.000	10.000	3820	287	37.2
		12.00	3	120	0.035	15.600	12.000	3185	334	62.6
		16.00	3	120	0.045	17.600	16.000	2385	322	90.7
		20.00	3	120	0.060	22.000	20.000	1910	344	151.3
	Steel 850 - 1100 N/mm²	3.00	3	85	0.010	2.000	3.000	9020	271	1.6
		4.00	3	85	0.015	3.100	4.000	6765	304	3.8
		5.00	3	85	0.015	4.400	5.000	5410	244	5.4
		6.00	3	85	0.020	7.800	6.000	4510	271	12.7
		8.00	3	85	0.025	10.400	8.000	3380	254	21.1
		10.00	3	85	0.025	13.000	10.000	2705	203	26.4
		12.00	3	85	0.035	15.600	12.000	2255	237	44.3
		16.00	3	85	0.045	17.600	16.000	1690	228	64.3
		20.00	3	85	0.060	22.000	20.000	1355	244	107.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	65	0.005	2.000	3.000	6895	103	0.6
		4.00	3	65	0.010	3.100	4.000	5175	155	1.9
		5.00	3	65	0.010	4.400	5.000	4140	124	2.7
		6.00	3	65	0.015	7.800	6.000	3450	155	7.3
		8.00	3	65	0.020	10.400	8.000	2585	155	12.9
		10.00	3	65	0.025	13.000	10.000	2070	155	20.2
		12.00	3	65	0.025	15.600	12.000	1725	129	24.2
		16.00	3	65	0.035	17.600	16.000	1295	136	38.3
		20.00	3	65	0.040	22.000	20.000	1035	124	54.6
	Cast iron (lamellar / spheroidal)	3.00	3	110	0.010	2.000	3.000	11670	350	2.1
		4.00	3	110	0.015	3.100	4.000	8755	394	4.9
		5.00	3	110	0.015	4.400	5.000	7005	315	6.9
		6.00	3	110	0.020	7.800	6.000	5835	350	16.4
		8.00	3	110	0.025	10.400	8.000	4375	328	27.3
		10.00	3	110	0.025	13.000	10.000	3500	263	34.1
		12.00	3	110	0.035	15.600	12.000	2920	307	57.4
		16.00	3	110	0.045	17.600	16.000	2190	296	83.3
		20.00	3	110	0.060	22.000	20.000	1750	315	138.6

Cylindrical/Square end mills

Smooth-edged, medium version, short neck

Favora® F

HM MG10	λ 40° γ 6°
45°	
Vario	



Roughing

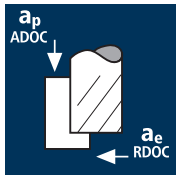
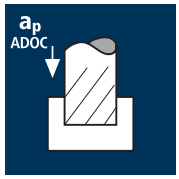
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **45334** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P45334	POLYCHROM P45234
180	3.00	6.00	2.80	63	14.00	20.00	26.63	0.05	3		●
220	4.00	6.00	3.70	63	17.00	22.00	26.95	0.05	3		●
260	5.00	6.00	4.60	63	19.00	24.00	27.27	0.10	3		●
300	6.00	6.00	5.50	63	19.00	25.34	26.00	0.10	3		●
391	8.00	8.00	7.40	72	28.00	34.29	35.00	0.10	3		●
450	10.00	10.00	9.20	84	34.00	42.20	43.00	0.15	3		●
501	12.00	12.00	11.00	97	40.00	50.13	51.00	0.15	3		●
610	16.00	16.00	15.00	108	48.00	58.13	59.00	0.15	3		●
682	20.00	20.00	19.00	122	56.00	70.13	71.00	0.15	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	4.00	4	150	0.025	4.000	1.800	11935	1194	8.6
		5.00	4	150	0.035	5.000	2.250	9550	1337	15.0
		6.00	4	150	0.040	6.000	2.700	7960	1274	20.6
		8.00	4	150	0.055	8.000	3.600	5970	1313	37.8
		10.00	4	150	0.065	10.000	4.500	4775	1242	55.9
		12.00	4	150	0.080	12.000	5.400	3980	1274	82.5
		16.00	4	150	0.090	16.000	7.200	2985	1075	123.8
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.025	4.000	1.800	9150	915	6.6
		5.00	4	115	0.035	5.000	2.250	7320	1025	11.5
		6.00	4	115	0.040	6.000	2.700	6100	976	15.8
		8.00	4	115	0.055	8.000	3.600	4575	1007	29.0
		10.00	4	115	0.065	10.000	4.500	3660	952	42.8
		12.00	4	115	0.080	12.000	5.400	3050	976	63.2
		16.00	4	115	0.090	16.000	7.200	2290	824	95.0
	Steel 1300 - 1500 N/mm²	4.00	4	80	0.025	4.000	1.800	6365	637	4.6
		5.00	4	80	0.030	5.000	2.250	5095	611	6.9
		6.00	4	80	0.035	6.000	2.700	4245	594	9.6
		8.00	4	80	0.045	8.000	3.600	3185	573	16.5
		10.00	4	80	0.060	10.000	4.500	2545	611	27.5
		12.00	4	80	0.070	12.000	5.400	2120	594	38.5
		16.00	4	80	0.080	16.000	7.200	1590	509	58.6
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	50	0.015	4.000	1.800	3980	239	1.7
		5.00	4	50	0.020	5.000	2.250	3185	255	2.9
		6.00	4	50	0.020	6.000	2.700	2655	212	3.4
		8.00	4	50	0.025	8.000	3.600	1990	199	5.7
		10.00	4	50	0.035	10.000	4.500	1590	223	10.0
		12.00	4	50	0.040	12.000	5.400	1325	212	13.7
		16.00	4	50	0.050	16.000	7.200	995	199	22.9
	Steel 850 - 1100 N/mm²	4.00	4	115	0.020	3.200	4.000	9150	732	9.4
		5.00	4	115	0.025	4.000	5.000	7320	732	14.6
		6.00	4	115	0.035	4.800	6.000	6100	854	24.6
		8.00	4	115	0.045	6.400	8.000	4575	824	42.2
		10.00	4	115	0.055	8.000	10.000	3660	805	64.4
		12.00	4	115	0.065	9.600	12.000	3050	793	91.4
		16.00	4	115	0.075	11.200	16.000	2290	687	123.1
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.020	3.200	4.000	7160	573	7.3
		5.00	4	90	0.025	4.000	5.000	5730	573	11.5
		6.00	4	90	0.035	4.800	6.000	4775	669	19.3
		8.00	4	90	0.045	6.400	8.000	3580	644	33.0
		10.00	4	90	0.055	8.000	10.000	2865	630	50.4
		12.00	4	90	0.065	9.600	12.000	2385	620	71.4
		16.00	4	90	0.075	11.200	16.000	1790	537	96.2
	Steel 1300 - 1500 N/mm²	4.00	4	65	0.020	3.200	4.000	5175	414	5.3
		5.00	4	65	0.025	4.000	5.000	4140	414	8.3
		6.00	4	65	0.030	4.800	6.000	3450	414	11.9
		8.00	4	65	0.040	6.400	8.000	2585	414	21.2
		10.00	4	65	0.050	8.000	10.000	2070	414	33.1
		12.00	4	65	0.060	9.600	12.000	1725	414	47.7
		16.00	4	65	0.070	11.200	16.000	1295	363	65.0
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	40	0.015	3.200	4.000	3185	191	2.4
		5.00	4	40	0.015	4.000	5.000	2545	153	3.1
		6.00	4	40	0.020	4.800	6.000	2120	170	4.9
		8.00	4	40	0.025	6.400	8.000	1590	159	8.1
		10.00	4	40	0.035	8.000	10.000	1275	179	14.3
		12.00	4	40	0.040	9.600	12.000	1060	170	19.5
		16.00	4	40	0.045	11.200	16.000	795	143	25.6

Cylindrical/Square end mills NX

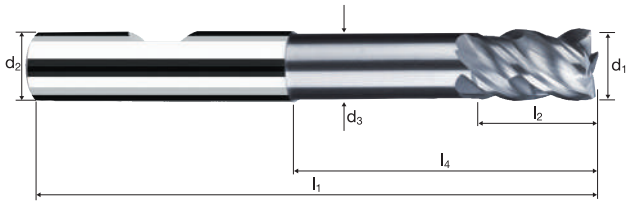
Smooth-edged, medium version, neck

HM MG10

λ 45°
γ -20°

45°

Vario



Roughing

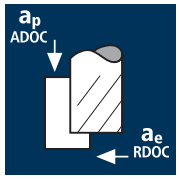
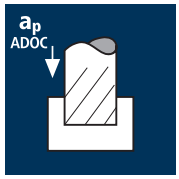
Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15359** ø-Code **220**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15359	POLYCHROM P15259
220	4.00	6.00	3.70	63	6.00	22.00	26.95	0.05	4		●
260	5.00	6.00	4.60	63	8.00	24.00	27.27	0.10	4		●
300	6.00	6.00	5.50	63	9.00	25.34	26.00	0.10	4		●
391	8.00	8.00	7.40	72	12.00	34.29	35.00	0.10	4		●
450	10.00	10.00	9.20	84	15.00	42.20	43.00	0.15	4		●
501	12.00	12.00	11.00	97	18.00	50.13	51.00	0.15	4		●
610	16.00	16.00	15.00	108	24.00	58.13	59.00	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	170	0.050	6.000	2.400	9020	1804	26.0
		8.00	4	170	0.065	8.000	3.200	6765	1759	45.0
		10.00	4	170	0.080	10.000	4.000	5410	1731	69.2
		12.00	4	170	0.095	12.000	4.800	4510	1714	98.7
		16.00	4	170	0.125	16.000	3.200	3380	1690	86.5
	Steel 850 - 1100 N/mm²	6.00	4	140	0.050	6.000	2.400	7425	1485	21.4
		8.00	4	140	0.065	8.000	3.200	5570	1448	37.1
		10.00	4	140	0.080	10.000	4.000	4455	1426	57.0
		12.00	4	140	0.095	12.000	4.800	3715	1412	81.3
		16.00	4	140	0.125	16.000	3.200	2785	1393	71.3
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	70	0.045	6.000	2.400	3715	669	9.6
		8.00	4	70	0.060	8.000	3.200	2785	668	17.1
		10.00	4	70	0.070	10.000	4.000	2230	624	25.0
		12.00	4	70	0.085	12.000	4.800	1855	631	36.3
		16.00	4	70	0.110	16.000	3.200	1395	614	31.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	90	0.030	6.000	2.400	4775	573	8.3
		8.00	4	90	0.040	8.000	3.200	3580	573	14.7
		10.00	4	90	0.050	10.000	4.000	2865	573	22.9
		12.00	4	90	0.060	12.000	4.800	2385	572	33.0
		16.00	4	90	0.080	16.000	3.200	1790	573	29.3
	Steel < 850 N/mm²	6.00	4	135	0.040	4.200	6.000	7160	1146	28.9
		8.00	4	135	0.050	5.600	8.000	5370	1074	48.1
		10.00	4	135	0.065	7.000	10.000	4295	1117	78.2
		12.00	4	135	0.075	8.400	12.000	3580	1074	108.3
		16.00	4	135	0.075	6.400	16.000	2685	806	82.5
	Steel 850 - 1100 N/mm²	6.00	4	105	0.040	4.200	6.000	5570	891	22.5
		8.00	4	105	0.050	5.600	8.000	4180	836	37.5
		10.00	4	105	0.065	7.000	10.000	3340	868	60.8
		12.00	4	105	0.075	8.400	12.000	2785	836	84.2
		16.00	4	105	0.075	6.400	16.000	2090	627	64.2
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	55	0.035	4.200	6.000	2920	409	10.3
		8.00	4	55	0.045	5.600	8.000	2190	394	17.7
		10.00	4	55	0.055	7.000	10.000	1750	385	27.0
		12.00	4	55	0.060	8.400	12.000	1460	350	35.3
		16.00	4	55	0.075	6.400	16.000	1095	329	33.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	75	0.030	4.200	6.000	3980	478	12.0
		8.00	4	75	0.040	5.600	8.000	2985	478	21.4
		10.00	4	75	0.045	7.000	10.000	2385	429	30.1
		12.00	4	75	0.050	8.400	12.000	1990	398	40.1
		16.00	4	75	0.065	6.400	16.000	1490	387	39.7

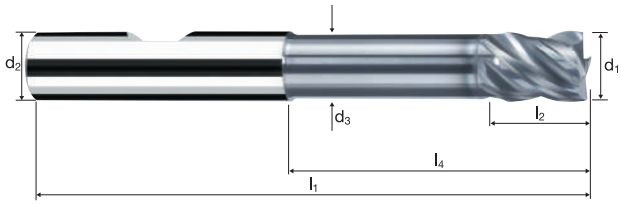
Cylindrical/Square end mills

Smooth-edged, medium version, neck

HM MG10 | λ 40° γ 0°

45°

Vario



Roughing

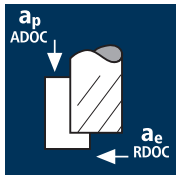
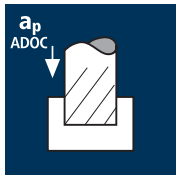
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15325** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15325	POLYCHROM P15225
300	6.00	6.00	5.50	70	7.00	32.34	33.00	0.10	4		●
391	8.00	8.00	7.40	80	9.00	42.29	43.00	0.10	4		●
450	10.00	10.00	9.20	84	11.00	42.20	43.00	0.15	4		●
501	12.00	12.00	11.00	97	13.00	50.13	51.00	0.15	4		●
610	16.00	16.00	15.00	115	17.00	65.13	66.00	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	3	190	0.015	4.500	1.200	20160	907	4.9
		4.00	3	190	0.015	6.000	1.600	15120	680	6.5
		5.00	3	190	0.020	7.500	2.000	12095	726	10.9
		6.00	3	190	0.040	9.000	2.400	10080	1210	26.1
		8.00	3	190	0.050	12.000	3.200	7560	1134	43.5
		10.00	3	190	0.065	15.000	4.000	6050	1180	70.8
		12.00	3	190	0.075	18.000	4.800	5040	1134	98.0
		16.00	3	190	0.085	24.000	6.400	3780	964	148.1
	Steel 850 - 1100 N/mm²	3.00	3	140	0.015	4.500	1.200	14855	669	3.6
		4.00	3	140	0.015	6.000	1.600	11140	501	4.8
		5.00	3	140	0.020	7.500	2.000	8915	535	8.0
		6.00	3	140	0.040	9.000	2.400	7425	891	19.2
		8.00	3	140	0.050	12.000	3.200	5570	836	32.1
		10.00	3	140	0.065	15.000	4.000	4455	869	52.1
		12.00	3	140	0.075	18.000	4.800	3715	836	72.2
		16.00	3	140	0.085	24.000	6.400	2785	710	109.1
	Cold work tool steel (12%Cr) high alloyed [1.2379]	3.00	3	70	0.010	4.500	1.200	7425	223	1.2
		4.00	3	70	0.015	6.000	1.600	5570	251	2.4
		5.00	3	70	0.015	7.500	2.000	4455	201	3.0
		6.00	3	70	0.035	9.000	2.400	3715	390	8.4
		8.00	3	70	0.045	12.000	3.200	2785	376	14.4
		10.00	3	70	0.055	15.000	4.000	2230	368	22.1
		12.00	3	70	0.065	18.000	4.800	1855	362	31.3
		16.00	3	70	0.075	24.000	6.400	1395	314	48.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	90	0.010	4.500	1.200	9550	287	1.5
		4.00	3	90	0.010	6.000	1.600	7160	215	2.1
		5.00	3	90	0.010	7.500	2.000	5730	172	2.6
		6.00	3	90	0.030	9.000	2.400	4775	430	9.3
		8.00	3	90	0.035	12.000	3.200	3580	376	14.4
		10.00	3	90	0.045	15.000	4.000	2865	387	23.2
		12.00	3	90	0.050	18.000	4.800	2385	358	30.9
		16.00	3	90	0.060	24.000	6.400	1790	322	49.5
	Steel < 850 N/mm²	3.00	3	155	0.015	4.200	3.000	16445	740	9.3
		4.00	3	155	0.015	5.600	4.000	12335	555	12.4
		5.00	3	155	0.025	7.000	5.000	9870	740	25.9
		6.00	3	155	0.030	8.400	6.000	8225	740	37.3
		8.00	3	155	0.040	11.200	8.000	6165	740	66.3
		10.00	3	155	0.050	14.000	10.000	4935	740	103.6
		12.00	3	155	0.060	16.800	12.000	4110	740	149.1
		16.00	3	155	0.070	14.400	16.000	3085	648	149.3
	Steel 850 - 1100 N/mm²	3.00	3	105	0.015	4.200	3.000	11140	501	6.3
		4.00	3	105	0.015	5.600	4.000	8355	376	8.4
		5.00	3	105	0.025	7.000	5.000	6685	501	17.5
		6.00	3	105	0.030	8.400	6.000	5570	501	25.3
		8.00	3	105	0.040	11.200	8.000	4180	502	44.9
		10.00	3	105	0.050	14.000	10.000	3340	501	70.1
		12.00	3	105	0.060	16.800	12.000	2785	501	101.1
		16.00	3	105	0.070	14.400	16.000	2090	439	101.1
	Cold work tool steel (12%Cr) high alloyed [1.2379]	3.00	3	55	0.010	4.200	3.000	5835	175	2.2
		4.00	3	55	0.015	5.600	4.000	4375	197	4.4
		5.00	3	55	0.015	7.000	5.000	3500	158	5.5
		6.00	3	55	0.030	8.400	6.000	2920	263	13.2
		8.00	3	55	0.040	11.200	8.000	2190	263	23.5
		10.00	3	55	0.050	14.000	10.000	1750	263	36.8
		12.00	3	55	0.060	16.800	12.000	1460	263	53.0
		16.00	3	55	0.070	14.400	16.000	1095	230	53.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	70	0.010	4.200	3.000	7425	223	2.8
		4.00	3	70	0.010	5.600	4.000	5570	167	3.7
		5.00	3	70	0.010	7.000	5.000	4455	134	4.7
		6.00	3	70	0.025	8.400	6.000	3715	279	14.0
		8.00	3	70	0.030	11.200	8.000	2785	251	22.5
		10.00	3	70	0.040	14.000	10.000	2230	268	37.5
		12.00	3	70	0.050	16.800	12.000	1855	278	56.1
		16.00	3	70	0.055	14.400	16.000	1395	230	53.0

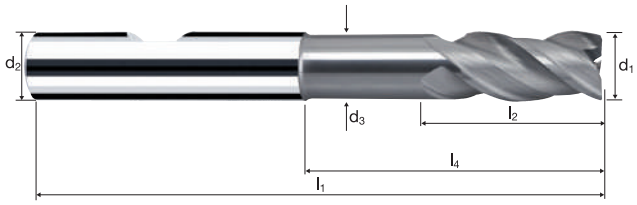
Cylindrical/Square end mills

Smooth-edged, medium version, neck

HM MG10 | λ 40° γ 0°

45°

Vario



Roughing

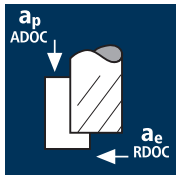
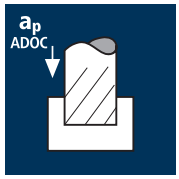
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15399** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15399	POLYCHROM P15299
180	3.00	6.00	2.80	63	8.00	20.00	26.63	0.05	3		●
220	4.00	6.00	3.70	63	11.00	22.00	26.95	0.05	3		●
260	5.00	6.00	4.60	63	13.00	24.00	27.27	0.10	3		●
300	6.00	6.00	5.50	63	13.00	25.34	26.00	0.10	3		●
391	8.00	8.00	7.40	72	19.00	34.29	35.00	0.10	3		●
450	10.00	10.00	9.20	84	22.00	42.20	43.00	0.15	3		●
501	12.00	12.00	11.00	97	26.00	50.13	51.00	0.15	3		●
610	16.00	16.00	15.00	108	32.00	58.13	59.00	0.15	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	115	0.034	9.000	2.400	6101	830	17.9
		8.00	4	115	0.046	12.000	3.200	4576	842	32.3
		10.00	4	115	0.058	15.000	4.000	3661	849	51.0
		12.00	4	115	0.065	18.000	4.200	3050	793	60.0
		16.00	4	115	0.077	24.000	4.800	2288	705	81.2
		20.00	4	115	0.089	30.000	6.000	1830	652	117.3
	Steel 850 - 1100 N/mm²	6.00	4	105	0.030	9.000	2.400	5570	668	14.4
		8.00	4	105	0.040	12.000	3.200	4178	668	25.7
		10.00	4	105	0.050	15.000	4.000	3342	668	40.1
		12.00	4	105	0.059	18.000	4.200	2785	657	49.7
		16.00	4	105	0.071	24.000	4.800	2089	593	68.3
		20.00	4	105	0.081	30.000	6.000	1671	541	97.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	70	0.021	9.000	2.400	3714	312	6.7
		8.00	4	70	0.028	12.000	3.200	2785	312	12.0
		10.00	4	70	0.034	15.000	4.000	2228	303	18.2
		12.00	4	70	0.041	18.000	4.200	1857	305	23.0
		16.00	4	70	0.046	24.000	4.800	1393	256	29.5
		20.00	4	70	0.057	30.000	6.000	1114	254	45.7
	Cast iron (lamellar / spheroidal)	6.00	4	130	0.032	9.000	2.400	6897	883	19.1
		8.00	4	130	0.043	12.000	3.200	5173	890	34.2
		10.00	4	130	0.054	15.000	4.000	4138	894	53.6
		12.00	4	130	0.064	18.000	4.200	3448	883	66.7
		16.00	4	130	0.077	24.000	4.800	2586	797	91.8
		20.00	4	130	0.089	30.000	6.000	2069	737	132.6
	Steel 500 - 850 N/mm²	6.00	4	92	0.020	7.500	6.000	4881	390	17.6
		8.00	4	92	0.028	10.000	8.000	3661	410	32.8
		10.00	4	92	0.035	12.500	10.000	2928	410	51.2
		12.00	4	92	0.039	15.000	12.000	2440	381	68.5
		16.00	4	92	0.046	20.000	16.000	1830	337	107.8
		20.00	4	92	0.053	25.000	20.000	1464	310	155.2
	Steel 850 - 1100 N/mm²	6.00	4	84	0.018	7.500	6.000	4456	321	14.4
		8.00	4	84	0.024	10.000	8.000	3342	321	25.7
		10.00	4	84	0.030	12.500	10.000	2674	321	40.1
		12.00	4	84	0.035	15.000	12.000	2228	312	56.1
		16.00	4	84	0.043	20.000	16.000	1671	287	92.0
		20.00	4	84	0.049	25.000	20.000	1337	262	131.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	56	0.013	7.500	6.000	2971	154	7.0
		8.00	4	56	0.017	10.000	8.000	2228	152	12.1
		10.00	4	56	0.020	12.500	10.000	1783	143	17.8
		12.00	4	56	0.025	15.000	12.000	1485	149	26.7
		16.00	4	56	0.028	20.000	16.000	1114	125	39.9
		20.00	4	56	0.034	25.000	20.000	891	121	60.6
	Cast iron (lamellar / spheroidal)	6.00	4	104	0.019	7.500	6.000	5517	419	18.9
		8.00	4	104	0.026	10.000	8.000	4138	430	34.4
		10.00	4	104	0.032	12.500	10.000	3310	424	53.0
		12.00	4	104	0.038	15.000	12.000	2759	419	75.5
		16.00	4	104	0.046	20.000	16.000	2069	381	121.8
		20.00	4	104	0.053	25.000	20.000	1655	351	175.5

Cylindrical/Square end mills

Smooth-edged, medium version, neck

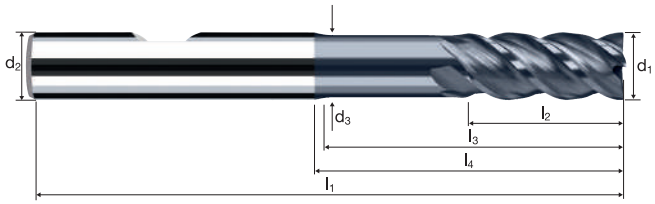
Favora® F

l_2=2.2xd_1

l_3=4.5xd_1

HM MG10 | λ 43° γ 3°

new!



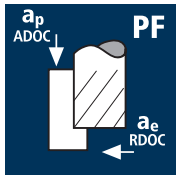
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **45382** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P45382	POLYCHROM P45282
300	6.00	6.00	5.50	65	13.50	27.00	28.85	0.150	4		●
391	8.00	8.00	7.40	76	18.00	36.00	38.37	0.150	4		●
450	10.00	10.00	9.20	90	22.00	45.00	48.01	0.200	4		●
501	12.00	12.00	11.00	105	27.00	54.00	57.71	0.200	4		●
610	16.00	16.00	15.00	125	36.00	72.00	76.27	0.200	4		●
682	20.00	20.00	19.00	145	44.00	90.00	94.77	0.250	4		●

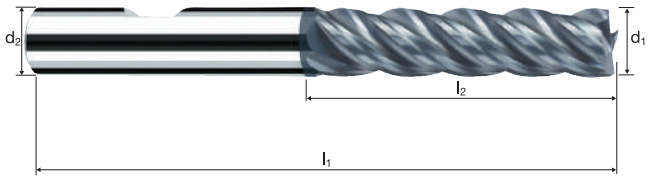
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	130	0.045	15.000	0.600	6895	1241	11.2
		8.00	4	130	0.060	20.000	0.800	5175	1242	19.9
		10.00	4	130	0.075	25.000	1.000	4140	1242	31.1
		12.00	4	130	0.090	30.000	1.200	3450	1242	44.7
		16.00	4	130	0.115	40.000	1.600	2585	1189	76.1
		20.00	4	130	0.145	50.000	2.000	2070	1201	120.1
	Steel 850 - 1100 N/mm²	6.00	4	120	0.040	15.000	0.600	6365	1018	9.2
		8.00	4	120	0.050	20.000	0.800	4775	955	15.3
		10.00	4	120	0.065	25.000	1.000	3820	993	24.8
		12.00	4	120	0.080	30.000	1.200	3185	1019	36.7
		16.00	4	120	0.100	40.000	1.600	2385	954	61.1
		20.00	4	120	0.125	50.000	2.000	1910	955	95.5
	Steel 1100 - 1300 N/mm²	6.00	4	100	0.035	15.000	0.600	5305	743	6.7
		8.00	4	100	0.045	20.000	0.800	3980	716	11.5
		10.00	4	100	0.060	25.000	1.000	3185	764	19.1
		12.00	4	100	0.070	30.000	1.200	2655	743	26.8
		16.00	4	100	0.090	40.000	1.600	1990	716	45.8
		20.00	4	100	0.110	50.000	2.000	1590	700	70.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	80	0.025	15.000	0.450	4245	425	2.9
		8.00	4	80	0.030	20.000	0.600	3185	382	4.6
		10.00	4	80	0.040	25.000	0.750	2545	407	7.6
		12.00	4	80	0.050	30.000	0.900	2120	424	11.4
		16.00	4	80	0.060	40.000	1.200	1590	382	18.3
		20.00	4	80	0.075	50.000	1.500	1275	383	28.7
	Cast iron (lamellar / spheroidal)	6.00	4	120	0.045	15.000	0.600	6365	1146	10.3
		8.00	4	120	0.060	20.000	0.800	4775	1146	18.3
		10.00	4	120	0.070	25.000	1.000	3820	1070	26.7
		12.00	4	120	0.085	30.000	1.200	3185	1083	39.0
		16.00	4	120	0.110	40.000	1.600	2385	1049	67.2
		20.00	4	120	0.135	50.000	2.000	1910	1031	103.1
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	76	0.045	15.000	0.450	4030	725	4.9
		8.00	4	76	0.060	20.000	0.600	3025	726	8.7
		10.00	4	76	0.075	25.000	0.750	2420	726	13.6
		12.00	4	76	0.090	30.000	0.900	2015	725	19.6
		16.00	4	76	0.115	40.000	1.200	1510	695	33.3
		20.00	4	76	0.145	50.000	1.500	1210	702	52.6
	Titanium alloys > 300 HB [Ti6Al4V]	6.00	4	50	0.030	15.000	0.600	2655	319	2.9
		8.00	4	50	0.035	20.000	0.800	1990	279	4.5
		10.00	4	50	0.045	25.000	1.000	1590	286	7.2
		12.00	4	50	0.055	30.000	1.200	1325	292	10.5
		16.00	4	50	0.065	40.000	1.600	995	259	16.6
		20.00	4	50	0.085	50.000	2.000	795	270	27.0
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	6.00	4	40	0.025	15.000	0.450	2120	212	1.4
		8.00	4	40	0.030	20.000	0.600	1590	191	2.3
		10.00	4	40	0.040	25.000	0.750	1275	204	3.8
		12.00	4	40	0.050	30.000	0.900	1060	212	5.7
		16.00	4	40	0.060	40.000	1.200	795	191	9.2
		20.00	4	40	0.075	50.000	1.500	635	191	14.3

Cylindrical/Square end mills

Smooth-edged, long version

Favora® F

HM MG10	λ 40° γ 6°
45°	
Vario	



Roughing

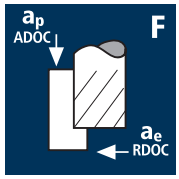
Finishing

ToolSchool P46220 / P46320

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **45323** ø-Code **300**

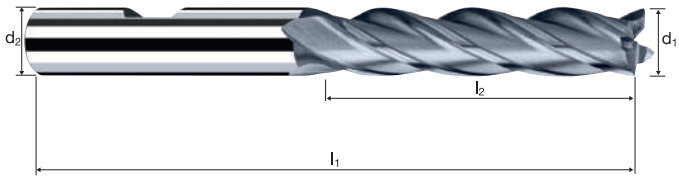
Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z		POLYCHROM P45323	POLYCHROM P45223
300	6.00	6.00	70	26.00	0.10	4		●	
391	8.00	8.00	80	36.00	0.10	4		●	
450	10.00	10.00	100	45.00	0.15	4		●	
501	12.00	12.00	110	53.00	0.15	4		●	
610	16.00	16.00	123	63.00	0.15	4		●	
682	20.00	20.00	141	75.00	0.15	4		●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel 500 - 850 N/mm²	4.00	4	28	0.005	11.200	0.050	2230	45
		6.00	4	28	0.010	16.800	0.100	1485	59
		8.00	4	28	0.015	22.400	0.100	1115	67
		10.00	4	28	0.020	28.000	0.150	890	71
		12.00	4	28	0.020	33.600	0.200	745	60
		16.00	4	28	0.030	44.800	0.250	555	67
		20.00	4	28	0.035	56.000	0.300	445	62
		30.00	5	28	0.055	84.000	0.450	295	81
		40.00	6	28	0.075	112.000	0.600	225	101
	Steel 850 - 1100 N/mm²	4.00	4	25	0.005	11.200	0.050	1990	40
		6.00	4	25	0.010	16.800	0.100	1325	53
		8.00	4	25	0.015	22.400	0.100	995	60
		10.00	4	25	0.020	28.000	0.150	795	64
		12.00	4	25	0.020	33.600	0.200	665	53
		16.00	4	25	0.030	44.800	0.250	495	59
		20.00	4	25	0.035	56.000	0.300	400	56
		30.00	5	25	0.055	84.000	0.450	265	73
		40.00	6	25	0.075	112.000	0.600	200	90
	Steel 1100 - 1300 N/mm²	4.00	4	20	0.005	11.200	0.050	1590	32
		6.00	4	20	0.010	16.800	0.100	1060	42
		8.00	4	20	0.015	22.400	0.100	795	48
		10.00	4	20	0.020	28.000	0.150	635	51
		12.00	4	20	0.020	33.600	0.200	530	42
		16.00	4	20	0.030	44.800	0.250	400	48
		20.00	4	20	0.035	56.000	0.300	320	45
		30.00	5	20	0.055	84.000	0.450	210	58
		40.00	6	20	0.075	112.000	0.600	160	72
	Cold work tool steel (12%Cr) high alloyed [1.2379]	4.00	4	18	0.005	11.200	0.050	1430	29
		6.00	4	18	0.010	16.800	0.100	955	38
		8.00	4	18	0.015	22.400	0.100	715	43
		10.00	4	18	0.020	28.000	0.150	575	46
		12.00	4	18	0.020	33.600	0.200	475	38
		16.00	4	18	0.030	44.800	0.250	360	43
		20.00	4	18	0.035	56.000	0.300	285	40
		30.00	5	18	0.055	84.000	0.450	190	52
		40.00	6	18	0.075	112.000	0.600	145	65
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	4	15	0.005	11.200	0.050	1195	24
		6.00	4	15	0.010	16.800	0.100	795	32
		8.00	4	15	0.015	22.400	0.100	595	36
		10.00	4	15	0.020	28.000	0.150	475	38
		12.00	4	15	0.020	33.600	0.200	400	32
		16.00	4	15	0.030	44.800	0.250	300	36
		20.00	4	15	0.035	56.000	0.300	240	34
		30.00	5	15	0.055	84.000	0.450	160	44
		40.00	6	15	0.075	112.000	0.600	120	54
	Cast iron (lamellar / spheroidal)	4.00	4	24	0.005	11.200	0.050	1910	38
		6.00	4	24	0.010	16.800	0.100	1275	51
		8.00	4	24	0.015	22.400	0.100	955	57
		10.00	4	24	0.020	28.000	0.150	765	61
		12.00	4	24	0.020	33.600	0.200	635	51
		16.00	4	24	0.030	44.800	0.250	475	57
		20.00	4	24	0.035	56.000	0.300	380	53
		30.00	5	24	0.055	84.000	0.450	255	70
		40.00	6	24	0.075	112.000	0.600	190	86
	Wrought aluminium Construction aluminium	4.00	4	50	0.005	11.200	0.050	3980	80
		6.00	4	50	0.010	16.800	0.100	2655	106
		8.00	4	50	0.015	22.400	0.100	1990	119
		10.00	4	50	0.020	28.000	0.150	1590	127
		12.00	4	50	0.020	33.600	0.200	1325	106
		16.00	4	50	0.030	44.800	0.250	995	119
		20.00	4	50	0.035	56.000	0.300	795	111
		30.00	5	50	0.055	84.000	0.450	530	146
		40.00	6	50	0.075	112.000	0.600	400	180
	Unalloyed copper	4.00	4	40	0.005	11.200	0.050	3185	64
		6.00	4	40	0.010	16.800	0.100	2120	85
		8.00	4	40	0.015	22.400	0.100	1590	95
		10.00	4	40	0.020	28.000	0.150	1275	102
		12.00	4	40	0.020	33.600	0.200	1060	85
		16.00	4	40	0.030	44.800	0.250	795	95
		20.00	4	40	0.035	56.000	0.300	635	89
		30.00	5	40	0.055	84.000	0.450	425	117
		40.00	6	40	0.075	112.000	0.600	320	144

Cylindrical/Square end mills

Smooth-edged, long version

HSS-E Co8	λ 30° γ 8°
90°	



Roughing

Finishing

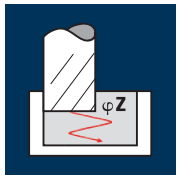
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Copper

Example: **Order-N°.** Coating **P** Article-N°. **0201** ø-Code **140**

Ø Code	d_1 k10	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0201
140	2.00	6.00	54	10.00	18.00	3		●
180	3.00	6.00	56	12.00	20.00	4		●
220	4.00	6.00	63	19.00	27.00	4		●
260	5.00	6.00	68	24.00	32.00	4		●
300	6.00	6.00	68	24.00	-	4		●
391	8.00	10.00	88	38.00	48.00	4		●
450	10.00	10.00	95	45.00	-	4		●
501	12.00	12.00	110	53.00	-	4		●
570	14.00	12.00	110	53.00	-	4		●
610	16.00	16.00	123	63.00	-	4		●
640	18.00	16.00	123	63.00	-	4		●
682	20.00	20.00	141	75.00	-	4		●
772	25.00	25.00	166	90.00	-	5		●
810	30.00	25.00	166	90.00	-	5		●
832	32.00	32.00	186	106.00	-	6		●
860	36.00	32.00	186	106.00	-	6		●
881	40.00	32.00	205	125.00	-	6		●

Application



Material

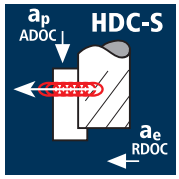
Steel
850 - 1100 N/mm²

Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
6.00	4	113	0.033	32.000	5.400	5995	791	10.0°
8.00	4	113	0.044	42.000	7.200	4495	791	10.0°
10.00	4	113	0.055	53.000	9.000	3595	791	10.0°
12.00	4	113	0.066	63.000	10.800	2995	791	10.0°
16.00	4	113	0.075	84.000	14.400	2250	677	10.0°
20.00	4	113	0.090	105.000	18.000	1800	648	10.0°
6.00	4	86	0.028	32.000	5.400	4560	514	10.0°
8.00	4	86	0.038	42.000	7.200	3420	514	10.0°
10.00	4	86	0.047	53.000	9.000	2735	514	10.0°
12.00	4	86	0.056	63.000	10.800	2280	514	10.0°
16.00	4	86	0.066	84.000	14.400	1710	449	10.0°
20.00	4	86	0.080	105.000	18.000	1370	438	10.0°
6.00	4	68	0.023	32.000	5.400	3610	329	7.0°
8.00	4	68	0.030	42.000	7.200	2705	329	7.0°
10.00	4	68	0.038	53.000	9.000	2165	329	7.0°
12.00	4	68	0.046	63.000	10.800	1805	329	7.0°
16.00	4	68	0.054	84.000	14.400	1355	295	7.0°
20.00	4	68	0.066	105.000	18.000	1080	285	7.0°

Application



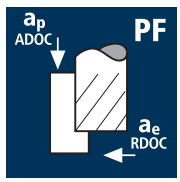
Material

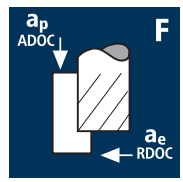
Steel
850 - 1100 N/mm²

Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
6.00	4	202	0.085	32.000	0.300	10715	3643	35.0
8.00	4	202	0.137	42.000	0.400	8035	4403	74.0
10.00	4	202	0.164	53.000	0.500	6430	4218	111.8
12.00	4	202	0.195	63.000	0.600	5360	4181	158.0
16.00	4	202	0.191	84.000	0.800	4020	3071	206.4
20.00	4	202	0.233	105.000	1.000	3215	2996	314.6
6.00	4	160	0.068	32.000	0.300	8490	2309	22.2
8.00	4	160	0.110	42.000	0.400	6365	2801	47.1
10.00	4	160	0.132	53.000	0.500	5095	2690	71.3
12.00	4	160	0.156	63.000	0.600	4245	2649	100.1
16.00	4	160	0.154	84.000	0.800	3185	1962	131.8
20.00	4	160	0.188	105.000	1.000	2545	1914	200.9
6.00	4	118	0.045	32.000	0.300	6260	1127	10.8
8.00	4	118	0.073	42.000	0.400	4695	1371	23.0
10.00	4	118	0.087	53.000	0.500	3755	1307	34.6
12.00	4	118	0.104	63.000	0.600	3130	1302	49.2
16.00	4	118	0.099	84.000	0.800	2350	931	62.5
20.00	4	118	0.121	105.000	1.000	1880	910	95.5





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

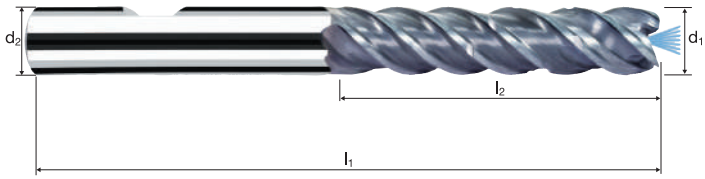
Cylindrical/Square end mills MFC

Smooth-edged, chip breaker, 5.2xd version
High-performance penetration edge, central air/cooling channel

HM MG10 | λ **45°** γ **10°**

r

Vario



Roughing HPC | Roughing HDC | Finishing

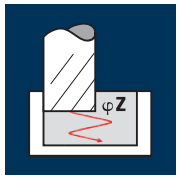
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** | Article-N°. **8221** | ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z	POLYCHROM P8221	POLYCHROM P8121
300	6.00	6.00	73	32.00	0.100	4		●
391	8.00	8.00	84	42.00	0.150	4		●
450	10.00	10.00	100	53.00	0.200	4		●
501	12.00	12.00	117	63.00	0.200	4		●
610	16.00	16.00	144	84.00	0.200	4		●
682	20.00	20.00	169	105.00	0.200	4		●

Application



Material

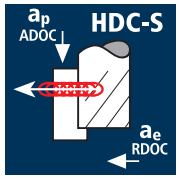
Steel
< 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
3.00	4	90	0.020	16.000	2.700	9550	764	1.5°
4.00	4	90	0.030	21.000	3.600	7160	859	1.5°
5.00	4	90	0.037	26.000	4.500	5730	848	1.5°
6.00	4	90	0.038	32.000	5.400	4775	726	1.5°
8.00	4	90	0.051	42.000	7.200	3580	730	1.5°
10.00	4	90	0.064	53.000	9.000	2865	733	1.5°
12.00	4	90	0.072	63.000	10.800	2385	687	1.5°
16.00	4	90	0.086	84.000	14.400	1790	616	1.5°
20.00	4	90	0.099	105.000	18.000	1430	566	1.5°
3.00	4	85	0.019	16.000	2.700	9020	686	2.0°
4.00	4	85	0.026	21.000	3.600	6765	704	2.0°
5.00	4	85	0.032	26.000	4.500	5410	693	2.0°
6.00	4	85	0.033	32.000	5.400	4510	595	2.0°
8.00	4	85	0.044	42.000	7.200	3380	595	2.0°
10.00	4	85	0.055	53.000	9.000	2705	595	2.0°
12.00	4	85	0.066	63.000	10.800	2255	595	2.0°
16.00	4	85	0.079	84.000	14.400	1690	534	2.0°
20.00	4	85	0.090	105.000	18.000	1355	488	2.0°
3.00	4	55	0.012	16.000	2.700	5835	280	1.5°
4.00	4	55	0.016	21.000	3.600	4375	280	1.5°
5.00	4	55	0.020	26.000	4.500	3500	280	1.5°
6.00	4	55	0.023	32.000	5.400	2920	269	1.5°
8.00	4	55	0.031	42.000	7.200	2190	272	1.5°
10.00	4	55	0.038	53.000	9.000	1750	266	1.5°
12.00	4	55	0.046	63.000	10.800	1460	269	1.5°
16.00	4	55	0.050	84.000	14.400	1095	219	1.5°
20.00	4	55	0.063	105.000	18.000	875	221	1.5°

Application



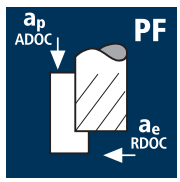
Material

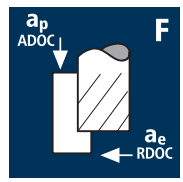
Steel
< 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
3.00	4	260	0.064	16.000	0.075	27585	7062	8.5
4.00	4	260	0.087	21.000	0.100	20690	7200	15.1
5.00	4	260	0.110	26.000	0.125	16550	7282	23.7
6.00	4	260	0.132	32.000	0.150	13795	7284	35.0
8.00	4	260	0.177	42.000	0.200	10345	7324	61.5
10.00	4	260	0.219	53.000	0.250	8275	7249	96.0
12.00	4	260	0.264	63.000	0.300	6895	7281	137.6
16.00	4	260	0.290	84.000	0.400	5175	6003	201.7
20.00	4	260	0.363	105.000	0.500	4140	6011	315.6
3.00	4	266	0.072	16.000	0.075	28225	8129	9.8
4.00	4	266	0.098	21.000	0.100	21170	8299	17.4
5.00	4	266	0.123	26.000	0.125	16935	8332	27.1
6.00	4	266	0.148	32.000	0.150	14110	8353	40.1
8.00	4	266	0.199	42.000	0.200	10585	8426	70.8
10.00	4	266	0.246	53.000	0.250	8465	8330	110.4
12.00	4	266	0.297	63.000	0.300	7055	8381	158.4
16.00	4	266	0.326	84.000	0.400	5290	6898	231.8
20.00	4	266	0.409	105.000	0.500	4235	6929	363.7
3.00	4	184	0.046	16.000	0.075	19525	3593	4.3
4.00	4	184	0.064	21.000	0.100	14640	3748	7.9
5.00	4	184	0.080	26.000	0.125	11715	3749	12.2
6.00	4	184	0.097	32.000	0.150	9760	3787	18.2
8.00	4	184	0.129	42.000	0.200	7320	3777	31.7
10.00	4	184	0.161	53.000	0.250	5855	3771	50.0
12.00	4	184	0.193	63.000	0.300	4880	3767	71.2
16.00	4	184	0.209	84.000	0.400	3660	3060	102.8
20.00	4	184	0.269	105.000	0.500	2930	3153	165.5





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

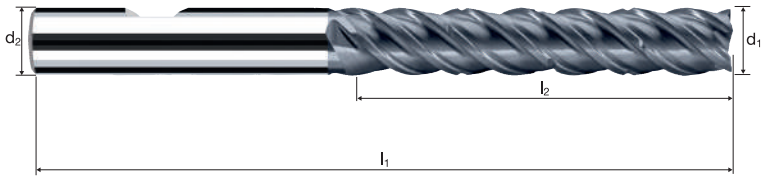
Cylindrical/Square end mills E-Cut

Smooth-edged, chip breaker, 5.2xd version

HM MG10 | λ 45° γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

ReTool®

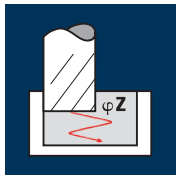
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox Stainless** | **Ti Titanium** | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8420** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P8420	POLYCHROM P8320
180*	3.00	6.00	63	16.00	25.26	0.050	4		●
220*	4.00	6.00	70	21.00	29.39	0.100	4		●
260	5.00	6.00	73	26.00	33.52	0.100	4		●
300	6.00	6.00	73	32.00	-	0.100	4		●
391	8.00	8.00	84	42.00	-	0.150	4		●
450	10.00	10.00	100	53.00	-	0.200	4		●
501	12.00	12.00	117	63.00	-	0.200	4		●
610	16.00	16.00	144	84.00	-	0.200	4		●
682	20.00	20.00	169	105.00	-	0.250	4		●

* without chip breaker

Application



Material

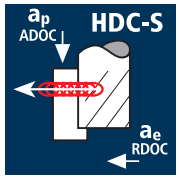
Steel
< 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
3.00	3	85	0.018	16.000	2.700	9020	487	2.0°
4.00	3	85	0.027	21.000	3.600	6765	548	2.0°
5.00	3	85	0.033	26.000	4.500	5410	536	2.0°
6.00	3	85	0.034	32.000	5.400	4510	460	2.0°
8.00	3	85	0.046	42.000	7.200	3380	466	2.0°
10.00	3	85	0.058	53.000	9.000	2705	471	2.0°
12.00	3	85	0.065	63.000	10.800	2255	440	2.0°
16.00	3	85	0.077	84.000	14.400	1690	390	2.0°
20.00	3	85	0.089	105.000	18.000	1355	362	2.0°
3.00	3	75	0.017	16.000	2.700	7960	406	3.0°
4.00	3	75	0.023	21.000	3.600	5970	412	3.0°
5.00	3	75	0.029	26.000	4.500	4775	415	3.0°
6.00	3	75	0.030	32.000	5.400	3980	358	3.0°
8.00	3	75	0.040	42.000	7.200	2985	358	3.0°
10.00	3	75	0.050	53.000	9.000	2385	358	3.0°
12.00	3	75	0.059	63.000	10.800	1990	352	3.0°
16.00	3	75	0.071	84.000	14.400	1490	317	3.0°
20.00	3	75	0.081	105.000	18.000	1195	290	3.0°
3.00	3	50	0.013	16.000	2.700	5305	207	2.0°
4.00	3	50	0.019	21.000	3.600	3980	227	2.0°
5.00	3	50	0.022	26.000	4.500	3185	210	2.0°
6.00	3	50	0.023	32.000	5.400	2655	183	2.0°
8.00	3	50	0.031	42.000	7.200	1990	185	2.0°
10.00	3	50	0.038	53.000	9.000	1590	181	2.0°
12.00	3	50	0.046	63.000	10.800	1325	183	2.0°
16.00	3	50	0.050	84.000	14.400	995	149	2.0°
20.00	3	50	0.063	105.000	18.000	795	150	2.0°

Application



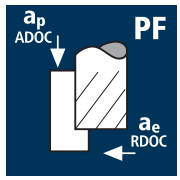
Material

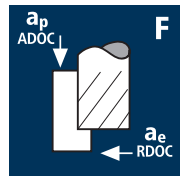
Steel
< 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
3.00	3	211	0.042	16.000	0.150	22390	2821	6.8
4.00	3	211	0.057	21.000	0.200	16790	2871	12.1
5.00	3	211	0.072	26.000	0.250	13435	2902	18.9
6.00	3	211	0.087	32.000	0.300	11195	2922	28.1
8.00	3	211	0.116	42.000	0.400	8395	2922	49.1
10.00	3	211	0.144	53.000	0.500	6715	2901	76.9
12.00	3	211	0.173	63.000	0.600	5595	2904	109.8
16.00	3	211	0.190	84.000	0.800	4200	2394	160.9
20.00	3	211	0.239	105.000	1.000	3360	2409	253.0
3.00	3	216	0.047	16.000	0.150	22920	3232	7.8
4.00	3	216	0.064	21.000	0.200	17190	3301	13.9
5.00	3	216	0.080	26.000	0.250	13750	3300	21.5
6.00	3	216	0.097	32.000	0.300	11460	3335	32.0
8.00	3	216	0.130	42.000	0.400	8595	3352	56.3
10.00	3	216	0.161	53.000	0.500	6875	3321	88.0
12.00	3	216	0.194	63.000	0.600	5730	3335	126.1
16.00	3	216	0.213	84.000	0.800	4295	2745	184.4
20.00	3	216	0.267	105.000	1.000	3440	2755	289.3
3.00	3	149	0.029	16.000	0.150	15810	1376	3.3
4.00	3	149	0.040	21.000	0.200	11855	1423	6.0
5.00	3	149	0.050	26.000	0.250	9485	1423	9.2
6.00	3	149	0.060	32.000	0.300	7905	1423	13.7
8.00	3	149	0.080	42.000	0.400	5930	1423	23.9
10.00	3	149	0.099	53.000	0.500	4745	1409	37.3
12.00	3	149	0.119	63.000	0.600	3950	1410	53.3
16.00	3	149	0.129	84.000	0.800	2965	1148	77.1
20.00	3	149	0.167	105.000	1.000	2370	1187	124.7





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

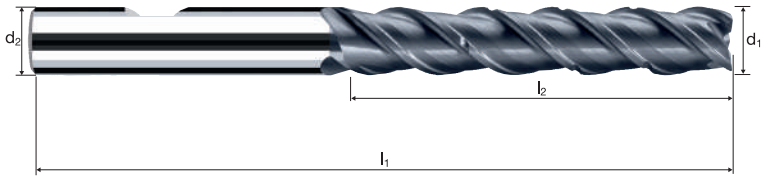
Cylindrical/Square end mills E-Cut

Smooth-edged, chip breaker, 5.2xd version

HM MG10 | λ 45° γ 10°

r

Vario



Roughing HPC | Roughing HDC | Finishing

ReTool®

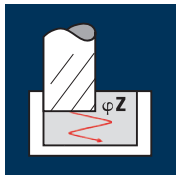
Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox Stainless** | **Ti Titanium** | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8423** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P8423	POLYCHROM P8323
180*	3.00	6.00	63	16.00	25.26	0.050	3		●
220*	4.00	6.00	70	21.00	29.39	0.100	3		●
260	5.00	6.00	73	26.00	33.52	0.100	3		●
300	6.00	6.00	73	32.00	-	0.100	3		●
391	8.00	8.00	84	42.00	-	0.150	3		●
450	10.00	10.00	100	53.00	-	0.200	3		●
501	12.00	12.00	117	63.00	-	0.200	3		●
610	16.00	16.00	144	84.00	-	0.200	3		●
682	20.00	20.00	169	105.00	-	0.250	3		●

* without chip breaker

Application



Material

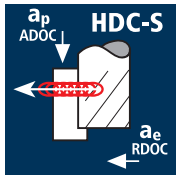
Steel
500 - 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
3.00	4	81	0.018	16.000	2.700	8595	619	1.5°
4.00	4	81	0.027	21.000	3.600	6445	696	1.5°
5.00	4	81	0.033	26.000	4.500	5155	687	1.5°
6.00	4	81	0.034	32.000	5.400	4295	588	1.5°
8.00	4	81	0.046	42.000	7.200	3225	592	1.5°
10.00	4	81	0.058	53.000	9.000	2580	594	1.5°
12.00	4	81	0.065	63.000	10.800	2150	557	1.5°
16.00	4	81	0.077	84.000	14.400	1610	499	1.5°
20.00	4	81	0.089	105.000	18.000	1290	460	1.5°
3.00	4	77	0.017	16.000	2.700	8170	559	1.5°
4.00	4	77	0.023	21.000	3.600	6125	573	1.5°
5.00	4	77	0.029	26.000	4.500	4900	565	1.5°
6.00	4	77	0.030	32.000	5.400	4085	485	1.5°
8.00	4	77	0.040	42.000	7.200	3065	486	1.5°
10.00	4	77	0.050	53.000	9.000	2450	485	1.5°
12.00	4	77	0.059	63.000	10.800	2040	485	1.5°
16.00	4	77	0.071	84.000	14.400	1530	435	1.5°
20.00	4	77	0.081	105.000	18.000	1225	397	1.5°
3.00	4	50	0.011	16.000	2.700	5305	229	1.5°
4.00	4	50	0.014	21.000	3.600	3980	229	1.5°
5.00	4	50	0.018	26.000	4.500	3185	229	1.5°
6.00	4	50	0.021	32.000	5.400	2655	220	1.5°
8.00	4	50	0.028	42.000	7.200	1990	222	1.5°
10.00	4	50	0.034	53.000	9.000	1590	218	1.5°
12.00	4	50	0.041	63.000	10.800	1325	219	1.5°
16.00	4	50	0.045	84.000	14.400	995	179	1.5°
20.00	4	50	0.057	105.000	18.000	795	180	1.5°

Application



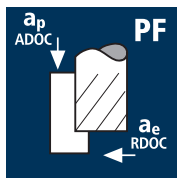
Material

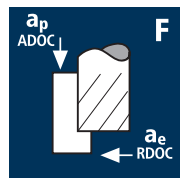
Steel
500 - 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
3.00	4	210	0.037	16.000	0.075	22280	3297	4.0
4.00	4	210	0.050	21.000	0.100	16710	3342	7.0
5.00	4	210	0.091	26.000	0.125	13370	4867	15.8
6.00	4	210	0.109	32.000	0.150	11140	4857	23.3
8.00	4	210	0.145	42.000	0.200	8355	4846	40.7
10.00	4	210	0.182	53.000	0.250	6685	4867	64.5
12.00	4	210	0.220	63.000	0.300	5570	4902	92.6
16.00	4	210	0.243	84.000	0.400	4180	4063	136.5
20.00	4	210	0.304	105.000	0.500	3340	4061	213.2
3.00	4	240	0.055	16.000	0.075	25465	5602	6.7
4.00	4	240	0.074	21.000	0.100	19100	5654	11.9
5.00	4	240	0.103	26.000	0.125	15280	6295	20.5
6.00	4	240	0.123	32.000	0.150	12730	6263	30.1
8.00	4	240	0.163	42.000	0.200	9550	6227	52.3
10.00	4	240	0.205	53.000	0.250	7640	6265	83.0
12.00	4	240	0.247	63.000	0.300	6365	6289	118.9
16.00	4	240	0.274	84.000	0.400	4775	5233	175.8
20.00	4	240	0.342	105.000	0.500	3820	5226	274.4
3.00	4	147	0.038	16.000	0.075	15595	2370	2.8
4.00	4	147	0.052	21.000	0.100	11700	2434	5.1
5.00	4	147	0.072	26.000	0.125	9360	2696	8.8
6.00	4	147	0.087	32.000	0.150	7800	2714	13.0
8.00	4	147	0.116	42.000	0.200	5850	2714	22.8
10.00	4	147	0.145	53.000	0.250	4680	2714	36.0
12.00	4	147	0.174	63.000	0.300	3900	2714	51.3
16.00	4	147	0.188	84.000	0.400	2925	2200	73.9
20.00	4	147	0.242	105.000	0.500	2340	2265	118.9





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills

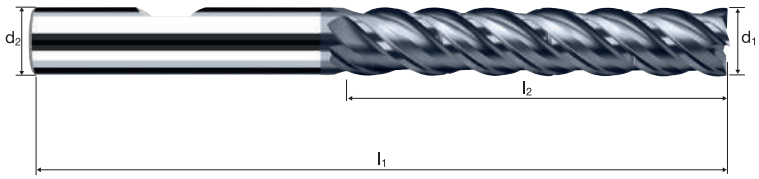
Smooth-edged, chip breaker, 5.2xd version

Favora® F

HM MG10 | λ 45° γ 6°

r

Vario



Roughing HPC | Roughing HDC | Finishing

ReTool®

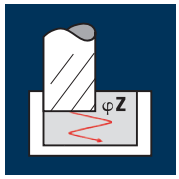
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **46320** ø-Code **180**

Ø Code	d1 e8	d2 h6	l1	l2	l4	r	z	POLYCHROM P46320	POLYCHROM P46220
180*	3.00	6.00	63	16.00	25.26	0.050	4		●
220*	4.00	6.00	70	21.00	29.39	0.100	4		●
260	5.00	6.00	73	26.00	33.52	0.100	4		●
300	6.00	6.00	73	32.00	-	0.150	4		●
391	8.00	8.00	84	42.00	-	0.150	4		●
450	10.00	10.00	100	53.00	-	0.200	4		●
501	12.00	12.00	117	63.00	-	0.200	4		●
610	16.00	16.00	144	84.00	-	0.200	4		●
682	20.00	20.00	169	105.00	-	0.250	4		●

* without chip breaker

Application



Material

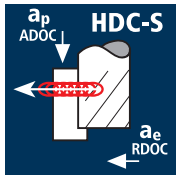
Steel
850 - 1100 N/mm²

Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
6.00	4	75	0.033	38.000	5.400	3980	525	8.0°
8.00	4	75	0.044	51.000	7.200	2985	525	8.0°
10.00	4	75	0.055	63.000	9.000	2385	525	8.0°
12.00	4	75	0.066	76.000	10.800	1990	525	8.0°
16.00	4	75	0.075	101.000	14.400	1490	448	8.0°
20.00	4	75	0.090	126.000	18.000	1195	430	8.0°
6.00	4	58	0.028	38.000	5.400	3075	347	8.0°
8.00	4	58	0.038	51.000	7.200	2310	347	8.0°
10.00	4	58	0.047	63.000	9.000	1845	347	8.0°
12.00	4	58	0.056	76.000	10.800	1540	347	8.0°
16.00	4	58	0.066	101.000	14.400	1155	303	8.0°
20.00	4	58	0.080	126.000	18.000	925	296	8.0°
6.00	4	45	0.023	38.000	5.400	2385	218	6.0°
8.00	4	45	0.030	51.000	7.200	1790	218	6.0°
10.00	4	45	0.038	63.000	9.000	1430	217	6.0°
12.00	4	45	0.046	76.000	10.800	1195	218	6.0°
16.00	4	45	0.054	101.000	14.400	895	195	6.0°
20.00	4	45	0.066	126.000	18.000	715	189	6.0°

Application



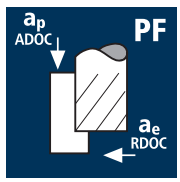
Material

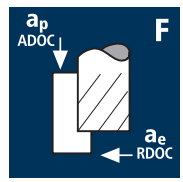
Steel
850 - 1100 N/mm²

Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
6.00	4	143	0.121	38.000	0.150	7585	3671	20.9
8.00	4	143	0.190	51.000	0.200	5690	4324	44.1
10.00	4	143	0.234	63.000	0.250	4550	4259	67.1
12.00	4	143	0.273	76.000	0.300	3795	4144	94.5
16.00	4	143	0.269	101.000	0.400	2845	3061	123.7
20.00	4	143	0.328	126.000	0.500	2275	2985	188.0
6.00	4	113	0.098	38.000	0.150	5995	2350	13.4
8.00	4	113	0.154	51.000	0.200	4495	2769	28.2
10.00	4	113	0.189	63.000	0.250	3595	2718	42.8
12.00	4	113	0.221	76.000	0.300	2995	2648	60.4
16.00	4	113	0.218	101.000	0.400	2250	1962	79.3
20.00	4	113	0.266	126.000	0.500	1800	1915	120.7
6.00	4	119	0.053	38.000	0.150	6315	1339	7.6
8.00	4	119	0.083	51.000	0.200	4735	1572	16.0
10.00	4	119	0.102	63.000	0.250	3790	1546	24.4
12.00	4	119	0.118	76.000	0.300	3155	1489	34.0
16.00	4	119	0.114	101.000	0.400	2365	1078	43.6
20.00	4	119	0.139	126.000	0.500	1895	1054	66.4





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills MFC

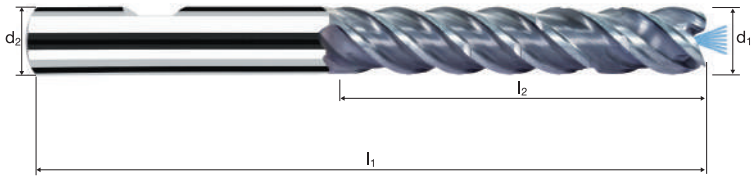
Smooth-edged, chip breaker, 6.3xd version
High-performance penetration edge, central air/cooling channel

HM MG10

λ 43°
γ 8°

r

Vario



Roughing HPC

Roughing HDC

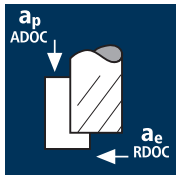
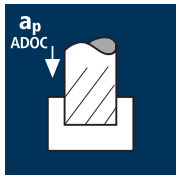
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8222** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z		POLYCHROM P8222	POLYCHROM P8122
300	6.00	6.00	80	38.00	0.100	4			●
391	8.00	8.00	93	51.00	0.150	4			●
450	10.00	10.00	110	63.00	0.200	4			●
501	12.00	12.00	130	76.00	0.200	4			●
610	16.00	16.00	160	101.00	0.200	4			●
682	20.00	20.00	189	126.00	0.200	4			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Hardened tool steel 42 - 48 HRC	2.00	3	90	0.015	2.000	1.200	14325	645	1.5
		3.00	4	90	0.025	3.000	1.800	9550	955	5.2
		4.00	4	90	0.025	4.000	2.400	7160	716	6.9
		5.00	4	90	0.035	5.000	3.000	5730	802	12.0
		6.00	4	90	0.040	6.000	1.500	4775	764	6.9
		8.00	4	90	0.055	8.000	4.800	3580	788	30.2
		10.00	4	90	0.070	10.000	6.000	2865	802	48.1
		12.00	4	90	0.085	12.000	7.200	2385	811	70.1
		16.00	4	90	0.110	16.000	4.000	1790	788	50.4
	Hardened tool steel 48 - 52 HRC	2.00	3	70	0.010	2.000	1.200	11140	334	0.8
		3.00	4	70	0.020	3.000	1.800	7425	594	3.2
		4.00	4	70	0.025	4.000	2.400	5570	557	5.3
		5.00	4	70	0.030	5.000	3.000	4455	535	8.0
		6.00	4	70	0.035	6.000	1.500	3715	520	4.7
		8.00	4	70	0.050	8.000	4.800	2785	557	21.4
		10.00	4	70	0.060	10.000	6.000	2230	535	32.1
		12.00	4	70	0.075	12.000	7.200	1855	557	48.1
		16.00	4	70	0.100	16.000	4.000	1395	558	35.7
	Hardened tool steel 52 - 56 HRC	2.00	3	45	0.010	2.000	1.200	7160	215	0.5
		3.00	4	45	0.015	3.000	1.800	4775	287	1.5
		4.00	4	45	0.020	4.000	2.400	3580	286	2.7
		5.00	4	45	0.025	5.000	3.000	2865	287	4.3
		6.00	4	45	0.030	6.000	1.500	2385	286	2.6
		8.00	4	45	0.040	8.000	4.800	1790	286	11.0
		10.00	4	45	0.050	10.000	6.000	1430	286	17.2
		12.00	4	45	0.060	12.000	7.200	1195	287	24.8
		16.00	4	45	0.080	16.000	4.000	895	286	18.3
	Hardened tool steel 56 - 60 HRC	2.00	3	20	0.005	2.000	1.200	3185	48	0.1
		3.00	4	20	0.010	3.000	1.800	2120	85	0.5
		4.00	4	20	0.015	4.000	2.400	1590	95	0.9
		5.00	4	20	0.020	5.000	3.000	1275	102	1.5
		6.00	4	20	0.020	6.000	1.500	1060	85	0.8
		8.00	4	20	0.030	8.000	4.800	795	95	3.7
		10.00	4	20	0.035	10.000	6.000	635	89	5.3
		12.00	4	20	0.045	12.000	7.200	530	95	8.2
		16.00	4	20	0.060	16.000	4.000	400	96	6.1
	Hardened tool steel 42 - 48 HRC	2.00	3	75	0.010	1.000	2.000	11935	358	0.7
		3.00	4	75	0.015	1.500	3.000	7960	478	2.1
		4.00	4	75	0.025	2.000	4.000	5970	597	4.8
		5.00	4	75	0.025	2.500	5.000	4775	478	6.0
		6.00	4	75	0.035	3.000	6.000	3980	557	10.0
		8.00	4	75	0.045	4.000	8.000	2985	537	17.2
		10.00	4	75	0.055	5.000	10.000	2385	525	26.2
		12.00	4	75	0.070	6.000	12.000	1990	557	40.1
		16.00	4	75	0.085	4.000	16.000	1490	507	32.4
	Hardened tool steel 48 - 52 HRC	2.00	3	60	0.010	1.000	2.000	9550	287	0.6
		3.00	4	60	0.015	1.500	3.000	6365	382	1.7
		4.00	4	60	0.020	2.000	4.000	4775	382	3.1
		5.00	4	60	0.030	2.500	5.000	3820	458	5.7
		6.00	4	60	0.035	3.000	6.000	3185	446	8.0
		8.00	4	60	0.045	4.000	8.000	2385	429	13.7
		10.00	4	60	0.055	5.000	10.000	1910	420	21.0
		12.00	4	60	0.065	6.000	12.000	1590	413	29.8
		16.00	4	60	0.090	4.000	16.000	1195	430	27.5
	Hardened tool steel 52 - 56 HRC	2.00	3	30	0.010	1.000	2.000	4775	143	0.3
		3.00	4	30	0.015	1.500	3.000	3185	191	0.9
		4.00	4	30	0.020	2.000	4.000	2385	191	1.5
		5.00	4	30	0.020	2.500	5.000	1910	153	1.9
		6.00	4	30	0.025	3.000	6.000	1590	159	2.9
		8.00	4	30	0.035	4.000	8.000	1195	167	5.4
		10.00	4	30	0.045	5.000	10.000	955	172	8.6
		12.00	4	30	0.055	6.000	12.000	795	175	12.6
		16.00	4	30	0.070	4.000	16.000	595	167	10.7
	Hardened tool steel 56 - 60 HRC	2.00	3	15	0.006	1.000	2.000	2385	43	0.1
		3.00	4	15	0.009	1.500	3.000	1590	57	0.3
		4.00	4	15	0.013	2.000	4.000	1195	62	0.5
		5.00	4	15	0.016	2.500	5.000	955	61	0.8
		6.00	4	15	0.019	3.000	6.000	795	60	1.1
		8.00	4	15	0.025	4.000	8.000	595	60	1.9
		10.00	4	15	0.031	5.000	10.000	475	59	2.9
		12.00	4	15	0.038	6.000	12.000	400	61	4.4
		16.00	4	15	0.050	4.000	16.000	300	60	3.8

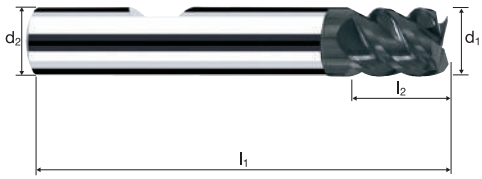
Cylindrical/Square end mills HX

Smooth-edged, short version

HM MG10

λ 55°
γ -10°

45°



Roughing

Finishing

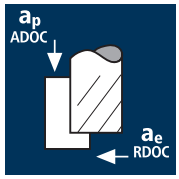
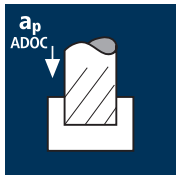
ToolSchool P8308 / P8408 P8309 / P8409

POLYCHROM only, DURO-S remains

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **5349** ø-Code **100**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	DURO-S D5349 D5249	POLYCHROM P5349 P5249
100	1.00	6.00	50	1.00	11.79	0.04	3	●	●
108	1.20	6.00	50	1.20	11.82	0.04	3	●	●
120	1.50	6.00	50	1.50	11.56	0.04	3	●	●
140	2.00	6.00	50	2.00	11.12	0.05	3	●	●
148	2.20	6.00	50	2.20	11.45	0.05	3	●	●
160	2.50	6.00	50	2.50	11.19	0.05	3	●	●
180	3.00	6.00	50	3.00	10.76	0.05	4	●	●
220	4.00	6.00	54	4.00	9.89	0.05	4	●	●
260	5.00	6.00	54	5.00	9.02	0.10	4	●	●
300	6.00	6.00	54	7.00	-	0.10	4	●	●
391	8.00	8.00	58	9.00	-	0.10	4	●	●
450	10.00	10.00	66	11.00	-	0.15	4	●	●
501	12.00	12.00	73	13.00	-	0.15	4	●	●
610	16.00	16.00	82	17.00	-	0.15	4	●	●

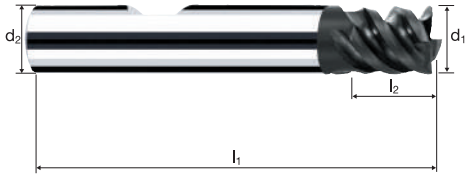
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	80	0.015	3.000	1.800	8490	509	2.8
		4.00	4	80	0.020	4.000	2.400	6365	509	4.9
		5.00	4	80	0.025	5.000	3.000	5095	510	7.6
		6.00	4	80	0.030	6.000	3.600	4245	509	11.0
		8.00	4	80	0.040	8.000	4.800	3185	510	19.6
		10.00	4	80	0.050	10.000	6.000	2545	509	30.5
		12.00	4	80	0.060	12.000	7.200	2120	509	44.0
		16.00	4	80	0.075	16.000	6.400	1590	477	48.8
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	3.00	4	40	0.015	3.000	1.800	4245	255	1.4
		4.00	4	40	0.020	4.000	2.400	3185	255	2.4
		5.00	4	40	0.025	5.000	3.000	2545	255	3.8
		6.00	4	40	0.030	6.000	3.600	2120	254	5.5
		8.00	4	40	0.040	8.000	4.800	1590	254	9.8
		10.00	4	40	0.050	10.000	6.000	1275	255	15.3
		12.00	4	40	0.060	12.000	7.200	1060	254	22.0
		16.00	4	40	0.075	16.000	6.400	795	239	24.4
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	25	0.015	3.000	1.800	2655	159	0.9
		4.00	4	25	0.020	4.000	2.400	1990	159	1.5
		5.00	4	25	0.025	5.000	3.000	1590	159	2.4
		6.00	4	25	0.030	6.000	3.600	1325	159	3.4
		8.00	4	25	0.035	8.000	4.800	995	139	5.3
		10.00	4	25	0.045	10.000	6.000	795	143	8.6
		12.00	4	25	0.050	12.000	7.200	665	133	11.5
		16.00	4	25	0.060	16.000	6.400	495	119	12.2
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	3.00	4	15	0.015	3.000	1.800	1590	95	0.5
		4.00	4	15	0.020	4.000	2.400	1195	96	0.9
		5.00	4	15	0.025	5.000	3.000	955	96	1.4
		6.00	4	15	0.030	6.000	3.600	795	95	2.1
		8.00	4	15	0.035	8.000	4.800	595	83	3.2
		10.00	4	15	0.045	10.000	6.000	475	86	5.1
		12.00	4	15	0.050	12.000	7.200	400	80	6.9
		16.00	4	15	0.060	16.000	6.400	300	72	7.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	60	0.015	2.100	3.000	6365	382	2.4
		4.00	4	60	0.020	2.800	4.000	4775	382	4.3
		5.00	4	60	0.025	3.500	5.000	3820	382	6.7
		6.00	4	60	0.030	4.200	6.000	3185	382	9.6
		8.00	4	60	0.040	5.600	8.000	2385	382	17.1
		10.00	4	60	0.045	7.000	10.000	1910	344	24.1
		12.00	4	60	0.045	8.400	12.000	1590	286	28.8
		16.00	4	60	0.065	6.400	16.000	1195	311	31.8
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	3.00	4	30	0.015	2.100	3.000	3185	191	1.2
		4.00	4	30	0.020	2.800	4.000	2385	191	2.1
		5.00	4	30	0.025	3.500	5.000	1910	191	3.3
		6.00	4	30	0.030	4.200	6.000	1590	191	4.8
		8.00	4	30	0.040	5.600	8.000	1195	191	8.6
		10.00	4	30	0.045	7.000	10.000	955	172	12.0
		12.00	4	30	0.045	8.400	12.000	795	143	14.4
		16.00	4	30	0.065	6.400	16.000	595	155	15.8
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	20	0.015	2.100	3.000	2120	127	0.8
		4.00	4	20	0.020	2.800	4.000	1590	127	1.4
		5.00	4	20	0.025	3.500	5.000	1275	128	2.2
		6.00	4	20	0.030	4.200	6.000	1060	127	3.2
		8.00	4	20	0.035	5.600	8.000	795	111	5.0
		10.00	4	20	0.045	7.000	10.000	635	114	8.0
		12.00	4	20	0.045	8.400	12.000	530	95	9.6
		16.00	4	20	0.060	6.400	16.000	400	96	9.8
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	3.00	4	10	0.015	2.100	3.000	1060	64	0.4
		4.00	4	10	0.020	2.800	4.000	795	64	0.7
		5.00	4	10	0.025	3.500	5.000	635	64	1.1
		6.00	4	10	0.030	4.200	6.000	530	64	1.6
		8.00	4	10	0.035	5.600	8.000	400	56	2.5
		10.00	4	10	0.045	7.000	10.000	320	58	4.0
		12.00	4	10	0.045	8.400	12.000	265	48	4.8
		16.00	4	10	0.060	6.400	16.000	200	48	4.9

Cylindrical/Square end mills SX

Smooth-edged, short version

HM MG10 | λ 55° γ 15°

45°



Roughing

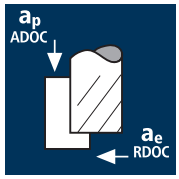
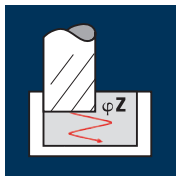
Finishing

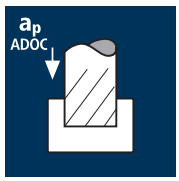
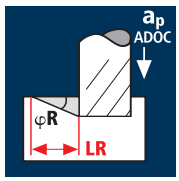
ToolSchool P8308 / P8408 P8309 / P8409

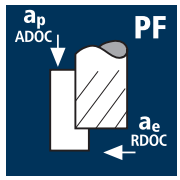
Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Inox** Stainless | **Ti** Titanium | **Nickel-Alloys Tool Steel**

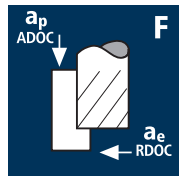
Example: **Order-N°.** Coating **P** Article-N°. **5313** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P5313	POLYCHROM P5213
180	3.00	6.00	50	3.00	10.76	0.05	4		●
220	4.00	6.00	54	4.00	9.89	0.05	4		●
260	5.00	6.00	54	5.00	9.02	0.10	4		●
300	6.00	6.00	54	7.00	-	0.10	4		●
391	8.00	8.00	58	9.00	-	0.10	4		●
450	10.00	10.00	66	11.00	-	0.15	4		●
501	12.00	12.00	73	13.00	-	0.15	4		●
610	16.00	16.00	82	17.00	-	0.15	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	4	155	0.027	4.500	1.350	16445	1776	10.8	1.5°
		4.00	4	155	0.034	6.000	1.800	12335	1678	18.1	1.5°
		5.00	4	155	0.039	7.500	2.250	9870	1540	26.0	1.5°
		6.00	4	155	0.048	9.000	2.700	8225	1579	38.4	1.5°
		8.00	4	155	0.064	12.000	3.600	6165	1578	68.2	1.5°
		10.00	4	155	0.080	15.000	4.500	4935	1579	106.6	1.5°
		12.00	4	155	0.090	18.000	5.400	4110	1480	143.9	1.5°
		16.00	4	155	0.102	24.000	7.200	3085	1259	217.6	1.5°
	Steel 850 - 1100 N/mm²	3.00	4	135	0.025	4.500	1.350	14325	1433	8.7	2.0°
		4.00	4	135	0.028	6.000	1.800	10745	1203	13.0	2.0°
		5.00	4	135	0.034	7.500	2.250	8595	1169	19.7	2.0°
		6.00	4	135	0.042	9.000	2.700	7160	1203	29.2	2.0°
		8.00	4	135	0.056	12.000	3.600	5370	1203	52.0	2.0°
		10.00	4	135	0.069	15.000	4.500	4295	1185	80.0	2.0°
		12.00	4	135	0.083	18.000	5.400	3580	1189	115.6	2.0°
		16.00	4	135	0.094	24.000	7.200	2685	1010	174.5	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	90	0.015	4.500	1.350	9550	573	3.5	1.5°
		4.00	4	90	0.018	6.000	1.800	7160	516	5.6	1.5°
		5.00	4	90	0.021	7.500	2.250	5730	481	8.1	1.5°
		6.00	4	90	0.029	9.000	2.700	4775	554	13.5	1.5°
		8.00	4	90	0.038	12.000	3.600	3580	544	23.5	1.5°
		10.00	4	90	0.048	15.000	4.500	2865	550	37.1	1.5°
		12.00	4	90	0.058	18.000	5.400	2385	553	53.8	1.5°
		16.00	4	90	0.060	24.000	7.200	1790	430	74.3	1.5°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	4	116	0.012	3.000	3.000	12310	591	5.3	1.5°
		4.00	4	116	0.023	4.000	4.000	9230	849	13.6	1.5°
		5.00	4	116	0.018	7.500	5.000	7385	532	19.9	1.5°
		6.00	4	116	0.029	9.000	6.000	6155	714	38.6	1.5°
		8.00	4	116	0.039	12.000	8.000	4615	720	69.1	1.5°
		10.00	4	116	0.049	15.000	10.000	3690	723	108.5	1.5°
		12.00	4	116	0.055	18.000	12.000	3075	677	146.1	1.5°
		16.00	4	116	0.062	24.000	16.000	2310	573	220.0	1.5°
	Steel 850 - 1100 N/mm²	3.00	4	101	0.008	4.500	3.000	10715	343	4.6	2.0°
		4.00	4	101	0.013	6.000	4.000	8035	418	10.0	2.0°
		5.00	4	101	0.016	7.500	5.000	6430	412	15.4	2.0°
		6.00	4	101	0.025	9.000	6.000	5360	536	28.9	2.0°
		8.00	4	101	0.034	12.000	8.000	4020	547	52.5	2.0°
		10.00	4	101	0.042	15.000	10.000	3215	540	81.0	2.0°
		12.00	4	101	0.051	18.000	12.000	2680	547	118.1	2.0°
		16.00	4	101	0.057	24.000	16.000	2010	458	176.0	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	68	0.005	4.500	3.000	7215	144	1.9	1.5°
		4.00	4	68	0.008	6.000	4.000	5410	173	4.2	1.5°
		5.00	4	68	0.009	7.500	5.000	4330	156	5.8	1.5°
		6.00	4	68	0.018	9.000	6.000	3610	260	14.0	1.5°
		8.00	4	68	0.023	12.000	8.000	2705	249	23.9	1.5°
		10.00	4	68	0.029	15.000	10.000	2165	251	37.7	1.5°
		12.00	4	68	0.035	18.000	12.000	1805	253	54.6	1.5°
		16.00	4	68	0.036	24.000	16.000	1355	195	74.9	1.5°





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills E-Cut

Smooth-edged, short version

l_2=1.5xd_1

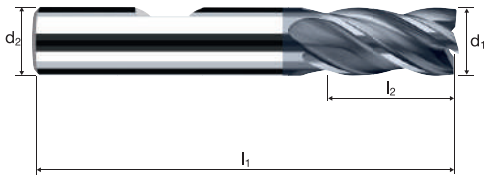
HM MG10

λ 37° γ 6°

new!

r

Vario



Roughing HPC

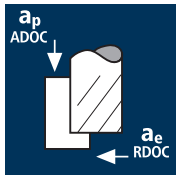
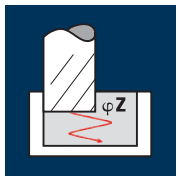
Finishing

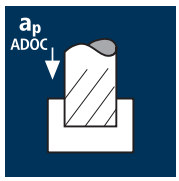
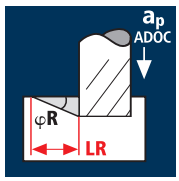
ReTool®

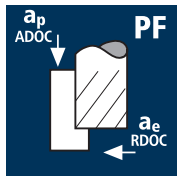
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

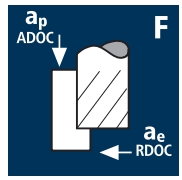
Example: **Order-N°.** Coating **P** Article-N°. **8408** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r	z	POLYCHROM P8408	POLYCHROM P8308
180	3.00	6.00	50	4.50	10.45	0.050	4		●
200	3.50	6.00	50	5.30	11.25	0.050	4		●
220	4.00	6.00	50	6.00	12.04	0.100	4		●
240	4.50	6.00	50	6.80	12.81	0.100	4		●
260	5.00	6.00	51	7.50	13.37	0.100	4		●
300	6.00	6.00	51	9.00	-	0.100	4		●
391	8.00	8.00	55	12.00	-	0.150	4		●
450	10.00	10.00	63	15.00	-	0.200	4		●
501	12.00	12.00	73	18.00	-	0.200	4		●
610	16.00	16.00	85	24.00	-	0.200	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	1.00	3	123	0.003	1.500	0.700	39150	352	0.4	2.0°
		2.00	3	145	0.008	3.000	1.400	23075	554	2.3	2.0°
		3.00	3	145	0.024	4.500	2.100	15385	1108	10.5	2.0°
		4.00	3	145	0.031	6.000	2.800	11540	1073	18.0	2.0°
		5.00	3	145	0.037	7.500	3.500	9230	1025	26.9	2.0°
		6.00	3	145	0.046	9.000	4.200	7690	1061	40.1	2.0°
		8.00	3	145	0.060	12.000	5.600	5770	1039	69.8	2.0°
		10.00	3	145	0.076	15.000	7.000	4615	1052	110.5	2.0°
	Steel 850 - 1100 N/mm²	1.00	3	106	0.003	1.500	0.700	33740	304	0.3	3.0°
		2.00	3	125	0.009	3.000	1.400	19895	537	2.3	3.0°
		3.00	3	125	0.023	4.500	2.100	13265	915	8.6	3.0°
		4.00	3	125	0.028	6.000	2.800	9945	835	14.0	3.0°
		5.00	3	125	0.032	7.500	3.500	7960	764	20.1	3.0°
		6.00	3	125	0.039	9.000	4.200	6630	776	29.3	3.0°
		8.00	3	125	0.052	12.000	5.600	4975	776	52.1	3.0°
		10.00	3	125	0.066	15.000	7.000	3980	788	82.7	3.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	3	72	0.002	1.500	0.700	22920	138	0.1	2.0°
		2.00	3	80	0.007	3.000	1.400	12730	267	1.1	2.0°
		3.00	3	80	0.016	4.500	2.100	8490	408	3.9	2.0°
		4.00	3	80	0.019	6.000	2.800	6365	363	6.1	2.0°
		5.00	3	80	0.024	7.500	3.500	5095	367	9.6	2.0°
		6.00	3	80	0.030	9.000	4.200	4245	382	14.4	2.0°
		8.00	3	80	0.040	12.000	5.600	3185	382	25.7	2.0°
		10.00	3	80	0.050	15.000	7.000	2545	382	40.1	2.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	1.00	3	105	0.002	1.000	1.000	33425	201	0.2	2.0°
		2.00	3	123	0.009	2.000	2.000	19575	529	2.1	2.0°
		3.00	3	123	0.026	3.000	3.000	13050	1018	9.2	2.0°
		4.00	3	123	0.040	4.000	4.000	9790	1175	18.8	2.0°
		5.00	3	123	0.031	7.500	5.000	7830	728	27.3	2.0°
		6.00	3	123	0.040	9.000	6.000	6525	783	42.3	2.0°
		8.00	3	123	0.052	12.000	8.000	4895	764	73.3	2.0°
		10.00	3	123	0.065	15.000	10.000	3915	763	114.5	2.0°
	Steel 850 - 1100 N/mm²	1.00	3	90	0.002	1.000	1.000	28650	172	0.2	2.0°
		2.00	3	106	0.009	2.000	2.000	16870	455	1.8	2.0°
		3.00	3	106	0.016	4.500	3.000	11245	540	7.3	2.0°
		4.00	3	106	0.024	6.000	4.000	8435	607	14.6	2.0°
		5.00	3	106	0.027	7.500	5.000	6750	547	20.5	2.0°
		6.00	3	106	0.034	9.000	6.000	5625	574	31.0	2.0°
		8.00	3	106	0.046	12.000	8.000	4220	582	55.9	2.0°
		10.00	3	106	0.056	15.000	10.000	3375	567	85.1	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	3	61	0.002	1.000	1.000	19415	116	0.1	2.0°
		2.00	3	68	0.008	2.000	2.000	10825	260	1.0	2.0°
		3.00	3	68	0.011	4.500	3.000	7215	238	3.2	2.0°
		4.00	3	68	0.016	6.000	4.000	5410	260	6.2	2.0°
		5.00	3	68	0.021	7.500	5.000	4330	273	10.2	2.0°
		6.00	3	68	0.026	9.000	6.000	3610	282	15.2	2.0°
		8.00	3	68	0.035	12.000	8.000	2705	284	27.3	2.0°
		10.00	3	68	0.043	15.000	10.000	2165	279	41.9	2.0°





Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

Cylindrical/Square end mills E-Cut

Smooth-edged, short version

$l_2=1.5xd_1$

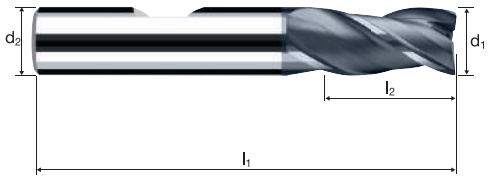
HM MG10

λ 40°
γ 6°

new!

r

Vario



Roughing HPC

Finishing

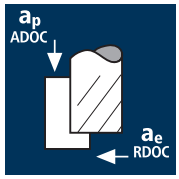
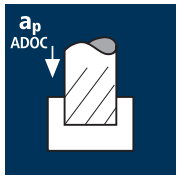
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8409** ø-Code **100**

	POLYCHROM
	P8409
	P8309

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r	z		
100	1.00	6.00	50	1.50	8.07	0.050	3		●
120	1.50	6.00	50	2.30	8.83	0.050	3		●
140	2.00	6.00	50	3.00	9.46	0.050	3		●
160	2.50	6.00	50	3.80	10.19	0.050	3		●
180	3.00	6.00	50	4.50	10.45	0.050	3		●
200	3.50	6.00	50	5.30	11.25	0.050	3		●
220	4.00	6.00	50	6.00	12.04	0.100	3		●
240	4.50	6.00	50	6.80	12.81	0.100	3		●
260	5.00	6.00	51	7.50	13.37	0.100	3		●
300	6.00	6.00	51	9.00	-	0.100	3		●
391	8.00	8.00	55	12.00	-	0.150	3		●
450	10.00	10.00	63	15.00	-	0.200	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	170	0.020	3.000	1.400	18040	1443	6.1
		4.00	4	170	0.025	4.000	1.800	13530	1353	9.7
		5.00	4	170	0.035	5.000	2.300	10825	1516	17.4
		6.00	4	170	0.040	6.000	2.700	9020	1443	23.4
		8.00	4	170	0.055	8.000	3.600	6765	1488	42.9
		10.00	4	170	0.070	10.000	4.500	5410	1515	68.2
		12.00	4	170	0.075	12.000	5.400	4510	1353	87.7
		16.00	4	170	0.100	16.000	4.000	3380	1352	86.5
	Steel 850 - 1100 N/mm²	3.00	4	140	0.020	3.000	1.400	14855	1188	5.0
		4.00	4	140	0.025	4.000	1.800	11140	1114	8.0
		5.00	4	140	0.035	5.000	2.300	8915	1248	14.4
		6.00	4	140	0.040	6.000	2.700	7425	1188	19.2
		8.00	4	140	0.055	8.000	3.600	5570	1225	35.3
		10.00	4	140	0.070	10.000	4.500	4455	1247	56.1
		12.00	4	140	0.075	12.000	5.400	3715	1115	72.2
		16.00	4	140	0.100	16.000	4.000	2785	1114	71.3
	Cold work tool steel (12% Cr) high alloyed [1.2379]	3.00	4	70	0.020	3.000	1.400	7425	594	2.5
		4.00	4	70	0.025	4.000	1.800	5570	557	4.0
		5.00	4	70	0.030	5.000	2.300	4455	535	6.1
		6.00	4	70	0.040	6.000	2.700	3715	594	9.6
		8.00	4	70	0.050	8.000	3.600	2785	557	16.0
		10.00	4	70	0.065	10.000	4.500	2230	580	26.1
		12.00	4	70	0.075	12.000	5.400	1855	557	36.1
		16.00	4	70	0.095	16.000	4.000	1395	530	33.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	90	0.015	3.000	1.400	9550	573	2.4
		4.00	4	90	0.020	4.000	1.800	7160	573	4.1
		5.00	4	90	0.020	5.000	2.300	5730	458	5.3
		6.00	4	90	0.030	6.000	2.700	4775	573	9.3
		8.00	4	90	0.035	8.000	3.600	3580	501	14.4
		10.00	4	90	0.045	10.000	4.500	2865	516	23.2
		12.00	4	90	0.055	12.000	5.400	2385	525	34.0
		16.00	4	90	0.065	16.000	4.000	1790	465	29.8
	Steel < 850 N/mm²	3.00	4	135	0.015	2.400	3.000	14325	860	6.2
		4.00	4	135	0.020	3.200	4.000	10745	860	11.0
		5.00	4	135	0.030	4.000	5.000	8595	1031	20.6
		6.00	4	135	0.035	4.800	6.000	7160	1002	28.9
		8.00	4	135	0.045	6.400	8.000	5370	967	49.5
		10.00	4	135	0.055	8.000	10.000	4295	945	75.6
		12.00	4	135	0.060	9.600	12.000	3580	859	99.0
		16.00	4	135	0.075	6.600	16.000	2685	806	85.1
	Steel 850 - 1100 N/mm²	3.00	4	105	0.015	2.400	3.000	11140	668	4.8
		4.00	4	105	0.020	3.200	4.000	8355	668	8.6
		5.00	4	105	0.030	4.000	5.000	6685	802	16.0
		6.00	4	105	0.035	4.800	6.000	5570	780	22.5
		8.00	4	105	0.045	6.400	8.000	4180	752	38.5
		10.00	4	105	0.055	8.000	10.000	3340	735	58.8
		12.00	4	105	0.060	9.600	12.000	2785	668	77.0
		16.00	4	105	0.075	6.400	16.000	2090	627	64.2
	Cold work tool steel (12% Cr) high alloyed [1.2379]	3.00	4	55	0.015	2.400	3.000	5835	350	2.5
		4.00	4	55	0.020	3.200	4.000	4375	350	4.5
		5.00	4	55	0.030	4.000	5.000	3500	420	8.4
		6.00	4	55	0.035	3.000	6.000	2920	409	7.4
		8.00	4	55	0.045	4.000	8.000	2190	394	12.6
		10.00	4	55	0.055	5.000	10.000	1750	385	19.3
		12.00	4	55	0.060	6.000	12.000	1460	350	25.2
		16.00	4	55	0.075	4.000	16.000	1095	329	21.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	70	0.010	2.400	3.000	7425	297	2.1
		4.00	4	70	0.015	3.200	4.000	5570	334	4.3
		5.00	4	70	0.025	4.000	5.000	4455	446	8.9
		6.00	4	70	0.030	4.800	6.000	3715	446	12.8
		8.00	4	70	0.035	6.400	8.000	2785	390	20.0
		10.00	4	70	0.045	8.000	10.000	2230	401	32.1
		12.00	4	70	0.050	9.600	12.000	1855	371	42.7
		16.00	4	70	0.060	6.400	16.000	1395	335	34.3

Cylindrical/Square end mills

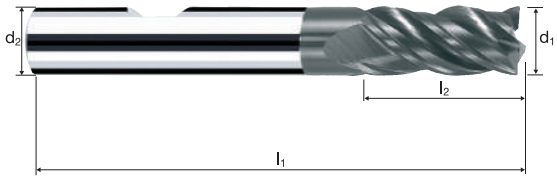
Smooth-edged, short version

HM
MG10

λ 40°
γ 0°

45°

Vario



Roughing

Finishing

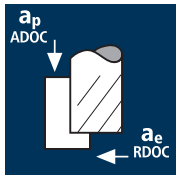
ToolSchool P8308 / P8408 P8309 / P8409

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **5329** ø-Code **180**

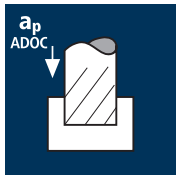
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z		POLYCHROM P5329	P5229
180	3.00	6.00	50	6.00	13.56	0.05	4			●
220	4.00	6.00	50	8.00	14.09	0.05	4			●
260	5.00	6.00	50	9.00	13.22	0.10	4			●
300	6.00	6.00	50	10.00	-	0.10	4			●
391	8.00	8.00	54	13.00	-	0.10	4			●
450	10.00	10.00	63	16.00	-	0.15	4			●
501	12.00	12.00	73	19.00	-	0.15	4			●
610	16.00	16.00	82	25.00	-	0.15	4			●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
Steel < 850 N/mm²	1.50	3	170	0.010	1.800	0.200	36075	1082
	2.00	3	170	0.015	2.400	0.200	27055	1218
	2.50	3	170	0.015	3.000	0.300	21645	974
	3.00	3	170	0.020	3.600	0.300	18040	1082
	4.00	3	170	0.025	4.800	0.400	13530	1015
	5.00	3	170	0.035	6.000	0.500	10825	1137
	6.00	3	170	0.040	7.200	0.600	9020	1082
	8.00	3	170	0.055	9.600	0.800	6765	1116
	10.00	3	170	0.065	12.000	1.000	5410	1055
Steel 850 - 1100 N/mm²	1.50	3	130	0.010	1.800	0.200	27585	828
	2.00	3	130	0.015	2.400	0.200	20690	931
	2.50	3	130	0.015	3.000	0.300	16550	745
	3.00	3	130	0.020	3.600	0.300	13795	828
	4.00	3	130	0.025	4.800	0.400	10345	776
	5.00	3	130	0.035	6.000	0.500	8275	869
	6.00	3	130	0.040	7.200	0.600	6895	827
	8.00	3	130	0.050	9.600	0.800	5175	776
	10.00	3	130	0.060	12.000	1.000	4140	745
Titanium alloys >300 HB [Ti6Al4V]	1.50	3	50	0.005	1.800	0.200	10610	159
	2.00	3	50	0.010	2.400	0.200	7960	239
	2.50	3	50	0.010	3.000	0.300	6365	191
	3.00	3	50	0.010	3.600	0.300	5305	159
	4.00	3	50	0.015	4.800	0.400	3980	179
	5.00	3	50	0.020	6.000	0.500	3185	191
	6.00	3	50	0.020	7.200	0.600	2655	159
	8.00	3	50	0.030	9.600	0.800	1990	179
	10.00	3	50	0.035	12.000	1.000	1590	167
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.50	3	80	0.005	1.800	0.200	16975	255
	2.00	3	80	0.010	2.400	0.200	12730	382
	2.50	3	80	0.010	3.000	0.300	10185	306
	3.00	3	80	0.015	3.600	0.300	8490	382
	4.00	3	80	0.020	4.800	0.400	6365	382
	5.00	3	80	0.025	6.000	0.500	5095	382
	6.00	3	80	0.030	7.200	0.600	4245	382
	8.00	3	80	0.040	9.600	0.800	3185	382
	10.00	3	80	0.045	12.000	1.000	2545	344

Application



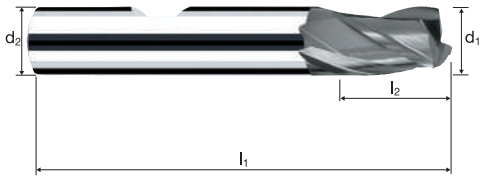
Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel < 850 N/mm²	1.50	3	130	0.010	0.600	1.500	27585	828	0.7
	2.00	3	130	0.010	0.800	2.000	20690	621	1.0
	2.50	3	130	0.015	1.000	2.500	16550	745	1.9
	3.00	3	130	0.015	1.200	3.000	13795	621	2.2
	4.00	3	130	0.020	1.600	4.000	10345	621	4.0
	5.00	3	130	0.030	2.000	5.000	8275	745	7.4
	6.00	3	130	0.035	2.400	6.000	6895	724	10.4
	8.00	3	130	0.045	3.200	8.000	5175	699	17.9
	10.00	3	130	0.055	4.000	10.000	4140	683	27.3
Steel 850 - 1100 N/mm²	1.50	3	85	0.010	0.600	1.500	18040	541	0.5
	2.00	3	85	0.010	0.800	2.000	13530	406	0.6
	2.50	3	85	0.015	1.000	2.500	10825	487	1.2
	3.00	3	85	0.015	1.200	3.000	9020	406	1.5
	4.00	3	85	0.020	1.600	4.000	6765	406	2.6
	5.00	3	85	0.030	2.000	5.000	5410	487	4.9
	6.00	3	85	0.035	2.400	6.000	4510	474	6.8
	8.00	3	85	0.045	3.200	8.000	3380	456	11.7
	10.00	3	85	0.050	4.000	10.000	2705	406	16.2
Titanium alloys >300 HB [Ti6Al4V]	1.50	3	40	0.005	0.600	1.500	8490	127	0.1
	2.00	3	40	0.005	0.800	2.000	6365	96	0.2
	2.50	3	40	0.010	1.000	2.500	5095	153	0.4
	3.00	3	40	0.010	1.200	3.000	4245	127	0.5
	4.00	3	40	0.010	1.600	4.000	3185	96	0.6
	5.00	3	40	0.015	2.000	5.000	2545	115	1.1
	6.00	3	40	0.020	2.400	6.000	2120	127	1.8
	8.00	3	40	0.025	3.200	8.000	1590	119	3.1
	10.00	3	40	0.030	4.000	10.000	1275	115	4.6
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.50	3	55	0.005	0.600	1.500	11670	175	0.2
	2.00	3	55	0.005	0.800	2.000	8755	131	0.2
	2.50	3	55	0.010	1.000	2.500	7005	210	0.5
	3.00	3	55	0.010	1.200	3.000	5835	175	0.6
	4.00	3	55	0.015	1.600	4.000	4375	197	1.3
	5.00	3	55	0.020	2.000	5.000	3500	210	2.1
	6.00	3	55	0.025	2.400	6.000	2920	219	3.2
	8.00	3	55	0.030	3.200	8.000	2190	197	5.0
	10.00	3	55	0.040	4.000	10.000	1750	210	8.4

Cylindrical/Square end mills

Smooth-edged, short version

HM MG10 | λ 30° γ 12°

90°



Roughing

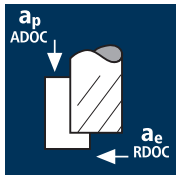
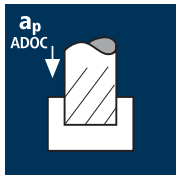
Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **5036** ø-Code **120**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	POLYCHROM P5036
120	1.50	6.00	50	5.00	13.92	3	●
140	2.00	6.00	50	5.00	13.15	3	●
160	2.50	6.00	50	5.00	12.88	3	●
180	3.00	6.00	50	6.00	13.96	3	●
200	3.50	6.00	50	8.00	14.34	3	●
220	4.00	6.00	50	8.00	14.59	3	●
240	4.50	6.00	50	8.00	13.66	3	●
260	5.00	6.00	50	9.00	13.72	3	●
300	6.00	6.00	50	10.00	-	3	●
331	7.00	8.00	54	10.00	14.72	3	●
391	8.00	8.00	54	12.00	-	3	●
420	9.00	10.00	63	12.00	16.72	3	●
450	10.00	10.00	63	13.00	-	3	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	140	0.045	9.000	2.400	7427	1337	28.9
		8.00	4	140	0.059	12.000	3.200	5570	1315	50.5
		10.00	4	140	0.075	15.000	4.000	4456	1337	80.2
		12.00	4	140	0.084	18.000	4.800	3714	1248	107.8
		16.00	4	140	0.095	24.000	6.400	2785	1058	162.6
		20.00	4	140	0.109	30.000	8.000	2228	971	233.2
	Steel 850 - 1100 N/mm²	6.00	4	120	0.039	9.000	2.400	6366	993	21.5
		8.00	4	120	0.052	12.000	3.200	4775	993	38.1
		10.00	4	120	0.065	15.000	4.000	3820	993	59.6
		12.00	4	120	0.077	18.000	4.800	3183	980	84.7
		16.00	4	120	0.087	24.000	6.400	2387	831	127.6
		20.00	4	120	0.099	30.000	8.000	1910	756	181.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	80	0.026	9.000	2.400	4244	441	9.5
		8.00	4	80	0.035	12.000	3.200	3183	446	17.1
		10.00	4	80	0.045	15.000	4.000	2546	458	27.5
		12.00	4	80	0.054	18.000	4.800	2122	458	39.6
		16.00	4	80	0.055	24.000	6.400	1592	350	53.8
		20.00	4	80	0.069	30.000	8.000	1273	351	84.3
	Cast iron (lamellar / spheroidal)	6.00	4	155	0.042	9.000	2.400	8223	1381	29.8
		8.00	4	155	0.055	12.000	3.200	6167	1357	52.1
		10.00	4	155	0.069	15.000	4.000	4934	1362	81.7
		12.00	4	155	0.084	18.000	4.800	4112	1381	119.4
		16.00	4	155	0.095	24.000	6.400	3084	1172	180.0
		20.00	4	155	0.109	30.000	8.000	2467	1076	258.1
	Steel 500 - 850 N/mm²	6.00	4	105	0.029	9.000	6.000	5570	646	34.9
		8.00	4	105	0.038	12.000	8.000	4178	635	61.0
		10.00	4	105	0.049	15.000	10.000	3342	655	98.3
		12.00	4	105	0.055	18.000	12.000	2785	613	132.4
		16.00	4	105	0.062	24.000	16.000	2089	518	198.9
		20.00	4	105	0.071	30.000	20.000	1671	475	284.8
	Steel 850 - 1100 N/mm²	6.00	4	90	0.025	9.000	6.000	4775	477	25.8
		8.00	4	90	0.034	12.000	8.000	3581	487	46.8
		10.00	4	90	0.042	15.000	10.000	2865	481	72.2
		12.00	4	90	0.050	18.000	12.000	2387	477	103.1
		16.00	4	90	0.057	24.000	16.000	1790	408	156.8
		20.00	4	90	0.064	30.000	20.000	1432	367	220.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	60	0.017	9.000	6.000	3183	216	11.7
		8.00	4	60	0.023	12.000	8.000	2387	220	21.1
		10.00	4	60	0.029	15.000	10.000	1910	222	33.2
		12.00	4	60	0.035	18.000	12.000	1592	223	48.1
		16.00	4	60	0.036	24.000	16.000	1194	172	66.0
		20.00	4	60	0.045	30.000	20.000	955	172	103.1
	Cast iron (lamellar / spheroidal)	6.00	4	116	0.027	9.000	6.000	6154	665	35.9
		8.00	4	116	0.036	12.000	8.000	4615	665	63.8
		10.00	4	116	0.045	15.000	10.000	3692	665	99.7
		12.00	4	116	0.055	18.000	12.000	3077	677	146.2
		16.00	4	116	0.062	24.000	16.000	2308	572	219.8
		20.00	4	116	0.071	30.000	20.000	1846	524	314.6

Cylindrical/Square end mills

Smooth-edged, short version

Favora® F

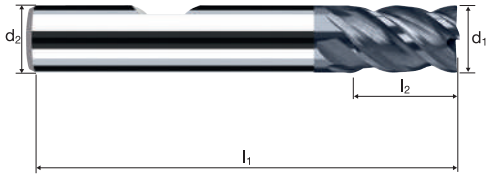
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HM MG10

λ 43°
γ 3°

new!

r



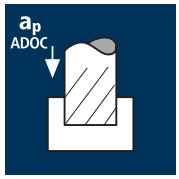
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **45368** ø-Code **300**

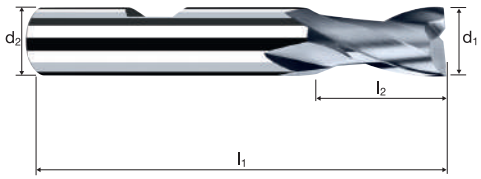
Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z	POLYCHROM P45368	POLYCHROM P45268
300	6.00	6.00	51	9.00	0.150	4		●
391	8.00	8.00	55	12.00	0.150	4		●
450	10.00	10.00	63	15.00	0.200	4		●
501	12.00	12.00	73	18.00	0.200	4		●
610	16.00	16.00	85	24.00	0.200	4		●
682	20.00	20.00	95	30.00	0.250	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min-1]	v_f [mm/min]
	Steel 500 - 850 N/mm²	1.00	2	40	0.002	0.500	1.000	12730	51
		2.00	2	40	0.004	1.000	2.000	6365	51
		3.00	2	40	0.006	1.500	3.000	4245	51
		4.00	2	40	0.008	2.000	4.000	3185	51
		5.00	2	40	0.012	2.500	5.000	2545	61
		6.00	2	40	0.014	3.000	6.000	2120	59
		8.00	2	40	0.018	4.000	8.000	1590	57
		9.00	2	40	0.020	4.500	9.000	1415	57
		10.00	2	40	0.022	5.000	10.000	1275	56
	Steel 850 - 1100 N/mm²	1.00	2	36	0.002	0.500	1.000	11460	46
		2.00	2	36	0.004	1.000	2.000	5730	46
		3.00	2	36	0.006	1.500	3.000	3820	46
		4.00	2	36	0.008	2.000	4.000	2865	46
		5.00	2	36	0.012	2.500	5.000	2290	55
		6.00	2	36	0.014	3.000	6.000	1910	54
		8.00	2	36	0.018	4.000	8.000	1430	52
		9.00	2	36	0.020	4.500	9.000	1275	51
		10.00	2	36	0.022	5.000	10.000	1145	50
	Steel 1100 - 1300 N/mm²	1.00	2	28	0.002	0.500	1.000	8915	36
		2.00	2	28	0.004	1.000	2.000	4455	36
		3.00	2	28	0.006	1.500	3.000	2970	36
		4.00	2	28	0.008	2.000	4.000	2230	36
		5.00	2	28	0.012	2.500	5.000	1785	43
		6.00	2	28	0.014	3.000	6.000	1485	42
		8.00	2	28	0.018	4.000	8.000	1115	40
		9.00	2	28	0.020	4.500	9.000	990	40
		10.00	2	28	0.022	5.000	10.000	890	39
	Cold work tool steel (12%Cr) high alloyed [1.2379]	1.00	2	25	0.002	0.500	1.000	7960	32
		2.00	2	25	0.004	1.000	2.000	3980	32
		3.00	2	25	0.006	1.500	3.000	2655	32
		4.00	2	25	0.008	2.000	4.000	1990	32
		5.00	2	25	0.012	2.500	5.000	1590	38
		6.00	2	25	0.014	3.000	6.000	1325	37
		8.00	2	25	0.018	4.000	8.000	995	36
		9.00	2	25	0.020	4.500	9.000	885	35
		10.00	2	25	0.022	5.000	10.000	795	35
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	18	0.002	0.500	1.000	5730	23
		2.00	2	18	0.004	1.000	2.000	2865	23
		3.00	2	18	0.006	1.500	3.000	1910	23
		4.00	2	18	0.008	2.000	4.000	1430	23
		5.00	2	18	0.012	2.500	5.000	1145	28
		6.00	2	18	0.014	3.000	6.000	955	27
		8.00	2	18	0.018	4.000	8.000	715	26
		9.00	2	18	0.020	4.500	9.000	635	25
		10.00	2	18	0.022	5.000	10.000	575	25
	Cast iron (lamellar / spheroidal)	1.00	2	34	0.002	0.500	1.000	10825	43
		2.00	2	34	0.004	1.000	2.000	5410	43
		3.00	2	34	0.006	1.500	3.000	3610	43
		4.00	2	34	0.008	2.000	4.000	2705	43
		5.00	2	34	0.012	2.500	5.000	2165	52
		6.00	2	34	0.014	3.000	6.000	1805	51
		8.00	2	34	0.018	4.000	8.000	1355	49
		9.00	2	34	0.020	4.500	9.000	1205	48
		10.00	2	34	0.022	5.000	10.000	1080	48
	Wrought aluminium Construction aluminium	1.00	2	100	0.002	0.500	1.000	31830	127
		2.00	2	100	0.004	1.000	2.000	15915	127
		3.00	2	100	0.006	1.500	3.000	10610	127
		4.00	2	100	0.008	2.000	4.000	7960	127
		5.00	2	100	0.012	2.500	5.000	6365	153
		6.00	2	100	0.014	3.000	6.000	5305	149
		8.00	2	100	0.018	4.000	8.000	3980	143
		9.00	2	100	0.020	4.500	9.000	3535	141
		10.00	2	100	0.022	5.000	10.000	3185	140
	Unalloyed copper	1.00	2	80	0.002	0.500	1.000	25465	102
		2.00	2	80	0.004	1.000	2.000	12730	102
		3.00	2	80	0.006	1.500	3.000	8490	102
		4.00	2	80	0.008	2.000	4.000	6365	102
		5.00	2	80	0.012	2.500	5.000	5095	122
		6.00	2	80	0.014	3.000	6.000	4245	119
		8.00	2	80	0.018	4.000	8.000	3185	115
		9.00	2	80	0.020	4.500	9.000	2830	113
		10.00	2	80	0.022	5.000	10.000	2545	112

Cylindrical/Square end mills

Smooth-edged, short version

HSS-E Co8	λ 25° γ 12°
90°	



Roughing

Finishing

ReTool®

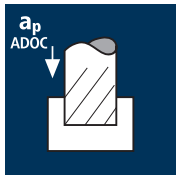
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0701** ø-Code **100**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0701
100	1.00	6.00	47	2.50	11.00	2		●
120	1.50	6.00	47	3.00	11.00	2		●
140*	2.00	6.00	48	4.00	12.00	2		●
160	2.50	6.00	49	5.00	13.00	2		●
180*	3.00	6.00	49	5.00	13.00	2		●
200	3.50	6.00	50	6.00	14.00	2		●
220*	4.00	6.00	51	7.00	15.00	2		●
240	4.50	6.00	51	7.00	15.00	2		●
260*	5.00	6.00	52	8.00	16.00	2		●
280	5.50	6.00	52	8.00	16.00	2		●
300*	6.00	6.00	52	8.00	-	2		●
322	6.50	10.00	60	10.00	20.00	2		●
331	7.00	10.00	60	10.00	20.00	2		●
362	7.50	10.00	60	10.00	20.00	2		●
391*	8.00	10.00	61	11.00	21.00	2		●
410	8.50	10.00	61	11.00	21.00	2		●
420	9.00	10.00	61	11.00	21.00	2		●
440	9.70	10.00	63	13.00	23.00	2		●
450*	10.00	10.00	63	13.00	-	2		●
460	10.50	12.00	70	13.00	25.00	2		●

* d1 tolerance for keyway P9

Application

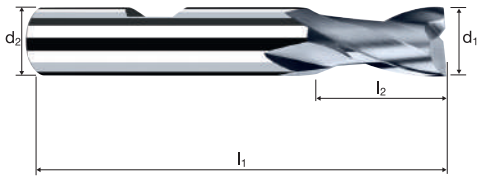


Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min-1]	v_f [mm/min]
Steel 500 - 850 N/mm²	11.00	2	40	0.024	5.500	11.000	1155	55
	12.00	2	40	0.026	6.000	12.000	1060	55
	13.00	2	40	0.028	6.500	13.000	980	55
	14.00	2	40	0.032	7.000	14.000	910	58
	16.00	2	40	0.036	8.000	16.000	795	57
	18.00	2	40	0.040	9.000	18.000	705	56
	20.00	2	40	0.044	10.000	20.000	635	56
	22.00	2	40	0.048	11.000	22.000	580	56
	25.00	2	40	0.056	12.500	25.000	510	57
Steel 850 - 1100 N/mm²	11.00	2	36	0.024	5.500	11.000	1040	50
	12.00	2	36	0.026	6.000	12.000	955	50
	13.00	2	36	0.028	6.500	13.000	880	49
	14.00	2	36	0.032	7.000	14.000	820	53
	16.00	2	36	0.036	8.000	16.000	715	52
	18.00	2	36	0.040	9.000	18.000	635	51
	20.00	2	36	0.044	10.000	20.000	575	51
	22.00	2	36	0.048	11.000	22.000	520	50
	25.00	2	36	0.056	12.500	25.000	460	52
Steel 1100 - 1300 N/mm²	11.00	2	28	0.024	5.500	11.000	810	39
	12.00	2	28	0.026	6.000	12.000	745	39
	13.00	2	28	0.028	6.500	13.000	685	38
	14.00	2	28	0.032	7.000	14.000	635	41
	16.00	2	28	0.036	8.000	16.000	555	40
	18.00	2	28	0.040	9.000	18.000	495	40
	20.00	2	28	0.044	10.000	20.000	445	39
	22.00	2	28	0.048	11.000	22.000	405	39
	25.00	2	28	0.056	12.500	25.000	355	40
Cold work tool steel (12%Cr) high alloyed [1.2379]	11.00	2	25	0.024	5.500	11.000	725	35
	12.00	2	25	0.026	6.000	12.000	665	35
	13.00	2	25	0.028	6.500	13.000	610	34
	14.00	2	25	0.032	7.000	14.000	570	37
	16.00	2	25	0.036	8.000	16.000	495	36
	18.00	2	25	0.040	9.000	18.000	440	35
	20.00	2	25	0.044	10.000	20.000	400	35
	22.00	2	25	0.048	11.000	22.000	360	35
	25.00	2	25	0.056	12.500	25.000	320	36
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	11.00	2	18	0.024	5.500	11.000	520	25
	12.00	2	18	0.026	6.000	12.000	475	25
	13.00	2	18	0.028	6.500	13.000	440	25
	14.00	2	18	0.032	7.000	14.000	410	26
	16.00	2	18	0.036	8.000	16.000	360	26
	18.00	2	18	0.040	9.000	18.000	320	26
	20.00	2	18	0.044	10.000	20.000	285	25
	22.00	2	18	0.048	11.000	22.000	260	25
	25.00	2	18	0.056	12.500	25.000	230	26
Cast iron (lamellar / spheroidal)	11.00	2	34	0.024	5.500	11.000	985	47
	12.00	2	34	0.026	6.000	12.000	900	47
	13.00	2	34	0.028	6.500	13.000	835	47
	14.00	2	34	0.032	7.000	14.000	775	50
	16.00	2	34	0.036	8.000	16.000	675	49
	18.00	2	34	0.040	9.000	18.000	600	48
	20.00	2	34	0.044	10.000	20.000	540	48
	22.00	2	34	0.048	11.000	22.000	490	47
	25.00	2	34	0.056	12.500	25.000	435	49
Wrought aluminium Construction aluminium	11.00	2	100	0.024	5.500	11.000	2895	139
	12.00	2	100	0.026	6.000	12.000	2655	138
	13.00	2	100	0.028	6.500	13.000	2450	137
	14.00	2	100	0.032	7.000	14.000	2275	146
	16.00	2	100	0.036	8.000	16.000	1990	143
	18.00	2	100	0.040	9.000	18.000	1770	142
	20.00	2	100	0.044	10.000	20.000	1590	140
	22.00	2	100	0.048	11.000	22.000	1445	139
	25.00	2	100	0.056	12.500	25.000	1275	143
Unalloyed copper	11.00	2	80	0.024	5.500	11.000	2315	111
	12.00	2	80	0.026	6.000	12.000	2120	110
	13.00	2	80	0.028	6.500	13.000	1960	110
	14.00	2	80	0.032	7.000	14.000	1820	117
	16.00	2	80	0.036	8.000	16.000	1590	115
	18.00	2	80	0.040	9.000	18.000	1415	113
	20.00	2	80	0.044	10.000	20.000	1275	112
	22.00	2	80	0.048	11.000	22.000	1155	111
	25.00	2	80	0.056	12.500	25.000	1020	114

Cylindrical/Square end mills

Smooth-edged, short version

HSS-E Co8	λ 25° γ 12°
90°	



Roughing

Finishing

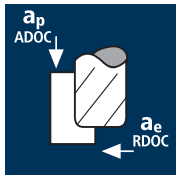
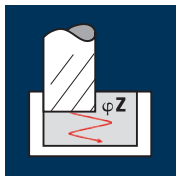
ReTool®

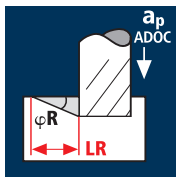
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0701** ø-Code **470**

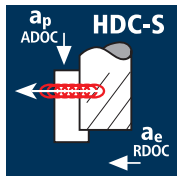
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	POLYCHROM P0701
470	11.00	12.00	70	13.00	25.00	2	●
501*	12.00	12.00	73	16.00	-	2	●
540	13.00	12.00	73	16.00	-	2	●
570*	14.00	12.00	73	16.00	-	2	●
581	15.00	12.00	73	16.00	-	2	●
610*	16.00	16.00	79	19.00	-	2	●
620	17.00	16.00	79	19.00	-	2	●
640*	18.00	16.00	79	19.00	-	2	●
650	19.00	16.00	79	19.00	-	2	●
682*	20.00	20.00	88	22.00	-	2	●
710*	22.00	20.00	88	22.00	-	2	●
772*	25.00	25.00	102	26.00	-	2	●

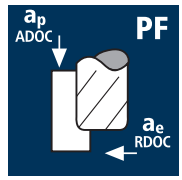
* d1 tolerance for keyway P9

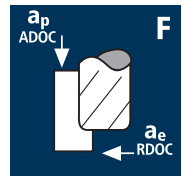
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Hardened tool steel 52 - 56 HRC H	3.00	4	60	0.012	4.500	1.800	6365	306	2.5	5.0°
		4.00	4	60	0.017	6.000	2.400	4775	325	4.7	5.0°
		5.00	4	60	0.022	7.500	3.000	3820	336	7.6	5.0°
		6.00	4	60	0.027	9.000	3.600	3185	344	11.1	5.0°
		8.00	4	60	0.035	12.000	4.800	2385	334	19.2	5.0°
		10.00	4	60	0.045	15.000	6.000	1910	344	30.9	5.0°
		12.00	4	60	0.055	18.000	7.200	1590	350	45.3	5.0°
		16.00	4	60	0.065	24.000	9.600	1195	311	71.6	5.0°
	Hardened tool steel > 60 HRC H	3.00	4	25	0.006	3.750	1.800	2655	64	0.4	3.0°
		4.00	4	25	0.008	5.000	2.400	1990	64	0.8	4.0°
		5.00	4	25	0.010	6.250	3.000	1590	64	1.2	5.0°
		6.00	4	25	0.012	7.500	3.600	1325	64	1.7	5.0°
		8.00	4	25	0.015	10.000	4.800	995	60	2.9	5.0°
		10.00	4	25	0.020	12.500	6.000	795	64	4.8	5.0°
		12.00	4	25	0.025	15.000	7.200	665	67	7.2	5.0°
		16.00	4	25	0.030	20.000	9.600	495	59	11.4	5.0°
	High speed steel, hardened 64 - 70 HRC H	3.00	4	15	0.005	3.000	0.750	1590	32	0.1	3.0°
		4.00	4	15	0.009	4.000	1.000	1195	43	0.2	4.0°
		5.00	4	15	0.012	5.000	1.250	955	46	0.3	5.0°
		6.00	4	15	0.009	6.000	3.600	795	29	0.6	5.0°
		8.00	4	15	0.012	8.000	4.800	595	29	1.1	5.0°
		10.00	4	15	0.015	10.000	6.000	475	29	1.7	5.0°
		12.00	4	15	0.018	12.000	7.200	400	29	2.5	5.0°
		16.00	4	15	0.023	16.000	9.600	300	28	4.2	5.0°

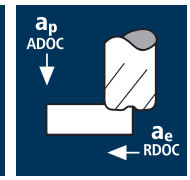
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Hardened tool steel 52 - 56 HRC H	3.00	4	50	0.013	3.000	3.000	5305	276	2.5	5.0°	34.3
		4.00	4	50	0.017	4.000	4.000	3980	271	4.3	5.0°	45.7
		5.00	4	50	0.022	5.000	5.000	3185	280	7.0	5.0°	57.2
		6.00	4	50	0.027	6.000	6.000	2655	287	10.3	5.0°	68.6
		8.00	4	50	0.035	8.000	8.000	1990	279	17.8	5.0°	91.4
		10.00	4	50	0.045	10.000	10.000	1590	286	28.6	5.0°	114.3
		12.00	4	50	0.055	12.000	12.000	1325	292	42.0	5.0°	137.2
		16.00	4	50	0.080	8.000	16.000	995	318	40.8	5.0°	91.4
	Hardened tool steel > 60 HRC H	3.00	4	20	0.007	3.000	3.000	2120	59	0.5	3.0°	57.2
		4.00	4	20	0.010	4.000	4.000	1590	64	1.0	4.0°	57.2
		5.00	4	20	0.013	5.000	5.000	1275	66	1.7	5.0°	57.2
		6.00	4	20	0.016	6.000	6.000	1060	68	2.4	5.0°	68.6
		8.00	4	20	0.021	8.000	8.000	795	67	4.3	5.0°	91.4
		10.00	4	20	0.026	10.000	10.000	635	66	6.6	5.0°	114.3
		12.00	4	20	0.032	12.000	12.000	530	68	9.8	5.0°	137.2
		16.00	4	20	0.050	8.000	16.000	400	80	10.2	5.0°	91.4
	High speed steel, hardened 64 - 70 HRC H	3.00	4	10	0.004	1.500	3.000	1060	17	0.1	3.0°	28.6
		4.00	4	10	0.006	2.000	4.000	795	19	0.2	4.0°	28.6
		5.00	4	10	0.008	3.750	5.000	635	20	0.4	5.0°	42.9
		6.00	4	10	0.009	4.500	6.000	530	19	0.5	5.0°	51.4
		8.00	4	10	0.012	6.000	8.000	400	19	0.9	5.0°	68.6
		10.00	4	10	0.015	7.500	10.000	320	19	1.4	5.0°	85.7
		12.00	4	10	0.020	9.000	12.000	265	21	2.3	5.0°	102.9
		16.00	4	10	0.030	8.000	16.000	200	24	3.1	5.0°	91.4

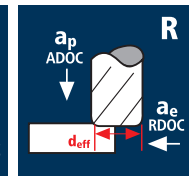
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

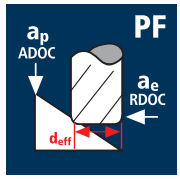


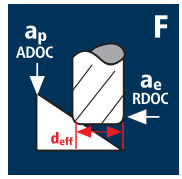


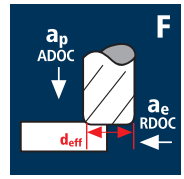


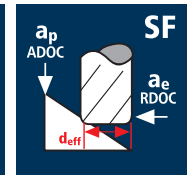










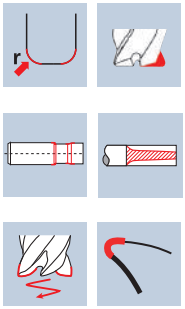


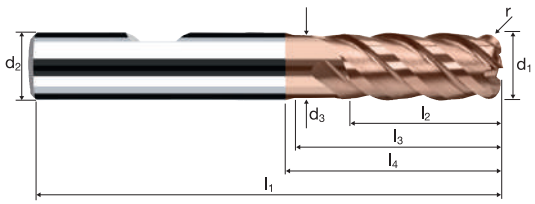
Corner radius end mills HX

Smooth-edged, normal version, short neck
High-performance penetration edge

HM XA

λ 45°
γ -10°





Roughing HPC

Roughing HDC

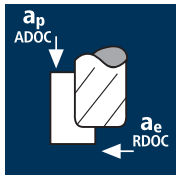
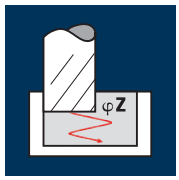
Finishing

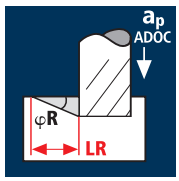
ReTool®

HRC 48-56 | **HRC 56-60** | **HRC > 60** | **HSS**

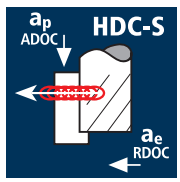
Example: **Order-N°.** Coating **H** Article-N°. **8607** ø-Code **178**

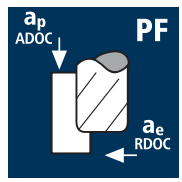
Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	DURO-Si H8607	DURO-Si H8507
178	3.00	6.00	2.80	57	8.00	14.00	20.37	0.200	4		●
218	4.00	6.00	3.70	57	11.00	16.00	20.82	0.200	4		●
258	5.00	6.00	4.60	57	13.00	18.00	21.27	0.200	4		●
297	6.00	6.00	5.50	57	13.00	18.15	20.00	0.200	4		●
385	8.00	8.00	7.40	63	19.00	23.63	26.00	0.200	4		●
445	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	4		●
496	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	4		●
605	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.500	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.500	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.500	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.500	4		●
388	8.00	8.00	7.40	63	19.00	23.63	26.00	0.500	4		●
448	10.00	10.00	9.20	72	22.00	27.99	31.00	0.500	4		●
498	12.00	12.00	11.00	83	26.00	33.29	37.00	0.500	4		●
606	16.00	16.00	15.00	92	32.00	38.73	43.00	0.500	4		●

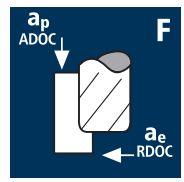
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Hardened tool steel 52 - 56 HRC H	6.00	4	60	0.027	9.000	3.600	3185	344	11.1	5.0°
		8.00	4	60	0.035	12.000	4.800	2385	334	19.2	5.0°
		10.00	4	60	0.045	15.000	6.000	1910	344	30.9	5.0°
		12.00	4	60	0.055	18.000	7.200	1590	350	45.3	5.0°
		16.00	4	60	0.065	24.000	9.600	1195	311	71.6	5.0°
	Hardened tool steel > 60 HRC H	6.00	4	25	0.012	7.500	3.600	1325	64	1.7	5.0°
		8.00	4	25	0.015	10.000	4.800	995	60	2.9	5.0°
		10.00	4	25	0.020	12.500	6.000	795	64	4.8	5.0°
		12.00	4	25	0.025	15.000	7.200	665	67	7.2	5.0°
		16.00	4	25	0.030	20.000	9.600	495	59	11.4	5.0°
	High speed steel, hardened 64 - 70 HRC H	6.00	4	15	0.009	6.000	3.600	795	29	0.6	5.0°
		8.00	4	15	0.012	8.000	4.800	595	29	1.1	5.0°
		10.00	4	15	0.015	10.000	6.000	475	29	1.7	5.0°
		12.00	4	15	0.018	12.000	7.200	400	29	2.5	5.0°
		16.00	4	15	0.023	16.000	9.600	300	28	4.2	5.0°

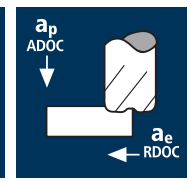
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Hardened tool steel 52 - 56 HRC H	6.00	4	50	0.027	6.000	6.000	2655	287	10.3	5.0°	68.6
		8.00	4	50	0.035	8.000	8.000	1990	279	17.8	5.0°	91.4
		10.00	4	50	0.045	10.000	10.000	1590	286	28.6	5.0°	114.3
		12.00	4	50	0.055	12.000	12.000	1325	292	42.0	5.0°	137.2
		16.00	4	50	0.080	8.000	16.000	995	318	40.8	5.0°	91.4
	Hardened tool steel > 60 HRC H	6.00	4	20	0.016	6.000	6.000	1060	68	2.4	5.0°	68.6
		8.00	4	20	0.021	8.000	8.000	795	67	4.3	5.0°	91.4
		10.00	4	20	0.026	10.000	10.000	635	66	6.6	5.0°	114.3
		12.00	4	20	0.032	12.000	12.000	530	68	9.8	5.0°	137.2
		16.00	4	20	0.050	8.000	16.000	400	80	10.2	5.0°	91.4
	High speed steel, hardened 64 - 70 HRC H	6.00	4	10	0.009	4.500	6.000	530	19	0.5	5.0°	51.4
		8.00	4	10	0.012	6.000	8.000	400	19	0.9	5.0°	68.6
		10.00	4	10	0.015	7.500	10.000	320	19	1.4	5.0°	85.7
		12.00	4	10	0.020	9.000	12.000	265	21	2.3	5.0°	102.9
		16.00	4	10	0.030	8.000	16.000	200	24	3.1	5.0°	91.4

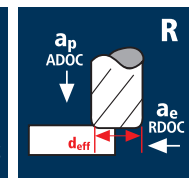
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

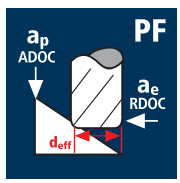


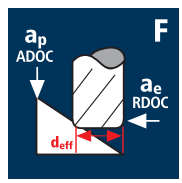


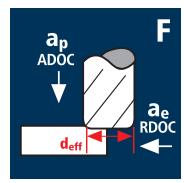


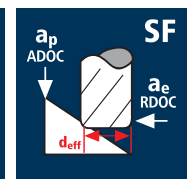










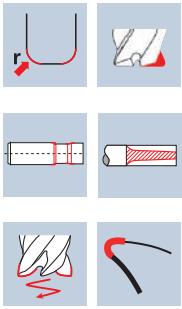


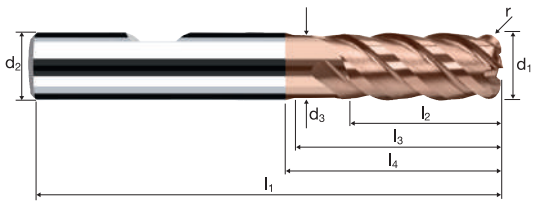
Corner radius end mills HX

Smooth-edged, normal version, short neck
High-performance penetration edge

HM XA

λ 45°
γ -10°





Roughing HPC

Roughing HDC

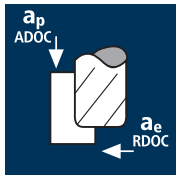
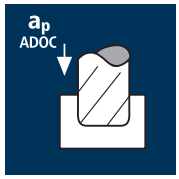
Finishing

ReTool®

HRC 48-56 | **HRC 56-60** | **HRC > 60** | **HSS**

Example: **Order-N°.** Coating **H** Article-N°. **8607** ø-Code **302**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	DURO-Si H8607	DURO-Si H8507
302	6.00	6.00	5.50	57	13.00	18.15	20.00	1.000	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	1.000	4		●
450	10.00	10.00	9.20	72	22.00	27.99	31.00	1.000	4		●
501	12.00	12.00	11.00	83	26.00	33.29	37.00	1.000	4		●
608	16.00	16.00	15.00	92	32.00	38.73	43.00	1.000	4		●
304	6.00	6.00	5.50	57	13.00	18.15	20.00	1.500	4		●
395	8.00	8.00	7.40	63	19.00	23.63	26.00	2.000	4		●
457	10.00	10.00	9.20	72	22.00	27.99	31.00	2.500	4		●
507	12.00	12.00	11.00	83	26.00	33.29	37.00	3.000	4		●

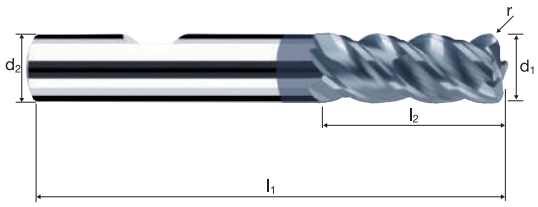
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	4.00	4	150	0.025	6.000	1.600	11935	1194	11.5
		5.00	4	150	0.035	7.500	2.000	9550	1337	20.1
		6.00	4	150	0.040	9.000	2.400	7960	1274	27.5
		8.00	4	150	0.055	12.000	3.200	5970	1313	50.4
		10.00	4	150	0.065	15.000	4.000	4775	1242	74.5
		12.00	4	150	0.080	18.000	4.800	3980	1274	110.0
		16.00	4	150	0.090	24.000	6.400	2985	1075	165.1
		20.00	4	150	0.110	30.000	8.000	2385	1049	251.9
	Steel 1100 - 1300 N/mm²	4.00	4	115	0.025	6.000	1.600	9150	915	8.8
		5.00	4	115	0.035	7.500	2.000	7320	1025	15.4
		6.00	4	115	0.040	9.000	2.400	6100	976	21.1
		8.00	4	115	0.055	12.000	3.200	4575	1007	38.6
		10.00	4	115	0.065	15.000	4.000	3660	952	57.1
		12.00	4	115	0.080	18.000	4.800	3050	976	84.3
		16.00	4	115	0.090	24.000	6.400	2290	824	126.6
		20.00	4	115	0.110	30.000	8.000	1830	805	193.2
	Hardened tool steel 52 - 56 HRC	4.00	4	55	0.015	6.000	1.200	4375	263	1.9
		5.00	4	55	0.018	7.500	1.500	3500	252	2.8
		6.00	4	55	0.021	9.000	1.800	2920	245	4.0
		8.00	4	55	0.027	12.000	2.400	2190	237	6.8
		10.00	4	55	0.036	15.000	3.000	1750	252	11.3
		12.00	4	55	0.042	18.000	3.600	1460	245	15.9
		16.00	4	55	0.048	24.000	4.800	1095	210	24.2
		20.00	4	55	0.060	30.000	6.000	875	210	37.8
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	50	0.015	6.000	1.600	3980	239	2.3
		5.00	4	50	0.020	7.500	2.000	3185	255	3.8
		6.00	4	50	0.020	9.000	2.400	2655	212	4.6
		8.00	4	50	0.025	12.000	3.200	1990	199	7.6
		10.00	4	50	0.035	15.000	4.000	1590	223	13.4
		12.00	4	50	0.040	18.000	4.800	1325	212	18.3
		16.00	4	50	0.050	24.000	6.400	995	199	30.6
		20.00	4	50	0.060	30.000	8.000	795	191	45.8
	Steel 850 - 1100 N/mm²	4.00	4	115	0.020	5.000	4.000	9150	732	14.6
		5.00	4	115	0.025	6.250	5.000	7320	732	22.9
		6.00	4	115	0.025	7.500	6.000	6100	610	27.5
		8.00	4	115	0.035	10.000	8.000	4575	641	51.2
		10.00	4	115	0.045	12.500	10.000	3660	659	82.4
		12.00	4	115	0.055	15.000	12.000	3050	671	120.8
		16.00	4	115	0.065	20.000	16.000	2290	595	190.5
		20.00	4	115	0.080	25.000	20.000	1830	586	292.8
	Steel 1100 - 1300 N/mm²	4.00	4	90	0.020	5.000	4.000	7160	573	11.5
		5.00	4	90	0.025	6.250	5.000	5730	573	17.9
		6.00	4	90	0.025	7.500	6.000	4775	478	21.5
		8.00	4	90	0.035	10.000	8.000	3580	501	40.1
		10.00	4	90	0.045	12.500	10.000	2865	516	64.5
		12.00	4	90	0.055	15.000	12.000	2385	525	94.4
		16.00	4	90	0.065	20.000	16.000	1790	465	148.9
		20.00	4	90	0.080	25.000	20.000	1430	458	228.8
	Hardened tool steel 52 - 56 HRC	4.00	4	50	0.009	4.000	4.000	3980	143	2.3
		5.00	4	50	0.012	5.000	5.000	3185	153	3.8
		6.00	4	50	0.015	6.000	6.000	2655	159	5.7
		8.00	4	50	0.018	8.000	8.000	1990	143	9.2
		10.00	4	50	0.024	10.000	10.000	1590	153	15.3
		12.00	4	50	0.030	12.000	12.000	1325	159	22.9
		16.00	4	50	0.033	16.000	16.000	995	131	33.6
		20.00	4	50	0.042	20.000	20.000	795	134	53.4
	Titanium alloys > 300 HB [Ti6Al4V]	4.00	4	40	0.010	5.000	4.000	3185	127	2.5
		5.00	4	40	0.015	6.250	5.000	2545	153	4.8
		6.00	4	40	0.020	7.500	6.000	2120	170	7.6
		8.00	4	40	0.025	10.000	8.000	1590	159	12.7
		10.00	4	40	0.030	12.500	10.000	1275	153	19.1
		12.00	4	40	0.040	15.000	12.000	1060	170	30.5
		16.00	4	40	0.045	20.000	16.000	795	143	45.8
		20.00	4	40	0.055	25.000	20.000	635	140	69.9

Corner radius end mills NX

Smooth-edged, normal version

HM MG10 | λ 45° γ -20°

Vario



Roughing

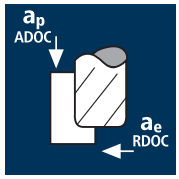
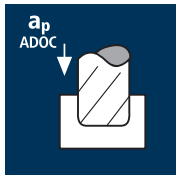
Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15368** ø-Code **178**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r 0/+0.03	z		POLYCHROM P15368	P15268
178	3.00	6.00	57	8.00	15.56	0.200	4			●
180	3.00	6.00	57	8.00	15.56	0.500	4			●
220	4.00	6.00	57	8.00	14.59	0.500	4			●
260	5.00	6.00	57	10.00	14.72	0.500	4			●
300	6.00	6.00	57	12.00	-	0.500	4			●
388	8.00	8.00	63	19.00	-	0.500	4			●
448	10.00	10.00	72	23.00	-	0.500	4			●
498	12.00	12.00	83	27.00	-	0.500	4			●
302	6.00	6.00	57	12.00	-	1.000	4			●
391	8.00	8.00	63	19.00	-	1.000	4			●
450	10.00	10.00	72	23.00	-	1.000	4			●
501	12.00	12.00	83	27.00	-	1.000	4			●
608	16.00	16.00	92	32.00	-	1.000	4			●
680	20.00	20.00	104	39.00	-	1.000	4			●
393	8.00	8.00	63	19.00	-	1.500	4			●
453	10.00	10.00	72	23.00	-	1.500	4			●
503	12.00	12.00	83	27.00	-	1.500	4			●
610	16.00	16.00	92	32.00	-	1.500	4			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	10.00	4	150	0.065	15.000	4.000	4775	1242	74.5
		12.00	4	150	0.080	18.000	4.800	3980	1274	110.0
		16.00	4	150	0.090	24.000	6.400	2985	1075	165.1
		20.00	4	150	0.110	30.000	8.000	2385	1049	251.9
	Steel 1100 - 1300 N/mm²	10.00	4	115	0.065	15.000	4.000	3660	952	57.1
		12.00	4	115	0.080	18.000	4.800	3050	976	84.3
		16.00	4	115	0.090	24.000	6.400	2290	824	126.6
		20.00	4	115	0.110	30.000	8.000	1830	805	193.2
	Hardened tool steel 52 - 56 HRC	10.00	4	55	0.036	15.000	3.000	1750	252	11.3
		12.00	4	55	0.042	18.000	3.600	1460	245	15.9
		16.00	4	55	0.048	24.000	4.800	1095	210	24.2
		20.00	4	55	0.060	30.000	6.000	875	210	37.8
	Titanium alloys > 300 HB [Ti6Al4V]	10.00	4	50	0.035	15.000	4.000	1590	223	13.4
		12.00	4	50	0.040	18.000	4.800	1325	212	18.3
		16.00	4	50	0.050	24.000	6.400	995	199	30.6
		20.00	4	50	0.060	30.000	8.000	795	191	45.8
	Steel 850 - 1100 N/mm²	10.00	4	115	0.045	12.500	10.000	3660	659	82.4
		12.00	4	115	0.055	15.000	12.000	3050	671	120.8
		16.00	4	115	0.065	20.000	16.000	2290	595	190.5
		20.00	4	115	0.080	25.000	20.000	1830	586	292.8
	Steel 1100 - 1300 N/mm²	10.00	4	90	0.045	12.500	10.000	2865	516	64.5
		12.00	4	90	0.055	15.000	12.000	2385	525	94.4
		16.00	4	90	0.065	20.000	16.000	1790	465	148.9
		20.00	4	90	0.080	25.000	20.000	1430	458	228.8
	Hardened tool steel 52 - 56 HRC	10.00	4	50	0.024	10.000	10.000	1590	153	15.3
		12.00	4	50	0.030	12.000	12.000	1325	159	22.9
		16.00	4	50	0.033	16.000	16.000	995	131	33.6
		20.00	4	50	0.042	20.000	20.000	795	134	53.4
	Titanium alloys > 300 HB [Ti6Al4V]	10.00	4	40	0.030	12.500	10.000	1275	153	19.1
		12.00	4	40	0.040	15.000	12.000	1060	170	30.5
		16.00	4	40	0.045	20.000	16.000	795	143	45.8
		20.00	4	40	0.055	25.000	20.000	635	140	69.9

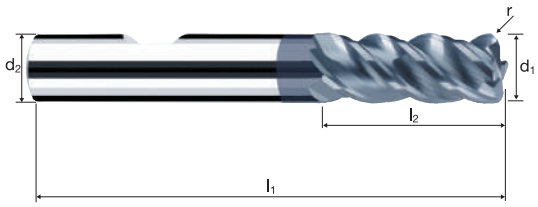
Corner radius end mills NX

Smooth-edged, normal version

HM MG10

λ 45°
γ -20°

Vario



Roughing

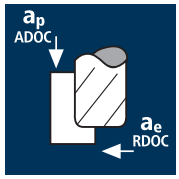
Finishing

ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60			Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15368** ø-Code **306**

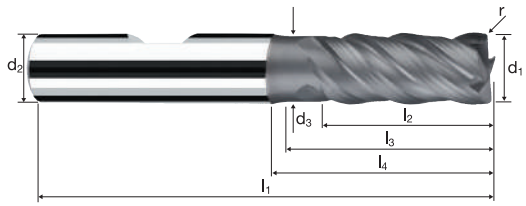
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r 0/+0.03	z		POLYCHROM P15368	P15268
306	6.00	6.00	57	12.00	-	2.000	4			●
395	8.00	8.00	63	19.00	-	2.000	4			●
505	12.00	12.00	83	27.00	-	2.000	4			●
611	16.00	16.00	92	32.00	-	2.000	4			●
683	20.00	20.00	104	39.00	-	2.000	4			●
457	10.00	10.00	72	23.00	-	2.500	4			●
506	12.00	12.00	83	27.00	-	2.500	4			●
612	16.00	16.00	92	32.00	-	2.500	4			●
684	20.00	20.00	104	39.00	-	2.500	4			●
508	12.00	12.00	83	27.00	-	4.000	4			●
614	16.00	16.00	92	32.00	-	4.000	4			●
686	20.00	20.00	104	39.00	-	4.000	4			●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Nickel-based alloys annealed Rm < 1000 N/mm² [Inconel 718]	3.00	4	35	0.010	5.400	1.350	3715	149	1.1
		4.00	4	35	0.015	7.200	1.800	2785	167	2.2
		5.00	4	35	0.020	9.000	2.250	2230	178	3.6
		6.00	4	35	0.020	10.800	2.700	1855	148	4.3
		8.00	4	35	0.030	14.400	3.600	1395	167	8.7
		10.00	4	35	0.035	18.000	4.500	1115	156	12.6
		12.00	4	35	0.045	21.600	5.400	930	167	19.5
		16.00	4	35	0.050	28.800	7.200	695	139	28.8
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	3.00	4	25	0.010	5.400	1.350	2655	106	0.8
		4.00	4	25	0.010	7.200	1.800	1990	80	1.0
		5.00	4	25	0.015	9.000	2.250	1590	95	1.9
		6.00	4	25	0.015	10.800	2.700	1325	80	2.3
		8.00	4	25	0.025	14.400	3.600	995	100	5.2
		10.00	4	25	0.030	18.000	4.500	795	95	7.7
		12.00	4	25	0.035	21.600	5.400	665	93	10.9
		16.00	4	25	0.040	28.800	7.200	495	79	16.4
	Manganese steel Mn > 5% [1.3964 / Nitronic] [1.3401 / X120Mn12]	3.00	4	40	0.010	5.400	1.350	4245	170	1.2
		4.00	4	40	0.015	7.200	1.800	3185	191	2.5
		5.00	4	40	0.020	9.000	2.250	2545	204	4.1
		6.00	4	40	0.020	10.800	2.700	2120	170	4.9
		8.00	4	40	0.030	14.400	3.600	1590	191	9.9
		10.00	4	40	0.035	18.000	4.500	1275	179	14.5
		12.00	4	40	0.045	21.600	5.400	1060	191	22.3
		16.00	4	40	0.050	28.800	7.200	795	159	33.0
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	50	0.015	5.400	1.350	5305	318	2.3
		4.00	4	50	0.020	7.200	1.800	3980	318	4.1
		5.00	4	50	0.030	9.000	2.250	3185	382	7.7
		6.00	4	50	0.035	10.800	2.700	2655	372	10.8
		8.00	4	50	0.045	14.400	3.600	1990	358	18.6
		10.00	4	50	0.055	18.000	4.500	1590	350	28.3
		12.00	4	50	0.065	21.600	5.400	1325	345	40.2
		16.00	4	50	0.070	28.800	7.200	995	279	57.8
	PM high-speed steel annealed [Böhler S390] [ASP 2023]	3.00	4	80	0.010	5.400	1.350	8490	340	2.5
		4.00	4	80	0.015	7.200	1.800	6365	382	4.9
		5.00	4	80	0.020	9.000	2.250	5095	408	8.3
		6.00	4	80	0.020	10.800	2.700	4245	340	9.9
		8.00	4	80	0.030	14.400	3.600	3185	382	19.8
		10.00	4	80	0.035	18.000	4.500	2545	356	28.9
		12.00	4	80	0.045	21.600	5.400	2120	382	44.5
		16.00	4	80	0.050	28.800	7.200	1590	318	65.9
	Titanium alloys >300 HB [Ti6Al4V]	3.00	4	70	0.010	5.400	1.350	7425	297	2.2
		4.00	4	70	0.015	7.200	1.800	5570	334	4.3
		5.00	4	70	0.015	9.000	2.250	4455	267	5.4
		6.00	4	70	0.020	10.800	2.700	3715	297	8.7
		8.00	4	70	0.025	14.400	3.600	2785	279	14.4
		10.00	4	70	0.035	18.000	4.500	2230	312	25.3
		12.00	4	70	0.040	21.600	5.400	1855	297	34.6
		16.00	4	70	0.045	28.800	7.200	1395	251	52.1
	Nickel-based alloys annealed Rm < 1000 N/mm² [Inconel 718]	3.00	4	25	0.010	3.750	3.000	2655	106	1.2
		4.00	4	25	0.010	5.000	4.000	1990	80	1.6
		5.00	4	25	0.015	6.250	5.000	1590	95	3.0
		6.00	4	25	0.015	7.500	6.000	1325	80	3.6
		8.00	4	25	0.025	10.000	8.000	995	100	8.0
		10.00	4	25	0.030	12.500	10.000	795	95	11.9
		12.00	4	25	0.035	15.000	12.000	665	93	16.8
		16.00	4	25	0.040	20.000	16.000	495	79	25.3
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	3.00	4	20	0.005	3.750	3.000	2120	42	0.5
		4.00	4	20	0.010	5.000	4.000	1590	64	1.3
		5.00	4	20	0.010	6.250	5.000	1275	51	1.6
		6.00	4	20	0.015	7.500	6.000	1060	64	2.9
		8.00	4	20	0.020	10.000	8.000	795	64	5.1
		10.00	4	20	0.020	12.500	10.000	635	51	6.4
		12.00	4	20	0.025	15.000	12.000	530	53	9.5
		16.00	4	20	0.030	20.000	16.000	400	48	15.4

Corner radius end mills ZX

Smooth-edged, normal version, short neck

HM MG10 | λ 40° γ 5°



Roughing

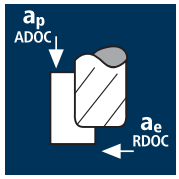
Finishing

ReTool®

Inox Stainless | **Ti** Titanium | **Nickel-Alloys Mangan-Steels HSS**

Example: **Order-N°.** Coating **P** Article-N°. **8820** ø-Code **299**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8820	POLYCHROM P8720
299	6.00	6.00	5.50	57	13.00	18.15	20.00	0.400	4		●
387	8.00	8.00	7.40	63	19.00	23.63	26.00	0.400	4		●
447	10.00	10.00	9.20	72	22.00	27.99	31.00	0.400	4		●
497	12.00	12.00	11.00	83	26.00	33.29	37.00	0.400	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.500	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.500	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.500	4		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.500	4		●
388	8.00	8.00	7.40	63	19.00	23.63	26.00	0.500	4		●
448	10.00	10.00	9.20	72	22.00	27.99	31.00	0.500	4		●
498	12.00	12.00	11.00	83	26.00	33.29	37.00	0.500	4		●
301	6.00	6.00	5.50	57	13.00	18.15	20.00	0.800	4		●
389	8.00	8.00	7.40	63	19.00	23.63	26.00	0.800	4		●
449	10.00	10.00	9.20	72	22.00	27.99	31.00	0.800	4		●
499	12.00	12.00	11.00	83	26.00	33.29	37.00	0.800	4		●
607	16.00	16.00	15.00	92	32.00	38.73	43.00	0.800	4		●

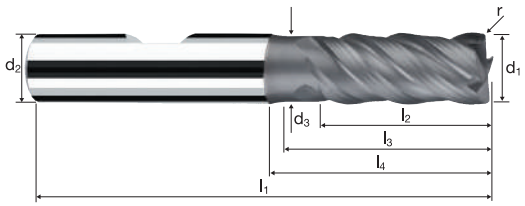
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Nickel-based alloys annealed Rm < 1000 N/mm² [Inconel 718]	6.00	4	35	0.020	10.800	2.400	1855	148	3.8
		8.00	4	35	0.025	14.400	3.200	1395	140	6.4
		10.00	4	35	0.030	18.000	4.000	1115	134	9.6
		12.00	4	35	0.040	21.600	4.800	930	149	15.4
		16.00	4	35	0.045	28.800	6.400	695	125	23.1
		20.00	4	35	0.055	36.000	8.000	555	122	35.2
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	6.00	4	25	0.015	10.800	2.400	1325	80	2.1
		8.00	4	25	0.020	14.400	3.200	995	80	3.7
		10.00	4	25	0.025	18.000	4.000	795	80	5.7
		12.00	4	25	0.030	21.600	4.800	665	80	8.3
		16.00	4	25	0.035	28.800	6.400	495	69	12.8
		20.00	4	25	0.045	36.000	8.000	400	72	20.7
	Manganese steel Mn > 5% [1.3964 / Nitronic] [1.3401 / X120Mn12]	6.00	4	40	0.020	10.800	2.400	2120	170	4.4
		8.00	4	40	0.025	14.400	3.200	1590	159	7.3
		10.00	4	40	0.030	18.000	4.000	1275	153	11.0
		12.00	4	40	0.040	21.600	4.800	1060	170	17.6
		16.00	4	40	0.045	28.800	6.400	795	143	26.4
		20.00	4	40	0.055	36.000	8.000	635	140	40.2
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	6.00	4	50	0.030	10.800	2.400	2655	319	8.3
		8.00	4	50	0.040	14.400	3.200	1990	318	14.7
		10.00	4	50	0.050	18.000	4.000	1590	318	22.9
		12.00	4	50	0.060	21.600	4.800	1325	318	33.0
		16.00	4	50	0.065	28.800	6.400	995	259	47.7
		20.00	4	50	0.080	36.000	8.000	795	254	73.3
	PM high-speed steel annealed [Böhler S390] [ASP 2023]	6.00	4	80	0.020	10.800	2.400	4245	340	8.8
		8.00	4	80	0.025	14.400	3.200	3185	319	14.7
		10.00	4	80	0.030	18.000	4.000	2545	305	22.0
		12.00	4	80	0.040	21.600	4.800	2120	339	35.2
		16.00	4	80	0.045	28.800	6.400	1590	286	52.8
		20.00	4	80	0.055	36.000	8.000	1275	281	80.8
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	70	0.020	10.800	2.400	3715	297	7.7
		8.00	4	70	0.025	14.400	3.200	2785	279	12.8
		10.00	4	70	0.030	18.000	4.000	2230	268	19.3
		12.00	4	70	0.035	21.600	4.800	1855	260	26.9
		16.00	4	70	0.040	28.800	6.400	1395	223	41.1
		20.00	4	70	0.050	36.000	8.000	1115	223	64.2
	Nickel-based alloys annealed Rm < 1000 N/mm² [Inconel 718]	6.00	4	25	0.015	7.200	6.000	1325	80	3.4
		8.00	4	25	0.020	9.600	8.000	995	80	6.1
		10.00	4	25	0.025	12.000	10.000	795	80	9.5
		12.00	4	25	0.030	14.400	12.000	665	80	13.8
		16.00	4	25	0.035	19.200	16.000	495	69	21.3
		20.00	4	25	0.045	24.000	20.000	400	72	34.6
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718]	6.00	4	20	0.010	7.200	6.000	1060	42	1.8
		8.00	4	20	0.015	9.600	8.000	795	48	3.7
		10.00	4	20	0.020	12.000	10.000	635	51	6.1
		12.00	4	20	0.025	14.400	12.000	530	53	9.2
		16.00	4	20	0.030	19.200	16.000	400	48	14.7
		20.00	4	20	0.035	24.000	20.000	320	45	21.5

Corner radius end mills ZX

Smooth-edged, normal version, short neck

HM MG10 | λ 40° γ 5°





Roughing

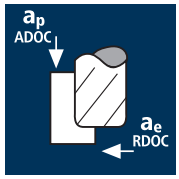
Finishing

ReTool®

Inox Stainless | **Ti** Titanium | **Nickel-Alloys Mangan-Steels HSS**

Example: **Order-N°.** Coating **P** Article-N°. **8820** ø-Code **302**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8820	POLYCHROM P8720
302	6.00	6.00	5.50	57	13.00	18.15	20.00	1.000	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	1.000	4		●
450	10.00	10.00	9.20	72	22.00	27.99	31.00	1.000	4		●
501	12.00	12.00	11.00	83	26.00	33.29	37.00	1.000	4		●
608	16.00	16.00	15.00	92	32.00	38.73	43.00	1.000	4		●
680	20.00	20.00	19.00	104	38.00	48.23	53.00	1.000	4		●
453	10.00	10.00	9.20	72	22.00	27.99	31.00	1.500	4		●
503	12.00	12.00	11.00	83	26.00	33.29	37.00	1.500	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	1.500	4		●
505	12.00	12.00	11.00	83	26.00	33.29	37.00	2.000	4		●
611	16.00	16.00	15.00	92	32.00	38.73	43.00	2.000	4		●
683	20.00	20.00	19.00	104	38.00	48.23	53.00	2.000	4		●

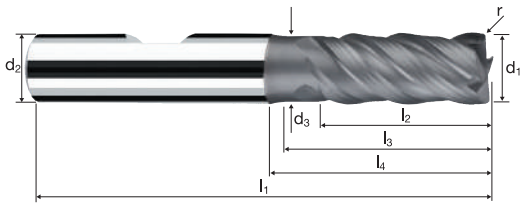
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Nickel-based alloys annealed Rm < 1000 N/mm² [Inconel 718] P	10.00	4	35	0.030	18.000	4.000	1115	134	9.6
		12.00	4	35	0.040	21.600	4.800	930	149	15.4
		16.00	4	35	0.045	28.800	6.400	695	125	23.1
		20.00	4	35	0.055	36.000	8.000	555	122	35.2
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718] P	10.00	4	25	0.025	18.000	4.000	795	80	5.7
		12.00	4	25	0.030	21.600	4.800	665	80	8.3
		16.00	4	25	0.035	28.800	6.400	495	69	12.8
		20.00	4	25	0.045	36.000	8.000	400	72	20.7
	Manganese steel Mn > 5% [1.3964 / Nitronic] [1.3401 / X120Mn12] P	10.00	4	40	0.030	18.000	4.000	1275	153	11.0
		12.00	4	40	0.040	21.600	4.800	1060	170	17.6
		16.00	4	40	0.045	28.800	6.400	795	143	26.4
		20.00	4	40	0.055	36.000	8.000	635	140	40.2
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] P	10.00	4	50	0.050	18.000	4.000	1590	318	22.9
		12.00	4	50	0.060	21.600	4.800	1325	318	33.0
		16.00	4	50	0.065	28.800	6.400	995	259	47.7
		20.00	4	50	0.080	36.000	8.000	795	254	73.3
	PM high-speed steel annealed [Böhler S390] [ASP 2023] P P	10.00	4	80	0.030	18.000	4.000	2545	305	22.0
		12.00	4	80	0.040	21.600	4.800	2120	339	35.2
		16.00	4	80	0.045	28.800	6.400	1590	286	52.8
		20.00	4	80	0.055	36.000	8.000	1275	281	80.8
	Titanium alloys >300 HB [Ti6Al4V] P	10.00	4	70	0.030	18.000	4.000	2230	268	19.3
		12.00	4	70	0.035	21.600	4.800	1855	260	26.9
		16.00	4	70	0.040	28.800	6.400	1395	223	41.1
		20.00	4	70	0.050	36.000	8.000	1115	223	64.2
	Nickel-based alloys annealed Rm < 1000 N/mm² [Inconel 718] P	10.00	4	25	0.025	12.000	10.000	795	80	9.5
		12.00	4	25	0.030	14.400	12.000	665	80	13.8
		16.00	4	25	0.035	19.200	16.000	495	69	21.3
		20.00	4	25	0.045	24.000	20.000	400	72	34.6
	Nickel-based alloys precipitation hardened Rm > 1000 N/mm² [Inconel 718] P	10.00	4	20	0.020	12.000	10.000	635	51	6.1
		12.00	4	20	0.025	14.400	12.000	530	53	9.2
		16.00	4	20	0.030	19.200	16.000	400	48	14.7
		20.00	4	20	0.035	24.000	20.000	320	45	21.5

Corner radius end mills ZX

Smooth-edged, normal version, short neck

HM MG10

λ 40°
γ 5°



Roughing

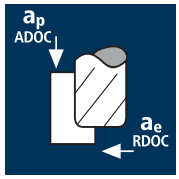
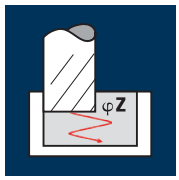
Finishing

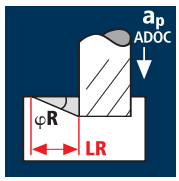
ReTool®

Inox Stainless
Ti Titanium
Nickel-Alloys
Mangan-Steels
HSS

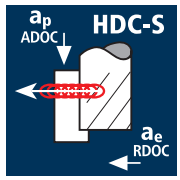
Example: **Order-N°.** Coating **P** Article-N°. **8820** ø-Code **457**

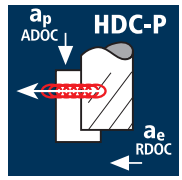
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8820	POLYCHROM P8720
457	10.00	10.00	9.20	72	22.00	27.99	31.00	2.500	4		●
506	12.00	12.00	11.00	83	26.00	33.29	37.00	2.500	4		●
612	16.00	16.00	15.00	92	32.00	38.73	43.00	2.500	4		●
684	20.00	20.00	19.00	104	38.00	48.23	53.00	2.500	4		●
508	12.00	12.00	11.00	83	26.00	33.29	37.00	4.000	4		●
614	16.00	16.00	15.00	92	32.00	38.73	43.00	4.000	4		●
686	20.00	20.00	19.00	104	38.00	48.23	53.00	4.000	4		●

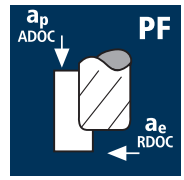
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	4.00	4	150	0.030	7.200	1.600	11935	1432	16.5	16.0°
		5.00	4	150	0.035	9.000	2.000	9550	1337	24.1	16.0°
		6.00	4	150	0.040	10.800	2.400	7960	1274	33.0	16.0°
		8.00	4	150	0.050	14.400	3.200	5970	1194	55.0	16.0°
		10.00	4	150	0.065	18.000	4.000	4775	1242	89.4	16.0°
		12.00	4	150	0.075	21.600	4.800	3980	1194	123.8	16.0°
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9	16.0°
	Steel 1100 - 1300 N/mm² P P	4.00	4	115	0.025	7.200	1.600	9150	915	10.5	14.0°
		5.00	4	115	0.030	9.000	2.000	7320	878	15.8	14.0°
		6.00	4	115	0.035	10.800	2.400	6100	854	22.1	14.0°
		8.00	4	115	0.045	14.400	3.200	4575	824	37.9	14.0°
		10.00	4	115	0.055	18.000	4.000	3660	805	58.0	14.0°
		12.00	4	115	0.065	21.600	4.800	3050	793	82.2	14.0°
		16.00	4	115	0.075	24.000	6.400	2290	687	105.5	14.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	90	0.020	7.200	1.600	7160	573	6.6	11.0°
		5.00	4	90	0.025	9.000	2.000	5730	573	10.3	11.0°
		6.00	4	90	0.030	10.800	2.400	4775	573	14.9	11.0°
		8.00	4	90	0.035	14.400	3.200	3580	501	23.1	11.0°
		10.00	4	90	0.045	18.000	4.000	2865	516	37.1	11.0°
		12.00	4	90	0.055	21.600	4.800	2385	525	54.4	11.0°
		16.00	4	90	0.065	24.000	6.400	1790	465	71.5	11.0°

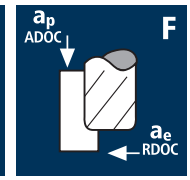
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	4.00	4	120	0.020	6.000	4.000	9550	764	18.3	18.0°	18.5
		5.00	4	120	0.023	7.500	5.000	7640	703	26.4	18.0°	23.1
		6.00	4	120	0.026	9.000	6.000	6365	662	35.7	18.0°	27.7
		8.00	4	120	0.033	12.000	8.000	4775	630	60.5	18.0°	36.9
		10.00	4	120	0.042	15.000	10.000	3820	642	96.3	18.0°	46.2
		12.00	4	120	0.049	18.000	12.000	3185	624	134.8	18.0°	55.4
		16.00	4	120	0.055	24.000	16.000	2385	525	201.5	18.0°	73.9
	Steel 1100 - 1300 N/mm² P P	4.00	4	90	0.016	6.000	4.000	7160	458	11.0	18.0°	18.5
		5.00	4	90	0.020	7.500	5.000	5730	458	17.2	18.0°	23.1
		6.00	4	90	0.023	9.000	6.000	4775	439	23.7	18.0°	27.7
		8.00	4	90	0.029	12.000	8.000	3580	415	39.9	18.0°	36.9
		10.00	4	90	0.036	15.000	10.000	2865	413	61.9	18.0°	46.2
		12.00	4	90	0.042	18.000	12.000	2385	401	86.6	18.0°	55.4
		16.00	4	90	0.049	24.000	16.000	1790	351	134.7	18.0°	73.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	70	0.013	6.000	4.000	5570	290	7.0	13.0°	26.0
		5.00	4	70	0.016	7.500	5.000	4455	285	10.7	13.0°	32.5
		6.00	4	70	0.020	9.000	6.000	3715	297	16.0	13.0°	39.0
		8.00	4	70	0.023	12.000	8.000	2785	256	24.6	13.0°	52.0
		10.00	4	70	0.029	15.000	10.000	2230	259	38.8	13.0°	65.0
		12.00	4	70	0.036	18.000	12.000	1855	267	57.7	13.0°	78.0
		16.00	4	70	0.042	24.000	16.000	1395	234	90.0	13.0°	104.0

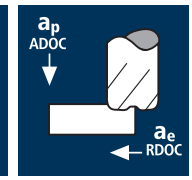
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

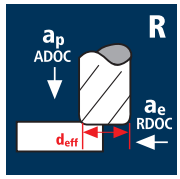


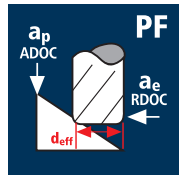


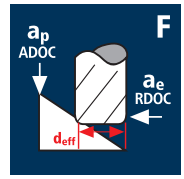


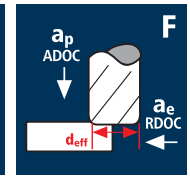












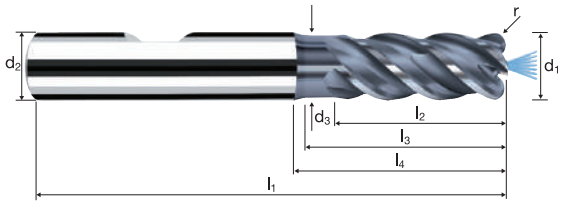
Corner radius end mills MFC

Smooth-edged, normal version, short neck
High-performance penetration edge, central air/cooling channel

HM MG10

λ 45°
γ 10°

Vario



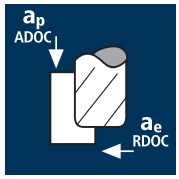
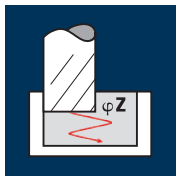
Roughing HPC | Roughing HDC | Finishing

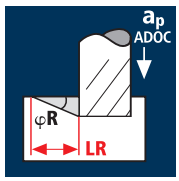
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Rm** 1300-1500 **HRC** 42-48 | **HRC** 48-56 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

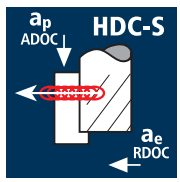
Example: **Order-N°.** Coating **P** Article-N°. **8207** ø-Code **218**

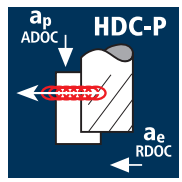
Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8207	POLYCHROM P8107
218	4.00	6.00	3.70	57	8.00	16.00	20.82	0.200	4		●
258	5.00	6.00	4.60	57	10.00	18.00	21.27	0.200	4		●
297	6.00	6.00	5.50	57	12.00	18.15	20.00	0.200	4		●
385	8.00	8.00	7.40	63	19.00	23.63	26.00	0.200	4		●
445	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	4		●
496	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	4		●
605	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	4		●
220	4.00	6.00	3.70	57	8.00	16.00	20.82	0.500	4		●
260	5.00	6.00	4.60	57	10.00	18.00	21.27	0.500	4		●
300	6.00	6.00	5.50	57	12.00	18.15	20.00	0.500	4		●
388	8.00	8.00	7.40	63	19.00	23.63	26.00	0.500	4		●
448	10.00	10.00	9.20	72	23.00	27.99	31.00	0.500	4		●
498	12.00	12.00	11.00	83	27.00	33.29	37.00	0.500	4		●
606	16.00	16.00	15.00	92	32.00	38.73	43.00	0.500	4		●
302	6.00	6.00	5.50	57	12.00	18.15	20.00	1.000	4		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	1.000	4		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	1.000	4		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	1.000	4		●
608	16.00	16.00	15.00	92	32.00	38.73	43.00	1.000	4		●

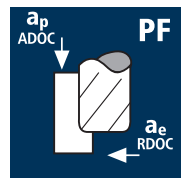
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm²	8.00	4	150	0.050	14.400	3.200	5970	1194	55.0	16.0°
		10.00	4	150	0.065	18.000	4.000	4775	1242	89.4	16.0°
		12.00	4	150	0.075	21.600	4.800	3980	1194	123.8	16.0°
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9	16.0°
	Steel 1100 - 1300 N/mm²	8.00	4	115	0.045	14.400	3.200	4575	824	37.9	14.0°
		10.00	4	115	0.055	18.000	4.000	3660	805	58.0	14.0°
		12.00	4	115	0.065	21.600	4.800	3050	793	82.2	14.0°
		16.00	4	115	0.075	24.000	6.400	2290	687	105.5	14.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	8.00	4	90	0.035	14.400	3.200	3580	501	23.1	11.0°
		10.00	4	90	0.045	18.000	4.000	2865	516	37.1	11.0°
		12.00	4	90	0.055	21.600	4.800	2385	525	54.4	11.0°
		16.00	4	90	0.065	24.000	6.400	1790	465	71.5	11.0°

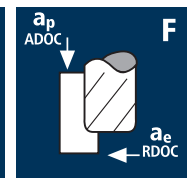
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm²	8.00	4	120	0.033	12.000	8.000	4775	630	60.5	18.0°	36.9
		10.00	4	120	0.042	15.000	10.000	3820	642	96.3	18.0°	46.2
		12.00	4	120	0.049	18.000	12.000	3185	624	134.8	18.0°	55.4
		16.00	4	120	0.055	24.000	16.000	2385	525	201.5	18.0°	73.9
	Steel 1100 - 1300 N/mm²	8.00	4	90	0.029	12.000	8.000	3580	415	39.9	18.0°	36.9
		10.00	4	90	0.036	15.000	10.000	2865	413	61.9	18.0°	46.2
		12.00	4	90	0.042	18.000	12.000	2385	401	86.6	18.0°	55.4
		16.00	4	90	0.049	24.000	16.000	1790	351	134.7	18.0°	73.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	8.00	4	70	0.023	12.000	8.000	2785	256	24.6	13.0°	52.0
		10.00	4	70	0.029	15.000	10.000	2230	259	38.8	13.0°	65.0
		12.00	4	70	0.036	18.000	12.000	1855	267	57.7	13.0°	78.0
		16.00	4	70	0.042	24.000	16.000	1395	234	90.0	13.0°	104.0

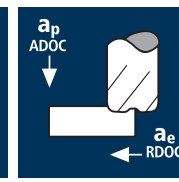
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

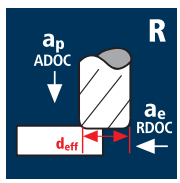


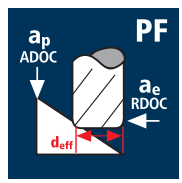


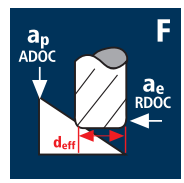


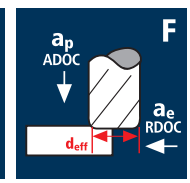










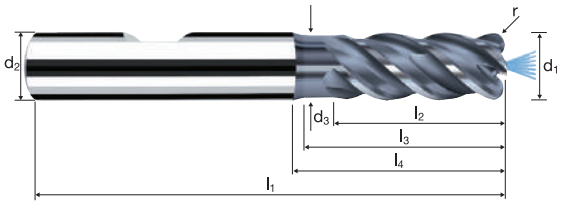


Corner radius end mills MFC

Smooth-edged, normal version, short neck
High-performance penetration edge, central air/cooling channel

HM MG10 | λ **45°** γ **10°**

Vario



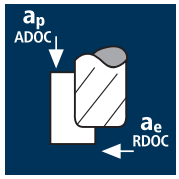
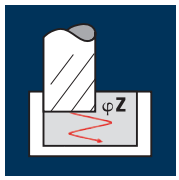
Roughing HPC | Roughing HDC | Finishing

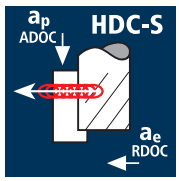
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Rm** 1300-1500 **HRC** 42-48 | **HRC** 48-56 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8207** ø-Code **393**

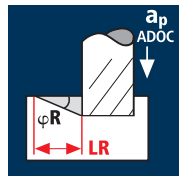
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393	8.00	8.00	7.40	63	19.00	23.63	26.00	1.500	4		●
453	10.00	10.00	9.20	72	23.00	27.99	31.00	1.500	4		●
503	12.00	12.00	11.00	83	27.00	33.29	37.00	1.500	4		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	1.500	4		●
455	10.00	10.00	9.20	72	23.00	27.99	31.00	2.000	4		●
505	12.00	12.00	11.00	83	27.00	33.29	37.00	2.000	4		●
611	16.00	16.00	15.00	92	32.00	38.73	43.00	2.000	4		●
506	12.00	12.00	11.00	83	27.00	33.29	37.00	2.500	4		●

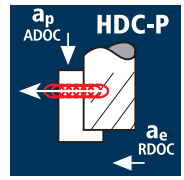
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	3.00	4	155	0.024	3.750	1.200	16445	1579	7.1	1.5°
		4.00	4	155	0.034	5.000	1.600	12335	1678	13.4	1.5°
		5.00	4	155	0.042	6.250	2.000	9870	1658	20.7	1.5°
		6.00	4	155	0.045	9.000	2.400	8225	1481	32.0	1.5°
		8.00	4	155	0.060	12.000	3.200	6165	1480	56.8	1.5°
		10.00	4	155	0.075	15.000	4.000	4935	1481	88.8	1.5°
		12.00	4	155	0.084	18.000	4.800	4110	1381	119.3	1.5°
	Steel 850 - 1100 N/mm²	3.00	4	135	0.022	3.750	1.200	14325	1261	5.7	2.0°
		4.00	4	135	0.028	5.000	1.600	10745	1203	9.6	2.0°
		5.00	4	135	0.037	6.250	2.000	8595	1272	15.9	2.0°
		6.00	4	135	0.039	9.000	2.400	7160	1117	24.1	2.0°
		8.00	4	135	0.052	12.000	3.200	5370	1117	42.9	2.0°
		10.00	4	135	0.065	15.000	4.000	4295	1117	67.0	2.0°
		12.00	4	135	0.078	18.000	4.800	3580	1117	96.5	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	90	0.014	3.750	1.200	9550	516	2.3	1.5°
		4.00	4	90	0.018	5.000	1.600	7160	516	4.1	1.5°
		5.00	4	90	0.023	6.250	2.000	5730	516	6.4	1.5°
		6.00	4	90	0.027	9.000	2.400	4775	516	11.1	1.5°
		8.00	4	90	0.036	12.000	3.200	3580	516	19.8	1.5°
		10.00	4	90	0.045	15.000	4.000	2865	516	30.9	1.5°
		12.00	4	90	0.054	18.000	4.800	2385	515	44.5	1.5°

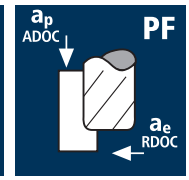
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	243	0.051	8.000	0.300	25785	5260	12.6
		4.00	4	243	0.069	11.000	0.400	19335	5337	23.5
		5.00	4	243	0.086	13.000	0.500	15470	5322	34.6
		6.00	4	243	0.103	13.000	0.600	12890	5311	41.4
		8.00	4	243	0.136	19.000	0.800	9670	5261	80.0
		10.00	4	243	0.171	23.000	1.000	7735	5291	121.7
		12.00	4	243	0.207	27.000	1.200	6445	5337	172.9
	Steel 850 - 1100 N/mm²	3.00	4	216	0.051	8.000	0.300	22920	4676	11.2
		4.00	4	216	0.069	11.000	0.400	17190	4744	20.9
		5.00	4	216	0.086	13.000	0.500	13750	4730	30.7
		6.00	4	216	0.103	13.000	0.600	11460	4722	36.8
		8.00	4	216	0.136	19.000	0.800	8595	4676	71.1
		10.00	4	216	0.171	23.000	1.000	6875	4703	108.2
		12.00	4	216	0.207	27.000	1.200	5730	4744	153.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	132	0.038	8.000	0.225	14005	2129	3.8
		4.00	4	132	0.053	11.000	0.300	10505	2227	7.3
		5.00	4	132	0.066	13.000	0.375	8405	2219	10.8
		6.00	4	132	0.080	13.000	0.450	7005	2242	13.1
		8.00	4	132	0.106	19.000	0.600	5250	2226	25.4
		10.00	4	132	0.133	23.000	0.750	4200	2234	38.5
		12.00	4	132	0.159	27.000	0.900	3500	2226	54.1

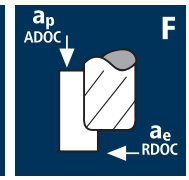
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

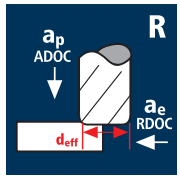


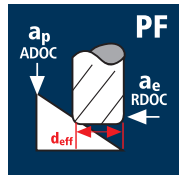


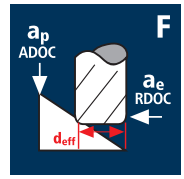


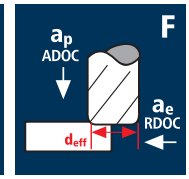












Corner radius end mills E-Cut

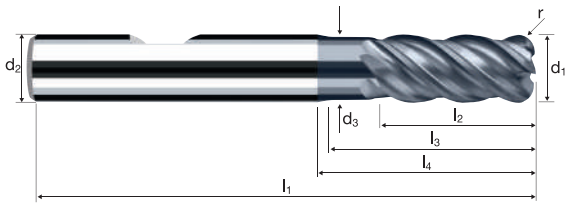
Smooth-edged, normal version, short neck

l_2=2.2xd_1

l_3=3.0xd_1

HM MG10 | λ 43° γ 6°

Vario



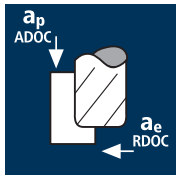
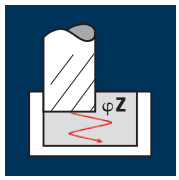
Roughing HPC | Roughing HDC | Finishing

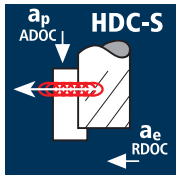
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8407** ø-Code **178**

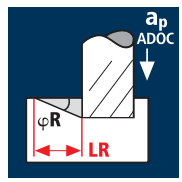
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8407	POLYCHROM P8307
178	3.00	6.00	2.80	54	6.60	9.00	15.37	0.200	4		●
218	4.00	6.00	3.70	54	9.00	12.00	16.82	0.200	4		●
258	5.00	6.00	4.60	57	11.00	15.00	18.27	0.200	4		●
297	6.00	6.00	5.50	57	13.50	18.00	19.85	0.200	4		●
385	8.00	8.00	7.40	63	18.00	24.00	26.37	0.200	4		●
445	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	4		●
496	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	4		●
180	3.00	6.00	2.80	54	6.60	9.00	15.37	0.500	4		●
220	4.00	6.00	3.70	54	9.00	12.00	16.82	0.500	4		●
260	5.00	6.00	4.60	57	11.00	15.00	18.27	0.500	4		●
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.500	4		●
388	8.00	8.00	7.40	63	18.00	24.00	26.35	0.500	4		●
448	10.00	10.00	9.20	74	22.00	30.00	33.00	0.500	4		●
498	12.00	12.00	11.00	85	27.00	36.00	39.70	0.500	4		●
301	6.00	6.00	5.50	57	13.50	18.00	19.85	0.800	4		●
389	8.00	8.00	7.40	63	18.00	24.00	26.35	0.800	4		●
449	10.00	10.00	9.20	74	22.00	30.00	33.00	0.800	4		●
499	12.00	12.00	11.00	85	27.00	36.00	39.70	0.800	4		●

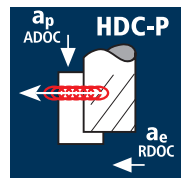
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm² P P	6.00	4	155	0.045	9.000	2.400	8225	1481	32.0	1.5°
		8.00	4	155	0.060	12.000	3.200	6165	1480	56.8	1.5°
		10.00	4	155	0.075	15.000	4.000	4935	1481	88.8	1.5°
		12.00	4	155	0.084	18.000	4.800	4110	1381	119.3	1.5°
		16.00	4	155	0.096	24.000	6.400	3085	1185	182.0	1.5°
		20.00	4	155	0.110	30.000	8.000	2465	1085	260.3	1.5°
	Steel 850 - 1100 N/mm² P P	6.00	4	135	0.039	9.000	2.400	7160	1117	24.1	2.0°
		8.00	4	135	0.052	12.000	3.200	5370	1117	42.9	2.0°
		10.00	4	135	0.065	15.000	4.000	4295	1117	67.0	2.0°
		12.00	4	135	0.078	18.000	4.800	3580	1117	96.5	2.0°
		16.00	4	135	0.088	24.000	6.400	2685	945	145.2	2.0°
		20.00	4	135	0.100	30.000	8.000	2150	860	206.4	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	6.00	4	90	0.027	9.000	2.400	4775	516	11.1	1.5°
		8.00	4	90	0.036	12.000	3.200	3580	516	19.8	1.5°
		10.00	4	90	0.045	15.000	4.000	2865	516	30.9	1.5°
		12.00	4	90	0.054	18.000	4.800	2385	515	44.5	1.5°
		16.00	4	90	0.056	24.000	6.400	1790	401	61.6	1.5°
		20.00	4	90	0.070	30.000	8.000	1430	400	96.1	1.5°

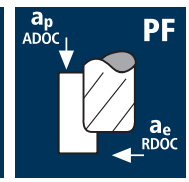
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm² P P	6.00	4	243	0.103	13.000	0.600	12890	5311	41.4
		8.00	4	243	0.136	19.000	0.800	9670	5261	80.0
		10.00	4	243	0.171	23.000	1.000	7735	5291	121.7
		12.00	4	243	0.207	27.000	1.200	6445	5337	172.9
		16.00	4	243	0.228	32.000	1.600	4835	4410	225.8
		20.00	4	243	0.286	40.000	2.000	3865	4422	353.7
	Steel 850 - 1100 N/mm² P P	6.00	4	216	0.103	13.000	0.600	11460	4722	36.8
		8.00	4	216	0.136	19.000	0.800	8595	4676	71.1
		10.00	4	216	0.171	23.000	1.000	6875	4703	108.2
		12.00	4	216	0.207	27.000	1.200	5730	4744	153.7
		16.00	4	216	0.228	32.000	1.600	4295	3917	200.6
		20.00	4	216	0.286	40.000	2.000	3440	3935	314.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	6.00	4	132	0.080	13.000	0.450	7005	2242	13.1
		8.00	4	132	0.106	19.000	0.600	5250	2226	25.4
		10.00	4	132	0.133	23.000	0.750	4200	2234	38.5
		12.00	4	132	0.159	27.000	0.900	3500	2226	54.1
		16.00	4	132	0.173	32.000	1.200	2625	1817	69.8
		20.00	4	132	0.222	40.000	1.500	2100	1865	111.9

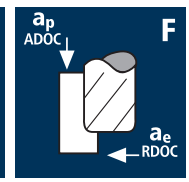
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

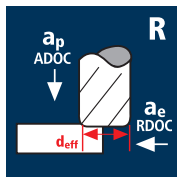


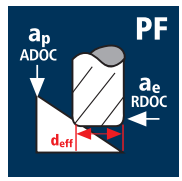


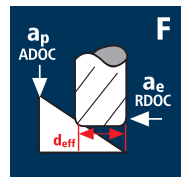


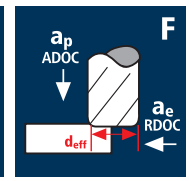












Corner radius end mills E-Cut

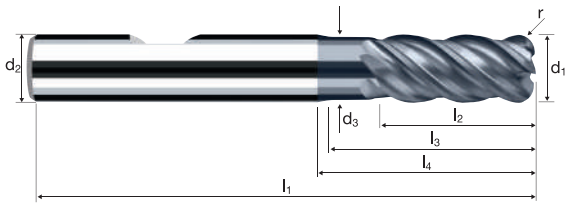
Smooth-edged, normal version, short neck

$l_2=2.2xd_1$

$l_3=3.0xd_1$

HM MG10 | λ 43° γ 6°

Vario



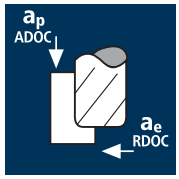
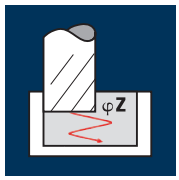
Roughing HPC | Roughing HDC | Finishing

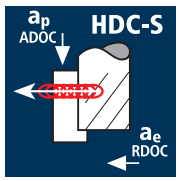
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** | Article-N°. **8407** | ø-Code **302**

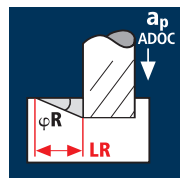
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8407	POLYCHROM P8307
302	6.00	6.00	5.50	57	13.50	18.00	19.85	1.000	4		●
391	8.00	8.00	7.40	63	18.00	24.00	26.35	1.000	4		●
450	10.00	10.00	9.20	74	22.00	30.00	33.00	1.000	4		●
501	12.00	12.00	11.00	85	27.00	36.00	39.70	1.000	4		●
608	16.00	16.00	15.00	102	36.00	48.00	52.27	1.000	4		●
304	6.00	6.00	5.50	57	13.50	18.00	19.85	1.500	4		●
393	8.00	8.00	7.40	63	18.00	24.00	26.35	1.500	4		●
453	10.00	10.00	9.20	74	22.00	30.00	33.00	1.500	4		●
503	12.00	12.00	11.00	85	27.00	36.00	39.70	1.500	4		●
610	16.00	16.00	15.00	102	36.00	48.00	52.25	1.500	4		●
306	6.00	6.00	5.50	57	13.50	18.00	19.85	2.000	4		●
395	8.00	8.00	7.40	63	18.00	24.00	26.35	2.000	4		●
455	10.00	10.00	9.20	74	22.00	30.00	33.00	2.000	4		●
505	12.00	12.00	11.00	85	27.00	36.00	39.70	2.000	4		●
611	16.00	16.00	15.00	102	36.00	48.00	52.25	2.000	4		●
683	20.00	20.00	19.00	115	44.00	60.00	64.77	2.000	4		●
457	10.00	10.00	9.20	74	22.00	30.00	33.00	2.500	4		●
506	12.00	12.00	11.00	85	27.00	36.00	39.70	2.500	4		●
612	16.00	16.00	15.00	102	36.00	48.00	52.25	2.500	4		●

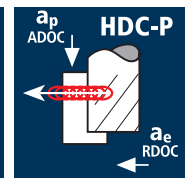
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	12.00	4	155	0.084	18.000	4.800	4110	1381	119.3	1.5°
		16.00	4	155	0.096	24.000	6.400	3085	1185	182.0	1.5°
		20.00	4	155	0.110	30.000	8.000	2465	1085	260.3	1.5°
	Steel 850 - 1100 N/mm²	12.00	4	135	0.078	18.000	4.800	3580	1117	96.5	2.0°
		16.00	4	135	0.088	24.000	6.400	2685	945	145.2	2.0°
		20.00	4	135	0.100	30.000	8.000	2150	860	206.4	2.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	12.00	4	90	0.054	18.000	4.800	2385	515	44.5	1.5°
		16.00	4	90	0.056	24.000	6.400	1790	401	61.6	1.5°
		20.00	4	90	0.070	30.000	8.000	1430	400	96.1	1.5°

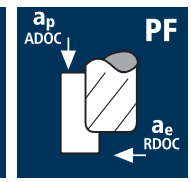
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	12.00	4	243	0.207	27.000	1.200	6445	5337	172.9
		16.00	4	243	0.228	32.000	1.600	4835	4410	225.8
		20.00	4	243	0.286	40.000	2.000	3865	4422	353.7
	Steel 850 - 1100 N/mm²	12.00	4	216	0.207	27.000	1.200	5730	4744	153.7
		16.00	4	216	0.228	32.000	1.600	4295	3917	200.6
		20.00	4	216	0.286	40.000	2.000	3440	3935	314.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	12.00	4	132	0.159	27.000	0.900	3500	2226	54.1
		16.00	4	132	0.173	32.000	1.200	2625	1817	69.8
		20.00	4	132	0.222	40.000	1.500	2100	1865	111.9

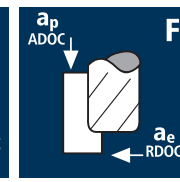
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

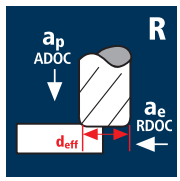


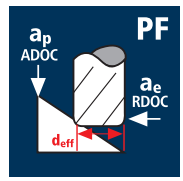


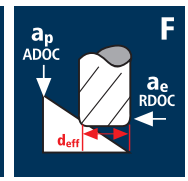


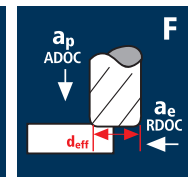












Corner radius end mills E-Cut

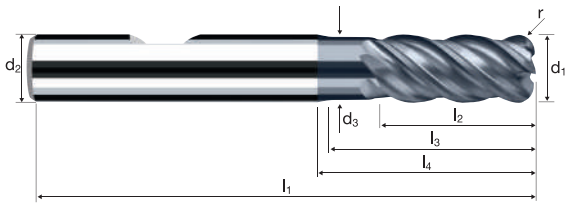
Smooth-edged, normal version, short neck

l_2=2.2xd_1

l_3=3.0xd_1

HM MG10 | λ 43° γ 6°

Vario



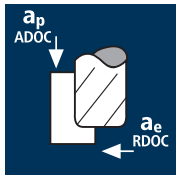
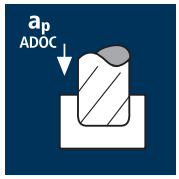
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8407** ø-Code **508**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P8407	POLYCHROM P8307
508	12.00	12.00	11.00	85	27.00	36.00	39.70	4.000	4		●
614	16.00	16.00	15.00	102	36.00	48.00	52.25	4.000	4		●
686	20.00	20.00	19.00	115	44.00	60.00	64.75	4.000	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	3.00	4	140	0.022	3.750	1.200	14855	1307	5.9
		4.00	4	140	0.031	5.000	1.600	11140	1381	11.1
		5.00	4	140	0.038	6.250	2.000	8915	1355	16.9
		6.00	4	140	0.041	9.000	2.400	7425	1218	26.3
		8.00	4	140	0.054	12.000	3.200	5570	1203	46.2
		10.00	4	140	0.068	15.000	4.000	4455	1212	72.7
		12.00	4	140	0.076	18.000	4.800	3715	1129	97.6
		16.00	4	140	0.086	24.000	6.400	2785	958	147.1
		20.00	4	140	0.099	30.000	8.000	2230	883	211.9
	Steel 850 - 1100 N/mm²	3.00	4	120	0.020	3.750	1.200	12730	1018	4.6
		4.00	4	120	0.025	5.000	1.600	9550	955	7.6
		5.00	4	120	0.033	6.250	2.000	7640	1009	12.6
		6.00	4	120	0.035	9.000	2.400	6365	891	19.2
		8.00	4	120	0.047	12.000	3.200	4775	898	34.5
		10.00	4	120	0.059	15.000	4.000	3820	902	54.1
		12.00	4	120	0.070	18.000	4.800	3185	892	77.1
		16.00	4	120	0.079	24.000	6.400	2385	754	115.8
		20.00	4	120	0.090	30.000	8.000	1910	688	165.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	80	0.012	3.750	1.200	8490	408	1.8
		4.00	4	80	0.016	5.000	1.600	6365	407	3.3
		5.00	4	80	0.020	6.250	2.000	5095	408	5.1
		6.00	4	80	0.024	9.000	2.400	4245	408	8.8
		8.00	4	80	0.032	12.000	3.200	3185	408	15.7
		10.00	4	80	0.041	15.000	4.000	2545	417	25.0
		12.00	4	80	0.049	18.000	4.800	2120	416	35.9
		16.00	4	80	0.050	24.000	6.400	1590	318	48.8
		20.00	4	80	0.063	30.000	8.000	1275	321	77.1
	Cast iron (lamellar / spheroidal)	3.00	4	155	0.020	3.750	1.200	16445	1316	5.9
		4.00	4	155	0.029	5.000	1.600	12335	1431	11.4
		5.00	4	155	0.034	6.250	2.000	9870	1342	16.8
		6.00	4	155	0.038	9.000	2.400	8225	1250	27.0
		8.00	4	155	0.050	12.000	3.200	6165	1233	47.3
		10.00	4	155	0.063	15.000	4.000	4935	1244	74.6
		12.00	4	155	0.076	18.000	4.800	4110	1249	107.9
		16.00	4	155	0.086	24.000	6.400	3085	1061	163.0
		20.00	4	155	0.099	30.000	8.000	2465	976	234.3
	Steel 500 - 850 N/mm²	3.00	4	105	0.011	2.250	3.000	11140	490	3.3
		4.00	4	105	0.016	4.000	4.000	8355	535	8.6
		5.00	4	105	0.019	5.000	5.000	6685	508	12.7
		6.00	4	105	0.027	7.500	6.000	5570	602	27.1
		8.00	4	105	0.035	10.000	8.000	4180	585	46.8
		10.00	4	105	0.044	12.500	10.000	3340	588	73.5
		12.00	4	105	0.049	15.000	12.000	2785	546	98.3
		16.00	4	105	0.056	20.000	16.000	2090	468	149.8
		20.00	4	105	0.064	25.000	20.000	1670	428	213.8
	Steel 850 - 1100 N/mm²	3.00	4	90	0.010	2.250	3.000	9550	382	2.6
		4.00	4	90	0.013	4.000	4.000	7160	372	6.0
		5.00	4	90	0.017	5.000	5.000	5730	390	9.7
		6.00	4	90	0.023	7.500	6.000	4775	439	19.8
		8.00	4	90	0.031	10.000	8.000	3580	444	35.5
		10.00	4	90	0.038	12.500	10.000	2865	436	54.4
		12.00	4	90	0.046	15.000	12.000	2385	439	79.0
		16.00	4	90	0.051	20.000	16.000	1790	365	116.9
		20.00	4	90	0.058	25.000	20.000	1430	332	165.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	60	0.006	2.250	3.000	6365	153	1.0
		4.00	4	60	0.008	4.000	4.000	4775	153	2.4
		5.00	4	60	0.010	5.000	5.000	3820	153	3.8
		6.00	4	60	0.016	7.500	6.000	3185	204	9.2
		8.00	4	60	0.021	10.000	8.000	2385	200	16.0
		10.00	4	60	0.027	12.500	10.000	1910	206	25.8
		12.00	4	60	0.032	15.000	12.000	1590	204	36.6
		16.00	4	60	0.033	20.000	16.000	1195	158	50.5
		20.00	4	60	0.041	25.000	20.000	955	157	78.3
	Cast iron (lamellar / spheroidal)	3.00	4	116	0.010	2.250	3.000	12310	492	3.3
		4.00	4	116	0.015	4.000	4.000	9230	554	8.9
		5.00	4	116	0.017	5.000	5.000	7385	502	12.6
		6.00	4	116	0.025	7.500	6.000	6155	616	27.7
		8.00	4	116	0.033	10.000	8.000	4615	609	48.7
		10.00	4	116	0.041	12.500	10.000	3690	605	75.7
		12.00	4	116	0.049	15.000	12.000	3075	603	108.5
		16.00	4	116	0.056	20.000	16.000	2310	517	165.6
		20.00	4	116	0.064	25.000	20.000	1845	472	236.2

Corner radius end mills

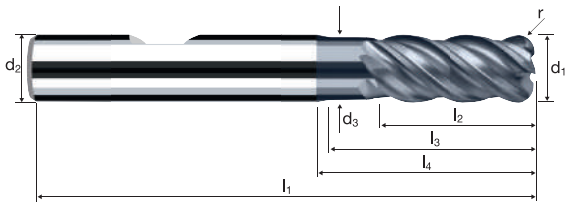
Smooth-edged, normal version, short neck

$l_2=2.2xd_1$

$l_3=3.0xd_1$

HM MG10 | λ 43° γ 6°

Vario



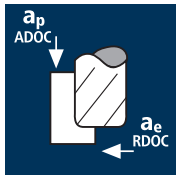
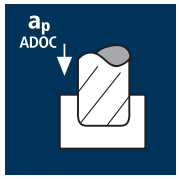
Roughing HPC | Roughing HDC | Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **46307** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P46307	POLYCHROM P46207
180	3.00	6.00	2.80	54	6.60	9.00	15.37	0.500	4		●
220	4.00	6.00	3.70	54	9.00	12.00	16.82	0.500	4		●
260	5.00	6.00	4.60	57	11.00	15.00	18.27	0.500	4		●
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.500	4		●
388	8.00	8.00	7.40	63	18.00	24.00	26.35	0.500	4		●
448	10.00	10.00	9.20	74	22.00	30.00	33.00	0.500	4		●
498	12.00	12.00	11.00	85	27.00	36.00	39.70	0.500	4		●
302	6.00	6.00	5.50	57	13.50	18.00	19.85	1.000	4		●
391	8.00	8.00	7.40	63	18.00	24.00	26.35	1.000	4		●
450	10.00	10.00	9.20	74	22.00	30.00	33.00	1.000	4		●
501	12.00	12.00	11.00	85	27.00	36.00	39.70	1.000	4		●
608	16.00	16.00	15.00	102	36.00	48.00	52.27	1.000	4		●
306	6.00	6.00	5.50	57	13.50	18.00	19.85	2.000	4		●
395	8.00	8.00	7.40	63	18.00	24.00	26.35	2.000	4		●
455	10.00	10.00	9.20	74	22.00	30.00	33.00	2.000	4		●
505	12.00	12.00	11.00	85	27.00	36.00	39.70	2.000	4		●
611	16.00	16.00	15.00	102	36.00	48.00	52.25	2.000	4		●
683	20.00	20.00	19.00	115	44.00	60.00	64.77	2.000	4		●

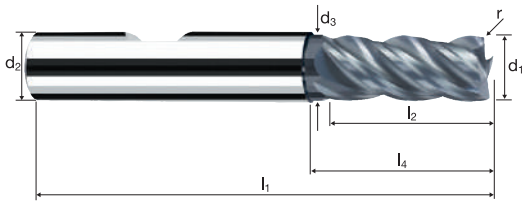
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	4	150	0.015	4.500	1.200	15915	955	5.2
		4.00	4	150	0.020	6.000	1.600	11935	955	9.2
		5.00	4	150	0.025	7.500	2.000	9550	955	14.3
		6.00	4	150	0.030	9.000	2.400	7960	955	20.6
		8.00	4	150	0.040	12.000	3.200	5970	955	36.7
		10.00	4	150	0.050	15.000	4.000	4775	955	57.3
		12.00	4	150	0.060	18.000	4.800	3980	955	82.5
		16.00	4	150	0.075	24.000	6.400	2985	896	137.5
		20.00	4	150	0.095	30.000	8.000	2385	906	217.5
	Steel 850 - 1100 N/mm²	3.00	4	120	0.015	4.500	1.200	12730	764	4.1
		4.00	4	120	0.020	6.000	1.600	9550	764	7.3
		5.00	4	120	0.025	7.500	2.000	7640	764	11.5
		6.00	4	120	0.030	9.000	2.400	6365	764	16.5
		8.00	4	120	0.040	12.000	3.200	4775	764	29.3
		10.00	4	120	0.050	15.000	4.000	3820	764	45.8
		12.00	4	120	0.060	18.000	4.800	3185	764	66.0
		16.00	4	120	0.075	24.000	6.400	2385	716	109.9
		20.00	4	120	0.095	30.000	8.000	1910	726	174.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	80	0.010	4.500	1.200	8490	340	1.8
		4.00	4	80	0.015	6.000	1.600	6365	382	3.7
		5.00	4	80	0.020	7.500	2.000	5095	408	6.1
		6.00	4	80	0.025	9.000	2.400	4245	425	9.2
		8.00	4	80	0.030	12.000	3.200	3185	382	14.7
		10.00	4	80	0.040	15.000	4.000	2545	407	24.4
		12.00	4	80	0.050	18.000	4.800	2120	424	36.6
		16.00	4	80	0.060	24.000	6.400	1590	382	58.6
		20.00	4	80	0.075	30.000	8.000	1275	383	91.8
	Cast iron (lamellar / spheroidal)	3.00	4	150	0.015	4.500	1.200	15915	955	5.2
		4.00	4	150	0.020	6.000	1.600	11935	955	9.2
		5.00	4	150	0.030	7.500	2.000	9550	1146	17.2
		6.00	4	150	0.035	9.000	2.400	7960	1114	24.1
		8.00	4	150	0.045	12.000	3.200	5970	1075	41.3
		10.00	4	150	0.055	15.000	4.000	4775	1051	63.0
		12.00	4	150	0.065	18.000	4.800	3980	1035	89.4
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9
		20.00	4	150	0.105	30.000	8.000	2385	1002	240.4
	Steel < 850 N/mm²	3.00	4	125	0.010	3.000	3.000	13265	531	4.8
		4.00	4	125	0.015	4.000	4.000	9945	597	9.5
		5.00	4	125	0.020	5.000	5.000	7960	637	15.9
		6.00	4	125	0.025	6.000	6.000	6630	663	23.9
		8.00	4	125	0.030	8.000	8.000	4975	597	38.2
		10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.045	12.000	12.000	3315	597	85.9
		16.00	4	125	0.055	8.000	16.000	2485	547	70.0
		20.00	4	125	0.070	10.000	20.000	1990	557	111.4
	Steel 850 - 1100 N/mm²	3.00	4	95	0.010	3.000	3.000	10080	403	3.6
		4.00	4	95	0.015	4.000	4.000	7560	454	7.3
		5.00	4	95	0.020	5.000	5.000	6050	484	12.1
		6.00	4	95	0.025	6.000	6.000	5040	504	18.1
		8.00	4	95	0.030	8.000	8.000	3780	454	29.0
		10.00	4	95	0.040	10.000	10.000	3025	484	48.4
		12.00	4	95	0.045	12.000	12.000	2520	454	65.3
		16.00	4	95	0.055	8.000	16.000	1890	416	53.2
		20.00	4	95	0.070	10.000	20.000	1510	423	84.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	65	0.010	2.100	3.000	6895	276	1.7
		4.00	4	65	0.010	2.800	4.000	5175	207	2.3
		5.00	4	65	0.015	3.500	5.000	4140	248	4.3
		6.00	4	65	0.020	4.200	6.000	3450	276	7.0
		8.00	4	65	0.025	8.000	8.000	2585	259	16.5
		10.00	4	65	0.030	10.000	10.000	2070	248	24.8
		12.00	4	65	0.040	12.000	12.000	1725	276	39.7
		16.00	4	65	0.045	8.000	16.000	1295	233	29.8
		20.00	4	65	0.055	10.000	20.000	1035	228	45.5
	Cast iron (lamellar / spheroidal)	3.00	4	125	0.010	3.000	3.000	13265	531	4.8
		4.00	4	125	0.015	4.000	4.000	9945	597	9.5
		5.00	4	125	0.025	5.000	5.000	7960	796	19.9
		6.00	4	125	0.025	6.000	6.000	6630	663	23.9
		8.00	4	125	0.035	8.000	8.000	4975	697	44.6
		10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.050	12.000	12.000	3315	663	95.5
		16.00	4	125	0.065	8.000	16.000	2485	646	82.7
		20.00	4	125	0.080	10.000	20.000	1990	637	127.4

Corner radius end mills

Smooth-edged, normal version, short neck

HM MG10 | λ 40° γ 6°

Vario



Roughing

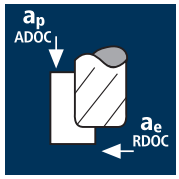
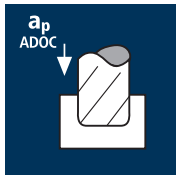
Finishing

ToolSchool P46207 / P46307 P8307 / P8407

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel Nickel-Alloys**

Example: **Order-N°.** Coating **P** Article-N°. **45319** ø-Code **178**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P45319	POLYCHROM P45219
178	3.00	6.00	2.80	57	8.00	14.00	20.63	0.200	4		●
218	4.00	6.00	3.70	57	11.00	16.00	20.95	0.200	4		●
258	5.00	6.00	4.60	57	13.00	18.00	21.27	0.200	4		●
297	6.00	6.00	5.50	57	13.00	19.34	20.00	0.200	4		●
385	8.00	8.00	7.40	63	19.00	25.29	26.00	0.200	4		●
445	10.00	10.00	9.20	72	22.00	30.20	31.00	0.200	4		●
496	12.00	12.00	11.00	83	26.00	36.13	37.00	0.200	4		●
605	16.00	16.00	15.00	92	32.00	42.13	43.00	0.200	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.500	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.500	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.500	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.500	4		●
388	8.00	8.00	7.40	63	19.00	25.29	26.00	0.500	4		●
448	10.00	10.00	9.20	72	22.00	30.20	31.00	0.500	4		●
498	12.00	12.00	11.00	83	26.00	36.13	37.00	0.500	4		●
606	16.00	16.00	15.00	92	32.00	42.13	43.00	0.500	4		●
678	20.00	20.00	19.00	104	38.00	52.13	53.00	0.500	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	150	0.030	9.000	2.400	7960	955	20.6
		8.00	4	150	0.040	12.000	3.200	5970	955	36.7
		10.00	4	150	0.050	15.000	4.000	4775	955	57.3
		12.00	4	150	0.060	18.000	4.800	3980	955	82.5
		16.00	4	150	0.075	24.000	6.400	2985	896	137.5
		20.00	4	150	0.095	30.000	8.000	2385	906	217.5
	Steel 850 - 1100 N/mm²	6.00	4	120	0.030	9.000	2.400	6365	764	16.5
		8.00	4	120	0.040	12.000	3.200	4775	764	29.3
		10.00	4	120	0.050	15.000	4.000	3820	764	45.8
		12.00	4	120	0.060	18.000	4.800	3185	764	66.0
		16.00	4	120	0.075	24.000	6.400	2385	716	109.9
		20.00	4	120	0.095	30.000	8.000	1910	726	174.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	80	0.025	9.000	2.400	4245	425	9.2
		8.00	4	80	0.030	12.000	3.200	3185	382	14.7
		10.00	4	80	0.040	15.000	4.000	2545	407	24.4
		12.00	4	80	0.050	18.000	4.800	2120	424	36.6
		16.00	4	80	0.060	24.000	6.400	1590	382	58.6
		20.00	4	80	0.075	30.000	8.000	1275	383	91.8
	Cast iron (lamellar / spheroidal)	6.00	4	150	0.035	9.000	2.400	7960	1114	24.1
		8.00	4	150	0.045	12.000	3.200	5970	1075	41.3
		10.00	4	150	0.055	15.000	4.000	4775	1051	63.0
		12.00	4	150	0.065	18.000	4.800	3980	1035	89.4
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9
		20.00	4	150	0.105	30.000	8.000	2385	1002	240.4
	Steel < 850 N/mm²	6.00	4	125	0.025	6.000	6.000	6630	663	23.9
		8.00	4	125	0.030	8.000	8.000	4975	597	38.2
		10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.045	12.000	12.000	3315	597	85.9
		16.00	4	125	0.055	8.000	16.000	2485	547	70.0
		20.00	4	125	0.070	10.000	20.000	1990	557	111.4
	Steel 850 - 1100 N/mm²	6.00	4	95	0.025	6.000	6.000	5040	504	18.1
		8.00	4	95	0.030	8.000	8.000	3780	454	29.0
		10.00	4	95	0.040	10.000	10.000	3025	484	48.4
		12.00	4	95	0.045	12.000	12.000	2520	454	65.3
		16.00	4	95	0.055	8.000	16.000	1890	416	53.2
		20.00	4	95	0.070	10.000	20.000	1510	423	84.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	65	0.020	4.200	6.000	3450	276	7.0
		8.00	4	65	0.025	8.000	8.000	2585	259	16.5
		10.00	4	65	0.030	10.000	10.000	2070	248	24.8
		12.00	4	65	0.040	12.000	12.000	1725	276	39.7
		16.00	4	65	0.045	8.000	16.000	1295	233	29.8
		20.00	4	65	0.055	10.000	20.000	1035	228	45.5
	Cast iron (lamellar / spheroidal)	6.00	4	125	0.025	6.000	6.000	6630	663	23.9
		8.00	4	125	0.035	8.000	8.000	4975	697	44.6
		10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.050	12.000	12.000	3315	663	95.5
		16.00	4	125	0.065	8.000	16.000	2485	646	82.7
		20.00	4	125	0.080	10.000	20.000	1990	637	127.4

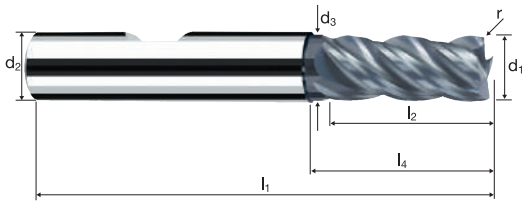
Corner radius end mills

Smooth-edged, normal version, short neck

Favora® F

HM MG10 | λ 40° γ 6°

Vario



Roughing

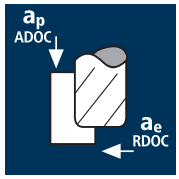
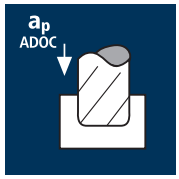
Finishing

ToolSchool P46207 / P46307 P8307 / P8407

Rm <850 HRC <24 | Rm 850-1100 HRC 24-34 | Rm 1100-1300 HRC 34-42 | Inox Stainless | Ti Titanium | GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **45319** ø-Code **301**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P45319	POLYCHROM P45219
301	6.00	6.00	5.50	57	13.00	19.34	20.00	0.800	4		●
389	8.00	8.00	7.40	63	19.00	25.29	26.00	0.800	4		●
449	10.00	10.00	9.20	72	22.00	30.20	31.00	0.800	4		●
499	12.00	12.00	11.00	83	26.00	36.13	37.00	0.800	4		●
302	6.00	6.00	5.50	57	13.00	19.34	20.00	1.000	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	1.000	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	1.000	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	1.000	4		●
608	16.00	16.00	15.00	92	32.00	42.13	43.00	1.000	4		●
680	20.00	20.00	19.00	104	38.00	52.13	53.00	1.000	4		●
304	6.00	6.00	5.50	57	13.00	19.34	20.00	1.500	4		●
393	8.00	8.00	7.40	63	19.00	25.29	26.00	1.500	4		●
453	10.00	10.00	9.20	72	22.00	30.20	31.00	1.500	4		●
503	12.00	12.00	11.00	83	26.00	36.13	37.00	1.500	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	1.500	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	10.00	4	150	0.050	15.000	4.000	4775	955	57.3
		12.00	4	150	0.060	18.000	4.800	3980	955	82.5
		16.00	4	150	0.075	24.000	6.400	2985	896	137.5
		20.00	4	150	0.095	30.000	8.000	2385	906	217.5
	Steel 850 - 1100 N/mm²	10.00	4	120	0.050	15.000	4.000	3820	764	45.8
		12.00	4	120	0.060	18.000	4.800	3185	764	66.0
		16.00	4	120	0.075	24.000	6.400	2385	716	109.9
		20.00	4	120	0.095	30.000	8.000	1910	726	174.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	10.00	4	80	0.040	15.000	4.000	2545	407	24.4
		12.00	4	80	0.050	18.000	4.800	2120	424	36.6
		16.00	4	80	0.060	24.000	6.400	1590	382	58.6
		20.00	4	80	0.075	30.000	8.000	1275	383	91.8
	Cast iron (lamellar / spheroidal)	10.00	4	150	0.055	15.000	4.000	4775	1051	63.0
		12.00	4	150	0.065	18.000	4.800	3980	1035	89.4
		16.00	4	150	0.085	24.000	6.400	2985	1015	155.9
		20.00	4	150	0.105	30.000	8.000	2385	1002	240.4
	Steel < 850 N/mm²	10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.045	12.000	12.000	3315	597	85.9
		16.00	4	125	0.055	8.000	16.000	2485	547	70.0
		20.00	4	125	0.070	10.000	20.000	1990	557	111.4
	Steel 850 - 1100 N/mm²	10.00	4	95	0.040	10.000	10.000	3025	484	48.4
		12.00	4	95	0.045	12.000	12.000	2520	454	65.3
		16.00	4	95	0.055	8.000	16.000	1890	416	53.2
		20.00	4	95	0.070	10.000	20.000	1510	423	84.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	10.00	4	65	0.030	10.000	10.000	2070	248	24.8
		12.00	4	65	0.040	12.000	12.000	1725	276	39.7
		16.00	4	65	0.045	8.000	16.000	1295	233	29.8
		20.00	4	65	0.055	10.000	20.000	1035	228	45.5
	Cast iron (lamellar / spheroidal)	10.00	4	125	0.040	10.000	10.000	3980	637	63.7
		12.00	4	125	0.050	12.000	12.000	3315	663	95.5
		16.00	4	125	0.065	8.000	16.000	2485	646	82.7
		20.00	4	125	0.080	10.000	20.000	1990	637	127.4

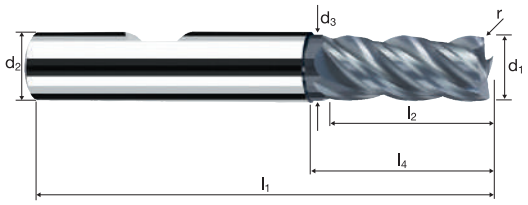
Corner radius end mills

Smooth-edged, normal version, short neck

Favora® F

HM MG10 | λ 40° γ 6°

Vario



Roughing

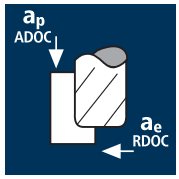
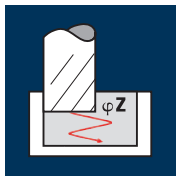
Finishing

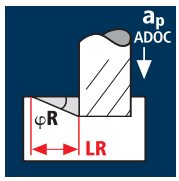
ToolSchool P46207 / P46307 P8307 / P8407

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel Nickel-Alloys**

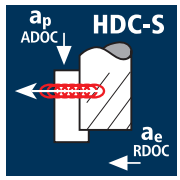
Example: **Order-N°.** Coating **P** Article-N°. **45319** ø-Code **306**

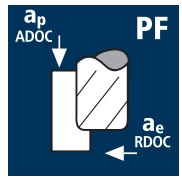
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P45319	POLYCHROM P45219
306	6.00	6.00	5.50	57	13.00	19.34	20.00	2.000	4		●
395	8.00	8.00	7.40	63	19.00	25.29	26.00	2.000	4		●
455	10.00	10.00	9.20	72	22.00	30.20	31.00	2.000	4		●
505	12.00	12.00	11.00	83	26.00	36.13	37.00	2.000	4		●
611	16.00	16.00	15.00	92	32.00	42.13	43.00	2.000	4		●
683	20.00	20.00	19.00	104	38.00	52.13	53.00	2.000	4		●
457	10.00	10.00	9.20	72	22.00	30.20	31.00	2.500	4		●
506	12.00	12.00	11.00	83	26.00	36.13	37.00	2.500	4		●
612	16.00	16.00	15.00	92	32.00	42.13	43.00	2.500	4		●
684	20.00	20.00	19.00	104	38.00	52.13	53.00	2.500	4		●
508	12.00	12.00	11.00	83	26.00	36.13	37.00	4.000	4		●
614	16.00	16.00	15.00	92	32.00	42.13	43.00	4.000	4		●
686	20.00	20.00	19.00	104	38.00	52.13	53.00	4.000	4		●

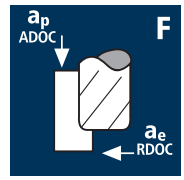
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Hardened tool steel 52 - 56 HRC H	3.00	4	60	0.009	3.000	1.800	6365	229	1.2	5.0°
		4.00	4	60	0.013	4.000	2.400	4775	248	2.4	5.0°
		5.00	4	60	0.017	5.000	3.000	3820	260	3.9	5.0°
		6.00	4	60	0.021	7.500	3.600	3185	268	7.2	5.0°
		8.00	4	60	0.028	10.000	4.800	2385	267	12.8	5.0°
		10.00	4	60	0.035	12.500	6.000	1910	267	20.1	5.0°
		12.00	4	60	0.042	15.000	7.200	1590	267	28.8	5.0°
		16.00	4	60	0.050	20.000	9.600	1195	239	45.9	5.0°
	Hardened tool steel > 60 HRC H	3.00	4	25	0.004	3.000	1.800	2655	43	0.2	3.0°
		4.00	4	25	0.006	4.000	2.400	1990	48	0.5	4.0°
		5.00	4	25	0.008	5.000	3.000	1590	51	0.8	5.0°
		6.00	4	25	0.009	6.000	3.600	1325	48	1.0	5.0°
		8.00	4	25	0.011	8.000	4.800	995	44	1.7	5.0°
		10.00	4	25	0.015	10.000	6.000	795	48	2.9	5.0°
		12.00	4	25	0.018	12.000	7.200	665	48	4.1	5.0°
		16.00	4	25	0.023	16.000	9.600	495	46	7.0	5.0°
	High speed steel, hardened 64 - 70 HRC H	3.00	4	15	0.005	2.250	0.450	1590	32	0.0	3.0°
		4.00	4	15	0.006	3.000	0.600	1195	29	0.1	4.0°
		5.00	4	15	0.008	3.750	0.750	955	31	0.1	5.0°
		6.00	4	15	0.006	4.500	3.600	795	19	0.3	5.0°
		8.00	4	15	0.008	6.000	4.800	595	19	0.5	5.0°
		10.00	4	15	0.010	7.500	6.000	475	19	0.9	5.0°
		12.00	4	15	0.012	9.000	7.200	400	19	1.2	5.0°
		16.00	4	15	0.016	12.000	9.600	300	19	2.2	5.0°

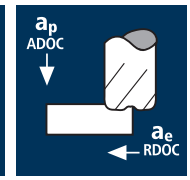
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Hardened tool steel 52 - 56 HRC H	3.00	4	50	0.010	3.000	3.000	5305	212	1.9	5.0°	34.3
		4.00	4	50	0.013	4.000	4.000	3980	207	3.3	5.0°	45.7
		5.00	4	50	0.017	5.000	5.000	3185	217	5.4	5.0°	57.2
		6.00	4	50	0.021	6.000	6.000	2655	223	8.0	5.0°	68.6
		8.00	4	50	0.028	8.000	8.000	1990	223	14.3	5.0°	91.4
		10.00	4	50	0.035	10.000	10.000	1590	223	22.3	5.0°	114.3
		12.00	4	50	0.042	12.000	12.000	1325	223	32.1	5.0°	137.2
		16.00	4	50	0.064	8.000	16.000	995	255	32.6	5.0°	91.4
	Hardened tool steel > 60 HRC H	3.00	4	20	0.004	3.000	3.000	2120	34	0.3	3.0°	57.2
		4.00	4	20	0.006	4.000	4.000	1590	38	0.6	4.0°	57.2
		5.00	4	20	0.008	5.000	5.000	1275	41	1.0	5.0°	57.2
		6.00	4	20	0.009	6.000	6.000	1060	38	1.4	5.0°	68.6
		8.00	4	20	0.011	8.000	8.000	795	35	2.2	5.0°	91.4
		10.00	4	20	0.015	10.000	10.000	635	38	3.8	5.0°	114.3
		12.00	4	20	0.020	12.000	12.000	530	42	6.1	5.0°	137.2
		16.00	4	20	0.032	8.000	16.000	400	51	6.6	5.0°	91.4
	High speed steel, hardened 64 - 70 HRC H	3.00	4	10	0.003	1.500	3.000	1060	13	0.1	3.0°	28.6
		4.00	4	10	0.004	2.000	4.000	795	13	0.1	4.0°	28.6
		5.00	4	10	0.005	2.500	5.000	635	13	0.2	5.0°	28.6
		6.00	4	10	0.006	3.000	6.000	530	13	0.2	5.0°	34.3
		8.00	4	10	0.008	4.000	8.000	400	13	0.4	5.0°	45.7
		10.00	4	10	0.010	5.000	10.000	320	13	0.6	5.0°	57.2
		12.00	4	10	0.012	6.000	12.000	265	13	0.9	5.0°	68.6
		16.00	4	10	0.016	8.000	16.000	200	13	1.6	5.0°	91.4

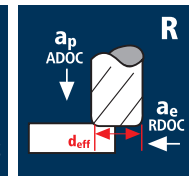
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

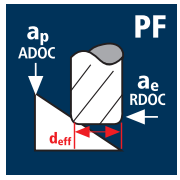


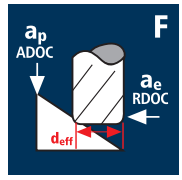


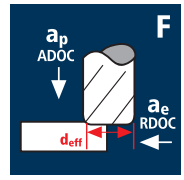


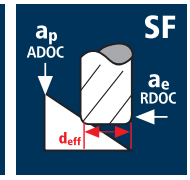












Corner radius end mills HX

Smooth-edged, medium version, short neck
High-performance penetration edge

HM XA

λ 45°
γ -10°



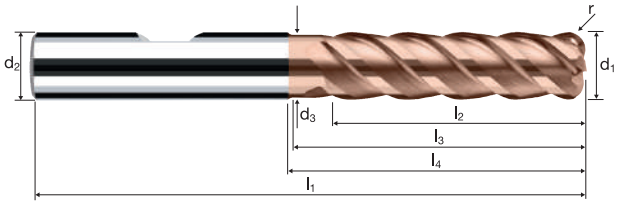












Roughing HPC

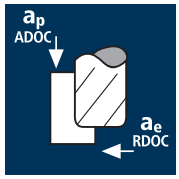
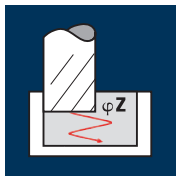
Roughing HDC

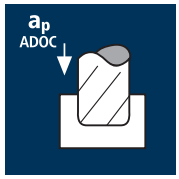
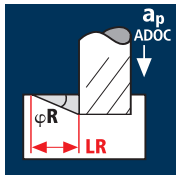
Finishing

ReTool®

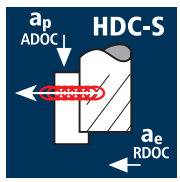
HRC 48-56 | **HRC 56-60** | **HRC > 60** | **HSS**

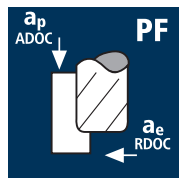
											DURO-Si
Example: **Order-N°.**			Coating: **H**	Article-N°.: **8617**	ø-Code: **178**						**H8617**
											H8517
Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z		
178	3.00	6.00	2.80	63	11.00	18.00	24.37	0.200	4		●
218	4.00	6.00	3.70	63	13.00	22.00	26.82	0.200	4		●
258	5.00	6.00	4.60	63	16.00	24.00	27.27	0.200	4		●
297	6.00	6.00	5.50	63	21.00	25.34	26.00	0.200	4		●
385	8.00	8.00	7.40	72	31.00	34.79	35.50	0.200	4		●
445	10.00	10.00	9.20	84	37.00	42.20	43.00	0.200	4		●
496	12.00	12.00	11.00	97	44.00	50.13	51.00	0.200	4		●
605	16.00	16.00	15.00	108	53.00	58.13	59.00	0.200	4		●
180	3.00	6.00	2.80	63	11.00	18.00	24.37	0.500	4		●
220	4.00	6.00	3.70	63	13.00	22.00	26.82	0.500	4		●
260	5.00	6.00	4.60	63	16.00	24.00	27.27	0.500	4		●
300	6.00	6.00	5.50	63	21.00	25.34	26.00	0.500	4		●
388	8.00	8.00	7.40	72	31.00	34.79	35.50	0.500	4		●
448	10.00	10.00	9.20	84	37.00	42.20	43.00	0.500	4		●
498	12.00	12.00	11.00	97	44.00	50.13	51.00	0.500	4		●
606	16.00	16.00	15.00	108	53.00	58.13	59.00	0.500	4		●

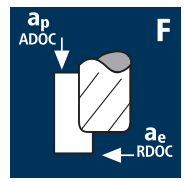
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Hardened tool steel 52 - 56 HRC H	6.00	4	60	0.021	7.500	3.600	3185	268	7.2	5.0°
		8.00	4	60	0.028	10.000	4.800	2385	267	12.8	5.0°
		10.00	4	60	0.035	12.500	6.000	1910	267	20.1	5.0°
		12.00	4	60	0.042	15.000	7.200	1590	267	28.8	5.0°
		16.00	4	60	0.050	20.000	9.600	1195	239	45.9	5.0°
	Hardened tool steel > 60 HRC H	6.00	4	25	0.009	6.000	3.600	1325	48	1.0	5.0°
		8.00	4	25	0.011	8.000	4.800	995	44	1.7	5.0°
		10.00	4	25	0.015	10.000	6.000	795	48	2.9	5.0°
		12.00	4	25	0.018	12.000	7.200	665	48	4.1	5.0°
		16.00	4	25	0.023	16.000	9.600	495	46	7.0	5.0°
	High speed steel, hardened 64 - 70 HRC H	6.00	4	15	0.006	4.500	3.600	795	19	0.3	5.0°
		8.00	4	15	0.008	6.000	4.800	595	19	0.5	5.0°
		10.00	4	15	0.010	7.500	6.000	475	19	0.9	5.0°
		12.00	4	15	0.012	9.000	7.200	400	19	1.2	5.0°
		16.00	4	15	0.016	12.000	9.600	300	19	2.2	5.0°

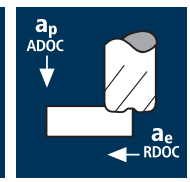
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Hardened tool steel 52 - 56 HRC H	6.00	4	50	0.021	6.000	6.000	2655	223	8.0	5.0°	68.6
		8.00	4	50	0.028	8.000	8.000	1990	223	14.3	5.0°	91.4
		10.00	4	50	0.035	10.000	10.000	1590	223	22.3	5.0°	114.3
		12.00	4	50	0.042	12.000	12.000	1325	223	32.1	5.0°	137.2
		16.00	4	50	0.064	8.000	16.000	995	255	32.6	5.0°	91.4
	Hardened tool steel > 60 HRC H	6.00	4	20	0.009	6.000	6.000	1060	38	1.4	5.0°	68.6
		8.00	4	20	0.011	8.000	8.000	795	35	2.2	5.0°	91.4
		10.00	4	20	0.015	10.000	10.000	635	38	3.8	5.0°	114.3
		12.00	4	20	0.020	12.000	12.000	530	42	6.1	5.0°	137.2
		16.00	4	20	0.032	8.000	16.000	400	51	6.6	5.0°	91.4
	High speed steel, hardened 64 - 70 HRC H	6.00	4	10	0.006	3.000	6.000	530	13	0.2	5.0°	34.3
		8.00	4	10	0.008	4.000	8.000	400	13	0.4	5.0°	45.7
		10.00	4	10	0.010	5.000	10.000	320	13	0.6	5.0°	57.2
		12.00	4	10	0.012	6.000	12.000	265	13	0.9	5.0°	68.6
		16.00	4	10	0.016	8.000	16.000	200	13	1.6	5.0°	91.4

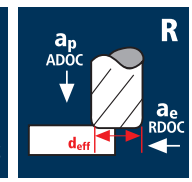
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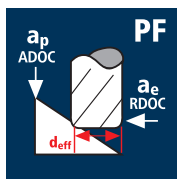


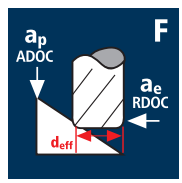


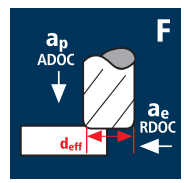


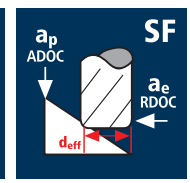












Corner radius end mills HX

Smooth-edged, medium version, short neck
High-performance penetration edge

HM
XA

λ 45°
γ -10°



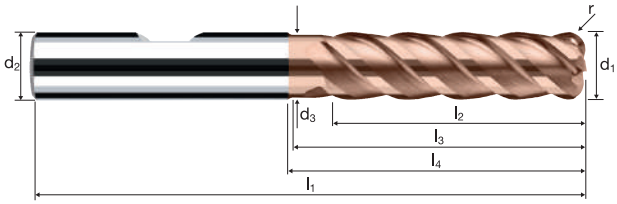












Roughing HPC

Roughing HDC

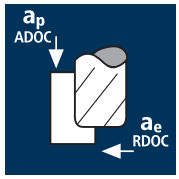
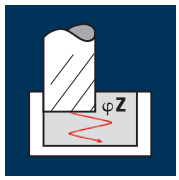
Finishing

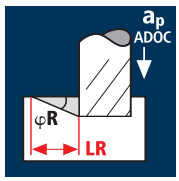
ReTool®

HRC 48-56 | **HRC** 56-60 | **HRC** > 60 | **HSS**

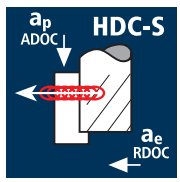
Example: **Order-N°.** Coating **H** | Article-N°. **8617** | ø-Code **302**

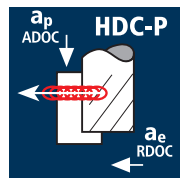
Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	DURO-Si H8617	DURO-Si H8517
302	6.00	6.00	5.50	63	21.00	25.34	26.00	1.000	4	●	
391	8.00	8.00	7.40	72	31.00	34.79	35.50	1.000	4	●	
450	10.00	10.00	9.20	84	37.00	42.20	43.00	1.000	4	●	
501	12.00	12.00	11.00	97	44.00	50.13	51.00	1.000	4	●	
608	16.00	16.00	15.00	108	53.00	58.13	59.00	1.000	4	●	
304	6.00	6.00	5.50	63	21.00	25.34	26.00	1.500	4	●	
395	8.00	8.00	7.40	72	31.00	34.79	35.50	2.000	4	●	
457	10.00	10.00	9.20	84	37.00	42.20	43.00	2.500	4	●	
507	12.00	12.00	11.00	97	44.00	50.13	51.00	3.000	4	●	

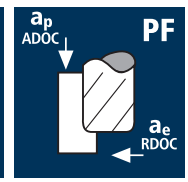
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	4.00	4	135	0.026	8.000	1.200	10745	1118	10.7	12.0°
		5.00	4	135	0.030	10.000	1.500	8595	1031	15.5	12.0°
		6.00	4	135	0.034	12.000	1.800	7160	974	21.0	12.0°
		8.00	4	135	0.043	16.000	2.400	5370	924	35.5	12.0°
		10.00	4	135	0.055	20.000	3.000	4295	945	56.7	12.0°
		12.00	4	135	0.064	24.000	3.600	3580	917	79.2	12.0°
		16.00	4	135	0.072	25.600	4.800	2685	773	95.0	12.0°
	Steel 1100 - 1300 N/mm² P P	4.00	4	105	0.021	8.000	1.200	8355	702	6.7	12.0°
		5.00	4	105	0.026	10.000	1.500	6685	695	10.4	12.0°
		6.00	4	105	0.030	12.000	1.800	5570	668	14.4	12.0°
		8.00	4	105	0.038	16.000	2.400	4180	635	24.4	12.0°
		10.00	4	105	0.047	20.000	3.000	3340	628	37.7	12.0°
		12.00	4	105	0.055	24.000	3.600	2785	613	52.9	12.0°
		16.00	4	105	0.064	25.600	4.800	2090	535	65.7	12.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	80	0.017	8.000	1.200	6365	433	4.2	8.0°
		5.00	4	80	0.021	10.000	1.500	5095	428	6.4	8.0°
		6.00	4	80	0.026	12.000	1.800	4245	442	9.5	8.0°
		8.00	4	80	0.030	16.000	2.400	3185	382	14.7	8.0°
		10.00	4	80	0.038	20.000	3.000	2545	387	23.2	8.0°
		12.00	4	80	0.047	24.000	3.600	2120	399	34.4	8.0°
		16.00	4	80	0.055	25.600	4.800	1590	350	43.0	8.0°

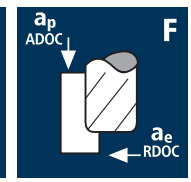
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	4.00	4	110	0.017	6.000	4.000	8755	595	14.3	12.0°	28.2
		5.00	4	110	0.020	7.500	5.000	7005	560	21.0	12.0°	35.3
		6.00	4	110	0.022	9.000	6.000	5835	514	27.7	12.0°	42.3
		8.00	4	110	0.028	12.000	8.000	4375	490	47.0	12.0°	56.5
		10.00	4	110	0.036	15.000	10.000	3500	504	75.6	12.0°	70.6
		12.00	4	110	0.042	18.000	12.000	2920	491	106.0	12.0°	84.7
		16.00	4	110	0.047	24.000	16.000	2190	412	158.1	12.0°	112.9
	Steel 1100 - 1300 N/mm² P P	4.00	4	85	0.014	6.000	4.000	6765	379	9.1	12.0°	28.2
		5.00	4	85	0.017	7.500	5.000	5410	368	13.8	12.0°	35.3
		6.00	4	85	0.020	9.000	6.000	4510	361	19.5	12.0°	42.3
		8.00	4	85	0.025	12.000	8.000	3380	338	32.4	12.0°	56.5
		10.00	4	85	0.031	15.000	10.000	2705	335	50.3	12.0°	70.6
		12.00	4	85	0.036	18.000	12.000	2255	325	70.1	12.0°	84.7
		16.00	4	85	0.042	24.000	16.000	1690	284	109.0	12.0°	112.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	4.00	4	65	0.011	6.000	4.000	5175	228	5.5	12.0°	28.2
		5.00	4	65	0.014	7.500	5.000	4140	232	8.7	12.0°	35.3
		6.00	4	65	0.017	9.000	6.000	3450	235	12.7	12.0°	42.3
		8.00	4	65	0.020	12.000	8.000	2585	207	19.9	12.0°	56.5
		10.00	4	65	0.025	15.000	10.000	2070	207	31.1	12.0°	70.6
		12.00	4	65	0.031	18.000	12.000	1725	214	46.2	12.0°	84.7
		16.00	4	65	0.036	24.000	16.000	1295	187	71.6	12.0°	112.9

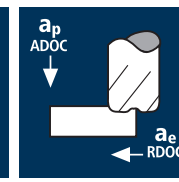
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

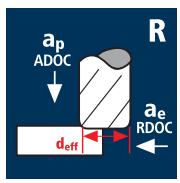


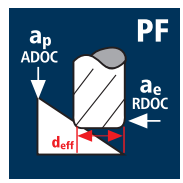


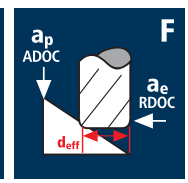


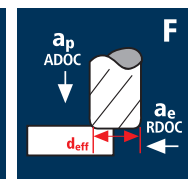










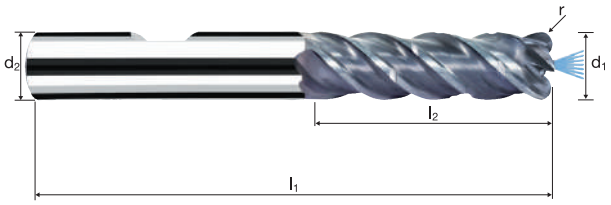


Corner radius end mills MFC

Smooth-edged, chip breaker, medium version
High-performance penetration edge, central air/cooling channel

HM MG10 | λ **45°** γ **10°**

Vario



Roughing HPC | Roughing HDC | Finishing

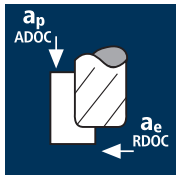
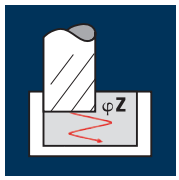
ReTool®

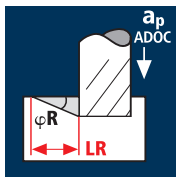
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8217** ø-Code **218**

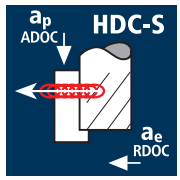
Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r 0/+0.03	z	POLYCHROM P8217	POLYCHROM P8117
218*	4.00	6.00	63	13.00	19.59	0.200	4		●
258*	5.00	6.00	63	16.00	20.72	0.200	4		●
297	6.00	6.00	63	21.00	-	0.200	4		●
385	8.00	8.00	72	31.00	-	0.200	4		●
445	10.00	10.00	84	37.00	-	0.200	4		●
496	12.00	12.00	97	44.00	-	0.200	4		●
605	16.00	16.00	108	53.00	-	0.200	4		●
220*	4.00	6.00	63	13.00	19.59	0.500	4		●
260*	5.00	6.00	63	16.00	20.72	0.500	4		●
300	6.00	6.00	63	21.00	-	0.500	4		●
388	8.00	8.00	72	31.00	-	0.500	4		●
448	10.00	10.00	84	37.00	-	0.500	4		●
498	12.00	12.00	97	44.00	-	0.500	4		●
606	16.00	16.00	108	53.00	-	0.500	4		●
302	6.00	6.00	63	21.00	-	1.000	4		●
391	8.00	8.00	72	31.00	-	1.000	4		●
450	10.00	10.00	84	37.00	-	1.000	4		●
501	12.00	12.00	97	44.00	-	1.000	4		●
608	16.00	16.00	108	53.00	-	1.000	4		●

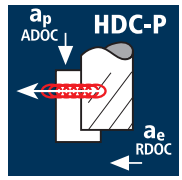
* without chip breaker

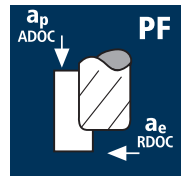
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel 850 - 1100 N/mm² P P	8.00	4	135	0.043	16.000	2.400	5370	924	35.5	12.0°
		10.00	4	135	0.055	20.000	3.000	4295	945	56.7	12.0°
		12.00	4	135	0.064	24.000	3.600	3580	917	79.2	12.0°
		16.00	4	135	0.072	25.600	4.800	2685	773	95.0	12.0°
	Steel 1100 - 1300 N/mm² P P	8.00	4	105	0.038	16.000	2.400	4180	635	24.4	12.0°
		10.00	4	105	0.047	20.000	3.000	3340	628	37.7	12.0°
		12.00	4	105	0.055	24.000	3.600	2785	613	52.9	12.0°
		16.00	4	105	0.064	25.600	4.800	2090	535	65.7	12.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	8.00	4	80	0.030	16.000	2.400	3185	382	14.7	8.0°
		10.00	4	80	0.038	20.000	3.000	2545	387	23.2	8.0°
		12.00	4	80	0.047	24.000	3.600	2120	399	34.4	8.0°
		16.00	4	80	0.055	25.600	4.800	1590	350	43.0	8.0°

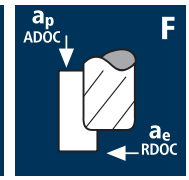
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel 850 - 1100 N/mm² P P	8.00	4	110	0.028	12.000	8.000	4375	490	47.0	12.0°	56.5
		10.00	4	110	0.036	15.000	10.000	3500	504	75.6	12.0°	70.6
		12.00	4	110	0.042	18.000	12.000	2920	491	106.0	12.0°	84.7
		16.00	4	110	0.047	24.000	16.000	2190	412	158.1	12.0°	112.9
	Steel 1100 - 1300 N/mm² P P	8.00	4	85	0.025	12.000	8.000	3380	338	32.4	12.0°	56.5
		10.00	4	85	0.031	15.000	10.000	2705	335	50.3	12.0°	70.6
		12.00	4	85	0.036	18.000	12.000	2255	325	70.1	12.0°	84.7
		16.00	4	85	0.042	24.000	16.000	1690	284	109.0	12.0°	112.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] P	8.00	4	65	0.020	12.000	8.000	2585	207	19.9	12.0°	56.5
		10.00	4	65	0.025	15.000	10.000	2070	207	31.1	12.0°	70.6
		12.00	4	65	0.031	18.000	12.000	1725	214	46.2	12.0°	84.7
		16.00	4	65	0.036	24.000	16.000	1295	187	71.6	12.0°	112.9

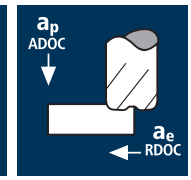
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

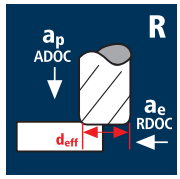


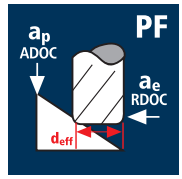


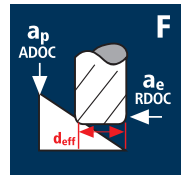


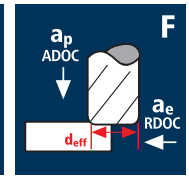










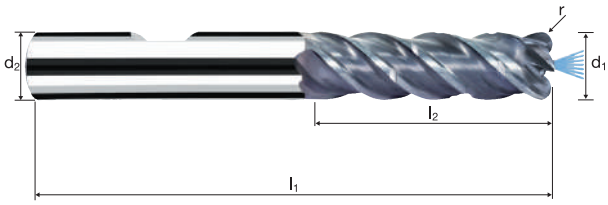


Corner radius end mills MFC

Smooth-edged, chip breaker, medium version
High-performance penetration edge, central air/cooling channel

HM MG10 | λ **45°** γ **10°**

Vario



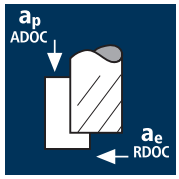
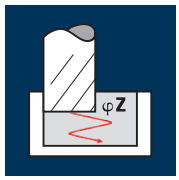
Roughing HPC | Roughing HDC | Finishing

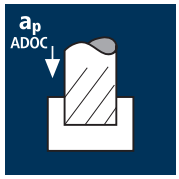
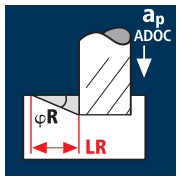
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8217** ø-Code **393**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r 0/+0.03	z	POLYCHROM P8217	POLYCHROM P8117
393	8.00	8.00	72	31.00	-	1.500	4		●
453	10.00	10.00	84	37.00	-	1.500	4		●
503	12.00	12.00	97	44.00	-	1.500	4		●
610	16.00	16.00	108	53.00	-	1.500	4		●
455	10.00	10.00	84	37.00	-	2.000	4		●
505	12.00	12.00	97	44.00	-	2.000	4		●
611	16.00	16.00	108	53.00	-	2.000	4		●
506	12.00	12.00	97	44.00	-	2.500	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Steel < 850 N/mm²	4.00	3	160	0.020	6.000	2.400	12730	764	11.0	20.0°
		5.00	4	160	0.025	7.500	3.000	10185	1019	22.9	20.0°
		6.00	4	160	0.030	9.000	3.600	8490	1019	33.0	20.0°
		8.00	4	160	0.040	12.000	4.800	6365	1018	58.7	20.0°
		10.00	4	160	0.050	15.000	6.000	5095	1019	91.7	20.0°
		12.00	4	160	0.055	18.000	7.200	4245	934	121.0	20.0°
		16.00	4	160	0.055	24.000	9.600	3185	701	161.4	20.0°
		20.00	4	160	0.060	30.000	12.000	2545	611	219.9	20.0°
	Steel 850 - 1100 N/mm²	4.00	3	130	0.020	6.000	2.400	10345	621	8.9	18.0°
		5.00	4	130	0.025	7.500	3.000	8275	828	18.6	18.0°
		6.00	4	130	0.030	9.000	3.600	6895	827	26.8	18.0°
		8.00	4	130	0.040	12.000	4.800	5175	828	47.7	18.0°
		10.00	4	130	0.050	15.000	6.000	4140	828	74.5	18.0°
		12.00	4	130	0.055	18.000	7.200	3450	759	98.4	18.0°
		16.00	4	130	0.055	24.000	9.600	2585	569	131.0	18.0°
		20.00	4	130	0.060	30.000	12.000	2070	497	178.8	18.0°
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	3	60	0.015	6.000	2.400	4775	215	3.1	12.0°
		5.00	4	60	0.020	7.500	3.000	3820	306	6.9	12.0°
		6.00	4	60	0.025	9.000	3.600	3185	319	10.3	12.0°
		8.00	4	60	0.030	12.000	4.800	2385	286	16.5	12.0°
		10.00	4	60	0.040	15.000	6.000	1910	306	27.5	12.0°
		12.00	4	60	0.045	18.000	7.200	1590	286	37.1	12.0°
		16.00	4	60	0.045	24.000	8.400	1195	215	43.4	12.0°
		20.00	4	60	0.050	30.000	12.000	955	191	68.8	12.0°
	Titanium alloys >300 HB [Ti6Al4V]	4.00	3	45	0.015	6.000	2.400	3580	161	2.3	12.0°
		5.00	4	45	0.020	7.500	3.000	2865	229	5.2	12.0°
		6.00	4	45	0.025	9.000	3.600	2385	239	7.7	12.0°
		8.00	4	45	0.030	12.000	4.800	1790	215	12.4	12.0°
		10.00	4	45	0.040	15.000	6.000	1430	229	20.6	12.0°
		12.00	4	45	0.045	18.000	7.200	1195	215	27.9	12.0°
		16.00	4	45	0.045	24.000	9.600	895	161	37.1	12.0°
		20.00	4	45	0.050	30.000	12.000	715	143	51.5	12.0°

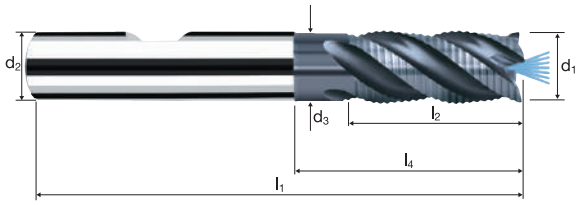
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Steel < 850 N/mm²	4.00	3	135	0.020	5.000	4.000	10745	645	12.9	20.0°	13.7
		5.00	4	135	0.025	6.300	5.000	8595	860	27.1	20.0°	17.3
		6.00	4	135	0.030	7.500	6.000	7160	859	38.7	20.0°	20.6
		8.00	4	135	0.040	10.000	8.000	5370	859	68.7	20.0°	27.5
		10.00	4	135	0.050	12.500	10.000	4295	859	107.4	20.0°	34.3
		12.00	4	135	0.055	15.000	12.000	3580	788	141.8	20.0°	41.2
		16.00	4	135	0.055	20.000	16.000	2685	591	189.0	20.0°	54.9
		20.00	4	135	0.060	25.000	20.000	2150	516	258.0	20.0°	68.7
	Steel 850 - 1100 N/mm²	4.00	3	80	0.020	5.000	4.000	6365	382	7.6	20.0°	13.7
		5.00	4	80	0.025	6.300	5.000	5095	510	16.0	20.0°	17.3
		6.00	4	80	0.030	7.500	6.000	4245	509	22.9	20.0°	20.6
		8.00	4	80	0.040	10.000	8.000	3185	510	40.8	20.0°	27.5
		10.00	4	80	0.050	12.500	10.000	2545	509	63.6	20.0°	34.3
		12.00	4	80	0.055	15.000	12.000	2120	466	84.0	20.0°	41.2
		16.00	4	80	0.055	20.000	16.000	1590	350	111.9	20.0°	54.9
		20.00	4	80	0.060	25.000	20.000	1275	306	153.0	20.0°	68.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.00	3	50	0.015	5.000	4.000	3980	179	3.6	14.0°	20.1
		5.00	4	50	0.020	6.300	5.000	3185	255	8.0	14.0°	25.3
		6.00	4	50	0.025	7.500	6.000	2655	266	11.9	14.0°	30.1
		8.00	4	50	0.030	10.000	8.000	1990	239	19.1	14.0°	40.1
		10.00	4	50	0.040	12.500	10.000	1590	254	31.8	14.0°	50.1
		12.00	4	50	0.045	15.000	12.000	1325	239	42.9	14.0°	60.2
		16.00	4	50	0.045	20.000	16.000	995	179	57.3	14.0°	80.2
		20.00	4	50	0.050	25.000	20.000	795	159	79.5	14.0°	100.3
	Titanium alloys >300 HB [Ti6Al4V]	4.00	3	35	0.015	5.000	4.000	2785	125	2.5	14.0°	20.1
		5.00	4	35	0.020	6.300	5.000	2230	178	5.6	14.0°	25.3
		6.00	4	35	0.025	7.500	6.000	1855	186	8.3	14.0°	30.1
		8.00	4	35	0.030	10.000	8.000	1395	167	13.4	14.0°	40.1
		10.00	4	35	0.040	12.500	10.000	1115	178	22.3	14.0°	50.1
		12.00	4	35	0.045	15.000	12.000	930	167	30.1	14.0°	60.2
		16.00	4	35	0.045	20.000	16.000	695	125	40.0	14.0°	80.2
		20.00	4	35	0.050	25.000	20.000	555	111	55.5	14.0°	100.3

Cylindrical/Square end mills SupraCarb®

Profiled, normal version, short neck
High-performance penetration edge, central air/cooling channel

HM MG10 | λ **38°** γ **0°**

r



Roughing

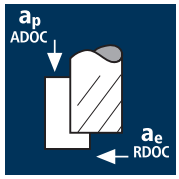
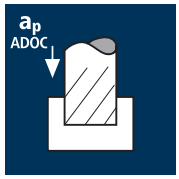
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8402** ø-Code **220**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8402	POLYCHROM P8302
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.100	3		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.100	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.150	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.200	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.200	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.200	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.200	4		●

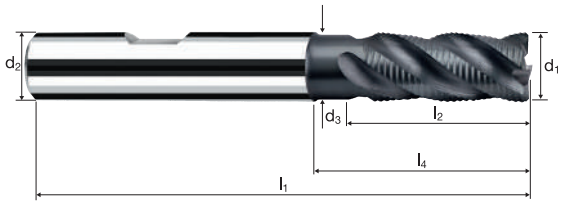
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	3	160	0.015	3.600	1.800	16975	764	5.0
		4.00	3	160	0.020	4.800	2.400	12730	764	8.8
		5.00	4	160	0.025	6.000	3.000	10185	1019	18.3
		6.00	4	160	0.030	7.200	3.600	8490	1019	26.4
		8.00	4	160	0.040	9.600	4.800	6365	1018	46.9
		10.00	4	160	0.050	12.000	6.000	5095	1019	73.4
		12.00	4	160	0.055	14.400	7.200	4245	934	96.8
		16.00	4	160	0.055	19.200	9.600	3185	701	129.2
		20.00	4	160	0.060	24.000	12.000	2545	611	175.9
	Steel 850 - 1100 N/mm²	3.00	3	130	0.015	3.600	1.800	13795	621	4.0
		4.00	3	130	0.020	4.800	2.400	10345	621	7.2
		5.00	4	130	0.025	6.000	3.000	8275	828	14.9
		6.00	4	130	0.030	7.200	3.600	6895	827	21.4
		8.00	4	130	0.040	9.600	4.800	5175	828	38.2
		10.00	4	130	0.050	12.000	6.000	4140	828	59.6
		12.00	4	130	0.055	14.400	7.200	3450	759	78.7
		16.00	4	130	0.055	19.200	9.600	2585	569	104.8
		20.00	4	130	0.060	24.000	12.000	2070	497	143.1
	Titanium alloys >300 HB [Ti6Al4V]	3.00	3	45	0.010	3.600	1.800	4775	143	0.9
		4.00	3	45	0.015	4.800	2.400	3580	161	1.9
		5.00	4	45	0.020	6.000	3.000	2865	229	4.1
		6.00	4	45	0.025	7.200	3.600	2385	239	6.2
		8.00	4	45	0.030	9.600	4.800	1790	215	9.9
		10.00	4	45	0.040	12.000	6.000	1430	229	16.5
		12.00	4	45	0.045	14.400	7.200	1195	215	22.3
		16.00	4	45	0.045	19.200	9.600	895	161	29.7
		20.00	4	45	0.050	24.000	12.000	715	143	41.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	60	0.010	3.600	1.800	6365	191	1.2
		4.00	3	60	0.015	4.800	2.400	4775	215	2.5
		5.00	4	60	0.020	6.000	3.000	3820	306	5.5
		6.00	4	60	0.025	7.200	3.600	3185	319	8.3
		8.00	4	60	0.030	9.600	4.800	2385	286	13.2
		10.00	4	60	0.040	12.000	6.000	1910	306	22.0
		12.00	4	60	0.045	14.400	7.200	1590	286	29.7
		16.00	4	60	0.045	16.800	8.400	1195	215	30.4
		20.00	4	60	0.050	24.000	12.000	955	191	55.0
	Steel < 850 N/mm²	3.00	3	135	0.015	3.000	3.000	14325	645	5.8
		4.00	3	135	0.020	4.000	4.000	10745	645	10.3
		5.00	4	135	0.025	5.000	5.000	8595	860	21.5
		6.00	4	135	0.030	6.000	6.000	7160	859	30.9
		8.00	4	135	0.040	8.000	8.000	5370	859	55.0
		10.00	4	135	0.050	10.000	10.000	4295	859	85.9
		12.00	4	135	0.055	12.000	12.000	3580	788	113.4
		16.00	4	135	0.055	16.000	16.000	2685	591	151.2
		20.00	4	135	0.060	20.000	20.000	2150	516	206.4
	Steel 850 - 1100 N/mm²	3.00	3	80	0.015	3.000	3.000	8490	382	3.4
		4.00	3	80	0.020	4.000	4.000	6365	382	6.1
		5.00	4	80	0.025	5.000	5.000	5095	510	12.7
		6.00	4	80	0.030	6.000	6.000	4245	509	18.3
		8.00	4	80	0.040	8.000	8.000	3185	510	32.6
		10.00	4	80	0.050	10.000	10.000	2545	509	50.9
		12.00	4	80	0.055	12.000	12.000	2120	466	67.2
		16.00	4	80	0.055	16.000	16.000	1590	350	89.5
		20.00	4	80	0.060	20.000	20.000	1275	306	122.4
	Titanium alloys >300 HB [Ti6Al4V]	3.00	3	35	0.010	3.000	3.000	3715	112	1.0
		4.00	3	35	0.015	4.000	4.000	2785	125	2.0
		5.00	4	35	0.020	5.000	5.000	2230	178	4.5
		6.00	4	35	0.025	6.000	6.000	1855	186	6.7
		8.00	4	35	0.030	8.000	8.000	1395	167	10.7
		10.00	4	35	0.040	10.000	10.000	1115	178	17.8
		12.00	4	35	0.045	12.000	12.000	930	167	24.1
		16.00	4	35	0.045	16.000	16.000	695	125	32.0
		20.00	4	35	0.050	20.000	20.000	555	111	44.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	50	0.010	3.000	3.000	5305	159	1.4
		4.00	3	50	0.015	4.000	4.000	3980	179	2.9
		5.00	4	50	0.020	5.000	5.000	3185	255	6.4
		6.00	4	50	0.025	6.000	6.000	2655	266	9.6
		8.00	4	50	0.030	8.000	8.000	1990	239	15.3
		10.00	4	50	0.040	10.000	10.000	1590	254	25.4
		12.00	4	50	0.045	12.000	12.000	1325	239	34.3
		16.00	4	50	0.045	16.000	16.000	995	179	45.8
		20.00	4	50	0.050	20.000	20.000	795	159	63.6

Cylindrical/Square end mills SupraCarb®

Profiled, normal version, short neck

HM MG10 | λ 38° γ 0°

45°



Roughing

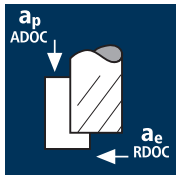
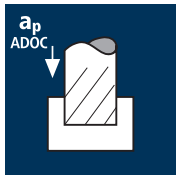
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15336** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15336	POLYCHROM P15236
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.20	3		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.25	3		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.30	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.30	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.40	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.50	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.50	4		●
570	14.00	14.00	13.00	83	26.00	36.13	37.00	0.50	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.60	4		●
612	16.00	16.00	15.00	92	32.00	42.13	43.00	0.60	6		●
640	18.00	18.00	17.00	92	32.00	42.13	43.00	0.60	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.60	4		●
684	20.00	20.00	19.00	104	38.00	52.13	53.00	0.60	6		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	3	150	0.015	3.600	1.800	15915	716	4.6
		4.00	3	150	0.020	4.800	2.400	11935	716	8.2
		5.00	4	150	0.025	6.000	3.000	9550	955	17.2
		6.00	4	150	0.030	7.200	3.600	7960	955	24.8
		8.00	4	150	0.040	9.600	4.800	5970	955	44.0
		10.00	4	150	0.050	12.000	6.000	4775	955	68.8
		12.00	4	150	0.055	14.400	7.200	3980	876	90.8
		16.00	4	150	0.055	19.200	9.600	2985	657	121.0
		20.00	4	150	0.060	24.000	12.000	2385	572	164.9
	Steel 850 - 1100 N/mm²	3.00	3	130	0.015	3.600	1.800	13795	621	4.0
		4.00	3	130	0.020	4.800	2.400	10345	621	7.2
		5.00	4	130	0.025	6.000	3.000	8275	828	14.9
		6.00	4	130	0.030	7.200	3.600	6895	827	21.4
		8.00	4	130	0.040	9.600	4.800	5175	828	38.2
		10.00	4	130	0.050	12.000	6.000	4140	828	59.6
		12.00	4	130	0.055	14.400	7.200	3450	759	78.7
		16.00	4	130	0.055	19.200	9.600	2585	569	104.8
		20.00	4	130	0.060	24.000	12.000	2070	497	143.1
	Titanium alloys >300 HB [Ti6Al4V]	3.00	3	45	0.010	3.600	1.800	4775	143	0.9
		4.00	3	45	0.015	4.800	2.400	3580	161	1.9
		5.00	4	45	0.020	6.000	3.000	2865	229	4.1
		6.00	4	45	0.025	7.200	3.600	2385	239	6.2
		8.00	4	45	0.030	9.600	4.800	1790	215	9.9
		10.00	4	45	0.040	12.000	6.000	1430	229	16.5
		12.00	4	45	0.045	14.400	7.200	1195	215	22.3
		16.00	4	45	0.045	19.200	9.600	895	161	29.7
		20.00	4	45	0.050	24.000	12.000	715	143	41.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	55	0.010	3.600	1.800	5835	175	1.1
		4.00	3	55	0.015	4.800	2.400	4375	197	2.3
		5.00	4	55	0.020	6.000	3.000	3500	280	5.0
		6.00	4	55	0.025	7.200	3.600	2920	292	7.6
		8.00	4	55	0.030	9.600	4.800	2190	263	12.1
		10.00	4	55	0.040	12.000	6.000	1750	280	20.2
		12.00	4	55	0.045	14.400	7.200	1460	263	27.2
		16.00	4	55	0.045	19.200	9.600	1095	197	36.3
		20.00	4	55	0.050	24.000	12.000	875	175	50.4
	Steel < 850 N/mm²	3.00	3	135	0.015	3.000	3.000	14325	645	5.8
		4.00	3	135	0.020	4.000	4.000	10745	645	10.3
		5.00	4	135	0.025	5.000	5.000	8595	860	21.5
		6.00	4	135	0.030	6.000	6.000	7160	859	30.9
		8.00	4	135	0.040	8.000	8.000	5370	859	55.0
		10.00	4	135	0.050	10.000	10.000	4295	859	85.9
		12.00	4	135	0.055	12.000	12.000	3580	788	113.4
		16.00	4	135	0.055	16.000	16.000	2685	591	151.2
		20.00	4	135	0.060	20.000	20.000	2150	516	206.4
	Steel 850 - 1100 N/mm²	3.00	3	80	0.015	3.000	3.000	8490	382	3.4
		4.00	3	80	0.020	4.000	4.000	6365	382	6.1
		5.00	4	80	0.025	5.000	5.000	5095	510	12.7
		6.00	4	80	0.030	6.000	6.000	4245	509	18.3
		8.00	4	80	0.040	8.000	8.000	3185	510	32.6
		10.00	4	80	0.050	10.000	10.000	2545	509	50.9
		12.00	4	80	0.055	12.000	12.000	2120	466	67.2
		16.00	4	80	0.055	16.000	16.000	1590	350	89.5
		20.00	4	80	0.060	20.000	20.000	1275	306	122.4
	Titanium alloys >300 HB [Ti6Al4V]	3.00	3	35	0.010	3.000	3.000	3715	112	1.0
		4.00	3	35	0.015	4.000	4.000	2785	125	2.0
		5.00	4	35	0.020	5.000	5.000	2230	178	4.5
		6.00	4	35	0.025	6.000	6.000	1855	186	6.7
		8.00	4	35	0.030	8.000	8.000	1395	167	10.7
		10.00	4	35	0.040	10.000	10.000	1115	178	17.8
		12.00	4	35	0.045	12.000	12.000	930	167	24.1
		16.00	4	35	0.045	16.000	16.000	695	125	32.0
		20.00	4	35	0.050	20.000	20.000	555	111	44.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	45	0.010	3.000	3.000	4775	143	1.3
		4.00	3	45	0.015	4.000	4.000	3580	161	2.6
		5.00	4	45	0.020	5.000	5.000	2865	229	5.7
		6.00	4	45	0.025	6.000	6.000	2385	239	8.6
		8.00	4	45	0.030	8.000	8.000	1790	215	13.7
		10.00	4	45	0.040	10.000	10.000	1430	229	22.9
		12.00	4	45	0.045	12.000	12.000	1195	215	31.0
		16.00	4	45	0.045	16.000	16.000	895	161	41.2
		20.00	4	45	0.050	20.000	20.000	715	143	57.2

Cylindrical/Square end mills

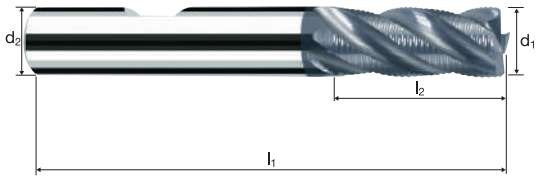
Profiled, normal version

Favora® F

HM MG10	λ 38° γ 0°









Roughing



Finishing

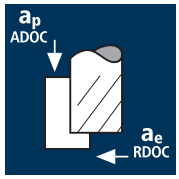
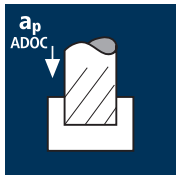


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **45371** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P45371
180	3.00	6.00	57	8.00	15.56	0.20	3	●
220	4.00	6.00	57	11.00	16.89	0.25	3	●
260	5.00	6.00	57	13.00	17.22	0.30	4	●
300	6.00	6.00	57	13.00	-	0.30	4	●
391	8.00	8.00	63	19.00	-	0.40	4	●
450	10.00	10.00	72	22.00	-	0.50	4	●
501	12.00	12.00	83	26.00	-	0.50	4	●
610	16.00	16.00	92	32.00	-	0.60	4	●
612	16.00	16.00	92	32.00	-	0.60	6	●
682	20.00	20.00	104	38.00	-	0.60	4	●
684	20.00	20.00	104	38.00	-	0.60	6	●

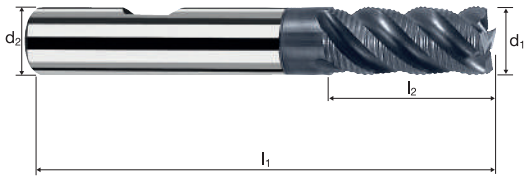
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	62	0.030	9.000	2.400	3290	395	8.5
		8.00	4	62	0.040	12.000	3.200	2465	394	15.1
		10.00	4	62	0.050	15.000	4.000	1975	395	23.7
		12.00	4	62	0.080	18.000	4.800	1645	526	45.5
		16.00	4	62	0.105	24.000	6.400	1235	519	79.7
		20.00	4	62	0.130	30.000	8.000	985	512	122.9
		25.00	4	62	0.165	37.500	10.000	790	521	195.5
	Steel 850 - 1100 N/mm²	6.00	4	52	0.030	9.000	2.400	2760	331	7.2
		8.00	4	52	0.040	12.000	3.200	2070	331	12.7
		10.00	4	52	0.050	15.000	4.000	1655	331	19.9
		12.00	4	52	0.080	18.000	4.800	1380	442	38.2
		16.00	4	52	0.105	24.000	6.400	1035	435	66.8
		20.00	4	52	0.130	30.000	8.000	830	432	103.6
		25.00	4	52	0.165	37.500	10.000	660	436	163.4
	Steel 1100 - 1300 N/mm²	6.00	4	40	0.030	9.000	2.400	2120	254	5.5
		8.00	4	40	0.040	12.000	3.200	1590	254	9.8
		10.00	4	40	0.050	15.000	4.000	1275	255	15.3
		12.00	4	40	0.080	18.000	4.800	1060	339	29.3
		16.00	4	40	0.105	24.000	6.400	795	334	51.3
		20.00	4	40	0.130	30.000	8.000	635	330	79.2
		25.00	4	40	0.165	37.500	10.000	510	337	126.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	30	0.030	9.000	2.400	1590	191	4.1
		8.00	4	30	0.040	12.000	3.200	1195	191	7.3
		10.00	4	30	0.050	15.000	4.000	955	191	11.5
		12.00	4	30	0.080	18.000	4.800	795	254	22.0
		16.00	4	30	0.105	24.000	6.400	595	250	38.4
		20.00	4	30	0.130	30.000	8.000	475	247	59.3
		25.00	4	30	0.165	37.500	10.000	380	251	94.1
	Steel 500 - 850 N/mm²	6.00	4	56	0.020	6.000	6.000	2970	238	8.6
		8.00	4	56	0.030	8.000	8.000	2230	268	17.1
		10.00	4	56	0.035	10.000	10.000	1785	250	25.0
		12.00	4	56	0.060	12.000	12.000	1485	356	51.3
		16.00	4	56	0.080	16.000	16.000	1115	357	91.3
		20.00	4	56	0.100	20.000	20.000	890	356	142.4
		25.00	4	56	0.125	25.000	25.000	715	358	223.4
	Steel 850 - 1100 N/mm²	6.00	4	50	0.020	6.000	6.000	2655	212	7.6
		8.00	4	50	0.030	8.000	8.000	1990	239	15.3
		10.00	4	50	0.035	10.000	10.000	1590	223	22.3
		12.00	4	50	0.060	12.000	12.000	1325	318	45.8
		16.00	4	50	0.080	16.000	16.000	995	318	81.5
		20.00	4	50	0.100	20.000	20.000	795	318	127.2
		25.00	4	50	0.125	25.000	25.000	635	318	198.4
	Steel 1100 - 1300 N/mm²	6.00	4	37	0.020	6.000	6.000	1965	157	5.7
		8.00	4	37	0.030	8.000	8.000	1470	176	11.3
		10.00	4	37	0.035	10.000	10.000	1180	165	16.5
		12.00	4	37	0.060	12.000	12.000	980	235	33.9
		16.00	4	37	0.080	16.000	16.000	735	235	60.2
		20.00	4	37	0.100	20.000	20.000	590	236	94.4
		25.00	4	37	0.125	25.000	25.000	470	235	146.9
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	25	0.020	6.000	6.000	1325	106	3.8
		8.00	4	25	0.030	8.000	8.000	995	119	7.6
		10.00	4	25	0.035	10.000	10.000	795	111	11.1
		12.00	4	25	0.060	12.000	12.000	665	160	23.0
		16.00	4	25	0.080	16.000	16.000	495	158	40.6
		20.00	4	25	0.100	20.000	20.000	400	160	64.0
		25.00	4	25	0.125	25.000	25.000	320	160	100.0

Cylindrical/Square end mills

Profiled, normal version

HSS PM/F | λ 45° γ 2°





Roughing

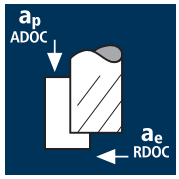
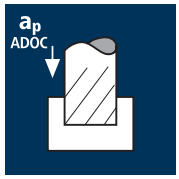
Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless

Example: **Order-N°.** Coating **P** Article-N°. **0541** ø-Code **300**

Ø Code	d_1 k10	d_2 h6	l_1	l_2	45°	z	POLYCHROM P0541
300	6.00	6.00	57	13.00	0.30	4	●
391	8.00	8.00	63	19.00	0.40	4	●
450	10.00	10.00	72	22.00	0.50	4	●
501	12.00	12.00	83	26.00	0.50	4	●
610	16.00	16.00	92	32.00	0.60	4	●
682	20.00	20.00	104	38.00	0.60	4	●
772	25.00	25.00	121	45.00	0.75	4	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	5.00	3	54	0.025	5.000	2.000	3440	258	2.6
		6.00	3	54	0.025	6.000	2.400	2865	215	3.1
		8.00	4	54	0.035	8.000	3.200	2150	226	5.8
		9.00	4	54	0.040	9.000	3.600	1910	306	9.9
		10.00	4	54	0.045	10.000	4.000	1720	310	12.4
		12.00	4	54	0.070	12.000	4.800	1430	400	23.1
		16.00	4	54	0.095	16.000	6.400	1075	409	41.8
		20.00	4	54	0.115	20.000	8.000	860	396	63.3
		22.00	4	54	0.130	22.000	8.800	780	406	78.5
	Steel 850 - 1100 N/mm²	5.00	3	48	0.025	5.000	2.000	3055	229	2.3
		6.00	3	48	0.025	6.000	2.400	2545	191	2.7
		8.00	4	48	0.035	8.000	3.200	1910	201	5.1
		9.00	4	48	0.040	9.000	3.600	1700	272	8.8
		10.00	4	48	0.045	10.000	4.000	1530	275	11.0
		12.00	4	48	0.070	12.000	4.800	1275	357	20.6
		16.00	4	48	0.095	16.000	6.400	955	363	37.2
		20.00	4	48	0.115	20.000	8.000	765	352	56.3
		22.00	4	48	0.130	22.000	8.800	695	361	70.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	5.00	3	25	0.025	5.000	2.000	1590	119	1.2
		6.00	3	25	0.025	6.000	2.400	1325	99	1.4
		8.00	4	25	0.035	8.000	3.200	995	105	2.7
		9.00	4	25	0.040	9.000	3.600	885	142	4.6
		10.00	4	25	0.045	10.000	4.000	795	143	5.7
		12.00	4	25	0.070	12.000	4.800	665	186	10.7
		16.00	4	25	0.095	16.000	6.400	495	188	19.3
		20.00	4	25	0.115	20.000	8.000	400	184	29.4
		22.00	4	25	0.130	22.000	8.800	360	187	36.2
	Cast iron (lamellar / spheroidal)	5.00	3	42	0.025	5.000	2.000	2675	201	2.0
		6.00	3	42	0.025	6.000	2.400	2230	167	2.4
		8.00	4	42	0.035	8.000	3.200	1670	175	4.5
		9.00	4	42	0.040	9.000	3.600	1485	238	7.7
		10.00	4	42	0.045	10.000	4.000	1335	240	9.6
		12.00	4	42	0.070	12.000	4.800	1115	312	18.0
		16.00	4	42	0.095	16.000	6.400	835	317	32.5
		20.00	4	42	0.115	20.000	8.000	670	308	49.3
		22.00	4	42	0.130	22.000	8.800	610	317	61.4
	Steel 500 - 850 N/mm²	5.00	3	50	0.015	5.000	5.000	3185	143	3.6
		6.00	3	50	0.020	6.000	6.000	2655	159	5.7
		8.00	4	50	0.025	8.000	8.000	1990	149	9.6
		9.00	4	50	0.030	9.000	9.000	1770	212	17.2
		10.00	4	50	0.035	10.000	10.000	1590	223	22.3
		12.00	4	50	0.055	12.000	12.000	1325	292	42.0
		16.00	4	50	0.070	16.000	16.000	995	279	71.3
		20.00	4	50	0.090	20.000	20.000	795	286	114.5
		22.00	4	50	0.095	22.000	22.000	725	276	133.3
	Steel 850 - 1100 N/mm²	5.00	3	45	0.015	5.000	5.000	2865	129	3.2
		6.00	3	45	0.020	6.000	6.000	2385	143	5.2
		8.00	4	45	0.025	8.000	8.000	1790	134	8.6
		9.00	4	45	0.030	9.000	9.000	1590	191	15.5
		10.00	4	45	0.035	10.000	10.000	1430	200	20.0
		12.00	4	45	0.055	12.000	12.000	1195	263	37.9
		16.00	4	45	0.070	16.000	16.000	895	251	64.2
		20.00	4	45	0.090	20.000	20.000	715	257	103.0
		22.00	4	45	0.095	22.000	22.000	650	247	119.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	5.00	3	22	0.015	5.000	5.000	1400	63	1.6
		6.00	3	22	0.020	6.000	6.000	1165	70	2.5
		8.00	4	22	0.025	8.000	8.000	875	66	4.2
		9.00	4	22	0.030	9.000	9.000	780	94	7.6
		10.00	4	22	0.035	10.000	10.000	700	98	9.8
		12.00	4	22	0.055	12.000	12.000	585	129	18.5
		16.00	4	22	0.070	16.000	16.000	440	123	31.5
		20.00	4	22	0.090	20.000	20.000	350	126	50.4
		22.00	4	22	0.095	22.000	22.000	320	122	58.9
	Cast iron (lamellar / spheroidal)	5.00	3	36	0.015	5.000	5.000	2290	103	2.6
		6.00	3	36	0.020	6.000	6.000	1910	115	4.1
		8.00	4	36	0.025	8.000	8.000	1430	107	6.9
		9.00	4	36	0.030	9.000	9.000	1275	153	12.4
		10.00	4	36	0.035	10.000	10.000	1145	160	16.0
		12.00	4	36	0.055	12.000	12.000	955	210	30.3
		16.00	4	36	0.070	16.000	16.000	715	200	51.3
		20.00	4	36	0.090	20.000	20.000	575	207	82.8
		22.00	4	36	0.095	22.000	22.000	520	198	95.6

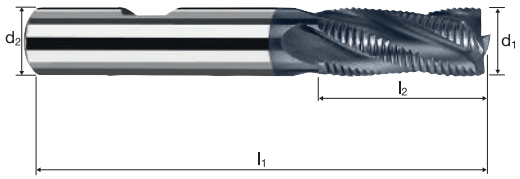
Cylindrical/Square end mills

Profiled NRF, normal version

HSS-E Co8

λ **25°**
γ **10°**

45°



Roughing

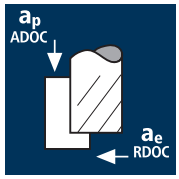
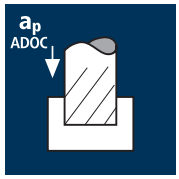
Finishing

ReTool®

Rm <850 **HRC** <24
Rm 850-1100 **HRC** 24-34
Rm 1100-1300 **HRC** 34-42
Inox Stainless
Ti Titanium
GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **0612** ø-Code **260**

Ø Code	d_1 k12	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P0612
260	5.00	6.00	57	13.00	20.55	0.30	3	●
300	6.00	6.00	57	13.00	-	0.30	3	●
342	7.00	10.00	66	16.00	25.50	0.30	3	●
391	8.00	8.00	63	19.00	-	0.30	4	●
402	8.00	10.00	69	19.00	28.50	0.30	4	●
420	9.00	10.00	69	19.00	28.50	0.30	4	●
450	10.00	10.00	72	22.00	-	0.30	4	●
470	11.00	12.00	79	22.00	33.50	0.30	4	●
501	12.00	12.00	83	26.00	-	0.30	4	●
540	13.00	12.00	83	26.00	-	0.30	4	●
570	14.00	12.00	83	26.00	-	0.30	4	●
581	15.00	12.00	83	26.00	-	0.40	4	●
610	16.00	16.00	92	32.00	-	0.40	4	●
640	18.00	16.00	92	32.00	-	0.40	4	●
671	20.00	16.00	98	38.00	-	0.40	4	●
682	20.00	20.00	104	38.00	-	0.40	4	●
710	22.00	20.00	104	38.00	-	0.60	4	●
741	24.00	20.00	111	45.00	-	0.60	4	●

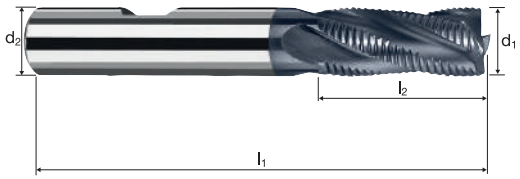
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	25.00	4	54	0.145	25.000	10.000	690	400	100.1
		28.00	6	54	0.115	28.000	11.200	615	424	133.1
		30.00	6	54	0.120	30.000	12.000	575	414	149.0
		32.00	6	54	0.130	32.000	12.800	535	417	170.9
		36.00	6	54	0.145	36.000	14.400	475	413	214.3
		40.00	6	54	0.160	40.000	16.000	430	413	264.2
	Steel 850 - 1100 N/mm²	25.00	4	48	0.145	25.000	10.000	610	354	88.5
		28.00	6	48	0.115	28.000	11.200	545	376	117.9
		30.00	6	48	0.120	30.000	12.000	510	367	132.2
		32.00	6	48	0.130	32.000	12.800	475	371	151.8
		36.00	6	48	0.145	36.000	14.400	425	370	191.7
		40.00	6	48	0.160	40.000	16.000	380	365	233.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	25.00	4	25	0.145	25.000	10.000	320	186	46.4
		28.00	6	25	0.115	28.000	11.200	285	197	61.7
		30.00	6	25	0.120	30.000	12.000	265	191	68.7
		32.00	6	25	0.130	32.000	12.800	250	195	79.9
		36.00	6	25	0.145	36.000	14.400	220	191	99.2
		40.00	6	25	0.160	40.000	16.000	200	192	122.9
	Cast iron (lamellar / spheroidal)	25.00	4	42	0.145	25.000	10.000	535	310	77.6
		28.00	6	42	0.115	28.000	11.200	475	328	102.8
		30.00	6	42	0.120	30.000	12.000	445	320	115.3
		32.00	6	42	0.130	32.000	12.800	420	328	134.2
		36.00	6	42	0.145	36.000	14.400	370	322	166.9
		40.00	6	42	0.160	40.000	16.000	335	322	205.8
	Steel 500 - 850 N/mm²	25.00	4	50	0.110	25.000	25.000	635	279	174.6
		28.00	6	50	0.085	28.000	28.000	570	291	227.9
		30.00	6	50	0.090	30.000	30.000	530	286	257.6
		32.00	6	50	0.095	32.000	32.000	495	282	289.0
		36.00	6	50	0.105	36.000	36.000	440	277	359.3
		40.00	6	50	0.120	40.000	40.000	400	288	460.8
	Steel 850 - 1100 N/mm²	25.00	4	45	0.110	25.000	25.000	575	253	158.1
		28.00	6	45	0.085	28.000	28.000	510	260	203.9
		30.00	6	45	0.090	30.000	30.000	475	257	230.9
		32.00	6	45	0.095	32.000	32.000	450	257	262.7
		36.00	6	45	0.105	36.000	36.000	400	252	326.6
		40.00	6	45	0.120	40.000	40.000	360	259	414.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	25.00	4	22	0.110	25.000	25.000	280	123	77.0
		28.00	6	22	0.085	28.000	28.000	250	128	100.0
		30.00	6	22	0.090	30.000	30.000	235	127	114.2
		32.00	6	22	0.095	32.000	32.000	220	125	128.4
		36.00	6	22	0.105	36.000	36.000	195	123	159.3
		40.00	6	22	0.120	40.000	40.000	175	126	201.6
	Cast iron (lamellar / spheroidal)	25.00	4	36	0.110	25.000	25.000	460	202	126.5
		28.00	6	36	0.085	28.000	28.000	410	209	163.9
		30.00	6	36	0.090	30.000	30.000	380	205	184.7
		32.00	6	36	0.095	32.000	32.000	360	205	210.1
		36.00	6	36	0.105	36.000	36.000	320	202	261.3
		40.00	6	36	0.120	40.000	40.000	285	205	328.3

Cylindrical/Square end mills

Profiled NRF, normal version

HSS-E Co8 | λ **25°** γ **10°**

45°



Roughing

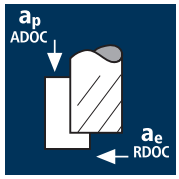
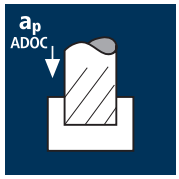
Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G)**

Example: **Order-N°.** Coating **P** Article-N°. **0612** ø-Code **761**

Ø Code	d_1 k12	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P0612
761	25.00	20.00	111	45.00	-	0.60	4	●
772	25.00	25.00	121	45.00	-	0.60	4	●
800	28.00	25.00	121	45.00	-	0.60	6	●
810	30.00	25.00	121	45.00	-	0.60	6	●
832	32.00	32.00	133	53.00	-	0.60	6	●
860	36.00	32.00	133	53.00	-	0.80	6	●
881	40.00	32.00	143	63.00	-	0.80	6	●

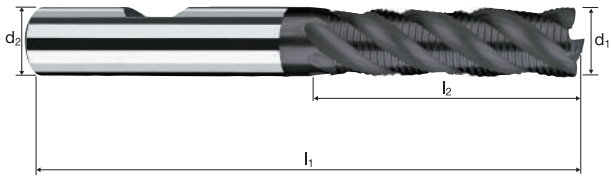
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	160	0.035	9.600	1.200	8490	1189	13.7
		8.00	4	160	0.045	12.800	1.600	6365	1146	23.5
		10.00	4	160	0.060	16.000	2.000	5095	1223	39.1
		12.00	4	160	0.070	19.200	2.400	4245	1189	54.8
		16.00	4	160	0.075	25.600	3.200	3185	956	78.3
		20.00	4	160	0.080	32.000	4.000	2545	814	104.2
	Steel 850 - 1100 N/mm²	6.00	4	130	0.035	9.600	1.200	6895	965	11.1
		8.00	4	130	0.045	12.800	1.600	5175	932	19.1
		10.00	4	130	0.060	16.000	2.000	4140	994	31.8
		12.00	4	130	0.070	19.200	2.400	3450	966	44.5
		16.00	4	130	0.075	25.600	3.200	2585	776	63.5
		20.00	4	130	0.080	32.000	4.000	2070	662	84.8
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	45	0.025	9.600	1.200	2385	239	2.7
		8.00	4	45	0.035	12.800	1.600	1790	251	5.1
		10.00	4	45	0.045	16.000	2.000	1430	257	8.2
		12.00	4	45	0.055	19.200	2.400	1195	263	12.1
		16.00	4	45	0.060	25.600	3.200	895	215	17.6
		20.00	4	45	0.065	32.000	4.000	715	186	23.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	60	0.025	9.600	1.200	3185	319	3.7
		8.00	4	60	0.035	12.800	1.600	2385	334	6.8
		10.00	4	60	0.045	16.000	2.000	1910	344	11.0
		12.00	4	60	0.055	19.200	2.400	1590	350	16.1
		16.00	4	60	0.060	25.600	3.200	1195	287	23.5
		20.00	4	60	0.065	32.000	4.000	955	248	31.8
	Steel < 850 N/mm²	6.00	4	135	0.030	3.300	6.000	7160	859	17.0
		8.00	4	135	0.040	4.400	8.000	5370	859	30.2
		10.00	4	135	0.050	5.500	10.000	4295	859	47.2
		12.00	4	135	0.055	6.600	12.000	3580	788	62.4
		16.00	4	135	0.055	8.800	16.000	2685	591	83.2
		20.00	4	135	0.060	11.000	20.000	2150	516	113.5
	Steel 850 - 1100 N/mm²	6.00	4	80	0.030	3.300	6.000	4245	509	10.1
		8.00	4	80	0.040	4.400	8.000	3185	510	17.9
		10.00	4	80	0.050	5.500	10.000	2545	509	28.0
		12.00	4	80	0.055	6.600	12.000	2120	466	36.9
		16.00	4	80	0.055	8.800	16.000	1590	350	49.3
		20.00	4	80	0.060	11.000	20.000	1275	306	67.3
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	35	0.025	3.300	6.000	1855	186	3.7
		8.00	4	35	0.030	4.400	8.000	1395	167	5.9
		10.00	4	35	0.040	5.500	10.000	1115	178	9.8
		12.00	4	35	0.045	6.600	12.000	930	167	13.3
		16.00	4	35	0.045	8.800	16.000	695	125	17.6
		20.00	4	35	0.050	11.000	20.000	555	111	24.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	50	0.025	3.300	6.000	2655	266	5.3
		8.00	4	50	0.030	4.400	8.000	1990	239	8.4
		10.00	4	50	0.040	5.500	10.000	1590	254	14.0
		12.00	4	50	0.045	6.600	12.000	1325	239	18.9
		16.00	4	50	0.045	8.800	16.000	995	179	25.2
		20.00	4	50	0.050	11.000	20.000	795	159	35.0

Cylindrical/Square end mills SupraCarb®

Profiled, medium version

HM MG10 | λ 38° γ 0°

45°



Roughing

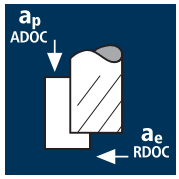
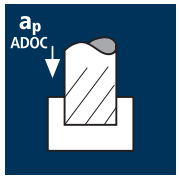
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15338** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z		POLYCHROM P15338	POLYCHROM P15238
300	6.00	6.00	63	19.00	0.30	4		●	
391	8.00	8.00	72	28.00	0.40	4		●	
450	10.00	10.00	84	34.00	0.50	4		●	
501	12.00	12.00	97	40.00	0.50	4		●	
610	16.00	16.00	108	48.00	0.60	4		●	
682	20.00	20.00	122	56.00	0.60	4		●	

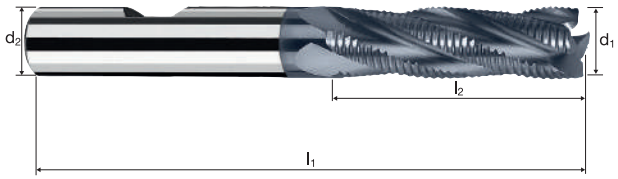
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	3	32	0.020	12.000	1.500	1700	102	1.8
		8.00	4	32	0.030	16.000	2.000	1275	153	4.9
		10.00	4	32	0.035	20.000	2.500	1020	143	7.1
		12.00	4	32	0.055	24.000	3.000	850	187	13.5
		16.00	4	32	0.075	32.000	4.000	635	191	24.4
		20.00	4	32	0.095	40.000	5.000	510	194	38.8
		25.00	4	32	0.115	50.000	6.250	405	186	58.2
		30.00	6	32	0.095	60.000	7.500	340	194	87.2
		32.00	6	32	0.105	64.000	8.000	320	202	103.2
	Steel 850 - 1100 N/mm²	6.00	3	30	0.020	12.000	1.500	1590	95	1.7
		8.00	4	30	0.030	16.000	2.000	1195	143	4.6
		10.00	4	30	0.035	20.000	2.500	955	134	6.7
		12.00	4	30	0.055	24.000	3.000	795	175	12.6
		16.00	4	30	0.075	32.000	4.000	595	179	22.8
		20.00	4	30	0.095	40.000	5.000	475	181	36.1
		25.00	4	30	0.115	50.000	6.250	380	175	54.6
		30.00	6	30	0.095	60.000	7.500	320	182	82.1
		32.00	6	30	0.105	64.000	8.000	300	189	96.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	3	15	0.020	12.000	1.500	795	48	0.9
		8.00	4	15	0.030	16.000	2.000	595	71	2.3
		10.00	4	15	0.035	20.000	2.500	475	67	3.3
		12.00	4	15	0.055	24.000	3.000	400	88	6.3
		16.00	4	15	0.075	32.000	4.000	300	90	11.5
		20.00	4	15	0.095	40.000	5.000	240	91	18.2
		25.00	4	15	0.115	50.000	6.250	190	87	27.3
		30.00	6	15	0.095	60.000	7.500	160	91	41.0
		32.00	6	15	0.105	64.000	8.000	150	95	48.4
	Cast iron (lamellar / spheroidal)	6.00	3	28	0.020	12.000	1.500	1485	89	1.6
		8.00	4	28	0.030	16.000	2.000	1115	134	4.3
		10.00	4	28	0.035	20.000	2.500	890	125	6.2
		12.00	4	28	0.055	24.000	3.000	745	164	11.8
		16.00	4	28	0.075	32.000	4.000	555	167	21.3
		20.00	4	28	0.095	40.000	5.000	445	169	33.8
		25.00	4	28	0.115	50.000	6.250	355	163	51.0
		30.00	6	28	0.095	60.000	7.500	295	168	75.7
		32.00	6	28	0.105	64.000	8.000	280	176	90.3
	Steel 500 - 850 N/mm²	6.00	3	28	0.020	4.200	6.000	1485	89	2.2
		8.00	4	28	0.025	5.600	8.000	1115	112	5.0
		10.00	4	28	0.035	7.000	10.000	890	125	8.7
		12.00	4	28	0.055	8.400	12.000	745	164	16.5
		16.00	4	28	0.070	11.200	16.000	555	155	27.8
		20.00	4	28	0.090	14.000	20.000	445	160	44.9
		25.00	4	28	0.110	17.500	25.000	355	156	68.3
		30.00	6	28	0.090	21.000	30.000	295	159	100.4
		32.00	6	28	0.095	22.400	32.000	280	160	114.4
	Steel 850 - 1100 N/mm²	6.00	3	26	0.020	4.200	6.000	1380	83	2.1
		8.00	4	26	0.025	5.600	8.000	1035	104	4.6
		10.00	4	26	0.035	7.000	10.000	830	116	8.1
		12.00	4	26	0.055	8.400	12.000	690	152	15.3
		16.00	4	26	0.070	11.200	16.000	515	144	25.8
		20.00	4	26	0.090	14.000	20.000	415	149	41.8
		25.00	4	26	0.110	17.500	25.000	330	145	63.5
		30.00	6	26	0.090	21.000	30.000	275	149	93.6
		32.00	6	26	0.095	22.400	32.000	260	148	106.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	3	14	0.020	4.200	6.000	745	45	1.1
		8.00	4	14	0.025	5.600	8.000	555	56	2.5
		10.00	4	14	0.035	7.000	10.000	445	62	4.4
		12.00	4	14	0.055	8.400	12.000	370	81	8.2
		16.00	4	14	0.070	11.200	16.000	280	78	14.0
		20.00	4	14	0.090	14.000	20.000	225	81	22.7
		25.00	4	14	0.110	17.500	25.000	180	79	34.7
		30.00	6	14	0.090	21.000	30.000	150	81	51.0
		32.00	6	14	0.095	22.400	32.000	140	80	57.2
	Cast iron (lamellar / spheroidal)	6.00	3	22	0.020	4.200	6.000	1165	70	1.8
		8.00	4	22	0.025	5.600	8.000	875	88	3.9
		10.00	4	22	0.035	7.000	10.000	700	98	6.9
		12.00	4	22	0.055	8.400	12.000	585	129	13.0
		16.00	4	22	0.070	11.200	16.000	440	123	22.1
		20.00	4	22	0.090	14.000	20.000	350	126	35.3
		25.00	4	22	0.110	17.500	25.000	280	123	53.9
		30.00	6	22	0.090	21.000	30.000	235	127	79.9
		32.00	6	22	0.095	22.400	32.000	220	125	89.9

Cylindrical/Square end mills

Profiled NRF, medium version

HSS-E Co8 | λ **25°** γ **10°**

45°



Roughing

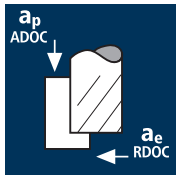
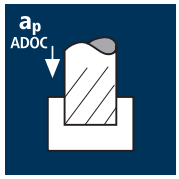
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **0651** ø-Code **260**

Ø Code	d_1 k12	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P0651
260	5.00	6.00	63	19.00	26.55	0.30	3	●
300	6.00	6.00	63	19.00	-	0.30	3	●
402	8.00	10.00	78	28.00	37.50	0.30	4	●
450	10.00	10.00	84	34.00	-	0.30	4	●
501	12.00	12.00	97	40.00	-	0.30	4	●
570	14.00	12.00	97	40.00	-	0.30	4	●
610	16.00	16.00	108	48.00	-	0.40	4	●
640	18.00	16.00	108	48.00	-	0.40	4	●
682	20.00	20.00	122	56.00	-	0.40	4	●
710	22.00	20.00	122	56.00	-	0.60	4	●
772	25.00	25.00	144	68.00	-	0.60	4	●
800	28.00	25.00	144	68.00	-	0.60	6	●
810	30.00	25.00	144	68.00	-	0.60	6	●
832	32.00	32.00	160	80.00	-	0.60	6	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	160	0.035	7.200	1.800	8490	1189	15.4
		8.00	4	160	0.045	9.600	2.400	6365	1146	26.4
		10.00	4	160	0.060	12.000	3.000	5095	1223	44.0
		12.00	4	160	0.070	14.400	3.600	4245	1189	61.6
		16.00	4	160	0.075	19.200	4.800	3185	956	88.1
		20.00	4	160	0.080	24.000	6.000	2545	814	117.3
	Steel 850 - 1100 N/mm²	6.00	4	130	0.035	7.200	1.800	6895	965	12.5
		8.00	4	130	0.045	9.600	2.400	5175	932	21.5
		10.00	4	130	0.060	12.000	3.000	4140	994	35.8
		12.00	4	130	0.070	14.400	3.600	3450	966	50.1
		16.00	4	130	0.075	19.200	4.800	2585	776	71.5
		20.00	4	130	0.080	24.000	6.000	2070	662	95.4
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	45	0.025	7.200	1.800	2385	239	3.1
		8.00	4	45	0.035	9.600	2.400	1790	251	5.8
		10.00	4	45	0.045	12.000	3.000	1430	257	9.3
		12.00	4	45	0.055	14.400	3.600	1195	263	13.6
		16.00	4	45	0.060	19.200	4.800	895	215	19.8
		20.00	4	45	0.065	24.000	6.000	715	186	26.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	60	0.025	7.200	1.800	3185	319	4.1
		8.00	4	60	0.035	9.600	2.400	2385	334	7.7
		10.00	4	60	0.045	12.000	3.000	1910	344	12.4
		12.00	4	60	0.055	14.400	3.600	1590	350	18.1
		16.00	4	60	0.060	19.200	4.800	1195	287	26.4
		20.00	4	60	0.065	24.000	6.000	955	248	35.8
	Steel < 850 N/mm²	6.00	4	135	0.030	3.600	6.000	7160	859	18.6
		8.00	4	135	0.040	4.800	8.000	5370	859	33.0
		10.00	4	135	0.050	6.000	10.000	4295	859	51.5
		12.00	4	135	0.055	7.200	12.000	3580	788	68.0
		16.00	4	135	0.055	9.600	16.000	2685	591	90.7
		20.00	4	135	0.060	12.000	20.000	2150	516	123.8
	Steel 850 - 1100 N/mm²	6.00	4	80	0.030	3.600	6.000	4245	509	11.0
		8.00	4	80	0.040	4.800	8.000	3185	510	19.6
		10.00	4	80	0.050	6.000	10.000	2545	509	30.5
		12.00	4	80	0.055	7.200	12.000	2120	466	40.3
		16.00	4	80	0.055	9.600	16.000	1590	350	53.7
		20.00	4	80	0.060	12.000	20.000	1275	306	73.4
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	35	0.025	3.600	6.000	1855	186	4.0
		8.00	4	35	0.030	4.800	8.000	1395	167	6.4
		10.00	4	35	0.040	6.000	10.000	1115	178	10.7
		12.00	4	35	0.045	7.200	12.000	930	167	14.5
		16.00	4	35	0.045	9.600	16.000	695	125	19.2
		20.00	4	35	0.050	12.000	20.000	555	111	26.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	50	0.025	3.600	6.000	2655	266	5.7
		8.00	4	50	0.030	4.800	8.000	1990	239	9.2
		10.00	4	50	0.040	6.000	10.000	1590	254	15.3
		12.00	4	50	0.045	7.200	12.000	1325	239	20.6
		16.00	4	50	0.045	9.600	16.000	995	179	27.5
		20.00	4	50	0.050	12.000	20.000	795	159	38.2

Cylindrical/Square end mills SupraCarb®

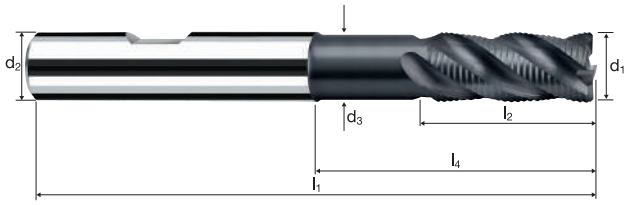
Profiled, medium version, neck

HM MG10 | λ 38° γ 0°









Roughing



Finishing



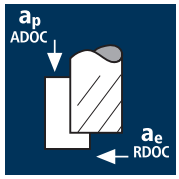
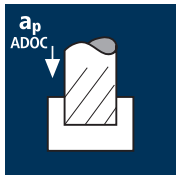
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15339** ø-Code **300**



Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15339	POLYCHROM P15239
300	6.00	6.00	5.50	63	13.00	25.34	26.00	0.30	4		●
391	8.00	8.00	7.40	72	19.00	34.29	35.00	0.40	4		●
450	10.00	10.00	9.20	84	22.00	42.20	43.00	0.50	4		●
501	12.00	12.00	11.00	97	26.00	50.13	51.00	0.50	4		●
610	16.00	16.00	15.00	108	32.00	58.13	59.00	0.60	4		●
682	20.00	20.00	19.00	122	38.00	70.13	71.00	0.60	4		●

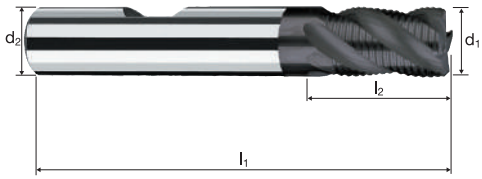
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	3.00	3	160	0.015	3.000	2.100	16975	764	4.8
		4.00	3	160	0.020	4.000	2.800	12730	764	8.6
		5.00	4	160	0.030	5.000	3.500	10185	1222	21.4
		6.00	4	160	0.035	6.000	4.200	8490	1189	30.0
		8.00	4	160	0.045	8.000	5.600	6365	1146	51.3
		10.00	4	160	0.055	10.000	7.000	5095	1121	78.5
		12.00	4	160	0.060	12.000	8.400	4245	1019	102.7
		16.00	4	160	0.065	16.000	11.200	3185	828	148.4
	Steel 850 - 1100 N/mm²	3.00	3	130	0.015	3.000	2.100	13795	621	3.9
		4.00	3	130	0.020	4.000	2.800	10345	621	7.0
		5.00	4	130	0.030	5.000	3.500	8275	993	17.4
		6.00	4	130	0.035	6.000	4.200	6895	965	24.3
		8.00	4	130	0.045	8.000	5.600	5175	932	41.7
		10.00	4	130	0.055	10.000	7.000	4140	911	63.8
		12.00	4	130	0.060	12.000	8.400	3450	828	83.5
		16.00	4	130	0.065	16.000	11.200	2585	672	120.4
	Titanium alloys >300 HB [Ti6Al4V]	3.00	3	45	0.015	3.000	2.100	4775	215	1.4
		4.00	3	45	0.020	4.000	2.800	3580	215	2.4
		5.00	4	45	0.020	5.000	3.500	2865	229	4.0
		6.00	4	45	0.025	6.000	4.200	2385	239	6.0
		8.00	4	45	0.035	8.000	5.600	1790	251	11.2
		10.00	4	45	0.045	10.000	7.000	1430	257	18.0
		12.00	4	45	0.050	12.000	8.400	1195	239	24.1
		16.00	4	45	0.050	16.000	11.200	895	179	32.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	60	0.015	3.000	2.100	6365	286	1.8
		4.00	3	60	0.020	4.000	2.800	4775	287	3.2
		5.00	4	60	0.020	5.000	3.500	3820	306	5.3
		6.00	4	60	0.025	6.000	4.200	3185	319	8.0
		8.00	4	60	0.035	8.000	5.600	2385	334	15.0
		10.00	4	60	0.045	10.000	7.000	1910	344	24.1
		12.00	4	60	0.050	12.000	8.400	1590	318	32.1
		16.00	4	60	0.050	16.000	11.200	1195	239	42.8
	Steel < 850 N/mm²	3.00	3	135	0.015	3.000	3.000	14325	645	5.8
		4.00	3	135	0.020	4.000	4.000	10745	645	10.3
		5.00	4	135	0.025	5.000	5.000	8595	860	21.5
		6.00	4	135	0.030	6.000	6.000	7160	859	30.9
		8.00	4	135	0.040	8.000	8.000	5370	859	55.0
		10.00	4	135	0.050	10.000	10.000	4295	859	85.9
		12.00	4	135	0.055	12.000	12.000	3580	788	113.4
		16.00	4	135	0.055	16.000	16.000	2685	591	151.2
	Steel 850 - 1100 N/mm²	3.00	3	80	0.015	3.000	3.000	8490	382	3.4
		4.00	3	80	0.020	4.000	4.000	6365	382	6.1
		5.00	4	80	0.025	5.000	5.000	5095	510	12.7
		6.00	4	80	0.030	6.000	6.000	4245	509	18.3
		8.00	4	80	0.040	8.000	8.000	3185	510	32.6
		10.00	4	80	0.050	10.000	10.000	2545	509	50.9
		12.00	4	80	0.055	12.000	12.000	2120	466	67.2
		16.00	4	80	0.055	16.000	16.000	1590	350	89.5
	Titanium alloys >300 HB [Ti6Al4V]	3.00	3	35	0.010	3.000	3.000	3715	112	1.0
		4.00	3	35	0.015	4.000	4.000	2785	125	2.0
		5.00	4	35	0.020	5.000	5.000	2230	178	4.5
		6.00	4	35	0.025	6.000	6.000	1855	186	6.7
		8.00	4	35	0.030	8.000	8.000	1395	167	10.7
		10.00	4	35	0.040	10.000	10.000	1115	178	17.8
		12.00	4	35	0.045	12.000	12.000	930	167	24.1
		16.00	4	35	0.045	16.000	16.000	695	125	32.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	50	0.010	3.000	3.000	5305	159	1.4
		4.00	3	50	0.015	4.000	4.000	3980	179	2.9
		5.00	4	50	0.020	5.000	5.000	3185	255	6.4
		6.00	4	50	0.025	6.000	6.000	2655	266	9.6
		8.00	4	50	0.030	8.000	8.000	1990	239	15.3
		10.00	4	50	0.040	10.000	10.000	1590	254	25.4
		12.00	4	50	0.045	12.000	12.000	1325	239	34.3
		16.00	4	50	0.045	16.000	16.000	995	179	45.8

Cylindrical/Square end mills SupraCarb®

Profiled, short version

HM MG10 | λ 38° | γ 0°

45°



Roughing

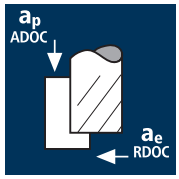
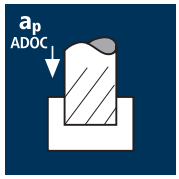
Finishing

ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** | Article-N°. **15360** | ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P15360	POLYCHROM P15260
180	3.00	6.00	50	5.00	12.56	0.20	3		●
220	4.00	6.00	54	8.00	14.09	0.25	3		●
260	5.00	6.00	54	9.00	13.22	0.30	4		●
300	6.00	6.00	54	10.00	-	0.30	4		●
391	8.00	8.00	58	12.00	-	0.40	4		●
450	10.00	10.00	66	14.00	-	0.50	4		●
501	12.00	12.00	73	16.00	-	0.50	4		●
610	16.00	16.00	82	22.00	-	0.60	4		●
612	16.00	16.00	82	22.00	-	0.60	6		●

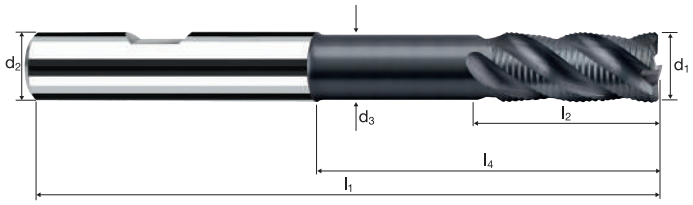
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	6.00	4	160	0.030	7.200	1.500	8490	1019	11.0
		8.00	4	160	0.040	9.600	2.000	6365	1018	19.6
		10.00	4	160	0.055	12.000	2.500	5095	1121	33.6
		12.00	4	160	0.065	14.400	3.000	4245	1104	47.7
		16.00	4	160	0.070	19.200	4.000	3185	892	68.5
		20.00	4	160	0.075	24.000	5.000	2545	764	91.6
	Steel 850 - 1100 N/mm²	6.00	4	130	0.030	7.200	1.500	6895	827	8.9
		8.00	4	130	0.040	9.600	2.000	5175	828	15.9
		10.00	4	130	0.055	12.000	2.500	4140	911	27.3
		12.00	4	130	0.065	14.400	3.000	3450	897	38.8
		16.00	4	130	0.070	19.200	4.000	2585	724	55.6
		20.00	4	130	0.075	24.000	5.000	2070	621	74.5
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	45	0.025	7.200	1.500	2385	239	2.6
		8.00	4	45	0.035	9.600	2.000	1790	251	4.8
		10.00	4	45	0.045	12.000	2.500	1430	257	7.7
		12.00	4	45	0.055	14.400	3.000	1195	263	11.4
		16.00	4	45	0.060	19.200	4.000	895	215	16.5
		20.00	4	45	0.065	24.000	5.000	715	186	22.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	60	0.025	7.200	1.500	3185	319	3.4
		8.00	4	60	0.035	9.600	2.000	2385	334	6.4
		10.00	4	60	0.045	12.000	2.500	1910	344	10.3
		12.00	4	60	0.055	14.400	3.000	1590	350	15.1
		16.00	4	60	0.060	19.200	4.000	1195	287	22.0
		20.00	4	60	0.065	24.000	5.000	955	248	29.8
	Steel < 850 N/mm²	6.00	4	135	0.025	3.000	6.000	7160	716	12.9
		8.00	4	135	0.035	4.000	8.000	5370	752	24.1
		10.00	4	135	0.045	5.000	10.000	4295	773	38.7
		12.00	4	135	0.050	6.000	12.000	3580	716	51.6
		16.00	4	135	0.050	8.000	16.000	2685	537	68.7
		20.00	4	135	0.055	10.000	20.000	2150	473	94.6
	Steel 850 - 1100 N/mm²	6.00	4	80	0.025	3.000	6.000	4245	425	7.6
		8.00	4	80	0.035	4.000	8.000	3185	446	14.3
		10.00	4	80	0.045	5.000	10.000	2545	458	22.9
		12.00	4	80	0.050	6.000	12.000	2120	424	30.5
		16.00	4	80	0.050	8.000	16.000	1590	318	40.7
		20.00	4	80	0.055	10.000	20.000	1275	281	56.1
	Titanium alloys >300 HB [Ti6Al4V]	6.00	4	35	0.020	3.000	6.000	1855	148	2.7
		8.00	4	35	0.030	4.000	8.000	1395	167	5.4
		10.00	4	35	0.035	5.000	10.000	1115	156	7.8
		12.00	4	35	0.040	6.000	12.000	930	149	10.7
		16.00	4	35	0.040	8.000	16.000	695	111	14.2
		20.00	4	35	0.045	10.000	20.000	555	100	20.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	50	0.020	3.000	6.000	2655	212	3.8
		8.00	4	50	0.030	4.000	8.000	1990	239	7.6
		10.00	4	50	0.035	5.000	10.000	1590	223	11.1
		12.00	4	50	0.040	6.000	12.000	1325	212	15.3
		16.00	4	50	0.040	8.000	16.000	995	159	20.4
		20.00	4	50	0.045	10.000	20.000	795	143	28.6

Cylindrical/Square end mills SupraCarb®

Profiled, long version, neck

HM MG10 | λ 38° γ 0°

45°



Roughing

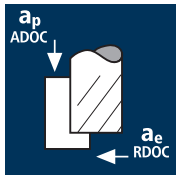
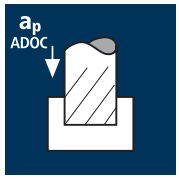
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **15348** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P15348	POLYCHROM P15248
300	6.00	6.00	5.50	70	13.00	32.34	33.00	0.30	4		●
391	8.00	8.00	7.40	80	19.00	42.29	43.00	0.40	4		●
450	10.00	10.00	9.20	100	22.00	58.20	59.00	0.50	4		●
501	12.00	12.00	11.00	110	26.00	63.13	64.00	0.50	4		●
610	16.00	16.00	15.00	123	32.00	73.13	74.00	0.60	4		●
682	20.00	20.00	19.00	141	38.00	89.13	90.00	0.60	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 500 - 850 N/mm²	6.00	4	26	0.020	15.000	2.400	1380	110	4.0
		8.00	4	26	0.030	20.000	3.200	1035	124	7.9
		10.00	4	26	0.035	25.000	4.000	830	116	11.6
		12.00	4	26	0.055	30.000	4.800	690	152	21.9
		16.00	4	26	0.075	40.000	6.400	515	155	39.6
		20.00	4	26	0.095	50.000	8.000	415	158	63.1
		25.00	5	26	0.115	62.500	10.000	330	190	118.6
		32.00	6	26	0.105	80.000	12.800	260	164	167.7
		40.00	6	26	0.130	100.000	16.000	205	160	255.8
	Steel 850 - 1100 N/mm²	6.00	4	22	0.020	15.000	2.400	1165	93	3.4
		8.00	4	22	0.030	20.000	3.200	875	105	6.7
		10.00	4	22	0.035	25.000	4.000	700	98	9.8
		12.00	4	22	0.055	30.000	4.800	585	129	18.5
		16.00	4	22	0.075	40.000	6.400	440	132	33.8
		20.00	4	22	0.095	50.000	8.000	350	133	53.2
		25.00	5	22	0.115	62.500	10.000	280	161	100.6
		32.00	6	22	0.105	80.000	12.800	220	139	141.9
		40.00	6	22	0.130	100.000	16.000	175	137	218.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	11	0.020	15.000	2.400	585	47	1.7
		8.00	4	11	0.030	20.000	3.200	440	53	3.4
		10.00	4	11	0.035	25.000	4.000	350	49	4.9
		12.00	4	11	0.055	30.000	4.800	290	64	9.2
		16.00	4	11	0.075	40.000	6.400	220	66	16.9
		20.00	4	11	0.095	50.000	8.000	175	67	26.6
		25.00	5	11	0.115	62.500	10.000	140	81	50.3
		32.00	6	11	0.105	80.000	12.800	110	69	71.0
		40.00	6	11	0.130	100.000	16.000	90	70	112.3
	Cast iron (lamellar / spheroidal)	6.00	4	20	0.020	15.000	2.400	1060	85	3.1
		8.00	4	20	0.030	20.000	3.200	795	95	6.1
		10.00	4	20	0.035	25.000	4.000	635	89	8.9
		12.00	4	20	0.055	30.000	4.800	530	117	16.8
		16.00	4	20	0.075	40.000	6.400	400	120	30.7
		20.00	4	20	0.095	50.000	8.000	320	122	48.6
		25.00	5	20	0.115	62.500	10.000	255	147	91.6
		32.00	6	20	0.105	80.000	12.800	200	126	129.0
		40.00	6	20	0.130	100.000	16.000	160	125	199.7
	Steel 500 - 850 N/mm²	6.00	4	22	0.020	3.000	6.000	1165	93	1.7
		8.00	4	22	0.025	4.000	8.000	875	88	2.8
		10.00	4	22	0.035	5.000	10.000	700	98	4.9
		12.00	4	22	0.055	6.000	12.000	585	129	9.3
		16.00	4	22	0.070	8.000	16.000	440	123	15.8
		20.00	4	22	0.090	10.000	20.000	350	126	25.2
		25.00	5	22	0.110	12.500	25.000	280	154	48.1
		32.00	6	22	0.095	16.000	32.000	220	125	64.2
		40.00	6	22	0.120	20.000	40.000	175	126	100.8
	Steel 850 - 1100 N/mm²	6.00	4	18	0.020	3.000	6.000	955	76	1.4
		8.00	4	18	0.025	4.000	8.000	715	72	2.3
		10.00	4	18	0.035	5.000	10.000	575	81	4.0
		12.00	4	18	0.055	6.000	12.000	475	105	7.5
		16.00	4	18	0.070	8.000	16.000	360	101	12.9
		20.00	4	18	0.090	10.000	20.000	285	103	20.5
		25.00	5	18	0.110	12.500	25.000	230	127	39.5
		32.00	6	18	0.095	16.000	32.000	180	103	52.5
		40.00	6	18	0.120	20.000	40.000	145	104	83.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	10	0.020	3.000	6.000	530	42	0.8
		8.00	4	10	0.025	4.000	8.000	400	40	1.3
		10.00	4	10	0.035	5.000	10.000	320	45	2.2
		12.00	4	10	0.055	6.000	12.000	265	58	4.2
		16.00	4	10	0.070	8.000	16.000	200	56	7.2
		20.00	4	10	0.090	10.000	20.000	160	58	11.5
		25.00	5	10	0.110	12.500	25.000	125	69	21.5
		32.00	6	10	0.095	16.000	32.000	100	57	29.2
		40.00	6	10	0.120	20.000	40.000	80	58	46.1
	Cast iron (lamellar / spheroidal)	6.00	4	16	0.020	3.000	6.000	850	68	1.2
		8.00	4	16	0.025	4.000	8.000	635	64	2.0
		10.00	4	16	0.035	5.000	10.000	510	71	3.6
		12.00	4	16	0.055	6.000	12.000	425	94	6.7
		16.00	4	16	0.070	8.000	16.000	320	90	11.5
		20.00	4	16	0.090	10.000	20.000	255	92	18.4
		25.00	5	16	0.110	12.500	25.000	205	113	35.3
		32.00	6	16	0.095	16.000	32.000	160	91	46.7
		40.00	6	16	0.120	20.000	40.000	125	90	72.0

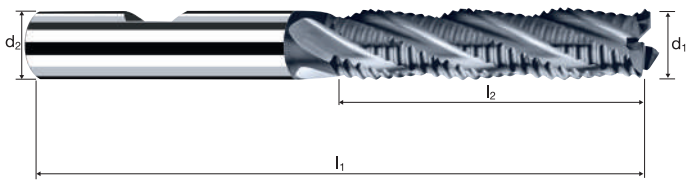
Cylindrical/Square end mills

Profiled NRF, long version

HSS-E Co8

λ **30°**
γ **12°**

45°



Roughing

Finishing

ReTool®

Rm <850 **HRC** <24

Rm 850-1100 **HRC** 24-34

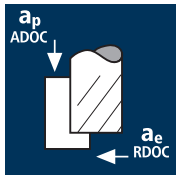
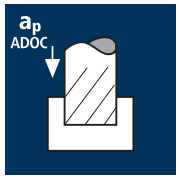
Rm 1100-1300 **HRC** 34-42

Inox Stainless

GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **0666** ø-Code **300**

Ø Code	d_1 k12	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P0666
300	6.00	6.00	68	24.00	-	0.40	4	●
342	7.00	10.00	80	30.00	40.00	0.40	4	●
402	8.00	10.00	88	38.00	48.00	0.50	4	●
420	9.00	10.00	88	38.00	48.00	0.50	4	●
450	10.00	10.00	95	45.00	-	0.50	4	●
470	11.00	12.00	102	45.00	57.00	0.50	4	●
501	12.00	12.00	110	53.00	-	0.60	4	●
570	14.00	12.00	110	53.00	-	0.60	4	●
610	16.00	16.00	123	63.00	-	0.60	4	●
640	18.00	16.00	123	63.00	-	0.60	4	●
682	20.00	20.00	141	75.00	-	0.60	4	●
710	22.00	20.00	141	75.00	-	0.60	5	●
772	25.00	25.00	166	90.00	-	0.60	5	●
800	28.00	25.00	166	90.00	-	0.60	5	●
810	30.00	25.00	166	90.00	-	0.60	5	●
832	32.00	32.00	186	106.00	-	0.80	6	●
860	36.00	32.00	186	106.00	-	1.00	6	●
892	40.00	32.00	205	125.00	-	1.00	6	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	6.00	4	27	0.015	6.000	1.200	1430	86	0.6
		8.00	4	27	0.020	8.000	1.600	1075	86	1.1
		10.00	4	27	0.025	10.000	2.000	860	86	1.7
		12.00	4	27	0.035	12.000	2.400	715	100	2.9
		16.00	4	27	0.050	16.000	3.200	535	107	5.5
		20.00	4	27	0.060	20.000	4.000	430	103	8.3
		25.00	4	27	0.080	25.000	5.000	345	110	13.8
	Steel 1100 - 1300 N/mm²	6.00	4	22	0.015	6.000	1.200	1165	70	0.5
		8.00	4	22	0.020	8.000	1.600	875	70	0.9
		10.00	4	22	0.025	10.000	2.000	700	70	1.4
		12.00	4	22	0.035	12.000	2.400	585	82	2.4
		16.00	4	22	0.050	16.000	3.200	440	88	4.5
		20.00	4	22	0.060	20.000	4.000	350	84	6.7
		25.00	4	22	0.080	25.000	5.000	280	90	11.2
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	16	0.015	6.000	1.200	850	51	0.4
		8.00	4	16	0.020	8.000	1.600	635	51	0.7
		10.00	4	16	0.025	10.000	2.000	510	51	1.0
		12.00	4	16	0.035	12.000	2.400	425	60	1.7
		16.00	4	16	0.050	16.000	3.200	320	64	3.3
		20.00	4	16	0.060	20.000	4.000	255	61	4.9
		25.00	4	16	0.080	25.000	5.000	205	66	8.2
	Cast iron (lamellar / spheroidal)	6.00	4	24	0.015	6.000	1.200	1275	77	0.6
		8.00	4	24	0.020	8.000	1.600	955	76	1.0
		10.00	4	24	0.025	10.000	2.000	765	77	1.5
		12.00	4	24	0.035	12.000	2.400	635	89	2.6
		16.00	4	24	0.050	16.000	3.200	475	95	4.9
		20.00	4	24	0.060	20.000	4.000	380	91	7.3
		25.00	4	24	0.080	25.000	5.000	305	98	12.2
	Steel 850 - 1100 N/mm²	6.00	4	24	0.020	3.000	6.000	1275	102	1.8
		8.00	4	24	0.025	4.000	8.000	955	96	3.1
		10.00	4	24	0.030	5.000	10.000	765	92	4.6
		12.00	4	24	0.045	6.000	12.000	635	114	8.2
		16.00	4	24	0.065	8.000	16.000	475	124	15.8
		20.00	4	24	0.080	10.000	20.000	380	122	24.3
		25.00	4	24	0.100	12.500	25.000	305	122	38.1
	Steel 1100 - 1300 N/mm²	6.00	4	20	0.020	3.000	6.000	1060	85	1.5
		8.00	4	20	0.025	4.000	8.000	795	80	2.5
		10.00	4	20	0.030	5.000	10.000	635	76	3.8
		12.00	4	20	0.045	6.000	12.000	530	95	6.9
		16.00	4	20	0.065	8.000	16.000	400	104	13.3
		20.00	4	20	0.080	10.000	20.000	320	102	20.5
		25.00	4	20	0.100	12.500	25.000	255	102	31.9
	Cold work tool steel (12%Cr) high alloyed [1.2379]	6.00	4	14	0.020	3.000	6.000	745	60	1.1
		8.00	4	14	0.025	4.000	8.000	555	56	1.8
		10.00	4	14	0.030	5.000	10.000	445	53	2.7
		12.00	4	14	0.045	6.000	12.000	370	67	4.8
		16.00	4	14	0.065	8.000	16.000	280	73	9.3
		20.00	4	14	0.080	10.000	20.000	225	72	14.4
		25.00	4	14	0.100	12.500	25.000	180	72	22.5
	Cast iron (lamellar / spheroidal)	6.00	4	21	0.020	3.000	6.000	1115	89	1.6
		8.00	4	21	0.025	4.000	8.000	835	84	2.7
		10.00	4	21	0.030	5.000	10.000	670	80	4.0
		12.00	4	21	0.045	6.000	12.000	555	100	7.2
		16.00	4	21	0.065	8.000	16.000	420	109	14.0
		20.00	4	21	0.080	10.000	20.000	335	107	21.4
		25.00	4	21	0.100	12.500	25.000	265	106	33.1

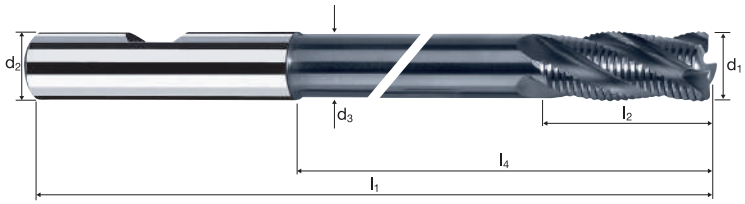
Cylindrical/Square end mills

Profiled NRC, extra-long version, neck

HSS PM/F

λ **30°**
γ **12°**

45°



Roughing

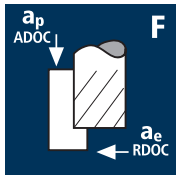
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42							GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **0622** ø-Code **300**

Ø Code	d_1 k8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	POLYCHROM P0622
300	6.00	6.00	5.50	81	13.00	43.34	44.00	0.30	4	●
391	8.00	8.00	7.40	101	19.00	63.29	64.00	0.30	4	●
450	10.00	10.00	9.20	117	22.00	75.20	76.00	0.30	4	●
501	12.00	12.00	11.00	136	26.00	89.13	90.00	0.30	4	●
610	16.00	16.00	14.50	155	32.00	105.03	106.00	0.40	4	●
682	20.00	20.00	18.00	179	38.00	127.00	128.00	0.40	4	●
772	25.00	25.00	23.00	211	45.00	153.00	154.00	0.60	4	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel 850 - 1100 N/mm²	3.00	5	160	0.025	8.000	0.030	16975	2122
		4.00	5	160	0.029	11.000	0.030	12730	1846
		5.00	5	160	0.033	13.000	0.050	10185	1681
		6.00	5	160	0.036	13.000	0.050	8490	1528
		8.00	7	160	0.041	19.000	0.080	6365	1827
		10.00	7	160	0.046	22.000	0.080	5095	1641
		12.00	7	160	0.051	26.000	0.120	4245	1516
		16.00	7	160	0.059	32.000	0.120	3185	1315
		20.00	7	160	0.065	38.000	0.150	2545	1158
	Steel 1100 - 1300 N/mm²	3.00	5	140	0.025	8.000	0.030	14855	1857
		4.00	5	140	0.029	11.000	0.030	11140	1615
		5.00	5	140	0.033	13.000	0.050	8915	1471
		6.00	5	140	0.036	13.000	0.050	7425	1337
		8.00	7	140	0.041	19.000	0.080	5570	1599
		10.00	7	140	0.046	22.000	0.080	4455	1435
		12.00	7	140	0.051	26.000	0.120	3715	1326
		16.00	7	140	0.059	32.000	0.120	2785	1150
		20.00	7	140	0.065	38.000	0.150	2230	1015
	Hardened tool steel 52 - 56 HRC	3.00	5	85	0.020	8.000	0.030	9020	902
		4.00	5	85	0.023	11.000	0.030	6765	778
		5.00	5	85	0.026	13.000	0.050	5410	703
		6.00	5	85	0.029	13.000	0.050	4510	654
		8.00	7	100	0.021	19.000	0.080	3980	585
		10.00	7	100	0.024	22.000	0.080	3185	535
		12.00	7	100	0.026	26.000	0.096	2655	483
		16.00	7	100	0.030	32.000	0.096	1990	418
		20.00	7	100	0.033	38.000	0.120	1590	367
	Hardened tool steel 56 - 60 HRC	3.00	5	60	0.020	8.000	0.030	6365	637
		4.00	5	60	0.023	11.000	0.030	4775	549
		5.00	5	60	0.026	13.000	0.050	3820	497
		6.00	5	60	0.029	13.000	0.050	3185	462
		8.00	7	70	0.021	19.000	0.080	2785	409
		10.00	7	70	0.024	22.000	0.080	2230	375
		12.00	7	70	0.026	26.000	0.096	1855	338
		16.00	7	70	0.030	32.000	0.096	1395	293
		20.00	7	70	0.033	38.000	0.120	1115	258
	Wrought aluminium Construction aluminium	3.00	5	300	0.025	8.000	0.030	31830	3979
		4.00	5	300	0.029	11.000	0.030	23875	3462
		5.00	5	300	0.033	13.000	0.050	19100	3152
		6.00	5	300	0.036	13.000	0.050	15915	2865
		8.00	7	300	0.041	19.000	0.080	11935	3425
		10.00	7	300	0.046	22.000	0.080	9550	3075
		12.00	7	300	0.051	26.000	0.120	7960	2842
		16.00	7	300	0.059	32.000	0.120	5970	2466
		20.00	7	300	0.065	38.000	0.150	4775	2173
	Cast iron (lamellar / spheroidal)	3.00	5	180	0.025	8.000	0.030	19100	2388
		4.00	5	180	0.029	11.000	0.030	14325	2077
		5.00	5	180	0.033	13.000	0.050	11460	1891
		6.00	5	180	0.036	13.000	0.050	9550	1719
		8.00	7	180	0.041	19.000	0.080	7160	2055
		10.00	7	180	0.046	22.000	0.080	5730	1845
		12.00	7	180	0.051	26.000	0.120	4775	1705
		16.00	7	180	0.059	32.000	0.120	3580	1479
		20.00	7	180	0.065	38.000	0.150	2865	1304
	Titanium alloys >300 HB [Ti6Al4V]	3.00	5	90	0.025	8.000	0.030	9550	1194
		4.00	5	90	0.029	11.000	0.030	7160	1038
		5.00	5	90	0.033	13.000	0.050	5730	946
		6.00	5	90	0.036	13.000	0.050	4775	860
		8.00	7	90	0.041	19.000	0.080	3580	1028
		10.00	7	90	0.046	22.000	0.080	2865	923
		12.00	7	90	0.051	26.000	0.120	2385	851
		16.00	7	90	0.059	32.000	0.120	1790	739
		20.00	7	90	0.065	38.000	0.150	1430	651
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	5	95	0.025	8.000	0.030	10080	1260
		4.00	5	95	0.029	11.000	0.030	7560	1096
		5.00	5	95	0.033	13.000	0.050	6050	998
		6.00	5	95	0.036	13.000	0.050	5040	907
		8.00	7	95	0.041	19.000	0.080	3780	1085
		10.00	7	95	0.046	22.000	0.080	3025	974
		12.00	7	95	0.051	26.000	0.120	2520	900
		16.00	7	95	0.059	32.000	0.120	1890	781
		20.00	7	95	0.065	38.000	0.150	1510	687

Cylindrical/Square end mills MulticutXF

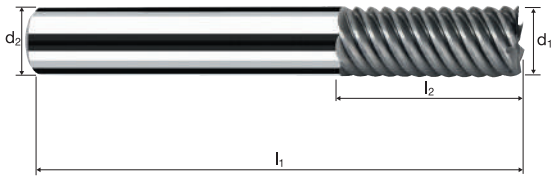
Finishing, normal version

HM XA

λ 65°
γ 8°

45°

h5



Roughing

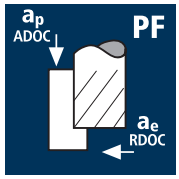
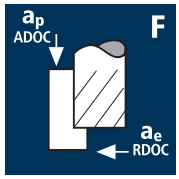
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **15250** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	45°	z	DURO-Si **H15250**	POLYCHROM **P15250**
180	3.00	6.00	57	8.00	15.36	-	5	●	●
220	4.00	6.00	57	11.00	16.79	-	5	●	●
260	5.00	6.00	57	13.00	16.92	-	5	●	●
300	6.00	6.00	57	13.00	-	0.10	5	●	●
391	8.00	8.00	63	19.00	-	0.10	7	●	●
450	10.00	10.00	72	22.00	-	0.15	7	●	●
501	12.00	12.00	83	26.00	-	0.15	7	●	●
610	16.00	16.00	92	32.00	-	0.15	7	●	●
682	20.00	20.00	104	38.00	-	0.15	7	●	●

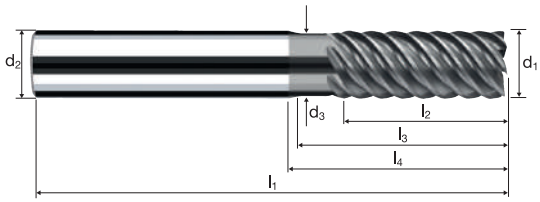
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	3.00	4	130	0.030	8.000	0.060	13795	1655
		4.00	5	130	0.035	11.000	0.060	10345	1810
		5.00	5	130	0.039	13.000	0.120	8275	1614
		6.00	6	130	0.043	13.000	0.120	6895	1779
		8.00	6	130	0.050	19.000	0.200	5175	1553
		10.00	7	130	0.056	23.000	0.200	4140	1623
		12.00	7	130	0.061	27.000	0.240	3450	1473
		16.00	8	130	0.070	32.000	0.240	2585	1448
		20.00	8	130	0.078	40.000	0.300	2070	1292
	Steel 850 - 1100 N/mm²	3.00	4	110	0.030	8.000	0.060	11670	1400
		4.00	5	110	0.035	11.000	0.060	8755	1532
		5.00	5	110	0.039	13.000	0.120	7005	1366
		6.00	6	110	0.043	13.000	0.120	5835	1505
		8.00	6	110	0.050	19.000	0.200	4375	1313
		10.00	7	110	0.056	23.000	0.200	3500	1372
		12.00	7	110	0.061	27.000	0.240	2920	1247
		16.00	8	110	0.070	32.000	0.240	2190	1226
		20.00	8	110	0.078	40.000	0.300	1750	1092
	Steel 1100 - 1300 N/mm²	3.00	4	105	0.030	8.000	0.060	11140	1337
		4.00	5	105	0.035	11.000	0.060	8355	1462
		5.00	5	105	0.039	13.000	0.120	6685	1304
		6.00	6	105	0.043	13.000	0.120	5570	1437
		8.00	6	105	0.050	19.000	0.200	4180	1254
		10.00	7	105	0.056	23.000	0.200	3340	1309
		12.00	7	105	0.061	27.000	0.240	2785	1189
		16.00	8	105	0.070	32.000	0.240	2090	1170
		20.00	8	105	0.078	40.000	0.300	1670	1042
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	55	0.030	8.000	0.060	5835	700
		4.00	5	55	0.035	11.000	0.060	4375	766
		5.00	5	55	0.039	13.000	0.120	3500	683
		6.00	6	55	0.043	13.000	0.120	2920	753
		8.00	6	55	0.050	19.000	0.200	2190	657
		10.00	7	55	0.056	23.000	0.200	1750	686
		12.00	7	55	0.061	27.000	0.240	1460	623
		16.00	8	55	0.070	32.000	0.240	1095	613
		20.00	8	55	0.078	40.000	0.300	875	546
	Steel < 850 N/mm²	3.00	4	160	0.025	8.000	0.030	16975	1698
		4.00	5	160	0.029	11.000	0.030	12730	1846
		5.00	5	160	0.033	13.000	0.060	10185	1681
		6.00	6	160	0.036	13.000	0.060	8490	1834
		8.00	6	160	0.041	19.000	0.100	6365	1566
		10.00	7	160	0.046	23.000	0.100	5095	1641
		12.00	7	160	0.051	27.000	0.120	4245	1516
		16.00	8	160	0.059	32.000	0.120	3185	1503
		20.00	8	160	0.065	40.000	0.150	2545	1323
	Steel 850 - 1100 N/mm²	3.00	4	140	0.025	8.000	0.030	14855	1486
		4.00	5	140	0.029	11.000	0.030	11140	1615
		5.00	5	140	0.033	13.000	0.060	8915	1471
		6.00	6	140	0.036	13.000	0.060	7425	1604
		8.00	6	140	0.041	19.000	0.100	5570	1370
		10.00	7	140	0.046	23.000	0.100	4455	1435
		12.00	7	140	0.051	27.000	0.120	3715	1326
		16.00	8	140	0.059	32.000	0.120	2785	1315
		20.00	8	140	0.065	40.000	0.150	2230	1160
	Steel 1100 - 1300 N/mm²	3.00	4	130	0.025	8.000	0.030	13795	1380
		4.00	5	130	0.029	11.000	0.030	10345	1500
		5.00	5	130	0.033	13.000	0.060	8275	1365
		6.00	6	130	0.036	13.000	0.060	6895	1489
		8.00	6	130	0.041	19.000	0.100	5175	1273
		10.00	7	130	0.046	23.000	0.100	4140	1333
		12.00	7	130	0.051	27.000	0.120	3450	1232
		16.00	8	130	0.059	32.000	0.120	2585	1220
		20.00	8	130	0.065	40.000	0.150	2070	1076
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	70	0.025	8.000	0.030	7425	743
		4.00	5	70	0.029	11.000	0.030	5570	808
		5.00	5	70	0.033	13.000	0.060	4455	735
		6.00	6	70	0.036	13.000	0.060	3715	802
		8.00	6	70	0.041	19.000	0.100	2785	685
		10.00	7	70	0.046	23.000	0.100	2230	718
		12.00	7	70	0.051	27.000	0.120	1855	662
		16.00	8	70	0.059	32.000	0.120	1395	658
		20.00	8	70	0.065	40.000	0.150	1115	580

Cylindrical/Square end mills E-Cut

Finishing, normal version

HM MG10 | λ 55° γ 10°

r



Roughing

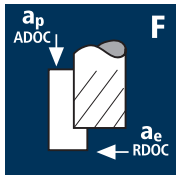
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8401** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	POLYCHROM P8401	POLYCHROM P8301
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.050	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	5		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	5		●
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.100	6		●
391	8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	6		●
450	10.00	10.00	9.20	72	23.00	27.99	31.00	0.200	7		●
501	12.00	12.00	11.00	83	27.00	33.29	37.00	0.200	7		●
610	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	8		●
682	20.00	20.00	19.00	104	40.00	48.23	53.00	0.250	8		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel 850 - 1100 N/mm²	3.00	5	130	0.021	14.000	0.030	13795	1449
		4.00	5	130	0.024	17.000	0.030	10345	1241
		5.00	5	130	0.027	19.000	0.050	8275	1117
		6.00	5	130	0.030	19.000	0.050	6895	1034
		8.00	7	130	0.034	28.000	0.080	5175	1232
		10.00	7	130	0.039	34.000	0.080	4140	1130
		12.00	7	130	0.042	40.000	0.120	3450	1014
		16.00	7	130	0.049	48.000	0.120	2585	887
		20.00	7	130	0.055	56.000	0.150	2070	797
	Steel 1100 - 1300 N/mm²	3.00	5	110	0.021	14.000	0.030	11670	1225
		4.00	5	110	0.024	17.000	0.030	8755	1051
		5.00	5	110	0.027	19.000	0.050	7005	946
		6.00	5	110	0.030	19.000	0.050	5835	875
		8.00	7	110	0.034	28.000	0.080	4375	1041
		10.00	7	110	0.039	34.000	0.080	3500	956
		12.00	7	110	0.042	40.000	0.120	2920	859
		16.00	7	110	0.049	48.000	0.120	2190	751
		20.00	7	110	0.055	56.000	0.150	1750	674
	Hardened tool steel 52 - 56 HRC	3.00	5	70	0.020	14.000	0.030	7425	743
		4.00	5	70	0.023	17.000	0.030	5570	641
		5.00	5	70	0.026	19.000	0.050	4455	579
		6.00	5	70	0.029	19.000	0.050	3715	539
		8.00	7	80	0.021	28.000	0.080	3185	468
		10.00	7	80	0.024	34.000	0.080	2545	428
		12.00	7	80	0.026	40.000	0.096	2120	386
		16.00	7	80	0.030	48.000	0.096	1590	334
		20.00	7	80	0.033	56.000	0.120	1275	295
	Hardened tool steel 56 - 60 HRC	3.00	5	50	0.020	14.000	0.030	5305	531
		4.00	5	50	0.023	17.000	0.030	3980	458
		5.00	5	50	0.026	19.000	0.050	3185	414
		6.00	5	50	0.029	19.000	0.050	2655	385
		8.00	7	55	0.021	28.000	0.080	2190	322
		10.00	7	55	0.024	34.000	0.080	1750	294
		12.00	7	55	0.026	40.000	0.096	1460	266
		16.00	7	55	0.030	48.000	0.096	1095	230
		20.00	7	55	0.033	56.000	0.120	875	202
	Wrought aluminium Construction aluminium	3.00	5	240	0.021	14.000	0.030	25465	2674
		4.00	5	240	0.024	17.000	0.030	19100	2292
		5.00	5	240	0.027	19.000	0.050	15280	2063
		6.00	5	240	0.030	19.000	0.050	12730	1910
		8.00	7	240	0.034	28.000	0.080	9550	2273
		10.00	7	240	0.039	34.000	0.080	7640	2086
		12.00	7	240	0.042	40.000	0.120	6365	1871
		16.00	7	240	0.049	48.000	0.120	4775	1638
		20.00	7	240	0.055	56.000	0.150	3820	1471
	Cast iron (lamellar / spheroidal)	3.00	5	145	0.021	14.000	0.030	15385	1615
		4.00	5	145	0.024	17.000	0.030	11540	1385
		5.00	5	145	0.027	19.000	0.050	9230	1246
		6.00	5	145	0.030	19.000	0.050	7690	1154
		8.00	7	145	0.034	28.000	0.080	5770	1373
		10.00	7	145	0.039	34.000	0.080	4615	1260
		12.00	7	145	0.042	40.000	0.120	3845	1130
		16.00	7	145	0.049	48.000	0.120	2885	990
		20.00	7	145	0.055	56.000	0.150	2310	889
	Titanium alloys >300 HB [Ti6Al4V]	3.00	5	70	0.021	14.000	0.030	7425	780
		4.00	5	70	0.024	17.000	0.030	5570	668
		5.00	5	70	0.027	19.000	0.050	4455	601
		6.00	5	70	0.030	19.000	0.050	3715	557
		8.00	7	70	0.034	28.000	0.080	2785	663
		10.00	7	70	0.039	34.000	0.080	2230	609
		12.00	7	70	0.042	40.000	0.120	1855	545
		16.00	7	70	0.049	48.000	0.120	1395	479
		20.00	7	70	0.055	56.000	0.150	1115	429
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	5	75	0.021	14.000	0.030	7960	836
		4.00	5	75	0.024	17.000	0.030	5970	716
		5.00	5	75	0.027	19.000	0.050	4775	645
		6.00	5	75	0.030	19.000	0.050	3980	597
		8.00	7	75	0.034	28.000	0.080	2985	710
		10.00	7	75	0.039	34.000	0.080	2385	651
		12.00	7	75	0.042	40.000	0.120	1990	585
		16.00	7	75	0.049	48.000	0.120	1490	511
		20.00	7	75	0.055	56.000	0.150	1195	460

Cylindrical/Square end mills MulticutXF

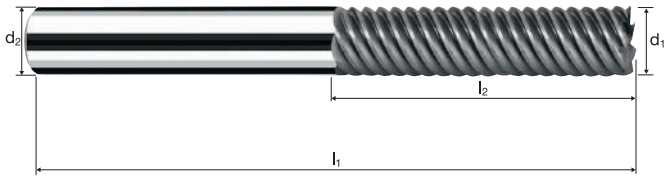
Finishing, medium version

HM XA

λ 65°
γ 8°

45°

h5



Roughing

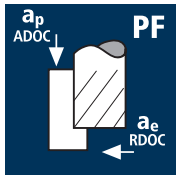
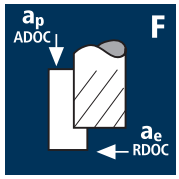
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **15251** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	45°	z	DURO-Si H15251	POLYCHROM P15251
180	3.00	6.00	63	14.00	21.56	-	5	●	●
220	4.00	6.00	63	17.00	23.09	-	5	●	●
260	5.00	6.00	63	19.00	23.22	-	5	●	●
300	6.00	6.00	63	19.00	-	0.10	5	●	●
391	8.00	8.00	72	28.00	-	0.10	7	●	●
450	10.00	10.00	84	34.00	-	0.15	7	●	●
501	12.00	12.00	97	40.00	-	0.15	7	●	●
610	16.00	16.00	108	48.00	-	0.15	7	●	●
682	20.00	20.00	122	56.00	-	0.15	7	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	3.00	4	100	0.025	11.000	0.060	10610	1061
		4.00	5	100	0.029	13.000	0.060	7960	1154
		5.00	5	100	0.033	16.000	0.120	6365	1050
		6.00	6	100	0.036	21.000	0.120	5305	1146
		8.00	6	100	0.041	31.000	0.200	3980	979
		10.00	7	100	0.046	37.000	0.200	3185	1026
		12.00	7	100	0.051	44.000	0.240	2655	948
		16.00	8	100	0.059	53.000	0.240	1990	939
		20.00	8	100	0.066	62.000	0.300	1590	840
	Steel 850 - 1100 N/mm²	3.00	4	90	0.025	11.000	0.060	9550	955
		4.00	5	90	0.029	13.000	0.060	7160	1038
		5.00	5	90	0.033	16.000	0.120	5730	946
		6.00	6	90	0.036	21.000	0.120	4775	1031
		8.00	6	90	0.041	31.000	0.200	3580	881
		10.00	7	90	0.046	37.000	0.200	2865	923
		12.00	7	90	0.051	44.000	0.240	2385	851
		16.00	8	90	0.059	53.000	0.240	1790	845
		20.00	8	90	0.066	62.000	0.300	1430	755
	Steel 1100 - 1300 N/mm²	3.00	4	80	0.025	11.000	0.060	8490	849
		4.00	5	80	0.029	13.000	0.060	6365	923
		5.00	5	80	0.033	16.000	0.120	5095	841
		6.00	6	80	0.036	21.000	0.120	4245	917
		8.00	6	80	0.041	31.000	0.200	3185	784
		10.00	7	80	0.046	37.000	0.200	2545	820
		12.00	7	80	0.051	44.000	0.240	2120	757
		16.00	8	80	0.059	53.000	0.240	1590	751
		20.00	8	80	0.066	62.000	0.300	1275	673
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	40	0.025	11.000	0.060	4245	425
		4.00	5	40	0.029	13.000	0.060	3185	462
		5.00	5	40	0.033	16.000	0.120	2545	420
		6.00	6	40	0.036	21.000	0.120	2120	458
		8.00	6	40	0.041	31.000	0.200	1590	391
		10.00	7	40	0.046	37.000	0.200	1275	411
		12.00	7	40	0.051	44.000	0.240	1060	378
		16.00	8	40	0.059	53.000	0.240	795	375
		20.00	8	40	0.066	62.000	0.300	635	335
	Steel < 850 N/mm²	3.00	4	130	0.021	11.000	0.030	13795	1159
		4.00	5	130	0.024	13.000	0.030	10345	1241
		5.00	5	130	0.027	16.000	0.060	8275	1117
		6.00	6	130	0.030	21.000	0.060	6895	1241
		8.00	6	130	0.034	31.000	0.100	5175	1056
		10.00	7	130	0.039	37.000	0.100	4140	1130
		12.00	7	130	0.042	44.000	0.120	3450	1014
		16.00	8	130	0.049	53.000	0.120	2585	1013
		20.00	8	130	0.055	62.000	0.150	2070	911
	Steel 850 - 1100 N/mm²	3.00	4	110	0.021	11.000	0.030	11670	980
		4.00	5	110	0.024	13.000	0.030	8755	1051
		5.00	5	110	0.027	16.000	0.060	7005	946
		6.00	6	110	0.030	21.000	0.060	5835	1050
		8.00	6	110	0.034	31.000	0.100	4375	893
		10.00	7	110	0.039	37.000	0.100	3500	956
		12.00	7	110	0.042	44.000	0.120	2920	859
		16.00	8	110	0.049	53.000	0.120	2190	859
		20.00	8	110	0.055	62.000	0.150	1750	770
	Steel 1100 - 1300 N/mm²	3.00	4	100	0.021	11.000	0.030	10610	891
		4.00	5	100	0.024	13.000	0.030	7960	955
		5.00	5	100	0.027	16.000	0.060	6365	859
		6.00	6	100	0.030	21.000	0.060	5305	955
		8.00	6	100	0.034	31.000	0.100	3980	812
		10.00	7	100	0.039	37.000	0.100	3185	870
		12.00	7	100	0.042	44.000	0.120	2655	781
		16.00	8	100	0.049	53.000	0.120	1990	780
		20.00	8	100	0.055	62.000	0.150	1590	700
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	60	0.021	11.000	0.030	6365	535
		4.00	5	60	0.024	13.000	0.030	4775	573
		5.00	5	60	0.027	16.000	0.060	3820	516
		6.00	6	60	0.030	21.000	0.060	3185	573
		8.00	6	60	0.034	31.000	0.100	2385	487
		10.00	7	60	0.039	37.000	0.100	1910	521
		12.00	7	60	0.042	44.000	0.120	1590	468
		16.00	8	60	0.049	53.000	0.120	1195	468
		20.00	8	60	0.055	62.000	0.150	955	420

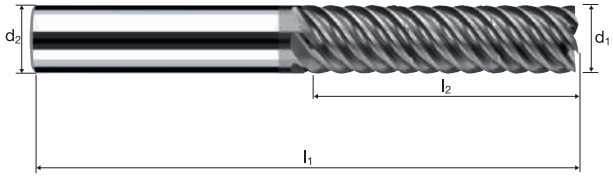
Cylindrical/Square end mills E-Cut

Finishing, chip breaker, medium version

HM
MG10

λ 55°
γ 10°

r



Roughing

Finishing

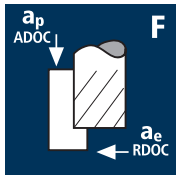
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8311** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r	z	POLYCHROM P8311
180*	3.00	6.00	63	11.00	20.26	0.050	4	●
220*	4.00	6.00	63	13.00	21.39	0.100	5	●
260*	5.00	6.00	63	16.00	23.52	0.100	5	●
300	6.00	6.00	63	21.00	-	0.100	6	●
391	8.00	8.00	72	31.00	-	0.150	6	●
450	10.00	10.00	84	37.00	-	0.200	7	●
501	12.00	12.00	97	44.00	-	0.200	7	●
610	16.00	16.00	108	53.00	-	0.200	8	●
682	20.00	20.00	122	62.00	-	0.250	8	●

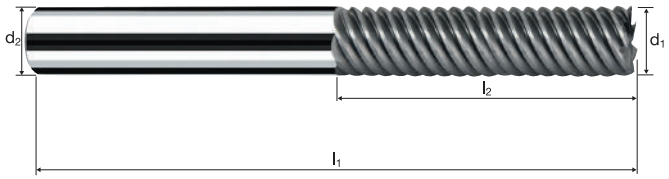
* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel 850 - 1100 N/mm²	6.00	5	100	0.028	26.000	0.060	5305	743
		8.00	7	100	0.032	36.000	0.100	3980	892
		10.00	7	100	0.036	45.000	0.100	3185	803
		12.00	7	100	0.039	53.000	0.120	2655	725
		16.00	7	100	0.045	63.000	0.120	1990	627
		20.00	7	100	0.050	75.000	0.150	1590	557
	Steel 1100 - 1300 N/mm²	6.00	5	90	0.028	26.000	0.060	4775	669
		8.00	7	90	0.032	36.000	0.100	3580	802
		10.00	7	90	0.036	45.000	0.100	2865	722
		12.00	7	90	0.039	53.000	0.120	2385	651
		16.00	7	90	0.045	63.000	0.120	1790	564
		20.00	7	90	0.050	75.000	0.150	1430	501
	Hardened tool steel 52 - 56 HRC	6.00	5	55	0.028	26.000	0.060	2920	409
		8.00	7	65	0.021	36.000	0.080	2585	380
		10.00	7	65	0.024	45.000	0.080	2070	348
		12.00	7	65	0.026	53.000	0.100	1725	314
		16.00	7	65	0.030	63.000	0.100	1295	272
		20.00	7	65	0.033	75.000	0.120	1035	239
	Hardened tool steel 56 - 60 HRC	6.00	5	40	0.028	26.000	0.060	2120	297
		8.00	7	45	0.021	36.000	0.080	1790	263
		10.00	7	45	0.024	45.000	0.080	1430	240
		12.00	7	45	0.026	53.000	0.100	1195	218
		16.00	7	45	0.030	63.000	0.100	895	188
		20.00	7	45	0.033	75.000	0.120	715	165
	Wrought aluminium Construction aluminium	6.00	5	290	0.028	26.000	0.060	15385	2154
		8.00	7	290	0.032	36.000	0.100	11540	2585
		10.00	7	290	0.036	45.000	0.100	9230	2326
		12.00	7	290	0.039	53.000	0.120	7690	2099
		16.00	7	290	0.045	63.000	0.120	5770	1818
		20.00	7	290	0.050	75.000	0.150	4615	1615
	Cast iron (lamellar / spheroidal)	6.00	5	110	0.028	26.000	0.060	5835	817
		8.00	7	110	0.032	36.000	0.100	4375	980
		10.00	7	110	0.036	45.000	0.100	3500	882
		12.00	7	110	0.039	53.000	0.120	2920	797
		16.00	7	110	0.045	63.000	0.120	2190	690
		20.00	7	110	0.050	75.000	0.150	1750	613
	Titanium alloys >300 HB [Ti6Al4V]	6.00	5	40	0.028	26.000	0.060	2120	297
		8.00	7	40	0.032	36.000	0.100	1590	356
		10.00	7	40	0.036	45.000	0.100	1275	321
		12.00	7	40	0.039	53.000	0.120	1060	289
		16.00	7	40	0.045	63.000	0.120	795	250
		20.00	7	40	0.050	75.000	0.150	635	222
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	5	50	0.028	26.000	0.060	2655	372
		8.00	7	50	0.032	36.000	0.100	1990	446
		10.00	7	50	0.036	45.000	0.100	1590	401
		12.00	7	50	0.039	53.000	0.120	1325	362
		16.00	7	50	0.045	63.000	0.120	995	313
		20.00	7	50	0.050	75.000	0.150	795	278

Cylindrical/Square end mills MulticutXF

Finishing, long version

HM XA	λ 65° γ 8°
45°	h5



Roughing

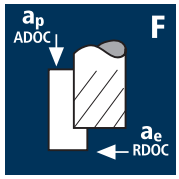
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **15254** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	45°	z	DURO-Si H15254	POLYCHROM P15254
300	6.00	6.00	70	26.00	0.10	5	●	●
391	8.00	8.00	80	36.00	0.10	7	●	●
450	10.00	10.00	100	45.00	0.15	7	●	●
501	12.00	12.00	110	53.00	0.15	7	●	●
610	16.00	16.00	123	63.00	0.15	7	●	●
682	20.00	20.00	141	75.00	0.15	7	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel 850 - 1100 N/mm²	6.00	5	80	0.026	32.000	0.050	4245	552
		8.00	7	80	0.030	42.000	0.080	3185	669
		10.00	7	80	0.033	53.000	0.080	2545	588
		12.00	7	80	0.036	63.000	0.120	2120	534
		16.00	7	80	0.042	84.000	0.120	1590	468
		20.00	7	80	0.047	105.000	0.150	1275	420
	Steel 1100 - 1300 N/mm²	6.00	5	70	0.026	32.000	0.050	3715	483
		8.00	7	70	0.030	42.000	0.080	2785	585
		10.00	7	70	0.033	53.000	0.080	2230	515
		12.00	7	70	0.036	63.000	0.120	1855	468
		16.00	7	70	0.042	84.000	0.120	1395	410
		20.00	7	70	0.047	105.000	0.150	1115	367
	Hardened tool steel 52 - 56 HRC	6.00	5	45	0.028	32.000	0.050	2385	334
		8.00	7	50	0.021	42.000	0.080	1990	293
		10.00	7	50	0.024	53.000	0.080	1590	267
		12.00	7	50	0.026	63.000	0.096	1325	241
		16.00	7	50	0.030	84.000	0.096	995	209
		20.00	7	50	0.033	105.000	0.120	795	184
	Hardened tool steel 56 - 60 HRC	6.00	5	30	0.028	32.000	0.050	1590	223
		8.00	7	35	0.021	42.000	0.080	1395	205
		10.00	7	35	0.024	53.000	0.080	1115	187
		12.00	7	35	0.026	63.000	0.096	930	169
		16.00	7	35	0.030	84.000	0.096	695	146
		20.00	7	35	0.033	105.000	0.120	555	128
	Wrought aluminium Construction aluminium	6.00	5	100	0.026	32.000	0.050	5305	690
		8.00	7	100	0.030	42.000	0.080	3980	836
		10.00	7	100	0.033	53.000	0.080	3185	736
		12.00	7	100	0.036	63.000	0.120	2655	669
		16.00	7	100	0.042	84.000	0.120	1990	585
		20.00	7	100	0.047	105.000	0.150	1590	523
	Cast iron (lamellar / spheroidal)	6.00	5	90	0.026	32.000	0.050	4775	621
		8.00	7	90	0.030	42.000	0.080	3580	752
		10.00	7	90	0.033	53.000	0.080	2865	662
		12.00	7	90	0.036	63.000	0.120	2385	601
		16.00	7	90	0.042	84.000	0.120	1790	526
		20.00	7	90	0.047	105.000	0.150	1430	471
	Titanium alloys >300 HB [Ti6Al4V]	6.00	5	30	0.026	32.000	0.050	1590	207
		8.00	7	30	0.030	42.000	0.080	1195	251
		10.00	7	30	0.033	53.000	0.080	955	221
		12.00	7	30	0.036	63.000	0.120	795	200
		16.00	7	30	0.042	84.000	0.120	595	175
		20.00	7	30	0.047	105.000	0.150	475	156
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	5	40	0.026	32.000	0.050	2120	276
		8.00	7	40	0.030	42.000	0.080	1590	334
		10.00	7	40	0.033	53.000	0.080	1275	295
		12.00	7	40	0.036	63.000	0.120	1060	267
		16.00	7	40	0.042	84.000	0.120	795	234
		20.00	7	40	0.047	105.000	0.150	635	209

Cylindrical/Square end mills MulticutXF

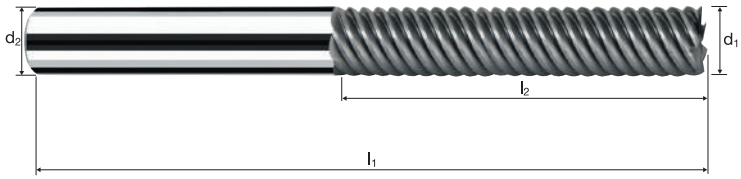
Finishing, 5.2xd version

HM XA

λ 65°
γ 8°

45°

h5



Roughing

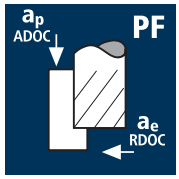
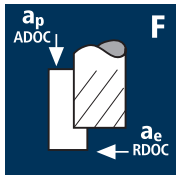
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **8521** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	45°	z	DURO-Si H8521	POLYCHROM P8521
300	6.00	6.00	73	32.00	0.10	5	●	●
391	8.00	8.00	84	42.00	0.10	7	●	●
450	10.00	10.00	100	53.00	0.15	7	●	●
501	12.00	12.00	117	63.00	0.15	7	●	●
610	16.00	16.00	144	84.00	0.15	7	●	●
682	20.00	20.00	169	105.00	0.15	7	●	●

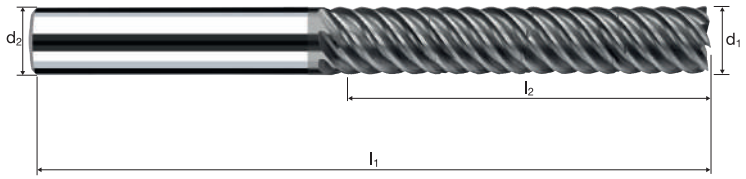
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	6.00	6	60	0.031	32.000	0.090	3185	592
		8.00	6	60	0.035	42.000	0.150	2385	501
		10.00	7	60	0.040	53.000	0.150	1910	535
		12.00	7	60	0.043	63.000	0.180	1590	479
		16.00	8	60	0.050	84.000	0.180	1195	478
		20.00	8	60	0.056	105.000	0.225	955	428
	Steel 850 - 1100 N/mm²	6.00	6	60	0.031	32.000	0.090	3185	592
		8.00	6	60	0.035	42.000	0.150	2385	501
		10.00	7	60	0.040	53.000	0.150	1910	535
		12.00	7	60	0.043	63.000	0.180	1590	479
		16.00	8	60	0.050	84.000	0.180	1195	478
		20.00	8	60	0.056	105.000	0.225	955	428
	Steel 1100 - 1300 N/mm²	6.00	6	50	0.031	32.000	0.090	2655	494
		8.00	6	50	0.035	42.000	0.150	1990	418
		10.00	7	50	0.040	53.000	0.150	1590	445
		12.00	7	50	0.043	63.000	0.180	1325	399
		16.00	8	50	0.050	84.000	0.180	995	398
		20.00	8	50	0.056	105.000	0.225	795	356
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	30	0.031	32.000	0.090	1590	296
		8.00	6	30	0.035	42.000	0.150	1195	251
		10.00	7	30	0.040	53.000	0.150	955	267
		12.00	7	30	0.043	63.000	0.180	795	239
		16.00	8	30	0.050	84.000	0.180	595	238
		20.00	8	30	0.056	105.000	0.225	475	213
	Steel < 850 N/mm²	6.00	6	80	0.026	32.000	0.060	4245	662
		8.00	6	80	0.030	42.000	0.100	3185	573
		10.00	7	80	0.033	53.000	0.100	2545	588
		12.00	7	80	0.036	63.000	0.120	2120	534
		16.00	8	80	0.042	84.000	0.120	1590	534
		20.00	8	80	0.047	105.000	0.150	1275	479
	Steel 850 - 1100 N/mm²	6.00	6	70	0.026	32.000	0.060	3715	580
		8.00	6	70	0.030	42.000	0.100	2785	501
		10.00	7	70	0.033	53.000	0.100	2230	515
		12.00	7	70	0.036	63.000	0.120	1855	468
		16.00	8	70	0.042	84.000	0.120	1395	469
		20.00	8	70	0.047	105.000	0.150	1115	419
	Steel 1100 - 1300 N/mm²	6.00	6	60	0.026	32.000	0.060	3185	497
		8.00	6	60	0.030	42.000	0.100	2385	429
		10.00	7	60	0.033	53.000	0.100	1910	441
		12.00	7	60	0.036	63.000	0.120	1590	401
		16.00	8	60	0.042	84.000	0.120	1195	402
		20.00	8	60	0.047	105.000	0.150	955	359
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	40	0.026	32.000	0.060	2120	331
		8.00	6	40	0.030	42.000	0.100	1590	286
		10.00	7	40	0.033	53.000	0.100	1275	295
		12.00	7	40	0.036	63.000	0.120	1060	267
		16.00	8	40	0.042	84.000	0.120	795	267
		20.00	8	40	0.047	105.000	0.150	635	239

Cylindrical/Square end mills E-Cut

Finishing, chip breaker, 5.2xd version

HM MG10 | λ 55° γ 10°

r



Roughing

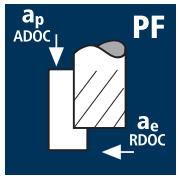
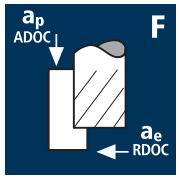
Finishing

ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8321** ø-Code **300**

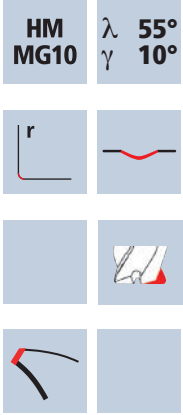
Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z		POLYCHROM P8321
300	6.00	6.00	73	32.00	0.100	6		●
391	8.00	8.00	84	42.00	0.150	6		●
450	10.00	10.00	100	53.00	0.200	7		●
501	12.00	12.00	117	63.00	0.200	7		●
610	16.00	16.00	144	84.00	0.200	8		●
682	20.00	20.00	169	105.00	0.250	8		●

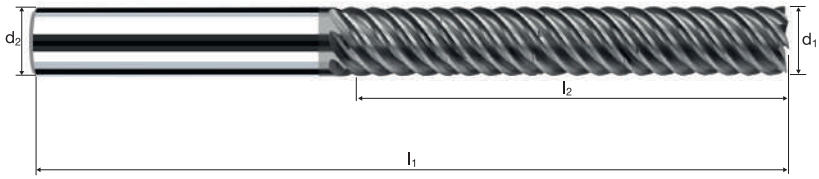
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel < 850 N/mm²	6.00	6	56	0.034	38.000	0.080	2970	606
		8.00	6	56	0.039	51.000	0.120	2230	522
		10.00	7	56	0.043	63.000	0.120	1785	537
		12.00	7	56	0.048	76.000	0.180	1485	499
		16.00	8	56	0.055	101.000	0.180	1115	491
		20.00	8	56	0.061	126.000	0.230	890	434
	Steel 850 - 1100 N/mm²	6.00	6	48	0.034	38.000	0.080	2545	519
		8.00	6	48	0.039	51.000	0.120	1910	447
		10.00	7	48	0.043	63.000	0.120	1530	461
		12.00	7	48	0.048	76.000	0.180	1275	428
		16.00	8	48	0.055	101.000	0.180	955	420
		20.00	8	48	0.061	126.000	0.230	765	373
	Steel 1100 - 1300 N/mm²	6.00	6	44	0.034	38.000	0.075	2335	476
		8.00	6	44	0.039	51.000	0.120	1750	410
		10.00	7	44	0.043	63.000	0.120	1400	421
		12.00	7	44	0.048	76.000	0.180	1165	391
		16.00	8	44	0.055	101.000	0.180	875	385
		20.00	8	44	0.061	126.000	0.225	700	342
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	24	0.034	38.000	0.080	1275	260
		8.00	6	24	0.039	51.000	0.120	955	224
		10.00	7	24	0.043	63.000	0.120	765	230
		12.00	7	24	0.048	76.000	0.180	635	213
		16.00	8	24	0.055	101.000	0.180	475	209
		20.00	8	24	0.061	126.000	0.230	380	185
	Steel < 850 N/mm²	6.00	6	70	0.024	38.000	0.050	3715	535
		8.00	6	70	0.028	51.000	0.080	2785	468
		10.00	7	70	0.031	63.000	0.080	2230	484
		12.00	7	70	0.036	76.000	0.120	1855	468
		16.00	8	70	0.039	101.000	0.120	1395	435
		20.00	8	70	0.044	126.000	0.150	1115	393
	Steel 850 - 1100 N/mm²	6.00	6	60	0.024	38.000	0.050	3185	459
		8.00	6	60	0.028	51.000	0.080	2385	401
		10.00	7	60	0.031	63.000	0.080	1910	415
		12.00	7	60	0.036	76.000	0.120	1590	401
		16.00	8	60	0.039	101.000	0.120	1195	373
		20.00	8	60	0.044	126.000	0.150	955	336
	Steel 1100 - 1300 N/mm²	6.00	6	55	0.024	38.000	0.050	2920	421
		8.00	6	55	0.028	51.000	0.080	2190	368
		10.00	7	55	0.031	63.000	0.080	1750	380
		12.00	7	55	0.036	76.000	0.120	1460	368
		16.00	8	55	0.039	101.000	0.120	1095	342
		20.00	8	55	0.044	126.000	0.150	875	308
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	30	0.024	38.000	0.050	1590	229
		8.00	6	30	0.028	51.000	0.080	1195	201
		10.00	7	30	0.031	63.000	0.080	955	207
		12.00	7	30	0.036	76.000	0.120	795	200
		16.00	8	30	0.039	101.000	0.120	595	186
		20.00	8	30	0.044	126.000	0.150	475	167

Cylindrical/Square end mills E-Cut

Finishing, chip breaker, 6.3xd version

HM MG10 | λ 55° γ 10°





Roughing

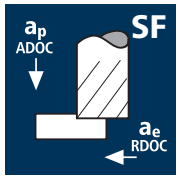
Finishing

ReTool®

Rm <850 HRC <24 | **Rm 850-1100 HRC 24-34** | **Rm 1100-1300 HRC 34-42** | **Rm 1300-1500 HRC 42-48** | **HRC 48-56** | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8322** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z	POLYCHROM P8322
300	6.00	6.00	80	38.00	0.100	6	●
391	8.00	8.00	93	51.00	0.150	6	●
450	10.00	10.00	110	63.00	0.200	7	●
501	12.00	12.00	130	76.00	0.200	7	●
610	16.00	16.00	160	101.00	0.200	8	●
682	20.00	20.00	189	126.00	0.250	8	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Hardened tool steel 42 - 48 HRC H	3.00	4	180	0.005	0.050	1.800	19100	382
		4.00	4	180	0.006	0.050	2.400	14325	344
		5.00	4	180	0.007	0.075	3.000	11460	321
		6.00	4	180	0.008	0.075	3.600	9550	306
		8.00	4	180	0.009	0.100	4.800	7160	258
		10.00	4	180	0.010	0.100	6.000	5730	229
		12.00	4	180	0.011	0.150	7.200	4775	210
		16.00	4	180	0.013	0.150	9.600	3580	186
	Hardened tool steel 48 - 52 HRC H	3.00	4	180	0.005	0.050	1.800	19100	382
		4.00	4	180	0.006	0.050	2.400	14325	344
		5.00	4	180	0.007	0.075	3.000	11460	321
		6.00	4	180	0.008	0.075	3.600	9550	306
		8.00	4	180	0.009	0.100	4.800	7160	258
		10.00	4	180	0.010	0.100	6.000	5730	229
		12.00	4	180	0.011	0.150	7.200	4775	210
		16.00	4	180	0.013	0.150	9.600	3580	186
	Hardened tool steel 52 - 56 HRC H	3.00	4	160	0.005	0.050	1.800	16975	340
		4.00	4	160	0.006	0.050	2.400	12730	306
		5.00	4	160	0.007	0.075	3.000	10185	285
		6.00	4	160	0.008	0.075	3.600	8490	272
		8.00	4	160	0.009	0.100	4.800	6365	229
		10.00	4	160	0.010	0.100	6.000	5095	204
		12.00	4	160	0.011	0.150	7.200	4245	187
		16.00	4	160	0.013	0.150	9.600	3185	166
	Titanium alloys >300 HB [Ti6Al4V] H	3.00	4	125	0.005	0.050	1.800	13265	265
		4.00	4	125	0.006	0.050	2.400	9945	239
		5.00	4	125	0.007	0.075	3.000	7960	223
		6.00	4	125	0.008	0.075	3.600	6630	212
		8.00	4	125	0.009	0.100	4.800	4975	179
		10.00	4	125	0.010	0.100	6.000	3980	159
		12.00	4	125	0.011	0.150	7.200	3315	146
		16.00	4	125	0.013	0.150	9.600	2485	129
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	250	0.005	0.050	1.800	26525	531
		4.00	4	250	0.006	0.050	2.400	19895	478
		5.00	4	250	0.007	0.075	3.000	15915	446
		6.00	4	250	0.008	0.075	3.600	13265	425
		8.00	4	250	0.009	0.100	4.800	9945	358
		10.00	4	250	0.010	0.100	6.000	7960	318
		12.00	4	250	0.011	0.150	7.200	6630	292
		16.00	4	250	0.013	0.150	9.600	4975	259
	Wrought aluminium Construction aluminium H	3.00	4	280	0.006	0.050	1.800	29710	713
		4.00	4	370	0.007	0.050	2.400	29445	825
		5.00	4	400	0.008	0.075	3.250	25465	815
		6.00	4	400	0.010	0.075	3.900	21220	849
		8.00	4	450	0.012	0.100	5.600	17905	859
		10.00	4	450	0.015	0.100	7.000	14325	860
		12.00	4	500	0.018	0.150	8.400	13265	955
		16.00	4	500	0.020	0.150	11.200	9945	796

Cylindrical/Square end mills NX

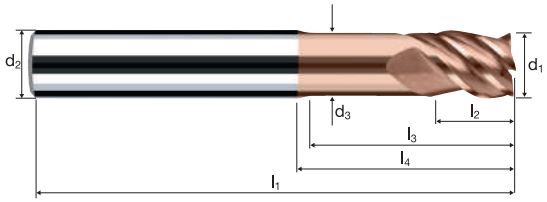
Face finishing, normal version, neck

HM XA

λ 45°
γ 10°

h5

G 2.5



Roughing

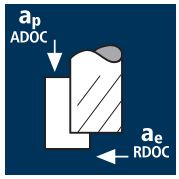
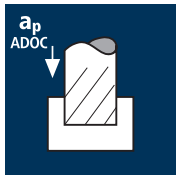
Finishing

ReTool®

Rm 1300-1500 **HRC** 42-48 | **HRC** 48-56 | **Inox** Stainless | **Ti** Titanium | **Aluminium Copper**

Example: **Order-N°.** Coating **H** Article-N°. **8502** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	45°$_{theo.}$	z	DURO-Si **H8502**
180	3.00	6.00	2.80	57	4.00	14.00	20.37	0.10	4	●
220	4.00	6.00	3.70	57	5.00	16.00	20.82	0.10	4	●
260	5.00	6.00	4.60	57	6.00	18.00	21.27	0.10	4	●
300	6.00	6.00	5.50	57	7.00	18.15	20.00	0.10	4	●
391	8.00	8.00	7.40	63	9.00	23.63	26.00	0.15	4	●
450	10.00	10.00	9.20	72	11.00	27.99	31.00	0.15	4	●
501	12.00	12.00	11.00	83	13.00	33.29	37.00	0.20	4	●
610	16.00	16.00	15.00	92	17.00	38.73	43.00	0.20	4	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.100	0.040	41380	108	0.5
		0.30	2	40	0.002	0.150	0.060	42440	166	1.5
		0.40	2	53	0.003	0.200	0.080	42175	219	3.5
		0.50	2	66	0.003	0.300	0.200	42015	273	16.4
		0.60	2	79	0.004	0.360	0.240	41910	327	28.3
		0.80	2	90	0.005	0.480	0.320	35810	372	57.2
		1.00	2	90	0.007	0.600	0.400	28650	373	89.4
		1.50	2	90	0.010	1.500	0.900	19100	373	502.9
		2.00	2	90	0.013	2.000	1.200	14325	373	894.0
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.100	0.040	41380	91	0.4
		0.30	2	40	0.002	0.150	0.060	42440	140	1.3
		0.40	2	53	0.002	0.200	0.080	42175	186	3.0
		0.50	2	66	0.003	0.300	0.200	42015	231	13.9
		0.60	2	75	0.003	0.360	0.240	39790	263	22.7
		0.80	2	75	0.004	0.480	0.320	29840	263	40.4
		1.00	2	75	0.006	0.600	0.400	23875	263	63.0
		1.50	2	75	0.008	1.500	0.900	15915	263	354.5
		2.00	2	75	0.011	2.000	1.200	11935	263	630.3
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.30	2	40	0.002	0.150	0.060	42440	127	1.2
		0.40	2	45	0.002	0.200	0.080	35810	143	2.3
		0.50	2	45	0.003	0.300	0.200	28650	143	8.6
		0.60	2	45	0.003	0.360	0.240	23875	143	12.4
		0.80	2	45	0.004	0.480	0.320	17905	143	22.0
		1.00	2	45	0.005	0.600	0.400	14325	143	34.4
		1.50	2	45	0.008	1.500	0.900	9550	143	193.5
		2.00	2	45	0.010	2.000	1.200	7160	143	343.7
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.30	2	35	0.002	0.150	0.060	37135	111	1.0
		0.40	2	35	0.002	0.200	0.080	27850	111	1.8
		0.50	2	35	0.003	0.300	0.100	22280	111	3.4
		0.60	2	35	0.003	0.360	0.120	18570	111	4.8
		0.80	2	35	0.004	0.480	0.160	13925	111	8.6
		1.00	2	35	0.005	0.600	0.200	11140	111	13.4
		1.50	2	35	0.008	1.500	0.300	7425	111	50.2
		2.00	2	35	0.010	1.200	0.400	5570	111	53.5
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.040	0.200	41380	108	0.9
		0.30	2	40	0.002	0.060	0.300	42440	166	3.0
		0.40	2	53	0.003	0.080	0.400	42175	219	7.0
		0.50	2	66	0.003	0.150	0.500	42015	273	20.5
		0.60	2	77	0.004	0.180	0.600	40850	319	34.4
		0.80	2	77	0.005	0.240	0.800	30635	319	61.2
		1.00	2	77	0.007	0.300	1.000	24510	319	95.6
		1.50	2	77	0.010	0.750	1.500	16340	319	358.5
		2.00	2	77	0.013	1.000	2.000	12255	319	637.2
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.040	0.200	41380	91	0.8
		0.30	2	40	0.002	0.060	0.300	42440	140	2.5
		0.40	2	53	0.002	0.080	0.400	42175	186	6.0
		0.50	2	64	0.003	0.150	0.500	40745	224	16.8
		0.60	2	64	0.003	0.180	0.600	33955	224	24.2
		0.80	2	64	0.004	0.240	0.800	25465	224	43.1
		1.00	2	64	0.006	0.300	1.000	20370	224	67.3
		1.50	2	64	0.008	0.750	1.500	13580	224	252.1
		2.00	2	64	0.011	1.000	2.000	10185	224	448.2
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.30	2	38	0.002	0.060	0.300	40320	121	2.2
		0.40	2	38	0.002	0.080	0.400	30240	121	3.9
		0.50	2	38	0.003	0.150	0.500	24190	121	9.1
		0.60	2	38	0.003	0.180	0.600	20160	121	13.1
		0.80	2	38	0.004	0.240	0.800	15120	121	23.3
		1.00	2	38	0.005	0.300	1.000	12095	121	36.3
		1.50	2	38	0.008	0.750	1.500	8065	121	136.2
		2.00	2	38	0.010	1.000	2.000	6050	121	242.0
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.30	2	30	0.002	0.060	0.300	31830	96	1.7
		0.40	2	30	0.002	0.080	0.400	23875	96	3.1
		0.50	2	30	0.003	0.100	0.500	19100	96	4.8
		0.60	2	30	0.003	0.120	0.600	15915	96	6.9
		0.80	2	30	0.004	0.160	0.800	11935	96	12.2
		1.00	2	30	0.005	0.200	1.000	9550	96	19.1
		1.50	2	30	0.008	0.300	1.500	6365	96	43.0
		2.00	2	30	0.010	0.400	2.000	4775	96	76.4

Cylindrical/Square end mills MicroX

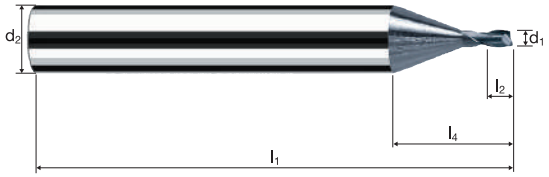
Shank ø 6mm, cylindrical neck, 1xd

X-Generation X

HM XA

λ 25°
γ -10°

45°

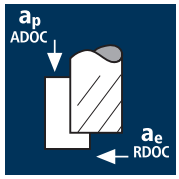
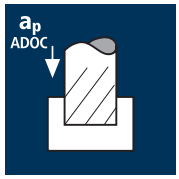


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6500** ø-Code **010**

Ø Code	d_1 0/-0.01	d_2 h4	l_1	l_2	l_4	45°	z	X-AL X6500
010	0.10	6.00	57	0.10	16.94	-	2	●
020	0.20	6.00	57	0.20	16.75	-	2	●
030	0.30	6.00	57	0.30	16.59	-	2	●
040	0.40	6.00	57	0.40	16.43	-	2	●
050	0.50	6.00	57	0.50	10.97	-	2	●
060	0.60	6.00	57	0.60	10.91	-	2	●
080	0.80	6.00	57	0.80	10.77	-	2	●
100	1.00	6.00	57	1.00	10.66	0.04	2	●
120	1.50	6.00	57	1.50	10.33	0.04	2	●
140	2.00	6.00	57	2.00	10.00	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.100	0.040	41380	108	0.5
		0.30	2	40	0.002	0.150	0.060	42440	166	1.5
		0.40	2	53	0.003	0.200	0.080	42175	219	3.5
		0.50	2	66	0.003	0.300	0.200	42015	273	16.4
		0.60	2	79	0.004	0.360	0.240	41910	327	28.3
		0.80	2	90	0.005	0.480	0.320	35810	372	57.2
		1.00	2	90	0.007	0.600	0.400	28650	373	89.4
		1.50	2	90	0.010	1.500	0.900	19100	373	502.9
		2.00	2	90	0.013	2.000	1.200	14325	373	894.0
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.100	0.040	41380	91	0.4
		0.30	2	40	0.002	0.150	0.060	42440	140	1.3
		0.40	2	53	0.002	0.200	0.080	42175	186	3.0
		0.50	2	66	0.003	0.300	0.200	42015	231	13.9
		0.60	2	75	0.003	0.360	0.240	39790	263	22.7
		0.80	2	75	0.004	0.480	0.320	29840	263	40.4
		1.00	2	75	0.006	0.600	0.400	23875	263	63.0
		1.50	2	75	0.008	1.500	0.900	15915	263	354.5
		2.00	2	75	0.011	2.000	1.200	11935	263	630.3
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.30	2	40	0.002	0.150	0.060	42440	127	1.2
		0.40	2	45	0.002	0.200	0.080	35810	143	2.3
		0.50	2	45	0.003	0.300	0.200	28650	143	8.6
		0.60	2	45	0.003	0.360	0.240	23875	143	12.4
		0.80	2	45	0.004	0.480	0.320	17905	143	22.0
		1.00	2	45	0.005	0.600	0.400	14325	143	34.4
		1.50	2	45	0.008	1.500	0.900	9550	143	193.5
		2.00	2	45	0.010	2.000	1.200	7160	143	343.7
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.30	2	35	0.002	0.150	0.060	37135	111	1.0
		0.40	2	35	0.002	0.200	0.080	27850	111	1.8
		0.50	2	35	0.003	0.300	0.100	22280	111	3.4
		0.60	2	35	0.003	0.360	0.120	18570	111	4.8
		0.80	2	35	0.004	0.480	0.160	13925	111	8.6
		1.00	2	35	0.005	0.600	0.200	11140	111	13.4
		1.50	2	35	0.008	1.500	0.300	7425	111	50.2
		2.00	2	35	0.010	1.200	0.400	5570	111	53.5
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.040	0.200	41380	108	0.9
		0.30	2	40	0.002	0.060	0.300	42440	166	3.0
		0.40	2	53	0.003	0.080	0.400	42175	219	7.0
		0.50	2	66	0.003	0.150	0.500	42015	273	20.5
		0.60	2	77	0.004	0.180	0.600	40850	319	34.4
		0.80	2	77	0.005	0.240	0.800	30635	319	61.2
		1.00	2	77	0.007	0.300	1.000	24510	319	95.6
		1.50	2	77	0.010	0.750	1.500	16340	319	358.5
		2.00	2	77	0.013	1.000	2.000	12255	319	637.2
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.040	0.200	41380	91	0.8
		0.30	2	40	0.002	0.060	0.300	42440	140	2.5
		0.40	2	53	0.002	0.080	0.400	42175	186	6.0
		0.50	2	64	0.003	0.150	0.500	40745	224	16.8
		0.60	2	64	0.003	0.180	0.600	33955	224	24.2
		0.80	2	64	0.004	0.240	0.800	25465	224	43.1
		1.00	2	64	0.006	0.300	1.000	20370	224	67.3
		1.50	2	64	0.008	0.750	1.500	13580	224	252.1
		2.00	2	64	0.011	1.000	2.000	10185	224	448.2
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.30	2	38	0.002	0.060	0.300	40320	121	2.2
		0.40	2	38	0.002	0.080	0.400	30240	121	3.9
		0.50	2	38	0.003	0.150	0.500	24190	121	9.1
		0.60	2	38	0.003	0.180	0.600	20160	121	13.1
		0.80	2	38	0.004	0.240	0.800	15120	121	23.3
		1.00	2	38	0.005	0.300	1.000	12095	121	36.3
		1.50	2	38	0.008	0.750	1.500	8065	121	136.2
		2.00	2	38	0.010	1.000	2.000	6050	121	242.0
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.30	2	30	0.002	0.060	0.300	31830	96	1.7
		0.40	2	30	0.002	0.080	0.400	23875	96	3.1
		0.50	2	30	0.003	0.150	0.500	19100	96	7.2
		0.60	2	30	0.003	0.180	0.600	15915	96	10.3
		0.80	2	30	0.004	0.240	0.800	11935	96	18.4
		1.00	2	30	0.005	0.300	1.000	9550	96	28.7
		1.50	2	30	0.008	0.750	1.500	6365	96	107.5
		2.00	2	30	0.010	1.000	2.000	4775	96	191.0

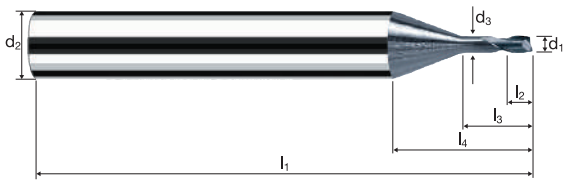
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 2xd

HM XA

λ 25°
γ -10°

45°

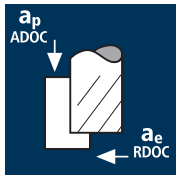
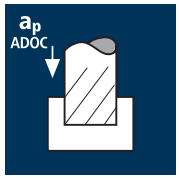


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6501** ø-Code **010**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL **X6501**
010	0.10	6.00	0.09	57	0.06	0.20	0.27	17.05	-	2	●
020	0.20	6.00	0.18	57	0.12	0.40	0.50	16.99	-	2	●
030	0.30	6.00	0.25	57	0.18	0.60	0.80	16.99	-	2	●
040	0.40	6.00	0.35	57	0.24	0.80	1.00	16.91	-	2	●
050	0.50	6.00	0.45	57	0.30	1.00	1.20	11.49	-	2	●
060	0.60	6.00	0.55	57	0.36	1.20	1.40	11.50	-	2	●
080	0.80	6.00	0.75	57	0.48	1.60	1.80	11.53	-	2	●
100	1.00	6.00	0.95	57	1.00	2.00	2.20	11.56	0.04	2	●
120	1.50	6.00	1.40	57	1.50	3.00	3.30	11.72	0.04	2	●
140	2.00	6.00	1.90	57	2.00	4.00	4.30	11.78	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.100	0.040	41380	108	0.5
		0.40	2	53	0.003	0.200	0.080	42175	219	3.5
		0.50	2	66	0.003	0.300	0.200	42015	273	16.4
		0.80	2	90	0.005	0.480	0.320	35810	372	57.2
		1.00	2	90	0.007	0.600	0.400	28650	373	89.4
		1.50	2	90	0.010	1.500	0.900	19100	373	502.9
		2.00	2	90	0.013	2.000	1.200	14325	373	894.0
		2.50	2	90	0.016	2.500	1.500	11460	373	1396.9
		3.00	2	90	0.020	3.000	1.800	9550	373	2011.5
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.100	0.040	41380	91	0.4
		0.40	2	53	0.002	0.200	0.080	42175	186	3.0
		0.50	2	66	0.003	0.300	0.200	42015	231	13.9
		0.80	2	75	0.004	0.480	0.320	29840	263	40.4
		1.00	2	75	0.006	0.600	0.400	23875	263	63.0
		1.50	2	75	0.008	1.500	0.900	15915	263	354.5
		2.00	2	75	0.011	2.000	1.200	11935	263	630.3
		2.50	2	75	0.014	2.500	1.500	9550	263	984.8
		3.00	2	75	0.017	3.000	1.800	7960	263	1418.6
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.40	2	45	0.002	0.200	0.080	35810	143	2.3
		0.50	2	45	0.003	0.300	0.200	28650	143	8.6
		0.80	2	45	0.004	0.480	0.320	17905	143	22.0
		1.00	2	45	0.005	0.600	0.400	14325	143	34.4
		1.50	2	45	0.008	1.500	0.900	9550	143	193.5
		2.00	2	45	0.010	2.000	1.200	7160	143	343.7
		2.50	2	45	0.013	2.500	1.500	5730	143	537.4
		3.00	2	45	0.015	3.000	1.800	4775	143	773.8
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.40	2	35	0.002	0.200	0.080	27850	111	1.8
		0.50	2	35	0.003	0.300	0.100	22280	111	3.4
		0.80	2	35	0.004	0.480	0.160	13925	111	8.6
		1.00	2	35	0.005	0.600	0.200	11140	111	13.4
		1.50	2	35	0.008	1.500	0.300	7425	111	50.2
		2.00	2	35	0.010	2.000	0.400	5570	111	89.1
		2.50	2	35	0.013	2.500	0.500	4455	111	139.3
		3.00	2	35	0.015	3.000	0.600	3715	112	200.7
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.040	0.200	41380	86	0.7
		0.40	2	53	0.002	0.080	0.400	42175	175	5.6
		0.50	2	66	0.003	0.150	0.500	42015	219	16.4
		0.80	2	77	0.004	0.240	0.800	30635	255	49.0
		1.00	2	77	0.005	0.300	1.000	24510	255	76.5
		1.50	2	77	0.008	0.750	1.500	16340	255	286.8
		2.00	2	77	0.010	1.000	2.000	12255	255	509.8
		2.50	2	77	0.013	1.250	2.500	9805	255	796.6
		3.00	2	77	0.016	1.500	3.000	8170	255	1147.1
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.040	0.200	41380	73	0.6
		0.40	2	53	0.002	0.080	0.400	42175	149	4.8
		0.50	2	64	0.002	0.150	0.500	40745	179	13.5
		0.80	2	64	0.004	0.240	0.800	25465	179	34.5
		1.00	2	64	0.004	0.300	1.000	20370	179	53.8
		1.50	2	64	0.007	0.750	1.500	13580	179	201.7
		2.00	2	64	0.009	1.000	2.000	10185	179	358.6
		2.50	2	64	0.011	1.250	2.500	8150	179	560.3
		3.00	2	64	0.013	1.500	3.000	6790	179	806.9
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.040	0.200	41380	66	0.6
		0.40	2	38	0.002	0.080	0.400	30240	97	3.1
		0.50	2	38	0.002	0.150	0.500	24190	97	7.3
		0.80	2	38	0.003	0.240	0.800	15120	97	18.6
		1.00	2	38	0.004	0.300	1.000	12095	97	29.1
		1.50	2	38	0.006	0.750	1.500	8065	97	108.9
		2.00	2	38	0.008	1.000	2.000	6050	97	193.6
		2.50	2	38	0.010	1.250	2.500	4840	97	302.5
		3.00	2	38	0.012	1.500	3.000	4030	97	435.2
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.040	0.200	41380	66	0.6
		0.40	2	30	0.002	0.080	0.400	23875	76	2.5
		0.50	2	30	0.002	0.100	0.500	19100	76	3.8
		0.80	2	30	0.003	0.160	0.800	11935	76	9.8
		1.00	2	30	0.004	0.200	1.000	9550	76	15.3
		1.50	2	30	0.006	0.300	1.500	6365	76	34.4
		2.00	2	30	0.008	0.400	2.000	4775	76	61.1
		2.50	2	30	0.010	0.500	2.500	3820	76	95.5
		3.00	2	30	0.012	0.600	3.000	3185	76	137.5

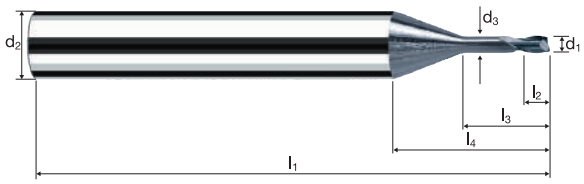
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 3xd

HM XA

λ 25°
γ -10°

45°

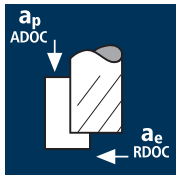
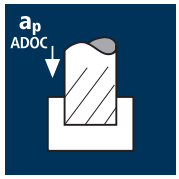


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6502** ø-Code **010**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL **X6502**
010	0.10	6.00	0.09	57	0.06	0.30	0.37	17.15	-	2	●
020	0.20	6.00	0.18	57	0.12	0.60	0.70	17.19	-	2	●
030	0.30	6.00	0.25	57	0.18	0.90	1.10	17.29	-	2	●
040	0.40	6.00	0.35	57	0.24	1.20	1.40	17.31	-	2	●
050	0.50	6.00	0.45	57	0.30	1.50	1.70	11.99	-	2	●
060	0.60	6.00	0.55	57	0.36	1.80	2.00	12.10	-	2	●
080	0.80	6.00	0.75	57	0.48	2.40	2.60	12.33	-	2	●
100	1.00	6.00	0.95	57	1.00	3.00	3.20	12.56	0.04	2	●
108	1.20	6.00	1.10	57	1.20	3.60	3.90	12.88	0.04	2	●
120	1.50	6.00	1.40	57	1.50	4.50	4.80	13.22	0.04	2	●
140	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	0.05	2	●
160	2.50	6.00	2.30	57	2.50	7.50	7.93	14.54	0.05	2	●
180	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.100	0.040	41380	108	0.5
		0.30	2	40	0.002	0.150	0.060	42440	166	1.5
		0.40	2	53	0.003	0.200	0.080	42175	219	3.5
		0.50	2	66	0.003	0.300	0.200	42015	273	16.4
		0.60	2	79	0.004	0.360	0.240	41910	327	28.3
		0.80	2	86	0.005	0.480	0.320	34220	356	54.7
		1.00	2	86	0.007	0.600	0.400	27375	356	85.4
		1.50	2	86	0.010	1.200	0.900	18250	356	384.4
		2.00	2	86	0.013	1.600	1.200	13685	356	683.2
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.100	0.040	41380	91	0.4
		0.30	2	40	0.002	0.150	0.060	42440	140	1.3
		0.40	2	53	0.002	0.200	0.080	42175	186	3.0
		0.50	2	66	0.003	0.300	0.200	42015	231	13.9
		0.60	2	71	0.003	0.360	0.240	37665	249	21.5
		0.80	2	71	0.004	0.480	0.320	28250	249	38.2
		1.00	2	71	0.006	0.600	0.400	22600	249	59.7
		1.50	2	71	0.008	1.200	0.900	15065	249	268.5
		2.00	2	71	0.011	1.600	1.200	11300	249	477.3
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.30	2	40	0.002	0.150	0.060	42440	127	1.2
		0.40	2	43	0.002	0.200	0.080	34220	137	2.2
		0.50	2	43	0.003	0.300	0.200	27375	137	8.2
		0.60	2	43	0.003	0.360	0.240	22810	137	11.9
		0.80	2	43	0.004	0.480	0.320	17110	137	21.1
		1.00	2	43	0.005	0.600	0.400	13685	137	32.9
		1.50	2	43	0.008	1.200	0.900	9125	137	147.9
		2.00	2	43	0.010	1.600	1.200	6845	137	262.9
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.100	0.040	41380	83	0.4
		0.30	2	33	0.002	0.150	0.060	35015	105	1.0
		0.40	2	33	0.002	0.200	0.080	26260	105	1.7
		0.50	2	33	0.003	0.300	0.100	21010	105	3.2
		0.60	2	33	0.003	0.360	0.120	17505	105	4.6
		0.80	2	33	0.004	0.480	0.160	13130	105	8.1
		1.00	2	33	0.005	0.600	0.200	10505	105	12.6
		1.50	2	33	0.008	1.200	0.300	7005	105	37.9
		2.00	2	33	0.010	1.200	0.400	5250	105	50.4
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.040	0.200	41380	97	0.8
		0.30	2	40	0.002	0.060	0.300	42440	149	2.7
		0.40	2	53	0.002	0.080	0.400	42175	197	6.3
		0.50	2	66	0.003	0.150	0.500	42015	246	18.5
		0.60	2	77	0.004	0.180	0.600	40850	287	31.0
		0.80	2	77	0.005	0.240	0.800	30635	287	55.1
		1.00	2	77	0.006	0.300	1.000	24510	287	86.1
		1.50	2	77	0.009	0.750	1.500	16340	287	322.7
		2.00	2	77	0.012	1.000	2.000	12255	287	573.6
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.040	0.200	41380	82	0.7
		0.30	2	40	0.001	0.060	0.300	42440	126	2.3
		0.40	2	53	0.002	0.080	0.400	42175	167	5.4
		0.50	2	64	0.002	0.150	0.500	40745	202	15.2
		0.60	2	64	0.003	0.180	0.600	33955	202	21.8
		0.80	2	64	0.004	0.240	0.800	25465	202	38.8
		1.00	2	64	0.005	0.300	1.000	20370	202	60.5
		1.50	2	64	0.007	0.750	1.500	13580	202	226.9
		2.00	2	64	0.010	1.000	2.000	10185	202	403.4
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.040	0.200	41380	75	0.6
		0.30	2	38	0.001	0.060	0.300	40320	109	2.0
		0.40	2	38	0.002	0.080	0.400	30240	109	3.5
		0.50	2	38	0.002	0.150	0.500	24190	109	8.2
		0.60	2	38	0.003	0.180	0.600	20160	109	11.8
		0.80	2	38	0.004	0.240	0.800	15120	109	20.9
		1.00	2	38	0.005	0.300	1.000	12095	109	32.7
		1.50	2	38	0.007	0.750	1.500	8065	109	122.5
		2.00	2	38	0.009	1.000	2.000	6050	109	217.8
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.040	0.200	41380	75	0.6
		0.30	2	30	0.001	0.060	0.300	31830	86	1.6
		0.40	2	30	0.002	0.080	0.400	23875	86	2.8
		0.50	2	30	0.002	0.100	0.500	19100	86	4.3
		0.60	2	30	0.003	0.120	0.600	15915	86	6.2
		0.80	2	30	0.004	0.160	0.800	11935	86	11.0
		1.00	2	30	0.005	0.200	1.000	9550	86	17.2
		1.50	2	30	0.007	0.300	1.500	6365	86	38.7
		2.00	2	30	0.009	0.400	2.000	4775	86	68.8

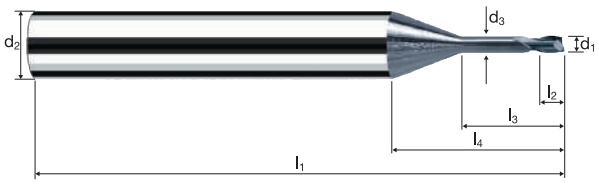
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 4xd

HM
XA

λ 25°
γ -10°

45°

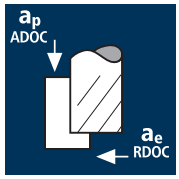
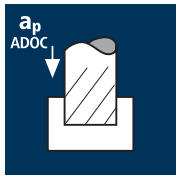


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6503** ø-Code **010**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6503
010	0.10	6.00	0.09	57	0.06	0.40	0.47	17.25	-	2		●
020	0.20	6.00	0.18	57	0.12	0.80	0.90	17.39	-	2		●
030	0.30	6.00	0.25	57	0.18	1.20	1.40	17.59	-	2		●
040	0.40	6.00	0.35	57	0.24	1.60	1.80	17.71	-	2		●
050	0.50	6.00	0.45	57	0.30	2.00	2.20	12.49	-	2		●
060	0.60	6.00	0.55	57	0.36	2.40	2.60	12.70	-	2		●
080	0.80	6.00	0.75	57	0.48	3.20	3.40	13.13	-	2		●
100	1.00	6.00	0.95	57	1.00	4.00	4.20	13.56	0.04	2		●
120	1.50	6.00	1.40	57	1.50	6.00	6.30	14.72	0.04	2		●
140	2.00	6.00	1.90	61	2.00	8.00	8.30	15.78	0.05	2		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.080	0.040	41380	108	0.4
		0.40	2	53	0.003	0.160	0.080	42175	219	2.8
		0.50	2	66	0.003	0.250	0.200	42015	273	13.7
		0.80	2	86	0.005	0.400	0.320	34220	356	45.6
		1.00	2	86	0.007	0.500	0.400	27375	356	71.2
		1.50	2	86	0.010	1.050	0.750	18250	356	280.3
		2.00	2	86	0.013	1.400	1.000	13685	356	498.1
		2.50	2	86	0.016	1.750	1.250	10950	356	778.6
		3.00	2	86	0.020	2.100	1.500	9125	356	1121.1
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.080	0.040	41380	91	0.3
		0.40	2	53	0.002	0.160	0.080	42175	186	2.4
		0.50	2	66	0.003	0.250	0.200	42015	231	11.6
		0.80	2	71	0.004	0.400	0.320	28250	249	31.8
		1.00	2	71	0.006	0.500	0.400	22600	249	49.7
		1.50	2	71	0.008	1.050	0.750	15065	249	195.8
		2.00	2	71	0.011	1.400	1.000	11300	249	348.1
		2.50	2	71	0.014	1.750	1.250	9040	249	543.8
		3.00	2	71	0.017	2.100	1.500	7535	249	783.4
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.080	0.040	41380	83	0.3
		0.40	2	43	0.002	0.160	0.080	34220	137	1.8
		0.50	2	43	0.003	0.250	0.200	27375	137	6.9
		0.80	2	43	0.004	0.400	0.320	17110	137	17.5
		1.00	2	43	0.005	0.500	0.400	13685	137	27.4
		1.50	2	43	0.008	1.050	0.750	9125	137	107.8
		2.00	2	43	0.010	1.400	1.000	6845	137	191.7
		2.50	2	43	0.013	1.750	1.250	5475	137	299.5
		3.00	2	43	0.015	2.100	1.500	4560	137	430.9
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.080	0.040	41380	83	0.3
		0.40	2	33	0.002	0.160	0.080	26260	105	1.4
		0.50	2	33	0.003	0.250	0.100	21010	105	2.7
		0.80	2	33	0.004	0.400	0.160	13130	105	6.7
		1.00	2	33	0.005	0.500	0.200	10505	105	10.5
		1.50	2	33	0.008	1.050	0.300	7005	105	33.1
		2.00	2	33	0.010	1.400	0.400	5250	105	58.8
		2.50	2	33	0.013	1.750	0.500	4200	105	91.9
		3.00	2	33	0.015	2.100	0.600	3500	105	132.3
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.040	0.200	41380	108	0.9
		0.40	2	53	0.003	0.080	0.400	42175	219	7.0
		0.50	2	66	0.003	0.125	0.500	42015	273	17.1
		0.80	2	77	0.005	0.200	0.800	30635	319	51.0
		1.00	2	77	0.007	0.250	1.000	24510	319	79.7
		1.50	2	77	0.010	0.450	1.500	16340	319	215.1
		2.00	2	77	0.013	0.600	2.000	12255	319	382.3
		2.50	2	77	0.016	0.750	2.500	9805	319	597.6
		3.00	2	77	0.020	0.900	3.000	8170	319	860.2
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.040	0.200	41380	91	0.8
		0.40	2	53	0.002	0.080	0.400	42175	186	6.0
		0.50	2	64	0.003	0.125	0.500	40745	224	14.0
		0.80	2	64	0.004	0.200	0.800	25465	224	35.9
		1.00	2	64	0.006	0.250	1.000	20370	224	56.1
		1.50	2	64	0.008	0.450	1.500	13580	224	151.3
		2.00	2	64	0.011	0.600	2.000	10185	224	268.9
		2.50	2	64	0.014	0.750	2.500	8150	224	420.2
		3.00	2	64	0.017	0.900	3.000	6790	224	605.1
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.40	2	38	0.002	0.080	0.400	30240	121	3.9
		0.50	2	38	0.003	0.125	0.500	24190	121	7.6
		0.80	2	38	0.004	0.200	0.800	15120	121	19.4
		1.00	2	38	0.005	0.250	1.000	12095	121	30.3
		1.50	2	38	0.008	0.450	1.500	8065	121	81.7
		2.00	2	38	0.010	0.600	2.000	6050	121	145.2
		2.50	2	38	0.013	0.750	2.500	4840	121	226.9
		3.00	2	38	0.015	0.900	3.000	4030	121	326.5
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.40	2	30	0.002	0.080	0.400	23875	96	3.1
		0.50	2	30	0.003	0.100	0.500	19100	96	4.8
		0.80	2	30	0.004	0.160	0.800	11935	96	12.2
		1.00	2	30	0.005	0.200	1.000	9550	96	19.1
		1.50	2	30	0.008	0.300	1.500	6365	96	43.0
		2.00	2	30	0.010	0.400	2.000	4775	96	76.4
		2.50	2	30	0.013	0.500	2.500	3820	96	119.4
		3.00	2	30	0.015	0.600	3.000	3185	96	172.1

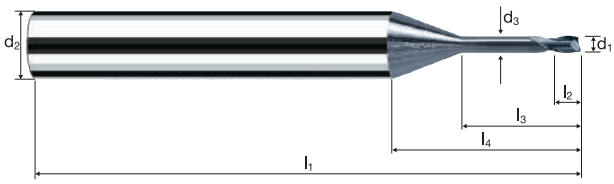
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

HM
XA

λ 25°
γ -10°

45°

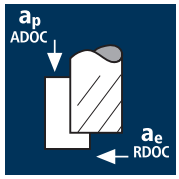
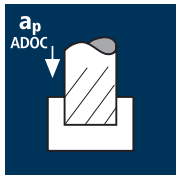


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6504** ø-Code **010**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL **X6504**
010	0.10	6.00	0.09	57	0.06	0.50	0.57	17.35	-	2	●
020	0.20	6.00	0.18	57	0.12	1.00	1.10	17.59	-	2	●
030	0.30	6.00	0.25	57	0.18	1.50	1.70	17.89	-	2	●
040	0.40	6.00	0.35	57	0.24	2.00	2.20	18.11	-	2	●
050	0.50	6.00	0.45	57	0.30	2.50	2.70	12.99	-	2	●
060	0.60	6.00	0.55	57	0.36	3.00	3.20	13.30	-	2	●
080	0.80	6.00	0.75	57	0.48	4.00	4.20	13.93	-	2	●
100	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.04	2	●
108	1.20	6.00	1.10	57	1.20	6.00	6.30	15.28	0.04	2	●
120	1.50	6.00	1.40	61	1.50	7.50	7.80	16.22	0.04	2	●
140	2.00	6.00	1.90	61	2.00	10.00	10.30	17.78	0.05	2	●
160	2.50	6.00	2.30	61	2.50	12.50	12.93	19.54	0.05	2	●
180	3.00	6.00	2.80	66	3.00	15.00	15.43	21.10	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.060	0.040	41380	97	0.3
		0.30	2	40	0.002	0.090	0.060	42440	149	0.8
		0.40	2	53	0.002	0.120	0.080	42175	197	1.9
		0.50	2	66	0.003	0.200	0.150	42015	246	7.4
		0.60	2	77	0.004	0.240	0.180	40850	287	12.4
		0.80	2	77	0.005	0.320	0.240	30635	287	22.0
		1.00	2	77	0.006	0.400	0.300	24510	287	34.4
		1.50	2	77	0.009	0.750	0.600	16340	287	129.1
		2.00	2	77	0.012	1.000	0.800	12255	287	229.5
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.060	0.040	41380	82	0.2
		0.30	2	40	0.001	0.090	0.060	42440	126	0.7
		0.40	2	53	0.002	0.120	0.080	42175	167	1.6
		0.50	2	64	0.002	0.200	0.150	40745	202	6.1
		0.60	2	64	0.003	0.240	0.180	33955	202	8.7
		0.80	2	64	0.004	0.320	0.240	25465	202	15.5
		1.00	2	64	0.005	0.400	0.300	20370	202	24.2
		1.50	2	64	0.007	0.750	0.600	13580	202	90.8
		2.00	2	64	0.010	1.000	0.800	10185	202	161.4
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.060	0.040	41380	75	0.2
		0.30	2	38	0.001	0.090	0.060	40320	109	0.6
		0.40	2	38	0.002	0.120	0.080	30240	109	1.1
		0.50	2	38	0.002	0.200	0.150	24190	109	3.3
		0.60	2	38	0.003	0.240	0.180	20160	109	4.7
		0.80	2	38	0.004	0.320	0.240	15120	109	8.4
		1.00	2	38	0.005	0.400	0.300	12095	109	13.1
		1.50	2	38	0.007	0.750	0.600	8065	109	49.0
		2.00	2	38	0.009	1.000	0.800	6050	109	87.1
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.060	0.040	41380	75	0.2
		0.30	2	30	0.001	0.090	0.060	31830	86	0.5
		0.40	2	30	0.002	0.120	0.080	23875	86	0.9
		0.50	2	30	0.002	0.200	0.100	19100	86	1.7
		0.60	2	30	0.003	0.240	0.120	15915	86	2.5
		0.80	2	30	0.004	0.320	0.160	11935	86	4.4
		1.00	2	30	0.005	0.400	0.200	9550	86	6.9
		1.50	2	30	0.007	0.750	0.300	6365	86	19.4
		2.00	2	30	0.009	0.800	0.400	4775	86	27.5
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.030	0.200	41380	87	0.5
		0.30	2	40	0.002	0.045	0.300	42440	134	1.8
		0.40	2	53	0.002	0.060	0.400	42175	178	4.3
		0.50	2	62	0.003	0.100	0.500	39470	208	10.4
		0.60	2	62	0.003	0.120	0.600	32890	208	15.0
		0.80	2	62	0.004	0.160	0.800	24670	208	26.6
		1.00	2	62	0.005	0.200	1.000	19735	208	41.6
		1.50	2	62	0.008	0.375	1.500	13155	208	116.9
		2.00	2	62	0.011	0.500	2.000	9870	208	207.9
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.030	0.200	41380	74	0.5
		0.30	2	40	0.001	0.045	0.300	42440	113	1.6
		0.40	2	51	0.002	0.060	0.400	40585	145	3.5
		0.50	2	51	0.002	0.100	0.500	32470	145	7.3
		0.60	2	51	0.003	0.120	0.600	27055	145	10.4
		0.80	2	51	0.004	0.160	0.800	20290	145	18.5
		1.00	2	51	0.004	0.200	1.000	16235	145	29.0
		1.50	2	51	0.007	0.375	1.500	10825	145	81.4
		2.00	2	51	0.009	0.500	2.000	8115	145	144.6
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.030	0.200	41380	67	0.4
		0.30	2	31	0.001	0.045	0.300	32890	80	1.1
		0.40	2	31	0.002	0.060	0.400	24670	80	1.9
		0.50	2	31	0.002	0.100	0.500	19735	80	4.0
		0.60	2	31	0.002	0.120	0.600	16445	80	5.8
		0.80	2	31	0.003	0.160	0.800	12335	80	10.3
		1.00	2	31	0.004	0.200	1.000	9870	80	16.0
		1.50	2	31	0.006	0.375	1.500	6580	80	45.0
		2.00	2	31	0.008	0.500	2.000	4935	80	79.9
	Hardened tool steel 56 - 60 HRC	0.20	2	24	0.001	0.030	0.200	38195	62	0.4
		0.30	2	24	0.001	0.045	0.300	25465	62	0.9
		0.40	2	24	0.002	0.060	0.400	19100	62	1.5
		0.50	2	24	0.002	0.100	0.500	15280	62	3.1
		0.60	2	24	0.002	0.120	0.600	12730	62	4.5
		0.80	2	24	0.003	0.160	0.800	9550	62	7.9
		1.00	2	24	0.004	0.200	1.000	7640	62	12.4
		1.50	2	24	0.006	0.375	1.500	5095	62	34.8
		2.00	2	24	0.008	0.500	2.000	3820	62	61.9

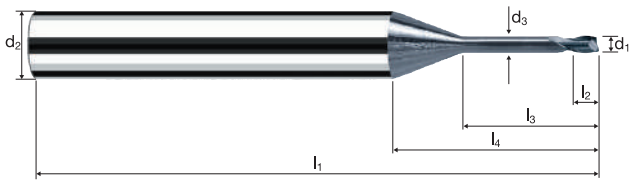
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 6xd

HM XA

λ 25°
γ -10°

45°

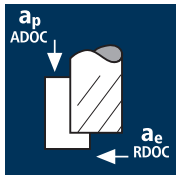
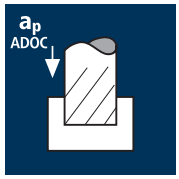


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6505** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6505
020	0.20	6.00	0.18	57	0.12	1.20	1.30	17.79	-	2		●
030	0.30	6.00	0.25	57	0.18	1.80	2.00	18.19	-	2		●
040	0.40	6.00	0.35	57	0.24	2.40	2.60	18.51	-	2		●
050	0.50	6.00	0.45	57	0.30	3.00	3.20	13.49	-	2		●
060	0.60	6.00	0.55	57	0.36	3.60	3.80	13.90	-	2		●
080	0.80	6.00	0.75	57	0.48	4.80	5.00	14.73	-	2		●
100	1.00	6.00	0.95	57	1.00	6.00	6.20	15.56	0.04	2		●
120	1.50	6.00	1.40	61	1.50	9.00	9.30	17.72	0.04	2		●
140	2.00	6.00	1.90	66	2.00	12.00	12.30	19.78	0.05	2		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.020	0.020	41380	87	0.1
		0.40	2	53	0.002	0.040	0.040	42175	178	0.3
		0.50	2	66	0.003	0.100	0.050	42015	221	1.1
		0.80	2	69	0.004	0.160	0.080	27455	231	3.0
		1.00	2	69	0.005	0.200	0.100	21965	231	4.7
		1.50	2	69	0.008	0.450	0.150	14640	231	15.6
		2.00	2	69	0.011	0.600	0.200	10980	231	27.8
		2.50	2	69	0.013	0.750	0.250	8785	231	43.4
		3.00	2	69	0.016	0.900	0.300	7320	231	62.4
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.020	0.020	41380	74	0.1
		0.40	2	53	0.002	0.040	0.040	42175	150	0.3
		0.50	2	58	0.002	0.100	0.050	36925	165	0.8
		0.80	2	58	0.004	0.160	0.080	23075	165	2.1
		1.00	2	58	0.004	0.200	0.100	18460	165	3.3
		1.50	2	58	0.007	0.450	0.150	12310	165	11.1
		2.00	2	58	0.009	0.600	0.200	9230	165	19.8
		2.50	2	58	0.011	0.750	0.250	7385	165	30.9
		3.00	2	58	0.013	0.900	0.300	6155	165	44.4
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.020	0.020	41380	67	0.1
		0.40	2	35	0.002	0.040	0.040	27850	90	0.2
		0.50	2	35	0.002	0.100	0.050	22280	90	0.5
		0.80	2	35	0.003	0.160	0.080	13925	90	1.2
		1.00	2	35	0.004	0.200	0.100	11140	90	1.8
		1.50	2	35	0.006	0.450	0.150	7425	90	6.1
		2.00	2	35	0.008	0.600	0.200	5570	90	10.8
		2.50	2	35	0.010	0.750	0.250	4455	90	16.9
		3.00	2	35	0.012	0.900	0.300	3715	90	24.4
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.020	0.020	41380	75	0.1
		0.40	2	30	0.002	0.040	0.040	23875	86	0.2
		0.50	2	30	0.002	0.100	0.050	19100	86	0.5
		0.80	2	30	0.004	0.160	0.080	11935	86	1.1
		1.00	2	30	0.005	0.200	0.100	9550	86	1.7
		1.50	2	30	0.007	0.450	0.150	6365	86	5.8
		2.00	2	30	0.009	0.600	0.200	4775	86	10.3
		2.50	2	30	0.011	0.750	0.250	3820	86	16.2
		3.00	2	30	0.014	0.900	0.300	3185	86	23.2
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.010	0.200	41380	78	0.2
		0.40	2	53	0.002	0.020	0.400	42175	160	1.3
		0.50	2	62	0.002	0.038	0.500	39470	187	3.5
		0.80	2	62	0.004	0.060	0.800	24670	187	9.0
		1.00	2	62	0.005	0.075	1.000	19735	187	14.1
		1.50	2	62	0.007	0.150	1.500	13155	187	42.1
		2.00	2	62	0.009	0.200	2.000	9870	187	74.9
		2.50	2	62	0.012	0.250	2.500	7895	187	117.0
		3.00	2	62	0.014	0.300	3.000	6580	187	168.4
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.010	0.200	41380	66	0.2
		0.40	2	52	0.002	0.020	0.400	41380	133	1.1
		0.50	2	52	0.002	0.038	0.500	33105	133	2.5
		0.80	2	52	0.003	0.060	0.800	20690	133	6.4
		1.00	2	52	0.004	0.075	1.000	16550	133	10.0
		1.50	2	52	0.006	0.150	1.500	11035	133	29.9
		2.00	2	52	0.008	0.200	2.000	8275	133	53.1
		2.50	2	52	0.010	0.250	2.500	6620	133	83.0
		3.00	2	52	0.012	0.300	3.000	5515	133	119.5
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.010	0.200	41380	60	0.1
		0.40	2	31	0.001	0.020	0.400	24670	72	0.6
		0.50	2	31	0.002	0.038	0.500	19735	72	1.4
		0.80	2	31	0.003	0.060	0.800	12335	72	3.5
		1.00	2	31	0.004	0.075	1.000	9870	72	5.4
		1.50	2	31	0.005	0.150	1.500	6580	72	16.2
		2.00	2	31	0.007	0.200	2.000	4935	72	28.8
		2.50	2	31	0.009	0.250	2.500	3945	72	45.0
		3.00	2	31	0.011	0.300	3.000	3290	72	64.8
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.010	0.200	41380	67	0.2
		0.40	2	27	0.002	0.020	0.400	21485	70	0.6
		0.50	2	27	0.002	0.038	0.500	17190	70	1.3
		0.80	2	27	0.003	0.060	0.800	10745	70	3.4
		1.00	2	27	0.004	0.075	1.000	8595	70	5.2
		1.50	2	27	0.006	0.150	1.500	5730	70	15.7
		2.00	2	27	0.008	0.200	2.000	4295	70	27.9
		2.50	2	27	0.010	0.250	2.500	3440	70	43.6
		3.00	2	27	0.012	0.300	3.000	2865	70	62.7

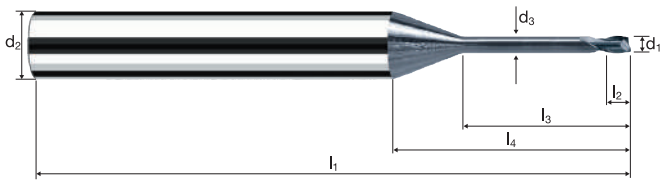
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

HM
XA

λ 25°
γ -10°

45°

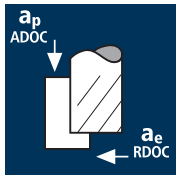
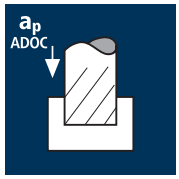


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6506** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL X6506
020	0.20	6.00	0.18	57	0.12	1.60	1.70	18.19	-	2	●
030	0.30	6.00	0.25	57	0.18	2.40	2.60	18.79	-	2	●
040	0.40	6.00	0.35	57	0.24	3.20	3.40	19.31	-	2	●
050	0.50	6.00	0.45	57	0.30	4.00	4.20	14.49	-	2	●
060	0.60	6.00	0.55	57	0.36	4.80	5.00	15.10	-	2	●
080	0.80	6.00	0.75	57	0.48	6.40	6.60	16.33	-	2	●
100	1.00	6.00	0.95	61	1.00	8.00	8.20	17.56	0.04	2	●
108	1.20	6.00	1.10	61	1.20	9.60	9.90	18.88	0.04	2	●
120	1.50	6.00	1.40	61	1.50	12.00	12.30	20.72	0.04	2	●
140	2.00	6.00	1.90	66	2.00	16.00	16.30	23.78	0.05	2	●
160	2.50	6.00	2.30	69	2.50	20.00	20.43	27.04	0.05	2	●
180	3.00	6.00	2.80	75	3.00	24.00	24.43	30.10	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.020	0.020	41380	78	0.1
		0.40	2	53	0.002	0.040	0.040	42175	160	0.3
		0.50	2	62	0.002	0.100	0.050	39470	187	1.0
		0.80	2	62	0.004	0.160	0.080	24670	187	2.4
		1.00	2	62	0.005	0.200	0.100	19735	187	3.8
		1.50	2	62	0.007	0.450	0.150	13155	187	12.6
		2.00	2	62	0.009	0.600	0.200	9870	187	22.5
		2.50	2	62	0.012	0.750	0.250	7895	187	35.1
		3.00	2	62	0.014	0.900	0.300	6580	187	50.5
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.020	0.020	41380	66	0.1
		0.40	2	52	0.002	0.040	0.040	41380	133	0.2
		0.50	2	52	0.002	0.100	0.050	33105	133	0.7
		0.80	2	52	0.003	0.160	0.080	20690	133	1.7
		1.00	2	52	0.004	0.200	0.100	16550	133	2.7
		1.50	2	52	0.006	0.450	0.150	11035	133	9.0
		2.00	2	52	0.008	0.600	0.200	8275	133	15.9
		2.50	2	52	0.010	0.750	0.250	6620	133	24.9
		3.00	2	52	0.012	0.900	0.300	5515	133	35.9
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.020	0.020	41380	60	0.0
		0.40	2	31	0.001	0.040	0.040	24670	72	0.1
		0.50	2	31	0.002	0.100	0.050	19735	72	0.4
		0.80	2	31	0.003	0.160	0.080	12335	72	0.9
		1.00	2	31	0.004	0.200	0.100	9870	72	1.5
		1.50	2	31	0.005	0.450	0.150	6580	72	4.9
		2.00	2	31	0.007	0.600	0.200	4935	72	8.7
		2.50	2	31	0.009	0.750	0.250	3945	72	13.5
		3.00	2	31	0.011	0.900	0.300	3290	72	19.5
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.020	0.020	41380	75	0.1
		0.40	2	30	0.002	0.040	0.040	23875	86	0.2
		0.50	2	30	0.002	0.100	0.050	19100	86	0.5
		0.80	2	30	0.004	0.160	0.080	11935	86	1.1
		1.00	2	30	0.005	0.200	0.100	9550	86	1.7
		1.50	2	30	0.007	0.450	0.150	6365	86	5.8
		2.00	2	30	0.009	0.600	0.200	4775	86	10.3
		2.50	2	30	0.011	0.750	0.250	3820	86	16.2
		3.00	2	30	0.014	0.900	0.300	3185	86	23.2
	Hardened tool steel 42 - 48 HRC	0.20	2	26	0.001	0.010	0.200	41380	71	0.2
		0.40	2	53	0.002	0.020	0.400	42175	144	1.2
		0.50	2	56	0.002	0.038	0.500	35650	152	2.9
		0.80	2	56	0.003	0.060	0.800	22280	152	7.3
		1.00	2	56	0.004	0.075	1.000	17825	152	11.4
		1.50	2	56	0.006	0.150	1.500	11885	152	34.2
		2.00	2	56	0.009	0.200	2.000	8915	152	60.9
		2.50	2	56	0.011	0.250	2.500	7130	152	95.0
		3.00	2	56	0.013	0.300	3.000	5940	152	136.8
	Hardened tool steel 48 - 52 HRC	0.20	2	26	0.001	0.010	0.200	41380	60	0.1
		0.40	2	47	0.001	0.020	0.400	37400	108	0.9
		0.50	2	47	0.002	0.038	0.500	29920	108	2.1
		0.80	2	47	0.003	0.060	0.800	18700	108	5.2
		1.00	2	47	0.004	0.075	1.000	14960	108	8.1
		1.50	2	47	0.005	0.150	1.500	9975	108	24.3
		2.00	2	47	0.007	0.200	2.000	7480	108	43.2
		2.50	2	47	0.009	0.250	2.500	5985	108	67.5
		3.00	2	47	0.011	0.300	3.000	4985	108	97.1
	Hardened tool steel 52 - 56 HRC	0.20	2	26	0.001	0.010	0.200	41380	54	0.1
		0.40	2	28	0.001	0.020	0.400	22280	59	0.5
		0.50	2	28	0.002	0.038	0.500	17825	59	1.1
		0.80	2	28	0.003	0.060	0.800	11140	59	2.8
		1.00	2	28	0.003	0.075	1.000	8915	59	4.4
		1.50	2	28	0.005	0.150	1.500	5940	59	13.2
		2.00	2	28	0.007	0.200	2.000	4455	59	23.4
		2.50	2	28	0.008	0.250	2.500	3565	59	36.6
		3.00	2	28	0.010	0.300	3.000	2970	59	52.7
	Hardened tool steel 56 - 60 HRC	0.20	2	26	0.001	0.010	0.200	41380	67	0.2
		0.40	2	27	0.002	0.020	0.400	21485	70	0.6
		0.50	2	27	0.002	0.038	0.500	17190	70	1.3
		0.80	2	27	0.003	0.060	0.800	10745	70	3.4
		1.00	2	27	0.004	0.075	1.000	8595	70	5.2
		1.50	2	27	0.006	0.150	1.500	5730	70	15.7
		2.00	2	27	0.008	0.200	2.000	4295	70	27.9
		2.50	2	27	0.010	0.250	2.500	3440	70	43.6
		3.00	2	27	0.012	0.300	3.000	2865	70	62.7

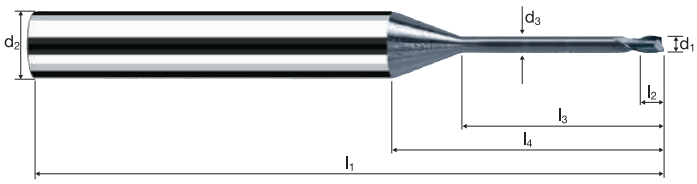
Cylindrical/Square end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

HM
XA

λ 25°
γ -10°

45°

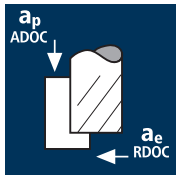
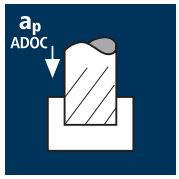


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6508** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6508
020	0.20	6.00	0.18	57	0.12	2.00	2.10	18.59	-	2		●
030	0.30	6.00	0.25	57	0.18	3.00	3.20	19.39	-	2		●
040	0.40	6.00	0.35	57	0.24	4.00	4.20	20.11	-	2		●
050	0.50	6.00	0.45	57	0.30	5.00	5.20	15.49	-	2		●
060	0.60	6.00	0.55	57	0.36	6.00	6.20	16.30	-	2		●
080	0.80	6.00	0.75	61	0.48	8.00	8.20	17.93	-	2		●
100	1.00	6.00	0.95	61	1.00	10.00	10.20	19.56	0.04	2		●
120	1.50	6.00	1.40	66	1.50	15.00	15.30	23.72	0.04	2		●
140	2.00	6.00	1.90	69	2.00	20.00	20.30	27.78	0.05	2		●
160	2.50	6.00	2.30	75	2.50	25.00	25.43	32.04	0.05	2		●
180	3.00	6.00	2.80	80	3.00	30.00	30.43	36.10	0.05	2		●

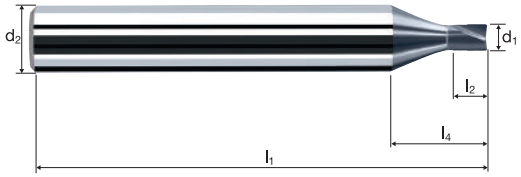
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.20	2	26	0.001	0.100	0.020	41380	116	0.3
		0.30	2	40	0.002	0.150	0.030	42440	178	0.8
		0.40	2	53	0.003	0.200	0.040	42175	236	1.9
		0.50	2	66	0.004	0.350	0.100	42015	294	10.3
		0.60	2	79	0.004	0.420	0.120	41910	352	17.8
		0.80	2	106	0.006	0.560	0.160	42175	472	42.4
		1.00	2	130	0.007	0.700	0.200	41380	579	81.1
		1.50	2	130	0.011	1.500	0.450	27585	579	391.1
		2.00	2	130	0.014	2.000	0.600	20690	579	695.2
	Steel 1100 - 1300 N/mm²	0.20	2	26	0.001	0.100	0.020	41380	99	0.2
		0.30	2	40	0.002	0.150	0.030	42440	153	0.7
		0.40	2	53	0.002	0.200	0.040	42175	202	1.6
		0.50	2	66	0.003	0.350	0.100	42015	252	8.8
		0.60	2	79	0.004	0.420	0.120	41910	302	15.2
		0.80	2	100	0.005	0.560	0.160	39790	382	34.3
		1.00	2	100	0.006	0.700	0.200	31830	382	53.5
		1.50	2	100	0.009	1.500	0.450	21220	382	257.9
		2.00	2	100	0.012	2.000	0.600	15915	382	458.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	26	0.001	0.100	0.020	41380	83	0.2
		0.30	2	40	0.002	0.150	0.030	42440	127	0.6
		0.40	2	53	0.002	0.200	0.040	42175	169	1.4
		0.50	2	66	0.003	0.350	0.100	42015	210	7.4
		0.60	2	79	0.003	0.420	0.120	41910	252	12.7
		0.80	2	80	0.004	0.560	0.160	31830	255	22.8
		1.00	2	80	0.005	0.700	0.200	25465	255	35.7
		1.50	2	80	0.008	1.500	0.450	16975	255	171.9
		2.00	2	80	0.010	2.000	0.600	12730	255	305.5
	Titanium alloys >300 HB [Ti6Al4V]	0.20	2	26	0.001	0.100	0.020	41380	83	0.2
		0.30	2	40	0.002	0.150	0.030	42440	127	0.6
		0.40	2	50	0.002	0.200	0.040	39790	159	1.3
		0.50	2	50	0.003	0.350	0.100	31830	159	5.6
		0.60	2	50	0.003	0.420	0.120	26525	159	8.0
		0.80	2	50	0.004	0.560	0.160	19895	159	14.3
		1.00	2	50	0.005	0.700	0.200	15915	159	22.3
		1.50	2	50	0.008	1.500	0.450	10610	159	107.5
		2.00	2	50	0.010	2.000	0.600	7960	159	191.1
	Steel 850 - 1100 N/mm²	0.20	2	26	0.001	0.050	0.200	41380	91	0.9
		0.30	2	40	0.002	0.080	0.300	42440	144	3.5
		0.40	2	53	0.002	0.100	0.400	42175	186	7.4
		0.50	2	66	0.003	0.250	0.500	42015	235	29.4
		0.60	2	79	0.003	0.300	0.600	41910	285	51.3
		0.80	2	106	0.005	0.400	0.800	42175	380	121.5
		1.00	2	117	0.006	0.500	1.000	37240	417	208.6
		1.50	2	117	0.008	0.750	1.500	24830	417	469.3
		2.00	2	117	0.011	1.000	2.000	18620	417	834.2
	Steel 1100 - 1300 N/mm²	0.20	2	26	0.001	0.050	0.200	41380	83	0.9
		0.30	2	40	0.001	0.080	0.300	42440	119	2.9
		0.40	2	53	0.002	0.100	0.400	42175	160	6.4
		0.50	2	66	0.002	0.250	0.500	42015	202	25.2
		0.60	2	79	0.003	0.300	0.600	41910	243	43.8
		0.80	2	90	0.004	0.400	0.800	35810	272	87.1
		1.00	2	90	0.005	0.500	1.000	28650	275	137.5
		1.50	2	90	0.007	0.750	1.500	19100	275	309.4
		2.00	2	90	0.010	1.000	2.000	14325	275	550.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	26	0.001	0.050	0.200	41380	66	0.7
		0.30	2	40	0.001	0.080	0.300	42440	102	2.5
		0.40	2	53	0.002	0.100	0.400	42175	135	5.4
		0.50	2	66	0.002	0.250	0.500	42015	168	21.0
		0.60	2	72	0.002	0.300	0.600	38195	183	33.0
		0.80	2	72	0.003	0.400	0.800	28650	183	58.7
		1.00	2	72	0.004	0.500	1.000	22920	183	91.7
		1.50	2	72	0.006	0.750	1.500	15280	183	206.4
		2.00	2	72	0.008	1.000	2.000	11460	183	366.8
	Titanium alloys >300 HB [Ti6Al4V]	0.20	2	26	0.001	0.050	0.200	41380	66	0.7
		0.30	2	40	0.001	0.080	0.300	42440	102	2.5
		0.40	2	45	0.002	0.100	0.400	35810	115	4.6
		0.50	2	45	0.002	0.250	0.500	28650	115	14.4
		0.60	2	45	0.002	0.300	0.600	23875	115	20.7
		0.80	2	45	0.003	0.400	0.800	17905	115	36.7
		1.00	2	45	0.004	0.500	1.000	14325	115	57.3
		1.50	2	45	0.006	0.750	1.500	9550	115	129.0
		2.00	2	45	0.008	1.000	2.000	7160	115	229.2

Cylindrical/Square end mills Microcut

Shank ø 4mm, 1xd

HM XA	λ 0° γ 0°

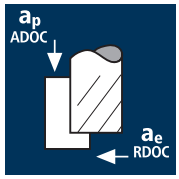
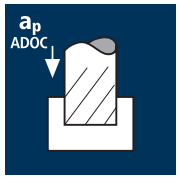
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6800** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	l_1	l_2	l_4	45°	z	X-AL	X6800
020	0.20	4.00	50	0.16	11.04	-	2		●
030	0.30	4.00	50	0.24	10.86	-	2		●
040	0.40	4.00	50	0.32	10.68	-	2		●
050	0.50	4.00	50	0.40	7.14	-	2		●
060	0.60	4.00	50	0.48	7.06	-	2		●
080	0.80	4.00	50	0.64	6.88	-	2		●
100	1.00	4.00	50	1.20	7.13	0.04	2		●
120	1.50	4.00	50	1.80	6.90	0.04	2		●
140	2.00	4.00	50	2.40	6.66	0.07	2		●

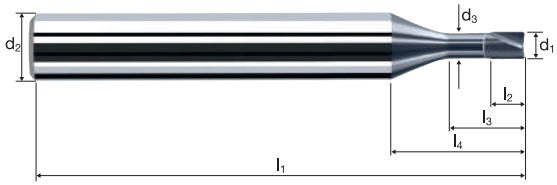
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.20	2	26	0.001	0.100	0.020	41380	116	0.3
		0.40	2	53	0.003	0.200	0.040	42175	236	1.9
		0.50	2	66	0.004	0.350	0.100	42015	294	10.3
		0.80	2	106	0.006	0.560	0.160	42175	472	42.4
		1.00	2	130	0.007	0.700	0.200	41380	579	81.1
		1.50	2	130	0.011	1.500	0.450	27585	579	391.1
		2.00	2	130	0.014	2.000	0.600	20690	579	695.2
		2.50	2	130	0.018	2.500	0.750	16550	579	1086.2
		3.00	2	130	0.021	3.000	0.900	13795	579	1564.4
	Steel 1100 - 1300 N/mm²	0.20	2	26	0.001	0.100	0.020	41380	99	0.2
		0.40	2	53	0.002	0.200	0.040	42175	202	1.6
		0.50	2	66	0.003	0.350	0.100	42015	252	8.8
		0.80	2	100	0.005	0.560	0.160	39790	382	34.3
		1.00	2	100	0.006	0.700	0.200	31830	382	53.5
		1.50	2	100	0.009	1.500	0.450	21220	382	257.9
		2.00	2	100	0.012	2.000	0.600	15915	382	458.4
		2.50	2	100	0.015	2.500	0.750	12730	382	716.1
		3.00	2	100	0.018	3.000	0.900	10610	382	1031.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	26	0.001	0.100	0.020	41380	83	0.2
		0.40	2	53	0.002	0.200	0.040	42175	169	1.4
		0.50	2	66	0.003	0.350	0.100	42015	210	7.4
		0.80	2	80	0.004	0.560	0.160	31830	255	22.8
		1.00	2	80	0.005	0.700	0.200	25465	255	35.7
		1.50	2	80	0.008	1.500	0.450	16975	255	171.9
		2.00	2	80	0.010	2.000	0.600	12730	255	305.5
		2.50	2	80	0.013	2.500	0.750	10185	255	477.4
		3.00	2	80	0.015	3.000	0.900	8490	255	687.7
	Titanium alloys >300 HB [Ti6Al4V]	0.20	2	26	0.001	0.100	0.020	41380	83	0.2
		0.40	2	50	0.002	0.200	0.040	39790	159	1.3
		0.50	2	50	0.003	0.350	0.100	31830	159	5.6
		0.80	2	50	0.004	0.560	0.160	19895	159	14.3
		1.00	2	50	0.005	0.700	0.200	15915	159	22.3
		1.50	2	50	0.008	1.500	0.450	10610	159	107.5
		2.00	2	50	0.010	2.000	0.600	7960	159	191.1
		2.50	2	50	0.013	2.500	0.750	6365	159	298.3
		3.00	2	50	0.015	3.000	0.900	5305	159	429.9
	Steel 850 - 1100 N/mm²	0.20	2	26	0.001	0.040	0.200	41380	91	0.8
		0.40	2	53	0.002	0.080	0.400	42175	186	6.0
		0.50	2	66	0.003	0.150	0.500	42015	235	17.7
		0.80	2	106	0.005	0.240	0.800	42175	380	72.9
		1.00	2	111	0.006	0.300	1.000	35330	396	118.7
		1.50	2	111	0.008	0.600	1.500	23555	396	356.2
		2.00	2	111	0.011	0.800	2.000	17665	396	633.1
		2.50	2	111	0.014	1.000	2.500	14135	396	989.5
		3.00	2	111	0.017	1.200	3.000	11775	396	1424.2
	Steel 1100 - 1300 N/mm²	0.20	2	26	0.001	0.040	0.200	41380	83	0.7
		0.40	2	53	0.002	0.080	0.400	42175	160	5.2
		0.50	2	66	0.002	0.150	0.500	42015	202	15.2
		0.80	2	85	0.004	0.240	0.800	33820	257	49.4
		1.00	2	85	0.005	0.300	1.000	27055	260	77.9
		1.50	2	85	0.007	0.600	1.500	18040	260	233.8
		2.00	2	85	0.010	0.800	2.000	13530	260	415.7
		2.50	2	85	0.012	1.000	2.500	10825	260	649.5
		3.00	2	85	0.014	1.200	3.000	9020	260	935.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	26	0.001	0.040	0.200	41380	66	0.6
		0.40	2	53	0.002	0.080	0.400	42175	135	4.3
		0.50	2	66	0.002	0.150	0.500	42015	168	12.6
		0.80	2	68	0.003	0.240	0.800	27055	173	33.3
		1.00	2	68	0.004	0.300	1.000	21645	173	52.0
		1.50	2	68	0.006	0.600	1.500	14430	173	155.9
		2.00	2	68	0.008	0.800	2.000	10825	173	277.1
		2.50	2	68	0.010	1.000	2.500	8660	173	433.0
		3.00	2	68	0.012	1.200	3.000	7215	173	623.5
	Titanium alloys >300 HB [Ti6Al4V]	0.20	2	26	0.001	0.040	0.200	41380	66	0.6
		0.40	2	43	0.002	0.080	0.400	34220	110	3.5
		0.50	2	43	0.002	0.150	0.500	27375	110	8.2
		0.80	2	43	0.003	0.240	0.800	17110	110	21.0
		1.00	2	43	0.004	0.300	1.000	13685	110	32.9
		1.50	2	43	0.006	0.600	1.500	9125	110	98.6
		2.00	2	43	0.008	0.800	2.000	6845	110	175.2
		2.50	2	43	0.010	1.000	2.500	5475	110	273.8
		3.00	2	43	0.012	1.200	3.000	4560	109	393.9

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 3xd

HM XA	λ 0° γ 0°

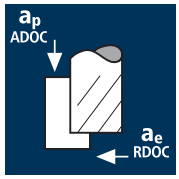
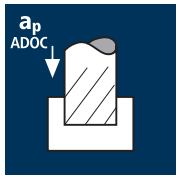
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6802** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6802
020	0.20	4.00	0.18	50	0.16	0.60	0.70	11.52	-	2		●
030	0.30	4.00	0.25	50	0.24	0.90	1.10	11.62	-	2		●
040	0.40	4.00	0.35	50	0.32	1.20	1.40	11.64	-	2		●
050	0.50	4.00	0.45	50	0.40	1.50	1.70	8.26	-	2		●
060	0.60	4.00	0.55	50	0.48	1.80	2.00	8.37	-	2		●
080	0.80	4.00	0.75	50	0.64	2.40	2.60	8.60	-	2		●
100	1.00	4.00	0.95	50	1.20	3.00	3.20	8.82	0.04	2		●
108	1.20	4.00	1.10	50	1.44	3.60	3.90	9.14	0.04	2		●
120	1.50	4.00	1.40	50	1.80	4.50	4.80	9.48	0.04	2		●
140	2.00	4.00	1.90	50	2.40	6.00	6.30	10.05	0.07	2		●
160	2.50	4.00	2.30	50	3.00	7.50	7.93	10.80	0.07	2		●
180	3.00	4.00	2.80	50	3.60	9.00	9.43	11.37	0.07	2		●

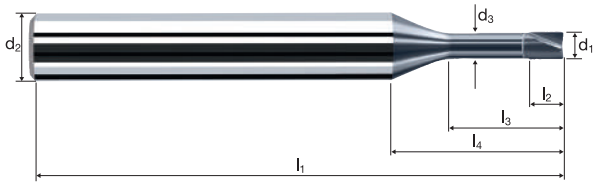
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.20	2	26	0.001	0.050	0.020	41380	116	0.1
		0.40	2	53	0.003	0.100	0.040	42175	236	1.0
		0.50	2	66	0.004	0.250	0.100	42015	294	7.4
		0.80	2	104	0.006	0.400	0.160	41380	464	29.7
		1.00	2	104	0.007	0.500	0.200	33105	464	46.4
		1.50	2	104	0.011	1.050	0.450	22070	464	219.0
		2.00	2	104	0.014	1.400	0.600	16550	463	389.3
		2.50	2	104	0.018	1.750	0.750	13240	463	608.2
		3.00	2	104	0.021	2.100	0.900	11035	464	876.0
	Steel 1100 - 1300 N/mm²	0.20	2	26	0.001	0.050	0.020	41380	99	0.1
		0.40	2	53	0.002	0.100	0.040	42175	202	0.8
		0.50	2	66	0.003	0.250	0.100	42015	252	6.3
		0.80	2	80	0.005	0.400	0.160	31830	306	19.6
		1.00	2	80	0.006	0.500	0.200	25465	306	30.6
		1.50	2	80	0.009	1.050	0.450	16975	306	144.4
		2.00	2	80	0.012	1.400	0.600	12730	306	256.6
		2.50	2	80	0.015	1.750	0.750	10185	306	401.1
		3.00	2	80	0.018	2.100	0.900	8490	306	577.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	26	0.001	0.050	0.020	41380	83	0.1
		0.40	2	53	0.002	0.100	0.040	42175	169	0.7
		0.50	2	64	0.003	0.250	0.100	40745	204	5.1
		0.80	2	64	0.004	0.400	0.160	25465	204	13.1
		1.00	2	64	0.005	0.500	0.200	20370	204	20.4
		1.50	2	64	0.008	1.050	0.450	13580	204	96.3
		2.00	2	64	0.010	1.400	0.600	10185	204	171.1
		2.50	2	64	0.013	1.750	0.750	8150	204	267.5
		3.00	2	64	0.015	2.100	0.900	6790	204	385.0
	Titanium alloys >300 HB [Ti6Al4V]	0.20	2	26	0.001	0.050	0.020	41380	83	0.1
		0.40	2	40	0.002	0.100	0.040	31830	127	0.5
		0.50	2	40	0.003	0.250	0.100	25465	127	3.2
		0.80	2	40	0.004	0.400	0.160	15915	127	8.2
		1.00	2	40	0.005	0.500	0.200	12730	127	12.8
		1.50	2	40	0.008	1.050	0.450	8490	127	60.2
		2.00	2	40	0.010	1.400	0.600	6365	127	107.0
		2.50	2	40	0.013	1.750	0.750	5095	127	167.2
		3.00	2	40	0.015	2.100	0.900	4245	127	240.8
	Steel 850 - 1100 N/mm²	0.20	2	26	0.001	0.020	0.200	41380	91	0.4
		0.40	2	53	0.002	0.040	0.400	42175	186	3.0
		0.50	2	66	0.003	0.100	0.500	42015	235	11.8
		0.80	2	88	0.005	0.160	0.800	35015	315	40.4
		1.00	2	88	0.006	0.200	1.000	28010	314	62.8
		1.50	2	88	0.008	0.450	1.500	18675	314	211.8
		2.00	2	88	0.011	0.600	2.000	14005	314	376.5
		2.50	2	88	0.014	0.750	2.500	11205	314	588.2
		3.00	2	88	0.017	0.900	3.000	9335	314	847.0
	Steel 1100 - 1300 N/mm²	0.20	2	26	0.001	0.020	0.200	41380	83	0.4
		0.40	2	53	0.002	0.040	0.400	42175	160	2.6
		0.50	2	66	0.002	0.100	0.500	42015	202	10.1
		0.80	2	68	0.004	0.160	0.800	27055	206	26.3
		1.00	2	68	0.005	0.200	1.000	21645	208	41.6
		1.50	2	68	0.007	0.450	1.500	14430	208	140.3
		2.00	2	68	0.010	0.600	2.000	10825	208	249.4
		2.50	2	68	0.012	0.750	2.500	8660	208	389.7
		3.00	2	68	0.014	0.900	3.000	7215	208	561.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	26	0.001	0.020	0.200	41380	66	0.3
		0.40	2	53	0.002	0.040	0.400	42175	135	2.2
		0.50	2	54	0.002	0.100	0.500	34375	138	6.9
		0.80	2	54	0.003	0.160	0.800	21485	138	17.6
		1.00	2	54	0.004	0.200	1.000	17190	138	27.5
		1.50	2	54	0.006	0.450	1.500	11460	138	92.8
		2.00	2	54	0.008	0.600	2.000	8595	138	165.0
		2.50	2	54	0.010	0.750	2.500	6875	138	257.8
		3.00	2	54	0.012	0.900	3.000	5730	138	371.3
	Titanium alloys >300 HB [Ti6Al4V]	0.20	2	26	0.001	0.020	0.200	41380	66	0.3
		0.40	2	34	0.002	0.040	0.400	27055	87	1.4
		0.50	2	34	0.002	0.100	0.500	21645	87	4.4
		0.80	2	34	0.003	0.160	0.800	13530	87	11.1
		1.00	2	34	0.004	0.200	1.000	10825	87	17.3
		1.50	2	34	0.006	0.450	1.500	7215	87	58.5
		2.00	2	34	0.008	0.600	2.000	5410	87	103.9
		2.50	2	34	0.010	0.750	2.500	4330	87	162.4
		3.00	2	34	0.012	0.900	3.000	3610	87	233.8

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 5xd

HM XA	λ 0° γ 0°

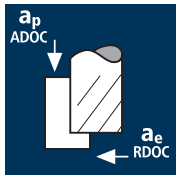
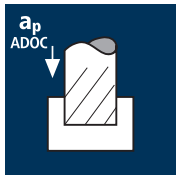
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6804** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6804
020	0.20	4.00	0.18	50	0.16	1.00	1.10	11.92	-	2		●
030	0.30	4.00	0.25	50	0.24	1.50	1.70	12.22	-	2		●
040	0.40	4.00	0.35	50	0.32	2.00	2.20	12.44	-	2		●
050	0.50	4.00	0.45	50	0.40	2.50	2.70	9.26	-	2		●
060	0.60	4.00	0.55	50	0.48	3.00	3.20	9.57	-	2		●
080	0.80	4.00	0.75	50	0.64	4.00	4.20	10.20	-	2		●
100	1.00	4.00	0.95	50	1.20	5.00	5.20	10.82	0.04	2		●
108	1.20	4.00	1.10	50	1.44	6.00	6.30	11.54	0.04	2		●
120	1.50	4.00	1.40	50	1.80	7.50	7.80	12.48	0.04	2		●
140	2.00	4.00	1.90	50	2.40	10.00	10.30	14.05	0.07	2		●
160	2.50	4.00	2.30	50	3.00	12.50	12.93	15.80	0.07	2		●
180	3.00	4.00	2.80	50	3.60	15.00	15.43	17.37	0.07	2		●

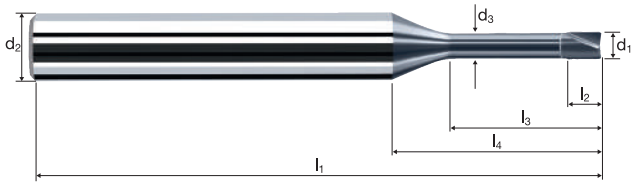
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.50	2	66	0.004	0.100	0.050	42015	294	1.5
		0.60	2	73	0.004	0.120	0.060	38730	325	2.4
		0.80	2	73	0.006	0.160	0.080	29045	325	4.2
		1.00	2	73	0.007	0.200	0.100	23235	325	6.5
		1.20	2	73	0.008	0.360	0.120	19365	325	14.1
		1.50	2	73	0.011	0.450	0.150	15490	325	22.0
		2.00	2	73	0.014	0.600	0.200	11620	325	39.1
		2.50	2	73	0.018	0.750	0.250	9295	325	61.0
		3.00	2	73	0.021	0.900	0.300	7745	325	87.9
	Steel 1100 - 1300 N/mm²	0.50	2	56	0.003	0.100	0.050	35650	214	1.1
		0.60	2	56	0.004	0.120	0.060	29710	214	1.6
		0.80	2	56	0.005	0.160	0.080	22280	214	2.8
		1.00	2	56	0.006	0.200	0.100	17825	214	4.3
		1.20	2	56	0.007	0.360	0.120	14855	214	9.3
		1.50	2	56	0.009	0.450	0.150	11885	214	14.5
		2.00	2	56	0.012	0.600	0.200	8915	214	25.7
		2.50	2	56	0.015	0.750	0.250	7130	214	40.1
		3.00	2	56	0.018	0.900	0.300	5940	214	57.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	45	0.002	0.100	0.050	28650	129	0.7
		0.60	2	45	0.003	0.120	0.060	23875	129	1.0
		0.80	2	45	0.004	0.160	0.080	17905	129	1.7
		1.00	2	45	0.005	0.200	0.100	14325	129	2.6
		1.20	2	45	0.005	0.360	0.120	11935	129	5.6
		1.50	2	45	0.007	0.450	0.150	9550	129	8.7
		2.00	2	45	0.009	0.600	0.200	7160	129	15.5
		2.50	2	45	0.011	0.750	0.250	5730	129	24.2
		3.00	2	45	0.014	0.900	0.300	4775	129	34.8
	Titanium alloys >300 HB [Ti6Al4V]	0.50	2	28	0.002	0.100	0.050	17825	80	0.4
		0.60	2	28	0.003	0.120	0.060	14855	80	0.6
		0.80	2	28	0.004	0.160	0.080	11140	80	1.1
		1.00	2	28	0.005	0.200	0.100	8915	80	1.6
		1.20	2	28	0.005	0.360	0.120	7425	80	3.5
		1.50	2	28	0.007	0.450	0.150	5940	80	5.4
		2.00	2	28	0.009	0.600	0.200	4455	80	9.6
		2.50	2	28	0.011	0.750	0.250	3565	80	15.1
		3.00	2	28	0.014	0.900	0.300	2970	80	21.7
	Steel 850 - 1100 N/mm²	0.50	2	66	0.003	0.050	0.500	42015	235	5.9
		0.60	2	66	0.003	0.060	0.600	35015	235	8.5
		0.80	2	66	0.004	0.080	0.800	26260	235	15.1
		1.00	2	66	0.006	0.100	1.000	21010	235	23.6
		1.20	2	66	0.007	0.120	1.200	17505	235	33.9
		1.50	2	66	0.008	0.150	1.500	14005	235	53.0
		2.00	2	66	0.011	0.200	2.000	10505	235	94.1
		2.50	2	66	0.014	0.250	2.500	8405	235	147.1
		3.00	2	66	0.017	0.300	3.000	7005	235	211.9
	Steel 1100 - 1300 N/mm²	0.50	2	50	0.002	0.050	0.500	31830	153	3.8
		0.60	2	50	0.003	0.060	0.600	26525	153	5.5
		0.80	2	50	0.004	0.080	0.800	19895	153	9.8
		1.00	2	50	0.005	0.100	1.000	15915	153	15.3
		1.20	2	50	0.006	0.120	1.200	13265	153	22.0
		1.50	2	50	0.007	0.150	1.500	10610	153	34.4
		2.00	2	50	0.010	0.200	2.000	7960	153	61.1
		2.50	2	50	0.012	0.250	2.500	6365	153	95.5
		3.00	2	50	0.014	0.300	3.000	5305	153	137.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	40	0.002	0.050	0.500	25465	92	2.3
		0.60	2	40	0.002	0.060	0.600	21220	92	3.3
		0.80	2	40	0.003	0.080	0.800	15915	92	5.9
		1.00	2	40	0.004	0.100	1.000	12730	92	9.2
		1.20	2	40	0.004	0.120	1.200	10610	92	13.2
		1.50	2	40	0.005	0.150	1.500	8490	92	20.7
		2.00	2	40	0.007	0.200	2.000	6365	92	36.7
		2.50	2	40	0.009	0.250	2.500	5095	92	57.3
		3.00	2	40	0.011	0.300	3.000	4245	92	82.6
	Titanium alloys >300 HB [Ti6Al4V]	0.50	2	25	0.002	0.050	0.500	15915	57	1.5
		0.60	2	25	0.002	0.060	0.600	13265	57	2.1
		0.80	2	25	0.003	0.080	0.800	9945	57	3.7
		1.00	2	25	0.004	0.100	1.000	7960	57	5.8
		1.20	2	25	0.004	0.120	1.200	6630	57	8.3
		1.50	2	25	0.005	0.150	1.500	5305	57	12.9
		2.00	2	25	0.007	0.200	2.000	3980	57	22.9
		2.50	2	25	0.009	0.250	2.500	3185	57	35.8
		3.00	2	25	0.011	0.300	3.000	2655	57	51.6

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 8xd

HM XA	λ 0° γ 0°

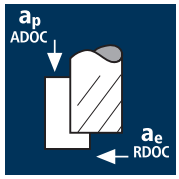
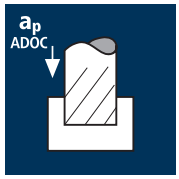
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6807** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6807
050	0.50	4.00	0.45	50	0.40	4.00	4.20	10.76	-	2		●
060	0.60	4.00	0.55	50	0.48	4.80	5.00	11.37	-	2		●
080	0.80	4.00	0.75	50	0.64	6.40	6.60	12.60	-	2		●
100	1.00	4.00	0.95	50	1.20	8.00	8.20	13.82	0.04	2		●
108	1.20	4.00	1.10	50	1.44	9.60	9.90	15.14	0.04	2		●
120	1.50	4.00	1.40	50	1.80	12.00	12.30	16.98	0.04	2		●
140	2.00	4.00	1.90	50	2.40	16.00	16.30	20.05	0.07	2		●
160	2.50	4.00	2.30	57	3.00	20.00	20.43	23.30	0.07	2		●
180	3.00	4.00	2.80	57	3.60	24.00	24.43	26.37	0.07	2		●

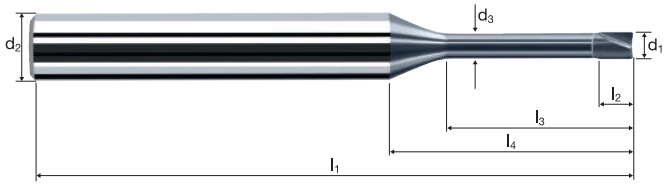
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.50	2	66	0.004	0.100	0.050	42015	294	1.5
		0.60	2	66	0.004	0.120	0.060	35015	294	2.1
		0.80	2	66	0.006	0.160	0.080	26260	294	3.8
		1.00	2	66	0.007	0.200	0.100	21010	294	5.9
		1.50	2	66	0.011	0.300	0.150	14005	294	13.3
		2.00	2	66	0.014	0.400	0.200	10505	294	23.6
		2.50	2	66	0.018	0.500	0.250	8405	294	36.8
		3.00	2	66	0.021	0.600	0.300	7005	294	53.0
	Steel 1100 - 1300 N/mm²	0.50	2	50	0.003	0.100	0.050	31830	191	1.0
		0.60	2	50	0.004	0.120	0.060	26525	191	1.4
		0.80	2	50	0.005	0.160	0.080	19895	191	2.5
		1.00	2	50	0.006	0.200	0.100	15915	191	3.8
		1.50	2	50	0.009	0.300	0.150	10610	191	8.6
		2.00	2	50	0.012	0.400	0.200	7960	191	15.3
		2.50	2	50	0.015	0.500	0.250	6365	191	23.9
		3.00	2	50	0.018	0.600	0.300	5305	191	34.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	40	0.002	0.100	0.050	25465	115	0.6
		0.60	2	40	0.003	0.120	0.060	21220	115	0.9
		0.80	2	40	0.004	0.160	0.080	15915	115	1.5
		1.00	2	40	0.005	0.200	0.100	12730	115	2.3
		1.50	2	40	0.007	0.300	0.150	8490	115	5.2
		2.00	2	40	0.009	0.400	0.200	6365	115	9.2
		2.50	2	40	0.011	0.500	0.250	5095	115	14.4
		3.00	2	40	0.014	0.600	0.300	4245	115	20.7
	Titanium alloys >300 HB [Ti6Al4V]	0.50	2	25	0.002	0.100	0.050	15915	72	0.4
		0.60	2	25	0.003	0.120	0.060	13265	72	0.5
		0.80	2	25	0.004	0.160	0.080	9945	72	0.9
		1.00	2	25	0.005	0.200	0.100	7960	72	1.5
		1.50	2	25	0.007	0.300	0.150	5305	72	3.2
		2.00	2	25	0.009	0.400	0.200	3980	72	5.8
		2.50	2	25	0.011	0.500	0.250	3185	72	9.0
		3.00	2	25	0.014	0.600	0.300	2655	72	12.9
	Steel 850 - 1100 N/mm²	0.50	2	59	0.003	0.050	0.500	37560	210	5.3
		0.60	2	59	0.003	0.060	0.600	31300	210	7.6
		0.80	2	59	0.004	0.080	0.800	23475	210	13.5
		1.00	2	59	0.006	0.100	1.000	18780	210	21.1
		1.50	2	59	0.008	0.150	1.500	12520	210	47.3
		2.00	2	59	0.011	0.200	2.000	9390	210	84.1
		2.50	2	59	0.014	0.250	2.500	7510	210	131.5
		3.00	2	59	0.017	0.300	3.000	6260	210	189.3
	Steel 1100 - 1300 N/mm²	0.50	2	45	0.002	0.050	0.500	28650	138	3.5
		0.60	2	45	0.003	0.060	0.600	23875	138	5.0
		0.80	2	45	0.004	0.080	0.800	17905	138	8.8
		1.00	2	45	0.005	0.100	1.000	14325	138	13.8
		1.50	2	45	0.007	0.150	1.500	9550	138	31.0
		2.00	2	45	0.010	0.200	2.000	7160	138	55.0
		2.50	2	45	0.012	0.250	2.500	5730	138	86.0
		3.00	2	45	0.014	0.300	3.000	4775	138	123.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	36	0.002	0.050	0.500	22920	83	2.1
		0.60	2	36	0.002	0.060	0.600	19100	83	3.0
		0.80	2	36	0.003	0.080	0.800	14325	83	5.3
		1.00	2	36	0.004	0.100	1.000	11460	83	8.3
		1.50	2	36	0.005	0.150	1.500	7640	83	18.6
		2.00	2	36	0.007	0.200	2.000	5730	83	33.0
		2.50	2	36	0.009	0.250	2.500	4585	83	51.6
		3.00	2	36	0.011	0.300	3.000	3820	83	74.3
	Titanium alloys >300 HB [Ti6Al4V]	0.50	2	23	0.002	0.050	0.500	14640	53	1.3
		0.60	2	23	0.002	0.060	0.600	12200	53	1.9
		0.80	2	23	0.003	0.080	0.800	9150	53	3.4
		1.00	2	23	0.004	0.100	1.000	7320	53	5.3
		1.50	2	23	0.005	0.150	1.500	4880	53	11.9
		2.00	2	23	0.007	0.200	2.000	3660	53	21.1
		2.50	2	23	0.009	0.250	2.500	2930	53	33.0
		3.00	2	23	0.011	0.300	3.000	2440	53	47.5

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 10xd

HM XA	λ 0° γ 0°

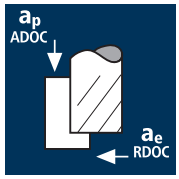
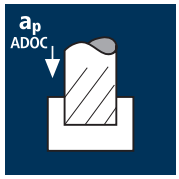
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6809** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6809
050	0.50	4.00	0.45	50	0.40	5.00	5.20	11.76	-	2		●
060	0.60	4.00	0.55	50	0.48	6.00	6.20	12.57	-	2		●
080	0.80	4.00	0.75	50	0.64	8.00	8.20	14.20	-	2		●
100	1.00	4.00	0.95	50	1.20	10.00	10.20	15.82	0.04	2		●
120	1.50	4.00	1.40	50	1.80	15.00	15.30	19.98	0.04	2		●
140	2.00	4.00	1.90	57	2.40	20.00	20.30	24.05	0.07	2		●
160	2.50	4.00	2.30	57	3.00	25.00	25.43	28.30	0.07	2		●
180	3.00	4.00	2.80	61	3.60	30.00	30.43	32.37	0.07	2		●

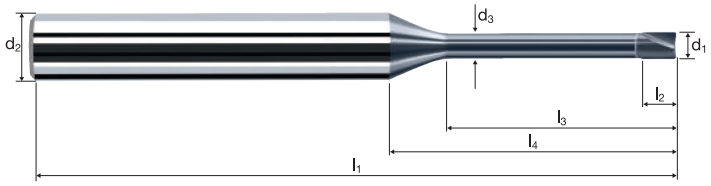
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	1.00	2	59	0.007	0.200	0.100	18780	263	5.3
		1.50	2	59	0.011	0.300	0.150	12520	263	11.9
		2.00	2	59	0.014	0.400	0.200	9390	263	21.1
		3.00	2	59	0.021	0.600	0.300	6260	263	47.3
	Steel 1100 - 1300 N/mm²	1.00	2	45	0.006	0.200	0.100	14325	172	3.5
		1.50	2	45	0.009	0.300	0.150	9550	172	7.8
		2.00	2	45	0.012	0.400	0.200	7160	172	13.8
		3.00	2	45	0.018	0.600	0.300	4775	172	31.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	36	0.005	0.200	0.100	11460	103	2.1
		1.50	2	36	0.007	0.300	0.150	7640	103	4.7
		2.00	2	36	0.009	0.400	0.200	5730	103	8.3
		3.00	2	36	0.014	0.600	0.300	3820	103	18.6
	Titanium alloys >300 HB [Ti6Al4V]	1.00	2	23	0.005	0.200	0.100	7320	66	1.3
		1.50	2	23	0.007	0.300	0.150	4880	66	3.0
		2.00	2	23	0.009	0.400	0.200	3660	66	5.3
		3.00	2	23	0.014	0.600	0.300	2440	66	11.9
	Steel 850 - 1100 N/mm²	1.00	2	53	0.006	0.100	1.000	16870	189	18.9
		1.50	2	53	0.008	0.150	1.500	11245	189	42.5
		2.00	2	53	0.011	0.200	2.000	8435	189	75.6
		3.00	2	53	0.017	0.300	3.000	5625	189	170.1
	Steel 1100 - 1300 N/mm²	1.00	2	41	0.005	0.100	1.000	13050	125	12.6
		1.50	2	41	0.007	0.150	1.500	8700	125	28.2
		2.00	2	41	0.010	0.200	2.000	6525	125	50.1
		3.00	2	41	0.014	0.300	3.000	4350	125	112.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	33	0.004	0.100	1.000	10505	76	7.6
		1.50	2	33	0.005	0.150	1.500	7005	76	17.1
		2.00	2	33	0.007	0.200	2.000	5250	76	30.3
		3.00	2	33	0.011	0.300	3.000	3500	76	68.1
	Titanium alloys >300 HB [Ti6Al4V]	1.00	2	20	0.004	0.100	1.000	6365	46	4.6
		1.50	2	20	0.005	0.150	1.500	4245	46	10.3
		2.00	2	20	0.007	0.200	2.000	3185	46	18.4
		3.00	2	20	0.011	0.300	3.000	2120	46	41.2

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 12xd

HM	λ 0°
XA	γ 0°

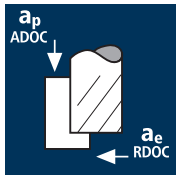
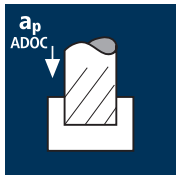
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6810** ø-Code **100**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6810
100	1.00	4.00	0.95	50	1.20	12.00	12.20	17.82	0.04	2		●
120	1.50	4.00	1.40	57	1.80	18.00	18.30	22.98	0.04	2		●
140	2.00	4.00	1.90	57	2.40	24.00	24.30	28.05	0.07	2		●
180	3.00	4.00	2.80	75	3.60	36.00	36.43	38.37	0.07	2		●

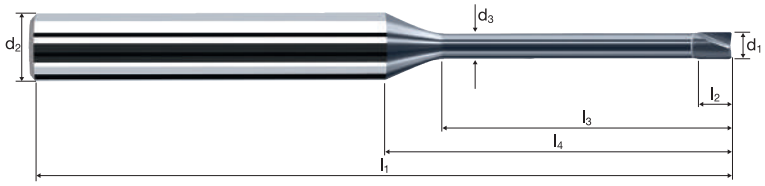
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	1.00	2	53	0.007	0.200	0.100	16870	236	4.7
		1.50	2	53	0.011	0.300	0.150	11245	236	10.6
		2.00	2	53	0.014	0.400	0.200	8435	236	18.9
		3.00	2	53	0.021	0.600	0.300	5625	236	42.6
	Steel 1100 - 1300 N/mm²	1.00	2	41	0.006	0.200	0.100	13050	157	3.2
		1.50	2	41	0.009	0.300	0.150	8700	157	7.1
		2.00	2	41	0.012	0.400	0.200	6525	157	12.6
		3.00	2	41	0.018	0.600	0.300	4350	157	28.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	33	0.005	0.200	0.100	10505	95	1.9
		1.50	2	33	0.007	0.300	0.150	7005	95	4.3
		2.00	2	33	0.009	0.400	0.200	5250	95	7.6
		3.00	2	33	0.014	0.600	0.300	3500	95	17.0
	Titanium alloys >300 HB [Ti6Al4V]	1.00	2	20	0.005	0.200	0.100	6365	57	1.2
		1.50	2	20	0.007	0.300	0.150	4245	57	2.6
		2.00	2	20	0.009	0.400	0.200	3185	57	4.6
		3.00	2	20	0.014	0.600	0.300	2120	57	10.3
	Steel 850 - 1100 N/mm²	1.00	2	48	0.006	0.100	1.000	15280	171	17.1
		1.50	2	48	0.008	0.150	1.500	10185	171	38.5
		2.00	2	48	0.011	0.200	2.000	7640	171	68.5
		3.00	2	48	0.017	0.300	3.000	5095	171	154.1
	Steel 1100 - 1300 N/mm²	1.00	2	37	0.005	0.100	1.000	11775	113	11.3
		1.50	2	37	0.007	0.150	1.500	7850	113	25.5
		2.00	2	37	0.010	0.200	2.000	5890	113	45.3
		3.00	2	37	0.014	0.300	3.000	3925	113	101.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	29	0.004	0.100	1.000	9230	67	6.7
		1.50	2	29	0.005	0.150	1.500	6155	67	15.0
		2.00	2	29	0.007	0.200	2.000	4615	67	26.6
		3.00	2	29	0.011	0.300	3.000	3075	66	59.8
	Titanium alloys >300 HB [Ti6Al4V]	1.00	2	18	0.004	0.100	1.000	5730	41	4.2
		1.50	2	18	0.005	0.150	1.500	3820	41	9.3
		2.00	2	18	0.007	0.200	2.000	2865	41	16.5
		3.00	2	18	0.011	0.300	3.000	1910	41	37.2

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 15xd

HM XA	λ 0° γ 0°

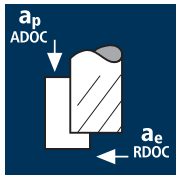
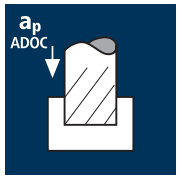
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6811** ø-Code **100**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	X-AL	X6811
100	1.00	4.00	0.95	50	1.20	15.00	15.20	20.82	0.04	2		●
120	1.50	4.00	1.40	57	1.80	22.50	22.80	27.48	0.04	2		●
140	2.00	4.00	1.90	61	2.40	30.00	30.30	34.05	0.07	2		●
180	3.00	4.00	2.80	75	3.60	45.00	45.43	47.37	0.07	2		●

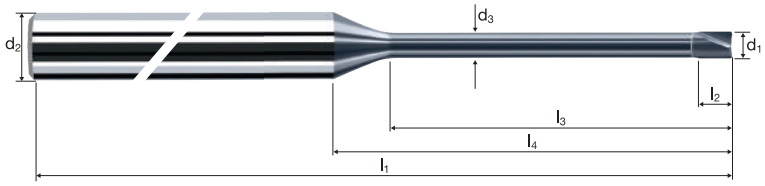
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	1.00	2	48	0.007	0.200	0.100	15280	214	4.3
		1.50	2	48	0.011	0.300	0.150	10185	214	9.7
		2.00	2	48	0.014	0.400	0.200	7640	214	17.1
		3.00	2	48	0.021	0.600	0.300	5095	214	38.5
	Steel 1100 - 1300 N/mm²	1.00	2	37	0.006	0.200	0.100	11775	141	2.9
		1.50	2	37	0.009	0.300	0.150	7850	141	6.4
		2.00	2	37	0.012	0.400	0.200	5890	141	11.3
		3.00	2	37	0.018	0.600	0.300	3925	141	25.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	29	0.005	0.200	0.100	9230	83	1.7
		1.50	2	29	0.007	0.300	0.150	6155	83	3.8
		2.00	2	29	0.009	0.400	0.200	4615	83	6.7
		3.00	2	29	0.014	0.600	0.300	3075	83	15.0
	Titanium alloys >300 HB [Ti6Al4V]	1.00	2	18	0.005	0.200	0.100	5730	52	1.1
		1.50	2	18	0.007	0.300	0.150	3820	52	2.3
		2.00	2	18	0.009	0.400	0.200	2865	52	4.2
		3.00	2	18	0.014	0.600	0.300	1910	52	9.3
	Steel 850 - 1100 N/mm²	1.00	2	43	0.007	0.100	1.000	13685	192	19.2
		1.50	2	43	0.011	0.150	1.500	9125	192	43.1
		2.00	2	43	0.014	0.200	2.000	6845	192	76.7
		3.00	2	43	0.021	0.300	3.000	4560	192	172.4
	Steel 1100 - 1300 N/mm²	1.00	2	33	0.006	0.100	1.000	10505	126	12.6
		1.50	2	33	0.009	0.150	1.500	7005	126	28.4
		2.00	2	33	0.012	0.200	2.000	5250	126	50.4
		3.00	2	33	0.018	0.300	3.000	3500	126	113.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	26	0.005	0.100	1.000	8275	75	7.5
		1.50	2	26	0.007	0.150	1.500	5515	75	16.8
		2.00	2	26	0.009	0.200	2.000	4140	75	29.8
		3.00	2	26	0.014	0.300	3.000	2760	75	67.1
	Titanium alloys >300 HB [Ti6Al4V]	1.00	2	17	0.005	0.100	1.000	5410	49	4.9
		1.50	2	17	0.007	0.150	1.500	3610	49	11.0
		2.00	2	17	0.009	0.200	2.000	2705	49	19.5
		3.00	2	17	0.014	0.300	3.000	1805	49	43.9

Cylindrical/Square end mills Microcut

Shank ø 4mm, cylindrical neck, 20xd

HM XA	λ 0° γ 0°

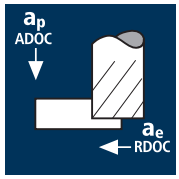
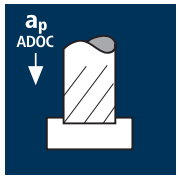
45°



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6812** ø-Code **100**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z		X-AL
												X6812
100	1.00	4.00	0.95	57	1.20	20.00	20.20	25.82	0.04	2		●
120	1.50	4.00	1.40	66	1.80	30.00	30.30	34.98	0.04	2		●
140	2.00	4.00	1.90	75	2.40	40.00	40.30	44.05	0.07	2		●
180	3.00	4.00	2.80	100	3.60	60.00	60.43	62.37	0.07	2		●

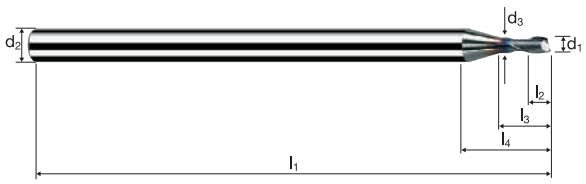
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.20	2	180	0.004	0.160	0.030	60000	480	2.3
		0.50	2	180	0.012	0.400	0.080	60000	1440	46.1
		0.80	2	180	0.018	0.640	0.120	60000	2160	165.9
		1.00	2	180	0.022	0.800	0.150	57295	2521	302.5
		1.20	2	180	0.026	0.960	0.180	47745	2483	429.0
		1.50	2	180	0.034	1.200	0.230	38195	2597	716.9
		2.00	2	180	0.044	1.600	0.300	28650	2521	1210.2
		2.50	2	180	0.056	2.000	0.380	22920	2567	1950.9
		3.00	2	180	0.066	2.400	0.450	19100	2521	2722.9
	Steel 1100 - 1300 N/mm²	0.20	2	160	0.004	0.160	0.030	60000	480	2.3
		0.50	2	160	0.010	0.400	0.080	60000	1200	38.4
		0.80	2	160	0.016	0.640	0.120	60000	1920	147.5
		1.00	2	160	0.020	0.800	0.150	50930	2037	244.5
		1.20	2	160	0.024	0.960	0.180	42440	2037	352.0
		1.50	2	160	0.030	1.200	0.230	33955	2037	562.3
		2.00	2	160	0.040	1.600	0.300	25465	2037	977.9
		2.50	2	160	0.050	2.000	0.380	20370	2037	1548.1
		3.00	2	160	0.060	2.400	0.450	16975	2037	2200.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	80	0.004	0.160	0.030	60000	480	2.3
		0.50	2	80	0.010	0.400	0.080	50930	1019	32.6
		0.80	2	80	0.014	0.640	0.120	31830	891	68.4
		1.00	2	80	0.018	0.800	0.150	25465	917	110.0
		1.20	2	80	0.020	0.960	0.180	21220	849	146.7
		1.50	2	80	0.028	1.200	0.230	16975	951	262.4
		2.00	2	80	0.036	1.600	0.300	12730	917	440.0
		2.50	2	80	0.044	2.000	0.380	10185	896	681.2
		3.00	2	80	0.052	2.400	0.450	8490	883	953.6
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.20	2	60	0.002	0.160	0.030	60000	240	1.2
		0.50	2	60	0.008	0.400	0.080	38195	611	19.6
		0.80	2	60	0.012	0.640	0.120	23875	573	44.0
		1.00	2	60	0.016	0.800	0.150	19100	611	73.3
		1.20	2	60	0.018	0.960	0.180	15915	573	99.0
		1.50	2	60	0.024	1.200	0.230	12730	611	168.6
		2.00	2	60	0.030	1.600	0.300	9550	573	275.0
		2.50	2	60	0.040	2.000	0.380	7640	611	464.5
		3.00	2	60	0.046	2.400	0.450	6365	586	632.4
	Steel 850 - 1100 N/mm²	0.20	2	160	0.004	0.020	0.200	60000	480	1.9
		0.50	2	160	0.010	0.060	0.500	60000	1200	36.0
		0.80	2	160	0.014	0.100	0.800	60000	1680	134.4
		1.00	2	160	0.018	0.120	1.000	50930	1834	220.0
		1.20	2	160	0.022	0.140	1.200	42440	1867	313.7
		1.50	2	160	0.028	0.180	1.500	33955	1902	513.4
		2.00	2	160	0.036	0.240	2.000	25465	1834	880.1
		2.50	2	160	0.046	0.300	2.500	20370	1874	1405.5
		3.00	2	160	0.054	0.360	3.000	16975	1833	1980.0
	Steel 1100 - 1300 N/mm²	0.20	2	140	0.004	0.020	0.200	60000	480	1.9
		0.50	2	140	0.010	0.060	0.500	60000	1200	36.0
		0.80	2	140	0.014	0.100	0.800	55705	1560	124.8
		1.00	2	140	0.018	0.120	1.000	44565	1604	192.5
		1.20	2	140	0.020	0.140	1.200	37135	1485	249.5
		1.50	2	140	0.026	0.180	1.500	29710	1545	417.1
		2.00	2	140	0.034	0.240	2.000	22280	1515	727.2
		2.50	2	140	0.044	0.300	2.500	17825	1569	1176.5
		3.00	2	140	0.052	0.360	3.000	14855	1545	1668.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.20	2	70	0.004	0.020	0.200	60000	480	1.9
		0.50	2	70	0.008	0.060	0.500	44565	713	21.4
		0.80	2	70	0.012	0.100	0.800	27850	668	53.5
		1.00	2	70	0.016	0.120	1.000	22280	713	85.6
		1.20	2	70	0.020	0.140	1.200	18570	743	124.8
		1.50	2	70	0.024	0.180	1.500	14855	713	192.5
		2.00	2	70	0.032	0.240	2.000	11140	713	342.2
		2.50	2	70	0.040	0.300	2.500	8915	713	534.9
		3.00	2	70	0.048	0.360	3.000	7425	713	769.8
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.20	2	50	0.004	0.020	0.200	60000	480	1.9
		0.50	2	50	0.008	0.060	0.500	31830	509	15.3
		0.80	2	50	0.012	0.100	0.800	19895	478	38.2
		1.00	2	50	0.014	0.120	1.000	15915	446	53.5
		1.20	2	50	0.018	0.140	1.200	13265	478	80.2
		1.50	2	50	0.022	0.180	1.500	10610	467	126.0
		2.00	2	50	0.028	0.240	2.000	7960	446	214.0
		2.50	2	50	0.036	0.300	2.500	6365	458	343.7
		3.00	2	50	0.044	0.360	3.000	5305	467	504.1

Cylindrical/Square end mills Microcut

Shank ø 3mm, cylindrical neck, 3xd

HM MG10 | λ 25° γ 6°

45°

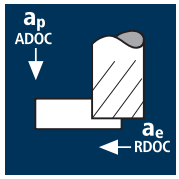
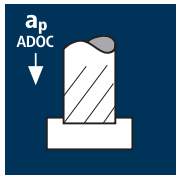


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5712** ø-Code **020**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	MICRO M5712
020	0.20	3.00	0.18	40	0.24	0.60	0.60	8.86	-	2	●
030	0.30	3.00	0.25	40	0.36	0.90	0.90	8.96	-	2	●
040	0.40	3.00	0.35	40	0.48	1.20	1.20	8.98	-	2	●
050	0.50	3.00	0.45	40	0.60	1.50	1.50	6.65	-	2	●
060	0.60	3.00	0.55	40	0.72	1.80	1.80	6.77	-	2	●
080	0.80	3.00	0.75	40	0.96	2.40	2.40	6.99	-	2	●
100	1.00	3.00	0.95	50	1.20	3.00	3.00	7.22	0.04	2	●
108	1.20	3.00	1.10	50	1.44	3.60	3.60	7.54	0.04	2	●
120	1.50	3.00	1.40	50	1.80	4.50	4.50	7.88	0.04	2	●
140	2.00	3.00	1.90	50	2.40	6.00	6.00	8.45	0.05	2	●
160	2.50	3.00	2.30	50	3.00	7.50	7.50	9.20	0.05	2	●
180	3.00	3.00	2.80	50	3.60	8.56	8.56	9.00	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	3	80	0.010	0.400	0.080	50930	1528	48.9
		0.60	3	80	0.012	0.480	0.090	42440	1528	66.0
		0.80	3	80	0.016	0.640	0.120	31830	1528	117.3
		1.00	3	80	0.020	0.800	0.150	25465	1528	183.3
		1.20	3	80	0.024	0.960	0.180	21220	1528	264.0
		1.50	3	80	0.030	1.200	0.230	16975	1528	421.7
		2.00	3	80	0.040	1.600	0.300	12730	1528	733.2
		2.50	3	80	0.050	2.000	0.380	10185	1528	1161.1
		3.00	3	80	0.060	2.400	0.450	8490	1528	1650.5
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.50	3	50	0.008	0.400	0.080	31830	764	24.4
		0.60	3	50	0.010	0.480	0.090	26525	796	34.4
		0.80	3	50	0.012	0.640	0.120	19895	716	55.0
		1.00	3	50	0.016	0.800	0.150	15915	764	91.7
		1.20	3	50	0.020	0.960	0.180	13265	796	137.5
		1.50	3	50	0.024	1.200	0.230	10610	764	210.8
		2.00	3	50	0.032	1.600	0.300	7960	764	366.8
		2.50	3	50	0.040	2.000	0.380	6365	764	580.5
		3.00	3	50	0.048	2.400	0.450	5305	764	825.0
	Gold	0.50	3	180	0.012	0.400	0.080	60000	2160	69.1
		0.60	3	180	0.014	0.480	0.090	60000	2520	108.9
		0.80	3	180	0.020	0.640	0.120	60000	3600	276.5
		1.00	3	180	0.024	0.800	0.150	57295	4125	495.0
		1.20	3	180	0.028	0.960	0.180	47745	4011	693.0
		1.50	3	180	0.036	1.200	0.230	38195	4125	1138.5
		2.00	3	180	0.048	1.600	0.300	28650	4126	1980.3
		2.50	3	180	0.060	2.000	0.380	22920	4126	3135.5
		3.00	3	180	0.072	2.400	0.450	19100	4126	4455.6
	Steel 850 - 1300 N/mm²	0.50	3	66	0.010	0.400	0.080	42015	1261	40.3
		0.60	3	79	0.012	0.480	0.090	41910	1509	65.2
		0.80	3	106	0.016	0.640	0.120	42175	2024	155.5
		1.00	3	120	0.020	0.800	0.150	38195	2292	275.0
		1.20	3	120	0.024	0.960	0.180	31830	2292	396.0
		1.50	3	120	0.030	1.200	0.230	25465	2292	632.6
		2.00	3	120	0.040	1.600	0.300	19100	2292	1100.2
		2.50	3	120	0.050	2.000	0.380	15280	2292	1741.9
		3.00	3	120	0.060	2.400	0.450	12730	2291	2474.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	3	60	0.008	0.060	0.500	38195	917	27.5
		0.60	3	60	0.008	0.070	0.600	31830	764	32.1
		0.80	3	60	0.012	0.100	0.800	23875	860	68.8
		1.00	3	60	0.014	0.120	1.000	19100	802	96.3
		1.20	3	60	0.018	0.140	1.200	15915	859	144.4
		1.50	3	60	0.022	0.180	1.500	12730	840	226.9
		2.00	3	60	0.028	0.240	2.000	9550	802	385.1
		2.50	3	60	0.036	0.300	2.500	7640	825	618.8
		3.00	3	60	0.042	0.360	3.000	6365	802	866.2
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.50	3	40	0.006	0.060	0.500	25465	458	13.8
		0.60	3	40	0.006	0.070	0.600	21220	382	16.0
		0.80	3	40	0.010	0.100	0.800	15915	478	38.2
		1.00	3	40	0.012	0.120	1.000	12730	458	55.0
		1.20	3	40	0.014	0.140	1.200	10610	446	74.9
		1.50	3	40	0.018	0.180	1.500	8490	459	123.8
		2.00	3	40	0.022	0.240	2.000	6365	420	201.6
		2.50	3	40	0.028	0.300	2.500	5095	428	321.0
		3.00	3	40	0.034	0.360	3.000	4245	433	467.6
	Gold	0.50	3	160	0.010	0.060	0.500	60000	1800	54.0
		0.60	3	160	0.010	0.070	0.600	60000	1800	75.6
		0.80	3	160	0.014	0.100	0.800	60000	2520	201.6
		1.00	3	160	0.016	0.120	1.000	50930	2445	293.4
		1.20	3	160	0.022	0.140	1.200	42440	2801	470.6
		1.50	3	160	0.026	0.180	1.500	33955	2649	715.1
		2.00	3	160	0.034	0.240	2.000	25465	2597	1246.8
		2.50	3	160	0.044	0.300	2.500	20370	2689	2016.6
		3.00	3	160	0.050	0.360	3.000	16975	2546	2750.0
	Steel 850 - 1300 N/mm²	0.50	3	66	0.008	0.060	0.500	42015	1008	30.3
		0.60	3	79	0.008	0.070	0.600	41910	1006	42.2
		0.80	3	100	0.012	0.100	0.800	39790	1432	114.6
		1.00	3	100	0.014	0.120	1.000	31830	1337	160.4
		1.20	3	100	0.018	0.140	1.200	26525	1432	240.6
		1.50	3	100	0.022	0.180	1.500	21220	1401	378.1
		2.00	3	100	0.028	0.240	2.000	15915	1337	641.7
		2.50	3	100	0.036	0.300	2.500	12730	1375	1031.1
		3.00	3	100	0.042	0.360	3.000	10610	1337	1443.9

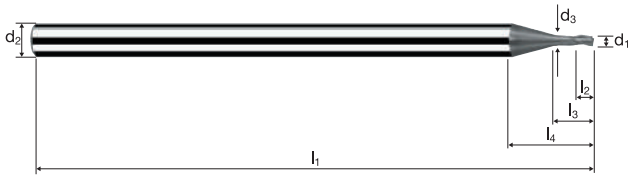
Cylindrical/Square end mills Microcut

Shank ø 3mm, cylindrical neck, 3xd

HM
XA

λ 25°
γ -10°

90°

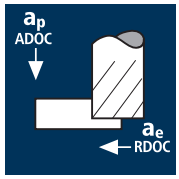
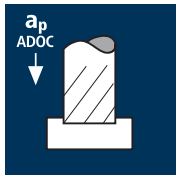


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **15752** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	z	MICRO M15752
050	0.50	3.00	0.45	40	0.60	1.50	1.50	6.65	3	●
060	0.60	3.00	0.55	40	0.72	1.80	1.80	6.77	3	●
080	0.80	3.00	0.75	40	0.96	2.40	2.40	6.99	3	●
100	1.00	3.00	0.95	50	1.20	3.00	3.00	7.22	3	●
108	1.20	3.00	1.10	50	1.44	3.60	3.60	7.54	3	●
120	1.50	3.00	1.40	60	1.80	4.50	4.50	7.88	3	●
140	2.00	3.00	1.90	60	2.40	6.00	6.00	8.45	3	●
160	2.50	3.00	2.30	60	3.00	7.50	7.50	9.20	3	●
180	3.00	3.00	2.80	60	3.60	8.56	8.56	9.00	3	●

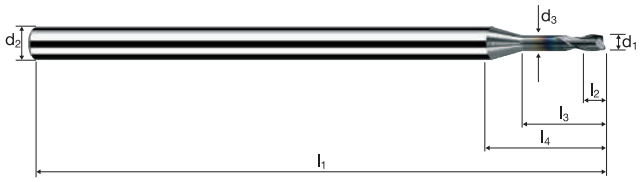
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.50	2	180	0.012	0.400	0.070	60000	1440	40.3
		0.60	2	180	0.014	0.480	0.080	60000	1680	64.5
		0.80	2	180	0.018	0.640	0.100	60000	2160	138.2
		1.00	2	180	0.022	0.800	0.130	57295	2521	262.2
		1.20	2	180	0.026	0.960	0.160	47745	2483	381.3
		1.50	2	180	0.034	1.200	0.200	38195	2597	623.4
		2.00	2	180	0.044	1.600	0.260	28650	2521	1048.8
		2.50	2	180	0.056	2.000	0.330	22920	2567	1694.2
		3.00	2	180	0.066	2.400	0.390	19100	2521	2359.8
	Steel 1100 - 1300 N/mm²	0.50	2	160	0.010	0.400	0.070	60000	1200	33.6
		0.60	2	160	0.012	0.480	0.080	60000	1440	55.3
		0.80	2	160	0.016	0.640	0.100	60000	1920	122.9
		1.00	2	160	0.020	0.800	0.130	50930	2037	211.9
		1.20	2	160	0.024	0.960	0.160	42440	2037	312.9
		1.50	2	160	0.030	1.200	0.200	33955	2037	489.0
		2.00	2	160	0.040	1.600	0.260	25465	2037	847.5
		2.50	2	160	0.050	2.000	0.330	20370	2037	1344.4
		3.00	2	160	0.060	2.400	0.390	16975	2037	1906.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	80	0.010	0.400	0.070	50930	1019	28.5
		0.60	2	80	0.012	0.480	0.080	42440	1019	39.1
		0.80	2	80	0.014	0.640	0.100	31830	891	57.0
		1.00	2	80	0.018	0.800	0.130	25465	917	95.3
		1.20	2	80	0.020	0.960	0.160	21220	849	130.4
		1.50	2	80	0.028	1.200	0.200	16975	951	228.1
		2.00	2	80	0.036	1.600	0.260	12730	917	381.3
		2.50	2	80	0.044	2.000	0.330	10185	896	591.6
		3.00	2	80	0.052	2.400	0.390	8490	883	826.5
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	0.50	2	65	0.010	0.400	0.070	41380	828	23.2
		0.60	2	65	0.012	0.480	0.080	34485	828	31.8
		0.80	2	65	0.014	0.640	0.100	25865	724	46.3
		1.00	2	65	0.018	0.800	0.130	20690	745	77.5
		1.20	2	65	0.020	0.960	0.160	17240	690	105.9
		1.50	2	65	0.028	1.200	0.200	13795	773	185.4
		2.00	2	65	0.036	1.600	0.260	10345	745	309.8
		2.50	2	65	0.044	2.000	0.330	8275	728	480.6
		3.00	2	65	0.052	2.400	0.390	6895	717	671.2
	Steel 850 - 1100 N/mm²	0.50	2	160	0.010	0.060	0.500	60000	1200	36.0
		0.60	2	160	0.010	0.070	0.600	60000	1200	50.4
		0.80	2	160	0.014	0.090	0.800	60000	1680	121.0
		1.00	2	160	0.018	0.110	1.000	50930	1834	201.7
		1.20	2	160	0.022	0.130	1.200	42440	1867	291.3
		1.50	2	160	0.028	0.170	1.500	33955	1902	484.9
		2.00	2	160	0.036	0.220	2.000	25465	1834	806.7
		2.50	2	160	0.046	0.280	2.500	20370	1874	1311.8
		3.00	2	160	0.054	0.330	3.000	16975	1833	1815.0
	Steel 1100 - 1300 N/mm²	0.50	2	140	0.010	0.060	0.500	60000	1200	36.0
		0.60	2	140	0.010	0.070	0.600	60000	1200	50.4
		0.80	2	140	0.014	0.090	0.800	55705	1560	112.3
		1.00	2	140	0.018	0.110	1.000	44565	1604	176.5
		1.20	2	140	0.020	0.130	1.200	37135	1485	231.7
		1.50	2	140	0.026	0.170	1.500	29710	1545	393.9
		2.00	2	140	0.034	0.220	2.000	22280	1515	666.6
		2.50	2	140	0.044	0.280	2.500	17825	1569	1098.0
		3.00	2	140	0.052	0.330	3.000	14855	1545	1529.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	70	0.008	0.060	0.500	44565	713	21.4
		0.60	2	70	0.008	0.070	0.600	37135	594	25.0
		0.80	2	70	0.012	0.090	0.800	27850	668	48.1
		1.00	2	70	0.016	0.110	1.000	22280	713	78.4
		1.20	2	70	0.020	0.130	1.200	18570	743	115.9
		1.50	2	70	0.024	0.170	1.500	14855	713	181.8
		2.00	2	70	0.032	0.220	2.000	11140	713	313.7
		2.50	2	70	0.040	0.280	2.500	8915	713	499.2
		3.00	2	70	0.048	0.330	3.000	7425	713	705.7
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	0.50	2	55	0.008	0.060	0.500	35015	560	16.8
		0.60	2	55	0.008	0.070	0.600	29180	467	19.6
		0.80	2	55	0.012	0.090	0.800	21885	525	37.8
		1.00	2	55	0.016	0.110	1.000	17505	560	61.6
		1.20	2	55	0.020	0.130	1.200	14590	584	91.0
		1.50	2	55	0.024	0.170	1.500	11670	560	142.9
		2.00	2	55	0.032	0.220	2.000	8755	560	246.5
		2.50	2	55	0.040	0.280	2.500	7005	560	392.3
		3.00	2	55	0.048	0.330	3.000	5835	560	554.6

Cylindrical/Square end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

HM MG10 | λ 25° γ 6°

45°

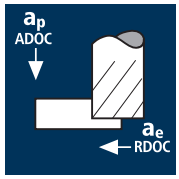
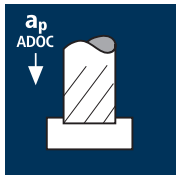


ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Rm** 1300-1500 **HRC** 42-48 | **Inox** Stainless | **Ti** Titanium | Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5714** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	MICRO M5714
050	0.50	3.00	0.45	40	0.60	2.50	2.50	7.65	-	2	●
060	0.60	3.00	0.55	40	0.72	3.00	3.00	7.97	-	2	●
070	0.70	3.00	0.65	40	0.84	3.50	3.50	8.28	-	2	●
080	0.80	3.00	0.75	40	0.96	4.00	4.00	8.59	-	2	●
090	0.90	3.00	0.85	40	1.08	4.50	4.50	8.91	-	2	●
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	0.04	2	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	0.04	2	●
120	1.50	3.00	1.40	50	1.80	7.50	7.50	10.88	0.04	2	●
132	1.80	3.00	1.70	50	2.16	9.00	9.00	11.82	0.04	2	●
140	2.00	3.00	1.90	50	2.40	10.00	10.00	12.45	0.05	2	●
152	2.30	3.00	2.10	50	2.76	11.50	11.50	13.57	0.05	2	●
160	2.50	3.00	2.30	50	3.00	12.50	12.50	14.20	0.05	2	●
172	2.80	3.00	2.60	50	3.36	14.00	14.00	15.14	0.05	2	●
180	3.00	3.00	2.80	50	3.60	14.56	14.56	15.00	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	3	80	0.010	0.400	0.070	50930	1528	42.8
		0.60	3	80	0.010	0.480	0.080	42440	1273	48.9
		0.80	3	80	0.014	0.640	0.100	31830	1337	85.6
		1.00	3	80	0.018	0.800	0.130	25465	1375	143.0
		1.20	3	80	0.022	0.960	0.160	21220	1401	215.1
		1.50	3	80	0.028	1.200	0.200	16975	1426	342.2
		2.00	3	80	0.036	1.600	0.260	12730	1375	571.9
		2.50	3	80	0.046	2.000	0.330	10185	1406	927.6
		3.00	3	80	0.054	2.400	0.390	8490	1375	1287.4
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.50	3	50	0.008	0.400	0.070	31830	764	21.4
		0.60	3	50	0.008	0.480	0.080	26525	637	24.4
		0.80	3	50	0.012	0.640	0.100	19895	716	45.8
		1.00	3	50	0.014	0.800	0.130	15915	668	69.5
		1.20	3	50	0.018	0.960	0.160	13265	716	110.0
		1.50	3	50	0.022	1.200	0.200	10610	700	168.1
		2.00	3	50	0.028	1.600	0.260	7960	669	278.1
		2.50	3	50	0.036	2.000	0.330	6365	687	453.7
		3.00	3	50	0.044	2.400	0.390	5305	700	655.5
	Gold	0.50	3	180	0.012	0.400	0.070	60000	2160	60.5
		0.60	3	180	0.012	0.480	0.080	60000	2160	82.9
		0.80	3	180	0.016	0.640	0.100	60000	2880	184.3
		1.00	3	180	0.022	0.800	0.130	57295	3782	393.3
		1.20	3	180	0.026	0.960	0.160	47745	3724	572.0
		1.50	3	180	0.034	1.200	0.200	38195	3896	935.0
		2.00	3	180	0.044	1.600	0.260	28650	3782	1573.2
		2.50	3	180	0.056	2.000	0.330	22920	3851	2541.4
		3.00	3	180	0.064	2.400	0.390	19100	3667	3432.5
	Steel 850 - 1300 N/mm²	0.50	3	66	0.010	0.400	0.070	42015	1261	35.3
		0.60	3	79	0.010	0.480	0.080	41910	1257	48.3
		0.80	3	106	0.014	0.640	0.100	42175	1771	113.4
		1.00	3	120	0.018	0.800	0.130	38195	2063	214.5
		1.20	3	120	0.022	0.960	0.160	31830	2101	322.7
		1.50	3	120	0.028	1.200	0.200	25465	2139	513.4
		2.00	3	120	0.036	1.600	0.260	19100	2063	858.1
		2.50	3	120	0.046	2.000	0.330	15280	2109	1391.7
		3.00	3	120	0.054	2.400	0.390	12730	2062	1930.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	3	60	0.006	0.050	0.500	38195	688	17.2
		0.60	3	60	0.008	0.060	0.600	31830	764	27.5
		0.80	3	60	0.010	0.080	0.800	23875	716	45.8
		1.00	3	60	0.014	0.100	1.000	19100	802	80.2
		1.20	3	60	0.016	0.120	1.200	15915	764	110.0
		1.50	3	60	0.020	0.150	1.500	12730	764	171.9
		2.00	3	60	0.026	0.200	2.000	9550	745	298.0
		2.50	3	60	0.034	0.250	2.500	7640	779	487.1
		3.00	3	60	0.040	0.300	3.000	6365	764	687.4
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.50	3	40	0.004	0.050	0.500	25465	306	7.6
		0.60	3	40	0.006	0.060	0.600	21220	382	13.8
		0.80	3	40	0.008	0.080	0.800	15915	382	24.4
		1.00	3	40	0.012	0.100	1.000	12730	458	45.8
		1.20	3	40	0.012	0.120	1.200	10610	382	55.0
		1.50	3	40	0.016	0.150	1.500	8490	408	91.7
		2.00	3	40	0.020	0.200	2.000	6365	382	152.8
		2.50	3	40	0.028	0.250	2.500	5095	428	267.5
		3.00	3	40	0.032	0.300	3.000	4245	408	366.8
	Gold	0.50	3	160	0.008	0.050	0.500	60000	1440	36.0
		0.60	3	160	0.010	0.060	0.600	60000	1800	64.8
		0.80	3	160	0.012	0.080	0.800	60000	2160	138.2
		1.00	3	160	0.016	0.100	1.000	50930	2445	244.5
		1.20	3	160	0.020	0.120	1.200	42440	2546	366.7
		1.50	3	160	0.024	0.150	1.500	33955	2445	550.1
		2.00	3	160	0.032	0.200	2.000	25465	2445	977.8
		2.50	3	160	0.040	0.250	2.500	20370	2444	1527.8
		3.00	3	160	0.048	0.300	3.000	16975	2444	2200.0
	Steel 850 - 1300 N/mm²	0.50	3	66	0.006	0.050	0.500	42015	756	18.9
		0.60	3	79	0.008	0.060	0.600	41910	1006	36.2
		0.80	3	100	0.010	0.080	0.800	39790	1194	76.4
		1.00	3	100	0.014	0.100	1.000	31830	1337	133.7
		1.20	3	100	0.016	0.120	1.200	26525	1273	183.3
		1.50	3	100	0.020	0.150	1.500	21220	1273	286.5
		2.00	3	100	0.026	0.200	2.000	15915	1241	496.6
		2.50	3	100	0.034	0.250	2.500	12730	1299	811.6
		3.00	3	100	0.040	0.300	3.000	10610	1273	1145.9

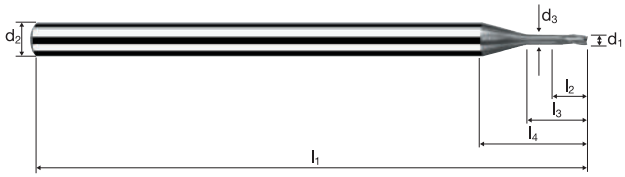
Cylindrical/Square end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

HM
XA

λ 25°
γ -10°

90°

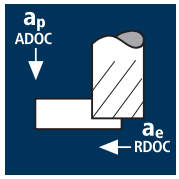
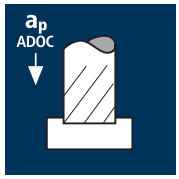


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **15754** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	z	MICRO M15754
050	0.50	3.00	0.45	40	0.60	2.50	2.50	7.65	3	●
060	0.60	3.00	0.55	40	0.72	3.00	3.00	7.97	3	●
080	0.80	3.00	0.75	40	0.96	4.00	4.00	8.59	3	●
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	3	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	3	●
120	1.50	3.00	1.40	60	1.80	7.50	7.50	10.88	3	●
140	2.00	3.00	1.90	60	2.40	10.00	10.00	12.45	3	●
160	2.50	3.00	2.30	60	3.00	12.50	12.50	14.20	3	●
180	3.00	3.00	2.80	60	3.60	14.56	14.56	15.00	3	●

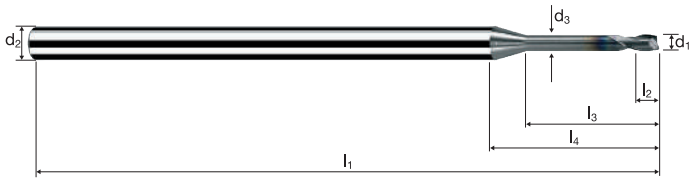
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel 850 - 1100 N/mm²	0.50	2	180	0.012	0.300	0.060	60000	1440	25.9
		0.60	2	180	0.014	0.360	0.070	60000	1680	42.3
		0.80	2	180	0.018	0.480	0.090	60000	2160	93.3
		1.00	2	180	0.022	0.600	0.110	57295	2521	166.4
		1.20	2	180	0.026	0.720	0.130	47745	2483	232.4
		1.50	2	180	0.034	0.900	0.170	38195	2597	397.4
		2.00	2	180	0.044	1.200	0.220	28650	2521	665.6
		2.50	2	180	0.056	1.500	0.280	22920	2567	1078.1
		3.00	2	180	0.066	1.800	0.330	19100	2521	1497.6
	Steel 1100 - 1300 N/mm²	0.50	2	160	0.010	0.300	0.060	60000	1200	21.6
		0.60	2	160	0.012	0.360	0.070	60000	1440	36.3
		0.80	2	160	0.016	0.480	0.090	60000	1920	82.9
		1.00	2	160	0.020	0.600	0.110	50930	2037	134.5
		1.20	2	160	0.024	0.720	0.130	42440	2037	190.7
		1.50	2	160	0.030	0.900	0.170	33955	2037	311.7
		2.00	2	160	0.040	1.200	0.220	25465	2037	537.8
		2.50	2	160	0.050	1.500	0.280	20370	2037	855.5
		3.00	2	160	0.060	1.800	0.330	16975	2037	1210.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	80	0.010	0.300	0.060	50930	1019	18.3
		0.60	2	80	0.012	0.360	0.070	42440	1019	25.7
		0.80	2	80	0.014	0.480	0.090	31830	891	38.5
		1.00	2	80	0.018	0.600	0.110	25465	917	60.5
		1.20	2	80	0.020	0.720	0.130	21220	849	79.4
		1.50	2	80	0.028	0.900	0.170	16975	951	145.4
		2.00	2	80	0.036	1.200	0.220	12730	917	242.0
		2.50	2	80	0.044	1.500	0.280	10185	896	376.4
		3.00	2	80	0.052	1.800	0.330	8490	883	524.5
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.50	2	60	0.008	0.300	0.060	38195	611	11.0
		0.60	2	60	0.010	0.360	0.070	31830	637	16.0
		0.80	2	60	0.012	0.480	0.090	23875	573	24.8
		1.00	2	60	0.016	0.600	0.110	19100	611	40.3
		1.20	2	60	0.018	0.720	0.130	15915	573	53.6
		1.50	2	60	0.024	0.900	0.170	12730	611	93.5
		2.00	2	60	0.030	1.200	0.220	9550	573	151.3
		2.50	2	60	0.040	1.500	0.280	7640	611	256.7
		3.00	2	60	0.046	1.800	0.330	6365	586	347.8
	Steel 850 - 1100 N/mm²	0.50	2	160	0.010	0.050	0.500	60000	1200	30.0
		0.60	2	160	0.010	0.060	0.600	60000	1200	43.2
		0.80	2	160	0.014	0.080	0.800	60000	1680	107.5
		1.00	2	160	0.018	0.100	1.000	50930	1834	183.4
		1.20	2	160	0.022	0.120	1.200	42440	1867	268.9
		1.50	2	160	0.028	0.150	1.500	33955	1902	427.8
		2.00	2	160	0.036	0.200	2.000	25465	1834	733.4
		2.50	2	160	0.046	0.250	2.500	20370	1874	1171.3
		3.00	2	160	0.054	0.300	3.000	16975	1833	1650.0
	Steel 1100 - 1300 N/mm²	0.50	2	140	0.010	0.050	0.500	60000	1200	30.0
		0.60	2	140	0.010	0.060	0.600	60000	1200	43.2
		0.80	2	140	0.014	0.080	0.800	55705	1560	99.8
		1.00	2	140	0.018	0.100	1.000	44565	1604	160.4
		1.20	2	140	0.020	0.120	1.200	37135	1485	213.9
		1.50	2	140	0.026	0.150	1.500	29710	1545	347.6
		2.00	2	140	0.034	0.200	2.000	22280	1515	606.0
		2.50	2	140	0.044	0.250	2.500	17825	1569	980.4
		3.00	2	140	0.052	0.300	3.000	14855	1545	1390.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.50	2	70	0.008	0.050	0.500	44565	713	17.8
		0.60	2	70	0.008	0.060	0.600	37135	594	21.4
		0.80	2	70	0.012	0.080	0.800	27850	668	42.8
		1.00	2	70	0.016	0.100	1.000	22280	713	71.3
		1.20	2	70	0.020	0.120	1.200	18570	743	107.0
		1.50	2	70	0.024	0.150	1.500	14855	713	160.4
		2.00	2	70	0.032	0.200	2.000	11140	713	285.2
		2.50	2	70	0.040	0.250	2.500	8915	713	445.8
		3.00	2	70	0.048	0.300	3.000	7425	713	641.5
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.50	2	50	0.008	0.050	0.500	31830	509	12.7
		0.60	2	50	0.008	0.060	0.600	26525	424	15.3
		0.80	2	50	0.012	0.080	0.800	19895	478	30.6
		1.00	2	50	0.014	0.100	1.000	15915	446	44.6
		1.20	2	50	0.018	0.120	1.200	13265	478	68.8
		1.50	2	50	0.022	0.150	1.500	10610	467	105.0
		2.00	2	50	0.028	0.200	2.000	7960	446	178.3
		2.50	2	50	0.036	0.250	2.500	6365	458	286.4
		3.00	2	50	0.044	0.300	3.000	5305	467	420.1

Cylindrical/Square end mills Microcut

Shank ø 3mm, cylindrical neck, 8xd

HM MG10 | λ 25° γ 6°

45°

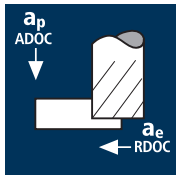
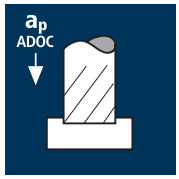


ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Rm** 1300-1500 **HRC** 42-48 | **Inox** Stainless | **Ti** Titanium | Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5716** ø-Code **050**

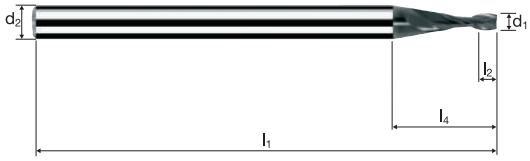
Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	MICRO M5716
050	0.50	3.00	0.45	40	0.60	4.00	4.00	9.15	-	2	●
060	0.60	3.00	0.55	40	0.72	4.80	4.80	9.77	-	2	●
080	0.80	3.00	0.75	40	0.96	6.40	6.40	10.99	-	2	●
100	1.00	3.00	0.95	50	1.20	8.00	8.00	12.22	0.04	2	●
108	1.20	3.00	1.10	50	1.44	9.60	9.60	13.54	0.04	2	●
120	1.50	3.00	1.40	60	1.80	12.00	12.00	15.38	0.04	2	●
140	2.00	3.00	1.90	60	2.40	16.00	16.00	18.45	0.05	2	●
160	2.50	3.00	2.30	60	3.00	20.00	20.00	21.70	0.05	2	●
180	3.00	3.00	2.80	60	3.60	23.56	23.56	24.00	0.05	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel < 850 N/mm²	0.30	2	180	0.006	0.240	0.050	60000	720	8.6
		0.50	2	180	0.010	0.400	0.080	60000	1200	38.4
		0.60	2	180	0.010	0.480	0.090	60000	1200	51.8
		0.80	2	180	0.014	0.640	0.120	60000	1680	129.0
		1.00	2	180	0.018	0.800	0.150	57295	2063	247.5
		1.20	2	180	0.022	0.960	0.180	47745	2101	363.0
		1.50	2	180	0.028	1.200	0.230	38195	2139	590.3
		1.80	2	180	0.032	1.440	0.270	31830	2037	792.0
		2.00	2	180	0.036	1.600	0.300	28650	2063	990.1
	Steel 850 - 1100 N/mm²	0.30	2	160	0.006	0.240	0.050	60000	720	8.6
		0.50	2	160	0.010	0.400	0.080	60000	1200	38.4
		0.60	2	160	0.010	0.480	0.090	60000	1200	51.8
		0.80	2	160	0.012	0.640	0.120	60000	1440	110.6
		1.00	2	160	0.016	0.800	0.150	50930	1630	195.6
		1.20	2	160	0.020	0.960	0.180	42440	1698	293.3
		1.50	2	160	0.026	1.200	0.230	33955	1766	487.3
		1.80	2	160	0.028	1.440	0.270	28295	1585	616.1
		2.00	2	160	0.032	1.600	0.300	25465	1630	782.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.30	2	70	0.004	0.240	0.050	60000	480	5.8
		0.50	2	70	0.008	0.400	0.080	44565	713	22.8
		0.60	2	70	0.008	0.480	0.090	37135	594	25.7
		0.80	2	70	0.012	0.640	0.120	27850	668	51.3
		1.00	2	70	0.014	0.800	0.150	22280	624	74.9
		1.20	2	70	0.018	0.960	0.180	18570	669	115.5
		1.50	2	70	0.022	1.200	0.230	14855	654	180.4
		1.80	2	70	0.026	1.440	0.270	12380	644	250.3
		2.00	2	70	0.028	1.600	0.300	11140	624	299.4
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.30	2	60	0.004	0.240	0.050	60000	480	5.8
		0.50	2	60	0.008	0.400	0.080	38195	611	19.6
		0.60	2	60	0.008	0.480	0.090	31830	509	22.0
		0.80	2	60	0.010	0.640	0.120	23875	478	36.7
		1.00	2	60	0.012	0.800	0.150	19100	458	55.0
		1.20	2	60	0.016	0.960	0.180	15915	509	88.0
		1.50	2	60	0.020	1.200	0.230	12730	509	140.5
		1.80	2	60	0.022	1.440	0.270	10610	467	181.5
		2.00	2	60	0.026	1.600	0.300	9550	497	238.4
	Steel < 850 N/mm²	0.30	2	160	0.006	0.040	0.300	60000	720	8.6
		0.50	2	160	0.008	0.060	0.500	60000	960	28.8
		0.60	2	160	0.010	0.070	0.600	60000	1200	50.4
		0.80	2	160	0.014	0.100	0.800	60000	1680	134.4
		1.00	2	160	0.016	0.120	1.000	50930	1630	195.6
		1.20	2	160	0.020	0.140	1.200	42440	1698	285.2
		1.50	2	160	0.026	0.180	1.500	33955	1766	476.7
		1.80	2	160	0.030	0.220	1.800	28295	1698	672.3
		2.00	2	160	0.034	0.240	2.000	25465	1732	831.2
	Steel 850 - 1100 N/mm²	0.30	2	140	0.006	0.040	0.300	60000	720	8.6
		0.50	2	140	0.008	0.060	0.500	60000	960	28.8
		0.60	2	140	0.010	0.070	0.600	60000	1200	50.4
		0.80	2	140	0.014	0.100	0.800	55705	1560	124.8
		1.00	2	140	0.016	0.120	1.000	44565	1426	171.1
		1.20	2	140	0.020	0.140	1.200	37135	1485	249.5
		1.50	2	140	0.024	0.180	1.500	29710	1426	385.0
		1.80	2	140	0.028	0.220	1.800	24755	1386	549.0
		2.00	2	140	0.032	0.240	2.000	22280	1426	684.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.30	2	60	0.006	0.040	0.300	60000	720	8.6
		0.50	2	60	0.008	0.060	0.500	38195	611	18.3
		0.60	2	60	0.008	0.070	0.600	31830	509	21.4
		0.80	2	60	0.012	0.100	0.800	23875	573	45.8
		1.00	2	60	0.014	0.120	1.000	19100	535	64.2
		1.20	2	60	0.018	0.140	1.200	15915	573	96.2
		1.50	2	60	0.022	0.180	1.500	12730	560	151.2
		1.80	2	60	0.026	0.220	1.800	10610	552	218.5
		2.00	2	60	0.030	0.240	2.000	9550	573	275.0
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	0.30	2	50	0.004	0.040	0.300	53050	424	5.1
		0.50	2	50	0.006	0.060	0.500	31830	382	11.5
		0.60	2	50	0.008	0.070	0.600	26525	424	17.8
		0.80	2	50	0.012	0.100	0.800	19895	478	38.2
		1.00	2	50	0.012	0.120	1.000	15915	382	45.8
		1.20	2	50	0.016	0.140	1.200	13265	425	71.3
		1.50	2	50	0.020	0.180	1.500	10610	424	114.6
		1.80	2	50	0.024	0.220	1.800	8840	424	168.0
		2.00	2	50	0.028	0.240	2.000	7960	446	214.0

Cylindrical/Square end mills

Shank ø 3mm, 3xd

HM MG10	λ 30° γ 12°
90°	

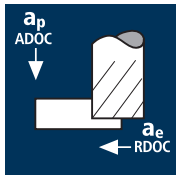
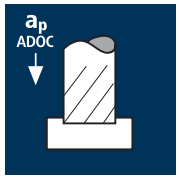


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	Copper Aluminium

Example: **Order-N°.** Coating **M** Article-N°. **45710** ø-Code **030**

Ø Code	d_1 ±0.01	d_2 h6	l_1	l_2	l_4	z	MICRO M45710
030	0.30	3.00	40	1.00	8.97	2	●
040	0.40	3.00	40	1.00	8.69	2	●
050	0.50	3.00	40	1.50	8.90	2	●
060	0.60	3.00	40	1.50	8.62	2	●
070	0.70	3.00	40	2.00	8.83	2	●
080	0.80	3.00	40	2.00	8.55	2	●
090	0.90	3.00	40	2.50	8.77	2	●
100	1.00	3.00	40	3.00	8.98	2	●
104	1.10	3.00	40	3.00	8.75	2	●
108	1.20	3.00	40	4.00	9.47	2	●
112	1.30	3.00	40	4.00	9.18	2	●
116	1.40	3.00	40	4.00	8.90	2	●
120	1.50	3.00	40	4.00	8.62	2	●
123	1.60	3.00	40	5.00	9.33	2	●
126	1.70	3.00	40	5.00	7.41	2	●
130	1.80	3.00	40	5.00	7.28	2	●
135	1.90	3.00	40	5.00	7.14	2	●
140	2.00	3.00	40	5.00	7.00	2	●

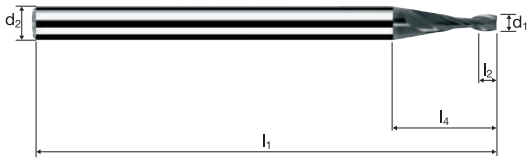
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel < 850 N/mm²	2.10	2	180	0.038	1.680	0.320	27285	2074	1114.8
		2.20	2	180	0.040	1.760	0.330	26045	2084	1210.2
		2.30	2	180	0.042	1.840	0.350	24910	2092	1347.5
		2.40	2	180	0.044	1.920	0.360	23875	2101	1452.2
		2.50	2	180	0.046	2.000	0.380	22920	2109	1602.5
		3.00	2	180	0.054	2.400	0.450	19100	2063	2227.8
	Steel 850 - 1100 N/mm²	2.10	2	160	0.034	1.680	0.320	24250	1649	886.5
		2.20	2	160	0.036	1.760	0.330	23150	1667	968.1
		2.30	2	160	0.038	1.840	0.350	22145	1683	1083.9
		2.40	2	160	0.040	1.920	0.360	21220	1698	1173.4
		2.50	2	160	0.042	2.000	0.380	20370	1711	1300.4
		3.00	2	160	0.048	2.400	0.450	16975	1630	1760.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.10	2	70	0.030	1.680	0.320	10610	637	342.2
		2.20	2	70	0.032	1.760	0.330	10130	648	376.5
		2.30	2	70	0.034	1.840	0.350	9690	659	424.3
		2.40	2	70	0.036	1.920	0.360	9285	669	462.1
		2.50	2	70	0.036	2.000	0.380	8915	642	487.8
		3.00	2	70	0.044	2.400	0.450	7425	653	705.7
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	2.10	2	60	0.026	1.680	0.320	9095	473	254.2
		2.20	2	60	0.028	1.760	0.330	8680	486	282.3
		2.30	2	60	0.030	1.840	0.350	8305	498	320.9
		2.40	2	60	0.030	1.920	0.360	7960	478	330.1
		2.50	2	60	0.032	2.000	0.380	7640	489	371.6
		3.00	2	60	0.038	2.400	0.450	6365	484	522.4
	Steel < 850 N/mm²	2.10	2	160	0.036	0.250	2.100	24250	1746	916.7
		2.20	2	160	0.036	0.260	2.200	23150	1667	953.4
		2.30	2	160	0.038	0.280	2.300	22145	1683	1083.9
		2.40	2	160	0.040	0.290	2.400	21220	1698	1181.5
		2.50	2	160	0.042	0.300	2.500	20370	1711	1283.3
		3.00	2	160	0.050	0.360	3.000	16975	1698	1833.3
	Steel 850 - 1100 N/mm²	2.10	2	140	0.034	0.250	2.100	21220	1443	757.6
		2.20	2	140	0.034	0.260	2.200	20255	1377	787.8
		2.30	2	140	0.036	0.280	2.300	19375	1395	898.4
		2.40	2	140	0.038	0.290	2.400	18570	1411	982.3
		2.50	2	140	0.040	0.300	2.500	17825	1426	1069.5
		3.00	2	140	0.048	0.360	3.000	14855	1426	1540.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.10	2	60	0.032	0.250	2.100	9095	582	305.6
		2.20	2	60	0.032	0.260	2.200	8680	556	317.7
		2.30	2	60	0.034	0.280	2.300	8305	565	363.7
		2.40	2	60	0.036	0.290	2.400	7960	573	398.9
		2.50	2	60	0.036	0.300	2.500	7640	550	412.6
		3.00	2	60	0.044	0.360	3.000	6365	560	604.9
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	2.10	2	50	0.028	0.250	2.100	7580	425	222.9
		2.20	2	50	0.028	0.260	2.200	7235	405	231.8
		2.30	2	50	0.030	0.280	2.300	6920	415	267.4
		2.40	2	50	0.032	0.290	2.400	6630	424	295.3
		2.50	2	50	0.034	0.300	2.500	6365	433	324.6
		3.00	2	50	0.040	0.360	3.000	5305	424	458.4

Cylindrical/Square end mills

Shank ø 3mm, 3xd

HM MG10 | λ 30° γ 12°

90°

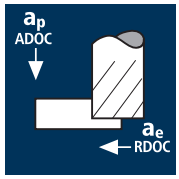
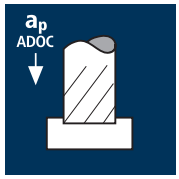


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	Copper Aluminium

Example: **Order-N°.** Coating **M** Article-N°. **45710** ø-Code **143**

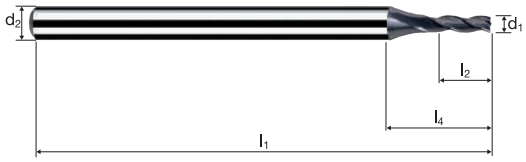
Ø Code	d_1 ±0.01	d_2 h6	l_1	l_2	l_4	z	MICRO M45710
143	2.10	3.00	40	6.00	7.87	2	●
146	2.20	3.00	40	6.00	7.73	2	●
150	2.30	3.00	40	6.00	7.59	2	●
155	2.40	3.00	40	6.00	7.45	2	●
160	2.50	3.00	40	7.00	8.32	2	●
180	3.00	4.00	44	10.00	12.36	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel < 850 N/mm²	0.40	3	180	0.004	0.480	0.040	60000	720	13.8
		0.60	3	180	0.008	0.720	0.060	60000	1440	62.2
		0.80	3	180	0.010	0.960	0.080	60000	1800	138.2
		1.00	3	180	0.012	1.200	0.100	57295	2063	247.5
		1.20	3	180	0.014	1.440	0.120	47745	2005	346.5
		1.40	3	180	0.016	1.680	0.140	40925	1964	462.0
		1.60	3	180	0.018	1.920	0.160	35810	1934	594.0
		1.80	3	180	0.022	2.160	0.180	31830	2101	816.8
		2.00	3	180	0.024	2.400	0.200	28650	2063	990.1
	Short-chipping brass [CuZn]	0.40	3	190	0.004	0.480	0.040	60000	720	13.8
		0.60	3	190	0.008	0.720	0.060	60000	1440	62.2
		0.80	3	190	0.012	0.960	0.080	60000	2160	165.9
		1.00	3	190	0.014	1.200	0.100	60000	2520	302.4
		1.20	3	190	0.016	1.440	0.120	50400	2419	418.0
		1.40	3	190	0.018	1.680	0.140	43200	2333	548.7
		1.60	3	190	0.020	1.920	0.160	37800	2268	696.7
		1.80	3	190	0.024	2.160	0.180	33600	2419	940.6
		2.00	3	190	0.026	2.400	0.200	30240	2359	1132.2
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.40	3	70	0.004	0.480	0.040	55705	669	12.8
		0.60	3	70	0.006	0.720	0.060	37135	668	28.9
		0.80	3	70	0.008	0.960	0.080	27850	668	51.3
		1.00	3	70	0.010	1.200	0.100	22280	668	80.2
		1.20	3	70	0.012	1.440	0.120	18570	669	115.5
		1.40	3	70	0.012	1.680	0.140	15915	573	134.7
		1.60	3	70	0.014	1.920	0.160	13925	585	179.7
		1.80	3	70	0.018	2.160	0.180	12380	669	259.9
		2.00	3	70	0.020	2.400	0.200	11140	668	320.8
	Titanium alloys >300 HB [Ti6Al4V]	0.40	3	50	0.002	0.480	0.040	39790	239	4.6
		0.60	3	50	0.006	0.720	0.060	26525	478	20.6
		0.80	3	50	0.008	0.960	0.080	19895	478	36.7
		1.00	3	50	0.008	1.200	0.100	15915	382	45.8
		1.20	3	50	0.010	1.440	0.120	13265	398	68.8
		1.40	3	50	0.012	1.680	0.140	11370	409	96.3
		1.60	3	50	0.012	1.920	0.160	9945	358	110.0
		1.80	3	50	0.016	2.160	0.180	8840	424	165.0
		2.00	3	50	0.016	2.400	0.200	7960	382	183.4
	Steel < 850 N/mm²	0.40	3	160	0.004	0.050	0.400	60000	720	14.4
		0.60	3	160	0.006	0.070	0.600	60000	1080	45.4
		0.80	3	160	0.008	0.100	0.800	60000	1440	115.2
		1.00	3	160	0.012	0.120	1.000	50930	1834	220.0
		1.20	3	160	0.014	0.140	1.200	42440	1783	299.5
		1.40	3	160	0.016	0.170	1.400	36380	1746	415.6
		1.60	3	160	0.018	0.190	1.600	31830	1719	522.5
		1.80	3	160	0.020	0.220	1.800	28295	1698	672.3
		2.00	3	160	0.022	0.240	2.000	25465	1681	806.7
	Short-chipping brass [CuZn]	0.40	3	170	0.004	0.050	0.400	60000	720	14.4
		0.60	3	170	0.006	0.070	0.600	60000	1080	45.4
		0.80	3	170	0.008	0.100	0.800	60000	1440	115.2
		1.00	3	170	0.012	0.120	1.000	54115	1948	233.8
		1.20	3	170	0.014	0.140	1.200	45095	1894	318.2
		1.40	3	170	0.016	0.170	1.400	38650	1855	441.5
		1.60	3	170	0.018	0.190	1.600	33820	1826	555.2
		1.80	3	170	0.022	0.220	1.800	30065	1984	785.8
		2.00	3	170	0.024	0.240	2.000	27055	1948	935.0
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	0.40	3	60	0.004	0.050	0.400	47745	573	11.5
		0.60	3	60	0.006	0.070	0.600	31830	573	24.1
		0.80	3	60	0.008	0.100	0.800	23875	573	45.8
		1.00	3	60	0.010	0.120	1.000	19100	573	68.8
		1.20	3	60	0.012	0.140	1.200	15915	573	96.2
		1.40	3	60	0.014	0.170	1.400	13640	573	136.4
		1.60	3	60	0.016	0.190	1.600	11935	573	174.2
		1.80	3	60	0.018	0.220	1.800	10610	573	226.9
		2.00	3	60	0.020	0.240	2.000	9550	573	275.0
	Titanium alloys >300 HB [Ti6Al4V]	0.40	3	40	0.004	0.050	0.400	31830	382	7.6
		0.60	3	40	0.004	0.070	0.600	21220	255	10.7
		0.80	3	40	0.006	0.100	0.800	15915	287	22.9
		1.00	3	40	0.010	0.120	1.000	12730	382	45.8
		1.20	3	40	0.012	0.140	1.200	10610	382	64.2
		1.40	3	40	0.012	0.170	1.400	9095	327	77.9
		1.60	3	40	0.014	0.190	1.600	7960	334	101.6
		1.80	3	40	0.016	0.220	1.800	7075	340	134.5
		2.00	3	40	0.018	0.240	2.000	6365	344	165.0

Cylindrical/Square end mills

Shank ø 3mm, 3xd

HM MG10	λ 30° γ 8°
90°	

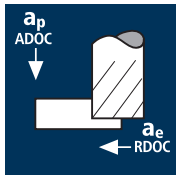
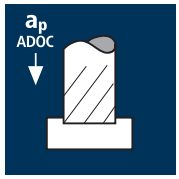


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	CuZn Brass Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **45713** ø-Code **040**

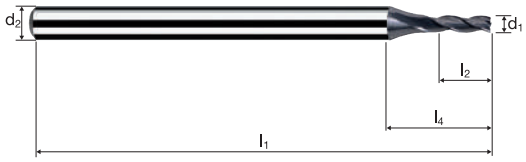
Ø Code	d_1 ±0.01	d_2 h6	l_1	l_2	l_4	z	MICRO M45713
040	0.40	3.00	40	1.20	6.50	3	●
050	0.50	3.00	40	1.50	6.61	3	●
060	0.60	3.00	40	1.80	6.72	3	●
070	0.70	3.00	40	2.10	6.84	3	●
080	0.80	3.00	40	2.40	6.95	3	●
090	0.90	3.00	40	2.70	7.06	3	●
100	1.00	3.00	40	3.00	7.18	3	●
104	1.10	3.00	40	3.30	7.34	3	●
108	1.20	3.00	40	3.60	7.45	3	●
112	1.30	3.00	40	3.90	7.57	3	●
116	1.40	3.00	40	4.20	7.68	3	●
120	1.50	3.00	40	4.50	7.79	3	●
123	1.60	3.00	40	4.80	7.91	3	●
126	1.70	3.00	40	5.10	8.02	3	●
130	1.80	3.00	40	5.40	8.13	3	●
135	1.90	3.00	40	5.70	8.25	3	●
140	2.00	3.00	40	6.00	8.36	3	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
	Steel < 850 N/mm²	2.10	3	180	0.024	2.520	0.210	27285	1965	1039.6
		2.20	3	180	0.026	2.640	0.220	26045	2032	1179.9
		2.30	3	180	0.028	2.760	0.230	24910	2092	1328.3
		2.40	3	180	0.028	2.880	0.240	23875	2006	1386.2
		2.50	3	180	0.030	3.000	0.250	22920	2063	1547.1
		2.60	3	180	0.030	3.120	0.260	22035	1983	1608.8
		2.70	3	180	0.032	3.240	0.270	21220	2037	1782.1
		2.80	3	180	0.032	3.360	0.280	20465	1965	1848.3
		2.90	3	180	0.034	3.480	0.290	19755	2015	2033.5
	Short-chipping brass [CuZn]	2.10	3	190	0.026	2.520	0.210	28800	2246	1188.8
		2.20	3	190	0.028	2.640	0.220	27490	2309	1341.2
		2.30	3	190	0.030	2.760	0.230	26295	2367	1502.3
		2.40	3	190	0.030	2.880	0.240	25200	2268	1567.6
		2.50	3	190	0.034	3.000	0.250	24190	2467	1850.6
		2.60	3	190	0.034	3.120	0.260	23260	2373	1924.6
		2.70	3	190	0.036	3.240	0.270	22400	2419	2116.3
		2.80	3	190	0.036	3.360	0.280	21600	2333	2194.7
		2.90	3	190	0.038	3.480	0.290	20855	2378	2399.4
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.10	3	70	0.020	2.520	0.210	10610	637	336.9
		2.20	3	70	0.020	2.640	0.220	10130	608	353.0
		2.30	3	70	0.022	2.760	0.230	9690	640	406.0
		2.40	3	70	0.022	2.880	0.240	9285	613	423.6
		2.50	3	70	0.024	3.000	0.250	8915	642	481.4
		2.60	3	70	0.024	3.120	0.260	8570	617	500.5
		2.70	3	70	0.026	3.240	0.270	8250	644	562.9
		2.80	3	70	0.026	3.360	0.280	7960	621	584.1
		2.90	3	70	0.028	3.480	0.290	7685	646	651.4
	Titanium alloys >300 HB [Ti6Al4V]	2.10	3	50	0.016	2.520	0.210	7580	364	192.5
		2.20	3	50	0.018	2.640	0.220	7235	391	226.9
		2.30	3	50	0.020	2.760	0.230	6920	415	263.6
		2.40	3	50	0.020	2.880	0.240	6630	398	275.0
		2.50	3	50	0.022	3.000	0.250	6365	420	315.1
		2.60	3	50	0.022	3.120	0.260	6120	404	327.6
		2.70	3	50	0.022	3.240	0.270	5895	389	340.4
		2.80	3	50	0.022	3.360	0.280	5685	375	353.0
		2.90	3	50	0.024	3.480	0.290	5490	395	398.9
	Steel < 850 N/mm²	2.10	3	160	0.024	0.250	2.100	24250	1746	916.7
		2.20	3	160	0.024	0.260	2.200	23150	1667	953.4
		2.30	3	160	0.026	0.280	2.300	22145	1727	1112.4
		2.40	3	160	0.026	0.290	2.400	21220	1655	1152.0
		2.50	3	160	0.028	0.300	2.500	20370	1711	1283.3
		2.60	3	160	0.028	0.310	2.600	19590	1646	1326.4
		2.70	3	160	0.030	0.320	2.700	18865	1698	1467.0
		2.80	3	160	0.032	0.340	2.800	18190	1746	1662.4
		2.90	3	160	0.032	0.350	2.900	17560	1686	1711.1
	Short-chipping brass [CuZn]	2.10	3	170	0.026	0.250	2.100	25770	2010	1055.3
		2.20	3	170	0.026	0.260	2.200	24595	1918	1097.3
		2.30	3	170	0.028	0.280	2.300	23525	1976	1272.6
		2.40	3	170	0.028	0.290	2.400	22545	1894	1318.1
		2.50	3	170	0.030	0.300	2.500	21645	1948	1461.1
		2.60	3	170	0.030	0.310	2.600	20815	1873	1510.0
		2.70	3	170	0.032	0.320	2.700	20040	1924	1662.2
		2.80	3	170	0.034	0.340	2.800	19325	1971	1876.6
		2.90	3	170	0.034	0.350	2.900	18660	1903	1931.8
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.10	3	60	0.022	0.250	2.100	9095	600	315.2
		2.20	3	60	0.022	0.260	2.200	8680	573	327.7
		2.30	3	60	0.022	0.280	2.300	8305	548	353.0
		2.40	3	60	0.022	0.290	2.400	7960	525	365.7
		2.50	3	60	0.024	0.300	2.500	7640	550	412.6
		2.60	3	60	0.024	0.310	2.600	7345	529	426.2
		2.70	3	60	0.026	0.320	2.700	7075	552	476.8
		2.80	3	60	0.028	0.340	2.800	6820	573	545.4
		2.90	3	60	0.028	0.350	2.900	6585	553	561.4
	Titanium alloys >300 HB [Ti6Al4V]	2.10	3	40	0.020	0.250	2.100	6065	364	191.0
		2.20	3	40	0.020	0.260	2.200	5785	347	198.5
		2.30	3	40	0.020	0.280	2.300	5535	332	213.9
		2.40	3	40	0.020	0.290	2.400	5305	318	221.5
		2.50	3	40	0.022	0.300	2.500	5095	336	252.2
		2.60	3	40	0.022	0.310	2.600	4895	323	260.4
		2.70	3	40	0.024	0.320	2.700	4715	340	293.3
		2.80	3	40	0.026	0.340	2.800	4545	355	337.5
		2.90	3	40	0.026	0.350	2.900	4390	342	347.5

Cylindrical/Square end mills

Shank ø 3mm, 3xd

HM MG10	λ 30° γ 8°
90°	



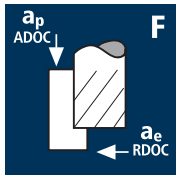
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	CuZn Brass Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **45713** ø-Code **143**

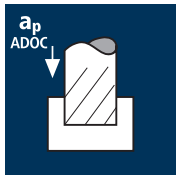
Ø Code	d_1 ±0.01	d_2 h6	l_1	l_2	l_4	z	MICRO M45713
143	2.10	3.00	40	6.30	8.47	3	●
146	2.20	3.00	40	6.60	8.59	3	●
150	2.30	3.00	40	6.90	8.70	3	●
155	2.40	3.00	40	7.20	8.81	3	●
160	2.50	3.00	40	7.50	8.93	3	●
165	2.60	3.00	45	7.80	9.04	3	●
170	2.70	3.00	45	8.10	9.15	3	●
172	2.80	3.00	45	8.40	9.27	3	●
176	2.90	3.00	45	8.70	9.38	3	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
Steel < 850 N/mm²	2.00	3	115	0.005	2.000	0.300	18305	275
	3.00	3	115	0.010	3.000	0.500	12200	366
	4.00	3	115	0.015	4.000	0.600	9150	412
	5.00	3	115	0.015	5.000	0.800	7320	329
	6.00	3	115	0.020	6.000	0.900	6100	366
	8.00	3	115	0.025	8.000	1.200	4575	343
	10.00	3	115	0.035	10.000	1.500	3660	384
Steel 850 - 1100 N/mm²	2.00	3	75	0.005	2.000	0.300	11935	179
	3.00	3	75	0.010	3.000	0.500	7960	239
	4.00	3	75	0.015	4.000	0.600	5970	269
	5.00	3	75	0.015	5.000	0.800	4775	215
	6.00	3	75	0.020	6.000	0.900	3980	239
	8.00	3	75	0.025	8.000	1.200	2985	224
	10.00	3	75	0.035	10.000	1.500	2385	250
Titanium alloys >300 HB [Ti6Al4V]	2.00	3	50	0.005	2.000	0.300	7960	119
	3.00	3	50	0.010	3.000	0.500	5305	159
	4.00	3	50	0.015	4.000	0.600	3980	179
	5.00	3	50	0.015	5.000	0.800	3185	143
	6.00	3	50	0.020	6.000	0.900	2655	159
	8.00	3	50	0.025	8.000	1.200	1990	149
	10.00	3	50	0.035	10.000	1.500	1590	167
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	80	0.005	2.000	0.300	12730	191
	3.00	3	80	0.010	3.000	0.500	8490	255
	4.00	3	80	0.015	4.000	0.600	6365	286
	5.00	3	80	0.015	5.000	0.800	5095	229
	6.00	3	80	0.020	6.000	0.900	4245	255
	8.00	3	80	0.025	8.000	1.200	3185	239
	10.00	3	80	0.035	10.000	1.500	2545	267

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel < 850 N/mm²	2.00	3	85	0.005	1.600	2.000	13530	203	0.6
	3.00	3	85	0.010	2.400	3.000	9020	271	1.9
	4.00	3	85	0.010	3.200	4.000	6765	203	2.6
	5.00	3	85	0.015	4.000	5.000	5410	244	4.9
	6.00	3	85	0.015	4.800	6.000	4510	203	5.8
	8.00	3	85	0.020	6.400	8.000	3380	203	10.4
	10.00	3	85	0.030	8.000	10.000	2705	244	19.5
Steel 850 - 1100 N/mm²	2.00	3	60	0.005	1.600	2.000	9550	143	0.5
	3.00	3	60	0.010	2.400	3.000	6365	191	1.4
	4.00	3	60	0.010	3.200	4.000	4775	143	1.8
	5.00	3	60	0.015	4.000	5.000	3820	172	3.4
	6.00	3	60	0.015	4.800	6.000	3185	143	4.1
	8.00	3	60	0.020	6.400	8.000	2385	143	7.3
	10.00	3	60	0.025	8.000	10.000	1910	143	11.5
Titanium alloys >300 HB [Ti6Al4V]	2.00	3	40	0.005	1.600	2.000	6365	96	0.3
	3.00	3	40	0.010	2.400	3.000	4245	127	0.9
	4.00	3	40	0.010	3.200	4.000	3185	96	1.2
	5.00	3	40	0.015	4.000	5.000	2545	115	2.3
	6.00	3	40	0.015	4.800	6.000	2120	95	2.7
	8.00	3	40	0.020	6.400	8.000	1590	95	4.9
	10.00	3	40	0.025	8.000	10.000	1275	96	7.6
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	55	0.005	1.600	2.000	8755	131	0.4
	3.00	3	55	0.010	2.400	3.000	5835	175	1.3
	4.00	3	55	0.010	3.200	4.000	4375	131	1.7
	5.00	3	55	0.015	4.000	5.000	3500	158	3.2
	6.00	3	55	0.015	4.800	6.000	2920	131	3.8
	8.00	3	55	0.020	6.400	8.000	2190	131	6.7
	10.00	3	55	0.025	8.000	10.000	1750	131	10.5

Cylindrical/Square end mills

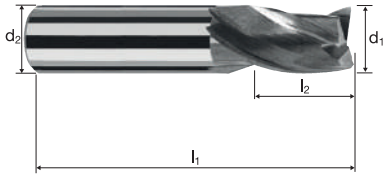
Smooth-edged, short-shank version

HM
MG10

λ **30°**
γ **12°**

90°

Vario



Roughing

Finishing

ReTool®

Rm < 850 **HRC** < 24

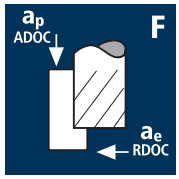
Rm 850-1100 **HRC** 24-34

Aluminium
Copper / CuZn Brass
Gold

Example: **Order-N°.** Coating **P** Article-N°. **15232** ø-Code **120**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	15232	POLYCHROM P15232
120	1.50	6.00	38	3.00	11.92	3	●	●
140	2.00	6.00	38	3.00	11.15	3	●	●
160	2.50	6.00	38	3.00	10.88	3	●	●
180	3.00	6.00	38	4.00	11.96	3	●	●
200	3.50	6.00	38	4.00	11.02	3	●	●
220	4.00	6.00	38	5.00	11.59	3	●	●
240	4.50	6.00	38	5.00	10.66	3	●	●
260	5.00	6.00	38	6.00	10.72	3	●	●
300	6.00	6.00	38	7.00	-	3	●	●
391	8.00	8.00	41	9.00	-	3	●	●
450	10.00	10.00	48	11.00	-	3	●	●

Application



Material

Steel
< 850 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
2.00	3	105	0.005	2.000	0.200	16710	251
3.00	3	105	0.010	3.000	0.300	11140	334
4.00	3	105	0.015	4.000	0.400	8355	376
5.00	3	105	0.015	5.000	0.500	6685	301
6.00	3	105	0.020	6.000	0.600	5570	334
8.00	3	105	0.025	8.000	0.800	4180	314
10.00	3	105	0.035	10.000	1.000	3340	351

Steel
850 - 1100 N/mm²

2.00	3	75	0.005	2.000	0.200	11935	179
3.00	3	75	0.010	3.000	0.300	7960	239
4.00	3	75	0.015	4.000	0.400	5970	269
5.00	3	75	0.015	5.000	0.500	4775	215
6.00	3	75	0.020	6.000	0.600	3980	239
8.00	3	75	0.025	8.000	0.800	2985	224
10.00	3	75	0.035	10.000	1.000	2385	250

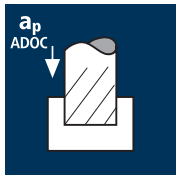
Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

2.00	3	40	0.005	2.000	0.200	6365	96
3.00	3	40	0.010	3.000	0.300	4245	127
4.00	3	40	0.015	4.000	0.400	3185	143
5.00	3	40	0.015	5.000	0.500	2545	115
6.00	3	40	0.020	6.000	0.600	2120	127
8.00	3	40	0.025	8.000	0.800	1590	119
10.00	3	40	0.035	10.000	1.000	1275	134

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

2.00	3	80	0.005	2.000	0.200	12730	191
3.00	3	80	0.010	3.000	0.300	8490	255
4.00	3	80	0.015	4.000	0.400	6365	286
5.00	3	80	0.015	5.000	0.500	5095	229
6.00	3	80	0.020	6.000	0.600	4245	255
8.00	3	80	0.025	8.000	0.800	3185	239
10.00	3	80	0.035	10.000	1.000	2545	267

Application



Material

Steel
< 850 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
2.00	3	75	0.005	1.000	2.000	11935	179	0.4
3.00	3	75	0.010	1.500	3.000	7960	239	1.1
4.00	3	75	0.010	2.000	4.000	5970	179	1.4
5.00	3	75	0.015	2.500	5.000	4775	215	2.7
6.00	3	75	0.015	3.000	6.000	3980	179	3.2
8.00	3	75	0.020	4.000	8.000	2985	179	5.7
10.00	3	75	0.030	5.000	10.000	2385	215	10.7

Steel
850 - 1100 N/mm²

2.00	3	60	0.005	1.000	2.000	9550	143	0.3
3.00	3	60	0.010	1.500	3.000	6365	191	0.9
4.00	3	60	0.010	2.000	4.000	4775	143	1.1
5.00	3	60	0.015	2.500	5.000	3820	172	2.1
6.00	3	60	0.015	3.000	6.000	3185	143	2.6
8.00	3	60	0.020	4.000	8.000	2385	143	4.6
10.00	3	60	0.025	5.000	10.000	1910	143	7.2

Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

2.00	3	30	0.005	1.000	2.000	4775	72	0.1
3.00	3	30	0.010	1.500	3.000	3185	96	0.4
4.00	3	30	0.010	2.000	4.000	2385	72	0.6
5.00	3	30	0.015	2.500	5.000	1910	86	1.1
6.00	3	30	0.015	3.000	6.000	1590	72	1.3
8.00	3	30	0.020	4.000	8.000	1195	72	2.3
10.00	3	30	0.025	5.000	10.000	955	72	3.6

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

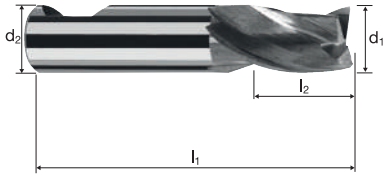
2.00	3	55	0.005	1.000	2.000	8755	131	0.3
3.00	3	55	0.010	1.500	3.000	5835	175	0.8
4.00	3	55	0.010	2.000	4.000	4375	131	1.1
5.00	3	55	0.015	2.500	5.000	3500	158	2.0
6.00	3	55	0.015	3.000	6.000	2920	131	2.4
8.00	3	55	0.020	4.000	8.000	2190	131	4.2
10.00	3	55	0.025	5.000	10.000	1750	131	6.6

Cylindrical/Square end mills

Smooth-edged, short-shank version

Favora® F

HM MG10	λ 30° γ 12°
90°	



Roughing

Finishing

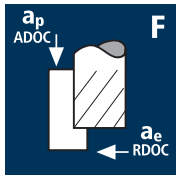
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **5336** ø-Code **120**

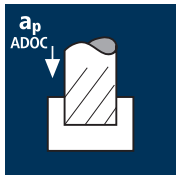
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	POLYCHROM P5336	POLYCHROM P5236
120	1.50	6.00	38	3.00	11.92	3		●
140	2.00	6.00	38	3.00	11.15	3		●
160	2.50	6.00	38	3.00	10.88	3		●
180	3.00	6.00	38	4.00	11.96	3		●
200	3.50	6.00	38	4.00	11.02	3		●
220	4.00	6.00	38	5.00	11.59	3		●
240	4.50	6.00	38	5.00	10.66	3		●
260	5.00	6.00	38	6.00	10.72	3		●
300	6.00	6.00	38	7.00	-	3		●
331	7.00	8.00	41	8.00	12.72	3		●
391	8.00	8.00	41	9.00	-	3		●
420	9.00	10.00	48	10.00	14.72	3		●
450	10.00	10.00	48	11.00	-	3		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
Steel < 850 N/mm²	2.00	3	105	0.005	2.000	0.200	16710	251
	3.00	3	105	0.010	3.000	0.300	11140	334
	4.00	3	105	0.015	4.000	0.400	8355	376
	5.00	3	105	0.015	5.000	0.500	6685	301
	6.00	3	105	0.020	6.000	0.600	5570	334
	8.00	3	105	0.025	8.000	0.800	4180	314
	10.00	3	105	0.035	10.000	1.000	3340	351
Steel 850 - 1100 N/mm²	2.00	3	75	0.005	2.000	0.200	11935	179
	3.00	3	75	0.010	3.000	0.300	7960	239
	4.00	3	75	0.015	4.000	0.400	5970	269
	5.00	3	75	0.015	5.000	0.500	4775	215
	6.00	3	75	0.020	6.000	0.600	3980	239
	8.00	3	75	0.025	8.000	0.800	2985	224
	10.00	3	75	0.035	10.000	1.000	2385	250
Titanium alloys up to 300 HB [Ti5Al2.5Sn]	2.00	3	40	0.005	2.000	0.200	6365	96
	3.00	3	40	0.010	3.000	0.300	4245	127
	4.00	3	40	0.015	4.000	0.400	3185	143
	5.00	3	40	0.015	5.000	0.500	2545	115
	6.00	3	40	0.020	6.000	0.600	2120	127
	8.00	3	40	0.025	8.000	0.800	1590	119
	10.00	3	40	0.035	10.000	1.000	1275	134
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	80	0.005	2.000	0.200	12730	191
	3.00	3	80	0.010	3.000	0.300	8490	255
	4.00	3	80	0.015	4.000	0.400	6365	286
	5.00	3	80	0.015	5.000	0.500	5095	229
	6.00	3	80	0.020	6.000	0.600	4245	255
	8.00	3	80	0.025	8.000	0.800	3185	239
	10.00	3	80	0.035	10.000	1.000	2545	267

Application



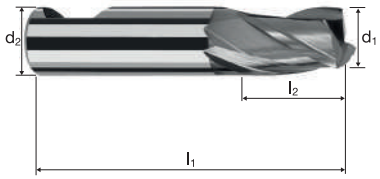
Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel < 850 N/mm²	2.00	3	75	0.005	1.000	2.000	11935	179	0.4
	3.00	3	75	0.010	1.500	3.000	7960	239	1.1
	4.00	3	75	0.010	2.000	4.000	5970	179	1.4
	5.00	3	75	0.015	2.500	5.000	4775	215	2.7
	6.00	3	75	0.015	3.000	6.000	3980	179	3.2
	8.00	3	75	0.020	4.000	8.000	2985	179	5.7
	10.00	3	75	0.030	5.000	10.000	2385	215	10.7
Steel 850 - 1100 N/mm²	2.00	3	60	0.005	1.000	2.000	9550	143	0.3
	3.00	3	60	0.010	1.500	3.000	6365	191	0.9
	4.00	3	60	0.010	2.000	4.000	4775	143	1.1
	5.00	3	60	0.015	2.500	5.000	3820	172	2.1
	6.00	3	60	0.015	3.000	6.000	3185	143	2.6
	8.00	3	60	0.020	4.000	8.000	2385	143	4.6
	10.00	3	60	0.025	5.000	10.000	1910	143	7.2
Titanium alloys up to 300 HB [Ti5Al2.5Sn]	2.00	3	30	0.005	1.000	2.000	4775	72	0.1
	3.00	3	30	0.010	1.500	3.000	3185	96	0.4
	4.00	3	30	0.010	2.000	4.000	2385	72	0.6
	5.00	3	30	0.015	2.500	5.000	1910	86	1.1
	6.00	3	30	0.015	3.000	6.000	1590	72	1.3
	8.00	3	30	0.020	4.000	8.000	1195	72	2.3
	10.00	3	30	0.025	5.000	10.000	955	72	3.6
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	55	0.005	1.000	2.000	8755	131	0.3
	3.00	3	55	0.010	1.500	3.000	5835	175	0.8
	4.00	3	55	0.010	2.000	4.000	4375	131	1.1
	5.00	3	55	0.015	2.500	5.000	3500	158	2.0
	6.00	3	55	0.015	3.000	6.000	2920	131	2.4
	8.00	3	55	0.020	4.000	8.000	2190	131	4.2
	10.00	3	55	0.025	5.000	10.000	1750	131	6.6

Cylindrical/Square end mills

Smooth-edged, short-shank version

HM MG10	λ 30° γ 12°

45°



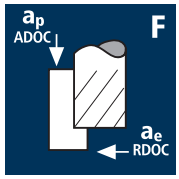
Roughing

Finishing

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **5335** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	45°	z	POLYCHROM P5335
140	2.00	6.00	38	3.00	11.15	0.05	3	●
180	3.00	6.00	38	4.00	11.96	0.05	3	●
220	4.00	6.00	38	5.00	11.59	0.05	3	●
260	5.00	6.00	38	6.00	10.72	0.10	3	●
300	6.00	6.00	38	7.00	-	0.10	3	●
391	8.00	8.00	41	9.00	-	0.10	3	●
450	10.00	10.00	48	11.00	-	0.15	3	●

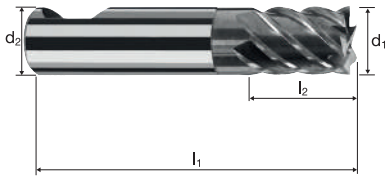
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel < 850 N/mm²	3.00	4	140	0.010	3.000	0.150	14855	594
		4.00	4	140	0.010	4.000	0.200	11140	446
		5.00	4	140	0.015	5.000	0.250	8915	535
		6.00	6	140	0.015	6.000	0.300	7425	668
		8.00	6	140	0.025	8.000	0.400	5570	836
		10.00	6	140	0.030	10.000	0.500	4455	802
	Steel 850 - 1100 N/mm²	3.00	4	100	0.010	3.000	0.150	10610	424
		4.00	4	100	0.010	4.000	0.200	7960	318
		5.00	4	100	0.015	5.000	0.250	6365	382
		6.00	6	100	0.015	6.000	0.300	5305	478
		8.00	6	100	0.025	8.000	0.400	3980	597
		10.00	6	100	0.030	10.000	0.500	3185	573
	Steel 1100 - 1300 N/mm²	3.00	4	75	0.010	3.000	0.150	7960	318
		4.00	4	75	0.010	4.000	0.200	5970	239
		5.00	4	75	0.015	5.000	0.250	4775	287
		6.00	6	75	0.015	6.000	0.300	3980	358
		8.00	6	75	0.025	8.000	0.400	2985	448
		10.00	6	75	0.030	10.000	0.500	2385	429
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	90	0.010	3.000	0.150	9550	382
		4.00	4	90	0.010	4.000	0.200	7160	286
		5.00	4	90	0.015	5.000	0.250	5730	344
		6.00	6	90	0.015	6.000	0.300	4775	430
		8.00	6	90	0.025	8.000	0.400	3580	537
		10.00	6	90	0.030	10.000	0.500	2865	516
	Cast iron (lamellar / spheroidal)	3.00	4	120	0.010	3.000	0.150	12730	509
		4.00	4	120	0.010	4.000	0.200	9550	382
		5.00	4	120	0.015	5.000	0.250	7640	458
		6.00	6	120	0.015	6.000	0.300	6365	573
		8.00	6	120	0.025	8.000	0.400	4775	716
		10.00	6	120	0.030	10.000	0.500	3820	688
	Cold work tool steel (12%Cr) high alloyed [1.2379]	3.00	4	65	0.010	3.000	0.150	6895	276
		4.00	4	65	0.010	4.000	0.200	5175	207
		5.00	4	65	0.015	5.000	0.250	4140	248
		6.00	6	65	0.015	6.000	0.300	3450	311
		8.00	6	65	0.025	8.000	0.400	2585	388
		10.00	6	65	0.030	10.000	0.500	2070	373
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	3.00	4	95	0.010	3.000	0.150	10080	403
		4.00	4	95	0.010	4.000	0.200	7560	302
		5.00	4	95	0.015	5.000	0.250	6050	363
		6.00	6	95	0.015	6.000	0.300	5040	454
		8.00	6	95	0.025	8.000	0.400	3780	567
		10.00	6	95	0.030	10.000	0.500	3025	545
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	50	0.010	3.000	0.150	5305	212
		4.00	4	50	0.010	4.000	0.200	3980	159
		5.00	4	50	0.015	5.000	0.250	3185	191
		6.00	6	50	0.015	6.000	0.300	2655	239
		8.00	6	50	0.025	8.000	0.400	1990	299
		10.00	6	50	0.030	10.000	0.500	1590	286

Cylindrical/Square end mills

Finishing, short-shank version

HM MG10 | λ **45°** γ **10°**

90°



Roughing

Finishing

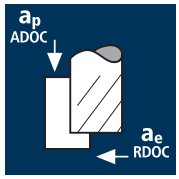
ReTool®

Rm <850 **HRC** <24 | **Rm** 850-1100 **HRC** 24-34 | **Rm** 1100-1300 **HRC** 34-42 | **Inox** Stainless | **Ti** Titanium | **GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **5337** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	POLYCHROM P5337	POLYCHROM P5237
180	3.00	6.00	38	4.00	11.96	4	●	
220	4.00	6.00	38	5.00	11.59	4	●	
260	5.00	6.00	38	6.00	10.72	4	●	
300	6.00	6.00	38	7.00	-	6	●	
391	8.00	8.00	41	9.00	-	6	●	
450	10.00	10.00	48	11.00	-	6	●	

Application



Material

Steel
500 - 850 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
1.50	3	54	0.005	1.500	0.150	11460	172
2.00	3	54	0.010	2.000	0.200	8595	258
2.50	3	54	0.010	2.500	0.250	6875	206
3.00	3	54	0.010	3.000	0.300	5730	172
3.50	3	54	0.015	3.500	0.350	4910	221
4.00	3	54	0.015	4.000	0.400	4295	193
5.00	3	54	0.020	5.000	0.500	3440	206
5.50	3	54	0.020	5.500	0.550	3125	188
6.00	3	54	0.025	6.000	0.600	2865	215

Steel
850 - 1100 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
1.50	3	48	0.005	1.500	0.150	10185	153
2.00	3	48	0.010	2.000	0.200	7640	229
2.50	3	48	0.010	2.500	0.250	6110	183
3.00	3	48	0.010	3.000	0.300	5095	153
3.50	3	48	0.015	3.500	0.350	4365	196
4.00	3	48	0.015	4.000	0.400	3820	172
5.00	3	48	0.020	5.000	0.500	3055	183
5.50	3	48	0.020	5.500	0.550	2780	167
6.00	3	48	0.025	6.000	0.600	2545	191

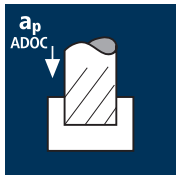
Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
1.50	3	25	0.005	1.500	0.150	5305	80
2.00	3	25	0.010	2.000	0.200	3980	119
2.50	3	25	0.010	2.500	0.250	3185	96
3.00	3	25	0.010	3.000	0.300	2655	80
3.50	3	25	0.015	3.500	0.350	2275	102
4.00	3	25	0.015	4.000	0.400	1990	90
5.00	3	25	0.020	5.000	0.500	1590	95
5.50	3	25	0.020	5.500	0.550	1445	87
6.00	3	25	0.025	6.000	0.600	1325	99

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
1.50	3	22	0.005	1.500	0.150	4670	70
2.00	3	22	0.010	2.000	0.200	3500	105
2.50	3	22	0.010	2.500	0.250	2800	84
3.00	3	22	0.010	3.000	0.300	2335	70
3.50	3	22	0.015	3.500	0.350	2000	90
4.00	3	22	0.015	4.000	0.400	1750	79
5.00	3	22	0.020	5.000	0.500	1400	84
5.50	3	22	0.020	5.500	0.550	1275	77
6.00	3	22	0.025	6.000	0.600	1165	87

Application



Material

Steel
500 - 850 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.50	3	50	0.005	0.750	1.500	10610	159	0.2
2.00	3	50	0.010	1.000	2.000	7960	239	0.5
2.50	3	50	0.010	1.250	2.500	6365	191	0.6
3.00	3	50	0.010	1.500	3.000	5305	159	0.7
3.50	3	50	0.015	1.750	3.500	4545	205	1.3
4.00	3	50	0.015	2.000	4.000	3980	179	1.4
5.00	3	50	0.020	2.500	5.000	3185	191	2.4
5.50	3	50	0.020	2.750	5.500	2895	174	2.6
6.00	3	50	0.025	3.000	6.000	2655	199	3.6

Steel
850 - 1100 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.50	3	45	0.005	0.750	1.500	9550	143	0.2
2.00	3	45	0.010	1.000	2.000	7160	215	0.4
2.50	3	45	0.010	1.250	2.500	5730	172	0.5
3.00	3	45	0.010	1.500	3.000	4775	143	0.6
3.50	3	45	0.015	1.750	3.500	4095	184	1.1
4.00	3	45	0.015	2.000	4.000	3580	161	1.3
5.00	3	45	0.020	2.500	5.000	2865	172	2.1
5.50	3	45	0.020	2.750	5.500	2605	156	2.4
6.00	3	45	0.025	3.000	6.000	2385	179	3.2

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.50	3	22	0.005	0.750	1.500	4670	70	0.1
2.00	3	22	0.010	1.000	2.000	3500	105	0.2
2.50	3	22	0.010	1.250	2.500	2800	84	0.3
3.00	3	22	0.010	1.500	3.000	2335	70	0.3
3.50	3	22	0.015	1.750	3.500	2000	90	0.6
4.00	3	22	0.015	2.000	4.000	1750	79	0.6
5.00	3	22	0.020	2.500	5.000	1400	84	1.1
5.50	3	22	0.020	2.750	5.500	1275	77	1.2
6.00	3	22	0.025	3.000	6.000	1165	87	1.6

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.50	3	20	0.005	0.750	1.500	4245	64	0.1
2.00	3	20	0.010	1.000	2.000	3185	96	0.2
2.50	3	20	0.010	1.250	2.500	2545	76	0.2
3.00	3	20	0.010	1.500	3.000	2120	64	0.3
3.50	3	20	0.015	1.750	3.500	1820	82	0.5
4.00	3	20	0.015	2.000	4.000	1590	72	0.6
5.00	3	20	0.020	2.500	5.000	1275	77	1.0
5.50	3	20	0.020	2.750	5.500	1155	69	1.0
6.00	3	20	0.025	3.000	6.000	1060	80	1.4

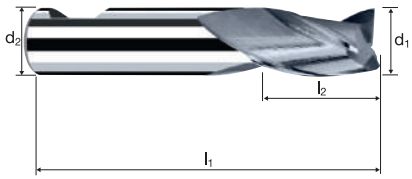
Cylindrical/Square end mills

Smooth-edged, short-shank version

HSS-E Co8

λ 30°
γ 12°

90°



Roughing

Finishing

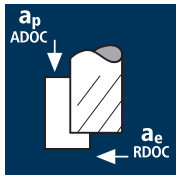
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34						Inox Stainless		Copper

Example: **Order-N°.** Coating **P** Article-N°. **0401** ø-Code **120**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z		POLYCHROM P0401
120	1.50	6.00	34	3.00	10.00	3		●
130	1.80	6.00	34	3.00	10.00	3		●
140	2.00	6.00	35	4.00	11.00	3		●
150	2.30	6.00	35	4.00	11.00	3		●
160	2.50	6.00	36	5.00	12.00	3		●
170	2.80	6.00	36	5.00	12.00	3		●
180	3.00	6.00	36	5.00	12.00	3		●
190	3.30	6.00	37	6.00	13.00	3		●
200	3.50	6.00	37	6.00	13.00	3		●
210	3.80	6.00	38	7.00	14.00	3		●
220	4.00	6.00	38	7.00	14.00	3		●
230	4.30	6.00	38	7.00	14.00	3		●
240	4.50	6.00	38	7.00	14.00	3		●
250	4.80	6.00	39	8.00	15.00	3		●
260	5.00	6.00	39	8.00	15.00	3		●
270	5.30	6.00	39	8.00	15.00	3		●
280	5.50	6.00	39	8.00	15.00	3		●
290	5.75	6.00	39	8.00	15.00	3		●
300	6.00	6.00	39	8.00	-	3		●

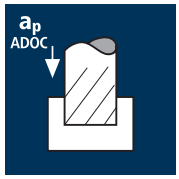
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
Steel 500 - 850 N/mm²							
6.50	3	54	0.025	6.500	0.650	2645	198
7.00	3	54	0.030	7.000	0.700	2455	221
7.50	3	54	0.030	7.500	0.750	2290	206
8.00	3	54	0.030	8.000	0.800	2150	194
8.50	3	54	0.035	8.500	0.850	2020	212
9.00	3	54	0.035	9.000	0.900	1910	201
9.50	3	54	0.040	9.500	0.950	1810	217
10.00	3	54	0.040	10.000	1.000	1720	206
Steel 850 - 1100 N/mm²							
6.50	3	48	0.025	6.500	0.650	2350	176
7.00	3	48	0.030	7.000	0.700	2185	197
7.50	3	48	0.030	7.500	0.750	2035	183
8.00	3	48	0.030	8.000	0.800	1910	172
8.50	3	48	0.035	8.500	0.850	1800	189
9.00	3	48	0.035	9.000	0.900	1700	179
9.50	3	48	0.040	9.500	0.950	1610	193
10.00	3	48	0.040	10.000	1.000	1530	184
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]							
6.50	3	25	0.025	6.500	0.650	1225	92
7.00	3	25	0.030	7.000	0.700	1135	102
7.50	3	25	0.030	7.500	0.750	1060	95
8.00	3	25	0.030	8.000	0.800	995	90
8.50	3	25	0.035	8.500	0.850	935	98
9.00	3	25	0.035	9.000	0.900	885	93
9.50	3	25	0.040	9.500	0.950	840	101
10.00	3	25	0.040	10.000	1.000	795	95
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]							
6.50	3	22	0.025	6.500	0.650	1075	81
7.00	3	22	0.030	7.000	0.700	1000	90
7.50	3	22	0.030	7.500	0.750	935	84
8.00	3	22	0.030	8.000	0.800	875	79
8.50	3	22	0.035	8.500	0.850	825	87
9.00	3	22	0.035	9.000	0.900	780	82
9.50	3	22	0.040	9.500	0.950	735	88
10.00	3	22	0.040	10.000	1.000	700	84

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel 500 - 850 N/mm²								
6.50	3	50	0.025	3.250	6.500	2450	184	3.9
7.00	3	50	0.030	3.500	7.000	2275	205	5.0
7.50	3	50	0.030	3.750	7.500	2120	191	5.4
8.00	3	50	0.030	4.000	8.000	1990	179	5.7
8.50	3	50	0.035	4.250	8.500	1870	196	7.1
9.00	3	50	0.035	4.500	9.000	1770	186	7.5
9.50	3	50	0.040	4.750	9.500	1675	201	9.1
10.00	3	50	0.040	5.000	10.000	1590	191	9.5
Steel 850 - 1100 N/mm²								
6.50	3	45	0.025	3.250	6.500	2205	165	3.5
7.00	3	45	0.030	3.500	7.000	2045	184	4.5
7.50	3	45	0.030	3.750	7.500	1910	172	4.8
8.00	3	45	0.030	4.000	8.000	1790	161	5.2
8.50	3	45	0.035	4.250	8.500	1685	177	6.4
9.00	3	45	0.035	4.500	9.000	1590	167	6.8
9.50	3	45	0.040	4.750	9.500	1510	181	8.2
10.00	3	45	0.040	5.000	10.000	1430	172	8.6
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
6.50	3	22	0.025	3.250	6.500	1075	81	1.7
7.00	3	22	0.030	3.500	7.000	1000	90	2.2
7.50	3	22	0.030	3.750	7.500	935	84	2.4
8.00	3	22	0.030	4.000	8.000	875	79	2.5
8.50	3	22	0.035	4.250	8.500	825	87	3.1
9.00	3	22	0.035	4.500	9.000	780	82	3.3
9.50	3	22	0.040	4.750	9.500	735	88	4.0
10.00	3	22	0.040	5.000	10.000	700	84	4.2
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]								
6.50	3	20	0.025	3.250	6.500	980	74	1.6
7.00	3	20	0.030	3.500	7.000	910	82	2.0
7.50	3	20	0.030	3.750	7.500	850	77	2.2
8.00	3	20	0.030	4.000	8.000	795	72	2.3
8.50	3	20	0.035	4.250	8.500	750	79	2.8
9.00	3	20	0.035	4.500	9.000	705	74	3.0
9.50	3	20	0.040	4.750	9.500	670	80	3.6
10.00	3	20	0.040	5.000	10.000	635	76	3.8

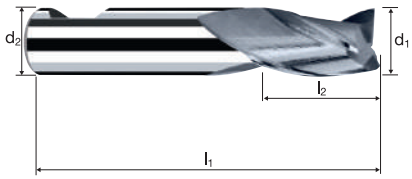
Cylindrical/Square end mills

Smooth-edged, short-shank version

HSS-E Co8

λ **30°**
γ **12°**

90°



Roughing

Finishing

ReTool®

Rm <850 **HRC** <24

Rm 850-1100 **HRC** 24-34

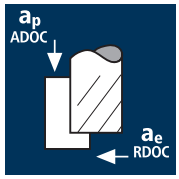
Inox Stainless

Copper

Example: **Order-N°.** Coating **P** Article-N°. **0401** ø-Code **311**

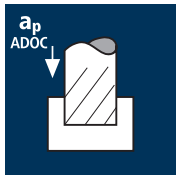
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	POLYCHROM P0401
311	6.50	8.00	42	10.00	18.00	3	●
331	7.00	8.00	42	10.00	18.00	3	●
351	7.50	8.00	42	10.00	18.00	3	●
391	8.00	8.00	43	11.00	-	3	●
410	8.50	10.00	48	11.00	20.00	3	●
420	9.00	10.00	48	11.00	20.00	3	●
430	9.50	10.00	48	11.00	20.00	3	●
450	10.00	10.00	50	13.00	-	3	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
Steel 500 - 850 N/mm²	2.00	3	54	0.005	3.000	0.200	8595	129
	3.00	3	54	0.010	4.500	0.300	5730	172
	4.00	3	54	0.015	6.000	0.400	4295	193
	5.00	3	54	0.015	7.500	0.500	3440	155
	6.00	3	54	0.020	9.000	0.600	2865	172
	7.00	3	54	0.025	10.500	0.700	2455	184
	8.00	3	54	0.025	12.000	0.800	2150	161
	9.00	3	54	0.030	13.500	0.900	1910	172
	10.00	3	54	0.035	15.000	1.000	1720	181
Steel 850 - 1100 N/mm²	2.00	3	48	0.005	3.000	0.200	7640	115
	3.00	3	48	0.010	4.500	0.300	5095	153
	4.00	3	48	0.015	6.000	0.400	3820	172
	5.00	3	48	0.015	7.500	0.500	3055	138
	6.00	3	48	0.020	9.000	0.600	2545	153
	7.00	3	48	0.025	10.500	0.700	2185	164
	8.00	3	48	0.025	12.000	0.800	1910	143
	9.00	3	48	0.030	13.500	0.900	1700	153
	10.00	3	48	0.035	15.000	1.000	1530	161
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	25	0.005	3.000	0.200	3980	60
	3.00	3	25	0.010	4.500	0.300	2655	80
	4.00	3	25	0.015	6.000	0.400	1990	90
	5.00	3	25	0.015	7.500	0.500	1590	72
	6.00	3	25	0.020	9.000	0.600	1325	80
	7.00	3	25	0.025	10.500	0.700	1135	85
	8.00	3	25	0.025	12.000	0.800	995	75
	9.00	3	25	0.030	13.500	0.900	885	80
	10.00	3	25	0.035	15.000	1.000	795	84
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	2.00	3	22	0.005	3.000	0.200	3500	53
	3.00	3	22	0.010	4.500	0.300	2335	70
	4.00	3	22	0.015	6.000	0.400	1750	79
	5.00	3	22	0.015	7.500	0.500	1400	63
	6.00	3	22	0.020	9.000	0.600	1165	70
	7.00	3	22	0.025	10.500	0.700	1000	75
	8.00	3	22	0.025	12.000	0.800	875	66
	9.00	3	22	0.030	13.500	0.900	780	70
	10.00	3	22	0.035	15.000	1.000	700	74

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel 500 - 850 N/mm²	2.00	3	50	0.005	1.000	2.000	7960	119	0.2
	3.00	3	50	0.010	1.500	3.000	5305	159	0.7
	4.00	3	50	0.010	2.000	4.000	3980	119	1.0
	5.00	3	50	0.015	2.500	5.000	3185	143	1.8
	6.00	3	50	0.015	3.000	6.000	2655	120	2.2
	7.00	3	50	0.020	3.500	7.000	2275	137	3.3
	8.00	3	50	0.025	4.000	8.000	1990	149	4.8
	9.00	3	50	0.025	4.500	9.000	1770	133	5.4
	10.00	3	50	0.030	5.000	10.000	1590	143	7.2
Steel 850 - 1100 N/mm²	2.00	3	45	0.005	1.000	2.000	7160	107	0.2
	3.00	3	45	0.010	1.500	3.000	4775	143	0.6
	4.00	3	45	0.010	2.000	4.000	3580	107	0.9
	5.00	3	45	0.015	2.500	5.000	2865	129	1.6
	6.00	3	45	0.015	3.000	6.000	2385	107	1.9
	7.00	3	45	0.020	3.500	7.000	2045	123	3.0
	8.00	3	45	0.025	4.000	8.000	1790	134	4.3
	9.00	3	45	0.025	4.500	9.000	1590	119	4.8
	10.00	3	45	0.030	5.000	10.000	1430	129	6.4
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	22	0.005	1.000	2.000	3500	53	0.1
	3.00	3	22	0.010	1.500	3.000	2335	70	0.3
	4.00	3	22	0.010	2.000	4.000	1750	53	0.4
	5.00	3	22	0.015	2.500	5.000	1400	63	0.8
	6.00	3	22	0.015	3.000	6.000	1165	52	0.9
	7.00	3	22	0.020	3.500	7.000	1000	60	1.5
	8.00	3	22	0.025	4.000	8.000	875	66	2.1
	9.00	3	22	0.025	4.500	9.000	780	59	2.4
	10.00	3	22	0.030	5.000	10.000	700	63	3.2
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	2.00	3	20	0.005	1.000	2.000	3185	48	0.1
	3.00	3	20	0.010	1.500	3.000	2120	64	0.3
	4.00	3	20	0.010	2.000	4.000	1590	48	0.4
	5.00	3	20	0.015	2.500	5.000	1275	57	0.7
	6.00	3	20	0.015	3.000	6.000	1060	48	0.9
	7.00	3	20	0.020	3.500	7.000	910	55	1.3
	8.00	3	20	0.025	4.000	8.000	795	60	1.9
	9.00	3	20	0.025	4.500	9.000	705	53	2.1
	10.00	3	20	0.030	5.000	10.000	635	57	2.9

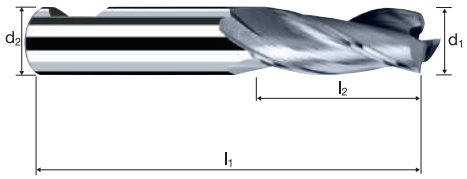
Cylindrical/Square end mills

Smooth-edged, short-shank version

HSS-E Co8

λ **30°**
γ **12°**

90°



Roughing

Finishing

ReTool®

Rm <850 **HRC** <24

Rm 850-1100 **HRC** 24-34

Inox Stainless

Copper

Example: **Order-N°.** Coating **P** Article-N°. **0411** ø-Code **140**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	z	POLYCHROM P0411
140	2.00	6.00	38	7.00	14.00	3	●
160	2.50	6.00	39	8.00	15.00	3	●
180	3.00	6.00	39	8.00	15.00	3	●
200	3.50	6.00	41	10.00	17.00	3	●
220	4.00	6.00	42	11.00	18.00	3	●
240	4.50	6.00	42	11.00	18.00	3	●
260	5.00	6.00	44	13.00	20.00	3	●
280	5.50	6.00	44	13.00	20.00	3	●
300	6.00	6.00	44	13.00	-	3	●
311	6.50	8.00	48	16.00	24.00	3	●
331	7.00	8.00	48	16.00	24.00	3	●
351	7.50	8.00	48	16.00	24.00	3	●
391	8.00	8.00	51	19.00	-	3	●
410	8.50	10.00	56	19.00	28.00	3	●
420	9.00	10.00	56	19.00	28.00	3	●
430	9.50	10.00	56	19.00	28.00	3	●
450	10.00	10.00	59	22.00	-	3	●


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for precision
fraisa

End milling tools for 3D machining
Ball nose

Tolerance r ±0.003

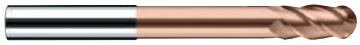
N° 7500 	**SpheroX**	X-Generation X	3xd F SF	d, 1 – 12	Rm 1100-1500 HRC 34-48	HRC 48- >60	Ti Titanium	339

Tolerance r ±0.005

N° 7470 	**SpheroX**	X-Generation X	3xd R F	d, 1 – 16	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS / Ti	341
N° 7490 	**SpheroX**	X-Generation X	3xd HDC R/F	d, 1 – 16	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS / Ti	343
N° 7400 	**SpheroX**	X-Generation X	3xd R F	d, 1 – 12	Rm 1100-1500 HRC 34-48	HRC 48- >60	Ti Titanium	345
N° 7460 	**SpheroX**	X-Generation X	3xd F SF	d, 6 – 12	Rm 1100-1500 HRC 34-48	HRC 48- >60	Ti Titanium	347
N° 7540 	**Sphericut**	Performance P	3xd PF F	d, 1 – 16	Rm <850-1500 HRC <24-48	Inox Stainless		349
N° 7550 	**Sphericut**	Performance P	3xd HDC R/F	d, 2 – 20	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	351
N° 7472 	**SpheroX**	X-Generation X	4.5xd R F	d, 1 – 16	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS / Ti	353
N° 7492 	**SpheroX**	X-Generation X	4.5xd HDC R/F	d, 1 – 16	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS / Ti	355
N° 7402 	**SpheroX**	X-Generation X	4.5xd R F	d, 1 – 12	Rm 1100-1500 HRC 34-48	HRC 48- >60	Ti Titanium	357

End milling tools for 3D machining
Ball nose

Tolerance r ±0.005

N° 7474 	**SpheroX**	X-Generation **X**	**6xd** **R** **F**	d, 1 – 16	**Rm** 1300-1500 **HRC** 42-48	**HRC** 48- >60	**HSS** / **Ti**	359
N° 7494 	**SpheroX**	X-Generation **X**	**6xd** **HDC** **R/F**	d, 1 – 16	**Rm** 1300-1500 **HRC** 42-48	**HRC** 48- >60	**HSS** / **Ti**	361
N° 7404 	**SpheroX**	X-Generation **X**	**6xd** **R** **F**	d, 1 – 12	**Rm** 1100-1500 **HRC** 34-48	**HRC** 48- >60	**Ti** Titanium	363
N° 7544 	**Sphericut**	Performance **P**	**6xd** **PF** **F**	d, 1 – 16	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless		365
N° 7554 	**Sphericut**	Performance **P**	**6xd** **HDC** **R/F**	d, 3 – 16	**Al** Aluminium Alloy	**Cu** Copper	**Plastic** Thermoplast	367
N° 7478 	**SpheroX**	X-Generation **X**	**9xd** **F** **SF**	d, 1 – 16	**Rm** 1300-1500 **HRC** 42-48	**HRC** 48- >60	**HSS** / **Ti**	369

Tolerance r f8 (-/-)

N° 5286



Sphericut

Performance **P**

3xd d, 1 – 16

PF **F**

Rm 1100-1500 **HRC** 34-48

HRC 48-56

371

End milling tools for 3D machining
Circular arc milling cutter

Spherical

N° 8530



ArCutX | X-Generation | X | PF | F | r_1 2, 3, 4 r_2 750, 1000 | HRC <24-56 | Inox / Ti | Al Aluminium Alloy | 373

N° 8531



ArCutX | X-Generation | X | PF | F | r_1 2, 3, 4 r_2 750, 1000 | Al Aluminium Alloy | Cu Copper | Plastic Thermoplast | 375

Spherical, micro

N° 8535



ArCutX | X-Generation | X | PF | F | r_1 0.5, 1, 2 r_2 250, 350 | HRC <24-56 | Inox / Ti | Al Aluminium Alloy | 377

N° 8536



ArCutX | X-Generation | X | PF | F | r_1 0.5, 1, 2 r_2 250, 350 | Al Aluminium Alloy | Cu Copper | Plastic Thermoplast | 379

Toric

N° 8540



ArCutX | X-Generation | X | PF | F | r_1 1.25, 2, 3.5 r_2 30, 40, 50 | HRC <24-56 | Inox / Ti | Al Aluminium Alloy | 381

N° 8541



ArCutX | X-Generation | X | PF | F | r_1 1.25, 2, 3.5 r_2 30, 40, 50 | Al Aluminium Alloy | Cu Copper | Plastic Thermoplast | 383

Flat surfaces

N° 8550



ArCutX | X-Generation | X | PF | F | r_1 1 r_2 250 | HRC <24-56 | Inox / Ti | Al Aluminium Alloy | 385

N° 8551



ArCutX | X-Generation | X | PF | F | r_1 1 r_2 250 | Al Aluminium Alloy | Cu Copper | Plastic Thermoplast | 387

End milling tools for 3D machining
Corner radius

Tolerance r 0/+0.015

N° 7210 	**XSpeed-H**	X-Generation X	3xd HDC R/F	r 0.2, 0.5	HRC 56- >60	HSS		389
N° 7200 	**XSpeed**	X-Generation X	3xd PF F	r 0.5, 1.0	Rm 1100-1500 HRC 34-48	HRC 48-60		391
N° 7100 	**ToroX**	X-Generation X	3xd R PF	r 0.2, 0.5, 1.0, 2.0	Rm 1100-1500 HRC 34-48	HRC 48-60		395
N° 7212 	**XSpeed-H**	X-Generation X	4.5xd HDC R/F	r 0.2, 0.5	HRC 56- >60	HSS		399
N° 7204 	**XSpeed**	X-Generation X	6xd PF F	r 0.5, 1.0	Rm 1100-1500 HRC 34-48	HRC 48-60		401
N° 7104 	**ToroX**	X-Generation X	6xd R PF	r 0.2, 0.5, 1.0, 2.0	Rm 1100-1500 HRC 34-48	HRC 48-60		405

Tolerance r 0/+0.03

N° 5250 	**Multispeed**	X-Generation X	3xd PF F	r 0.5, 0.8, 1.0, 1.5	Rm <850-1300 HRC <24-42	Inox Stainless		409
N° 7340 	**Torocut**	Performance P	3xd R PF	r 0.2, 0.5, 1.0, 1.5, 2.0	Rm <850-1500 HRC <24-48	Inox Stainless		411
N° 5252 	**Multispeed**	X-Generation X	5xd PF F	r 0.8, 1.0, 1.5	Rm <850-1300 HRC <24-42	Inox Stainless		415
N° 7344 	**Torocut**	Performance P	6xd R PF	r 0.2, 0.5, 1.0	Rm <850-1500 HRC <24-48	Inox Stainless		417

End milling tools for 3D machining
Corner radius

N° 8507 / 8607 	**HX**	X-Generation **X**	Roughing HPC Roughing HDC Finishing	r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0	**HRC** 48- >60	**HSS**		175
N° 8107 / 8207 	**MFC**	Performance **P**	Roughing HPC Roughing HDC Finishing	r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	189
N° 8307 / 8407  l_2 = 2.2xd, l_3 = 3.0xd,	**E-Cut**	Performance **P**	Roughing HPC Roughing HDC Finishing	r 0.2, 0.5, 0.8, 1.0, 1.5, 2, 2.5, 4.0	**Rm** <850-1500 **HRC** <24-48	**Inox** Stainless		193
N° 8517 / 8617 	**HX**	X-Generation **X**	Roughing HPC Roughing HDC Finishing	r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0	**HRC** 48- >60	**HSS**		207
N° 8117 / 8217 	**MFC**	Performance **P**	Roughing HPC Roughing HDC Finishing	r 0.2, 0.5, 1.0, 1.5, 2.0, 2.5	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	211

End milling tools for 3D machining
HFC

Cylindrical neck

N° 7610 	**XFeed-H**	X-Generation X	3xd R	d, 1 – 16	HRC 56- >60	HSS		421
N° 7630 	**XFeed**	X-Generation X	3xd R	d, 1 – 16	Rm 850-1500 HRC 24-48	HRC 48-56	Inox Stainless	423
N° 7620 	**XFeed**	X-Generation X	3xd R	d, 6 – 16	Rm 1100-1500 HRC 34-48	HRC 48-56		425
N° 7612 	**XFeed-H**	X-Generation X	4.5xd R	d, 1 – 16	HRC 56- >60	HSS		427
N° 7632 	**XFeed**	X-Generation X	4.5xd R	d, 1 – 16	Rm 850-1500 HRC 24-48	HRC 48-56	Inox Stainless	429
N° 7614 	**XFeed-H**	X-Generation X	6xd R	d, 3 – 16	HRC 56- >60	HSS		431
N° 7634 	**XFeed**	X-Generation X	6xd R	d, 3 – 16	Rm 850-1500 HRC 24-48	HRC 48-56	Inox Stainless	433

End milling tools for 3D machining
Micro with ball nose

Shank ø 6mm

N° 6460 	**MicroHX**	X-Generation X	1xd	d, 0.4 – 2.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	435
N° 6461 	**MicroHX**	X-Generation X	2xd	d, 0.4 – 2.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	437
N° 6481 	**MicroHX**	X-Generation X	2.5xd	d, 0.4 – 1.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	439
N° 6462 	**MicroHX**	X-Generation X	3xd	d, 0.4 – 3.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	441
N° 6482 	**MicroHX**	X-Generation X	3.5xd	d, 0.4 – 1.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	443
N° 6463 	**MicroHX**	X-Generation X	4xd	d, 0.4 – 2.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	445
N° 6483 	**MicroHX**	X-Generation X	4.5xd	d, 0.4 – 1.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	447
N° 6464 	**MicroHX**	X-Generation X	5xd	d, 0.4 – 3.0	Rm 1300-1500 HRC 42-48	HRC 48- >60	HSS	449

End milling tools for 3D machining
Micro with ball nose

Shank ø 6mm

N° 6560 	MicroX	X-Generation X	1xd	d, 0.1 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	451
N° 6561 	MicroX	X-Generation X	2xd	d, 0.1 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	453
N° 6581 	MicroX	X-Generation X	2.5xd	d, 0.1 – 1.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	455
N° 6562 	MicroX	X-Generation X	3xd	d, 0.1 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	457
N° 6582 	MicroX	X-Generation X	3.5xd	d, 0.1 – 1.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	459
N° 6563 	MicroX	X-Generation X	4xd	d, 0.1 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	461
N° 6583 	MicroX	X-Generation X	4.5xd	d, 0.1 – 1.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	463
N° 6564 	MicroX	X-Generation X	5xd	d, 0.1 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	465
N° 6565 	MicroX	X-Generation X	6xd	d, 0.2 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	467
N° 6579 	MicroX	X-Generation X	7xd	d, 0.2 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	469
N° 6566 	MicroX	X-Generation X	8xd	d, 0.2 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	471
N° 6567 	MicroX	X-Generation X	9xd	d, 0.2 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	473
N° 6568 	MicroX	X-Generation X	10xd	d, 0.2 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	475

End milling tools for 3D machining
Micro with ball nose

Shank ø 6mm, conical neck 0.9°

N° 6765 	MicroX	X-Generation X	6xd	d, 0.5 – 2.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	477
N° 6766 	MicroX	X-Generation X	8xd	d, 0.5 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	479
N° 6768 	MicroX	X-Generation X	10xd	d, 0.5 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	481
N° 6770 	MicroX	X-Generation X	12xd	d, 0.5 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	483
N° 6772 	MicroX	X-Generation X	15xd	d, 0.5 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	485
N° 6774 	MicroX	X-Generation X	20xd	d, 0.5 – 3.0	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	487

End milling tools for 3D machining
Micro with ball nose

Shank ø 4mm

N° 6832 	**Microcut**	Performance **P**	**1xd**	d, 0.2 – 2.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	489
N° 6836 	**Microcut**	Performance **P**	**3xd**	d, 0.2 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	491
N° 6840 	**Microcut**	Performance **P**	**5xd**	d, 0.2 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	493
N° 6844 	**Microcut**	Performance **P**	**8xd**	d, 0.5 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	495
N° 6846 	**Microcut**	Performance **P**	**10xd**	d, 0.5 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	497
N° 6847 	**Microcut**	Performance **P**	**12xd**	d, 1.0 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	499
N° 6848 	**Microcut**	Performance **P**	**15xd**	d, 1.0 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	501
N° 6849 	**Microcut**	Performance **P**	**20xd**	d, 1.0 – 3.0	**Rm** <850-1500 **HRC** <24-48	**HRC** 48-56	**Inox** / **Ti**	503

End milling tools for 3D machining
Micro with ball nose

Shank ø 3mm

N° 5782 	**Microcut**	Performance **P**	**3xd**	d, 0.2 – 3.0	**Rm** <850-1300 **HRC** <24-42	**Inox** Stainless	**Ti** Titanium	505
N° 5784 	**Microcut**	Performance **P**	**5xd**	d, 0.5 – 3.0	**Rm** <850-1300 **HRC** <24-42	**Inox** Stainless	**Ti** Titanium	507
N° 5786 	**Microcut**	Performance **P**	**8xd**	d, 0.5 – 3.0	**Rm** <850-1300 **HRC** <24-42	**Inox** Stainless	**Ti** Titanium	509
N° 45785 		Favora® **F**	**3xd**	d, 0.3 – 3.0	**Rm** <850-1100 **HRC** <24-34			511

End milling tools for 3D machining
Micro with corner radius

Shank ø 6mm

N° 6531 	MicroX	X-Generation X	2xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	513
N° 6532 	MicroX	X-Generation X	3xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	515
N° 6533 	MicroX	X-Generation X	4xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	519
N° 6534 	MicroX	X-Generation X	5xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	521
N° 6535 	MicroX	X-Generation X	6xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	525
N° 6536 	MicroX	X-Generation X	8xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	527
N° 6538 	MicroX	X-Generation X	10xd	r 0.05, 0.1, 0.2, 0.3, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	531

Shank ø 6mm, conical neck 0.9°

N° 6735 	MicroX	X-Generation X	6xd	r 0.1, 0.2, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	535
N° 6736 	MicroX	X-Generation X	8xd	r 0.1, 0.2, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	537
N° 6738 	MicroX	X-Generation X	10xd	r 0.1, 0.2, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	539
N° 6740 	MicroX	X-Generation X	12xd	r 0.1, 0.2, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	541
N° 6742 	MicroX	X-Generation X	15xd	r 0.1, 0.2, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	543
N° 6744 	MicroX	X-Generation X	20xd	r 0.1, 0.2, 0.5	Rm 850-1500 HRC 24-48	HRC 48-60	Inox / Ti	545


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End milling tools for 3D machining
Micro with corner radius

Shank ø 6mm, Z4

N° 6632



MicroX — X-Generation **X** — 3xd — r 0.1, 0.2, 0.5 — Rm 1100-1500 HRC 34-48 — HRC 48-60 — 547

N° 6634



MicroX — X-Generation **X** — 5xd — r 0.1, 0.2, 0.5 — Rm 1100-1500 HRC 34-48 — HRC 48-60 — 549

Shank ø 4mm

N° 6816



Microcut — Performance **P** — 1xd — r 0.1, 0.2 — Rm <850-1500 HRC <24-48 — HRC 48-56 — Inox / Ti — 551

N° 6818



Microcut — Performance **P** — 3xd — r 0.1, 0.2 — Rm <850-1500 HRC <24-48 — HRC 48-56 — Inox / Ti — 553

N° 6820



Microcut — Performance **P** — 5xd — r 0.1, 0.2 — Rm <850-1500 HRC <24-48 — HRC 48-56 — Inox / Ti — 555

N° 6823



Microcut — Performance **P** — 8xd — r 0.1, 0.2 — Rm <850-1500 HRC <24-48 — HRC 48-56 — Inox / Ti — 557

Shank ø 3mm

N° 5752



Microcut — Performance **P** — 3xd — r 0.2 — Rm <850-1300 HRC <24-42 — Inox Stainless — Ti Titanium — 559

N° 5754

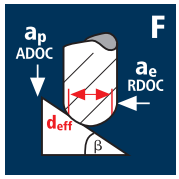
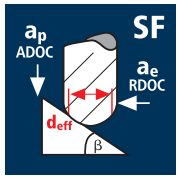


Microcut — Performance **P** — 5xd — r 0.2 — Rm <850-1300 HRC <24-42 — Inox Stainless — Ti Titanium — 561

N° 5756



Microcut — Performance **P** — 8xd — r 0.2 — Rm <850-1300 HRC <24-42 — Inox Stainless — Ti Titanium — 563

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	1.00	2	300	0.030	0.050	0.050	0.94	60000	3600	45°
		2.00	2	300	0.035	0.070	0.070	1.84	51898	3633	45°
		3.00	2	300	0.040	0.100	0.100	2.74	34851	2788	45°
		4.00	2	300	0.070	0.120	0.120	3.62	26379	3693	45°
		5.00	2	300	0.080	0.150	0.150	4.53	21080	3373	45°
		6.00	2	300	0.085	0.150	0.150	5.36	17816	3029	45°
		8.00	2	300	0.095	0.170	0.170	7.05	13545	2574	45°
		10.00	2	300	0.100	0.200	0.200	8.77	10889	2178	45°
		12.00	2	300	0.105	0.250	0.250	10.56	9043	1899	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	250	0.030	0.050	0.050	0.94	60000	3600	45°
		2.00	2	250	0.035	0.070	0.070	1.84	43249	3027	45°
		3.00	2	250	0.040	0.100	0.100	2.74	29043	2323	45°
		4.00	2	250	0.065	0.120	0.120	3.62	21983	2858	45°
		5.00	2	250	0.075	0.150	0.150	4.53	17567	2635	45°
		6.00	2	250	0.080	0.150	0.150	5.36	14847	2376	45°
		8.00	2	250	0.090	0.170	0.170	7.05	11288	2032	45°
		10.00	2	250	0.095	0.200	0.200	8.77	9074	1724	45°
		12.00	2	250	0.100	0.250	0.250	10.56	7536	1507	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
		2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
		3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
		4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
		5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
		6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
		8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
		10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
		12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
		2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
		3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
		4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
		5.00	2	150	0.070	0.150	0.150	4.53	10540	1476	45°
		6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
		8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
		10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
		12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°
	Hardened tool steel 42 - 48 HRC	1.00	2	400	0.025	0.020	0.020	0.88	60000	3000	45°
		2.00	2	400	0.030	0.020	0.020	1.67	60000	3600	45°
		3.00	2	400	0.035	0.030	0.030	2.50	50930	3565	45°
		4.00	2	400	0.050	0.030	0.030	3.27	38937	3894	45°
		5.00	2	400	0.055	0.030	0.030	4.04	31516	3467	45°
		6.00	2	400	0.060	0.030	0.030	4.80	26526	3183	45°
		8.00	2	400	0.065	0.030	0.030	6.31	20178	2623	45°
		10.00	2	400	0.070	0.040	0.040	7.91	16097	2254	45°
		12.00	2	400	0.075	0.040	0.040	9.41	13531	2030	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	350	0.025	0.020	0.020	0.88	60000	3000	45°
		2.00	2	350	0.030	0.020	0.020	1.67	60000	3600	45°
		3.00	2	350	0.035	0.030	0.030	2.50	44563	3119	45°
		4.00	2	350	0.050	0.030	0.030	3.27	34070	3407	45°
		5.00	2	350	0.050	0.030	0.030	4.04	27576	2758	45°
		6.00	2	350	0.055	0.030	0.030	4.80	23210	2553	45°
		8.00	2	350	0.060	0.030	0.030	6.31	17656	2119	45°
		10.00	2	350	0.065	0.040	0.040	7.91	14085	1831	45°
		12.00	2	350	0.070	0.040	0.040	9.41	11839	1658	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	280	0.025	0.020	0.020	0.88	60000	3000	45°
		2.00	2	280	0.025	0.020	0.020	1.67	53369	2669	45°
		3.00	2	280	0.030	0.030	0.030	2.50	35651	2139	45°
		4.00	2	280	0.045	0.030	0.030	3.27	27256	2453	45°
		5.00	2	280	0.050	0.030	0.030	4.04	22061	2206	45°
		6.00	2	280	0.055	0.030	0.030	4.80	18568	2043	45°
		8.00	2	280	0.060	0.030	0.030	6.31	14125	1695	45°
		10.00	2	280	0.065	0.040	0.040	7.91	11268	1465	45°
		12.00	2	280	0.070	0.040	0.040	9.41	9471	1326	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	180	0.020	0.020	0.020	0.88	60000	2400	45°
		2.00	2	180	0.025	0.020	0.020	1.67	34309	1716	45°
		3.00	2	180	0.030	0.030	0.030	2.50	22918	1375	45°
		4.00	2	180	0.045	0.030	0.030	3.27	17522	1577	45°
		5.00	2	180	0.045	0.030	0.030	4.04	14182	1276	45°
		6.00	2	180	0.050	0.030	0.030	4.80	11937	1194	45°
		8.00	2	180	0.055	0.030	0.030	6.31	9080	999	45°
		10.00	2	180	0.060	0.040	0.040	7.91	7243	869	45°
		12.00	2	180	0.065	0.040	0.040	9.41	6089	792	45°

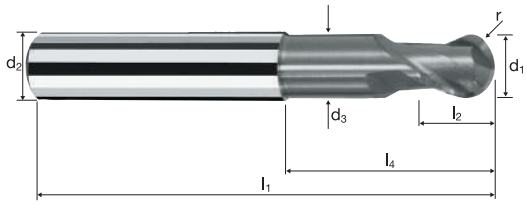
Ball nose end mills SpheroX

Tolerance r ±0.003, 3xd

X-Generation

II

HM XA	λ 30° γ -10°



h4

d1

3µ

r

F

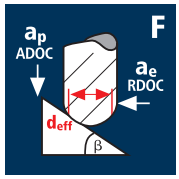
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7500** ø-Code **100**

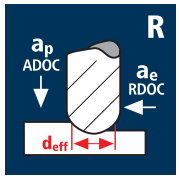
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100	1.00	6.00	0.95	57	1.50	3.00	13.08	0.500	2		●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	1.000	2		●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	1.500	2		●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	2.000	2		●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	2.500	2		●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	2		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	2		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	2		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	2		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC	1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
	2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
	3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
	4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
	5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
	6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
	8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
	10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
	12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°
Hardened tool steel 56 - 60 HRC	1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
	2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
	3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
	4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
	5.00	2	150	0.065	0.150	0.150	4.53	10540	1370	45°
	6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
	8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
	10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
	12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°
Hardened tool steel > 60 HRC	1.00	2	90	0.020	0.040	0.040	0.93	30804	1232	45°
	2.00	2	90	0.025	0.055	0.055	1.80	15915	796	45°
	3.00	2	90	0.030	0.075	0.075	2.68	10690	641	45°
	4.00	2	90	0.050	0.090	0.090	3.54	8093	809	45°
	5.00	2	90	0.055	0.115	0.115	4.43	6467	711	45°
	6.00	2	90	0.060	0.115	0.115	5.24	5467	656	45°
	8.00	2	90	0.070	0.130	0.130	6.90	4152	581	45°
	10.00	2	90	0.070	0.150	0.150	8.58	3339	468	45°
	12.00	2	90	0.075	0.190	0.190	10.34	2771	416	45°
High speed steel, hardened 64 - 70 HRC	1.00	2	60	0.015	0.025	0.025	0.89	21459	644	45°
	2.00	2	60	0.020	0.035	0.035	1.74	10976	439	45°
	3.00	2	60	0.020	0.050	0.050	2.59	7374	295	45°
	4.00	2	60	0.035	0.060	0.060	3.43	5568	390	45°
	5.00	2	60	0.040	0.075	0.075	4.29	4452	356	45°
	6.00	2	60	0.040	0.075	0.075	5.08	3760	301	45°
	8.00	2	60	0.050	0.085	0.085	6.70	2851	285	45°
	10.00	2	60	0.050	0.100	0.100	8.34	2290	229	45°
	12.00	2	60	0.055	0.125	0.125	10.03	1904	209	45°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Hardened tool steel 52 - 56 HRC	1.00	2	100	0.028	0.180	0.200	0.77	41339	2315	0.1
	2.00	2	111	0.048	0.280	0.400	1.39	25419	2440	0.3
	3.00	2	111	0.060	0.360	0.600	1.95	18119	2174	0.5
	4.00	2	111	0.072	0.480	0.800	2.60	13589	1957	0.8
	5.00	2	111	0.080	0.600	1.000	3.25	10872	1740	1.0
	6.00	2	111	0.086	0.720	1.200	3.90	9060	1558	1.3
	8.00	2	111	0.106	0.960	1.600	5.20	6795	1441	2.2
	10.00	2	111	0.120	1.200	2.000	6.50	5436	1305	3.1
	12.00	2	111	0.125	1.440	2.400	7.80	4530	1133	3.9
Hardened tool steel 56 - 60 HRC	1.00	2	68	0.017	0.160	0.200	0.73	29651	1008	0.0
	2.00	2	68	0.029	0.250	0.400	1.32	16398	951	0.1
	3.00	2	68	0.036	0.320	0.600	1.85	11700	842	0.2
	4.00	2	68	0.043	0.430	0.800	2.48	8728	751	0.3
	5.00	2	68	0.048	0.540	1.000	3.10	6982	670	0.4
	6.00	2	68	0.052	0.650	1.200	3.73	5803	604	0.5
	8.00	2	68	0.063	0.860	1.600	4.96	4364	550	0.8
	10.00	2	68	0.072	1.080	2.000	6.21	3486	502	1.1
	12.00	2	68	0.075	1.300	2.400	7.46	2901	435	1.4
Hardened tool steel > 60 HRC	1.00	2	51	0.014	0.130	0.200	0.67	24230	678	0.0
	2.00	2	51	0.023	0.200	0.400	1.20	13528	622	0.0
	3.00	2	51	0.029	0.250	0.600	1.66	9779	567	0.1
	4.00	2	51	0.035	0.340	0.800	2.23	7280	510	0.1
	5.00	2	51	0.038	0.420	1.000	2.77	5861	445	0.2
	6.00	2	51	0.041	0.500	1.200	3.32	4890	401	0.2
	8.00	2	51	0.051	0.670	1.600	4.43	3665	374	0.4
	10.00	2	51	0.058	0.840	2.000	5.55	2925	339	0.6
	12.00	2	51	0.060	1.010	2.400	6.66	2438	293	0.7
High speed steel, hardened 64 - 70 HRC	1.00	2	34	0.011	0.130	0.200	0.67	16153	355	0.0
	2.00	2	34	0.018	0.200	0.400	1.20	9019	325	0.0
	3.00	2	34	0.023	0.250	0.600	1.66	6520	300	0.0
	4.00	2	34	0.028	0.340	0.800	2.23	4853	272	0.1
	5.00	2	34	0.031	0.420	1.000	2.77	3907	242	0.1
	6.00	2	34	0.033	0.500	1.200	3.32	3260	215	0.1
	8.00	2	34	0.041	0.670	1.600	4.43	2443	200	0.2
	10.00	2	34	0.046	0.840	2.000	5.55	1950	179	0.3
	12.00	2	34	0.048	1.010	2.400	6.66	1625	156	0.4

Ball nose end mills SpheroX

Tolerance r ±0.005, 3xd

X-Generation X

II

HM XA

λ 30°
γ -10°

h4

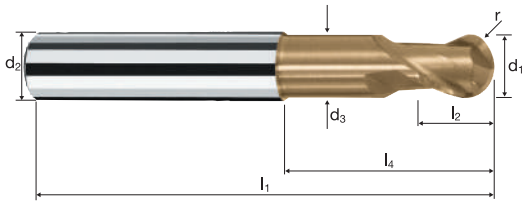
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d_1

r

R

F

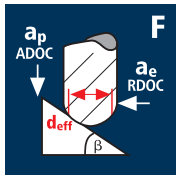
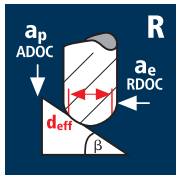


ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **V** Article-N°. **7470** ø-Code **100**

											DURO-V
											V7470
Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z		
100	1.00	6.00	0.95	57	1.50	3.00	13.08	0.500	2		●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	1.000	2		●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	1.500	2		●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	2.000	2		●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	2.500	2		●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	2		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	2		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	2		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	2		●
610	16.00	16.00	15.00	92	17.00	42.13	43.00	8.000	2		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 52 - 56 HRC H	1.00	4	160	0.014	0.030	0.090	0.91	55967	3134	45°
		2.00	4	160	0.022	0.030	0.120	1.72	29610	2606	45°
		3.00	4	200	0.034	0.050	0.150	2.59	24580	3343	45°
		4.00	4	200	0.042	0.050	0.180	3.39	18779	3155	45°
		5.00	4	200	0.048	0.050	0.210	4.17	15267	2931	45°
		6.00	4	200	0.052	0.050	0.230	4.94	12887	2681	45°
		8.00	4	200	0.056	0.080	0.280	6.67	9545	2138	45°
		10.00	4	200	0.060	0.080	0.310	8.22	7745	1859	45°
		12.00	4	200	0.066	0.100	0.340	9.89	6437	1699	45°
	Hardened tool steel 56 - 60 HRC H	1.00	4	120	0.014	0.030	0.090	0.91	41975	2351	45°
		2.00	4	120	0.022	0.030	0.120	1.72	22208	1954	45°
		3.00	4	150	0.034	0.050	0.150	2.59	18435	2507	45°
		4.00	4	150	0.042	0.050	0.180	3.39	14085	2366	45°
		5.00	4	150	0.048	0.050	0.210	4.17	11450	2198	45°
		6.00	4	150	0.052	0.050	0.230	4.94	9665	2010	45°
		8.00	4	150	0.056	0.080	0.280	6.67	7158	1603	45°
		10.00	4	150	0.060	0.080	0.310	8.22	5809	1394	45°
		12.00	4	150	0.066	0.100	0.340	9.89	4828	1275	45°
	Hardened tool steel > 60 HRC H	1.00	4	80	0.014	0.030	0.090	0.91	27983	1567	45°
		2.00	4	80	0.022	0.030	0.120	1.72	14805	1303	45°
		3.00	4	100	0.034	0.050	0.150	2.59	12290	1671	45°
		4.00	4	100	0.042	0.050	0.180	3.39	9390	1578	45°
		5.00	4	100	0.048	0.050	0.210	4.17	7633	1466	45°
		6.00	4	100	0.052	0.050	0.230	4.94	6444	1340	45°
		8.00	4	100	0.056	0.080	0.280	6.67	4772	1069	45°
		10.00	4	100	0.060	0.080	0.310	8.22	3872	929	45°
		12.00	4	100	0.066	0.100	0.340	9.89	3219	850	45°
	High speed steel, hardened 64 - 70 HRC H	1.00	4	50	0.014	0.030	0.090	0.91	17490	979	45°
		2.00	4	50	0.022	0.030	0.120	1.72	9253	814	45°
		3.00	4	60	0.034	0.050	0.150	2.59	7374	1003	45°
		4.00	4	60	0.042	0.050	0.180	3.39	5634	947	45°
		5.00	4	60	0.048	0.050	0.210	4.17	4580	879	45°
		6.00	4	60	0.052	0.050	0.230	4.94	3866	804	45°
		8.00	4	60	0.056	0.080	0.280	6.67	2863	641	45°
		10.00	4	60	0.060	0.080	0.310	8.22	2323	558	45°
		12.00	4	60	0.066	0.100	0.340	9.89	1931	510	45°
	Hardened tool steel 52 - 56 HRC H	1.00	4	130	0.023	0.180	0.180	0.99	41798	3845	30°
		2.00	4	130	0.039	0.280	0.280	1.92	21552	3362	30°
		3.00	4	130	0.049	0.360	0.360	2.83	14622	2866	30°
		4.00	4	130	0.058	0.480	0.480	3.77	10976	2546	30°
		5.00	4	130	0.065	0.600	0.600	4.71	8786	2284	30°
		6.00	4	130	0.070	0.720	0.720	5.66	7311	2047	30°
		8.00	4	130	0.086	0.960	0.960	7.54	5488	1888	30°
		10.00	4	130	0.098	1.200	1.200	9.43	4388	1720	30°
		12.00	4	130	0.101	1.440	1.440	11.31	3659	1478	30°
	Hardened tool steel 56 - 60 HRC H	1.00	4	80	0.014	0.162	0.162	0.98	25984	1455	30°
		2.00	4	80	0.023	0.252	0.252	1.90	13403	1233	30°
		3.00	4	80	0.029	0.324	0.324	2.79	9127	1059	30°
		4.00	4	80	0.035	0.432	0.432	3.72	6845	958	30°
		5.00	4	80	0.039	0.540	0.540	4.65	5476	854	30°
		6.00	4	80	0.042	0.648	0.648	5.58	4564	767	30°
		8.00	4	80	0.051	0.864	0.864	7.44	3423	698	30°
		10.00	4	80	0.058	1.080	1.080	9.30	2738	635	30°
		12.00	4	80	0.061	1.296	1.296	11.16	2282	557	30°
	Hardened tool steel > 60 HRC H	1.00	4	60	0.011	0.126	0.126	0.95	20104	885	30°
		2.00	4	60	0.019	0.196	0.196	1.83	10436	793	30°
		3.00	4	60	0.023	0.252	0.252	2.69	7100	653	30°
		4.00	4	60	0.028	0.336	0.336	3.59	5320	596	30°
		5.00	4	60	0.031	0.420	0.420	4.48	4263	529	30°
		6.00	4	60	0.034	0.504	0.504	5.38	3550	483	30°
		8.00	4	60	0.041	0.672	0.672	7.17	2664	437	30°
		10.00	4	60	0.047	0.840	0.840	8.96	2132	401	30°
		12.00	4	60	0.049	1.008	1.008	10.76	1775	348	30°
	High speed steel, hardened 64 - 70 HRC H	1.00	4	40	0.009	0.126	0.126	0.95	13403	483	30°
		2.00	4	40	0.015	0.196	0.196	1.83	6958	418	30°
		3.00	4	40	0.019	0.252	0.252	2.69	4733	360	30°
		4.00	4	40	0.023	0.336	0.336	3.59	3547	326	30°
		5.00	4	40	0.025	0.420	0.420	4.48	2842	284	30°
		6.00	4	40	0.027	0.504	0.504	5.38	2367	256	30°
		8.00	4	40	0.033	0.672	0.672	7.17	1776	234	30°
		10.00	4	40	0.037	0.840	0.840	8.96	1421	210	30°
		12.00	4	40	0.039	1.008	1.008	10.76	1183	185	30°

Ball nose end mills SpheroX

Tolerance r ±0.005, 3xd

X-Generation X

II

HM XA

λ 40°
γ 0°

h4

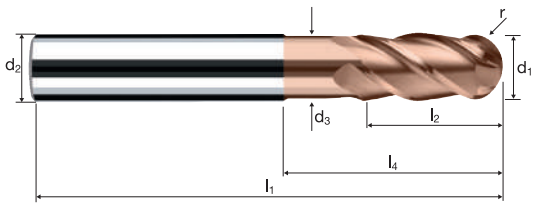
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Vario

r

R

F



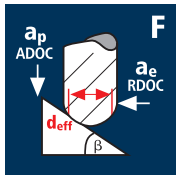
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS

Example: **Order-N°.** Coating **H** Article-N°. **7490** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z		DURO-Si H7490
100	1.00	6.00	0.95	57	2.00	3.10	13.18	0.500	4		●
140	2.00	6.00	1.90	57	4.00	6.00	14.31	1.000	4		●
180	3.00	6.00	2.80	57	6.00	9.00	15.63	1.500	4		●
220	4.00	6.00	3.70	57	8.00	12.00	16.95	2.000	4		●
260	5.00	6.00	4.60	57	10.00	15.00	18.27	2.500	4		●
300	6.00	6.00	5.50	57	12.00	19.34	20.00	3.000	4		●
391	8.00	8.00	7.40	63	16.00	25.29	26.00	4.000	4		●
450	10.00	10.00	9.20	72	20.00	30.20	31.00	5.000	4		●
501	12.00	12.00	11.00	83	24.00	36.13	37.00	6.000	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	8.000	4		●

Application



Material

Hardened tool steel 42 - 48 HRC

X

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	300	0.030	0.050	0.050	0.94	60000	3600	45°
2.00	2	300	0.035	0.070	0.070	1.84	51898	3633	45°
3.00	2	300	0.040	0.100	0.100	2.74	34851	2788	45°
4.00	2	300	0.070	0.120	0.120	3.62	26379	3693	45°
5.00	2	300	0.080	0.150	0.150	4.53	21080	3373	45°
6.00	2	300	0.085	0.150	0.150	5.36	17816	3029	45°
8.00	2	300	0.095	0.170	0.170	7.05	13545	2574	45°
10.00	2	300	0.100	0.200	0.200	8.77	10889	2178	45°
12.00	2	300	0.105	0.250	0.250	10.56	9043	1899	45°

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	250	0.030	0.050	0.050	0.94	60000	3600	45°
2.00	2	250	0.035	0.070	0.070	1.84	43249	3027	45°
3.00	2	250	0.040	0.100	0.100	2.74	29043	2323	45°
4.00	2	250	0.065	0.120	0.120	3.62	21983	2858	45°
5.00	2	250	0.075	0.150	0.150	4.53	17567	2635	45°
6.00	2	250	0.080	0.150	0.150	5.36	14847	2376	45°
8.00	2	250	0.090	0.170	0.170	7.05	11288	2032	45°
10.00	2	250	0.095	0.200	0.200	8.77	9074	1724	45°
12.00	2	250	0.100	0.250	0.250	10.56	7536	1507	45°

Hardened tool steel 52 - 56 HRC

X

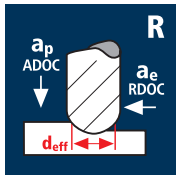
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°

Titanium alloys > 300 HB [Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
5.00	2	150	0.070	0.150	0.150	4.53	10540	1476	45°
6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°

Application



Material

Hardened tool steel 42 - 48 HRC

X

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.034	0.180	0.200	0.77	41339	2811	0.1
2.00	2	170	0.058	0.280	0.400	1.39	38930	4516	0.5
3.00	2	170	0.073	0.360	0.600	1.95	27750	4052	0.9
4.00	2	170	0.087	0.480	0.800	2.60	20813	3622	1.4
5.00	2	170	0.097	0.600	1.000	3.25	16650	3230	1.9
6.00	2	170	0.105	0.720	1.200	3.90	13875	2914	2.5
8.00	2	170	0.128	0.960	1.600	5.20	10406	2664	4.1
10.00	2	170	0.145	1.200	2.000	6.50	8325	2414	5.8
12.00	2	170	0.151	1.440	2.400	7.80	6938	2095	7.2

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.031	0.180	0.200	0.77	41339	2563	0.1
2.00	2	136	0.053	0.280	0.400	1.39	31144	3301	0.4
3.00	2	136	0.066	0.360	0.600	1.95	22200	2930	0.6
4.00	2	136	0.079	0.480	0.800	2.60	16650	2631	1.0
5.00	2	136	0.088	0.600	1.000	3.25	13320	2344	1.4
6.00	2	136	0.095	0.720	1.200	3.90	11100	2109	1.8
8.00	2	136	0.116	0.960	1.600	5.20	8325	1931	3.0
10.00	2	136	0.132	1.200	2.000	6.50	6660	1758	4.2
12.00	2	136	0.137	1.440	2.400	7.80	5550	1521	5.3

Hardened tool steel 52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.028	0.180	0.200	0.77	41339	2315	0.1
2.00	2	111	0.048	0.280	0.400	1.39	25419	2440	0.3
3.00	2	111	0.060	0.360	0.600	1.95	18119	2174	0.5
4.00	2	111	0.072	0.480	0.800	2.60	13589	1957	0.8
5.00	2	111	0.080	0.600	1.000	3.25	10872	1740	1.0
6.00	2	111	0.086	0.720	1.200	3.90	9060	1558	1.3
8.00	2	111	0.106	0.960	1.600	5.20	6795	1441	2.2
10.00	2	111	0.120	1.200	2.000	6.50	5436	1305	3.1
12.00	2	111	0.125	1.440	2.400	7.80	4530	1133	3.9

Titanium alloys > 300 HB [Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	85	0.031	0.180	0.200	0.77	35138	2179	0.1
2.00	2	85	0.053	0.280	0.400	1.39	19465	2063	0.2
3.00	2	85	0.066	0.360	0.600	1.95	13875	1832	0.4
4.00	2	85	0.079	0.480	0.800	2.60	10406	1644	0.6
5.00	2	85	0.088	0.600	1.000	3.25	8325	1465	0.9
6.00	2	85	0.095	0.720	1.200	3.90	6938	1318	1.1
8.00	2	85	0.116	0.960	1.600	5.20	5203	1207	1.9
10.00	2	85	0.132	1.200	2.000	6.50	4163	1099	2.6
12.00	2	85	0.137	1.440	2.400	7.80	3469	951	3.3

Ball nose end mills SpheroX

Tolerance r ±0.005, 3xd

X-Generation X

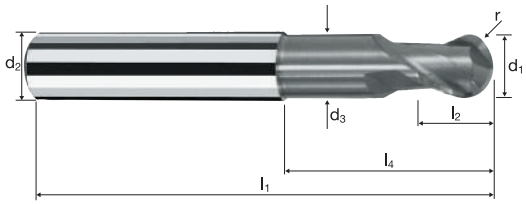
II

HM XA	λ 30° γ -10°

h4

d1 r

R F

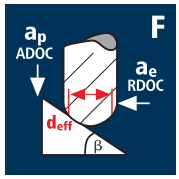
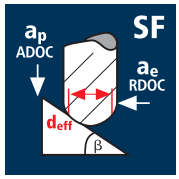


ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7400** ø-Code **100**

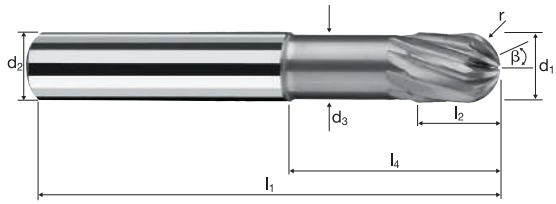
Ø Code	d1	d2 h4	d3	l1	l2	l3	l4	r ±0.005	z		X-AL X7400
100	1.00	6.00	0.95	57	1.50	3.00	13.08	0.500	2		●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	1.000	2		●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	1.500	2		●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	2.000	2		●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	2.500	2		●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	2		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	2		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	2		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	2		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	6.00	8	300	0.055	0.120	0.120	5.26	18155	7988	45°
		8.00	10	300	0.060	0.140	0.140	6.94	13760	8256	45°
		10.00	12	300	0.065	0.160	0.160	8.62	11078	8641	45°
		12.00	16	300	0.070	0.180	0.180	10.29	9280	10394	45°
	Hardened tool steel 48 - 52 HRC	6.00	8	250	0.050	0.120	0.120	5.26	15129	6052	45°
		8.00	10	250	0.055	0.140	0.140	6.94	11466	6306	45°
		10.00	12	250	0.060	0.160	0.160	8.62	9232	6647	45°
		12.00	16	250	0.065	0.180	0.180	10.29	7733	8042	45°
	Hardened tool steel 52 - 56 HRC	6.00	8	200	0.050	0.120	0.120	5.26	12103	4841	45°
		8.00	10	200	0.055	0.140	0.140	6.94	9173	5045	45°
		10.00	12	200	0.060	0.160	0.160	8.62	7385	5317	45°
		12.00	16	200	0.065	0.180	0.180	10.29	6187	6435	45°
	Hardened tool steel 56 - 60 HRC	6.00	8	150	0.045	0.120	0.120	5.26	9077	3268	45°
		8.00	10	150	0.050	0.140	0.140	6.94	6880	3440	45°
		10.00	12	150	0.055	0.160	0.160	8.62	5539	3656	45°
		12.00	16	150	0.060	0.180	0.180	10.29	4640	4454	45°
	Hardened tool steel 42 - 48 HRC	6.00	8	400	0.030	0.030	0.030	4.80	26526	6366	45°
		8.00	10	400	0.035	0.030	0.030	6.31	20178	7062	45°
		10.00	12	400	0.035	0.040	0.040	7.91	16097	6761	45°
		12.00	16	400	0.040	0.040	0.040	9.41	13531	8660	45°
	Hardened tool steel 48 - 52 HRC	6.00	8	350	0.030	0.030	0.030	4.80	23210	5570	45°
		8.00	10	350	0.035	0.030	0.030	6.31	17656	6180	45°
		10.00	12	350	0.035	0.040	0.040	7.91	14085	5916	45°
		12.00	16	350	0.040	0.040	0.040	9.41	11839	7577	45°
	Hardened tool steel 52 - 56 HRC	6.00	8	280	0.025	0.030	0.030	4.80	18568	3714	45°
		8.00	10	280	0.030	0.030	0.030	6.31	14125	4238	45°
		10.00	12	280	0.030	0.040	0.040	7.91	11268	4057	45°
		12.00	16	280	0.035	0.040	0.040	9.41	9471	5304	45°
	Hardened tool steel 56 - 60 HRC	6.00	8	180	0.025	0.030	0.030	4.80	11937	2387	45°
		8.00	10	180	0.030	0.030	0.030	6.31	9080	2724	45°
		10.00	12	180	0.030	0.040	0.040	7.91	7243	2608	45°
		12.00	16	180	0.035	0.040	0.040	9.41	6089	3410	45°

Ball nose end mills SpheroX

Tolerance r ±0.005, 3xd

HM XA	λ 30° γ -10°



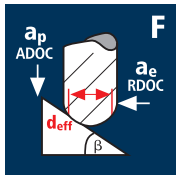
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7460** ø-Code **300**

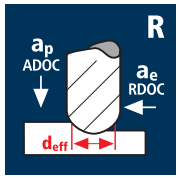
Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	β	z	X-AL	X7460
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	25°	8		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	25°	10		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	25°	12		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	25°	16		●

Application F



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Steel 1100 - 1300 N/mm²	1.00	2	119	0.058	0.03	0.09	0.91	41812	4850	45°
	2.00	2	226	0.078	0.03	0.12	1.72	41932	6541	45°
	3.00	2	290	0.098	0.05	0.15	2.59	35589	6975	45°
	4.00	2	290	0.117	0.05	0.18	3.39	27261	6379	45°
	5.00	2	290	0.137	0.05	0.21	4.17	22145	6068	45°
	6.00	2	290	0.150	0.05	0.23	4.94	18674	5602	45°
	8.00	2	290	0.182	0.08	0.28	6.67	13841	5038	45°
	10.00	2	290	0.202	0.08	0.31	8.22	11233	4538	45°
	12.00	2	290	0.221	0.10	0.34	9.89	9337	4127	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	119	0.058	0.03	0.09	0.91	41812	4850	45°
	2.00	2	160	0.078	0.03	0.12	1.72	29686	4631	45°
	3.00	2	200	0.098	0.05	0.15	2.59	24544	4811	45°
	4.00	2	200	0.117	0.05	0.18	3.39	18800	4399	45°
	5.00	2	200	0.137	0.05	0.21	4.17	15273	4185	45°
	6.00	2	200	0.150	0.05	0.23	4.94	12878	3863	45°
	8.00	2	200	0.182	0.08	0.28	6.67	9545	3474	45°
	10.00	2	200	0.202	0.08	0.31	8.22	7747	3130	45°
	12.00	2	200	0.221	0.10	0.34	9.89	6439	2846	45°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	1.00	2	119	0.058	0.03	0.09	0.91	41812	4850	45°
	2.00	2	120	0.078	0.03	0.12	1.72	22265	3473	45°
	3.00	2	150	0.098	0.05	0.15	2.59	18408	3608	45°
	4.00	2	150	0.117	0.05	0.18	3.39	14100	3299	45°
	5.00	2	150	0.137	0.05	0.21	4.17	11454	3138	45°
	6.00	2	150	0.150	0.05	0.23	4.94	9659	2898	45°
	8.00	2	150	0.182	0.08	0.28	6.67	7159	2606	45°
	10.00	2	150	0.202	0.08	0.31	8.22	5810	2347	45°
	12.00	2	150	0.221	0.10	0.34	9.89	4829	2134	45°
Cold work tool steel (12%Cr) high alloyed [1.2379]	1.00	2	112	0.058	0.03	0.09	0.91	39353	4565	45°
	2.00	2	112	0.078	0.03	0.12	1.72	20780	3242	45°
	3.00	2	140	0.098	0.05	0.15	2.59	17181	3367	45°
	4.00	2	140	0.117	0.05	0.18	3.39	13160	3079	45°
	5.00	2	140	0.137	0.05	0.21	4.17	10691	2929	45°
	6.00	2	140	0.150	0.05	0.23	4.94	9015	2705	45°
	8.00	2	140	0.182	0.08	0.28	6.67	6682	2432	45°
	10.00	2	140	0.202	0.08	0.31	8.22	5423	2191	45°
	12.00	2	140	0.221	0.10	0.34	9.89	4507	1992	45°

Application R

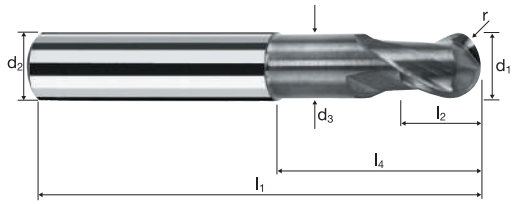


Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Steel 1100 - 1300 N/mm²	1.00	2	100	0.037	0.18	0.20	0.77	41426	3088	0.1
	2.00	2	180	0.064	0.28	0.40	1.39	41281	5275	0.6
	3.00	2	204	0.080	0.36	0.60	1.95	33304	5319	1.1
	4.00	2	204	0.096	0.48	0.80	2.60	24978	4787	1.8
	5.00	2	204	0.106	0.60	1.00	3.25	19982	4255	2.6
	6.00	2	204	0.115	0.72	1.20	3.90	16652	3830	3.3
	8.00	2	204	0.141	0.96	1.60	5.20	12489	3511	5.4
	10.00	2	204	0.160	1.20	2.00	6.50	9991	3192	7.7
	12.00	2	204	0.166	1.44	2.40	7.80	8326	2766	9.6
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	100	0.031	0.18	0.20	0.77	41426	2552	0.1
	2.00	2	111	0.053	0.28	0.40	1.39	25457	2688	0.3
	3.00	2	111	0.066	0.36	0.60	1.95	18121	2392	0.5
	4.00	2	111	0.079	0.48	0.80	2.60	13591	2153	0.8
	5.00	2	111	0.088	0.60	1.00	3.25	10873	1914	1.1
	6.00	2	111	0.095	0.72	1.20	3.90	9061	1722	1.5
	8.00	2	111	0.116	0.96	1.60	5.20	6795	1579	2.4
	10.00	2	111	0.132	1.20	2.00	6.50	5436	1435	3.4
	12.00	2	111	0.137	1.44	2.40	7.80	4530	1244	4.3
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]	1.00	2	83	0.029	0.18	0.20	0.77	34384	2012	0.1
	2.00	2	83	0.050	0.28	0.40	1.39	19035	1910	0.2
	3.00	2	83	0.063	0.36	0.60	1.95	13550	1699	0.4
	4.00	2	83	0.075	0.48	0.80	2.60	10163	1529	0.6
	5.00	2	83	0.084	0.60	1.00	3.25	8130	1359	0.8
	6.00	2	83	0.090	0.72	1.20	3.90	6775	1223	1.1
	8.00	2	83	0.110	0.96	1.60	5.20	5081	1121	1.7
	10.00	2	83	0.125	1.20	2.00	6.50	4065	1020	2.4
	12.00	2	83	0.130	1.44	2.40	7.80	3388	884	3.1
Cold work tool steel (12%Cr) high alloyed [1.2379]	1.00	2	80	0.041	0.18	0.20	0.77	33141	2717	0.1
	2.00	2	98	0.070	0.28	0.40	1.39	22475	3159	0.4
	3.00	2	98	0.088	0.36	0.60	1.95	15999	2811	0.6
	4.00	2	98	0.105	0.48	0.80	2.60	11999	2530	1.0
	5.00	2	98	0.117	0.60	1.00	3.25	9599	2249	1.3
	6.00	2	98	0.126	0.72	1.20	3.90	8000	2024	1.7
	8.00	2	98	0.155	0.96	1.60	5.20	6000	1855	2.8
	10.00	2	98	0.176	1.20	2.00	6.50	4800	1687	4.0
	12.00	2	98	0.183	1.44	2.40	7.80	4000	1462	5.1

Ball nose end mills Sphericut

Tolerance r ±0.005, 3xd

HM MG10 | λ 30° γ 5°



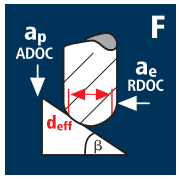
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **7540** ø-Code **100**

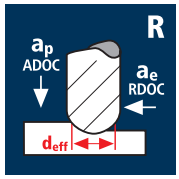
Ø Code	d_1	d_2 h6	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	POLYCHROM P7540
100	1.00	6.00	0.95	57	1.50	3.00	13.08	0.500	2	●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	1.000	2	●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	1.500	2	●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	2.000	2	●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	2.500	2	●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	2	●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	2	●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	2	●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	2	●
610	16.00	16.00	15.00	92	17.00	42.13	43.00	8.000	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Cast iron (lamellar / spheroidal)	2.00	2	250	0.055	0.050	0.120	1.79	44457	4890	45°
	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	490	0.070	0.050	0.180	3.39	46009	6441	45°
	5.00	2	610	0.075	0.050	0.200	4.17	46563	6985	45°
	6.00	2	730	0.085	0.075	0.230	5.08	45741	7776	45°
	8.00	2	810	0.090	0.075	0.250	6.64	38830	6989	45°
	10.00	2	810	0.100	0.100	0.300	8.34	30915	6183	45°
	12.00	2	810	0.105	0.100	0.350	9.89	26070	5475	45°
	16.00	2	810	0.115	0.120	0.400	13.10	19682	4527	45°
Unalloyed copper	2.00	2	250	0.055	0.050	0.120	1.79	44457	4890	45°
	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	490	0.070	0.050	0.180	3.39	46009	6441	45°
	5.00	2	540	0.075	0.050	0.200	4.17	41220	6183	45°
	6.00	2	540	0.085	0.075	0.230	5.08	33836	5752	45°
	8.00	2	540	0.090	0.075	0.250	6.64	25887	4660	45°
	10.00	2	540	0.100	0.100	0.300	8.34	20610	4122	45°
	12.00	2	540	0.105	0.100	0.350	9.89	17380	3650	45°
	16.00	2	540	0.115	0.120	0.400	13.10	13121	3018	45°
Thermoplastics	2.00	2	250	0.055	0.050	0.120	1.79	44457	4890	45°
	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	490	0.070	0.050	0.180	3.39	46009	6441	45°
	5.00	2	610	0.075	0.050	0.200	4.17	46563	6985	45°
	6.00	2	730	0.085	0.075	0.230	5.08	45741	7776	45°
	8.00	2	955	0.090	0.075	0.250	6.64	45781	8241	45°
	10.00	2	1195	0.100	0.100	0.300	8.34	45609	9122	45°
	12.00	2	1430	0.105	0.100	0.350	9.89	46025	9665	45°
	16.00	2	1800	0.115	0.120	0.400	13.10	43737	10060	45°
Cast aluminium	2.00	2	250	0.055	0.050	0.120	1.79	44457	4890	45°
	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	490	0.070	0.050	0.180	3.39	46009	6441	45°
	5.00	2	610	0.075	0.050	0.200	4.17	46563	6985	45°
	6.00	2	648	0.085	0.075	0.230	5.08	40603	6903	45°
	8.00	2	648	0.090	0.075	0.250	6.64	31064	5592	45°
	10.00	2	648	0.100	0.100	0.300	8.34	24732	4946	45°
	12.00	2	648	0.105	0.100	0.350	9.89	20856	4380	45°
	16.00	2	648	0.115	0.120	0.400	13.10	15745	3621	45°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Cast iron (lamellar / spheroidal)	2.00	2	210	0.065	0.400	0.800	1.60	41778	5431	1.7
	3.00	2	315	0.082	0.600	1.200	2.40	41778	6852	4.9
	4.00	2	405	0.090	0.800	1.600	3.20	40286	7252	9.3
	5.00	2	405	0.100	1.000	2.000	4.00	32229	6446	12.9
	6.00	2	405	0.120	1.200	2.400	4.80	26857	6446	18.6
	8.00	2	405	0.140	1.600	3.200	6.40	20143	5640	28.9
	10.00	2	405	0.150	2.000	4.000	8.00	16114	4834	38.7
	12.00	2	405	0.180	2.400	4.800	9.60	13429	4834	55.7
	16.00	2	405	0.200	3.200	6.400	12.80	10072	4029	82.5
Unalloyed copper	2.00	2	210	0.062	0.400	0.800	1.60	41778	5181	1.7
	3.00	2	270	0.078	0.600	1.200	2.40	35810	5586	4.0
	4.00	2	270	0.084	0.800	1.600	3.20	26857	4512	5.8
	5.00	2	270	0.092	1.000	2.000	4.00	21486	3953	7.9
	6.00	2	270	0.111	1.200	2.400	4.80	17905	3975	11.4
	8.00	2	270	0.128	1.600	3.200	6.40	13429	3438	17.6
	10.00	2	270	0.135	2.000	4.000	8.00	10743	2901	23.2
	12.00	2	270	0.162	2.400	4.800	9.60	8952	2900	33.4
	16.00	2	270	0.176	3.200	6.400	12.80	6714	2363	48.4
Thermoplastics	2.00	2	210	0.065	0.400	0.800	1.60	41778	5431	1.7
	3.00	2	315	0.082	0.600	1.200	2.40	41778	6852	4.9
	4.00	2	420	0.090	0.800	1.600	3.20	41778	7520	9.6
	5.00	2	520	0.100	1.000	2.000	4.00	41380	8276	16.6
	6.00	2	630	0.120	1.200	2.400	4.80	41778	10027	28.9
	8.00	2	830	0.140	1.600	3.200	6.40	41281	11559	59.2
	10.00	2	900	0.150	2.000	4.000	8.00	35810	10743	85.9
	12.00	2	900	0.180	2.400	4.800	9.60	29842	10743	123.8
	16.00	2	900	0.200	3.200	6.400	12.80	22381	8952	183.3
Cast aluminium	2.00	2	210	0.065	0.400	0.800	1.60	41778	5431	1.7
	3.00	2	315	0.082	0.600	1.200	2.40	41778	6852	4.9
	4.00	2	324	0.090	0.800	1.600	3.20	32229	5801	7.4
	5.00	2	324	0.100	1.000	2.000	4.00	25783	5157	10.3
	6.00	2	324	0.120	1.200	2.400	4.80	21486	5157	14.9
	8.00	2	324	0.140	1.600	3.200	6.40	16114	4512	23.1
	10.00	2	324	0.150	2.000	4.000	8.00	12892	3868	30.9
	12.00	2	324	0.180	2.400	4.800	9.60	10743	3868	44.6
	16.00	2	324	0.200	3.200	6.400	12.80	8057	3223	66.0

Ball nose end mills Sphericut

Tolerance r ±0.005, 3xd

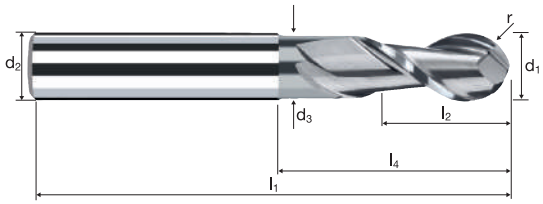
HM MG10 | λ 40° γ 20°

h4

r

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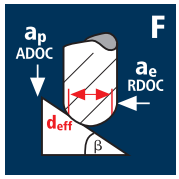
ReTool®

Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	Plastic Thermoplast

Example: **Order-N°.** Coating | Article-N°. **7550** | ø-Code **140**

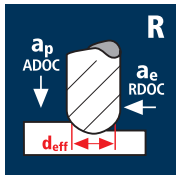
Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	7550
140	2.00	6.00	1.90	57	4.00	6.00	14.31	1.000	2	●
180	3.00	6.00	2.80	57	6.00	9.00	15.63	1.500	2	●
220	4.00	6.00	3.70	57	8.00	12.00	16.95	2.000	2	●
260	5.00	6.00	4.60	57	10.00	15.00	18.27	2.500	2	●
300	6.00	6.00	5.50	57	12.00	19.34	20.00	3.000	2	●
391	8.00	8.00	7.40	63	16.00	25.29	26.00	4.000	2	●
450	10.00	10.00	9.20	72	20.00	30.20	31.00	5.000	2	●
501	12.00	12.00	11.00	83	24.00	36.13	37.00	6.000	2	●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	8.000	2	●
682	20.00	20.00	19.00	104	40.00	52.13	53.00	10.000	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC	1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
	2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
	3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
	4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
	5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
	6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
	8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
	10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
	12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°
Hardened tool steel 56 - 60 HRC	1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
	2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
	3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
	4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
	5.00	2	150	0.065	0.150	0.150	4.53	10540	1370	45°
	6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
	8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
	10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
	12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°
Hardened tool steel > 60 HRC	1.00	2	90	0.020	0.040	0.040	0.93	30804	1232	45°
	2.00	2	90	0.025	0.055	0.055	1.80	15915	796	45°
	3.00	2	90	0.030	0.075	0.075	2.68	10690	641	45°
	4.00	2	90	0.050	0.090	0.090	3.54	8093	809	45°
	5.00	2	90	0.055	0.115	0.115	4.43	6467	711	45°
	6.00	2	90	0.060	0.115	0.115	5.24	5467	656	45°
	8.00	2	90	0.070	0.130	0.130	6.90	4152	581	45°
	10.00	2	90	0.070	0.150	0.150	8.58	3339	468	45°
	12.00	2	90	0.075	0.190	0.190	10.34	2771	416	45°
High speed steel, hardened 64 - 70 HRC	1.00	2	60	0.015	0.025	0.025	0.89	21459	644	45°
	2.00	2	60	0.020	0.035	0.035	1.74	10976	439	45°
	3.00	2	60	0.020	0.050	0.050	2.59	7374	295	45°
	4.00	2	60	0.035	0.060	0.060	3.43	5568	390	45°
	5.00	2	60	0.040	0.075	0.075	4.29	4452	356	45°
	6.00	2	60	0.040	0.075	0.075	5.08	3760	301	45°
	8.00	2	60	0.050	0.085	0.085	6.70	2851	285	45°
	10.00	2	60	0.050	0.100	0.100	8.34	2290	229	45°
	12.00	2	60	0.055	0.125	0.125	10.03	1904	209	45°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Hardened tool steel 52 - 56 HRC	1.00	2	100	0.028	0.180	0.200	0.77	41339	2315	0.1
	2.00	2	100	0.048	0.280	0.400	1.39	22900	2198	0.2
	3.00	2	100	0.060	0.360	0.600	1.95	16324	1959	0.4
	4.00	2	100	0.072	0.480	0.800	2.60	12243	1763	0.7
	5.00	2	100	0.080	0.600	1.000	3.25	9794	1567	0.9
	6.00	2	100	0.086	0.720	1.200	3.90	8162	1404	1.2
	8.00	2	100	0.106	0.960	1.600	5.20	6121	1298	2.0
	10.00	2	100	0.120	1.200	2.000	6.50	4897	1175	2.8
	12.00	2	100	0.125	1.440	2.400	7.80	4081	1020	3.5
Hardened tool steel 56 - 60 HRC	1.00	2	61	0.017	0.160	0.200	0.73	26598	904	0.0
	2.00	2	61	0.029	0.250	0.400	1.32	14710	853	0.1
	3.00	2	61	0.036	0.320	0.600	1.85	10496	756	0.1
	4.00	2	61	0.043	0.430	0.800	2.48	7829	673	0.2
	5.00	2	61	0.048	0.540	1.000	3.10	6264	601	0.3
	6.00	2	61	0.052	0.650	1.200	3.73	5206	541	0.4
	8.00	2	61	0.063	0.860	1.600	4.96	3915	493	0.7
	10.00	2	61	0.072	1.080	2.000	6.21	3127	450	1.0
	12.00	2	61	0.075	1.300	2.400	7.46	2603	391	1.2
Hardened tool steel > 60 HRC	1.00	2	46	0.014	0.130	0.200	0.67	21854	612	0.0
	2.00	2	46	0.023	0.200	0.400	1.20	12202	561	0.0
	3.00	2	46	0.029	0.250	0.600	1.66	8821	512	0.1
	4.00	2	46	0.035	0.340	0.800	2.23	6566	460	0.1
	5.00	2	46	0.038	0.420	1.000	2.77	5286	402	0.2
	6.00	2	46	0.041	0.500	1.200	3.32	4410	362	0.2
	8.00	2	46	0.051	0.670	1.600	4.43	3305	337	0.4
	10.00	2	46	0.058	0.840	2.000	5.55	2638	306	0.5
	12.00	2	46	0.060	1.010	2.400	6.66	2199	264	0.6
High speed steel, hardened 64 - 70 HRC	1.00	2	31	0.011	0.130	0.200	0.67	14728	324	0.0
	2.00	2	31	0.018	0.200	0.400	1.20	8223	296	0.0
	3.00	2	31	0.023	0.250	0.600	1.66	5944	273	0.0
	4.00	2	31	0.028	0.340	0.800	2.23	4425	248	0.1
	5.00	2	31	0.031	0.420	1.000	2.77	3562	221	0.1
	6.00	2	31	0.033	0.500	1.200	3.32	2972	196	0.1
	8.00	2	31	0.041	0.670	1.600	4.43	2227	183	0.2
	10.00	2	31	0.046	0.840	2.000	5.55	1778	164	0.3
	12.00	2	31	0.048	1.010	2.400	6.66	1482	142	0.3

Ball nose end mills SpheroX

Tolerance r ±0.005, 4.5xd

X-Generation X

II

HM XA

λ 30°
γ -10°

h4

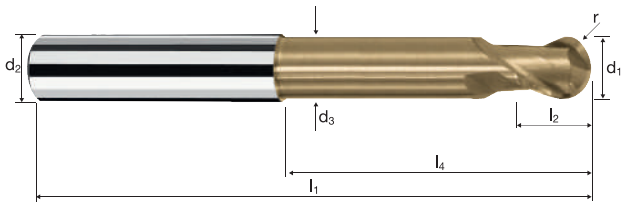
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R

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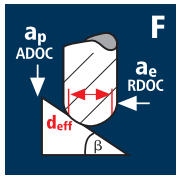
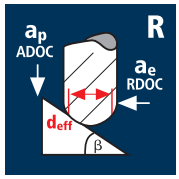


ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **V** Article-N°. **7472** ø-Code **100**

Ø Code	d1	d2 h4	d3	l1	l2	l3	l4	r ±0.005	z	DURO-V V7472
100	1.00	6.00	0.95	61	1.50	4.50	14.58	0.500	2	●
140	2.00	6.00	1.90	61	3.00	9.00	17.31	1.000	2	●
180	3.00	6.00	2.80	61	4.00	13.50	20.13	1.500	2	●
220	4.00	6.00	3.70	66	5.00	18.00	22.95	2.000	2	●
260	5.00	6.00	4.60	66	6.00	22.50	25.77	2.500	2	●
300	6.00	6.00	5.50	69	7.00	30.34	31.00	3.000	2	●
391	8.00	8.00	7.40	80	9.00	39.29	40.00	4.000	2	●
450	10.00	10.00	9.20	90	11.00	47.20	48.00	5.000	2	●
501	12.00	12.00	11.00	105	13.00	54.13	55.00	6.000	2	●
610	16.00	16.00	15.00	125	17.00	74.13	75.00	8.000	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 52 - 56 HRC H	1.00	4	140	0.014	0.030	0.090	0.91	48971	2742	45°
		2.00	4	140	0.022	0.030	0.120	1.72	25909	2280	45°
		3.00	4	180	0.034	0.050	0.150	2.59	22122	3009	45°
		4.00	4	180	0.042	0.050	0.180	3.39	16901	2839	45°
		5.00	4	180	0.048	0.050	0.210	4.17	13740	2638	45°
		6.00	4	180	0.052	0.050	0.230	4.94	11598	2412	45°
		8.00	4	180	0.056	0.080	0.280	6.67	8590	1924	45°
		10.00	4	180	0.060	0.080	0.310	8.22	6970	1673	45°
		12.00	4	180	0.066	0.100	0.340	9.89	5793	1529	45°
	Hardened tool steel 56 - 60 HRC H	1.00	4	110	0.014	0.030	0.090	0.91	38477	2155	45°
		2.00	4	110	0.022	0.030	0.120	1.72	20357	1791	45°
		3.00	4	140	0.034	0.050	0.150	2.59	17206	2340	45°
		4.00	4	140	0.042	0.050	0.180	3.39	13146	2209	45°
		5.00	4	140	0.048	0.050	0.210	4.17	10687	2052	45°
		6.00	4	140	0.052	0.050	0.230	4.94	9021	1876	45°
		8.00	4	140	0.056	0.080	0.280	6.67	6681	1497	45°
		10.00	4	140	0.060	0.080	0.310	8.22	5421	1301	45°
		12.00	4	140	0.066	0.100	0.340	9.89	4506	1190	45°
	Hardened tool steel > 60 HRC H	1.00	4	70	0.014	0.030	0.090	0.91	24485	1371	45°
		2.00	4	70	0.022	0.030	0.120	1.72	12954	1140	45°
		3.00	4	90	0.034	0.050	0.150	2.59	11061	1504	45°
		4.00	4	90	0.042	0.050	0.180	3.39	8451	1420	45°
		5.00	4	90	0.048	0.050	0.210	4.17	6870	1319	45°
		6.00	4	90	0.052	0.050	0.230	4.94	5799	1206	45°
		8.00	4	90	0.056	0.080	0.280	6.67	4295	962	45°
		10.00	4	90	0.060	0.080	0.310	8.22	3485	836	45°
		12.00	4	90	0.066	0.100	0.340	9.89	2897	765	45°
	High speed steel, hardened 64 - 70 HRC H	1.00	4	40	0.014	0.030	0.090	0.91	13992	784	45°
		2.00	4	40	0.022	0.030	0.120	1.72	7403	652	45°
		3.00	4	50	0.034	0.050	0.150	2.59	6145	836	45°
		4.00	4	50	0.042	0.050	0.180	3.39	4695	789	45°
		5.00	4	50	0.048	0.050	0.210	4.17	3817	733	45°
		6.00	4	50	0.052	0.050	0.230	4.94	3222	670	45°
		8.00	4	50	0.056	0.080	0.280	6.67	2386	535	45°
		10.00	4	50	0.060	0.080	0.310	8.22	1936	465	45°
		12.00	4	50	0.066	0.100	0.340	9.89	1609	425	45°
	Hardened tool steel 52 - 56 HRC H	1.00	4	104	0.023	0.180	0.180	0.99	33439	3076	30°
		2.00	4	104	0.039	0.280	0.280	1.92	17242	2690	30°
		3.00	4	104	0.049	0.360	0.360	2.83	11698	2293	30°
		4.00	4	104	0.058	0.480	0.480	3.77	8781	2037	30°
		5.00	4	104	0.065	0.600	0.600	4.71	7028	1827	30°
		6.00	4	104	0.070	0.720	0.720	5.66	5849	1638	30°
		8.00	4	104	0.086	0.960	0.960	7.54	4390	1510	30°
		10.00	4	104	0.098	1.200	1.200	9.43	3511	1376	30°
		12.00	4	104	0.101	1.440	1.440	11.31	2927	1183	30°
	Hardened tool steel 56 - 60 HRC H	1.00	4	64	0.014	0.160	0.160	0.97	21002	1176	30°
		2.00	4	64	0.023	0.250	0.250	1.90	10722	986	30°
		3.00	4	64	0.029	0.320	0.320	2.78	7328	850	30°
		4.00	4	64	0.035	0.430	0.430	3.72	5476	767	30°
		5.00	4	64	0.039	0.540	0.540	4.65	4381	683	30°
		6.00	4	64	0.042	0.650	0.650	5.58	3651	613	30°
		8.00	4	64	0.051	0.860	0.860	7.43	2742	559	30°
		10.00	4	64	0.058	1.080	1.080	9.30	2191	508	30°
		12.00	4	64	0.061	1.300	1.300	11.16	1825	445	30°
	Hardened tool steel > 60 HRC H	1.00	4	48	0.011	0.130	0.130	0.95	16083	708	30°
		2.00	4	48	0.019	0.200	0.200	1.84	8304	631	30°
		3.00	4	48	0.023	0.250	0.250	2.69	5680	523	30°
		4.00	4	48	0.028	0.340	0.340	3.59	4256	477	30°
		5.00	4	48	0.031	0.420	0.420	4.48	3410	423	30°
		6.00	4	48	0.034	0.500	0.500	5.37	2845	387	30°
		8.00	4	48	0.041	0.670	0.670	7.17	2131	350	30°
		10.00	4	48	0.047	0.840	0.840	8.96	1705	321	30°
		12.00	4	48	0.049	1.010	1.010	10.76	1420	278	30°
	High speed steel, hardened 64 - 70 HRC H	1.00	4	24	0.007	0.130	0.130	0.95	8042	225	30°
		2.00	4	24	0.012	0.200	0.200	1.84	4152	199	30°
		3.00	4	24	0.015	0.250	0.250	2.69	2840	170	30°
		4.00	4	24	0.018	0.340	0.340	3.59	2128	153	30°
		5.00	4	24	0.020	0.420	0.420	4.48	1705	136	30°
		6.00	4	24	0.022	0.500	0.500	5.37	1423	125	30°
		8.00	4	24	0.026	0.670	0.670	7.17	1065	111	30°
		10.00	4	24	0.030	0.840	0.840	8.96	853	102	30°
		12.00	4	24	0.031	1.010	1.010	10.76	710	88	30°

Ball nose end mills SpheroX

Tolerance r ±0.005, 4.5xd

X-Generation X

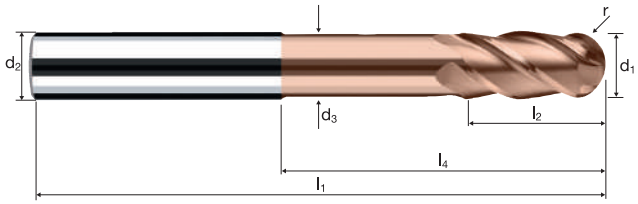
II

HM XA | λ 40° γ 0°

h4 | sc

Vario | r

R | F



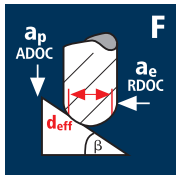
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS

Example: **Order-N°.** Coating **H** | Article-N°. **7492** | ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	DURO-Si H7492
100	1.00	6.00	0.95	61	2.00	4.50	14.58	0.500	4	●
140	2.00	6.00	1.90	61	4.00	9.00	17.31	1.000	4	●
180	3.00	6.00	2.80	61	6.00	13.50	20.13	1.500	4	●
220	4.00	6.00	3.70	66	8.00	18.00	22.95	2.000	4	●
260	5.00	6.00	4.60	66	10.00	22.50	25.77	2.500	4	●
300	6.00	6.00	5.50	69	12.00	30.34	31.00	3.000	4	●
391	8.00	8.00	7.40	80	16.00	39.29	40.00	4.000	4	●
450	10.00	10.00	9.20	90	20.00	47.20	48.00	5.000	4	●
501	12.00	12.00	11.00	105	24.00	54.13	55.00	6.000	4	●
610	16.00	16.00	15.00	125	32.00	74.13	75.00	8.000	4	●

Application



Material

Hardened tool steel 42 - 48 HRC

X X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	300	0.030	0.050	0.050	0.94	60000	3600	45°
2.00	2	300	0.035	0.070	0.070	1.84	51898	3633	45°
3.00	2	300	0.040	0.100	0.100	2.74	34851	2788	45°
4.00	2	300	0.070	0.120	0.120	3.62	26379	3693	45°
5.00	2	300	0.080	0.150	0.150	4.53	21080	3373	45°
6.00	2	300	0.085	0.150	0.150	5.36	17816	3029	45°
8.00	2	300	0.095	0.170	0.170	7.05	13545	2574	45°
10.00	2	300	0.100	0.200	0.200	8.77	10889	2178	45°
12.00	2	300	0.105	0.250	0.250	10.56	9043	1899	45°

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	250	0.030	0.050	0.050	0.94	60000	3600	45°
2.00	2	250	0.035	0.070	0.070	1.84	43249	3027	45°
3.00	2	250	0.040	0.100	0.100	2.74	29043	2323	45°
4.00	2	250	0.065	0.120	0.120	3.62	21983	2858	45°
5.00	2	250	0.075	0.150	0.150	4.53	17567	2635	45°
6.00	2	250	0.080	0.150	0.150	5.36	14847	2376	45°
8.00	2	250	0.090	0.170	0.170	7.05	11288	2032	45°
10.00	2	250	0.095	0.200	0.200	8.77	9074	1724	45°
12.00	2	250	0.100	0.250	0.250	10.56	7536	1507	45°

Hardened tool steel 52 - 56 HRC

X

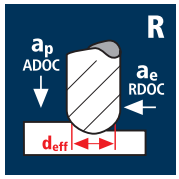
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°

Titanium alloys > 300 HB [Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
5.00	2	150	0.070	0.150	0.150	4.53	10540	1476	45°
6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°

Application



Material

Hardened tool steel 42 - 48 HRC

X X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.034	0.180	0.200	0.77	41339	2811	0.1
2.00	2	153	0.058	0.280	0.400	1.39	35037	4064	0.5
3.00	2	153	0.073	0.360	0.600	1.95	24975	3646	0.8
4.00	2	153	0.087	0.480	0.800	2.60	18731	3259	1.3
5.00	2	153	0.097	0.600	1.000	3.25	14985	2907	1.7
6.00	2	153	0.105	0.720	1.200	3.90	12488	2623	2.3
8.00	2	153	0.128	0.960	1.600	5.20	9366	2398	3.7
10.00	2	153	0.145	1.200	2.000	6.50	7493	2173	5.2
12.00	2	153	0.151	1.440	2.400	7.80	6244	1886	6.5

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.031	0.180	0.200	0.77	41339	2563	0.1
2.00	2	122	0.053	0.280	0.400	1.39	27938	2961	0.3
3.00	2	122	0.066	0.360	0.600	1.95	19915	2629	0.6
4.00	2	122	0.079	0.480	0.800	2.60	14936	2360	0.9
5.00	2	122	0.088	0.600	1.000	3.25	11949	2103	1.3
6.00	2	122	0.095	0.720	1.200	3.90	9957	1892	1.6
8.00	2	122	0.116	0.960	1.600	5.20	7468	1733	2.7
10.00	2	122	0.132	1.200	2.000	6.50	5974	1577	3.8
12.00	2	122	0.137	1.440	2.400	7.80	4979	1364	4.7

Hardened tool steel 52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.028	0.180	0.200	0.77	41339	2315	0.1
2.00	2	100	0.048	0.280	0.400	1.39	22900	2198	0.2
3.00	2	100	0.060	0.360	0.600	1.95	16324	1959	0.4
4.00	2	100	0.072	0.480	0.800	2.60	12243	1763	0.7
5.00	2	100	0.080	0.600	1.000	3.25	9794	1567	0.9
6.00	2	100	0.086	0.720	1.200	3.90	8162	1404	1.2
8.00	2	100	0.106	0.960	1.600	5.20	6121	1298	2.0
10.00	2	100	0.120	1.200	2.000	6.50	4897	1175	2.8
12.00	2	100	0.125	1.440	2.400	7.80	4081	1020	3.5

Titanium alloys > 300 HB [Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	77	0.031	0.180	0.200	0.77	31831	1974	0.1
2.00	2	77	0.053	0.280	0.400	1.39	17633	1869	0.2
3.00	2	77	0.066	0.360	0.600	1.95	12569	1659	0.4
4.00	2	77	0.079	0.480	0.800	2.60	9427	1490	0.6
5.00	2	77	0.088	0.600	1.000	3.25	7541	1327	0.8
6.00	2	77	0.095	0.720	1.200	3.90	6285	1194	1.0
8.00	2	77	0.116	0.960	1.600	5.20	4713	1093	1.7
10.00	2	77	0.132	1.200	2.000	6.50	3771	996	2.4
12.00	2	77	0.137	1.440	2.400	7.80	3142	861	3.0

Ball nose end mills SpheroX

Tolerance r ±0.005, 4.5xd

HM XA	λ 30° γ -10°

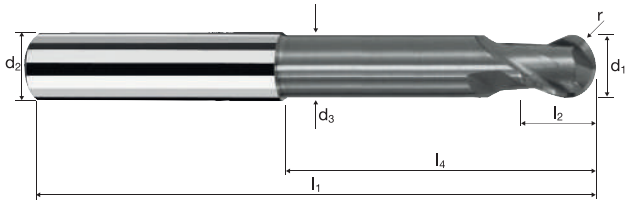












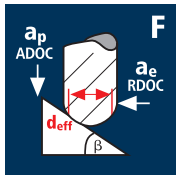
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7402** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	X-AL	X7402
100	1.00	6.00	0.95	61	1.50	4.50	14.58	0.500	2		●
140	2.00	6.00	1.90	61	3.00	9.00	17.31	1.000	2		●
180	3.00	6.00	2.80	61	4.00	13.50	20.13	1.500	2		●
220	4.00	6.00	3.70	66	5.00	18.00	22.95	2.000	2		●
260	5.00	6.00	4.60	66	6.00	22.50	25.77	2.500	2		●
300	6.00	6.00	5.50	69	7.00	30.34	31.00	3.000	2		●
391	8.00	8.00	7.40	80	9.00	39.29	40.00	4.000	2		●
450	10.00	10.00	9.20	90	11.00	47.20	48.00	5.000	2		●
501	12.00	12.00	11.00	105	13.00	54.13	55.00	6.000	2		●

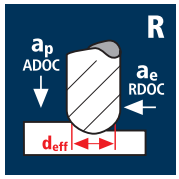
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC									
1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°
Hardened tool steel 56 - 60 HRC									
1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
5.00	2	150	0.065	0.150	0.150	4.53	10540	1370	45°
6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°
Hardened tool steel > 60 HRC									
1.00	2	90	0.020	0.040	0.040	0.93	30804	1232	45°
2.00	2	90	0.025	0.055	0.055	1.80	15915	796	45°
3.00	2	90	0.030	0.075	0.075	2.68	10690	641	45°
4.00	2	90	0.050	0.090	0.090	3.54	8093	809	45°
5.00	2	90	0.055	0.115	0.115	4.43	6467	711	45°
6.00	2	90	0.060	0.115	0.115	5.24	5467	656	45°
8.00	2	90	0.070	0.130	0.130	6.90	4152	581	45°
10.00	2	90	0.070	0.150	0.150	8.58	3339	468	45°
12.00	2	90	0.075	0.190	0.190	10.34	2771	416	45°
High speed steel, hardened 64 - 70 HRC									
1.00	2	60	0.015	0.025	0.025	0.89	21459	644	45°
2.00	2	60	0.020	0.035	0.035	1.74	10976	439	45°
3.00	2	60	0.020	0.050	0.050	2.59	7374	295	45°
4.00	2	60	0.035	0.060	0.060	3.43	5568	390	45°
5.00	2	60	0.040	0.075	0.075	4.29	4452	356	45°
6.00	2	60	0.040	0.075	0.075	5.08	3760	301	45°
8.00	2	60	0.050	0.085	0.085	6.70	2851	285	45°
10.00	2	60	0.050	0.100	0.100	8.34	2290	229	45°
12.00	2	60	0.055	0.125	0.125	10.03	1904	209	45°

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Hardened tool steel 52 - 56 HRC									
1.00	2	78	0.028	0.180	0.200	0.77	32244	1806	0.1
2.00	2	78	0.048	0.280	0.400	1.39	17862	1715	0.2
3.00	2	78	0.060	0.360	0.600	1.95	12732	1528	0.3
4.00	2	78	0.072	0.480	0.800	2.60	9549	1375	0.5
5.00	2	78	0.080	0.600	1.000	3.25	7639	1222	0.7
6.00	2	78	0.086	0.720	1.200	3.90	6366	1095	0.9
8.00	2	78	0.106	0.960	1.600	5.20	4775	1012	1.6
10.00	2	78	0.120	1.200	2.000	6.50	3820	917	2.2
12.00	2	78	0.125	1.440	2.400	7.80	3183	796	2.8
Hardened tool steel 56 - 60 HRC									
1.00	2	34	0.017	0.160	0.200	0.73	14825	504	0.0
2.00	2	34	0.029	0.250	0.400	1.32	8199	476	0.0
3.00	2	34	0.036	0.320	0.600	1.85	5850	421	0.1
4.00	2	34	0.043	0.430	0.800	2.48	4364	375	0.1
5.00	2	34	0.048	0.540	1.000	3.10	3491	335	0.2
6.00	2	34	0.052	0.650	1.200	3.73	2901	302	0.2
8.00	2	34	0.063	0.860	1.600	4.96	2182	275	0.4
10.00	2	34	0.072	1.080	2.000	6.21	1743	251	0.5
12.00	2	34	0.075	1.300	2.400	7.46	1451	218	0.7
Hardened tool steel > 60 HRC									
1.00	2	26	0.014	0.130	0.200	0.67	12352	346	0.0
2.00	2	26	0.023	0.200	0.400	1.20	6897	317	0.0
3.00	2	26	0.029	0.250	0.600	1.66	4986	289	0.0
4.00	2	26	0.035	0.340	0.800	2.23	3711	260	0.1
5.00	2	26	0.038	0.420	1.000	2.77	2988	227	0.1
6.00	2	26	0.041	0.500	1.200	3.32	2493	204	0.1
8.00	2	26	0.051	0.670	1.600	4.43	1868	191	0.2
10.00	2	26	0.058	0.840	2.000	5.55	1491	173	0.3
12.00	2	26	0.060	1.010	2.400	6.66	1243	149	0.4
High speed steel, hardened 64 - 70 HRC									
1.00	2	17	0.011	0.130	0.200	0.67	8077	178	0.0
2.00	2	17	0.018	0.200	0.400	1.20	4509	162	0.0
3.00	2	17	0.023	0.250	0.600	1.66	3260	150	0.0
4.00	2	17	0.028	0.340	0.800	2.23	2427	136	0.0
5.00	2	17	0.031	0.420	1.000	2.77	1954	121	0.1
6.00	2	17	0.033	0.500	1.200	3.32	1630	108	0.1
8.00	2	17	0.041	0.670	1.600	4.43	1222	100	0.1
10.00	2	17	0.046	0.840	2.000	5.55	975	90	0.2
12.00	2	17	0.048	1.010	2.400	6.66	813	78	0.2

Ball nose end mills SpheroX

Tolerance r ±0.005, 6xd

X-Generation X

II

HM XA

λ 30°
γ -10°

h4

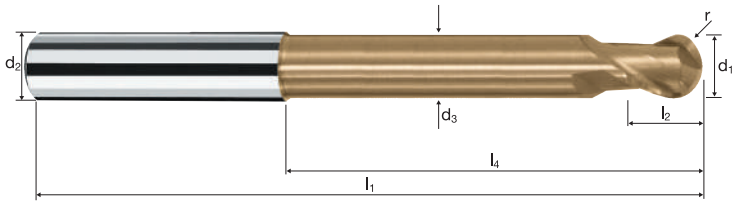
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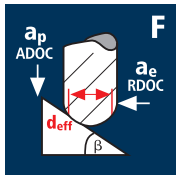
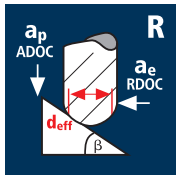


ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **V** Article-N°. **7474** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	DURO-V
										V7474
100	1.00	6.00	0.95	66	1.50	6.00	16.08	0.500	2	●
140	2.00	6.00	1.90	66	3.00	12.00	20.31	1.000	2	●
180	3.00	6.00	2.80	66	4.00	18.00	24.63	1.500	2	●
220	4.00	6.00	3.70	69	5.00	24.00	28.95	2.000	2	●
260	5.00	6.00	4.60	75	6.00	30.00	33.27	2.500	2	●
300	6.00	6.00	5.50	80	7.00	42.34	43.00	3.000	2	●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	4.000	2	●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	5.000	2	●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	6.000	2	●
610	16.00	16.00	15.00	135	17.00	85.13	86.00	8.000	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
	Hardened tool steel 52 - 56 HRC	1.00	4	130	0.014	0.030	0.090	0.91	45473	2547	45°
		2.00	4	130	0.022	0.030	0.120	1.72	24058	2117	45°
		3.00	4	160	0.034	0.050	0.150	2.59	19664	2674	45°
		4.00	4	160	0.042	0.050	0.180	3.39	15023	2524	45°
		5.00	4	160	0.048	0.050	0.210	4.17	12213	2345	45°
		6.00	4	160	0.052	0.050	0.230	4.94	10310	2145	45°
		8.00	4	160	0.056	0.080	0.280	6.67	7636	1711	45°
		10.00	4	160	0.060	0.080	0.310	8.22	6196	1487	45°
		12.00	4	160	0.066	0.100	0.340	9.89	5150	1360	45°
	Hardened tool steel 56 - 60 HRC	1.00	4	100	0.014	0.030	0.090	0.91	34979	1959	45°
		2.00	4	100	0.022	0.030	0.120	1.72	18506	1629	45°
		3.00	4	130	0.034	0.050	0.150	2.59	15977	2173	45°
		4.00	4	130	0.042	0.050	0.180	3.39	12207	2051	45°
		5.00	4	130	0.048	0.050	0.210	4.17	9923	1905	45°
		6.00	4	130	0.052	0.050	0.230	4.94	8377	1742	45°
		8.00	4	130	0.056	0.080	0.280	6.67	6204	1390	45°
		10.00	4	130	0.060	0.080	0.310	8.22	5034	1208	45°
		12.00	4	130	0.066	0.100	0.340	9.89	4184	1105	45°
	Hardened tool steel > 60 HRC	1.00	4	60	0.014	0.030	0.090	0.91	20987	1175	45°
		2.00	4	60	0.022	0.030	0.120	1.72	11104	977	45°
		3.00	4	80	0.034	0.050	0.150	2.59	9832	1337	45°
		4.00	4	80	0.042	0.050	0.180	3.39	7512	1262	45°
		5.00	4	80	0.048	0.050	0.210	4.17	6107	1173	45°
		6.00	4	80	0.052	0.050	0.230	4.94	5155	1072	45°
		8.00	4	80	0.056	0.080	0.280	6.67	3818	855	45°
		10.00	4	80	0.060	0.080	0.310	8.22	3098	744	45°
		12.00	4	80	0.066	0.100	0.340	9.89	2575	680	45°
	High speed steel, hardened 64 - 70 HRC	1.00	4	40	0.014	0.030	0.090	0.91	13992	784	45°
		2.00	4	40	0.022	0.030	0.120	1.72	7403	652	45°
		3.00	4	50	0.034	0.050	0.150	2.59	6145	836	45°
		4.00	4	50	0.042	0.050	0.180	3.39	4695	789	45°
		5.00	4	50	0.048	0.050	0.210	4.17	3817	733	45°
		6.00	4	50	0.052	0.050	0.230	4.94	3222	670	45°
		8.00	4	50	0.056	0.080	0.280	6.67	2386	535	45°
		10.00	4	50	0.060	0.080	0.310	8.22	1936	465	45°
		12.00	4	50	0.066	0.100	0.340	9.89	1609	425	45°
	Hardened tool steel 52 - 56 HRC	1.00	4	52	0.023	0.130	0.130	0.95	17423	1603	30°
		2.00	4	52	0.039	0.200	0.200	1.84	8996	1403	30°
		3.00	4	52	0.049	0.250	0.250	2.69	6153	1206	30°
		4.00	4	52	0.058	0.340	0.340	3.59	4611	1070	30°
		5.00	4	52	0.065	0.420	0.420	4.48	3695	961	30°
		6.00	4	52	0.070	0.500	0.500	5.37	3082	863	30°
		8.00	4	52	0.086	0.670	0.670	7.17	2309	794	30°
		10.00	4	52	0.098	0.840	0.840	8.96	1847	724	30°
		12.00	4	52	0.101	1.010	1.010	10.76	1538	621	30°
	Hardened tool steel 56 - 60 HRC	1.00	4	24	0.014	0.130	0.130	0.95	8042	450	30°
		2.00	4	24	0.023	0.200	0.200	1.84	4152	382	30°
		3.00	4	24	0.029	0.250	0.250	2.69	2840	329	30°
		4.00	4	24	0.035	0.340	0.340	3.59	2128	298	30°
		5.00	4	24	0.039	0.420	0.420	4.48	1705	266	30°
		6.00	4	24	0.042	0.500	0.500	5.37	1423	239	30°
		8.00	4	24	0.051	0.670	0.670	7.17	1065	217	30°
		10.00	4	24	0.058	0.840	0.840	8.96	853	198	30°
		12.00	4	24	0.061	1.010	1.010	10.76	710	173	30°
	Hardened tool steel > 60 HRC	1.00	4	18	0.011	0.130	0.130	0.95	6031	265	30°
		2.00	4	18	0.019	0.200	0.200	1.84	3114	237	30°
		3.00	4	18	0.023	0.250	0.250	2.69	2130	196	30°
		4.00	4	18	0.028	0.340	0.340	3.59	1596	179	30°
		5.00	4	18	0.031	0.420	0.420	4.48	1279	159	30°
		6.00	4	18	0.034	0.500	0.500	5.37	1067	145	30°
		8.00	4	18	0.041	0.670	0.670	7.17	799	131	30°
		10.00	4	18	0.047	0.840	0.840	8.96	639	120	30°
		12.00	4	18	0.049	1.010	1.010	10.76	532	104	30°
	High speed steel, hardened 64 - 70 HRC	1.00	4	12	0.007	0.130	0.130	0.95	4021	113	30°
		2.00	4	12	0.012	0.200	0.200	1.84	2076	100	30°
		3.00	4	12	0.015	0.250	0.250	2.69	1420	85	30°
		4.00	4	12	0.018	0.340	0.340	3.59	1064	77	30°
		5.00	4	12	0.020	0.420	0.420	4.48	853	68	30°
		6.00	4	12	0.022	0.500	0.500	5.37	711	63	30°
		8.00	4	12	0.026	0.670	0.670	7.17	533	55	30°
		10.00	4	12	0.030	0.840	0.840	8.96	426	51	30°
		12.00	4	12	0.031	1.010	1.010	10.76	355	44	30°

Ball nose end mills SpheroX

Tolerance r ±0.005, 6xd

X-Generation X

II

HM XA

λ 40°
γ 0°

h4

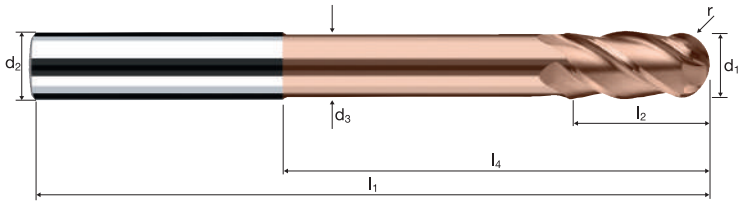
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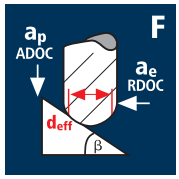
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS

Example: **Order-N°.** Coating **H** Article-N°. **7494** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	DURO-Si H7494
100	1.00	6.00	0.95	66	2.00	6.00	16.08	0.500	4	●
140	2.00	6.00	1.90	66	4.00	12.00	20.31	1.000	4	●
180	3.00	6.00	2.80	66	6.00	18.00	24.63	1.500	4	●
220	4.00	6.00	3.70	69	8.00	24.00	28.95	2.000	4	●
260	5.00	6.00	4.60	75	10.00	30.00	33.27	2.500	4	●
300	6.00	6.00	5.50	80	12.00	42.34	43.00	3.000	4	●
391	8.00	8.00	7.40	90	16.00	52.29	53.00	4.000	4	●
450	10.00	10.00	9.20	105	20.00	63.20	64.00	5.000	4	●
501	12.00	12.00	11.00	120	24.00	73.13	74.00	6.000	4	●
610	16.00	16.00	15.00	135	32.00	85.13	86.00	8.000	4	●

Application



Material

Hardened tool steel 42 - 48 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	300	0.030	0.050	0.050	0.94	60000	3600	45°
2.00	2	300	0.035	0.070	0.070	1.84	51898	3633	45°
3.00	2	300	0.040	0.100	0.100	2.74	34851	2788	45°
4.00	2	300	0.070	0.120	0.120	3.62	26379	3693	45°
5.00	2	300	0.080	0.150	0.150	4.53	21080	3373	45°
6.00	2	300	0.085	0.150	0.150	5.36	17816	3029	45°
8.00	2	300	0.095	0.170	0.170	7.05	13545	2574	45°
10.00	2	300	0.100	0.200	0.200	8.77	10889	2178	45°
12.00	2	300	0.105	0.250	0.250	10.56	9043	1899	45°

Hardened tool steel 48 - 52 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	250	0.030	0.050	0.050	0.94	60000	3600	45°
2.00	2	250	0.035	0.070	0.070	1.84	43249	3027	45°
3.00	2	250	0.040	0.100	0.100	2.74	29043	2323	45°
4.00	2	250	0.065	0.120	0.120	3.62	21983	2858	45°
5.00	2	250	0.075	0.150	0.150	4.53	17567	2635	45°
6.00	2	250	0.080	0.150	0.150	5.36	14847	2376	45°
8.00	2	250	0.090	0.170	0.170	7.05	11288	2032	45°
10.00	2	250	0.095	0.200	0.200	8.77	9074	1724	45°
12.00	2	250	0.100	0.250	0.250	10.56	7536	1507	45°

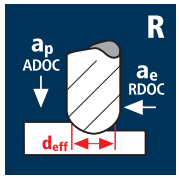
Hardened tool steel 52 - 56 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
2.00	2	200	0.030	0.070	0.070	1.84	34599	2076	45°
3.00	2	200	0.035	0.100	0.100	2.74	23234	1626	45°
4.00	2	200	0.065	0.120	0.120	3.62	17586	2286	45°
5.00	2	200	0.070	0.150	0.150	4.53	14053	1967	45°
6.00	2	200	0.075	0.150	0.150	5.36	11877	1782	45°
8.00	2	200	0.085	0.170	0.170	7.05	9030	1535	45°
10.00	2	200	0.090	0.200	0.200	8.77	7259	1307	45°
12.00	2	200	0.095	0.250	0.250	10.56	6029	1146	45°

Titanium alloys > 300 HB [Ti6Al4V]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	150	0.025	0.050	0.050	0.94	50794	2540	45°
2.00	2	150	0.030	0.070	0.070	1.84	25949	1557	45°
3.00	2	150	0.035	0.100	0.100	2.74	17426	1220	45°
4.00	2	150	0.060	0.120	0.120	3.62	13190	1583	45°
5.00	2	150	0.070	0.150	0.150	4.53	10540	1476	45°
6.00	2	150	0.070	0.150	0.150	5.36	8908	1247	45°
8.00	2	150	0.080	0.170	0.170	7.05	6773	1084	45°
10.00	2	150	0.085	0.200	0.200	8.77	5444	926	45°
12.00	2	150	0.090	0.250	0.250	10.56	4521	814	45°

Application



Material

Hardened tool steel 42 - 48 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.034	0.180	0.200	0.77	41339	2811	0.1
2.00	2	119	0.058	0.280	0.400	1.39	27251	3161	0.4
3.00	2	119	0.073	0.360	0.600	1.95	19425	2836	0.6
4.00	2	119	0.087	0.480	0.800	2.60	14569	2535	1.0
5.00	2	119	0.097	0.600	1.000	3.25	11655	2261	1.4
6.00	2	119	0.105	0.720	1.200	3.90	9713	2040	1.8
8.00	2	119	0.128	0.960	1.600	5.20	7284	1865	2.9
10.00	2	119	0.145	1.200	2.000	6.50	5828	1690	4.1
12.00	2	119	0.151	1.440	2.400	7.80	4856	1467	5.1

Hardened tool steel 48 - 52 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	95	0.031	0.180	0.200	0.77	39272	2435	0.1
2.00	2	95	0.053	0.280	0.400	1.39	21755	2306	0.3
3.00	2	95	0.066	0.360	0.600	1.95	15507	2047	0.4
4.00	2	95	0.079	0.480	0.800	2.60	11631	1838	0.7
5.00	2	95	0.088	0.600	1.000	3.25	9304	1638	1.0
6.00	2	95	0.095	0.720	1.200	3.90	7754	1473	1.3
8.00	2	95	0.116	0.960	1.600	5.20	5815	1349	2.1
10.00	2	95	0.132	1.200	2.000	6.50	4652	1228	2.9
12.00	2	95	0.137	1.440	2.400	7.80	3877	1062	3.7

Hardened tool steel 52 - 56 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	78	0.028	0.180	0.200	0.77	32244	1806	0.1
2.00	2	78	0.048	0.280	0.400	1.39	17862	1715	0.2
3.00	2	78	0.060	0.360	0.600	1.95	12732	1528	0.3
4.00	2	78	0.072	0.480	0.800	2.60	9549	1375	0.5
5.00	2	78	0.080	0.600	1.000	3.25	7639	1222	0.7
6.00	2	78	0.086	0.720	1.200	3.90	6366	1095	0.9
8.00	2	78	0.106	0.960	1.600	5.20	4775	1012	1.6
10.00	2	78	0.120	1.200	2.000	6.50	3820	917	2.2
12.00	2	78	0.125	1.440	2.400	7.80	3183	796	2.8

Titanium alloys > 300 HB [Ti6Al4V]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	60	0.031	0.180	0.200	0.77	24803	1538	0.1
2.00	2	60	0.053	0.280	0.400	1.39	13740	1456	0.2
3.00	2	60	0.066	0.360	0.600	1.95	9794	1293	0.3
4.00	2	60	0.079	0.480	0.800	2.60	7346	1161	0.4
5.00	2	60	0.088	0.600	1.000	3.25	5876	1034	0.6
6.00	2	60	0.095	0.720	1.200	3.90	4897	930	0.8
8.00	2	60	0.116	0.960	1.600	5.20	3673	852	1.3
10.00	2	60	0.132	1.200	2.000	6.50	2938	776	1.9
12.00	2	60	0.137	1.440	2.400	7.80	2449	671	2.3

Ball nose end mills SpheroX

Tolerance r ±0.005, 6xd

HM XA	λ 30° γ -10°

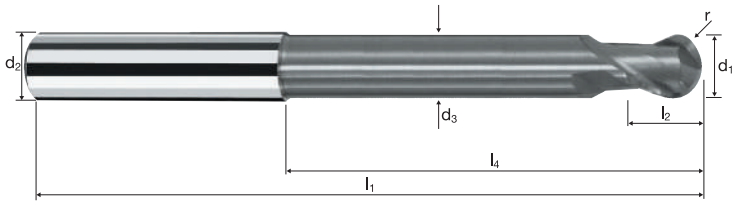












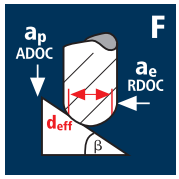
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7404** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	X-AL	X7404
100	1.00	6.00	0.95	66	1.50	6.00	16.08	0.500	2		●
140	2.00	6.00	1.90	66	3.00	12.00	20.31	1.000	2		●
180	3.00	6.00	2.80	66	4.00	18.00	24.63	1.500	2		●
220	4.00	6.00	3.70	69	5.00	24.00	28.95	2.000	2		●
260	5.00	6.00	4.60	75	6.00	30.00	33.27	2.500	2		●
300	6.00	6.00	5.50	80	7.00	42.34	43.00	3.000	2		●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	4.000	2		●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	5.000	2		●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	6.000	2		●

Application



Material

Steel
1100 - 1300 N/mm²

P

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	119	0.058	0.03	0.09	0.91	41812	4850	45°
2.00	2	162	0.078	0.03	0.12	1.72	30132	4701	45°
3.00	2	203	0.098	0.05	0.15	2.59	24913	4883	45°
4.00	2	203	0.117	0.05	0.18	3.39	19082	4465	45°
5.00	2	203	0.137	0.05	0.21	4.17	15502	4248	45°
6.00	2	203	0.150	0.05	0.23	4.94	13072	3922	45°
8.00	2	203	0.182	0.08	0.28	6.67	9689	3527	45°
10.00	2	203	0.202	0.08	0.31	8.22	7863	3177	45°
12.00	2	203	0.221	0.10	0.34	9.89	6536	2889	45°

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	112	0.058	0.03	0.09	0.91	39353	4565	45°
2.00	2	112	0.078	0.03	0.12	1.72	20780	3242	45°
3.00	2	140	0.098	0.05	0.15	2.59	17181	3367	45°
4.00	2	140	0.117	0.05	0.18	3.39	13160	3079	45°
5.00	2	140	0.137	0.05	0.21	4.17	10691	2929	45°
6.00	2	140	0.150	0.05	0.23	4.94	9015	2705	45°
8.00	2	140	0.182	0.08	0.28	6.67	6682	2432	45°
10.00	2	140	0.202	0.08	0.31	8.22	5423	2191	45°
12.00	2	140	0.221	0.10	0.34	9.89	4507	1992	45°

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	84	0.058	0.03	0.09	0.91	29515	3424	45°
2.00	2	84	0.078	0.03	0.12	1.72	15585	2431	45°
3.00	2	105	0.098	0.05	0.15	2.59	12886	2526	45°
4.00	2	105	0.117	0.05	0.18	3.39	9870	2310	45°
5.00	2	105	0.137	0.05	0.21	4.17	8018	2197	45°
6.00	2	105	0.150	0.05	0.23	4.94	6761	2028	45°
8.00	2	105	0.182	0.08	0.28	6.67	5011	1824	45°
10.00	2	105	0.202	0.08	0.31	8.22	4067	1643	45°
12.00	2	105	0.221	0.10	0.34	9.89	3381	1494	45°

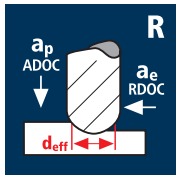
Cold work tool steel
(12%Cr)
high alloyed
[1.2379]

P

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
1.00	2	78	0.058	0.03	0.09	0.91	27547	3195	45°
2.00	2	78	0.078	0.03	0.12	1.72	14546	2269	45°
3.00	2	98	0.098	0.05	0.15	2.59	12027	2357	45°
4.00	2	98	0.117	0.05	0.18	3.39	9212	2156	45°
5.00	2	98	0.137	0.05	0.21	4.17	7484	2051	45°
6.00	2	98	0.150	0.05	0.23	4.94	6310	1893	45°
8.00	2	98	0.182	0.08	0.28	6.67	4677	1702	45°
10.00	2	98	0.202	0.08	0.31	8.22	3796	1534	45°
12.00	2	98	0.221	0.10	0.34	9.89	3155	1395	45°

Application



Material

Steel
1100 - 1300 N/mm²

P

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	100	0.037	0.18	0.20	0.77	41426	3088	0.1
2.00	2	143	0.064	0.28	0.40	1.39	32795	4190	0.5
3.00	2	143	0.080	0.36	0.60	1.95	23345	3729	0.8
4.00	2	143	0.096	0.48	0.80	2.60	17509	3356	1.3
5.00	2	143	0.106	0.60	1.00	3.25	14007	2983	1.8
6.00	2	143	0.115	0.72	1.20	3.90	11673	2685	2.3
8.00	2	143	0.141	0.96	1.60	5.20	8755	2461	3.8
10.00	2	143	0.160	1.20	2.00	6.50	7004	2237	5.4
12.00	2	143	0.166	1.44	2.40	7.80	5836	1939	6.7

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	78	0.031	0.18	0.20	0.77	32313	1990	0.1
2.00	2	78	0.053	0.28	0.40	1.39	17888	1889	0.2
3.00	2	78	0.066	0.36	0.60	1.95	12734	1681	0.4
4.00	2	78	0.079	0.48	0.80	2.60	9550	1513	0.6
5.00	2	78	0.088	0.60	1.00	3.25	7640	1345	0.8
6.00	2	78	0.095	0.72	1.20	3.90	6367	1210	1.0
8.00	2	78	0.116	0.96	1.60	5.20	4775	1109	1.7
10.00	2	78	0.132	1.20	2.00	6.50	3820	1008	2.4
12.00	2	78	0.137	1.44	2.40	7.80	3183	874	3.0

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	58	0.029	0.18	0.20	0.77	24027	1406	0.1
2.00	2	58	0.050	0.28	0.40	1.39	13302	1334	0.1
3.00	2	58	0.063	0.36	0.60	1.95	9469	1187	0.3
4.00	2	58	0.075	0.48	0.80	2.60	7102	1069	0.4
5.00	2	58	0.084	0.60	1.00	3.25	5681	950	0.6
6.00	2	58	0.090	0.72	1.20	3.90	4734	855	0.7
8.00	2	58	0.110	0.96	1.60	5.20	3551	784	1.2
10.00	2	58	0.125	1.20	2.00	6.50	2841	713	1.7
12.00	2	58	0.130	1.44	2.40	7.80	2367	617	2.1

Cold work tool steel
(12%Cr)
high alloyed
[1.2379]

P

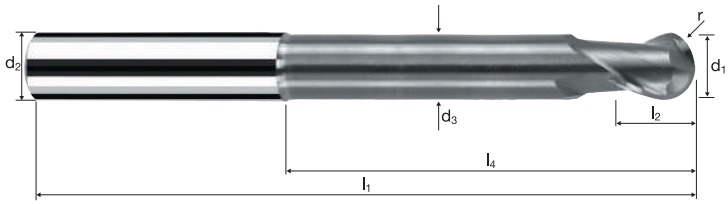
P

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
1.00	2	68	0.041	0.18	0.20	0.77	28170	2310	0.1
2.00	2	68	0.070	0.28	0.40	1.39	15595	2192	0.2
3.00	2	68	0.088	0.36	0.60	1.95	11101	1950	0.4
4.00	2	68	0.105	0.48	0.80	2.60	8326	1755	0.7
5.00	2	68	0.117	0.60	1.00	3.25	6661	1560	0.9
6.00	2	68	0.126	0.72	1.20	3.90	5551	1404	1.2
8.00	2	68	0.155	0.96	1.60	5.20	4163	1287	2.0
10.00	2	68	0.176	1.20	2.00	6.50	3330	1170	2.8
12.00	2	68	0.183	1.44	2.40	7.80	2775	1014	3.5

Ball nose end mills Sphericut

Tolerance r ±0.005, 6xd

HM MG10	λ 30° γ 5°



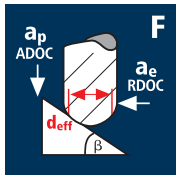
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **7544** ø-Code **100**

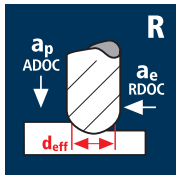
Ø Code	d_1	d_2 h6	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	POLYCHROM P7544
100	1.00	6.00	0.95	66	1.50	6.00	16.08	0.500	2	●
140	2.00	6.00	1.90	66	3.00	12.00	20.31	1.000	2	●
180	3.00	6.00	2.80	66	4.00	18.00	24.63	1.500	2	●
220	4.00	6.00	3.70	70	5.00	24.00	28.95	2.000	2	●
260	5.00	6.00	4.60	75	6.00	30.00	33.27	2.500	2	●
300	6.00	6.00	5.50	80	7.00	42.34	43.00	3.000	2	●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	4.000	2	●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	5.000	2	●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	6.000	2	●
610	16.00	16.00	15.00	135	17.00	85.13	86.00	8.000	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Cast iron (lamellar / spheroidal)	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	486	0.070	0.050	0.180	3.39	45634	6389	45°
	5.00	2	486	0.075	0.050	0.200	4.17	37098	5565	45°
	6.00	2	486	0.085	0.075	0.230	5.08	30452	5177	45°
	8.00	2	486	0.090	0.075	0.250	6.64	23298	4194	45°
	10.00	2	486	0.100	0.100	0.300	8.34	18549	3710	45°
	12.00	2	486	0.105	0.100	0.350	9.89	15642	3285	45°
	16.00	2	486	0.115	0.120	0.400	13.10	11809	2716	45°
Unalloyed copper	3.00	2	324	0.060	0.050	0.150	2.59	39819	4778	45°
	4.00	2	324	0.070	0.050	0.180	3.39	30423	4259	45°
	5.00	2	324	0.075	0.050	0.200	4.17	24732	3710	45°
	6.00	2	324	0.085	0.075	0.230	5.08	20302	3451	45°
	8.00	2	324	0.090	0.075	0.250	6.64	15532	2796	45°
	10.00	2	324	0.100	0.100	0.300	8.34	12366	2473	45°
	12.00	2	324	0.105	0.100	0.350	9.89	10428	2190	45°
	16.00	2	324	0.115	0.120	0.400	13.10	7873	1811	45°
Thermoplastics	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	490	0.070	0.050	0.180	3.39	46009	6441	45°
	5.00	2	610	0.075	0.050	0.200	4.17	46563	6985	45°
	6.00	2	730	0.085	0.075	0.230	5.08	45741	7776	45°
	8.00	2	955	0.090	0.075	0.250	6.64	45781	8241	45°
	10.00	2	1080	0.100	0.100	0.300	8.34	41220	8244	45°
	12.00	2	1080	0.105	0.100	0.350	9.89	34760	7300	45°
	16.00	2	1080	0.115	0.120	0.400	13.10	26242	6036	45°
Cast aluminium	3.00	2	370	0.060	0.050	0.150	2.59	45473	5457	45°
	4.00	2	389	0.070	0.050	0.180	3.39	36526	5114	45°
	5.00	2	389	0.075	0.050	0.200	4.17	29694	4454	45°
	6.00	2	389	0.085	0.075	0.230	5.08	24375	4144	45°
	8.00	2	389	0.090	0.075	0.250	6.64	18648	3357	45°
	10.00	2	389	0.100	0.100	0.300	8.34	14847	2969	45°
	12.00	2	389	0.105	0.100	0.350	9.89	12520	2629	45°
	16.00	2	389	0.115	0.120	0.400	13.10	9452	2174	45°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Cast iron (lamellar / spheroidal)	3.00	2	227	0.082	0.450	0.900	2.14	33765	5538	2.2
	4.00	2	227	0.090	0.600	1.200	2.86	25264	4548	3.3
	5.00	2	227	0.100	0.750	1.500	3.57	20240	4048	4.6
	6.00	2	227	0.120	0.900	1.800	4.28	16882	4052	6.6
	8.00	2	227	0.140	1.200	2.400	5.71	12654	3543	10.2
	10.00	2	227	0.150	1.500	3.000	7.14	10120	3036	13.7
	12.00	2	227	0.180	1.800	3.600	8.57	8431	3035	19.7
	16.00	2	227	0.200	2.400	4.800	11.43	6322	2529	29.1
Unalloyed copper	3.00	2	151	0.078	0.450	0.900	2.14	22460	3504	1.4
	4.00	2	151	0.084	0.600	1.200	2.86	16806	2823	2.0
	5.00	2	151	0.092	0.750	1.500	3.57	13464	2477	2.8
	6.00	2	151	0.111	0.900	1.800	4.28	11230	2493	4.0
	8.00	2	151	0.128	1.200	2.400	5.71	8418	2155	6.2
	10.00	2	151	0.135	1.500	3.000	7.14	6732	1818	8.2
	12.00	2	151	0.162	1.800	3.600	8.57	5608	1817	11.8
	16.00	2	151	0.176	2.400	4.800	11.43	4205	1480	17.1
Thermoplastics	3.00	2	273	0.082	0.450	0.900	2.14	40607	6660	2.7
	4.00	2	361	0.090	0.600	1.200	2.86	40178	7232	5.2
	5.00	2	455	0.100	0.750	1.500	3.57	40569	8114	9.1
	6.00	2	504	0.120	0.900	1.800	4.28	37483	8996	14.6
	8.00	2	504	0.140	1.200	2.400	5.71	28096	7867	22.7
	10.00	2	504	0.150	1.500	3.000	7.14	22469	6741	30.3
	12.00	2	504	0.180	1.800	3.600	8.57	18720	6739	43.7
	16.00	2	504	0.200	2.400	4.800	11.43	14036	5614	64.7
Cast aluminium	3.00	2	181	0.082	0.450	0.900	2.14	26922	4415	1.8
	4.00	2	181	0.090	0.600	1.200	2.86	20145	3626	2.6
	5.00	2	181	0.100	0.750	1.500	3.57	16138	3228	3.6
	6.00	2	181	0.120	0.900	1.800	4.28	13461	3231	5.2
	8.00	2	181	0.140	1.200	2.400	5.71	10090	2825	8.1
	10.00	2	181	0.150	1.500	3.000	7.14	8069	2421	10.9
	12.00	2	181	0.180	1.800	3.600	8.57	6723	2420	15.7
	16.00	2	181	0.200	2.400	4.800	11.43	5041	2016	23.2

Ball nose end mills Sphericut

Tolerance r ±0.005, 6xd

HM MG10

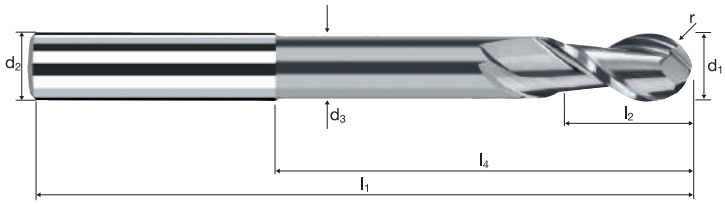
λ 40°
γ 20°

h4

r

R

F



ReTool®

Al Aluminium > 99%

Al Aluminium Alloy

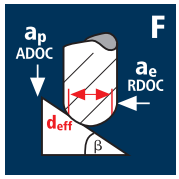
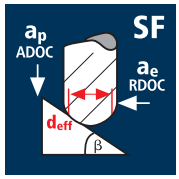
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **7554** ø-Code **180**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	7554	
180	3.00	6.00	2.80	66	6.00	18.00	24.63	1.500	2	●	
220	4.00	6.00	3.70	69	8.00	24.00	28.95	2.000	2	●	
260	5.00	6.00	4.60	75	10.00	30.00	33.27	2.500	2	●	
300	6.00	6.00	5.50	80	12.00	42.34	43.00	3.000	2	●	
391	8.00	8.00	7.40	90	16.00	52.29	53.00	4.000	2	●	
450	10.00	10.00	9.20	105	20.00	63.20	64.00	5.000	2	●	
501	12.00	12.00	11.00	120	24.00	73.13	74.00	6.000	2	●	
610	16.00	16.00	15.00	135	32.00	85.13	86.00	8.000	2	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 52 - 56 HRC	1.00	2	140	0.025	0.050	0.050	0.94	47408	2370	45°
		2.00	2	140	0.025	0.070	0.070	1.84	24219	1211	45°
		3.00	2	140	0.030	0.100	0.100	2.74	16264	976	45°
		4.00	2	140	0.055	0.120	0.120	3.62	12310	1354	45°
		5.00	2	140	0.060	0.150	0.150	4.53	9837	1180	45°
		6.00	2	140	0.065	0.150	0.150	5.36	8314	1081	45°
		8.00	2	140	0.070	0.170	0.170	7.05	6321	885	45°
		10.00	2	140	0.075	0.200	0.200	8.77	5081	762	45°
		12.00	2	140	0.080	0.250	0.250	10.56	4220	675	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	100	0.025	0.050	0.050	0.94	33863	1693	45°
		2.00	2	100	0.025	0.070	0.070	1.84	17299	865	45°
		3.00	2	100	0.030	0.100	0.100	2.74	11617	697	45°
		4.00	2	100	0.050	0.120	0.120	3.62	8793	879	45°
		5.00	2	100	0.055	0.150	0.150	4.53	7027	773	45°
		6.00	2	100	0.060	0.150	0.150	5.36	5939	713	45°
		8.00	2	100	0.065	0.170	0.170	7.05	4515	587	45°
		10.00	2	100	0.070	0.200	0.200	8.77	3630	508	45°
		12.00	2	100	0.075	0.250	0.250	10.56	3014	452	45°
	Hardened tool steel > 60 HRC	1.00	2	70	0.020	0.040	0.040	0.93	23959	958	45°
		2.00	2	70	0.020	0.055	0.055	1.80	12379	495	45°
		3.00	2	70	0.025	0.075	0.075	2.68	8314	416	45°
		4.00	2	70	0.045	0.090	0.090	3.54	6294	567	45°
		5.00	2	70	0.045	0.115	0.115	4.43	5030	453	45°
		6.00	2	70	0.050	0.115	0.115	5.24	4252	425	45°
		8.00	2	70	0.055	0.130	0.130	6.90	3229	355	45°
		10.00	2	70	0.060	0.150	0.150	8.58	2597	312	45°
		12.00	2	70	0.065	0.190	0.190	10.34	2155	280	45°
	High speed steel, hardened 64 - 70 HRC	1.00	2	45	0.015	0.025	0.025	0.89	16094	483	45°
		2.00	2	45	0.015	0.035	0.035	1.74	8232	247	45°
		3.00	2	45	0.020	0.050	0.050	2.59	5530	221	45°
		4.00	2	45	0.030	0.060	0.060	3.43	4176	251	45°
		5.00	2	45	0.035	0.075	0.075	4.29	3339	234	45°
		6.00	2	45	0.035	0.075	0.075	5.08	2820	197	45°
		8.00	2	45	0.040	0.085	0.085	6.70	2138	171	45°
		10.00	2	45	0.040	0.100	0.100	8.34	1717	137	45°
		12.00	2	45	0.045	0.125	0.125	10.03	1428	129	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	200	0.020	0.020	0.020	0.88	60000	2400	45°
		2.00	2	200	0.025	0.020	0.020	1.67	38121	1906	45°
		3.00	2	200	0.025	0.030	0.030	2.50	25465	1273	45°
		4.00	2	200	0.035	0.030	0.030	3.27	19468	1363	45°
		5.00	2	200	0.040	0.030	0.030	4.04	15758	1261	45°
		6.00	2	200	0.045	0.030	0.030	4.80	13263	1194	45°
		8.00	2	200	0.050	0.030	0.030	6.31	10089	1009	45°
		10.00	2	200	0.050	0.040	0.040	7.91	8048	805	45°
		12.00	2	200	0.055	0.040	0.040	9.41	6765	744	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	120	0.015	0.020	0.020	0.88	43406	1302	45°
		2.00	2	120	0.020	0.020	0.020	1.67	22873	915	45°
		3.00	2	120	0.020	0.030	0.030	2.50	15279	611	45°
		4.00	2	120	0.035	0.030	0.030	3.27	11681	818	45°
		5.00	2	120	0.040	0.030	0.030	4.04	9455	756	45°
		6.00	2	120	0.045	0.030	0.030	4.80	7958	716	45°
		8.00	2	120	0.045	0.030	0.030	6.31	6053	545	45°
		10.00	2	120	0.045	0.040	0.040	7.91	4829	435	45°
		12.00	2	120	0.050	0.040	0.040	9.41	4059	406	45°
	Hardened tool steel > 60 HRC	1.00	2	85	0.010	0.010	0.020	0.83	32598	652	45°
		2.00	2	85	0.010	0.010	0.020	1.60	16910	338	45°
		3.00	2	85	0.010	0.020	0.030	2.44	11089	222	45°
		4.00	2	85	0.020	0.020	0.030	3.20	8455	338	45°
		5.00	2	85	0.025	0.020	0.030	3.95	6850	343	45°
		6.00	2	85	0.025	0.020	0.030	4.70	5757	288	45°
		8.00	2	85	0.025	0.020	0.030	6.19	4371	219	45°
		10.00	2	85	0.025	0.020	0.040	7.67	3528	176	45°
		12.00	2	85	0.030	0.020	0.040	9.15	2957	177	45°
	High speed steel, hardened 64 - 70 HRC	1.00	2	55	0.010	0.010	0.020	0.83	21093	422	45°
		2.00	2	55	0.010	0.010	0.020	1.60	10942	219	45°
		3.00	2	55	0.010	0.020	0.030	2.44	7175	144	45°
		4.00	2	55	0.015	0.020	0.030	3.20	5471	164	45°
		5.00	2	55	0.020	0.020	0.030	3.95	4432	177	45°
		6.00	2	55	0.020	0.020	0.030	4.70	3725	149	45°
		8.00	2	55	0.020	0.020	0.030	6.19	2828	113	45°
		10.00	2	55	0.020	0.020	0.040	7.67	2283	91	45°
		12.00	2	55	0.025	0.020	0.040	9.15	1913	96	45°

Ball nose end mills SpheroX

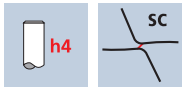
Tolerance r ±0.005, 9xd

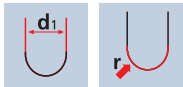
X-Generation X

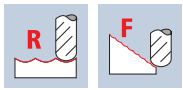
II

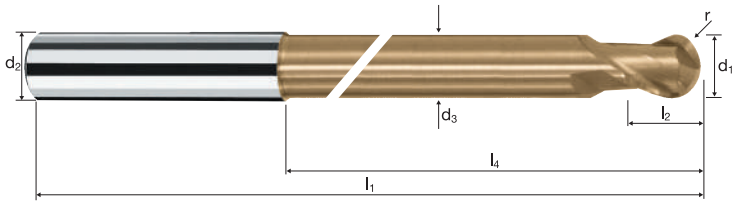
HM
XA

λ 30°
γ -10°







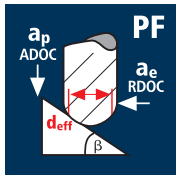
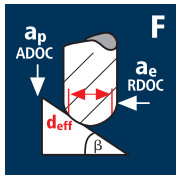


ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS Tool Steel

Example: **Order-N°.** Coating **V** Article-N°. **7478** ø-Code **100**

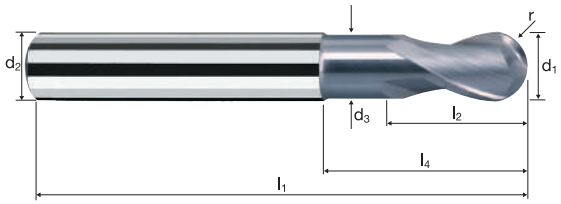
Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z		DURO-V
											V7478
100	1.00	6.00	0.95	69	1.50	9.00	19.08	0.500	2		●
140	2.00	6.00	1.90	69	3.00	18.00	26.31	1.000	2		●
180	3.00	6.00	2.80	75	4.00	27.00	33.63	1.500	2		●
220	4.00	6.00	3.70	80	5.00	36.00	40.95	2.000	2		●
260	5.00	6.00	4.60	87	6.00	45.00	48.27	2.500	2		●
300	6.00	6.00	5.50	100	7.00	62.34	63.00	3.000	2		●
391	8.00	8.00	7.40	120	9.00	82.29	83.00	4.000	2		●
450	10.00	10.00	9.20	135	11.00	93.20	94.00	5.000	2		●
501	12.00	12.00	11.00	160	13.00	113.13	114.00	6.000	2		●
610	16.00	16.00	15.00	180	17.00	130.13	131.00	8.000	2		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Steel 1100 - 1300 N/mm²	1.00	2	180	0.040	0.100	0.100	0.99	57875	4630	45°
		2.00	2	180	0.065	0.200	0.200	1.98	28937	3762	45°
		3.00	2	180	0.075	0.300	0.300	2.97	19292	2894	45°
		4.00	2	180	0.090	0.400	0.400	3.96	14469	2604	45°
		6.00	2	180	0.090	0.400	0.400	5.79	9896	1781	45°
		8.00	2	180	0.090	0.400	0.400	7.56	7579	1364	45°
		10.00	2	180	0.090	0.400	0.400	9.28	6174	1111	45°
		12.00	2	180	0.090	0.400	0.400	10.97	5223	940	45°
		16.00	2	180	0.090	0.400	0.400	14.28	4012	722	45°
	Hardened tool steel 42 - 48 HRC	1.00	2	160	0.035	0.100	0.100	0.99	51444	3601	45°
		2.00	2	160	0.060	0.200	0.200	1.98	25722	3087	45°
		3.00	2	160	0.070	0.300	0.300	2.97	17148	2401	45°
		4.00	2	160	0.085	0.400	0.400	3.96	12861	2186	45°
		6.00	2	160	0.100	0.600	0.600	5.94	8574	1715	45°
		8.00	2	160	0.115	0.800	0.800	7.92	6431	1479	45°
		10.00	2	160	0.135	1.000	1.000	9.90	5144	1389	45°
		12.00	2	160	0.140	1.200	1.200	11.88	4287	1200	45°
		16.00	2	160	0.165	1.600	1.600	15.84	3215	1061	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	140	0.035	0.120	0.120	1.00	44563	3119	45°
		2.00	2	140	0.055	0.150	0.150	1.95	22853	2514	45°
		3.00	2	140	0.065	0.180	0.180	2.87	15527	2019	45°
		4.00	2	140	0.075	0.200	0.200	3.78	11789	1768	45°
		6.00	2	140	0.095	0.300	0.300	5.67	7860	1493	45°
		8.00	2	140	0.105	0.400	0.400	7.56	5895	1238	45°
		10.00	2	140	0.125	0.500	0.500	9.45	4716	1179	45°
		12.00	2	140	0.130	0.600	0.600	11.34	3930	1022	45°
		16.00	2	140	0.155	0.800	0.800	15.11	2949	914	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	100	0.030	0.120	0.120	1.00	31831	1910	45°
		2.00	2	100	0.050	0.150	0.150	1.95	16324	1632	45°
		3.00	2	100	0.060	0.180	0.180	2.87	11091	1331	45°
		4.00	2	100	0.070	0.200	0.200	3.78	8421	1179	45°
		6.00	2	100	0.090	0.300	0.300	5.67	5614	1011	45°
		8.00	2	100	0.100	0.400	0.400	7.56	4210	842	45°
		10.00	2	100	0.115	0.500	0.500	9.45	3368	775	45°
		12.00	2	100	0.120	0.600	0.600	11.34	2807	674	45°
		16.00	2	100	0.145	0.800	0.800	15.11	2107	611	45°
	Steel 1100 - 1300 N/mm²	1.00	2	280	0.025	0.050	0.050	0.94	60000	3000	45°
		2.00	2	280	0.030	0.070	0.070	1.84	48438	2906	45°
		3.00	2	280	0.035	0.100	0.100	2.74	32528	2277	45°
		4.00	2	280	0.055	0.120	0.120	3.62	24621	2708	45°
		6.00	2	280	0.065	0.150	0.150	5.36	16628	2162	45°
		8.00	2	280	0.075	0.170	0.170	7.05	12642	1896	45°
		10.00	2	280	0.080	0.200	0.200	8.77	10163	1626	45°
		12.00	2	280	0.085	0.250	0.250	10.56	8440	1435	45°
		16.00	2	280	0.100	0.280	0.280	13.88	6421	1284	45°
	Hardened tool steel 42 - 48 HRC	1.00	2	250	0.025	0.050	0.050	0.94	60000	3000	45°
		2.00	2	250	0.030	0.070	0.070	1.84	43249	2595	45°
		3.00	2	250	0.035	0.100	0.100	2.74	29043	2033	45°
		4.00	2	250	0.050	0.120	0.120	3.62	21983	2198	45°
		6.00	2	250	0.060	0.150	0.150	5.36	14847	1782	45°
		8.00	2	250	0.070	0.170	0.170	7.05	11288	1580	45°
		10.00	2	250	0.075	0.200	0.200	8.77	9074	1361	45°
		12.00	2	250	0.080	0.250	0.250	10.56	7536	1206	45°
		16.00	2	250	0.095	0.280	0.280	13.88	5733	1089	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	200	0.025	0.050	0.050	0.94	60000	3000	45°
		2.00	2	200	0.025	0.070	0.070	1.84	34599	1730	45°
		3.00	2	200	0.030	0.100	0.100	2.74	23234	1394	45°
		4.00	2	200	0.050	0.120	0.120	3.62	17586	1759	45°
		6.00	2	200	0.060	0.150	0.150	5.36	11877	1425	45°
		8.00	2	200	0.070	0.170	0.170	7.05	9030	1264	45°
		10.00	2	200	0.070	0.200	0.200	8.77	7259	1016	45°
		12.00	2	200	0.075	0.250	0.250	10.56	6029	904	45°
		16.00	2	200	0.090	0.280	0.280	13.88	4587	826	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	150	0.020	0.050	0.050	0.94	50794	2032	45°
		2.00	2	150	0.025	0.070	0.070	1.84	25949	1298	45°
		3.00	2	150	0.030	0.100	0.100	2.74	17426	1046	45°
		4.00	2	150	0.045	0.120	0.120	3.62	13190	1187	45°
		6.00	2	150	0.055	0.150	0.150	5.36	8908	980	45°
		8.00	2	150	0.065	0.170	0.170	7.05	6773	881	45°
		10.00	2	150	0.070	0.200	0.200	8.77	5444	762	45°
		12.00	2	150	0.070	0.250	0.250	10.56	4521	633	45°
		16.00	2	150	0.085	0.280	0.280	13.88	3440	585	45°

Ball nose end mills Sphericut

Tolerance r f8 (-/-), 3xd

HM Plus	λ 30° γ -10°



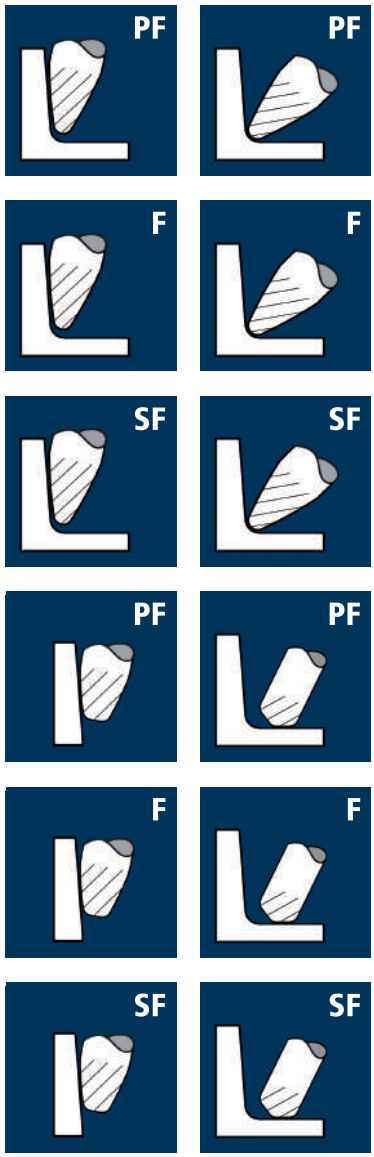
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60				GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **5286** ø-Code **100**

Ø Code	d_1 ±	d_2 h6	d_3	l_1	l_2	l_3	l_4	r f8	z	POLYCHROM P5286
100	1.00	3.00	-	40	1.00	-	5.93	0.500	2	●
120	1.50	3.00	-	40	2.00	-	5.99	0.750	2	●
138	2.00	3.00	-	40	2.50	-	5.96	1.000	2	●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	1.000	2	●
178	3.00	3.00	-	40	4.00	-	-	1.500	2	●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	1.500	2	●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	2.000	2	●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	2.500	2	●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	3.000	2	●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	4.000	2	●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	5.000	2	●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	6.000	2	●
610	16.00	16.00	15.00	92	17.00	42.13	43.00	8.000	2	●

Application



Cutting data calculator ToolExpert ArCut X

Perfect finishing tool whenever an excellent surface quality is demanded: ToolExpert ArCut X

With the ArCut X tool concept, FRAISA offers a range of conical end mills in various designs which cover a broad spectrum of finishing processes.

In combination with the respective tool characteristics, the technologies facilitate a wide range of applications in a variety of materials.

Optimize your finishing processes with the ToolExpert ArCut X.

This way to the cutting data calculator **ToolExpert ArCut X** or the FRAISA website **www.fraisa.com/en/toolexpert-arcut-x**

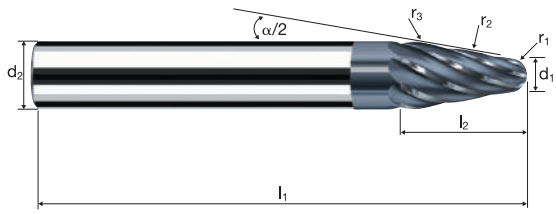
Circular arc milling cutter ArCutX

Spherical, form tolerance ±0.010

X-Generation X

II

HM MG10	λ 30° γ 10°











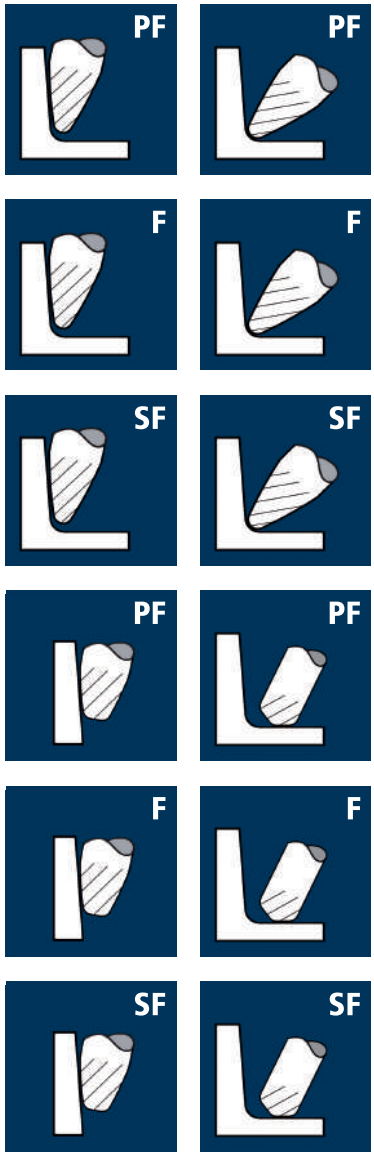
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **8530** ø-Code **220**

Ø Code	d_1	α/2	d_2 h5	l_1	l_2	r_1	r_2	r_3	z	POLYCHROM P8530
220	4.00	30.0°	16.00	108	14.50	2.00	750	3.00	4	●
221	4.00	30.0°	16.00	108	14.50	2.00	750	3.00	6	●
300	6.00	20.0°	16.00	108	18.50	3.00	1000	5.00	4	●
301	6.00	20.0°	16.00	108	18.50	3.00	1000	5.00	8	●
388	8.00	10.0°	16.00	108	28.50	4.00	1000	5.00	4	●
389	8.00	10.0°	16.00	108	28.50	4.00	1000	5.00	8	●
391	8.00	6.0°	16.00	123	44.00	4.00	1000	5.00	4	●
393	8.00	6.0°	16.00	123	44.00	4.00	1000	5.00	8	●

Application



Cutting data calculator ToolExpert ArCut X

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Circular arc milling cutter ArCutX

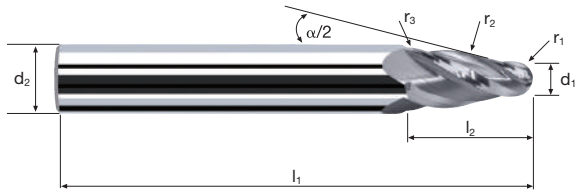
Spherical, form tolerance ±0.010

X-Generation X

II

HM MG10 | λ 30° γ 10°

h5



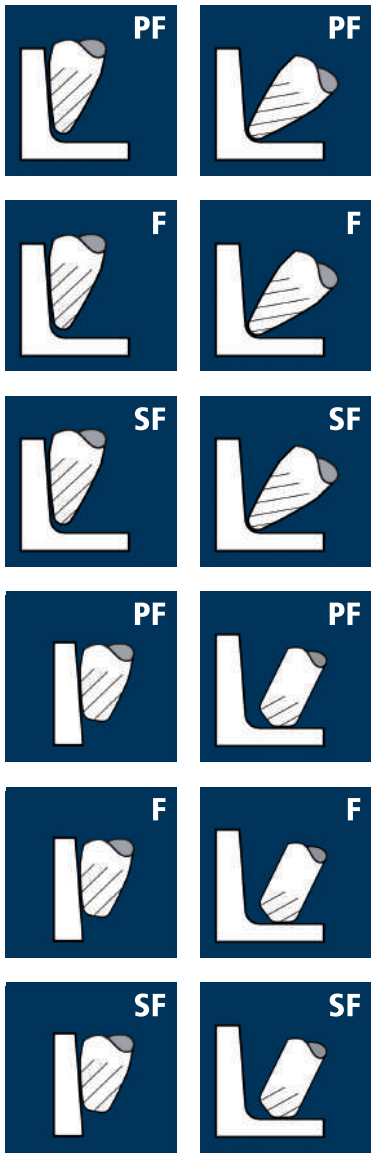
ReTool®

Rm < 850 HRC < 24 | Al Aluminium > 99% | Al Aluminium Alloy | Al Aluminium Cast | Cu Copper | Plastic Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8531** | ø-Code **220**

Ø Code	d_1	α/2	d_2 h5	l_1	l_2	r_1	r_2	r_3	z	8531	
220	4.00	30.0°	16.00	108	14.50	2.00	750	3.00	4	●	
300	6.00	20.0°	16.00	108	18.50	3.00	1000	5.00	4	●	
388	8.00	10.0°	16.00	108	28.50	4.00	1000	5.00	4	●	
391	8.00	6.0°	16.00	123	44.00	4.00	1000	5.00	4	●	

Application



Cutting data calculator ToolExpert ArCut X

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Optimize your finishing processes with the ToolExpert ArCut X.

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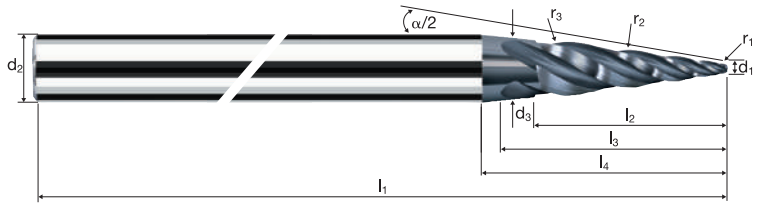
Circular arc milling cutter ArCutX

Spherical, form tolerance ±0.005

X-Generation X

II

HM MG10	λ 30° γ 10°



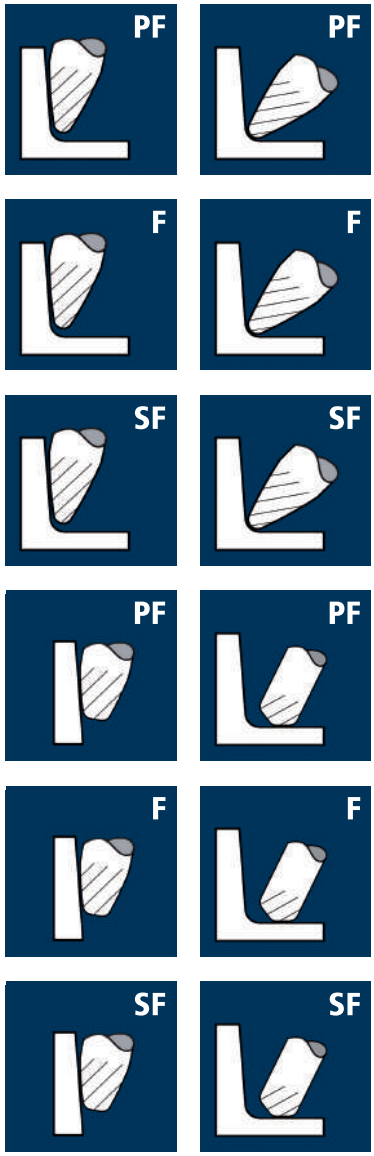
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **8535** ø-Code **100**

Ø Code	d_1	α/2	d_2 h5	d_3	l_1	l_2	l_3	l_4	r_1	r_2	r_3	z	POLYCHROM P8535
100	1.00	8.0°	6.00	5.00	70	16.00	17.50	22.50	0.50	350	1.00	4	●
140	2.00	15.0°	8.00	7.00	80	11.50	17.50	22.50	1.00	350	1.00	4	●
145	2.00	30.0°	8.00	-	80	8.00	-	-	1.00	250	1.00	4	●
220	4.00	14.0°	12.00	9.00	97	13.50	17.50	22.50	2.00	350	1.00	4	●

Application



Cutting data calculator ToolExpert ArCut X

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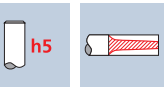
Circular arc milling cutter ArCutX

Spherical, form tolerance ±0.005

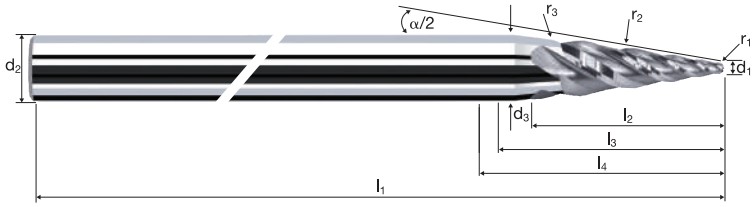
X-Generation X

II

HM MG10	λ 30° γ 10°







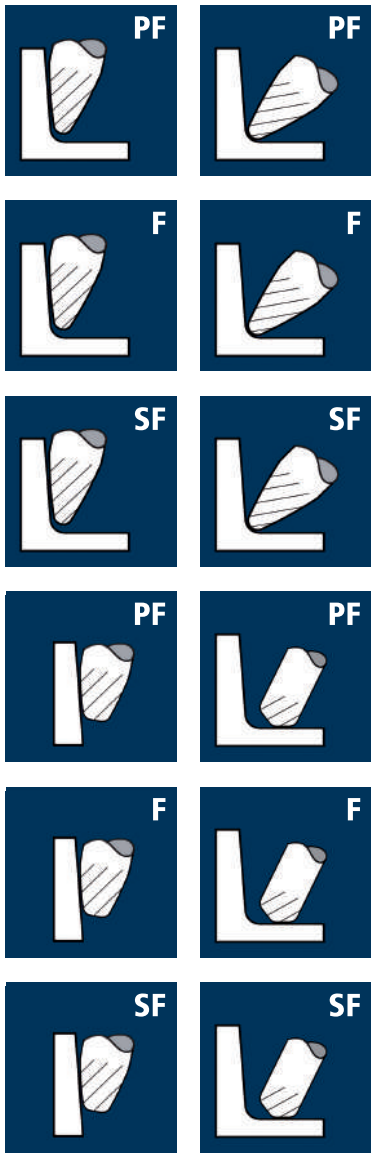
ReTool®

Rm < 850 HRC < 24			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating | Article-N°. **8536** | ø-Code **100**

Ø Code	d_1	α/2	d_2 h5	d_3	l_1	l_2	l_3	l_4	r_1	r_2	r_3	z	8536
100	1.00	8.0°	6.00	5.00	70	16.00	17.50	22.50	0.50	350	1.00	4	●
140	2.00	15.0°	8.00	7.00	80	11.50	17.50	22.50	1.00	350	1.00	4	●
145	2.00	30.0°	8.00	-	80	8.00	-	-	1.00	250	1.00	4	●
220	4.00	14.0°	12.00	9.00	97	13.50	17.50	22.50	2.00	350	1.00	4	●

Application



Cutting data calculator ToolExpert ArCut X

Perfect finishing tool whenever an excellent surface quality is demanded: ToolExpert ArCut X

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In combination with the respective tool characteristics, the technologies facilitate a wide range of applications in a variety of materials.

Optimize your finishing processes with the ToolExpert ArCut X.

This way to the cutting data calculator **ToolExpert ArCut X** or the FRAISA website **www.fraisa.com/en/toolexpert-arcut-x**

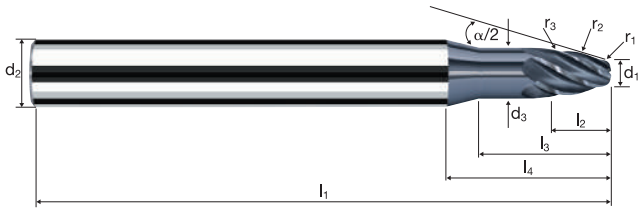
Circular arc milling cutter ArCutX

Toric, form tolerance ±0.010

X-Generation X

II

HM MG10	λ 30° γ 10°



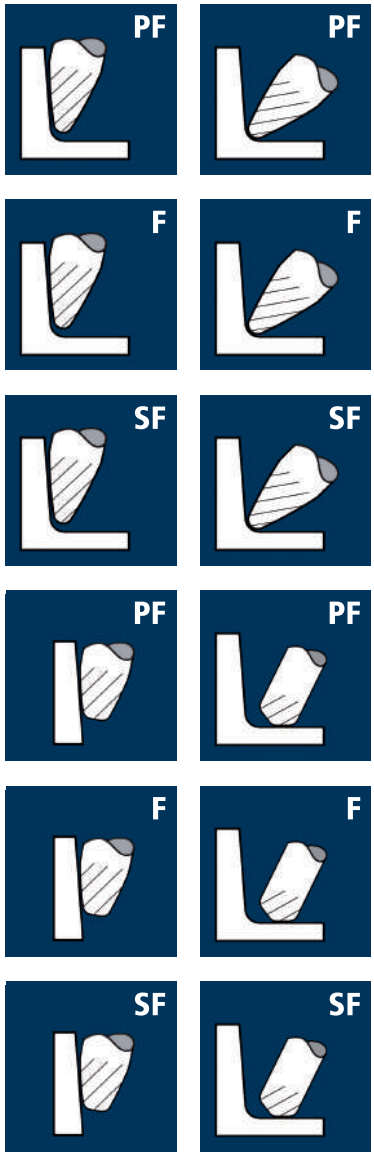
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **8540** ø-Code **220**

Ø Code	d_1	α/2	d_2 h5	d_3	l_1	l_2	l_3	l_4	r_1	r_2	r_3	z	POLYCHROM P8540
220	4.00	12.5°	10.00	7.50	84	11.00	20.00	25.00	1.25	30	1.00	4	●
221	4.00	12.5°	10.00	7.50	84	11.00	20.00	25.00	1.25	30	1.00	6	●
300	6.00	15.0°	12.00	-	97	15.00	-	-	2.00	40	2.00	4	●
301	6.00	15.0°	12.00	-	97	15.00	-	-	2.00	40	2.00	6	●
450	10.00	17.5°	16.00	-	108	15.00	-	-	3.50	50	2.00	4	●
453	10.00	17.5°	16.00	-	108	15.00	-	-	3.50	50	2.00	8	●

Application



Cutting data calculator ToolExpert ArCut X

Perfect finishing tool whenever an excellent surface quality is demanded: ToolExpert ArCut X

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This way to the cutting data calculator **ToolExpert ArCut X** or the FRAISA website **www.fraisa.com/en/toolexpert-arcut-x**

Circular arc milling cutter ArCutX

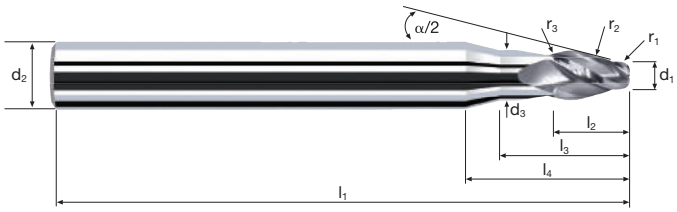
Toric, form tolerance ±0.010

X-Generation X

II

HM MG10 | λ 30° γ 10°

h5



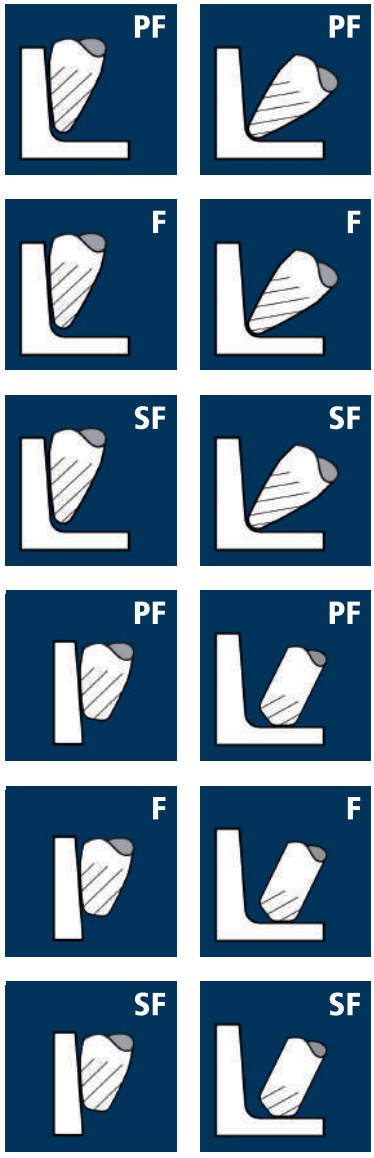
ReTool®

Rm < 850 HRC < 24 | Al Aluminium > 99% | Al Aluminium Alloy | Al Aluminium Cast | Cu Copper | Plastic Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8541** | ø-Code **220**

Ø Code	d_1	α/2	d_2 h5	d_3	l_1	l_2	l_3	l_4	r_1	r_2	r_3	z	8541
220	4.00	12.5°	10.00	7.50	84	11.00	20.00	25.00	1.25	30	1.00	4	●
300	6.00	15.0°	12.00	-	97	15.00	-	-	2.00	40	2.00	4	●
450	10.00	17.5°	16.00	-	108	15.00	-	-	3.50	50	2.00	4	●

Application



Cutting data calculator ToolExpert ArCut X

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This way to the cutting data calculator **ToolExpert ArCut X** or the FRAISA website **www.fraisa.com/en/toolexpert-arcut-x**

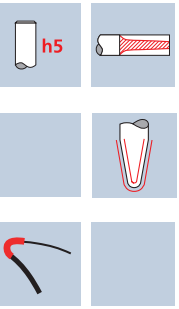
Circular arc milling cutter ArCutX

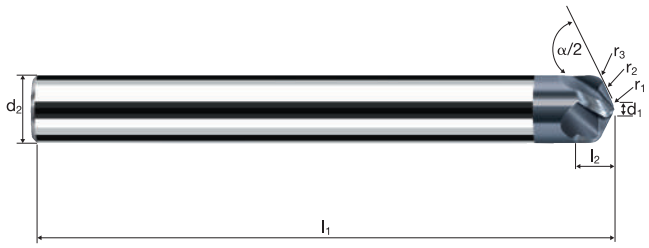
Flat surfaces, form tolerance ±0.010

X-Generation X

II

HM MG10	λ 30° γ 10°





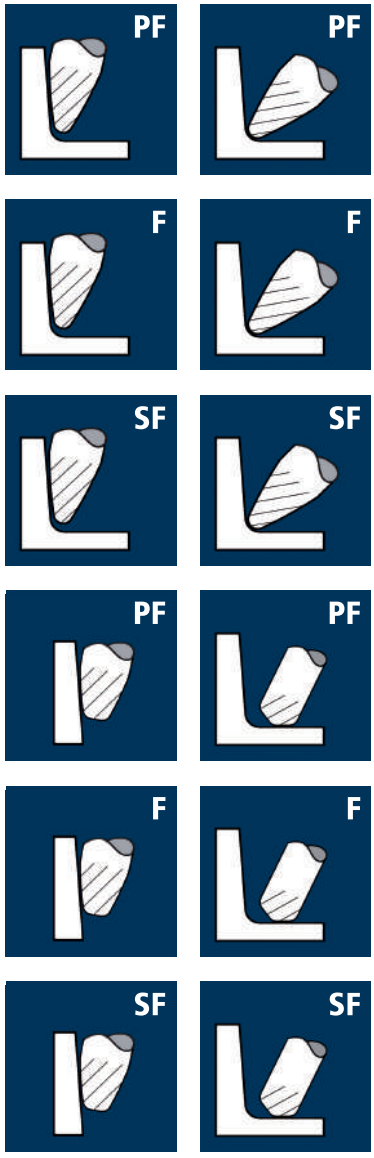
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium

Example: **Order-N°.** Coating **P** Article-N°. **8550** ø-Code **140**

Ø Code	d_1	α/2	d_2 h5	l_1	l_2	r_1	r_2	r_3	z		POLYCHROM P8550
140	2.00	65.0°	10.00	84	4.00	1.00	250	1.75	4		●
300	6.00	70.0°	20.00	104	5.50	1.00	250	1.00	8		●

Application



Cutting data calculator ToolExpert ArCut X

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Circular arc milling cutter ArCutX

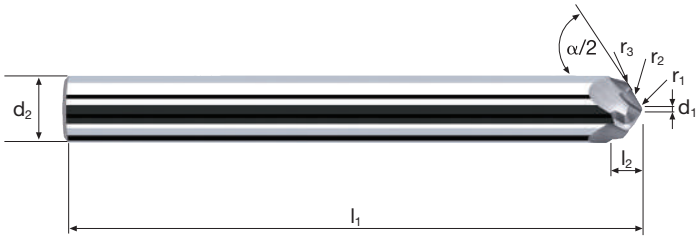
Flat surfaces, form tolerance ±0.010

X-Generation X

II

HM MG10 | λ 30° γ 10°

h5

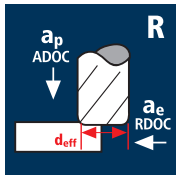


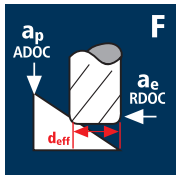
ReTool®

Rm < 850 HRC < 24 | Al Aluminium > 99% | Al Aluminium Alloy | Al Aluminium Cast | Cu Copper | Plastic Thermoplast

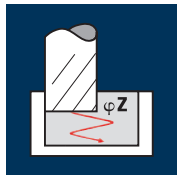
Example: **Order-N°.** Coating **8551** ø-Code **140**

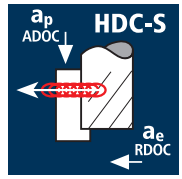
Ø Code	d_1	α/2	d_2 h5	l_1	l_2	r_1	r_2	r_3	z	8551	
140	2.00	65.0°	10.00	84	4.00	1.00	250	1.75	4	●	
300	6.00	70.0°	20.00	104	5.50	1.00	250	1.00	8	●	

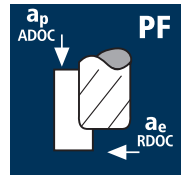
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
	Hardened tool steel 56 - 60 HRC H	2.00	6	80	0.014	0.200	1.200	1.80	14147	1188	0.500
		3.00	6	80	0.021	0.250	1.800	2.87	8873	1118	0.500
		4.00	6	80	0.028	0.250	2.400	3.87	6580	1105	0.500
		5.00	6	80	0.035	0.250	3.000	4.87	5229	1098	0.500
		6.00	8	80	0.042	0.200	3.600	5.80	4390	1475	0.500
		8.00	8	80	0.056	0.200	4.800	7.80	3265	1463	0.500
		10.00	8	80	0.070	0.200	6.000	9.80	2598	1455	0.500
		12.00	8	80	0.084	0.200	7.200	11.80	2158	1450	0.500
	Hardened tool steel > 60 HRC H	2.00	6	50	0.007	0.200	1.200	1.80	8842	371	0.500
		3.00	6	50	0.010	0.250	1.800	2.87	5545	333	0.500
		4.00	6	50	0.014	0.250	2.400	3.87	4113	346	0.500
		5.00	6	50	0.018	0.250	3.000	4.87	3268	353	0.500
		6.00	8	50	0.021	0.200	3.600	5.80	2744	461	0.500
		8.00	8	50	0.028	0.200	4.800	7.80	2040	457	0.500
		10.00	8	50	0.035	0.200	6.000	9.80	1624	455	0.500
		12.00	8	50	0.042	0.200	7.200	11.80	1349	453	0.500
	High speed steel, hardened 64 - 70 HRC H	2.00	6	20	0.004	0.200	1.200	1.80	3537	85	0.500
		3.00	6	20	0.006	0.250	1.800	2.87	2218	80	0.500
		4.00	6	20	0.008	0.250	2.400	3.87	1645	79	0.500
		5.00	6	20	0.010	0.250	3.000	4.87	1307	78	0.500
		6.00	8	20	0.012	0.200	3.600	5.80	1098	105	0.500
		8.00	8	20	0.016	0.200	4.800	7.80	816	104	0.500
		10.00	8	20	0.020	0.200	6.000	9.80	650	104	0.500
		12.00	8	20	0.024	0.200	7.200	11.80	540	104	0.500

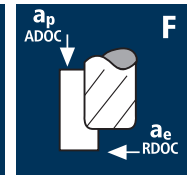
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 56 - 60 HRC H	2.00	6	180	0.020	0.090	0.030	1.98	28937	3472	45°
		3.00	6	180	0.028	0.090	0.030	2.98	19227	3230	45°
		4.00	6	180	0.035	0.090	0.050	3.98	14396	3023	45°
		5.00	6	180	0.041	0.090	0.050	4.98	11505	2830	45°
		6.00	8	180	0.042	0.090	0.075	5.98	9581	3219	45°
		8.00	8	180	0.048	0.090	0.075	7.98	7180	2757	45°
		10.00	8	180	0.050	0.090	0.100	9.98	5741	2296	45°
		12.00	8	180	0.048	0.090	0.100	11.98	4783	1837	45°
	Hardened tool steel > 60 HRC H	2.00	6	120	0.020	0.090	0.030	1.98	19292	2315	45°
		3.00	6	120	0.028	0.090	0.030	2.98	12818	2153	45°
		4.00	6	120	0.035	0.090	0.050	3.98	9597	2015	45°
		5.00	6	120	0.041	0.090	0.050	4.98	7670	1887	45°
		6.00	8	120	0.042	0.090	0.075	5.98	6387	2146	45°
		8.00	8	120	0.048	0.090	0.075	7.98	4787	1838	45°
		10.00	8	120	0.050	0.090	0.100	9.98	3827	1531	45°
		12.00	8	120	0.048	0.090	0.100	11.98	3188	1224	45°
	High speed steel, hardened 64 - 70 HRC H	2.00	6	80	0.020	0.090	0.030	1.98	12861	1543	45°
		3.00	6	80	0.028	0.090	0.030	2.98	8545	1436	45°
		4.00	6	80	0.035	0.090	0.050	3.98	6398	1344	45°
		5.00	6	80	0.041	0.090	0.050	4.98	5113	1258	45°
		6.00	8	80	0.042	0.090	0.075	5.98	4258	1431	45°
		8.00	8	80	0.048	0.090	0.075	7.98	3191	1225	45°
		10.00	8	80	0.050	0.090	0.100	9.98	2552	1021	45°
		12.00	8	80	0.048	0.090	0.100	11.98	2126	816	45°

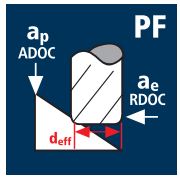
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

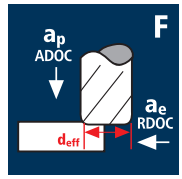


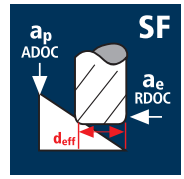












Corner radius end mills XSpeed-H

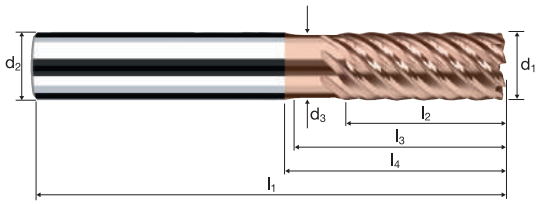
Tolerance r 0/+0.015, 3xd

X-Generation X

II

HM
XA

λ 45°
γ -10°



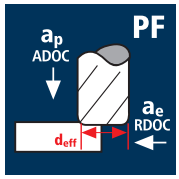
ReTool®

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

Example: **Order-N°.** Coating **H** Article-N°. **7210** ø-Code **138**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	DURO-Si H7210
138	2.00	6.00	1.90	57	5.00	6.00	14.31	0.200	6	●
178	3.00	6.00	2.80	57	8.00	9.00	15.63	0.200	6	●
218	4.00	6.00	3.70	57	11.00	12.00	16.95	0.200	6	●
258	5.00	6.00	4.60	57	13.00	15.00	18.27	0.200	6	●
297	6.00	6.00	5.50	57	13.00	19.34	20.00	0.200	8	●
385	8.00	8.00	7.40	63	19.00	25.29	26.00	0.200	8	●
445	10.00	10.00	9.20	72	22.00	30.20	31.00	0.200	8	●
496	12.00	12.00	11.00	83	26.00	36.13	37.00	0.200	8	●
140	2.00	6.00	1.90	57	5.00	6.00	14.31	0.500	6	●
180	3.00	6.00	2.80	57	8.00	9.00	15.63	0.500	6	●
220	4.00	6.00	3.70	57	11.00	12.00	16.95	0.500	6	●
260	5.00	6.00	4.60	57	13.00	15.00	18.27	0.500	6	●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.500	8	●
388	8.00	8.00	7.40	63	19.00	25.29	26.00	0.500	8	●
448	10.00	10.00	9.20	72	22.00	30.20	31.00	0.500	8	●
498	12.00	12.00	11.00	83	26.00	36.13	37.00	0.500	8	●

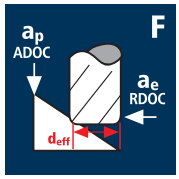
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Hardened tool steel 48 - 52 HRC									
2.00	4	150	0.030	0.120	0.700	1.65	28937	3472	0.500
3.00	4	150	0.045	0.150	1.050	2.71	17619	3171	0.500
4.00	4	150	0.050	0.170	1.400	3.75	12732	2546	0.500
5.00	4	150	0.055	0.190	1.750	4.78	9989	2198	0.500
6.00	4	150	0.065	0.200	2.700	5.80	8232	2140	0.500
8.00	4	150	0.080	0.220	3.600	7.83	6098	1951	0.500
10.00	4	150	0.105	0.240	4.500	9.85	4847	2036	0.500
12.00	4	150	0.125	0.250	5.400	11.87	4022	2011	0.500
16.00	6	150	0.130	0.280	5.600	15.90	3003	2342	0.500
Hardened tool steel 52 - 56 HRC									
2.00	4	120	0.025	0.120	0.700	1.65	23150	2315	0.500
3.00	4	120	0.040	0.150	1.050	2.71	14095	2255	0.500
4.00	4	120	0.045	0.170	1.400	3.75	10186	1834	0.500
5.00	4	120	0.050	0.190	1.750	4.78	7991	1598	0.500
6.00	4	120	0.060	0.200	2.700	5.80	6586	1581	0.500
8.00	4	120	0.070	0.220	3.600	7.83	4878	1366	0.500
10.00	4	120	0.095	0.240	4.500	9.85	3878	1474	0.500
12.00	4	120	0.115	0.250	5.400	11.87	3218	1480	0.500
16.00	6	120	0.115	0.280	5.600	15.90	2402	1657	0.500
Hardened tool steel 56 - 60 HRC									
2.00	4	80	0.025	0.120	0.700	1.65	15433	1543	0.500
3.00	4	80	0.035	0.150	1.050	2.71	9397	1316	0.500
4.00	4	80	0.040	0.170	1.400	3.75	6791	1087	0.500
5.00	4	80	0.045	0.190	1.750	4.78	5327	959	0.500
6.00	4	80	0.055	0.200	2.700	5.80	4390	966	0.500
8.00	4	80	0.065	0.220	3.600	7.83	3252	846	0.500
10.00	4	80	0.085	0.240	4.500	9.85	2585	879	0.500
12.00	4	80	0.105	0.250	5.400	11.87	2145	901	0.500
16.00	6	80	0.105	0.280	5.600	15.90	1602	1009	0.500
Hardened tool steel > 60 HRC									
2.00	4	40	0.015	0.120	0.700	1.65	7717	463	0.500
3.00	4	40	0.025	0.150	1.050	2.71	4698	470	0.500
4.00	4	40	0.030	0.170	1.400	3.75	3395	407	0.500
5.00	4	40	0.030	0.190	1.750	4.78	2664	320	0.500
6.00	4	40	0.040	0.200	2.700	5.80	2195	351	0.500
8.00	4	40	0.045	0.220	3.600	7.83	1626	293	0.500
10.00	4	40	0.060	0.240	4.500	9.85	1293	310	0.500
12.00	4	40	0.075	0.250	5.400	11.87	1073	322	0.500
16.00	6	40	0.075	0.280	5.600	15.90	801	361	0.500

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 48 - 52 HRC									
2.00	4	300	0.020	0.050	0.050	1.94	49223	3938	45°
3.00	4	300	0.025	0.050	0.050	2.94	32481	3248	45°
4.00	4	300	0.030	0.060	0.060	3.96	24114	2894	45°
5.00	4	300	0.035	0.060	0.060	4.96	19253	2695	45°
6.00	4	300	0.040	0.080	0.080	5.98	15969	2555	45°
8.00	4	300	0.045	0.080	0.080	7.98	11967	2154	45°
10.00	4	300	0.050	0.100	0.100	9.99	9559	1912	45°
12.00	4	300	0.055	0.100	0.100	11.99	7964	1752	45°
16.00	6	300	0.065	0.120	0.120	16.00	5968	2328	45°
Hardened tool steel 52 - 56 HRC									
2.00	4	250	0.020	0.050	0.050	1.94	41019	3282	45°
3.00	4	250	0.025	0.050	0.050	2.94	27067	2707	45°
4.00	4	250	0.030	0.060	0.060	3.96	20095	2411	45°
5.00	4	250	0.035	0.060	0.060	4.96	16044	2246	45°
6.00	4	250	0.040	0.080	0.080	5.98	13307	2129	45°
8.00	4	250	0.045	0.080	0.080	7.98	9972	1795	45°
10.00	4	250	0.050	0.100	0.100	9.99	7966	1593	45°
12.00	4	250	0.050	0.100	0.100	11.99	6637	1327	45°
16.00	6	250	0.060	0.120	0.120	16.00	4974	1791	45°
Hardened tool steel 56 - 60 HRC									
2.00	4	180	0.015	0.050	0.050	1.94	29534	1772	45°
3.00	4	180	0.020	0.050	0.050	2.94	19488	1559	45°
4.00	4	180	0.025	0.060	0.060	3.96	14469	1447	45°
5.00	4	180	0.030	0.060	0.060	4.96	11552	1386	45°
6.00	4	180	0.035	0.080	0.080	5.98	9581	1341	45°
8.00	4	180	0.040	0.080	0.080	7.98	7180	1149	45°
10.00	4	180	0.045	0.100	0.100	9.99	5735	1032	45°
12.00	4	180	0.045	0.100	0.100	11.99	4779	860	45°
16.00	6	180	0.055	0.120	0.120	16.00	3581	1182	45°
Hardened tool steel > 60 HRC									
2.00	4	100	0.010	0.050	0.050	1.94	16408	656	45°
3.00	4	100	0.015	0.050	0.050	2.94	10827	650	45°
4.00	4	100	0.015	0.060	0.060	3.96	8038	482	45°
5.00	4	100	0.020	0.060	0.060	4.96	6418	513	45°
6.00	4	100	0.020	0.080	0.080	5.98	5323	426	45°
8.00	4	100	0.025	0.080	0.080	7.98	3989	399	45°
10.00	4	100	0.025	0.100	0.100	9.99	3186	319	45°
12.00	4	100	0.030	0.100	0.100	11.99	2655	319	45°
16.00	6	100	0.035	0.120	0.120	16.00	1989	418	45°

Corner radius end mills XSpeed

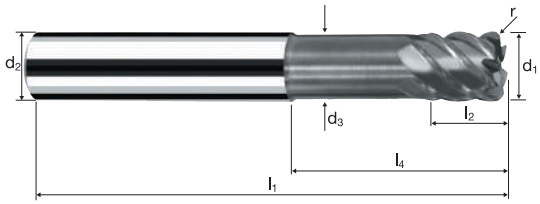
Tolerance r 0/+0.015, 3xd

X-Generation X

II

HM XT

λ 55°
γ -10°



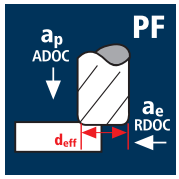
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7200** ø-Code **140**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL	X7200
140	2.00	6.00	1.90	57	3.00	6.00	14.31	0.500	4		●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	0.500	4		●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	0.500	4		●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	0.500	4		●
295	6.00	6.00	5.50	57	7.00	19.34	20.00	0.500	4		●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	0.500	6		●
386	8.00	8.00	7.40	63	9.00	25.29	26.00	0.500	4		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	0.500	6		●
440	10.00	10.00	9.20	72	11.00	30.20	31.00	0.500	4		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	0.500	6		●
491	12.00	12.00	11.00	83	13.00	36.13	37.00	0.500	4		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	0.500	6		●
606	16.00	16.00	15.00	92	17.00	42.13	43.00	0.500	6		●

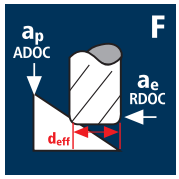
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 48 - 52 HRC									
4.00	4	150	0.045	0.340	1.400	3.50	13642	2456	1.000
5.00	4	150	0.050	0.380	1.750	4.57	10448	2090	1.000
6.00	4	150	0.065	0.400	2.700	5.60	8526	2217	1.000
8.00	4	150	0.080	0.440	3.600	7.66	6233	1995	1.000
10.00	4	150	0.095	0.480	4.500	9.71	4917	1869	1.000
12.00	4	150	0.115	0.500	5.400	11.73	4070	1872	1.000
16.00	6	150	0.130	0.560	5.600	15.80	3022	2357	1.000
Hardened tool steel 52 - 56 HRC									
4.00	4	120	0.040	0.340	1.400	3.50	10913	1746	1.000
5.00	4	120	0.045	0.380	1.750	4.57	8358	1504	1.000
6.00	4	120	0.060	0.400	2.700	5.60	6821	1637	1.000
8.00	4	120	0.070	0.440	3.600	7.66	4987	1396	1.000
10.00	4	120	0.085	0.480	4.500	9.71	3934	1338	1.000
12.00	4	120	0.105	0.500	5.400	11.73	3256	1368	1.000
16.00	6	120	0.115	0.560	5.600	15.80	2418	1668	1.000
Hardened tool steel 56 - 60 HRC									
4.00	4	80	0.035	0.340	1.400	3.50	7276	1019	1.000
5.00	4	80	0.040	0.380	1.750	4.57	5572	892	1.000
6.00	4	80	0.055	0.400	2.700	5.60	4547	1000	1.000
8.00	4	80	0.065	0.440	3.600	7.66	3324	864	1.000
10.00	4	80	0.080	0.480	4.500	9.71	2623	839	1.000
12.00	4	80	0.095	0.500	5.400	11.73	2171	825	1.000
16.00	6	80	0.105	0.560	5.600	15.80	1612	1016	1.000
Hardened tool steel > 60 HRC									
4.00	4	40	0.025	0.340	1.400	3.50	3638	364	1.000
5.00	4	40	0.030	0.380	1.750	4.57	2786	334	1.000
6.00	4	40	0.040	0.400	2.700	5.60	2274	364	1.000
8.00	4	40	0.045	0.440	3.600	7.66	1662	299	1.000
10.00	4	40	0.055	0.480	4.500	9.71	1311	288	1.000
12.00	4	40	0.065	0.500	5.400	11.73	1085	282	1.000
16.00	6	40	0.075	0.560	5.600	15.80	806	363	1.000

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 48 - 52 HRC									
4.00	4	300	0.030	0.080	0.080	3.86	24739	2969	45°
5.00	4	300	0.035	0.080	0.080	4.86	19649	2751	45°
6.00	4	300	0.040	0.110	0.110	5.90	16185	2590	45°
8.00	4	300	0.045	0.110	0.110	7.90	12088	2176	45°
10.00	4	300	0.050	0.140	0.140	9.94	9607	1921	45°
12.00	4	300	0.055	0.140	0.140	11.94	7998	1760	45°
16.00	6	300	0.065	0.160	0.160	15.96	5983	2333	45°
Hardened tool steel 52 - 56 HRC									
4.00	4	250	0.030	0.080	0.080	3.86	20616	2474	45°
5.00	4	250	0.035	0.080	0.080	4.86	16374	2292	45°
6.00	4	250	0.040	0.110	0.110	5.90	13488	2158	45°
8.00	4	250	0.045	0.110	0.110	7.90	10073	1813	45°
10.00	4	250	0.050	0.140	0.140	9.94	8006	1601	45°
12.00	4	250	0.050	0.140	0.140	11.94	6665	1333	45°
16.00	6	250	0.060	0.160	0.160	15.96	4986	1795	45°
Hardened tool steel 56 - 60 HRC									
4.00	4	180	0.025	0.080	0.080	3.86	14843	1484	45°
5.00	4	180	0.030	0.080	0.080	4.86	11789	1415	45°
6.00	4	180	0.035	0.110	0.110	5.90	9711	1360	45°
8.00	4	180	0.040	0.110	0.110	7.90	7253	1161	45°
10.00	4	180	0.045	0.140	0.140	9.94	5764	1038	45°
12.00	4	180	0.045	0.140	0.140	11.94	4799	864	45°
16.00	6	180	0.055	0.160	0.160	15.96	3590	1185	45°
Hardened tool steel > 60 HRC									
4.00	4	100	0.015	0.080	0.080	3.86	8246	495	45°
5.00	4	100	0.020	0.080	0.080	4.86	6550	524	45°
6.00	4	100	0.020	0.110	0.110	5.90	5395	432	45°
8.00	4	100	0.025	0.110	0.110	7.90	4029	403	45°
10.00	4	100	0.025	0.140	0.140	9.94	3202	320	45°
12.00	4	100	0.030	0.140	0.140	11.94	2666	320	45°
16.00	6	100	0.035	0.160	0.160	15.96	1994	419	45°

Corner radius end mills XSpeed

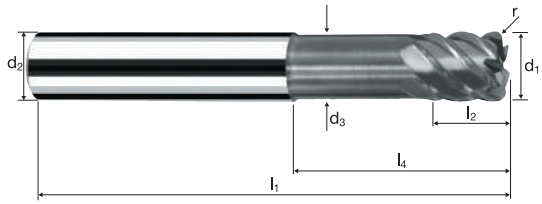
Tolerance r 0/+0.015, 3xd

X-Generation

II

HM
XT

λ 55°
γ -10°

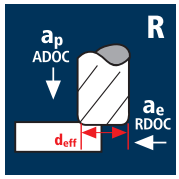


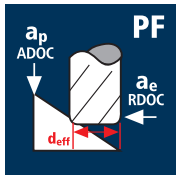
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7200** ø-Code **218**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL	X7200
218	4.00	6.00	3.70	57	5.00	12.00	16.95	1.000	4		●
258	5.00	6.00	4.60	57	6.00	15.00	18.27	1.000	4		●
293	6.00	6.00	5.50	57	7.00	19.34	20.00	1.000	4		●
297	6.00	6.00	5.50	57	7.00	19.34	20.00	1.000	6		●
384	8.00	8.00	7.40	63	9.00	25.29	26.00	1.000	4		●
388	8.00	8.00	7.40	63	9.00	25.29	26.00	1.000	6		●
435	10.00	10.00	9.20	72	11.00	30.20	31.00	1.000	4		●
445	10.00	10.00	9.20	72	11.00	30.20	31.00	1.000	6		●
486	12.00	12.00	11.00	83	13.00	36.13	37.00	1.000	4		●
496	12.00	12.00	11.00	83	13.00	36.13	37.00	1.000	6		●
608	16.00	16.00	15.00	92	17.00	42.13	43.00	1.000	6		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
	Hardened tool steel 42 - 48 HRC	2.00	4	150	0.020	0.400	1.200	1.98	24114	1929	0.500
		3.00	4	150	0.030	0.400	1.800	2.98	16022	1923	0.500
		4.00	4	150	0.040	0.400	2.400	3.98	11997	1920	0.500
		5.00	4	150	0.050	0.400	3.000	4.98	9588	1918	0.500
		6.00	4	150	0.060	0.400	3.600	5.98	7984	1916	0.500
		8.00	4	150	0.080	0.400	4.800	7.98	5983	1915	0.500
		10.00	4	150	0.100	0.400	6.000	9.98	4784	1914	0.500
		12.00	4	150	0.120	0.400	7.200	11.98	3986	1913	0.500
	Hardened tool steel 48 - 52 HRC	2.00	4	150	0.024	0.400	1.200	1.98	24114	2315	0.500
		3.00	4	150	0.036	0.400	1.800	2.98	16022	2307	0.500
		4.00	4	150	0.048	0.400	2.400	3.98	11997	2303	0.500
		5.00	4	150	0.060	0.400	3.000	4.98	9588	2301	0.500
		6.00	4	150	0.072	0.400	3.600	5.98	7984	2299	0.500
		8.00	4	150	0.096	0.400	4.800	7.98	5983	2298	0.500
		10.00	4	150	0.120	0.400	6.000	9.98	4784	2296	0.500
		12.00	4	150	0.144	0.400	7.200	11.98	3986	2296	0.500
	Hardened tool steel 52 - 56 HRC	2.00	4	140	0.020	0.400	1.200	1.98	22507	1801	0.500
		3.00	4	140	0.030	0.400	1.800	2.98	14954	1795	0.500
		4.00	4	140	0.040	0.400	2.400	3.98	11197	1792	0.500
		5.00	4	140	0.050	0.400	3.000	4.98	8948	1790	0.500
		6.00	4	140	0.060	0.400	3.600	5.98	7452	1789	0.500
		8.00	4	140	0.080	0.400	4.800	7.98	5584	1787	0.500
		10.00	4	140	0.100	0.400	6.000	9.98	4465	1786	0.500
		12.00	4	140	0.120	0.400	7.200	11.98	3720	1786	0.500
	Hardened tool steel 56 - 60 HRC	2.00	4	70	0.013	0.400	1.200	1.98	11253	567	0.500
		3.00	4	70	0.019	0.400	1.800	2.98	7477	565	0.500
		4.00	4	70	0.025	0.400	2.400	3.98	5598	564	0.500
		5.00	4	70	0.032	0.400	3.000	4.98	4474	564	0.500
		6.00	4	70	0.038	0.400	3.600	5.98	3726	563	0.500
		8.00	4	70	0.050	0.400	4.800	7.98	2792	563	0.500
		10.00	4	70	0.063	0.400	6.000	9.98	2233	563	0.500
		12.00	4	70	0.076	0.400	7.200	11.98	1860	563	0.500

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	2.00	4	225	0.034	0.180	0.060	2.00	35810	4870	45°
		3.00	4	225	0.051	0.180	0.090	3.00	23873	4870	45°
		4.00	4	225	0.068	0.180	0.120	4.00	17905	4870	45°
		5.00	4	225	0.085	0.180	0.150	5.00	14324	4870	45°
		6.00	4	225	0.102	0.180	0.180	6.00	11937	4870	45°
		8.00	4	225	0.136	0.180	0.240	8.00	8952	4870	45°
		10.00	4	225	0.170	0.180	0.300	10.00	7162	4870	45°
		12.00	4	225	0.204	0.180	0.360	12.00	5968	4870	45°
	Hardened tool steel 48 - 52 HRC	2.00	4	225	0.041	0.180	0.060	2.00	35810	5844	45°
		3.00	4	225	0.061	0.180	0.090	3.00	23873	5844	45°
		4.00	4	225	0.082	0.180	0.120	4.00	17905	5844	45°
		5.00	4	225	0.102	0.180	0.150	5.00	14324	5844	45°
		6.00	4	225	0.122	0.180	0.180	6.00	11937	5844	45°
		8.00	4	225	0.163	0.180	0.240	8.00	8952	5844	45°
		10.00	4	225	0.204	0.180	0.300	10.00	7162	5844	45°
		12.00	4	225	0.245	0.180	0.360	12.00	5968	5844	45°
	Hardened tool steel 52 - 56 HRC	2.00	4	210	0.036	0.180	0.060	2.00	33423	4813	45°
		3.00	4	210	0.054	0.180	0.090	3.00	22282	4813	45°
		4.00	4	210	0.072	0.180	0.120	4.00	16711	4813	45°
		5.00	4	210	0.090	0.180	0.150	5.00	13369	4813	45°
		6.00	4	210	0.108	0.180	0.180	6.00	11141	4813	45°
		8.00	4	210	0.144	0.180	0.240	8.00	8356	4813	45°
		10.00	4	210	0.180	0.180	0.300	10.00	6685	4813	45°
		12.00	4	210	0.216	0.180	0.360	12.00	5570	4813	45°
	Hardened tool steel 56 - 60 HRC	2.00	4	125	0.028	0.180	0.060	2.00	19894	2212	45°
		3.00	4	125	0.042	0.180	0.090	3.00	13263	2206	45°
		4.00	4	125	0.055	0.180	0.120	4.00	9947	2206	45°
		5.00	4	125	0.069	0.180	0.150	5.00	7958	2206	45°
		6.00	4	125	0.083	0.180	0.180	6.00	6631	2206	45°
		8.00	4	125	0.111	0.180	0.240	8.00	4974	2206	45°
		10.00	4	125	0.139	0.180	0.300	10.00	3979	2206	45°
		12.00	4	125	0.166	0.180	0.360	12.00	3316	2206	45°

Corner radius end mills ToroX

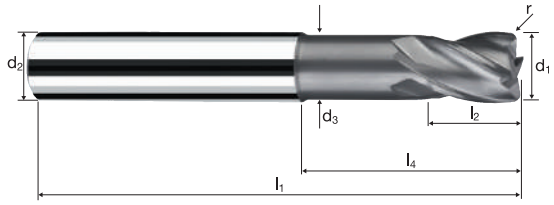
Tolerance r 0/+0.015, 3xd

X-Generation X

II

HM
XT

λ 30°
γ -5°



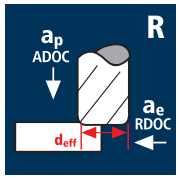
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7100** ø-Code **138**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL	X7100
138	2.00	6.00	1.90	57	3.00	6.00	14.31	0.200	4		●
178	3.00	6.00	2.80	57	4.00	9.00	15.63	0.200	4		●
218	4.00	6.00	3.70	57	5.00	12.00	16.95	0.200	4		●
258	5.00	6.00	4.60	57	6.00	15.00	18.27	0.200	4		●
297	6.00	6.00	5.50	57	7.00	19.34	20.00	0.200	4		●
385	8.00	8.00	7.40	63	9.00	25.29	26.00	0.200	4		●
445	10.00	10.00	9.20	72	11.00	30.20	31.00	0.200	4		●
496	12.00	12.00	11.00	83	13.00	36.13	37.00	0.200	4		●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	0.500	4		●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	0.500	4		●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	0.500	4		●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	0.500	4		●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	0.500	4		●
388	8.00	8.00	7.40	63	9.00	25.29	26.00	0.500	4		●
448	10.00	10.00	9.20	72	11.00	30.20	31.00	0.500	4		●
498	12.00	12.00	11.00	83	13.00	36.13	37.00	0.500	4		●

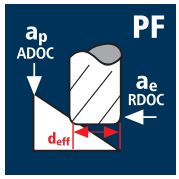
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
4.00	4	130	0.032	0.600	2.400	3.83	10804	1383	1.000
5.00	4	130	0.040	0.600	3.000	4.83	8567	1371	1.000
6.00	4	130	0.048	0.600	3.600	5.83	7098	1363	1.000
8.00	4	130	0.064	0.600	4.800	7.83	5285	1353	1.000
10.00	4	130	0.080	0.600	6.000	9.83	4210	1347	1.000
12.00	4	130	0.096	0.600	7.200	11.83	3498	1343	1.000
Hardened tool steel 48 - 52 HRC									
4.00	4	130	0.034	0.600	2.400	3.83	10804	1452	1.000
5.00	4	130	0.042	0.600	3.000	4.83	8567	1439	1.000
6.00	4	130	0.050	0.600	3.600	5.83	7098	1431	1.000
8.00	4	130	0.067	0.600	4.800	7.83	5285	1421	1.000
10.00	4	130	0.084	0.600	6.000	9.83	4210	1415	1.000
12.00	4	130	0.101	0.600	7.200	11.83	3498	1410	1.000
Hardened tool steel 52 - 56 HRC									
4.00	4	120	0.028	0.600	2.400	3.83	9973	1117	1.000
5.00	4	120	0.035	0.600	3.000	4.83	7908	1107	1.000
6.00	4	120	0.042	0.600	3.600	5.83	6552	1101	1.000
8.00	4	120	0.056	0.600	4.800	7.83	4878	1093	1.000
10.00	4	120	0.070	0.600	6.000	9.83	3886	1088	1.000
12.00	4	120	0.084	0.600	7.200	11.83	3229	1085	1.000
Hardened tool steel 56 - 60 HRC									
4.00	4	55	0.018	0.600	2.400	3.83	4571	323	1.000
5.00	4	55	0.022	0.600	3.000	4.83	3625	320	1.000
6.00	4	55	0.026	0.600	3.600	5.83	3003	318	1.000
8.00	4	55	0.035	0.600	4.800	7.83	2236	316	1.000
10.00	4	55	0.044	0.600	6.000	9.83	1781	314	1.000
12.00	4	55	0.053	0.600	7.200	11.83	1480	313	1.000

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
4.00	4	225	0.068	0.240	0.120	3.99	17950	4882	45°
5.00	4	225	0.085	0.240	0.150	4.99	14353	4880	45°
6.00	4	225	0.102	0.240	0.180	5.99	11957	4879	45°
8.00	4	225	0.136	0.240	0.240	7.99	8964	4876	45°
10.00	4	225	0.170	0.240	0.300	9.99	7169	4875	45°
12.00	4	225	0.204	0.240	0.360	11.99	5973	4874	45°
Hardened tool steel 48 - 52 HRC									
4.00	4	225	0.082	0.240	0.120	3.99	17950	5859	45°
5.00	4	225	0.102	0.240	0.150	4.99	14353	5856	45°
6.00	4	225	0.122	0.240	0.180	5.99	11957	5854	45°
8.00	4	225	0.163	0.240	0.240	7.99	8964	5852	45°
10.00	4	225	0.204	0.240	0.300	9.99	7169	5850	45°
12.00	4	225	0.245	0.240	0.360	11.99	5973	5849	45°
Hardened tool steel 52 - 56 HRC									
4.00	4	210	0.072	0.240	0.120	3.99	16753	4825	45°
5.00	4	210	0.090	0.240	0.150	4.99	13396	4823	45°
6.00	4	210	0.108	0.240	0.180	5.99	11159	4821	45°
8.00	4	210	0.144	0.240	0.240	7.99	8366	4819	45°
10.00	4	210	0.180	0.240	0.300	9.99	6691	4818	45°
12.00	4	210	0.216	0.240	0.360	11.99	5575	4817	45°
Hardened tool steel 56 - 60 HRC									
4.00	4	125	0.055	0.240	0.120	3.99	9972	2211	45°
5.00	4	125	0.069	0.240	0.150	4.99	7974	2210	45°
6.00	4	125	0.083	0.240	0.180	5.99	6643	2210	45°
8.00	4	125	0.111	0.240	0.240	7.99	4980	2209	45°
10.00	4	125	0.139	0.240	0.300	9.99	3983	2208	45°
12.00	4	125	0.166	0.240	0.360	11.99	3318	2207	45°

Corner radius end mills ToroX

Tolerance r 0/+0.015, 3xd

X-Generation X

II

HM
XT

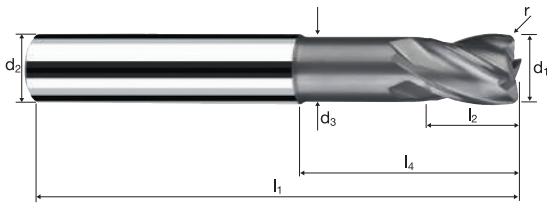
λ 30°
γ -5°

h4

d1

r

R



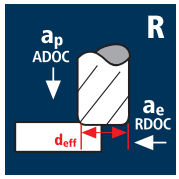
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7100** ø-Code **222**

Ø Code	d1 0/-0.01	d2 h4	d3	l1	l2	l3	l4	r 0/+0.015	z		X-AL X7100
222	4.00	6.00	3.70	57	5.00	12.00	16.95	1.000	4		●
262	5.00	6.00	4.60	57	6.00	15.00	18.27	1.000	4		●
302	6.00	6.00	5.50	57	7.00	19.34	20.00	1.000	4		●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	1.000	4		●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	1.000	4		●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	1.000	4		●
395	8.00	8.00	7.40	63	9.00	25.29	26.00	2.000	4		●
455	10.00	10.00	9.20	72	11.00	30.20	31.00	2.000	4		●
505	12.00	12.00	11.00	83	13.00	36.13	37.00	2.000	4		●

Application



Material

Hardened tool steel 56 - 60 HRC

H

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	r [mm]
2.00	6	54	0.014	0.200	1.200	1.80	9549	802	0.500
3.00	6	54	0.021	0.250	1.800	2.87	5989	755	0.500
4.00	6	54	0.028	0.250	2.400	3.87	4442	746	0.500
5.00	6	54	0.035	0.250	3.000	4.87	3530	741	0.500
6.00	8	54	0.042	0.200	3.600	5.80	2964	996	0.500
8.00	8	54	0.056	0.200	4.800	7.80	2204	987	0.500
10.00	8	54	0.070	0.200	6.000	9.80	1754	982	0.500
12.00	8	54	0.084	0.200	7.200	11.80	1457	979	0.500

Hardened tool steel > 60 HRC

H

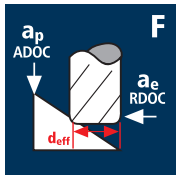
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	r [mm]
2.00	6	45	0.007	0.200	1.200	1.80	7958	334	0.500
3.00	6	45	0.011	0.250	1.800	2.87	4991	314	0.500
4.00	6	45	0.014	0.250	2.400	3.87	3701	311	0.500
5.00	6	45	0.018	0.250	3.000	4.87	2941	309	0.500
6.00	8	45	0.021	0.200	3.600	5.80	2470	415	0.500
8.00	8	45	0.028	0.200	4.800	7.80	1836	411	0.500
10.00	8	45	0.035	0.200	6.000	9.80	1462	409	0.500
12.00	8	45	0.042	0.200	7.200	11.80	1214	408	0.500

High speed steel, hardened 64 - 70 HRC

H

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	r [mm]
2.00	6	16	0.004	0.200	1.200	1.80	2829	68	0.500
3.00	6	16	0.006	0.250	1.800	2.87	1775	64	0.500
4.00	6	16	0.008	0.250	2.400	3.87	1316	63	0.500
5.00	6	16	0.010	0.250	3.000	4.87	1046	63	0.500
6.00	8	16	0.012	0.200	3.600	5.80	878	84	0.500
8.00	8	16	0.016	0.200	4.800	7.80	653	84	0.500
10.00	8	16	0.020	0.200	6.000	9.80	520	83	0.500
12.00	8	16	0.024	0.200	7.200	11.80	432	83	0.500

Application



Material

Hardened tool steel 56 - 60 HRC

H

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	β [°]
2.00	6	160	0.020	0.090	0.030	1.98	25722	3087	45°
3.00	6	160	0.028	0.090	0.030	2.98	17090	2871	45°
4.00	6	160	0.035	0.090	0.050	3.98	12796	2687	45°
5.00	6	160	0.041	0.090	0.050	4.98	10227	2516	45°
6.00	8	160	0.042	0.090	0.075	5.98	8517	2862	45°
8.00	8	160	0.048	0.090	0.075	7.98	6382	2451	45°
10.00	8	160	0.050	0.090	0.100	9.98	5103	2041	45°
12.00	8	160	0.048	0.090	0.100	11.98	4251	1632	45°

Hardened tool steel > 60 HRC

H

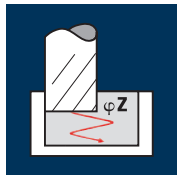
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	β [°]
2.00	6	110	0.020	0.090	0.030	1.98	17684	2122	45°
3.00	6	110	0.028	0.090	0.030	2.98	11750	1974	45°
4.00	6	110	0.035	0.090	0.050	3.98	8798	1848	45°
5.00	6	110	0.041	0.090	0.050	4.98	7031	1730	45°
6.00	8	110	0.042	0.090	0.075	5.98	5855	1967	45°
8.00	8	110	0.048	0.090	0.075	7.98	4388	1685	45°
10.00	8	110	0.050	0.090	0.100	9.98	3508	1403	45°
12.00	8	110	0.048	0.090	0.100	11.98	2923	1122	45°

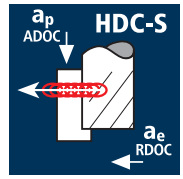
High speed steel, hardened 64 - 70 HRC

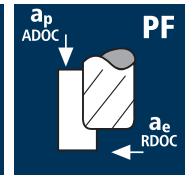
H

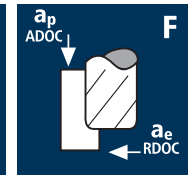
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	β [°]
2.00	6	70	0.020	0.090	0.030	1.98	11253	1350	45°
3.00	6	70	0.028	0.090	0.030	2.98	7477	1256	45°
4.00	6	70	0.035	0.090	0.050	3.98	5598	1176	45°
5.00	6	70	0.041	0.090	0.050	4.98	4474	1101	45°
6.00	8	70	0.042	0.090	0.075	5.98	3726	1252	45°
8.00	8	70	0.048	0.090	0.075	7.98	2792	1072	45°
10.00	8	70	0.050	0.090	0.100	9.98	2233	893	45°
12.00	8	70	0.048	0.090	0.100	11.98	1860	714	45°

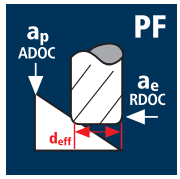
Precise cutting data for other applications and materials can be found in the cutting data software **ToolExpert®**

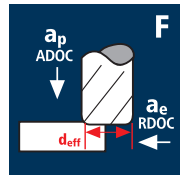


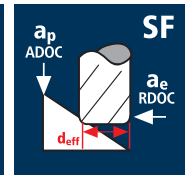












Corner radius end mills XSpeed-H

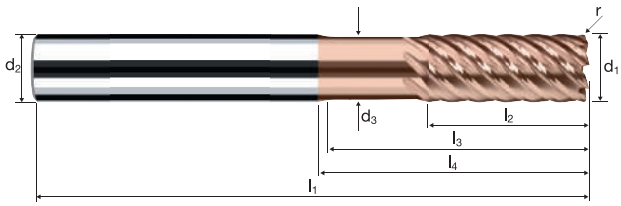
Tolerance r 0/+0.015, 4.5xd

X-Generation X

II

HM
XA

λ 45°
γ -10°



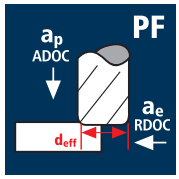
ReTool®

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

Example: **Order-N°.** Coating **H** Article-N°. **7212** ø-Code **138**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	DURO-Si H7212
138	2.00	6.00	1.90	61	5.00	9.00	17.31	0.200	6	●
178	3.00	6.00	2.80	61	8.00	13.50	20.13	0.200	6	●
218	4.00	6.00	3.70	66	11.00	18.00	22.95	0.200	6	●
258	5.00	6.00	4.60	66	13.00	22.50	25.77	0.200	6	●
297	6.00	6.00	5.50	69	13.00	30.34	31.00	0.200	8	●
385	8.00	8.00	7.40	80	19.00	39.29	40.00	0.200	8	●
445	10.00	10.00	9.20	90	22.00	47.20	48.00	0.200	8	●
496	12.00	12.00	11.00	105	26.00	54.13	55.00	0.200	8	●
140	2.00	6.00	1.90	61	5.00	9.00	17.31	0.500	6	●
180	3.00	6.00	2.80	61	8.00	13.50	20.13	0.500	6	●
220	4.00	6.00	3.70	66	11.00	18.00	22.95	0.500	6	●
260	5.00	6.00	4.60	66	13.00	22.50	25.77	0.500	6	●
300	6.00	6.00	5.50	69	13.00	30.34	31.00	0.500	8	●
388	8.00	8.00	7.40	80	19.00	39.29	40.00	0.500	8	●
448	10.00	10.00	9.20	90	22.00	47.20	48.00	0.500	8	●
498	12.00	12.00	11.00	105	26.00	54.13	55.00	0.500	8	●

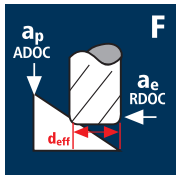
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Hardened tool steel 48 - 52 HRC									
2.00	4	150	0.025	0.100	0.440	1.60	29842	2984	0.500
3.00	4	150	0.040	0.120	0.660	2.65	18018	2883	0.500
4.00	4	150	0.045	0.150	0.880	3.71	12870	2317	0.500
5.00	4	150	0.050	0.160	1.100	4.73	10094	2019	0.500
6.00	4	150	0.060	0.170	2.100	5.75	8304	1993	0.500
8.00	4	150	0.070	0.190	2.800	7.78	6137	1718	0.500
10.00	4	150	0.090	0.200	3.500	9.80	4872	1754	0.500
12.00	4	150	0.110	0.220	4.200	11.83	4036	1776	0.500
16.00	6	150	0.120	0.240	3.520	15.85	3012	2169	0.500
Hardened tool steel 52 - 56 HRC									
2.00	4	120	0.025	0.100	0.440	1.60	23873	2387	0.500
3.00	4	120	0.035	0.120	0.660	2.65	14414	2018	0.500
4.00	4	120	0.040	0.150	0.880	3.71	10296	1647	0.500
5.00	4	120	0.045	0.160	1.100	4.73	8076	1454	0.500
6.00	4	120	0.055	0.170	2.100	5.75	6643	1462	0.500
8.00	4	120	0.065	0.190	2.800	7.78	4910	1277	0.500
10.00	4	120	0.080	0.200	3.500	9.80	3898	1247	0.500
12.00	4	120	0.100	0.220	4.200	11.83	3229	1292	0.500
16.00	6	120	0.110	0.240	3.520	15.85	2410	1591	0.500
Hardened tool steel 56 - 60 HRC									
2.00	4	80	0.020	0.100	0.440	1.60	15915	1273	0.500
3.00	4	80	0.035	0.120	0.660	2.65	9609	1345	0.500
4.00	4	80	0.035	0.150	0.880	3.71	6864	961	0.500
5.00	4	80	0.040	0.160	1.100	4.73	5384	861	0.500
6.00	4	80	0.050	0.170	2.100	5.75	4429	886	0.500
8.00	4	80	0.055	0.190	2.800	7.78	3273	720	0.500
10.00	4	80	0.075	0.200	3.500	9.80	2598	779	0.500
12.00	4	80	0.090	0.220	4.200	11.83	2153	775	0.500
16.00	6	80	0.100	0.240	3.520	15.85	1607	964	0.500
Hardened tool steel > 60 HRC									
2.00	4	40	0.015	0.100	0.440	1.60	7958	478	0.500
3.00	4	40	0.025	0.120	0.660	2.65	4805	481	0.500
4.00	4	40	0.025	0.150	0.880	3.71	3432	343	0.500
5.00	4	40	0.030	0.160	1.100	4.73	2692	323	0.500
6.00	4	40	0.035	0.170	2.100	5.75	2214	310	0.500
8.00	4	40	0.040	0.190	2.800	7.78	1637	262	0.500
10.00	4	40	0.050	0.200	3.500	9.80	1299	260	0.500
12.00	4	40	0.065	0.220	4.200	11.83	1076	280	0.500
16.00	6	40	0.070	0.240	3.520	15.85	803	337	0.500

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 48 - 52 HRC									
2.00	4	300	0.020	0.050	0.050	1.94	49223	3938	45°
3.00	4	300	0.025	0.050	0.050	2.94	32481	3248	45°
4.00	4	300	0.030	0.060	0.060	3.96	24114	2894	45°
5.00	4	300	0.035	0.060	0.060	4.96	19253	2695	45°
6.00	4	300	0.040	0.080	0.080	5.98	15969	2555	45°
8.00	4	300	0.045	0.080	0.080	7.98	11967	2154	45°
10.00	4	300	0.050	0.100	0.100	9.99	9559	1912	45°
12.00	4	300	0.055	0.100	0.100	11.99	7964	1752	45°
16.00	6	300	0.065	0.120	0.120	16.00	5968	2328	45°
Hardened tool steel 52 - 56 HRC									
2.00	4	250	0.020	0.050	0.050	1.94	41019	3282	45°
3.00	4	250	0.025	0.050	0.050	2.94	27067	2707	45°
4.00	4	250	0.030	0.060	0.060	3.96	20095	2411	45°
5.00	4	250	0.035	0.060	0.060	4.96	16044	2246	45°
6.00	4	250	0.040	0.080	0.080	5.98	13307	2129	45°
8.00	4	250	0.045	0.080	0.080	7.98	9972	1795	45°
10.00	4	250	0.050	0.100	0.100	9.99	7966	1593	45°
12.00	4	250	0.050	0.100	0.100	11.99	6637	1327	45°
16.00	6	250	0.060	0.120	0.120	16.00	4974	1791	45°
Hardened tool steel 56 - 60 HRC									
2.00	4	180	0.015	0.050	0.050	1.94	29534	1772	45°
3.00	4	180	0.020	0.050	0.050	2.94	19488	1559	45°
4.00	4	180	0.025	0.060	0.060	3.96	14469	1447	45°
5.00	4	180	0.030	0.060	0.060	4.96	11552	1386	45°
6.00	4	180	0.035	0.080	0.080	5.98	9581	1341	45°
8.00	4	180	0.040	0.080	0.080	7.98	7180	1149	45°
10.00	4	180	0.045	0.100	0.100	9.99	5735	1032	45°
12.00	4	180	0.045	0.100	0.100	11.99	4779	860	45°
16.00	6	180	0.055	0.120	0.120	16.00	3581	1182	45°
Hardened tool steel > 60 HRC									
2.00	4	100	0.010	0.050	0.050	1.94	16408	656	45°
3.00	4	100	0.015	0.050	0.050	2.94	10827	650	45°
4.00	4	100	0.015	0.060	0.060	3.96	8038	482	45°
5.00	4	100	0.020	0.060	0.060	4.96	6418	513	45°
6.00	4	100	0.020	0.080	0.080	5.98	5323	426	45°
8.00	4	100	0.025	0.080	0.080	7.98	3989	399	45°
10.00	4	100	0.025	0.100	0.100	9.99	3186	319	45°
12.00	4	100	0.030	0.100	0.100	11.99	2655	319	45°
16.00	6	100	0.035	0.120	0.120	16.00	1989	418	45°

Corner radius end mills XSpeed

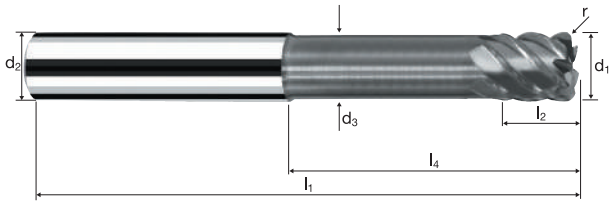
Tolerance r 0/+0.015, 6xd

X-Generation X

II

HM XT

λ 55°
γ -10°



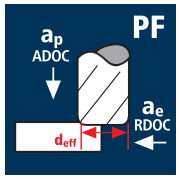
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7204** ø-Code **140**

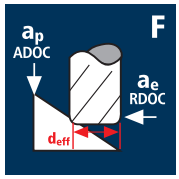
Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL	X7204
140	2.00	6.00	1.90	66	3.00	12.00	20.31	0.500	4		●
180	3.00	6.00	2.80	66	4.00	18.00	24.63	0.500	4		●
220	4.00	6.00	3.70	69	5.00	24.00	28.95	0.500	4		●
260	5.00	6.00	4.60	75	6.00	30.00	33.27	0.500	4		●
295	6.00	6.00	5.50	80	7.00	42.34	43.00	0.500	4		●
300	6.00	6.00	5.50	80	7.00	42.34	43.00	0.500	6		●
386	8.00	8.00	7.40	90	9.00	52.29	53.00	0.500	4		●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	0.500	6		●
440	10.00	10.00	9.20	105	11.00	63.20	64.00	0.500	4		●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	0.500	6		●
491	12.00	12.00	11.00	120	13.00	73.13	74.00	0.500	4		●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	0.500	6		●
606	16.00	16.00	15.00	135	17.00	85.13	86.00	0.500	6		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 48 - 52 HRC	4.00	4	150	0.040	0.180	0.880	3.14	15206	2433	1.000
	5.00	4	150	0.045	0.220	1.100	4.25	11234	2022	1.000
	6.00	4	150	0.055	0.260	2.100	5.35	8925	1964	1.000
	8.00	4	150	0.065	0.320	2.800	7.47	6392	1662	1.000
	10.00	4	150	0.085	0.380	3.500	9.57	4989	1696	1.000
	12.00	4	150	0.100	0.450	4.200	11.67	4091	1636	1.000
	16.00	6	150	0.105	0.500	3.520	15.73	3035	1912	1.000
Hardened tool steel 52 - 56 HRC	4.00	4	120	0.035	0.180	0.880	3.14	12165	1703	1.000
	5.00	4	120	0.040	0.220	1.100	4.25	8988	1438	1.000
	6.00	4	120	0.050	0.260	2.100	5.35	7140	1428	1.000
	8.00	4	120	0.060	0.320	2.800	7.47	5113	1227	1.000
	10.00	4	120	0.075	0.380	3.500	9.57	3991	1197	1.000
	12.00	4	120	0.090	0.450	4.200	11.67	3273	1178	1.000
	16.00	6	120	0.095	0.500	3.520	15.73	2428	1384	1.000
Hardened tool steel 56 - 60 HRC	4.00	4	80	0.035	0.180	0.880	3.14	8110	1135	1.000
	5.00	4	80	0.035	0.220	1.100	4.25	5992	839	1.000
	6.00	4	80	0.045	0.260	2.100	5.35	4760	857	1.000
	8.00	4	80	0.055	0.320	2.800	7.47	3409	750	1.000
	10.00	4	80	0.070	0.380	3.500	9.57	2661	745	1.000
	12.00	4	80	0.080	0.450	4.200	11.67	2182	698	1.000
	16.00	6	80	0.085	0.500	3.520	15.73	1619	826	1.000
Hardened tool steel > 60 HRC	4.00	4	40	0.025	0.180	0.880	3.14	4055	406	1.000
	5.00	4	40	0.025	0.220	1.100	4.25	2996	300	1.000
	6.00	4	40	0.030	0.260	2.100	5.35	2380	286	1.000
	8.00	4	40	0.040	0.320	2.800	7.47	1704	273	1.000
	10.00	4	40	0.050	0.380	3.500	9.57	1330	266	1.000
	12.00	4	40	0.060	0.450	4.200	11.67	1091	262	1.000
	16.00	6	40	0.060	0.500	3.520	15.73	809	291	1.000

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 48 - 52 HRC	4.00	4	300	0.030	0.080	0.080	3.86	24739	2969	45°
	5.00	4	300	0.035	0.080	0.080	4.86	19649	2751	45°
	6.00	4	300	0.040	0.110	0.110	5.90	16185	2590	45°
	8.00	4	300	0.045	0.110	0.110	7.90	12088	2176	45°
	10.00	4	300	0.050	0.140	0.140	9.94	9607	1921	45°
	12.00	4	300	0.055	0.140	0.140	11.94	7998	1760	45°
	16.00	6	300	0.065	0.160	0.160	15.96	5983	2333	45°
Hardened tool steel 52 - 56 HRC	4.00	4	250	0.030	0.080	0.080	3.86	20616	2474	45°
	5.00	4	250	0.035	0.080	0.080	4.86	16374	2292	45°
	6.00	4	250	0.040	0.110	0.110	5.90	13488	2158	45°
	8.00	4	250	0.045	0.110	0.110	7.90	10073	1813	45°
	10.00	4	250	0.050	0.140	0.140	9.94	8006	1601	45°
	12.00	4	250	0.050	0.140	0.140	11.94	6665	1333	45°
	16.00	6	250	0.060	0.160	0.160	15.96	4986	1795	45°
Hardened tool steel 56 - 60 HRC	4.00	4	180	0.025	0.080	0.080	3.86	14843	1484	45°
	5.00	4	180	0.030	0.080	0.080	4.86	11789	1415	45°
	6.00	4	180	0.035	0.110	0.110	5.90	9711	1360	45°
	8.00	4	180	0.040	0.110	0.110	7.90	7253	1161	45°
	10.00	4	180	0.045	0.140	0.140	9.94	5764	1038	45°
	12.00	4	180	0.045	0.140	0.140	11.94	4799	864	45°
	16.00	6	180	0.055	0.160	0.160	15.96	3590	1185	45°
Hardened tool steel > 60 HRC	4.00	4	100	0.015	0.080	0.080	3.86	8246	495	45°
	5.00	4	100	0.020	0.080	0.080	4.86	6550	524	45°
	6.00	4	100	0.020	0.110	0.110	5.90	5395	432	45°
	8.00	4	100	0.025	0.110	0.110	7.90	4029	403	45°
	10.00	4	100	0.025	0.140	0.140	9.94	3202	320	45°
	12.00	4	100	0.030	0.140	0.140	11.94	2666	320	45°
	16.00	6	100	0.035	0.160	0.160	15.96	1994	419	45°

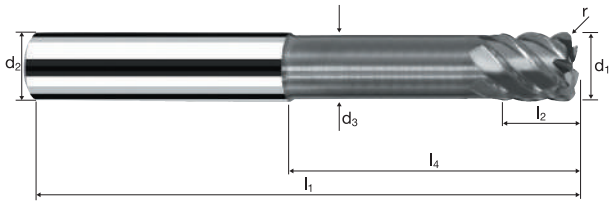
Corner radius end mills XSpeed

Tolerance r 0/+0.015, 6xd

X-Generation X

II

HM XT	λ 55° γ -10°



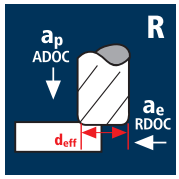
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7204** ø-Code **218**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL	X7204
218	4.00	6.00	3.70	69	5.00	24.00	28.95	1.000	4		●
258	5.00	6.00	4.60	75	6.00	30.00	33.27	1.000	4		●
293	6.00	6.00	5.50	80	7.00	42.34	43.00	1.000	4		●
297	6.00	6.00	5.50	80	7.00	42.34	43.00	1.000	6		●
384	8.00	8.00	7.40	90	9.00	52.29	53.00	1.000	4		●
388	8.00	8.00	7.40	90	9.00	52.29	53.00	1.000	6		●
435	10.00	10.00	9.20	105	11.00	63.20	64.00	1.000	4		●
445	10.00	10.00	9.20	105	11.00	63.20	64.00	1.000	6		●
486	12.00	12.00	11.00	120	13.00	73.13	74.00	1.000	4		●
496	12.00	12.00	11.00	120	13.00	73.13	74.00	1.000	6		●
608	16.00	16.00	15.00	135	17.00	85.13	86.00	1.000	6		●

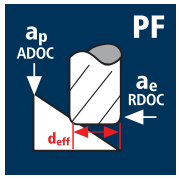
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC								
2.00	4	105	0.024	0.200	1.200	18568	1783	0.500
3.00	4	105	0.036	0.200	1.800	11937	1719	0.500
4.00	4	105	0.048	0.200	2.400	8795	1689	0.500
5.00	4	105	0.060	0.200	3.000	6963	1671	0.500
6.00	4	105	0.072	0.200	3.600	5763	1660	0.500
8.00	4	105	0.096	0.200	4.800	4285	1645	0.500
10.00	4	105	0.120	0.200	6.000	3410	1637	0.500
12.00	4	105	0.144	0.200	7.200	2832	1631	0.500
Hardened tool steel 48 - 52 HRC								
2.00	4	90	0.024	0.200	1.200	15915	1528	0.500
3.00	4	90	0.036	0.200	1.800	10231	1473	0.500
4.00	4	90	0.048	0.200	2.400	7539	1448	0.500
5.00	4	90	0.060	0.200	3.000	5968	1432	0.500
6.00	4	90	0.072	0.200	3.600	4939	1422	0.500
8.00	4	90	0.096	0.200	4.800	3673	1410	0.500
10.00	4	90	0.120	0.200	6.000	2923	1403	0.500
12.00	4	90	0.144	0.200	7.200	2428	1399	0.500
Hardened tool steel 52 - 56 HRC								
2.00	4	85	0.020	0.200	1.200	15031	1203	0.500
3.00	4	85	0.030	0.200	1.800	9663	1160	0.500
4.00	4	85	0.040	0.200	2.400	7120	1139	0.500
5.00	4	85	0.050	0.200	3.000	5637	1127	0.500
6.00	4	85	0.060	0.200	3.600	4665	1120	0.500
8.00	4	85	0.080	0.200	4.800	3469	1110	0.500
10.00	4	85	0.100	0.200	6.000	2761	1104	0.500
12.00	4	85	0.120	0.200	7.200	2293	1101	0.500
Hardened tool steel 56 - 60 HRC								
2.00	4	60	0.013	0.200	1.200	10610	535	0.500
3.00	4	60	0.019	0.200	1.800	6821	516	0.500
4.00	4	60	0.025	0.200	2.400	5026	507	0.500
5.00	4	60	0.032	0.200	3.000	3979	501	0.500
6.00	4	60	0.038	0.200	3.600	3293	498	0.500
8.00	4	60	0.050	0.200	4.800	2449	494	0.500
10.00	4	60	0.063	0.200	6.000	1949	491	0.500
12.00	4	60	0.076	0.200	7.200	1619	490	0.500

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
2.00	4	158	0.041	0.180	0.060	2.00	25146	4124	45°
3.00	4	158	0.061	0.180	0.090	3.00	16764	4090	45°
4.00	4	158	0.082	0.180	0.120	4.00	12573	4124	45°
5.00	4	158	0.102	0.180	0.150	5.00	10059	4104	45°
6.00	4	158	0.122	0.180	0.180	6.00	8382	4090	45°
8.00	4	158	0.163	0.180	0.240	8.00	6287	4099	45°
10.00	4	158	0.204	0.180	0.300	10.00	5029	4104	45°
12.00	4	158	0.245	0.180	0.360	12.00	4191	4107	45°
Hardened tool steel 48 - 52 HRC									
2.00	4	135	0.041	0.180	0.060	2.00	21486	3524	45°
3.00	4	135	0.061	0.180	0.090	3.00	14324	3495	45°
4.00	4	135	0.082	0.180	0.120	4.00	10743	3524	45°
5.00	4	135	0.102	0.180	0.150	5.00	8594	3506	45°
6.00	4	135	0.122	0.180	0.180	6.00	7162	3495	45°
8.00	4	135	0.163	0.180	0.240	8.00	5371	3502	45°
10.00	4	135	0.204	0.180	0.300	10.00	4297	3506	45°
12.00	4	135	0.245	0.180	0.360	12.00	3581	3509	45°
Hardened tool steel 52 - 56 HRC									
2.00	4	128	0.036	0.180	0.060	2.00	20372	2934	45°
3.00	4	128	0.054	0.180	0.090	3.00	13581	2934	45°
4.00	4	128	0.072	0.180	0.120	4.00	10186	2934	45°
5.00	4	128	0.090	0.180	0.150	5.00	8149	2934	45°
6.00	4	128	0.108	0.180	0.180	6.00	6791	2934	45°
8.00	4	128	0.144	0.180	0.240	8.00	5093	2934	45°
10.00	4	128	0.180	0.180	0.300	10.00	4074	2933	45°
12.00	4	128	0.216	0.180	0.360	12.00	3395	2933	45°
Hardened tool steel 56 - 60 HRC									
2.00	4	105	0.028	0.180	0.060	2.00	16711	1872	45°
3.00	4	105	0.042	0.180	0.090	3.00	11141	1872	45°
4.00	4	105	0.055	0.180	0.120	4.00	8356	1838	45°
5.00	4	105	0.069	0.180	0.150	5.00	6685	1845	45°
6.00	4	105	0.083	0.180	0.180	6.00	5570	1849	45°
8.00	4	105	0.111	0.180	0.240	8.00	4178	1855	45°
10.00	4	105	0.139	0.180	0.300	10.00	3342	1858	45°
12.00	4	105	0.166	0.180	0.360	12.00	2785	1849	45°

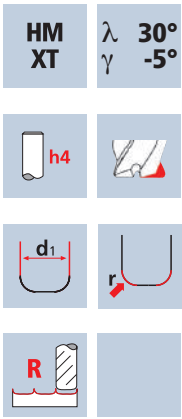
Corner radius end mills ToroX

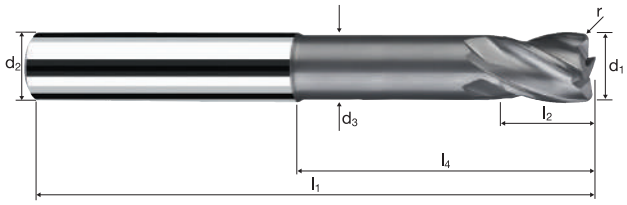
Tolerance r 0/+0.015, 6xd

X-Generation X

II

HM XT | λ 30° γ -5°



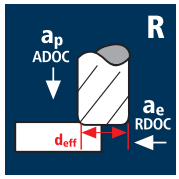


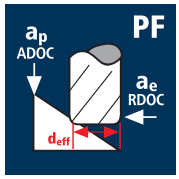
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7104** ø-Code **138**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL	**X7104**
138	2.00	6.00	1.90	66	3.00	12.00	20.31	0.200	4		●
178	3.00	6.00	2.80	66	4.00	18.00	24.63	0.200	4		●
218	4.00	6.00	3.70	69	5.00	24.00	28.95	0.200	4		●
258	5.00	6.00	4.60	75	6.00	30.00	33.27	0.200	4		●
297	6.00	6.00	5.50	80	7.00	42.34	43.00	0.200	4		●
385	8.00	8.00	7.40	90	9.00	52.29	53.00	0.200	4		●
445	10.00	10.00	9.20	105	11.00	63.20	64.00	0.200	4		●
496	12.00	12.00	11.00	120	13.00	73.13	74.00	0.200	4		●
140	2.00	6.00	1.90	66	3.00	12.00	20.31	0.500	4		●
180	3.00	6.00	2.80	66	4.00	18.00	24.63	0.500	4		●
220	4.00	6.00	3.70	69	5.00	24.00	28.95	0.500	4		●
260	5.00	6.00	4.60	75	6.00	30.00	33.27	0.500	4		●
300	6.00	6.00	5.50	80	7.00	42.34	43.00	0.500	4		●
388	8.00	8.00	7.40	90	9.00	52.29	53.00	0.500	4		●
448	10.00	10.00	9.20	105	11.00	63.20	64.00	0.500	4		●
498	12.00	12.00	11.00	120	13.00	73.13	74.00	0.500	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
	Hardened tool steel 42 - 48 HRC	4.00	4	95	0.055	0.200	2.400	9450	2087	1.000
		5.00	4	95	0.069	0.200	3.000	7200	1987	1.000
		6.00	4	95	0.083	0.200	3.600	5815	1926	1.000
		8.00	4	95	0.110	0.200	4.800	4200	1855	1.000
		10.00	4	95	0.138	0.200	6.000	3287	1814	1.000
		12.00	4	95	0.166	0.200	7.200	2700	1789	1.000
	Hardened tool steel 48 - 52 HRC	4.00	4	81	0.055	0.200	2.400	8057	1779	1.000
		5.00	4	81	0.069	0.200	3.000	6139	1694	1.000
		6.00	4	81	0.083	0.200	3.600	4958	1642	1.000
		8.00	4	81	0.110	0.200	4.800	3581	1581	1.000
		10.00	4	81	0.138	0.200	6.000	2803	1547	1.000
		12.00	4	81	0.166	0.200	7.200	2302	1525	1.000
	Hardened tool steel 52 - 56 HRC	4.00	4	74	0.046	0.200	2.400	7361	1354	1.000
		5.00	4	74	0.058	0.200	3.000	5608	1290	1.000
		6.00	4	74	0.069	0.200	3.600	4530	1250	1.000
		8.00	4	74	0.092	0.200	4.800	3272	1204	1.000
		10.00	4	74	0.115	0.200	6.000	2560	1178	1.000
		12.00	4	74	0.138	0.200	7.200	2103	1161	1.000
	Hardened tool steel 56 - 60 HRC	4.00	4	55	0.029	0.200	2.400	5471	634	1.000
		5.00	4	55	0.036	0.200	3.000	4168	604	1.000
		6.00	4	55	0.043	0.200	3.600	3367	586	1.000
		8.00	4	55	0.058	0.200	4.800	2432	564	1.000
		10.00	4	55	0.072	0.200	6.000	1903	552	1.000
		12.00	4	55	0.087	0.200	7.200	1563	544	1.000

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	4.00	4	158	0.082	0.240	0.120	3.99	12605	4134	45°
		5.00	4	158	0.102	0.240	0.150	4.99	10079	4112	45°
		6.00	4	158	0.122	0.240	0.180	5.99	8396	4097	45°
		8.00	4	158	0.163	0.240	0.240	7.99	6294	4104	45°
		10.00	4	158	0.204	0.240	0.300	9.99	5034	4108	45°
		12.00	4	158	0.245	0.240	0.360	11.99	4195	4111	45°
	Hardened tool steel 48 - 52 HRC	4.00	4	135	0.082	0.240	0.120	3.99	10770	3533	45°
		5.00	4	135	0.102	0.240	0.150	4.99	8612	3514	45°
		6.00	4	135	0.122	0.240	0.180	5.99	7174	3501	45°
		8.00	4	135	0.163	0.240	0.240	7.99	5378	3507	45°
		10.00	4	135	0.204	0.240	0.300	9.99	4301	3510	45°
		12.00	4	135	0.245	0.240	0.360	11.99	3584	3512	45°
	Hardened tool steel 52 - 56 HRC	4.00	4	128	0.072	0.240	0.120	3.99	10211	2941	45°
		5.00	4	128	0.090	0.240	0.150	4.99	8165	2939	45°
		6.00	4	128	0.108	0.240	0.180	5.99	6802	2939	45°
		8.00	4	128	0.144	0.240	0.240	7.99	5099	2937	45°
		10.00	4	128	0.180	0.240	0.300	9.99	4078	2936	45°
		12.00	4	128	0.216	0.240	0.360	11.99	3398	2936	45°
	Hardened tool steel 56 - 60 HRC	4.00	4	105	0.055	0.240	0.120	3.99	8377	1843	45°
		5.00	4	105	0.069	0.240	0.150	4.99	6698	1849	45°
		6.00	4	105	0.083	0.240	0.180	5.99	5580	1853	45°
		8.00	4	105	0.111	0.240	0.240	7.99	4183	1857	45°
		10.00	4	105	0.139	0.240	0.300	9.99	3346	1860	45°
		12.00	4	105	0.166	0.240	0.360	11.99	2788	1851	45°

Corner radius end mills ToroX

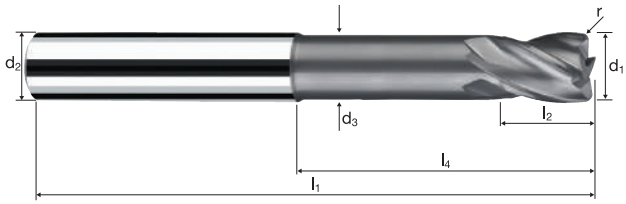
Tolerance r 0/+0.015, 6xd

X-Generation X

II

HM
XT

λ 30°
γ -5°



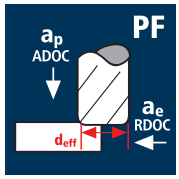
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G) Tool Steel HSS

Example: **Order-N°.** Coating **X** Article-N°. **7104** ø-Code **222**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	z	X-AL **X7104**
222	4.00	6.00	3.70	69	5.00	24.00	28.95	1.000	4	●
262	5.00	6.00	4.60	75	6.00	30.00	33.27	1.000	4	●
302	6.00	6.00	5.50	80	7.00	42.34	43.00	1.000	4	●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	1.000	4	●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	1.000	4	●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	1.000	4	●
395	8.00	8.00	7.40	90	9.00	52.29	53.00	2.000	4	●
455	10.00	10.00	9.20	105	11.00	63.20	64.00	2.000	4	●
505	12.00	12.00	11.00	120	13.00	73.13	74.00	2.000	4	●

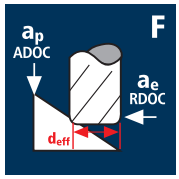
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Steel < 850 N/mm²									
3.00	4	200	0.040	0.150	0.900	2.71	23492	3759	0.500
4.00	4	200	0.050	0.180	1.200	3.77	16886	3377	0.500
5.00	4	200	0.055	0.200	1.500	4.80	13263	2918	0.500
6.00	6	200	0.060	0.220	1.800	5.83	10920	3931	0.500
8.00	6	200	0.075	0.250	2.400	7.87	8089	3640	0.500
10.00	6	200	0.090	0.280	3.000	9.90	6431	3473	0.500
12.00	6	200	0.110	0.300	3.600	11.92	5341	3525	0.500
16.00	6	200	0.120	0.650	4.800	15.47	4115	2963	1.500
Steel 850 - 1100 N/mm²									
3.00	4	180	0.040	0.150	0.900	2.71	21142	3383	0.500
4.00	4	180	0.050	0.180	1.200	3.77	15198	3040	0.500
5.00	4	180	0.050	0.200	1.500	4.80	11937	2387	0.500
6.00	6	180	0.055	0.220	1.800	5.83	9828	3243	0.500
8.00	6	180	0.070	0.250	2.400	7.87	7280	3058	0.500
10.00	6	180	0.085	0.280	3.000	9.90	5787	2951	0.500
12.00	6	180	0.105	0.300	3.600	11.92	4807	3028	0.500
16.00	6	180	0.115	0.650	4.800	15.47	3704	2556	1.500
Steel 1100 - 1300 N/mm²									
3.00	4	180	0.035	0.150	0.900	2.71	21142	2960	0.500
4.00	4	180	0.045	0.180	1.200	3.77	15198	2736	0.500
5.00	4	180	0.050	0.200	1.500	4.80	11937	2387	0.500
6.00	6	180	0.055	0.220	1.800	5.83	9828	3243	0.500
8.00	6	180	0.065	0.250	2.400	7.87	7280	2839	0.500
10.00	6	180	0.080	0.280	3.000	9.90	5787	2778	0.500
12.00	6	180	0.095	0.300	3.600	11.92	4807	2740	0.500
16.00	6	180	0.105	0.650	4.800	15.47	3704	2334	1.500
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
3.00	4	60	0.025	0.150	0.700	2.71	7047	705	0.500
4.00	4	60	0.030	0.180	1.000	3.77	5066	608	0.500
5.00	4	60	0.035	0.200	1.200	4.80	3979	557	0.500
6.00	6	60	0.040	0.220	1.400	5.83	3276	786	0.500
8.00	6	60	0.050	0.250	1.900	7.87	2427	728	0.500
10.00	6	60	0.055	0.280	2.400	9.90	1929	637	0.500
12.00	6	60	0.070	0.300	2.900	11.92	1602	673	0.500
16.00	6	60	0.075	0.650	3.800	15.47	1235	556	1.500

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Steel < 850 N/mm²									
3.00	4	420	0.025	0.050	0.050	2.94	45473	4547	45°
4.00	4	420	0.030	0.060	0.060	3.96	33760	4051	45°
5.00	4	420	0.035	0.060	0.060	4.96	26954	3774	45°
6.00	6	420	0.040	0.080	0.080	5.98	22356	5365	45°
8.00	6	420	0.045	0.080	0.080	7.98	16753	4523	45°
10.00	6	420	0.050	0.100	0.100	9.99	13382	4015	45°
12.00	6	420	0.055	0.100	0.100	11.99	11150	3680	45°
16.00	6	420	0.065	0.180	0.180	15.87	8424	3285	45°
Steel 850 - 1100 N/mm²									
3.00	4	360	0.025	0.050	0.050	2.94	38977	3898	45°
4.00	4	360	0.030	0.060	0.060	3.96	28937	3472	45°
5.00	4	360	0.035	0.060	0.060	4.96	23103	3234	45°
6.00	6	360	0.040	0.080	0.080	5.98	19162	4599	45°
8.00	6	360	0.045	0.080	0.080	7.98	14360	3877	45°
10.00	6	360	0.050	0.100	0.100	9.99	11471	3441	45°
12.00	6	360	0.050	0.100	0.100	11.99	9557	2867	45°
16.00	6	360	0.060	0.180	0.180	15.87	7221	2600	45°
Steel 1100 - 1300 N/mm²									
3.00	4	320	0.020	0.050	0.050	2.94	34646	2772	45°
4.00	4	320	0.025	0.060	0.060	3.96	25722	2572	45°
5.00	4	320	0.030	0.060	0.060	4.96	20536	2464	45°
6.00	6	320	0.035	0.080	0.080	5.98	17033	3577	45°
8.00	6	320	0.040	0.080	0.080	7.98	12764	3063	45°
10.00	6	320	0.045	0.100	0.100	9.99	10196	2753	45°
12.00	6	320	0.050	0.100	0.100	11.99	8495	2549	45°
16.00	6	320	0.055	0.180	0.180	15.87	6418	2118	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
3.00	4	145	0.020	0.050	0.050	2.94	15699	1256	45°
4.00	4	145	0.025	0.060	0.060	3.96	11655	1166	45°
5.00	4	145	0.030	0.060	0.060	4.96	9305	1117	45°
6.00	6	145	0.030	0.080	0.080	5.98	7718	1389	45°
8.00	6	145	0.035	0.080	0.080	7.98	5784	1215	45°
10.00	6	145	0.040	0.100	0.100	9.99	4620	1109	45°
12.00	6	145	0.045	0.100	0.100	11.99	3849	1039	45°
16.00	6	145	0.050	0.180	0.180	15.87	2908	872	45°

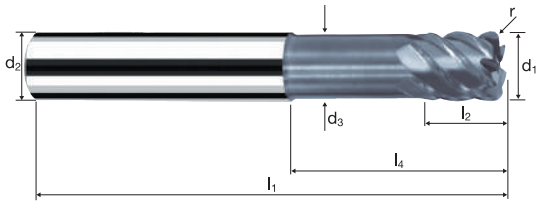
Corner radius end mills Multispeed

Tolerance r 0/+0.03, 3xd

X-Generation

II

HM MG10	λ 45° γ 5°



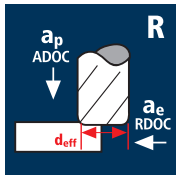
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **5250** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P5250
180	3.00	6.00	2.80	57	4.00	14.00	20.63	0.500	4	●
220	4.00	6.00	3.70	57	5.00	16.00	20.95	0.500	4	●
260	5.00	6.00	4.60	57	6.00	18.00	21.27	0.500	4	●
297	6.00	6.00	5.50	57	7.00	19.34	20.00	0.500	6	●
388	8.00	8.00	7.40	63	9.00	25.29	26.00	0.500	6	●
445	10.00	10.00	9.20	72	11.00	30.20	31.00	0.500	6	●
496	12.00	12.00	11.00	83	13.00	36.13	37.00	0.500	6	●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	0.800	6	●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	1.000	6	●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	1.000	6	●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	1.500	6	●
610	16.00	16.00	15.00	92	17.00	42.13	43.00	1.500	6	●

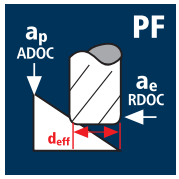
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
2.00	4	115	0.018	0.400	1.200	18488	1331	0.500
3.00	4	115	0.027	0.400	1.800	12284	1327	0.500
4.00	4	115	0.036	0.400	2.400	9197	1324	0.500
5.00	4	115	0.045	0.400	3.000	7351	1323	0.500
6.00	4	115	0.054	0.400	3.600	6121	1322	0.500
8.00	4	115	0.072	0.400	4.800	4587	1321	0.500
10.00	4	115	0.090	0.400	6.000	3668	1321	0.500
12.00	4	115	0.108	0.400	7.200	3056	1320	0.500
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]								
2.00	4	70	0.017	0.400	1.200	11253	765	0.500
3.00	4	70	0.026	0.400	1.800	7477	778	0.500
4.00	4	70	0.034	0.400	2.400	5598	761	0.500
5.00	4	70	0.043	0.400	3.000	4474	770	0.500
6.00	4	70	0.051	0.400	3.600	3726	760	0.500
8.00	4	70	0.068	0.400	4.800	2792	759	0.500
10.00	4	70	0.085	0.400	6.000	2233	759	0.500
12.00	4	70	0.103	0.400	7.200	1860	766	0.500
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]								
2.00	4	60	0.016	0.400	1.200	9646	617	0.500
3.00	4	60	0.024	0.400	1.800	6409	615	0.500
4.00	4	60	0.032	0.400	2.400	4799	614	0.500
5.00	4	60	0.041	0.400	3.000	3835	629	0.500
6.00	4	60	0.049	0.400	3.600	3194	626	0.500
8.00	4	60	0.065	0.400	4.800	2393	622	0.500
10.00	4	60	0.081	0.400	6.000	1914	620	0.500
12.00	4	60	0.097	0.400	7.200	1594	619	0.500
Steel < 850 N/mm²								
2.00	4	240	0.026	0.400	1.200	38583	4013	0.500
3.00	4	240	0.039	0.400	1.800	25636	3999	0.500
4.00	4	240	0.052	0.400	2.400	19195	3993	0.500
5.00	4	240	0.065	0.400	3.000	15340	3988	0.500
6.00	4	240	0.078	0.400	3.600	12775	3986	0.500
8.00	4	240	0.104	0.400	4.800	9573	3982	0.500
10.00	4	240	0.130	0.400	6.000	7655	3981	0.500
12.00	4	240	0.156	0.400	7.200	6377	3979	0.500

Application



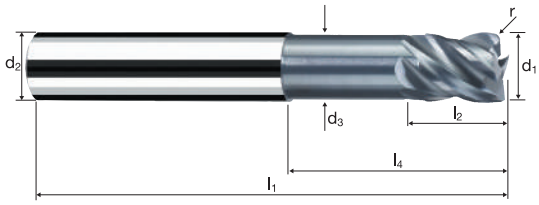
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
2.00	4	215	0.031	0.180	0.060	2.00	34218	4243	45°
3.00	4	215	0.046	0.180	0.090	3.00	22812	4197	45°
4.00	4	215	0.061	0.180	0.120	4.00	17109	4175	45°
5.00	4	215	0.077	0.180	0.150	5.00	13687	4216	45°
6.00	4	215	0.092	0.180	0.180	6.00	11406	4197	45°
8.00	4	215	0.122	0.180	0.240	8.00	8555	4175	45°
10.00	4	215	0.153	0.180	0.300	10.00	6844	4189	45°
12.00	4	215	0.184	0.180	0.360	12.00	5703	4197	45°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]									
2.00	4	130	0.029	0.180	0.060	2.00	20690	2400	45°
3.00	4	130	0.044	0.180	0.090	3.00	13793	2428	45°
4.00	4	130	0.058	0.180	0.120	4.00	10345	2400	45°
5.00	4	130	0.073	0.180	0.150	5.00	8276	2417	45°
6.00	4	130	0.087	0.180	0.180	6.00	6897	2400	45°
8.00	4	130	0.116	0.180	0.240	8.00	5173	2400	45°
10.00	4	130	0.145	0.180	0.300	10.00	4138	2400	45°
12.00	4	130	0.175	0.180	0.360	12.00	3448	2414	45°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]									
2.00	4	110	0.027	0.180	0.060	2.00	17507	1891	45°
3.00	4	110	0.041	0.180	0.090	3.00	11671	1914	45°
4.00	4	110	0.054	0.180	0.120	4.00	8754	1891	45°
5.00	4	110	0.070	0.180	0.150	5.00	7003	1961	45°
6.00	4	110	0.083	0.180	0.180	6.00	5836	1938	45°
8.00	4	110	0.111	0.180	0.240	8.00	4377	1943	45°
10.00	4	110	0.138	0.180	0.300	10.00	3501	1933	45°
12.00	4	110	0.165	0.180	0.360	12.00	2918	1926	45°
Steel < 850 N/mm²									
2.00	4	258	0.039	0.180	0.060	2.00	41062	6406	45°
3.00	4	360	0.059	0.180	0.090	3.00	38197	8938	45°
4.00	4	360	0.078	0.180	0.120	4.00	28648	8938	45°
5.00	4	360	0.098	0.180	0.150	5.00	22918	8938	45°
6.00	4	360	0.117	0.180	0.180	6.00	19099	8938	45°
8.00	4	360	0.156	0.180	0.240	8.00	14324	8938	45°
10.00	4	360	0.195	0.180	0.300	10.00	11459	8938	45°
12.00	4	360	0.234	0.180	0.360	12.00	9549	8938	45°

Corner radius end mills Torocut

Tolerance r 0/+0.03, 3xd

HM MG10	λ 40° γ 5°
Vario	



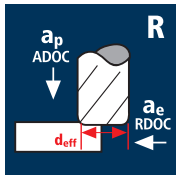
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **7340** ø-Code **138**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P7340
138	2.00	6.00	1.90	57	3.00	6.00	14.31	0.200	4	●
178	3.00	6.00	2.80	57	4.00	9.00	15.63	0.200	4	●
218	4.00	6.00	3.70	57	5.00	12.00	16.95	0.200	4	●
258	5.00	6.00	4.60	57	6.00	15.00	18.27	0.200	4	●
297	6.00	6.00	5.50	57	7.00	19.34	20.00	0.200	4	●
385	8.00	8.00	7.40	63	9.00	25.29	26.00	0.200	4	●
445	10.00	10.00	9.20	72	11.00	30.20	31.00	0.200	4	●
496	12.00	12.00	11.00	83	13.00	36.13	37.00	0.200	4	●
140	2.00	6.00	1.90	57	3.00	6.00	14.31	0.500	4	●
180	3.00	6.00	2.80	57	4.00	9.00	15.63	0.500	4	●
220	4.00	6.00	3.70	57	5.00	12.00	16.95	0.500	4	●
260	5.00	6.00	4.60	57	6.00	15.00	18.27	0.500	4	●
300	6.00	6.00	5.50	57	7.00	19.34	20.00	0.500	4	●
388	8.00	8.00	7.40	63	9.00	25.29	26.00	0.500	4	●
448	10.00	10.00	9.20	72	11.00	30.20	31.00	0.500	4	●
498	12.00	12.00	11.00	83	13.00	36.13	37.00	0.500	4	●

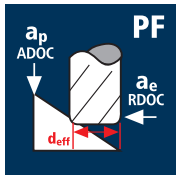
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
4.00	4	105	0.029	0.600	2.400	8727	1012	1.000
5.00	4	105	0.036	0.600	3.000	6920	997	1.000
6.00	4	105	0.043	0.600	3.600	5733	986	1.000
8.00	4	105	0.058	0.600	4.800	4269	990	1.000
10.00	4	105	0.072	0.600	6.000	3400	979	1.000
12.00	4	105	0.086	0.600	7.200	2825	972	1.000
16.00	4	105	0.072	1.200	9.600	2133	614	2.000
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]								
4.00	4	65	0.027	0.600	2.400	5402	583	1.000
5.00	4	65	0.034	0.600	3.000	4284	583	1.000
6.00	4	65	0.041	0.600	3.600	3549	582	1.000
8.00	4	65	0.054	0.600	4.800	2642	571	1.000
10.00	4	65	0.068	0.600	6.000	2105	573	1.000
12.00	4	65	0.082	0.600	7.200	1749	574	1.000
16.00	4	65	0.068	1.200	9.600	1320	359	2.000
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]								
4.00	4	55	0.026	0.600	2.400	4571	475	1.000
5.00	4	55	0.033	0.600	3.000	3625	479	1.000
6.00	4	55	0.039	0.600	3.600	3003	469	1.000
8.00	4	55	0.052	0.600	4.800	2236	465	1.000
10.00	4	55	0.065	0.600	6.000	1781	463	1.000
12.00	4	55	0.078	0.600	7.200	1480	462	1.000
16.00	4	55	0.065	1.200	9.600	1117	290	2.000
Steel < 850 N/mm²								
4.00	4	220	0.042	0.600	2.400	18284	3072	1.000
5.00	4	220	0.052	0.600	3.000	14499	3016	1.000
6.00	4	220	0.062	0.600	3.600	12012	2979	1.000
8.00	4	220	0.083	0.600	4.800	8944	2969	1.000
10.00	4	220	0.104	0.600	6.000	7124	2964	1.000
12.00	4	220	0.125	0.600	7.200	5920	2960	1.000
16.00	4	220	0.104	1.200	9.600	4469	1859	2.000

Application



Material

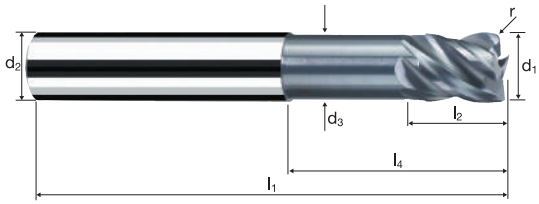
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
4.00	4	215	0.061	0.240	0.120	3.99	17152	4185	45°
5.00	4	215	0.077	0.240	0.150	4.99	13715	4224	45°
6.00	4	215	0.092	0.240	0.180	5.99	11425	4204	45°
8.00	4	215	0.122	0.240	0.240	7.99	8565	4180	45°
10.00	4	215	0.153	0.240	0.300	9.99	6851	4193	45°
12.00	4	215	0.184	0.240	0.360	11.99	5708	4201	45°
16.00	4	215	0.245	0.360	0.480	15.94	4293	4207	45°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]									
4.00	4	130	0.058	0.240	0.120	3.99	10371	2406	45°
5.00	4	130	0.073	0.240	0.150	4.99	8293	2422	45°
6.00	4	130	0.087	0.240	0.180	5.99	6908	2404	45°
8.00	4	130	0.116	0.240	0.240	7.99	5179	2403	45°
10.00	4	130	0.145	0.240	0.300	9.99	4142	2402	45°
12.00	4	130	0.175	0.240	0.360	11.99	3451	2416	45°
16.00	4	130	0.234	0.360	0.480	15.94	2596	2430	45°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]									
4.00	4	110	0.054	0.240	0.120	3.99	8775	1895	45°
5.00	4	110	0.070	0.240	0.150	4.99	7017	1965	45°
6.00	4	110	0.083	0.240	0.180	5.99	5845	1941	45°
8.00	4	110	0.111	0.240	0.240	7.99	4382	1946	45°
10.00	4	110	0.138	0.240	0.300	9.99	3505	1935	45°
12.00	4	110	0.165	0.240	0.360	11.99	2920	1927	45°
16.00	4	110	0.221	0.360	0.480	15.94	2197	1942	45°
Steel < 850 N/mm²									
4.00	4	360	0.078	0.240	0.120	3.99	28720	8961	45°
5.00	4	360	0.098	0.240	0.150	4.99	22964	8956	45°
6.00	4	360	0.117	0.240	0.180	5.99	19130	8953	45°
8.00	4	360	0.156	0.240	0.240	7.99	14342	8949	45°
10.00	4	360	0.195	0.240	0.300	9.99	11471	8947	45°
12.00	4	360	0.234	0.240	0.360	11.99	9557	8945	45°
16.00	4	360	0.312	0.360	0.480	15.94	7189	8972	45°

Corner radius end mills Torocut

Tolerance r 0/+0.03, 3xd

HM MG10 | λ 40° γ 5°

Vario



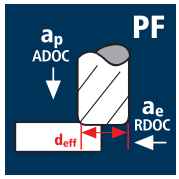
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **7340** ø-Code **222**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P7340
222	4.00	6.00	3.70	57	5.00	12.00	16.95	1.000	4	●
262	5.00	6.00	4.60	57	6.00	15.00	18.27	1.000	4	●
302	6.00	6.00	5.50	57	7.00	19.34	20.00	1.000	4	●
391	8.00	8.00	7.40	63	9.00	25.29	26.00	1.000	4	●
450	10.00	10.00	9.20	72	11.00	30.20	31.00	1.000	4	●
501	12.00	12.00	11.00	83	13.00	36.13	37.00	1.000	4	●
453	10.00	10.00	9.20	72	11.00	30.20	31.00	1.500	4	●
503	12.00	12.00	11.00	83	13.00	36.13	37.00	1.500	4	●
611	16.00	16.00	15.00	92	17.00	42.13	43.00	2.000	4	●

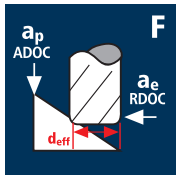
Application



Material

Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Steel < 850 N/mm²	6.00	6	200	0.050	0.150	1.320	5.33	11944	3583	0.800
	8.00	6	200	0.065	0.180	1.760	7.14	8916	3477	1.000
	10.00	6	200	0.080	0.200	2.200	9.20	6920	3322	1.000
	12.00	6	200	0.090	0.220	2.640	10.56	6029	3256	1.500
	16.00	6	200	0.115	0.250	3.520	14.66	4343	2997	1.500
Steel 850 - 1100 N/mm²	6.00	6	180	0.050	0.150	1.320	5.33	10750	3225	0.800
	8.00	6	180	0.060	0.180	1.760	7.14	8025	2889	1.000
	10.00	6	180	0.075	0.200	2.200	9.20	6228	2803	1.000
	12.00	6	180	0.085	0.220	2.640	10.56	5426	2767	1.500
	16.00	6	180	0.110	0.250	3.520	14.66	3908	2579	1.500
Steel 1100 - 1300 N/mm²	6.00	6	150	0.045	0.150	1.320	5.33	8958	2419	0.800
	8.00	6	150	0.055	0.180	1.760	7.14	6687	2207	1.000
	10.00	6	150	0.070	0.200	2.200	9.20	5190	2180	1.000
	12.00	6	150	0.080	0.220	2.640	10.56	4521	2170	1.500
	16.00	6	150	0.100	0.250	3.520	14.66	3257	1954	1.500
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	60	0.040	0.120	1.060	5.24	3645	875	0.800
	8.00	6	60	0.050	0.144	1.400	7.03	2717	815	1.000
	10.00	6	60	0.065	0.160	1.760	9.09	2101	819	1.000
	12.00	6	60	0.070	0.176	2.120	10.41	1835	771	1.500
	16.00	6	60	0.090	0.200	2.820	14.50	1317	711	1.500

Application



Material

Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Steel < 850 N/mm²	6.00	6	420	0.040	0.100	0.100	5.94	22507	5402	45°
	8.00	6	420	0.045	0.110	0.110	7.90	16923	4569	45°
	10.00	6	420	0.050	0.140	0.140	9.94	13450	4035	45°
	12.00	6	420	0.055	0.170	0.170	11.86	11272	3720	45°
	16.00	6	420	0.065	0.180	0.180	15.87	8424	3285	45°
Steel 850 - 1100 N/mm²	6.00	6	360	0.040	0.100	0.100	5.94	19292	4630	45°
	8.00	6	360	0.045	0.110	0.110	7.90	14505	3916	45°
	10.00	6	360	0.050	0.140	0.140	9.94	11528	3458	45°
	12.00	6	360	0.050	0.170	0.170	11.86	9662	2899	45°
	16.00	6	360	0.060	0.180	0.180	15.87	7221	2600	45°
Steel 1100 - 1300 N/mm²	6.00	6	320	0.035	0.100	0.100	5.94	17148	3601	45°
	8.00	6	320	0.040	0.110	0.110	7.90	12894	3095	45°
	10.00	6	320	0.045	0.140	0.140	9.94	10247	2767	45°
	12.00	6	320	0.050	0.170	0.170	11.86	8588	2576	45°
	16.00	6	320	0.055	0.180	0.180	15.87	6418	2118	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	6	145	0.030	0.100	0.100	5.94	7770	1399	45°
	8.00	6	145	0.035	0.110	0.110	7.90	5842	1227	45°
	10.00	6	145	0.040	0.140	0.140	9.94	4643	1114	45°
	12.00	6	145	0.045	0.170	0.170	11.86	3892	1051	45°
	16.00	6	145	0.050	0.180	0.180	15.87	2908	872	45°

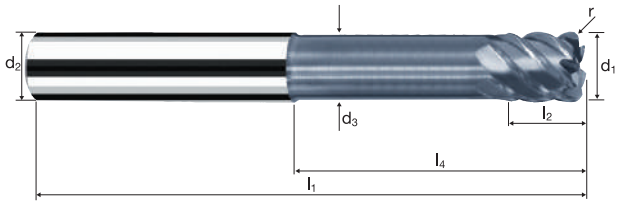
Corner radius end mills Multispeed

Tolerance r 0/+0.03, 5xd

X-Generation

II

HM MG10	λ 45° γ 5°



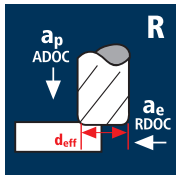
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)

Example: **Order-N°.** Coating **P** Article-N°. **5252** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P5252
300	6.00	6.00	5.50	70	7.00	32.34	33.00	0.800	6	●
391	8.00	8.00	7.40	80	9.00	42.29	43.00	1.000	6	●
450	10.00	10.00	9.20	84	11.00	42.20	43.00	1.000	6	●
501	12.00	12.00	11.00	97	13.00	50.13	51.00	1.500	6	●
610	16.00	16.00	15.00	115	17.00	65.13	66.00	1.500	6	●

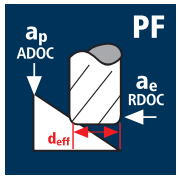
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
2.00	4	104	0.023	0.200	1.200	18391	1692	0.500
3.00	4	104	0.035	0.200	1.800	11823	1655	0.500
4.00	4	104	0.047	0.200	2.400	8712	1638	0.500
5.00	4	104	0.058	0.200	3.000	6897	1600	0.500
6.00	4	104	0.070	0.200	3.600	5708	1598	0.500
8.00	4	104	0.094	0.200	4.800	4244	1596	0.500
10.00	4	104	0.117	0.200	6.000	3378	1581	0.500
12.00	4	104	0.140	0.200	7.200	2805	1571	0.500
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]								
2.00	4	63	0.022	0.200	1.200	11141	980	0.500
3.00	4	63	0.034	0.200	1.800	7162	974	0.500
4.00	4	63	0.044	0.200	2.400	5277	929	0.500
5.00	4	63	0.056	0.200	3.000	4178	936	0.500
6.00	4	63	0.066	0.200	3.600	3458	913	0.500
8.00	4	63	0.088	0.200	4.800	2571	905	0.500
10.00	4	63	0.111	0.200	6.000	2046	908	0.500
12.00	4	63	0.134	0.200	7.200	1699	911	0.500
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]								
2.00	4	54	0.021	0.200	1.200	9549	802	0.500
3.00	4	54	0.031	0.200	1.800	6139	761	0.500
4.00	4	54	0.042	0.200	2.400	4523	760	0.500
5.00	4	54	0.053	0.200	3.000	3581	759	0.500
6.00	4	54	0.064	0.200	3.600	2964	759	0.500
8.00	4	54	0.085	0.200	4.800	2204	749	0.500
10.00	4	54	0.105	0.200	6.000	1754	737	0.500
12.00	4	54	0.126	0.200	7.200	1457	734	0.500
Steel < 850 N/mm²								
2.00	4	167	0.036	0.200	1.200	29532	4253	0.500
3.00	4	167	0.055	0.200	1.800	18985	4177	0.500
4.00	4	167	0.073	0.200	2.400	13989	4085	0.500
5.00	4	167	0.091	0.200	3.000	11075	4031	0.500
6.00	4	167	0.109	0.200	3.600	9165	3996	0.500
8.00	4	167	0.146	0.200	4.800	6815	3980	0.500
10.00	4	167	0.182	0.200	6.000	5424	3949	0.500
12.00	4	167	0.218	0.200	7.200	4505	3928	0.500

Application



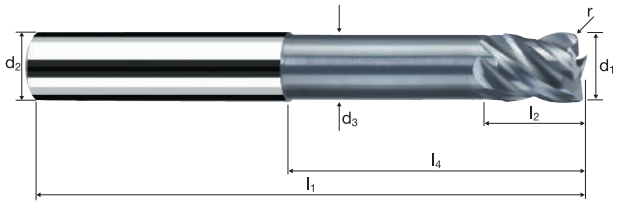
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
2.00	4	192	0.039	0.180	0.060	2.00	30558	4767	45°
3.00	4	192	0.060	0.180	0.090	3.00	20372	4889	45°
4.00	4	192	0.080	0.180	0.120	4.00	15279	4889	45°
5.00	4	192	0.099	0.180	0.150	5.00	12223	4840	45°
6.00	4	192	0.119	0.180	0.180	6.00	10186	4849	45°
8.00	4	192	0.160	0.180	0.240	8.00	7639	4889	45°
10.00	4	192	0.199	0.180	0.300	10.00	6112	4865	45°
12.00	4	192	0.238	0.180	0.360	12.00	5093	4849	45°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]									
2.00	4	117	0.037	0.180	0.060	2.00	18621	2756	45°
3.00	4	117	0.058	0.180	0.090	3.00	12414	2880	45°
4.00	4	117	0.075	0.180	0.120	4.00	9311	2793	45°
5.00	4	117	0.095	0.180	0.150	5.00	7448	2830	45°
6.00	4	117	0.112	0.180	0.180	6.00	6207	2781	45°
8.00	4	117	0.150	0.180	0.240	8.00	4655	2793	45°
10.00	4	117	0.189	0.180	0.300	10.00	3724	2815	45°
12.00	4	117	0.228	0.180	0.360	12.00	3104	2831	45°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]									
2.00	4	100	0.036	0.180	0.060	2.00	15915	2292	45°
3.00	4	100	0.053	0.180	0.090	3.00	10610	2249	45°
4.00	4	100	0.071	0.180	0.120	4.00	7958	2260	45°
5.00	4	100	0.090	0.180	0.150	5.00	6366	2292	45°
6.00	4	100	0.109	0.180	0.180	6.00	5305	2313	45°
8.00	4	100	0.145	0.180	0.240	8.00	3979	2308	45°
10.00	4	100	0.179	0.180	0.300	10.00	3183	2279	45°
12.00	4	100	0.214	0.180	0.360	12.00	2653	2271	45°
Steel < 850 N/mm²									
2.00	4	251	0.054	0.180	0.060	2.00	39948	8629	45°
3.00	4	251	0.083	0.180	0.090	3.00	26632	8842	45°
4.00	4	251	0.109	0.180	0.120	4.00	19974	8709	45°
5.00	4	251	0.137	0.180	0.150	5.00	15979	8757	45°
6.00	4	251	0.164	0.180	0.180	6.00	13316	8735	45°
8.00	4	251	0.219	0.180	0.240	8.00	9987	8749	45°
10.00	4	251	0.273	0.180	0.300	10.00	7990	8725	45°
12.00	4	251	0.327	0.180	0.360	12.00	6658	8709	45°

Corner radius end mills Torocut

Tolerance r 0/+0.03, 6xd

HM MG10	λ 40° γ 5°
Vario	



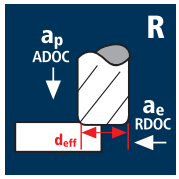
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **7344** ø-Code **138**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	POLYCHROM P7344
138	2.00	6.00	1.90	66	3.00	12.00	20.31	0.200	4	●
178	3.00	6.00	2.80	66	4.00	18.00	24.63	0.200	4	●
218	4.00	6.00	3.70	70	5.00	24.00	28.95	0.200	4	●
258	5.00	6.00	4.60	75	6.00	30.00	33.27	0.200	4	●
297	6.00	6.00	5.50	80	7.00	42.34	43.00	0.200	4	●
385	8.00	8.00	7.40	90	9.00	52.29	53.00	0.200	4	●
445	10.00	10.00	9.20	105	11.00	63.20	64.00	0.200	4	●
496	12.00	12.00	11.00	120	13.00	73.13	74.00	0.200	4	●
140	2.00	6.00	1.90	66	3.00	12.00	20.31	0.500	4	●
180	3.00	6.00	2.80	66	4.00	18.00	24.63	0.500	4	●
220	4.00	6.00	3.70	70	5.00	24.00	28.95	0.500	4	●
260	5.00	6.00	4.60	75	6.00	30.00	33.27	0.500	4	●
300	6.00	6.00	5.50	80	7.00	42.34	43.00	0.500	4	●
388	8.00	8.00	7.40	90	9.00	52.29	53.00	0.500	4	●
448	10.00	10.00	9.20	105	11.00	63.20	64.00	0.500	4	●
498	12.00	12.00	11.00	120	13.00	73.13	74.00	0.500	4	●

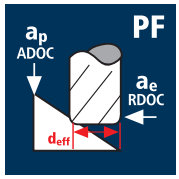
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]								
4.00	4	98	0.054	0.200	2.400	9748	2106	1.000
5.00	4	98	0.067	0.200	3.000	7427	1990	1.000
6.00	4	98	0.081	0.200	3.600	5999	1944	1.000
8.00	4	98	0.108	0.200	4.800	4333	1872	1.000
10.00	4	98	0.135	0.200	6.000	3391	1831	1.000
12.00	4	98	0.161	0.200	7.200	2785	1794	1.000
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]								
4.00	4	60	0.051	0.200	2.400	5968	1218	1.000
5.00	4	60	0.064	0.200	3.000	4547	1164	1.000
6.00	4	60	0.076	0.200	3.600	3673	1117	1.000
8.00	4	60	0.101	0.200	4.800	2653	1072	1.000
10.00	4	60	0.128	0.200	6.000	2076	1063	1.000
12.00	4	60	0.154	0.200	7.200	1705	1050	1.000
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]								
4.00	4	51	0.048	0.200	2.400	5073	974	1.000
5.00	4	51	0.061	0.200	3.000	3865	943	1.000
6.00	4	51	0.074	0.200	3.600	3122	924	1.000
8.00	4	51	0.098	0.200	4.800	2255	884	1.000
10.00	4	51	0.121	0.200	6.000	1765	854	1.000
12.00	4	51	0.145	0.200	7.200	1449	840	1.000
Steel < 850 N/mm²								
4.00	4	154	0.084	0.200	2.400	15319	5147	1.000
5.00	4	154	0.105	0.200	3.000	11671	4902	1.000
6.00	4	154	0.125	0.200	3.600	9427	4714	1.000
8.00	4	154	0.168	0.200	4.800	6808	4575	1.000
10.00	4	154	0.209	0.200	6.000	5328	4454	1.000
12.00	4	154	0.251	0.200	7.200	4377	4395	1.000

Application



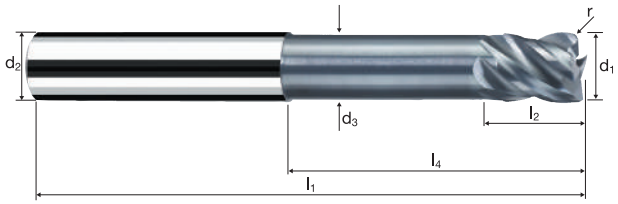
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
4.00	4	192	0.080	0.240	0.120	3.99	15317	4901	45°
5.00	4	192	0.099	0.240	0.150	4.99	12248	4850	45°
6.00	4	192	0.119	0.240	0.180	5.99	10203	4857	45°
8.00	4	192	0.160	0.240	0.240	7.99	7649	4895	45°
10.00	4	192	0.199	0.240	0.300	9.99	6118	4870	45°
12.00	4	192	0.238	0.240	0.360	11.99	5097	4852	45°
Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH]									
4.00	4	117	0.075	0.240	0.120	3.99	9334	2800	45°
5.00	4	117	0.095	0.240	0.150	4.99	7463	2836	45°
6.00	4	117	0.112	0.240	0.180	5.99	6217	2785	45°
8.00	4	117	0.150	0.240	0.240	7.99	4661	2797	45°
10.00	4	117	0.189	0.240	0.300	9.99	3728	2818	45°
12.00	4	117	0.228	0.240	0.360	11.99	3106	2833	45°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]									
4.00	4	100	0.071	0.240	0.120	3.99	7978	2266	45°
5.00	4	100	0.090	0.240	0.150	4.99	6379	2296	45°
6.00	4	100	0.109	0.240	0.180	5.99	5314	2317	45°
8.00	4	100	0.145	0.240	0.240	7.99	3984	2311	45°
10.00	4	100	0.179	0.240	0.300	9.99	3186	2281	45°
12.00	4	100	0.214	0.240	0.360	11.99	2655	2273	45°
Steel < 850 N/mm²									
4.00	4	251	0.109	0.240	0.120	3.99	20024	8731	45°
5.00	4	251	0.137	0.240	0.150	4.99	16011	8774	45°
6.00	4	251	0.164	0.240	0.180	5.99	13338	8750	45°
8.00	4	251	0.219	0.240	0.240	7.99	9999	8759	45°
10.00	4	251	0.273	0.240	0.300	9.99	7998	8734	45°
12.00	4	251	0.327	0.240	0.360	11.99	6664	8717	45°

Corner radius end mills Torocut

Tolerance r 0/+0.03, 6xd

HM MG10	λ 40° γ 5°
Vario	

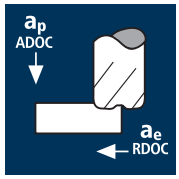


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys

Example: **Order-N°.** Coating **P** Article-N°. **7344** ø-Code **222**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z		POLYCHROM P7344
222	4.00	6.00	3.70	70	5.00	24.00	28.95	1.000	4		●
262	5.00	6.00	4.60	75	6.00	30.00	33.27	1.000	4		●
302	6.00	6.00	5.50	80	7.00	42.34	43.00	1.000	4		●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	1.000	4		●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	1.000	4		●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	1.000	4		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Hardened tool steel 48 - 52 HRC	2.00	4	140	0.070	0.060	1.500	22280	6238	0.6
		3.00	4	140	0.105	0.089	2.250	14855	6239	1.3
		4.00	4	140	0.140	0.140	3.000	11140	6238	2.6
		5.00	4	140	0.175	0.175	3.750	8915	6241	4.1
		6.00	6	105	0.147	0.210	4.500	5570	4913	4.6
		8.00	6	105	0.196	0.280	6.000	4180	4916	8.3
		10.00	6	105	0.245	0.350	7.500	3340	4910	12.9
		12.00	6	105	0.294	0.420	9.000	2785	4913	18.6
		16.00	6	105	0.392	0.560	12.000	2090	4916	33.0
	Hardened tool steel 52 - 56 HRC	2.00	4	120	0.070	0.060	1.500	19100	5348	0.5
		3.00	4	120	0.105	0.089	2.250	12730	5347	1.1
		4.00	4	120	0.140	0.140	3.000	9550	5348	2.2
		5.00	4	120	0.175	0.175	3.750	7640	5348	3.5
		6.00	6	90	0.147	0.210	4.500	4775	4212	4.0
		8.00	6	90	0.196	0.280	6.000	3580	4210	7.1
		10.00	6	90	0.245	0.350	7.500	2865	4212	11.1
		12.00	6	90	0.294	0.420	9.000	2385	4207	15.9
		16.00	6	90	0.392	0.560	12.000	1790	4210	28.3
	Hardened tool steel 56 - 60 HRC	2.00	4	90	0.054	0.051	1.500	14325	3094	0.2
		3.00	4	90	0.081	0.077	2.250	9550	3094	0.5
		4.00	4	90	0.108	0.120	3.000	7160	3093	1.1
		5.00	4	90	0.135	0.150	3.750	5730	3094	1.7
		6.00	6	80	0.144	0.180	4.500	4245	3668	3.0
		8.00	6	70	0.168	0.240	6.000	2785	2807	4.0
		10.00	6	60	0.180	0.300	7.500	1910	2063	4.6
		12.00	6	60	0.216	0.360	9.000	1590	2061	6.7
		16.00	6	50	0.240	0.480	12.000	995	1433	8.3
	Hardened tool steel > 60 HRC	2.00	4	70	0.045	0.050	1.500	11140	2005	0.2
		3.00	4	70	0.068	0.075	2.250	7425	2005	0.3
		4.00	4	70	0.090	0.100	3.000	5570	2005	0.6
		5.00	4	70	0.113	0.125	3.750	4455	2005	0.9
		6.00	6	65	0.120	0.150	4.500	3450	2484	1.7
		8.00	6	55	0.140	0.200	6.000	2190	1840	2.2
		10.00	6	50	0.150	0.250	7.500	1590	1431	2.7
		12.00	6	50	0.180	0.300	9.000	1325	1431	3.9
		16.00	6	40	0.200	0.400	12.000	795	954	4.6
	High speed steel, hardened 64 - 70 HRC	2.00	4	40	0.024	0.040	1.500	6365	611	0.0
		3.00	4	40	0.036	0.060	2.250	4245	611	0.1
		4.00	4	40	0.048	0.080	3.000	3185	612	0.1
		5.00	4	40	0.060	0.100	3.750	2545	611	0.2
		6.00	6	35	0.063	0.120	4.500	1855	701	0.4
		8.00	6	30	0.072	0.160	6.000	1195	516	0.5
		10.00	6	30	0.090	0.200	7.500	955	516	0.8
		12.00	6	30	0.108	0.240	9.000	795	515	1.1
		16.00	6	25	0.120	0.320	12.000	495	356	1.4

High feed end mills XFeed-H

Cylindrical neck, 3xd

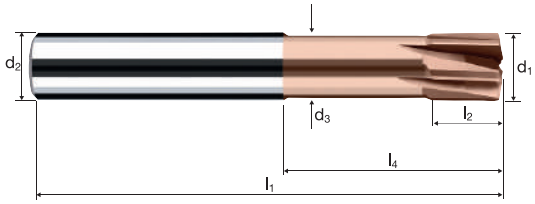
X-Generation

II

HM
XA

λ 0°
γ 0°

HFC

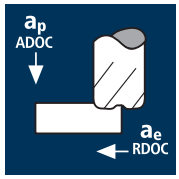


ReTool®

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

Example: **Order-N°.** Coating **H** Article-N°. **7610** ø-Code **100**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	ap_{max}	$R_{theo.}$	z	DURO-Si H7610
100	1.00	6.00	0.95	57	1.00	3.00	13.08	0.04	0.09	4	●
140	2.00	6.00	1.90	57	2.00	6.00	14.31	0.08	0.18	4	●
180	3.00	6.00	2.80	57	3.00	9.00	15.63	0.12	0.27	4	●
220	4.00	6.00	3.70	57	4.00	12.00	16.95	0.16	0.36	4	●
260	5.00	6.00	4.60	57	5.00	15.00	18.27	0.20	0.45	4	●
300	6.00	6.00	5.50	57	6.00	19.34	20.00	0.25	0.54	6	●
391	8.00	8.00	7.40	63	8.00	25.29	26.00	0.33	0.72	6	●
450	10.00	10.00	9.20	72	10.00	30.20	31.00	0.41	0.90	6	●
501	12.00	12.00	11.00	83	12.00	36.13	37.00	0.50	1.08	6	●
610	16.00	16.00	15.00	92	16.00	42.13	43.00	0.69	1.44	6	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	2.00	3	130	0.100	0.120	1.500	20690	6207	1.1
		3.00	3	130	0.150	0.180	2.250	13795	6208	2.5
		4.00	4	170	0.200	0.220	3.000	13530	10824	7.1
		5.00	4	170	0.250	0.275	3.750	10825	10825	11.2
		6.00	4	180	0.300	0.330	4.500	9550	11460	17.0
		8.00	4	180	0.400	0.440	6.000	7160	11456	30.2
		10.00	4	180	0.500	0.550	7.500	5730	11460	47.3
		12.00	4	180	0.540	0.660	9.000	4775	10314	61.3
		16.00	4	180	0.560	0.880	12.000	3580	8019	84.7
	Steel 850 - 1100 N/mm²	2.00	3	130	0.100	0.120	1.500	20690	6207	1.1
		3.00	3	130	0.150	0.180	2.250	13795	6208	2.5
		4.00	4	150	0.200	0.220	3.000	11935	9548	6.3
		5.00	4	150	0.250	0.275	3.750	9550	9550	9.8
		6.00	4	160	0.300	0.330	4.500	8490	10188	15.1
		8.00	4	160	0.400	0.440	6.000	6365	10184	26.9
		10.00	4	160	0.500	0.550	7.500	5095	10190	42.0
		12.00	4	160	0.540	0.660	9.000	4245	9169	54.5
		16.00	4	160	0.560	0.880	12.000	3185	7134	75.3
	Steel 1100 - 1300 N/mm²	2.00	3	120	0.100	0.120	1.500	19100	5730	1.0
		3.00	3	120	0.150	0.180	2.250	12730	5729	2.3
		4.00	4	140	0.200	0.220	3.000	11140	8912	5.9
		5.00	4	140	0.250	0.275	3.750	8915	8915	9.2
		6.00	4	150	0.300	0.330	4.500	7960	9552	14.2
		8.00	4	150	0.400	0.440	6.000	5970	9552	25.2
		10.00	4	150	0.500	0.550	7.500	4775	9550	39.4
		12.00	4	150	0.540	0.660	9.000	3980	8597	51.1
		16.00	4	150	0.560	0.880	12.000	2985	6686	70.6
	Hardened tool steel 42 - 48 HRC	2.00	3	120	0.085	0.120	1.500	19100	4871	0.9
		3.00	3	120	0.128	0.180	2.250	12730	4888	2.0
		4.00	4	140	0.150	0.220	3.000	11140	6684	4.4
		5.00	4	140	0.188	0.275	3.750	8915	6704	6.9
		6.00	4	150	0.225	0.330	4.500	7960	7164	10.6
		8.00	4	150	0.300	0.440	6.000	5970	7164	18.9
		10.00	4	150	0.325	0.550	7.500	4775	6208	25.6
		12.00	4	150	0.330	0.660	9.000	3980	5254	31.2
		16.00	4	150	0.400	0.880	12.000	2985	4776	50.4
	Hardened tool steel 48 - 52 HRC	2.00	3	120	0.085	0.140	1.500	19100	4871	1.0
		3.00	3	120	0.128	0.210	2.250	12730	4888	2.3
		4.00	4	120	0.150	0.240	3.000	9550	5730	4.1
		5.00	4	120	0.188	0.300	3.750	7640	5745	6.5
		6.00	4	110	0.225	0.360	4.500	5835	5252	8.5
		8.00	4	110	0.300	0.480	6.000	4375	5250	15.1
		10.00	4	100	0.325	0.600	7.500	3185	4141	18.6
		12.00	4	100	0.330	0.720	9.000	2655	3505	22.7
		16.00	4	100	0.400	0.800	12.000	1990	3184	30.6
	Hardened tool steel 52 - 56 HRC	2.00	3	120	0.075	0.140	1.500	19100	4298	0.9
		3.00	3	120	0.113	0.210	2.250	12730	4315	2.0
		4.00	4	120	0.130	0.240	3.000	9550	4966	3.6
		5.00	4	120	0.163	0.300	3.750	7640	4981	5.6
		6.00	4	110	0.195	0.360	4.500	5835	4551	7.4
		8.00	4	110	0.260	0.480	6.000	4375	4550	13.1
		10.00	4	100	0.275	0.600	7.500	3185	3504	15.8
		12.00	4	100	0.300	0.720	9.000	2655	3186	20.6
		16.00	4	100	0.320	0.800	12.000	1990	2547	24.5
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	120	0.075	0.140	1.500	19100	4298	0.9
		3.00	3	120	0.113	0.210	2.250	12730	4315	2.0
		4.00	4	120	0.130	0.240	3.000	9550	4966	3.6
		5.00	4	120	0.163	0.300	3.750	7640	4981	5.6
		6.00	4	120	0.195	0.360	4.500	6365	4965	8.0
		8.00	4	100	0.210	0.480	6.000	3980	3343	9.6
		10.00	4	90	0.220	0.600	7.500	2865	2521	11.3
		12.00	4	90	0.240	0.720	9.000	2385	2290	14.8
		16.00	4	90	0.230	0.800	12.000	1790	1647	15.8

High feed end mills XFeed

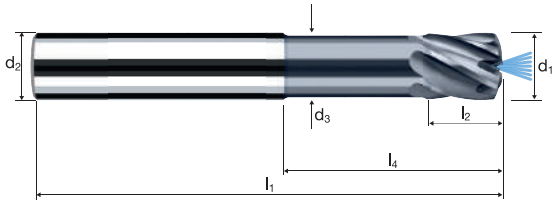
Cylindrical neck, 3xd, central air/cooling channel

X-Generation

II

HM MG10	λ 30° γ 0°

HFC



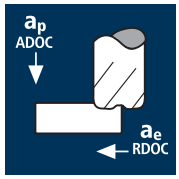
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7630** ø-Code **100**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	ap_{max}	$R_{theo.}$	z	X-AL	**X7630**
100*	1.00	6.00	0.95	57	1.00	3.00	13.08	0.09	0.13	3		●
140*	2.00	6.00	1.90	57	2.00	6.00	14.31	0.17	0.25	3		●
180*	3.00	6.00	2.80	57	3.00	9.00	15.63	0.26	0.38	3		●
220*	4.00	6.00	3.70	57	4.00	12.00	16.95	0.34	0.51	4		●
260*	5.00	6.00	4.60	57	5.00	15.00	18.27	0.43	0.64	4		●
300	6.00	6.00	5.50	57	6.00	19.34	20.00	0.52	0.76	4		●
391	8.00	8.00	7.30	63	8.00	25.29	26.00	0.69	1.02	4		●
450	10.00	10.00	9.20	72	10.00	30.20	31.00	0.86	1.27	4		●
453	10.00	10.00	9.20	72	10.00	30.20	31.00	0.86	1.27	6		●
501	12.00	12.00	11.00	83	12.00	36.13	37.00	1.03	1.52	4		●
503	12.00	12.00	11.00	83	12.00	36.13	37.00	1.03	1.52	6		●
610	16.00	16.00	15.00	92	16.00	42.13	43.00	1.37	2.03	4		●
612	16.00	16.00	15.00	92	16.00	42.13	43.00	1.37	2.03	6		●

* without internal cooling

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel 850 - 1100 N/mm²	6.00	4	250	0.315	0.240	3.600	13265	16714	14.4
		8.00	4	250	0.420	0.320	4.800	9945	16708	25.7
		10.00	4	250	0.525	0.400	6.000	7960	16716	40.1
		12.00	4	250	0.630	0.480	7.200	6630	16708	57.7
		16.00	4	250	0.695	0.560	9.600	4975	13831	74.4
	Steel 1100 - 1300 N/mm²	6.00	4	220	0.270	0.240	3.600	11670	12604	10.9
		8.00	4	220	0.355	0.320	4.800	8755	12432	19.1
		10.00	4	220	0.445	0.400	6.000	7005	12469	29.9
		12.00	4	220	0.535	0.480	7.200	5835	12487	43.2
		16.00	4	220	0.590	0.560	9.600	4375	10325	55.5
	Steel 1300 - 1500 N/mm²	6.00	4	200	0.245	0.220	3.600	10610	10398	8.2
		8.00	4	200	0.330	0.290	4.800	7960	10507	14.6
		10.00	4	200	0.410	0.360	6.000	6365	10439	22.5
		12.00	4	200	0.490	0.430	7.200	5305	10398	32.2
		16.00	4	200	0.540	0.500	9.600	3980	8597	41.3
	Hardened tool steel 48 - 52 HRC	6.00	4	160	0.180	0.210	3.600	8490	6113	4.6
		8.00	4	160	0.240	0.280	4.800	6365	6110	8.2
		10.00	4	160	0.300	0.350	6.000	5095	6114	12.8
		12.00	4	160	0.360	0.420	7.200	4245	6113	18.5
		16.00	4	160	0.480	0.560	9.600	3185	6115	32.9
	Hardened tool steel 52 - 56 HRC	6.00	4	140	0.150	0.210	3.600	7425	4455	3.4
		8.00	4	140	0.200	0.280	4.800	5570	4456	6.0
		10.00	4	140	0.250	0.350	6.000	4455	4455	9.4
		12.00	4	140	0.300	0.420	7.200	3715	4458	13.5
		16.00	4	140	0.400	0.560	9.600	2785	4456	24.0
	Hardened tool steel 56 - 60 HRC	6.00	4	100	0.090	0.180	3.600	5305	1910	1.2
		8.00	4	100	0.120	0.240	4.800	3980	1910	2.2
		10.00	4	100	0.150	0.300	6.000	3185	1911	3.4
		12.00	4	100	0.180	0.360	7.200	2655	1912	5.0
		16.00	4	100	0.240	0.480	9.600	1990	1910	8.8

High feed end mills XFeed

Cylindrical neck, 3xd

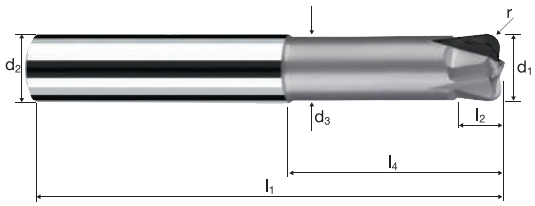
X-Generation

II

HM
XT

λ 0°
γ -10°

HFC

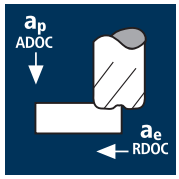


ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60			HSS GG(G)

Example: **Order-N°.** Coating **X** Article-N°. **7620** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	z	X-AL X7620
300	6.00	6.00	5.50	57	3.00	19.34	20.00	1.000	4	●
304	6.00	6.00	5.50	57	3.00	19.34	20.00	1.500	4	●
391	8.00	8.00	7.40	63	4.00	25.29	26.00	1.500	4	●
395	8.00	8.00	7.40	63	4.00	25.29	26.00	2.000	4	●
450	10.00	10.00	9.20	72	5.00	30.20	31.00	2.000	4	●
457	10.00	10.00	9.20	72	5.00	30.20	31.00	2.500	4	●
501	12.00	12.00	11.00	83	6.00	36.13	37.00	2.500	4	●
507	12.00	12.00	11.00	83	6.00	36.13	37.00	3.000	4	●
610	16.00	16.00	15.00	92	8.00	42.13	43.00	3.000	4	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Hardened tool steel 48 - 52 HRC H	2.00	4	130	0.070	0.060	1.500	20690	5793	0.5
		3.00	4	130	0.105	0.089	2.250	13795	5794	1.2
		4.00	4	130	0.140	0.140	3.000	10345	5793	2.4
		5.00	4	130	0.175	0.175	3.750	8275	5793	3.8
		6.00	6	95	0.147	0.210	4.500	5040	4445	4.2
		8.00	6	95	0.196	0.280	6.000	3780	4445	7.5
		10.00	6	95	0.245	0.350	7.500	3025	4447	11.7
		12.00	6	95	0.294	0.420	9.000	2520	4445	16.8
		16.00	6	95	0.392	0.560	12.000	1890	4445	29.9
	Hardened tool steel 52 - 56 HRC H	2.00	4	110	0.070	0.060	1.500	17505	4901	0.4
		3.00	4	110	0.105	0.089	2.250	11670	4901	1.0
		4.00	4	110	0.140	0.140	3.000	8755	4903	2.1
		5.00	4	110	0.175	0.175	3.750	7005	4904	3.2
		6.00	6	80	0.147	0.210	4.500	4245	3744	3.5
		8.00	6	80	0.196	0.280	6.000	3185	3746	6.3
		10.00	6	80	0.245	0.350	7.500	2545	3741	9.8
		12.00	6	80	0.294	0.420	9.000	2120	3740	14.1
		16.00	6	80	0.392	0.560	12.000	1590	3740	25.1
	Hardened tool steel 56 - 60 HRC H	2.00	4	65	0.054	0.051	1.500	10345	2235	0.2
		3.00	4	65	0.081	0.077	2.250	6895	2234	0.4
		4.00	4	65	0.108	0.120	3.000	5175	2236	0.8
		5.00	4	65	0.135	0.150	3.750	4140	2236	1.3
		6.00	6	65	0.144	0.180	4.500	3450	2981	2.4
		8.00	6	65	0.168	0.240	6.000	2585	2606	3.8
		10.00	6	65	0.180	0.300	7.500	2070	2236	5.0
		12.00	6	65	0.216	0.360	9.000	1725	2236	7.2
		16.00	6	50	0.240	0.480	12.000	995	1433	8.3
	Hardened tool steel > 60 HRC H	2.00	4	50	0.045	0.040	1.500	7960	1433	0.1
		3.00	4	50	0.068	0.075	2.250	5305	1432	0.2
		4.00	4	50	0.090	0.100	3.000	3980	1433	0.4
		5.00	4	50	0.113	0.125	3.750	3185	1433	0.7
		6.00	6	50	0.120	0.150	4.500	2655	1912	1.3
		8.00	6	50	0.140	0.200	6.000	1990	1672	2.0
		10.00	6	50	0.150	0.250	7.500	1590	1431	2.7
		12.00	6	50	0.180	0.300	9.000	1325	1431	3.9
		16.00	6	40	0.200	0.400	12.000	795	954	4.6
	High speed steel, hardened 64 - 70 HRC H	2.00	4	30	0.024	0.032	1.500	4775	458	0.0
		3.00	4	30	0.036	0.060	2.250	3185	459	0.1
		4.00	4	30	0.048	0.080	3.000	2385	458	0.1
		5.00	4	30	0.060	0.100	3.750	1910	458	0.2
		6.00	6	30	0.063	0.120	4.500	1590	601	0.3
		8.00	6	30	0.072	0.160	6.000	1195	516	0.5
		10.00	6	30	0.090	0.200	7.500	955	516	0.8
		12.00	6	30	0.108	0.240	9.000	795	515	1.1
		16.00	6	25	0.120	0.320	12.000	495	356	1.4

High feed end mills XFeed-H

Cylindrical neck, 4.5xd

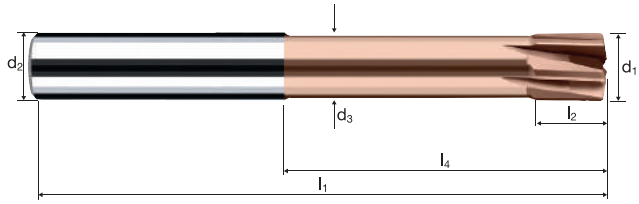
X-Generation X

II

HM
XA

λ 0°
γ 0°

HFC



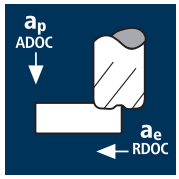
ReTool®

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

Example: **Order-N°.** Coating **H** Article-N°. **7612** ø-Code **100**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	ap_{max}	$R_{theo.}$	z	DURO-Si H7612
100	1.00	6.00	0.95	61	1.00	4.50	14.58	0.04	0.09	4	●
140	2.00	6.00	1.90	61	2.00	9.00	17.31	0.08	0.18	4	●
180	3.00	6.00	2.80	61	3.00	13.50	20.13	0.12	0.27	4	●
220	4.00	6.00	3.70	66	4.00	18.00	22.95	0.16	0.36	4	●
260	5.00	6.00	4.60	66	5.00	22.50	25.77	0.20	0.45	4	●
300	6.00	6.00	5.50	69	6.00	30.34	31.00	0.25	0.54	6	●
391	8.00	8.00	7.40	80	8.00	39.29	40.00	0.33	0.72	6	●
450	10.00	10.00	9.20	90	10.00	47.20	48.00	0.41	0.90	6	●
501	12.00	12.00	11.00	105	12.00	54.13	55.00	0.50	1.08	6	●
610	16.00	16.00	15.00	125	16.00	74.13	75.00	0.69	1.44	6	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
Steel **< 850 N/mm²** X	2.00	3	130	0.100	0.120	1.500	20690	6207	1.1
	3.00	3	130	0.150	0.180	2.250	13795	6208	2.5
	4.00	4	155	0.200	0.220	3.000	12335	9868	6.5
	5.00	4	155	0.250	0.275	3.750	9870	9870	10.2
	6.00	4	160	0.300	0.330	4.500	8490	10188	15.1
	8.00	4	160	0.400	0.440	6.000	6365	10184	26.9
	10.00	4	160	0.500	0.550	7.500	5095	10190	42.0
	12.00	4	160	0.540	0.660	9.000	4245	9169	54.5
	16.00	4	160	0.560	0.880	12.000	3185	7134	75.3
Steel **850 - 1100 N/mm²** X	2.00	3	130	0.100	0.120	1.500	20690	6207	1.1
	3.00	3	130	0.150	0.180	2.250	13795	6208	2.5
	4.00	4	135	0.200	0.220	3.000	10745	8596	5.7
	5.00	4	135	0.250	0.275	3.750	8595	8595	8.9
	6.00	4	145	0.300	0.330	4.500	7690	9228	13.7
	8.00	4	145	0.400	0.440	6.000	5770	9232	24.4
	10.00	4	145	0.500	0.550	7.500	4615	9230	38.1
	12.00	4	145	0.540	0.660	9.000	3845	8305	49.3
	16.00	4	145	0.560	0.880	12.000	2885	6462	68.2
Steel **1100 - 1300 N/mm²** X	2.00	3	120	0.100	0.120	1.500	19100	5730	1.0
	3.00	3	120	0.150	0.180	2.250	12730	5729	2.3
	4.00	4	125	0.200	0.220	3.000	9945	7956	5.3
	5.00	4	125	0.250	0.275	3.750	7960	7960	8.2
	6.00	4	135	0.300	0.330	4.500	7160	8592	12.8
	8.00	4	135	0.400	0.440	6.000	5370	8592	22.7
	10.00	4	135	0.500	0.550	7.500	4295	8590	35.4
	12.00	4	135	0.540	0.660	9.000	3580	7733	45.9
	16.00	4	135	0.560	0.880	12.000	2685	6014	63.5
Hardened tool steel **42 - 48 HRC** X	2.00	3	120	0.085	0.120	1.500	19100	4871	0.9
	3.00	3	120	0.128	0.180	2.250	12730	4888	2.0
	4.00	4	125	0.150	0.220	3.000	9945	5967	3.9
	5.00	4	125	0.188	0.275	3.750	7960	5986	6.2
	6.00	4	135	0.225	0.330	4.500	7160	6444	9.6
	8.00	4	135	0.300	0.440	6.000	5370	6444	17.0
	10.00	4	135	0.325	0.550	7.500	4295	5584	23.0
	12.00	4	135	0.330	0.660	9.000	3580	4726	28.1
	16.00	4	135	0.400	0.880	12.000	2685	4296	45.4
Hardened tool steel **48 - 52 HRC** X	2.00	3	120	0.085	0.140	1.500	19100	4871	1.0
	3.00	3	120	0.128	0.210	2.250	12730	4888	2.3
	4.00	4	110	0.150	0.240	3.000	8755	5253	3.8
	5.00	4	110	0.188	0.300	3.750	7005	5268	5.9
	6.00	4	100	0.225	0.360	4.500	5305	4775	7.7
	8.00	4	100	0.300	0.480	6.000	3980	4776	13.8
	10.00	4	90	0.325	0.500	7.500	2865	3725	14.0
	12.00	4	90	0.330	0.600	9.000	2385	3148	17.0
	16.00	4	90	0.400	0.480	12.000	1790	2864	16.5
Hardened tool steel **52 - 56 HRC** X	2.00	3	120	0.075	0.140	1.500	19100	4298	0.9
	3.00	3	120	0.113	0.210	2.250	12730	4315	2.0
	4.00	4	110	0.130	0.240	3.000	8755	4553	3.3
	5.00	4	110	0.163	0.300	3.750	7005	4567	5.1
	6.00	4	100	0.195	0.360	4.500	5305	4138	6.7
	8.00	4	100	0.260	0.480	6.000	3980	4139	11.9
	10.00	4	90	0.275	0.500	7.500	2865	3152	11.8
	12.00	4	90	0.300	0.600	9.000	2385	2862	15.5
	16.00	4	90	0.320	0.480	12.000	1790	2291	13.2
Inox normal **[Cr-Ni/1.4301]** **[Cr-Ni-Mo/1.4571]** X	2.00	3	120	0.075	0.140	1.500	19100	4298	0.9
	3.00	3	120	0.113	0.210	2.250	12730	4315	2.0
	4.00	4	108	0.130	0.240	3.000	8595	4469	3.2
	5.00	4	108	0.163	0.300	3.750	6875	4483	5.0
	6.00	4	108	0.195	0.360	4.500	5730	4469	7.2
	8.00	4	90	0.210	0.480	6.000	3580	3007	8.7
	10.00	4	81	0.220	0.500	7.500	2580	2270	8.5
	12.00	4	81	0.240	0.600	9.000	2150	2064	11.1
	16.00	4	81	0.230	0.800	12.000	1610	1481	14.2

High feed end mills XFeed

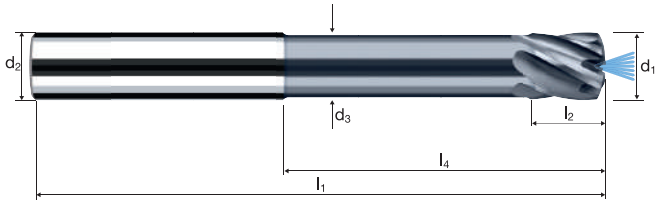
Cylindrical neck, 4.5xd, central air/cooling channel

X-Generation X

II

HM MG10	λ 30° γ 0°

HFC



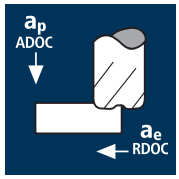
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7632** ø-Code **100**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	ap_{max}	$R_{theo.}$	z	X-AL	X7632
100*	1.00	6.00	0.95	61	1.00	4.50	14.58	0.09	0.13	3		●
140*	2.00	6.00	1.90	61	2.00	9.00	17.31	0.17	0.25	3		●
180*	3.00	6.00	2.80	61	3.00	13.50	20.13	0.26	0.38	3		●
220*	4.00	6.00	3.70	66	4.00	18.00	22.95	0.34	0.51	4		●
260*	5.00	6.00	4.60	66	5.00	22.50	25.77	0.43	0.64	4		●
300	6.00	6.00	5.50	69	6.00	30.34	31.00	0.52	0.76	4		●
391	8.00	8.00	7.30	80	8.00	39.29	40.00	0.69	1.02	4		●
450	10.00	10.00	9.20	90	10.00	47.20	48.00	0.86	1.27	4		●
453	10.00	10.00	9.20	90	10.00	47.20	48.00	0.86	1.27	6		●
501	12.00	12.00	11.00	105	12.00	54.13	55.00	1.03	1.52	4		●
503	12.00	12.00	11.00	105	12.00	54.13	55.00	1.03	1.52	6		●
610	16.00	16.00	15.00	125	16.00	74.13	75.00	1.37	2.03	4		●
612	16.00	16.00	15.00	125	16.00	74.13	75.00	1.37	2.03	6		●

* without internal cooling

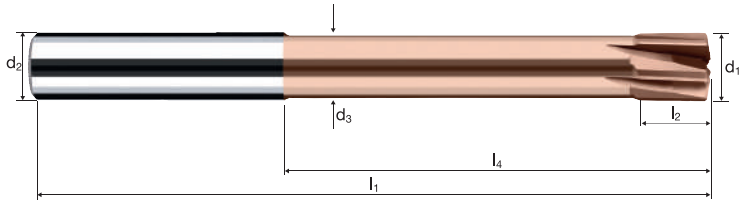
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Hardened tool steel 48 - 52 HRC H	3.00	4	112	0.105	0.069	2.250	11885	4992	0.8
		4.00	4	112	0.140	0.108	3.000	8915	4992	1.6
		5.00	4	112	0.175	0.135	3.750	7130	4991	2.5
		6.00	6	75	0.147	0.162	4.500	3980	3510	2.6
		8.00	6	75	0.196	0.216	6.000	2985	3510	4.5
		10.00	6	75	0.245	0.270	7.500	2385	3506	7.1
		12.00	6	75	0.294	0.324	9.000	1990	3510	10.2
		16.00	6	75	0.392	0.432	12.000	1490	3505	18.2
	Hardened tool steel 52 - 56 HRC H	3.00	4	90	0.105	0.069	2.250	9550	4011	0.6
		4.00	4	90	0.140	0.108	3.000	7160	4010	1.3
		5.00	4	90	0.175	0.135	3.750	5730	4011	2.0
		6.00	6	60	0.147	0.162	4.500	3185	2809	2.0
		8.00	6	60	0.196	0.216	6.000	2385	2805	3.6
		10.00	6	60	0.245	0.270	7.500	1910	2808	5.7
		12.00	6	60	0.294	0.324	9.000	1590	2805	8.2
		16.00	6	60	0.392	0.432	12.000	1195	2811	14.6
	Hardened tool steel 56 - 60 HRC H	3.00	4	65	0.081	0.059	2.250	6895	2234	0.3
		4.00	4	65	0.108	0.092	3.000	5175	2236	0.6
		5.00	4	65	0.135	0.115	3.750	4140	2236	1.0
		6.00	6	65	0.144	0.138	4.500	3450	2981	1.9
		8.00	6	65	0.168	0.184	6.000	2585	2606	2.9
		10.00	6	65	0.180	0.230	7.500	2070	2236	3.9
		12.00	6	65	0.216	0.276	9.000	1725	2236	5.6
		16.00	6	50	0.240	0.368	12.000	995	1433	6.3
	Hardened tool steel > 60 HRC H	3.00	4	50	0.068	0.057	2.250	5305	1432	0.2
		4.00	4	50	0.090	0.076	3.000	3980	1433	0.3
		5.00	4	50	0.113	0.095	3.750	3185	1433	0.5
		6.00	6	50	0.120	0.114	4.500	2655	1912	1.0
		8.00	6	50	0.140	0.152	6.000	1990	1672	1.5
		10.00	6	50	0.150	0.190	7.500	1590	1431	2.0
		12.00	6	50	0.180	0.228	9.000	1325	1431	2.9
		16.00	6	30	0.200	0.304	12.000	595	714	2.6
	High speed steel, hardened 64 - 70 HRC H	3.00	4	30	0.036	0.027	2.250	3185	459	0.0
		4.00	4	30	0.048	0.036	3.000	2385	458	0.0
		5.00	4	30	0.060	0.045	3.750	1910	458	0.1
		6.00	6	30	0.063	0.054	4.500	1590	601	0.1
		8.00	6	30	0.072	0.072	6.000	1195	516	0.2
		10.00	6	30	0.090	0.070	7.500	955	516	0.3
		12.00	6	30	0.108	0.084	9.000	795	515	0.4
		16.00	6	25	0.120	0.112	12.000	495	356	0.5

High feed end mills XFeed-H

Cylindrical neck, 6xd

HM XA	λ 0° γ 0°

HFC

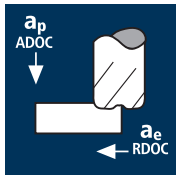


ReTool®

				HRC 48-56	HRC 56-60	HRC >60			HSS

Example: **Order-N°.** Coating **H** Article-N°. **7614** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	ap_{max}	$R_{theo.}$	z	DURO-Si H7614
180	3.00	6.00	2.80	66	3.00	18.00	24.63	0.12	0.27	4	●
220	4.00	6.00	3.70	69	4.00	24.00	28.95	0.16	0.36	4	●
260	5.00	6.00	4.60	75	5.00	30.00	33.27	0.20	0.45	4	●
300	6.00	6.00	5.50	80	6.00	42.34	43.00	0.25	0.54	6	●
391	8.00	8.00	7.40	90	8.00	52.29	53.00	0.33	0.72	6	●
450	10.00	10.00	9.20	105	10.00	63.20	64.00	0.41	0.90	6	●
501	12.00	12.00	11.00	120	12.00	73.13	74.00	0.50	1.08	6	●
610	16.00	16.00	15.00	135	16.00	85.13	86.00	0.69	1.44	6	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Steel < 850 N/mm²	3.00	3	105	0.150	0.090	2.250	11140	5013	1.0
		4.00	4	125	0.200	0.100	3.000	9945	7956	2.4
		5.00	4	125	0.250	0.125	3.750	7960	7960	3.7
		6.00	4	130	0.300	0.150	4.500	6895	8274	5.6
		8.00	4	130	0.400	0.200	6.000	5175	8280	9.9
		10.00	6	125	0.275	0.250	7.500	3980	6567	12.3
		12.00	6	125	0.270	0.300	9.000	3315	5370	14.5
		16.00	6	125	0.280	0.400	12.000	2485	4175	20.0
	Steel 850 - 1100 N/mm²	3.00	3	105	0.150	0.090	2.250	11140	5013	1.0
		4.00	4	110	0.200	0.100	3.000	8755	7004	2.1
		5.00	4	110	0.250	0.125	3.750	7005	7005	3.3
		6.00	4	115	0.300	0.150	4.500	6100	7320	4.9
		8.00	4	115	0.400	0.200	6.000	4575	7320	8.8
		10.00	6	110	0.275	0.250	7.500	3500	5775	10.8
		12.00	6	110	0.270	0.300	9.000	2920	4730	12.8
		16.00	6	110	0.280	0.400	12.000	2190	3679	17.7
	Steel 1100 - 1300 N/mm²	3.00	3	95	0.150	0.090	2.250	10080	4536	0.9
		4.00	4	100	0.200	0.100	3.000	7960	6368	1.9
		5.00	4	100	0.250	0.125	3.750	6365	6365	3.0
		6.00	4	110	0.300	0.150	4.500	5835	7002	4.7
		8.00	4	110	0.400	0.200	6.000	4375	7000	8.4
		10.00	6	100	0.275	0.250	7.500	3185	5255	9.9
		12.00	6	100	0.270	0.300	9.000	2655	4301	11.6
		16.00	6	100	0.280	0.400	12.000	1990	3343	16.0
	Hardened tool steel 42 - 48 HRC	3.00	3	95	0.128	0.090	2.250	10080	3871	0.8
		4.00	4	100	0.150	0.100	3.000	7960	4776	1.4
		5.00	4	100	0.188	0.125	3.750	6365	4786	2.2
		6.00	4	110	0.225	0.150	4.500	5835	5252	3.5
		8.00	4	110	0.300	0.200	6.000	4375	5250	6.3
		10.00	6	100	0.275	0.250	7.500	3185	5255	9.9
		12.00	6	100	0.270	0.300	9.000	2655	4301	11.6
		16.00	6	100	0.280	0.400	12.000	1990	3343	16.0
	Hardened tool steel 48 - 52 HRC	3.00	3	100	0.128	0.120	2.250	10610	4074	1.1
		4.00	4	90	0.150	0.140	3.000	7160	4296	1.8
		5.00	4	90	0.188	0.175	3.750	5730	4309	2.8
		6.00	4	90	0.225	0.210	4.500	4775	4298	4.1
		8.00	4	90	0.300	0.280	6.000	3580	4296	7.2
		10.00	6	80	0.275	0.300	7.500	2545	4199	9.4
		12.00	6	80	0.270	0.360	9.000	2120	3434	11.1
		16.00	6	80	0.280	0.400	12.000	1590	2671	12.8
	Hardened tool steel 52 - 56 HRC	3.00	3	100	0.113	0.120	2.250	10610	3597	1.0
		4.00	4	90	0.130	0.140	3.000	7160	3723	1.6
		5.00	4	90	0.163	0.175	3.750	5730	3736	2.5
		6.00	4	90	0.195	0.210	4.500	4775	3725	3.5
		8.00	4	90	0.260	0.280	6.000	3580	3723	6.3
		10.00	6	80	0.220	0.300	7.500	2545	3359	7.6
		12.00	6	80	0.240	0.360	9.000	2120	3053	9.9
		16.00	6	80	0.256	0.400	12.000	1590	2442	11.7
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	3	96	0.113	0.120	2.250	10185	3453	0.9
		4.00	4	86	0.130	0.140	3.000	6845	3559	1.5
		5.00	4	90	0.163	0.175	3.750	5730	3736	2.5
		6.00	4	97	0.195	0.210	4.500	5145	4013	3.8
		8.00	4	81	0.210	0.280	6.000	3225	2709	4.6
		10.00	6	73	0.220	0.300	7.500	2325	3069	6.9
		12.00	6	70	0.240	0.360	9.000	1855	2671	8.7
		16.00	6	70	0.256	0.400	12.000	1395	2143	10.3

High feed end mills XFeed

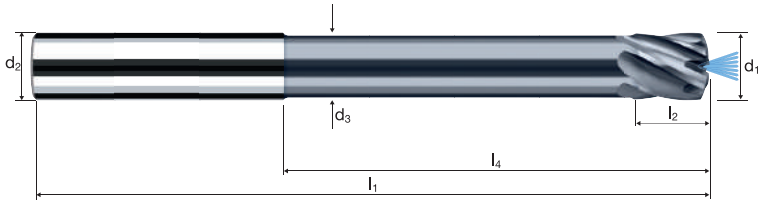
Cylindrical neck, 6xd, central air/cooling channel

X-Generation

II

HM MG10	λ 30° γ 0°

HFC



ReTool®

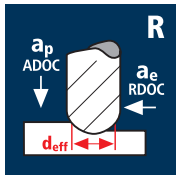
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **X** Article-N°. **7634** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	ap_{max}	$R_{theo.}$	z	X-AL	X7634
180*	3.00	6.00	2.80	66	3.00	18.00	24.63	0.13	0.29	3		●
220*	4.00	6.00	3.70	70	4.00	24.00	28.95	0.17	0.39	4		●
260*	5.00	6.00	4.60	75	5.00	30.00	33.27	0.21	0.49	4		●
300	6.00	6.00	5.50	80	6.00	42.34	43.00	0.26	0.59	4		●
391	8.00	8.00	7.40	90	8.00	52.29	53.00	0.34	0.79	4		●
453	10.00	10.00	9.20	105	10.00	63.20	64.00	0.43	0.98	6		●
503	12.00	12.00	11.00	120	12.00	73.13	74.00	0.51	1.18	6		●
612	16.00	16.00	15.00	135	16.00	85.13	86.00	0.68	1.57	6		●

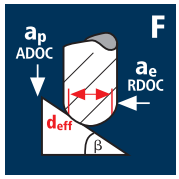
* without internal cooling

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 52 - 56 HRC	0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
	0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
	0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
	0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
	1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
	1.50	2	110	0.029	0.270	0.375	1.15	30447	1755	177.7
	2.00	2	110	0.038	0.360	0.500	1.54	22736	1747	314.5
Hardened tool steel 56 - 60 HRC	0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
	0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
	0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
	0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
	1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
	1.50	2	70	0.019	0.180	0.300	0.97	22971	896	48.4
	2.00	2	70	0.026	0.240	0.400	1.30	17140	891	85.6
Hardened tool steel > 60 HRC	0.40	2	27	0.003	0.028	0.120	0.20	42972	281	1.0
	0.50	2	40	0.005	0.050	0.125	0.30	42441	407	2.6
	0.60	2	48	0.006	0.060	0.150	0.36	42441	489	4.4
	0.80	2	50	0.008	0.080	0.200	0.48	33157	509	8.2
	1.00	2	50	0.010	0.100	0.250	0.60	26526	509	12.8
	1.50	2	50	0.016	0.180	0.300	0.97	16408	512	27.7
	2.00	2	50	0.021	0.240	0.400	1.30	12243	509	48.9
High speed steel, hardened 64 - 70 HRC	0.40	2	27	0.002	0.028	0.120	0.20	42972	211	0.7
	0.50	2	35	0.004	0.050	0.125	0.30	37136	267	1.7
	0.60	2	35	0.004	0.060	0.150	0.36	30947	267	2.4
	0.80	2	35	0.006	0.080	0.200	0.48	23210	267	4.3
	1.00	2	35	0.007	0.100	0.250	0.60	18568	267	6.7
	1.50	2	35	0.012	0.180	0.300	0.97	11485	269	14.5
	2.00	2	35	0.016	0.240	0.400	1.30	8570	267	25.7

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC	0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
	0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
	0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
	0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
	1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	1.50	2	160	0.068	0.030	0.105	1.32	38583	5247	45°
	2.00	2	160	0.078	0.040	0.120	1.75	29103	4540	45°
Hardened tool steel 56 - 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
	0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
	0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
	0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
	1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°
	1.50	2	80	0.053	0.020	0.105	1.28	19894	2109	45°
	2.00	2	80	0.060	0.020	0.120	1.67	15248	1830	45°
Hardened tool steel > 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
	0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
	0.60	2	48	0.035	0.010	0.070	0.52	29382	2057	45°
	0.80	2	48	0.040	0.010	0.080	0.68	22469	1798	45°
	1.00	2	60	0.045	0.020	0.090	0.88	21703	1953	45°
	1.50	2	60	0.053	0.020	0.105	1.28	14921	1582	45°
	2.00	2	60	0.060	0.020	0.120	1.67	11436	1372	45°
High speed steel, hardened 64 - 70 HRC	0.40	2	32	0.029	0.010	0.057	0.36	28294	1641	45°
	0.50	2	32	0.033	0.010	0.065	0.44	23150	1528	45°
	0.60	2	32	0.035	0.010	0.070	0.52	19588	1371	45°
	0.80	2	32	0.040	0.010	0.080	0.68	14979	1198	45°
	1.00	2	40	0.045	0.020	0.090	0.88	14469	1302	45°
	1.50	2	40	0.053	0.020	0.105	1.28	9947	1054	45°
	2.00	2	40	0.060	0.020	0.120	1.67	7624	915	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 1xd

X-Generation

II

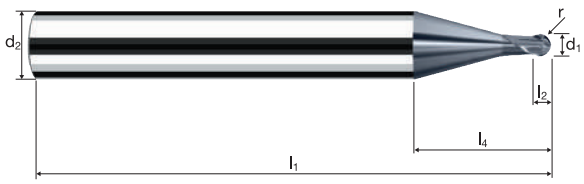
HM
XA

λ 30°
γ -10°

h4

d1

r



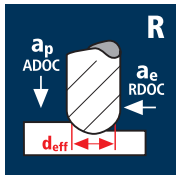
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6460** ø-Code **040**

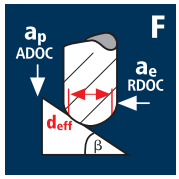
Ø Code	d_1	d_2 h4	l_1	l_2	l_4	r ±0.005	z	DURO-Al
								Y6460
040	0.40	6.00	57	0.40	16.43	0.200	2	●
050	0.50	6.00	57	0.50	10.97	0.250	2	●
060	0.60	6.00	57	0.60	10.91	0.300	2	●
080	0.80	6.00	57	0.80	10.77	0.400	2	●
100	1.00	6.00	57	1.00	10.66	0.500	2	●
120	1.50	6.00	57	1.50	10.33	0.750	2	●
140	2.00	6.00	57	2.00	10.00	1.000	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 52 - 56 HRC	0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
	0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
	0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
	0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
	1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
	1.50	2	110	0.029	0.270	0.375	1.15	30447	1755	177.7
	2.00	2	110	0.038	0.360	0.500	1.54	22736	1747	314.5
Hardened tool steel 56 - 60 HRC	0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
	0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
	0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
	0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
	1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
	1.50	2	70	0.019	0.180	0.300	0.97	22971	896	48.4
	2.00	2	70	0.026	0.240	0.400	1.30	17140	891	85.6
Hardened tool steel > 60 HRC	0.40	2	27	0.003	0.028	0.120	0.20	42972	281	1.0
	0.50	2	40	0.005	0.050	0.125	0.30	42441	407	2.6
	0.60	2	48	0.006	0.060	0.150	0.36	42441	489	4.4
	0.80	2	50	0.008	0.080	0.200	0.48	33157	509	8.2
	1.00	2	50	0.010	0.100	0.250	0.60	26526	509	12.8
	1.50	2	50	0.016	0.180	0.300	0.97	16408	512	27.7
	2.00	2	50	0.021	0.240	0.400	1.30	12243	509	48.9
High speed steel, hardened 64 - 70 HRC	0.40	2	27	0.002	0.028	0.120	0.20	42972	211	0.7
	0.50	2	35	0.004	0.050	0.125	0.30	37136	267	1.7
	0.60	2	35	0.004	0.060	0.150	0.36	30947	267	2.4
	0.80	2	35	0.006	0.080	0.200	0.48	23210	267	4.3
	1.00	2	35	0.007	0.100	0.250	0.60	18568	267	6.7
	1.50	2	35	0.012	0.180	0.300	0.97	11485	269	14.5
	2.00	2	35	0.016	0.240	0.400	1.30	8570	267	25.7

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC	0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
	0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
	0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
	0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
	1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	1.50	2	160	0.068	0.030	0.105	1.32	38583	5247	45°
	2.00	2	160	0.078	0.040	0.120	1.75	29103	4540	45°
Hardened tool steel 56 - 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
	0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
	0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
	0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
	1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°
	1.50	2	80	0.053	0.020	0.105	1.28	19894	2109	45°
	2.00	2	80	0.060	0.020	0.120	1.67	15248	1830	45°
Hardened tool steel > 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
	0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
	0.60	2	48	0.035	0.010	0.070	0.52	29382	2057	45°
	0.80	2	48	0.040	0.010	0.080	0.68	22469	1798	45°
	1.00	2	60	0.045	0.020	0.090	0.88	21703	1953	45°
	1.50	2	60	0.053	0.020	0.105	1.28	14921	1582	45°
	2.00	2	60	0.060	0.020	0.120	1.67	11436	1372	45°
High speed steel, hardened 64 - 70 HRC	0.40	2	32	0.029	0.010	0.057	0.36	28294	1641	45°
	0.50	2	32	0.033	0.010	0.065	0.44	23150	1528	45°
	0.60	2	32	0.035	0.010	0.070	0.52	19588	1371	45°
	0.80	2	32	0.040	0.010	0.080	0.68	14979	1198	45°
	1.00	2	40	0.045	0.020	0.090	0.88	14469	1302	45°
	1.50	2	40	0.053	0.020	0.105	1.28	9947	1054	45°
	2.00	2	40	0.060	0.020	0.120	1.67	7624	915	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 2xd

X-Generation

II

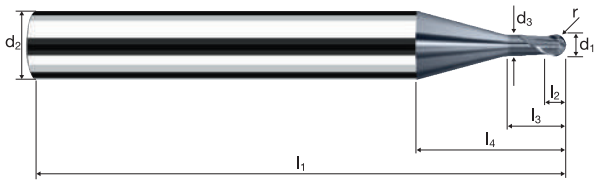
HM
XA

λ 30°
γ -10°

h4

d1

r



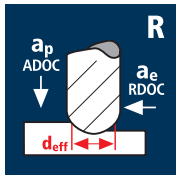
ReTool®

Rm 1100-1300 HRC 34-42 | Rm 1300-1500 HRC 42-48 | HRC 48-56 | HRC 56-60 | HRC > 60 | Inox Stainless | Ti Titanium | HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6461** ø-Code **040**

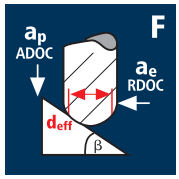
Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DURO-Al
											Y6461
040	0.40	6.00	0.35	57	0.24	0.80	1.00	16.91	0.200	2	●
050	0.50	6.00	0.45	57	0.30	1.00	1.20	11.49	0.250	2	●
060	0.60	6.00	0.55	57	0.36	1.20	1.40	11.50	0.300	2	●
080	0.80	6.00	0.75	57	0.48	1.60	1.80	11.53	0.400	2	●
100	1.00	6.00	0.95	57	0.60	2.00	2.20	11.56	0.500	2	●
120	1.50	6.00	1.40	57	0.90	3.00	3.30	11.72	0.750	2	●
140	2.00	6.00	1.90	57	1.20	4.00	4.30	11.78	1.000	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 52 - 56 HRC	0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
	0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
	0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
	0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
	1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
Hardened tool steel 56 - 60 HRC	0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
	0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
	0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
	0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
	1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
Hardened tool steel > 60 HRC	0.40	2	27	0.003	0.028	0.120	0.20	42972	281	1.0
	0.50	2	40	0.005	0.050	0.125	0.30	42441	407	2.6
	0.60	2	48	0.006	0.060	0.150	0.36	42441	489	4.4
	0.80	2	50	0.008	0.080	0.200	0.48	33157	509	8.2
	1.00	2	50	0.010	0.100	0.250	0.60	26526	509	12.8
High speed steel, hardened 64 - 70 HRC	0.40	2	27	0.002	0.028	0.120	0.20	42972	211	0.7
	0.50	2	35	0.004	0.050	0.125	0.30	37136	267	1.7
	0.60	2	35	0.004	0.060	0.150	0.36	30947	267	2.4
	0.80	2	35	0.006	0.080	0.200	0.48	23210	267	4.3
	1.00	2	35	0.007	0.100	0.250	0.60	18568	267	6.7

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC	0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
	0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
	0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
	0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
	1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
Hardened tool steel 56 - 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
	0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
	0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
	0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
	1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°
Hardened tool steel > 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
	0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
	0.60	2	48	0.035	0.010	0.070	0.52	29382	2057	45°
	0.80	2	48	0.040	0.010	0.080	0.68	22469	1798	45°
	1.00	2	60	0.045	0.020	0.090	0.88	21703	1953	45°
High speed steel, hardened 64 - 70 HRC	0.40	2	32	0.029	0.010	0.057	0.36	28294	1641	45°
	0.50	2	32	0.033	0.010	0.065	0.44	23150	1528	45°
	0.60	2	32	0.035	0.010	0.070	0.52	19588	1371	45°
	0.80	2	32	0.040	0.010	0.080	0.68	14979	1198	45°
	1.00	2	40	0.045	0.020	0.090	0.88	14469	1302	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 2.5xd

X-Generation X

II

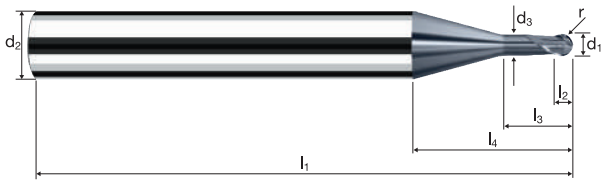
HM XA

λ 30°
γ -10°

h4

d1

r



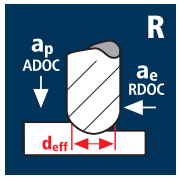
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6481** ø-Code **040**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DURO-Al
											Y6481
040	0.40	6.00	0.35	57	0.24	1.00	1.20	17.11	0.200	2	●
050	0.50	6.00	0.45	57	0.30	1.25	1.45	11.74	0.250	2	●
060	0.60	6.00	0.55	57	0.36	1.50	1.70	11.80	0.300	2	●
080	0.80	6.00	0.75	57	0.48	2.00	2.20	11.93	0.400	2	●
100	1.00	6.00	0.95	57	0.60	2.50	2.70	12.06	0.500	2	●

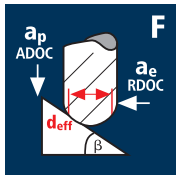
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 52 - 56 HRC									
0.40	2	32	0.006	0.040	0.140	0.24	42441	509	2.9
0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
1.50	2	110	0.029	0.270	0.375	1.15	30447	1755	177.7
2.00	2	110	0.038	0.360	0.500	1.54	22736	1747	314.5
2.50	2	110	0.048	0.450	0.625	1.92	18237	1752	492.7
3.00	2	110	0.058	0.540	0.750	2.31	15158	1747	707.6
Hardened tool steel 56 - 60 HRC									
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
1.50	2	70	0.019	0.180	0.300	0.97	22971	896	48.4
2.00	2	70	0.026	0.240	0.400	1.30	17140	891	85.6
2.50	2	70	0.032	0.300	0.500	1.62	13754	894	134.1
3.00	2	70	0.039	0.360	0.600	1.95	11427	891	192.5
Hardened tool steel > 60 HRC									
0.40	2	27	0.003	0.028	0.120	0.20	42972	281	1.0
0.50	2	40	0.005	0.050	0.125	0.30	42441	407	2.6
0.60	2	48	0.006	0.060	0.150	0.36	42441	489	4.4
0.80	2	50	0.008	0.080	0.200	0.48	33157	509	8.2
1.00	2	50	0.010	0.100	0.250	0.60	26526	509	12.8
1.50	2	50	0.016	0.180	0.300	0.97	16408	512	27.7
2.00	2	50	0.021	0.240	0.400	1.30	12243	509	48.9
2.50	2	50	0.026	0.300	0.500	1.62	9824	511	76.6
3.00	2	50	0.031	0.360	0.600	1.95	8162	509	110.0
High speed steel, hardened 64 - 70 HRC									
0.40	2	27	0.002	0.028	0.120	0.20	42972	211	0.7
0.50	2	35	0.004	0.050	0.125	0.30	37136	267	1.7
0.60	2	35	0.004	0.060	0.150	0.36	30947	267	2.4
0.80	2	35	0.006	0.080	0.200	0.48	23210	267	4.3
1.00	2	35	0.007	0.100	0.250	0.60	18568	267	6.7
1.50	2	35	0.012	0.180	0.300	0.97	11485	269	14.5
2.00	2	35	0.016	0.240	0.400	1.30	8570	267	25.7
2.50	2	35	0.019	0.300	0.500	1.62	6877	268	40.3
3.00	2	35	0.023	0.360	0.600	1.95	5713	267	57.8

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	160	0.068	0.030	0.105	1.32	38583	5247	45°
2.00	2	160	0.078	0.040	0.120	1.75	29103	4540	45°
2.50	2	160	0.088	0.040	0.135	2.15	23688	4169	45°
3.00	2	160	0.098	0.050	0.150	2.59	19664	3854	45°
Hardened tool steel 56 - 60 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	64	0.052	0.020	0.080	0.71	28693	2984	45°
1.00	2	80	0.058	0.030	0.090	0.91	27983	3246	45°
1.50	2	80	0.068	0.030	0.105	1.32	19292	2624	45°
2.00	2	80	0.078	0.040	0.120	1.75	14551	2270	45°
2.50	2	80	0.088	0.040	0.135	2.15	11844	2085	45°
3.00	2	80	0.098	0.050	0.150	2.59	9832	1927	45°
Hardened tool steel > 60 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	48	0.042	0.020	0.065	0.46	33215	2790	45°
0.60	2	48	0.046	0.020	0.070	0.55	27780	2556	45°
0.80	2	48	0.052	0.020	0.080	0.71	21520	2238	45°
1.00	2	60	0.058	0.030	0.090	0.91	20987	2435	45°
1.50	2	60	0.068	0.030	0.105	1.32	14469	1968	45°
2.00	2	60	0.078	0.040	0.120	1.75	10913	1702	45°
2.50	2	60	0.088	0.040	0.135	2.15	8883	1563	45°
3.00	2	60	0.098	0.050	0.150	2.59	7374	1445	45°
High speed steel, hardened 64 - 70 HRC									
0.40	2	32	0.037	0.010	0.057	0.36	28294	2094	45°
0.50	2	32	0.042	0.020	0.065	0.46	22143	1860	45°
0.60	2	32	0.046	0.020	0.070	0.55	18520	1704	45°
0.80	2	32	0.052	0.020	0.080	0.71	14346	1492	45°
1.00	2	40	0.058	0.030	0.090	0.91	13992	1623	45°
1.50	2	40	0.068	0.030	0.105	1.32	9646	1312	45°
2.00	2	40	0.078	0.040	0.120	1.75	7276	1135	45°
2.50	2	40	0.088	0.040	0.135	2.15	5922	1042	45°
3.00	2	40	0.098	0.050	0.150	2.59	4916	964	45°

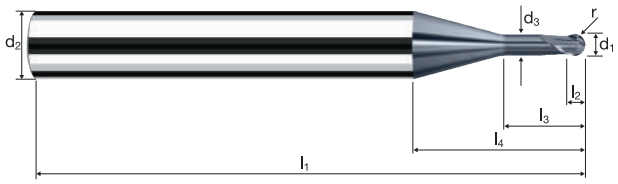
Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 3xd

X-Generation

II

HM XA	λ 30° γ -10°



h4

d1

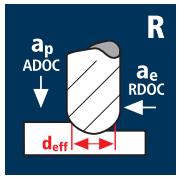
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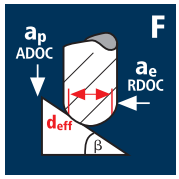
ReTool®

		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6462** ø-Code **040**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DURO-Al
											Y6462
040	0.40	6.00	0.35	57	0.24	1.20	1.40	17.31	0.200	2	●
050	0.50	6.00	0.45	57	0.30	1.50	1.70	11.99	0.250	2	●
060	0.60	6.00	0.55	57	0.36	1.80	2.00	12.10	0.300	2	●
080	0.80	6.00	0.75	57	0.48	2.40	2.60	12.33	0.400	2	●
100	1.00	6.00	0.95	57	0.60	3.00	3.20	12.56	0.500	2	●
108	1.20	6.00	1.10	57	0.72	3.60	3.90	12.88	0.600	2	●
120	1.50	6.00	1.40	57	0.90	4.50	4.80	13.22	0.750	2	●
140	2.00	6.00	1.90	57	1.20	6.00	6.30	13.78	1.000	2	●
160	2.50	6.00	2.40	57	1.50	7.50	7.93	14.54	1.250	2	●
180	3.00	6.00	2.90	57	1.80	9.00	9.43	15.10	1.500	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 52 - 56 HRC	0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
		0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
		0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
		0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
		1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
	Hardened tool steel 56 - 60 HRC	0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
		0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
		0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
		0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
		1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
	Hardened tool steel > 60 HRC	0.40	2	27	0.003	0.028	0.120	0.20	42972	281	1.0
		0.50	2	40	0.005	0.050	0.125	0.30	42441	407	2.6
		0.60	2	48	0.006	0.060	0.150	0.36	42441	489	4.4
		0.80	2	50	0.008	0.080	0.200	0.48	33157	509	8.2
		1.00	2	50	0.010	0.100	0.250	0.60	26526	509	12.8
	High speed steel, hardened 64 - 70 HRC	0.40	2	27	0.002	0.028	0.120	0.20	42972	211	0.7
		0.50	2	35	0.004	0.050	0.125	0.30	37136	267	1.7
		0.60	2	35	0.004	0.060	0.150	0.36	30947	267	2.4
		0.80	2	35	0.006	0.080	0.200	0.48	23210	267	4.3
		1.00	2	35	0.007	0.100	0.250	0.60	18568	267	6.7

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 52 - 56 HRC	0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
		0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
		0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
		0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
		1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	Hardened tool steel 56 - 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
		0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
		0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
		0.80	2	62	0.040	0.010	0.080	0.68	29022	2322	45°
		1.00	2	78	0.045	0.020	0.090	0.88	28214	2539	45°
	Hardened tool steel > 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
		0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
		0.60	2	47	0.035	0.010	0.070	0.52	28770	2014	45°
		0.80	2	47	0.040	0.010	0.080	0.68	22001	1760	45°
		1.00	2	59	0.045	0.020	0.090	0.88	21341	1921	45°
	High speed steel, hardened 64 - 70 HRC	0.40	2	31	0.029	0.010	0.057	0.36	27410	1590	45°
		0.50	2	31	0.033	0.010	0.065	0.44	22426	1480	45°
		0.60	2	31	0.035	0.010	0.070	0.52	18976	1328	45°
		0.80	2	31	0.040	0.010	0.080	0.68	14511	1161	45°
		1.00	2	39	0.045	0.020	0.090	0.88	14107	1270	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 3.5xd

X-Generation

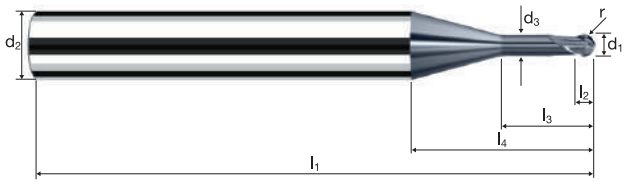
II

HM XA	λ 30° γ -10°

h4

d1

r

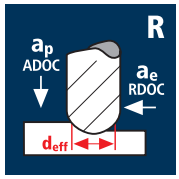


		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6482** ø-Code **040**

Ø Code	d1	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z	DURO-Al Y6482
040	0.40	6.00	0.35	57	0.24	1.40	1.60	17.51	0.200	2	●
050	0.50	6.00	0.45	57	0.30	1.75	1.95	12.24	0.250	2	●
060	0.60	6.00	0.55	57	0.36	2.10	2.30	12.40	0.300	2	●
080	0.80	6.00	0.75	57	0.48	2.80	3.00	12.73	0.400	2	●
100	1.00	6.00	0.95	57	0.60	3.50	3.70	13.06	0.500	2	●

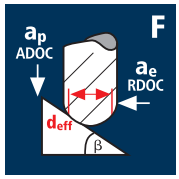
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [cm³/min]
Hardened tool steel 52 - 56 HRC									
0.40	2	38	0.009	0.060	0.120	0.29	41710	786	5.7
0.50	2	47	0.012	0.075	0.150	0.36	41557	979	11.0
0.60	2	57	0.014	0.090	0.180	0.43	42195	1193	19.3
0.80	2	75	0.019	0.120	0.240	0.57	41883	1579	45.5
1.00	2	80	0.024	0.150	0.300	0.71	35866	1690	76.0
1.50	2	80	0.038	0.270	0.375	1.15	22143	1684	170.5
2.00	2	80	0.051	0.360	0.500	1.54	16536	1677	302.0
Hardened tool steel 56 - 60 HRC									
0.40	2	26	0.004	0.028	0.120	0.20	41380	338	1.1
0.50	2	35	0.006	0.050	0.125	0.30	37136	446	2.8
0.60	2	35	0.007	0.060	0.150	0.36	30947	446	4.0
0.80	2	35	0.010	0.080	0.200	0.48	23210	446	7.1
1.00	2	35	0.012	0.100	0.250	0.60	18568	446	11.2
1.50	2	35	0.019	0.180	0.300	0.97	11485	448	24.2
2.00	2	35	0.026	0.240	0.400	1.30	8570	446	43.0
Hardened tool steel > 60 HRC									
0.40	2	25	0.003	0.028	0.120	0.20	39789	260	0.9
0.50	2	25	0.005	0.050	0.125	0.30	26526	255	1.6
0.60	2	25	0.006	0.060	0.150	0.36	22105	255	2.3
0.80	2	25	0.008	0.080	0.200	0.48	16579	255	4.1
1.00	2	25	0.010	0.100	0.250	0.60	13263	255	6.4
1.50	2	25	0.016	0.180	0.300	0.97	8204	256	13.8
2.00	2	25	0.021	0.240	0.400	1.30	6121	255	24.5
High speed steel, hardened 64 - 70 HRC									
0.40	2	20	0.002	0.028	0.120	0.20	31831	156	0.5
0.50	2	20	0.004	0.050	0.125	0.30	21221	153	1.0
0.60	2	20	0.004	0.060	0.150	0.36	17684	153	1.4
0.80	2	20	0.006	0.080	0.200	0.48	13263	153	2.4
1.00	2	20	0.007	0.100	0.250	0.60	10610	153	3.8
1.50	2	20	0.012	0.180	0.300	0.97	6563	154	8.3
2.00	2	20	0.016	0.240	0.400	1.30	4897	153	14.5

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	152	0.068	0.030	0.105	1.32	36654	4985	45°
2.00	2	152	0.078	0.040	0.120	1.75	27647	4313	45°
Hardened tool steel 56 - 60 HRC									
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
0.80	2	61	0.040	0.010	0.080	0.68	28554	2284	45°
1.00	2	76	0.045	0.020	0.090	0.88	27490	2474	45°
1.50	2	76	0.053	0.020	0.105	1.28	18900	2003	45°
2.00	2	76	0.060	0.020	0.120	1.67	14486	1738	45°
Hardened tool steel > 60 HRC									
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	46	0.035	0.010	0.070	0.52	28158	1971	45°
0.80	2	46	0.040	0.010	0.080	0.68	21533	1723	45°
1.00	2	57	0.045	0.020	0.090	0.88	20618	1856	45°
1.50	2	57	0.053	0.020	0.105	1.28	14175	1503	45°
2.00	2	57	0.060	0.020	0.120	1.67	10864	1304	45°
High speed steel, hardened 64 - 70 HRC									
0.40	2	30	0.029	0.010	0.057	0.36	26526	1539	45°
0.50	2	30	0.033	0.010	0.065	0.44	21703	1432	45°
0.60	2	30	0.035	0.010	0.070	0.52	18364	1286	45°
0.80	2	30	0.040	0.010	0.080	0.68	14043	1123	45°
1.00	2	38	0.045	0.020	0.090	0.88	13745	1237	45°
1.50	2	38	0.053	0.020	0.105	1.28	9450	1002	45°
2.00	2	38	0.060	0.020	0.120	1.67	7243	869	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 4xd

X-Generation

II

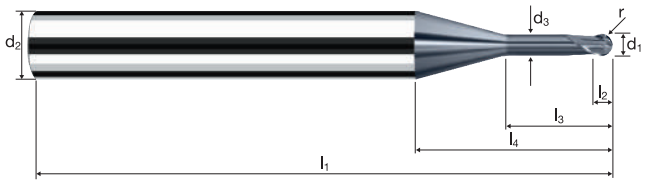
HM
XA

λ 30°
γ -10°

h4

d1

r

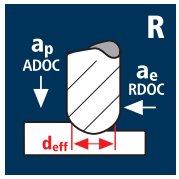


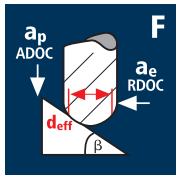
ReTool®

Rm 1100-1300 HRC 34-42 | Rm 1300-1500 HRC 42-48 | HRC 48-56 | HRC 56-60 | HRC > 60 | Inox Stainless | Ti Titanium | HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6463** ø-Code **040**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DURO-Al
											Y6463
040	0.40	6.00	0.35	57	0.24	1.60	1.80	17.71	0.200	2	●
050	0.50	6.00	0.45	57	0.30	2.00	2.20	12.49	0.250	2	●
060	0.60	6.00	0.55	57	0.36	2.40	2.60	12.70	0.300	2	●
080	0.80	6.00	0.75	57	0.48	3.20	3.40	13.13	0.400	2	●
100	1.00	6.00	0.95	57	0.60	4.00	4.20	13.56	0.500	2	●
120	1.50	6.00	1.40	57	0.90	6.00	6.30	14.72	0.750	2	●
140	2.00	6.00	1.90	57	1.20	8.00	8.30	15.78	1.000	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
	Hardened tool steel 52 - 56 HRC	0.40	2	38	0.009	0.060	0.120	0.29	41710	786	5.7
		0.50	2	47	0.012	0.075	0.150	0.36	41557	979	11.0
		0.60	2	57	0.014	0.090	0.180	0.43	42195	1193	19.4
		0.80	2	75	0.019	0.120	0.240	0.57	41883	1579	45.5
		1.00	2	84	0.024	0.150	0.300	0.71	37659	1775	79.9
	Hardened tool steel 56 - 60 HRC	0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
		0.50	2	37	0.006	0.050	0.125	0.30	39258	471	3.0
		0.60	2	37	0.007	0.060	0.150	0.36	32715	471	4.3
		0.80	2	37	0.010	0.080	0.200	0.48	24536	471	7.6
		1.00	2	37	0.012	0.100	0.250	0.60	19629	471	11.8
	Hardened tool steel > 60 HRC	0.40	2	26	0.003	0.028	0.120	0.20	41380	270	0.9
		0.50	2	26	0.005	0.050	0.125	0.30	27587	265	1.7
		0.60	2	26	0.006	0.060	0.150	0.36	22989	265	2.4
		0.80	2	26	0.008	0.080	0.200	0.48	17242	265	4.3
		1.00	2	26	0.010	0.100	0.250	0.60	13793	265	6.6
	High speed steel, hardened 64 - 70 HRC	0.40	2	21	0.002	0.028	0.120	0.20	33423	164	0.6
		0.50	2	21	0.004	0.050	0.125	0.30	22282	160	1.0
		0.60	2	21	0.004	0.060	0.150	0.36	18568	160	1.5
		0.80	2	21	0.006	0.080	0.200	0.48	13926	160	2.6
		1.00	2	21	0.007	0.100	0.250	0.60	11141	160	4.0

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 52 - 56 HRC	0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
		0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
		0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
		0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
		1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	Hardened tool steel 56 - 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
		0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
		0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
		0.80	2	59	0.040	0.010	0.080	0.68	27618	2209	45°
		1.00	2	74	0.045	0.020	0.090	0.88	26767	2409	45°
	Hardened tool steel > 60 HRC	0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
		0.50	2	44	0.033	0.010	0.065	0.44	31831	2101	45°
		0.60	2	44	0.035	0.010	0.070	0.52	26934	1885	45°
		0.80	2	44	0.040	0.010	0.080	0.68	20597	1648	45°
		1.00	2	56	0.045	0.020	0.090	0.88	20256	1823	45°
	High speed steel, hardened 64 - 70 HRC	0.40	2	30	0.029	0.010	0.057	0.36	26526	1539	45°
		0.50	2	30	0.033	0.010	0.065	0.44	21703	1432	45°
		0.60	2	30	0.035	0.010	0.070	0.52	18364	1286	45°
		0.80	2	30	0.040	0.010	0.080	0.68	14043	1123	45°
		1.00	2	37	0.045	0.020	0.090	0.88	13383	1205	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 4.5xd

X-Generation X

II

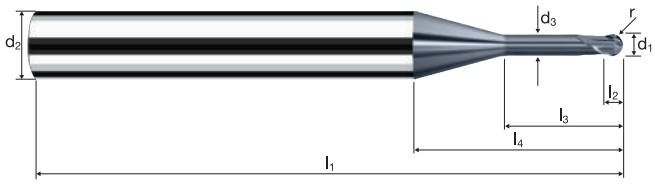
HM
XA

λ 30°
γ -10°

h4

d1

r

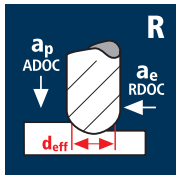


		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6483** ø-Code **040**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DURO-Al
											Y6483
040	0.40	6.00	0.35	57	0.24	1.80	2.00	17.91	0.200	2	●
050	0.50	6.00	0.45	57	0.30	2.25	2.45	12.74	0.250	2	●
060	0.60	6.00	0.55	57	0.36	2.70	2.90	13.00	0.300	2	●
080	0.80	6.00	0.75	57	0.48	3.60	3.80	13.53	0.400	2	●
100	1.00	6.00	0.95	57	0.60	4.50	4.70	14.06	0.500	2	●

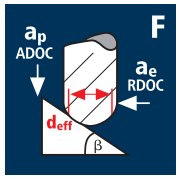
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 52 - 56 HRC									
0.40	2	29	0.007	0.032	0.160	0.22	41959	601	3.1
0.50	2	43	0.011	0.060	0.175	0.32	42773	917	9.7
0.60	2	51	0.013	0.072	0.210	0.39	41625	1071	16.2
0.80	2	69	0.017	0.096	0.280	0.52	42237	1449	39.0
1.00	2	80	0.021	0.120	0.350	0.65	39177	1681	70.6
1.50	2	80	0.035	0.225	0.450	1.07	23799	1683	170.4
2.00	2	80	0.047	0.300	0.600	1.43	17808	1679	302.2
2.50	2	80	0.059	0.375	0.750	1.79	14226	1676	471.5
3.00	2	80	0.071	0.450	0.900	2.14	11899	1683	681.4
Hardened tool steel 56 - 60 HRC									
0.40	2	23	0.003	0.020	0.120	0.17	43065	300	0.7
0.50	2	35	0.005	0.040	0.125	0.27	41262	448	2.3
0.60	2	35	0.007	0.048	0.150	0.33	33760	440	3.2
0.80	2	35	0.009	0.064	0.200	0.43	25909	450	5.8
1.00	2	35	0.011	0.080	0.250	0.54	20631	448	9.0
1.50	2	35	0.019	0.180	0.300	0.97	11485	448	24.2
2.00	2	35	0.026	0.240	0.400	1.30	8570	446	42.8
2.50	2	35	0.032	0.300	0.500	1.62	6877	447	67.1
3.00	2	35	0.039	0.360	0.600	1.95	5713	446	96.3
Hardened tool steel > 60 HRC									
0.40	2	23	0.003	0.020	0.120	0.17	43065	240	0.6
0.50	2	25	0.004	0.040	0.125	0.27	29473	256	1.3
0.60	2	25	0.005	0.048	0.150	0.33	24114	251	1.8
0.80	2	25	0.007	0.064	0.200	0.43	18506	257	3.3
1.00	2	25	0.009	0.080	0.250	0.54	14737	256	5.1
1.50	2	25	0.016	0.180	0.300	0.97	8204	256	13.8
2.00	2	25	0.021	0.240	0.400	1.30	6121	255	24.5
2.50	2	25	0.026	0.300	0.500	1.62	4912	255	38.3
3.00	2	25	0.031	0.360	0.600	1.95	4081	255	55.0
High speed steel, hardened 64 - 70 HRC									
0.40	2	20	0.002	0.020	0.120	0.17	37448	157	0.4
0.50	2	20	0.003	0.040	0.125	0.27	23579	154	0.8
0.60	2	20	0.004	0.048	0.150	0.33	19292	151	1.1
0.80	2	20	0.005	0.064	0.200	0.43	14805	154	2.0
1.00	2	20	0.007	0.080	0.250	0.54	11789	154	3.1
1.50	2	20	0.012	0.180	0.300	0.97	6563	154	8.3
2.00	2	20	0.016	0.240	0.400	1.30	4897	153	14.7
2.50	2	20	0.019	0.300	0.500	1.62	3930	153	23.0
3.00	2	20	0.023	0.360	0.600	1.95	3265	153	33.0

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 52 - 56 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	144	0.068	0.030	0.105	1.32	34725	4723	45°
2.00	2	144	0.078	0.040	0.120	1.75	26192	4086	45°
2.50	2	144	0.088	0.040	0.135	2.15	21319	3752	45°
3.00	2	144	0.098	0.050	0.150	2.59	17698	3469	45°
Hardened tool steel 56 - 60 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	58	0.046	0.020	0.070	0.55	33567	3088	45°
0.80	2	58	0.052	0.020	0.080	0.71	26003	2704	45°
1.00	2	72	0.058	0.030	0.090	0.91	25185	2922	45°
1.50	2	72	0.068	0.030	0.105	1.32	17362	2361	45°
2.00	2	72	0.078	0.040	0.120	1.75	13096	2043	45°
2.50	2	72	0.088	0.040	0.135	2.15	10660	1876	45°
3.00	2	72	0.098	0.050	0.150	2.59	8849	1734	45°
Hardened tool steel > 60 HRC									
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	43	0.042	0.020	0.065	0.46	29755	2499	45°
0.60	2	43	0.046	0.020	0.070	0.55	24886	2290	45°
0.80	2	43	0.052	0.020	0.080	0.71	19278	2005	45°
1.00	2	54	0.058	0.030	0.090	0.91	18889	2191	45°
1.50	2	54	0.068	0.030	0.105	1.32	13022	1771	45°
2.00	2	54	0.078	0.040	0.120	1.75	9822	1532	45°
2.50	2	54	0.088	0.040	0.135	2.15	7995	1407	45°
3.00	2	54	0.098	0.050	0.150	2.59	6637	1301	45°
High speed steel, hardened 64 - 70 HRC									
0.40	2	29	0.037	0.010	0.057	0.36	25642	1898	45°
0.50	2	29	0.042	0.020	0.065	0.46	20067	1686	45°
0.60	2	29	0.046	0.020	0.070	0.55	16784	1544	45°
0.80	2	29	0.052	0.020	0.080	0.71	13001	1352	45°
1.00	2	36	0.058	0.030	0.090	0.91	12592	1461	45°
1.50	2	36	0.068	0.030	0.105	1.32	8681	1181	45°
2.00	2	36	0.078	0.040	0.120	1.75	6548	1022	45°
2.50	2	36	0.088	0.040	0.135	2.15	5330	938	45°
3.00	2	36	0.098	0.050	0.150	2.59	4424	867	45°

Ball nose end mills MicroHX

Shank ø 6mm, cylindrical neck, 5xd

X-Generation X

II

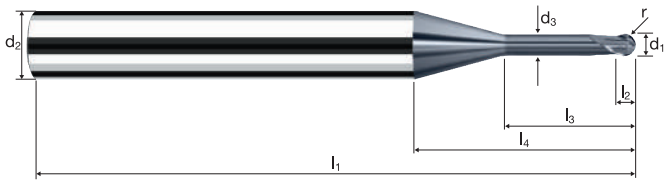
HM XA

λ 30°
γ -10°

h4

d1

r



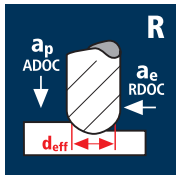
ReTool®

Rm 1100-1300 HRC 34-42 | Rm 1300-1500 HRC 42-48 | HRC 48-56 | HRC 56-60 | HRC > 60 | Inox Stainless | Ti Titanium | HSS

Example: **Order-N°.** Coating **Y** Article-N°. **6464** ø-Code **040**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DURO-Al Y6464
040	0.40	6.00	0.35	57	0.24	2.00	2.20	18.11	0.200	2	●
050	0.50	6.00	0.45	57	0.30	2.50	2.70	12.99	0.250	2	●
060	0.60	6.00	0.55	57	0.36	3.00	3.20	13.30	0.300	2	●
080	0.80	6.00	0.75	57	0.48	4.00	4.20	13.93	0.400	2	●
100	1.00	6.00	0.95	57	0.60	5.00	5.20	14.56	0.500	2	●
108	1.20	6.00	1.10	57	0.72	6.00	6.30	15.28	0.600	2	●
120	1.50	6.00	1.40	61	0.90	7.50	7.80	16.22	0.750	2	●
140	2.00	6.00	1.90	61	1.20	10.00	10.30	17.78	1.000	2	●
160	2.50	6.00	2.40	61	1.50	12.50	12.93	19.54	1.250	2	●
180	3.00	6.00	2.90	66	1.80	15.00	15.43	21.10	1.500	2	●

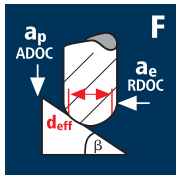
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	346	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	520	1.7
0.40	2	38	0.010	0.060	0.120	0.29	41710	810	5.9
0.50	2	47	0.012	0.075	0.150	0.36	41557	1009	11.4
0.60	2	57	0.015	0.090	0.180	0.43	42195	1229	19.9
0.80	2	75	0.019	0.120	0.240	0.57	41883	1627	46.9
1.00	2	94	0.024	0.150	0.300	0.71	42142	2047	92.1
1.50	2	152	0.039	0.270	0.375	1.15	42072	3297	333.9
2.00	2	160	0.052	0.360	0.500	1.54	33071	3456	622.1
Hardened tool steel 48 - 52 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
0.30	2	24	0.007	0.030	0.105	0.18	42441	565	1.8
0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
0.60	2	57	0.016	0.090	0.180	0.43	42195	1338	21.7
0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2
1.50	2	140	0.043	0.270	0.375	1.15	38751	3305	334.7
2.00	2	140	0.057	0.360	0.500	1.54	28937	3291	592.4
Hardened tool steel 52 - 56 HRC									
0.20	2	16	0.003	0.020	0.070	0.12	42441	255	0.4
0.30	2	24	0.005	0.030	0.105	0.18	42441	382	1.2
0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
1.50	2	110	0.029	0.270	0.375	1.15	30447	1755	177.7
2.00	2	110	0.038	0.360	0.500	1.54	22736	1747	314.5
Hardened tool steel 56 - 60 HRC									
0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
0.30	2	20	0.003	0.021	0.090	0.15	42441	260	0.5
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
1.50	2	70	0.019	0.180	0.300	0.97	22971	896	48.4
2.00	2	70	0.026	0.240	0.400	1.30	17140	891	85.6

Application



Material

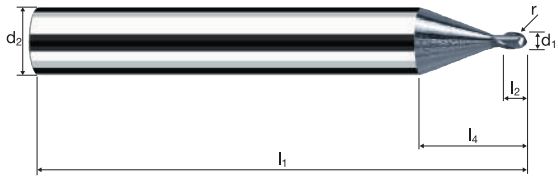
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	195	0.078	0.040	0.120	1.75	35469	5533	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	175	0.078	0.040	0.120	1.75	31831	4966	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	160	0.068	0.030	0.105	1.32	38583	5247	45°
2.00	2	160	0.078	0.040	0.120	1.75	29103	4540	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°
1.50	2	80	0.053	0.020	0.105	1.28	19894	2109	45°
2.00	2	80	0.060	0.020	0.120	1.67	15248	1830	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 1xd

HM
XA

λ 30°
γ -10°



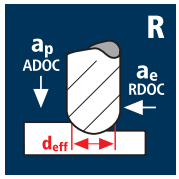
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6560** ø-Code **010**

Ø Code	d_1	d_2 h4	l_1	l_2	l_4	r ±0.005	z	X-AL
								X6560
010	0.10	6.00	57	0.10	16.94	0.050	2	●
020	0.20	6.00	57	0.20	16.75	0.100	2	●
030	0.30	6.00	57	0.30	16.59	0.150	2	●
040	0.40	6.00	57	0.40	16.43	0.200	2	●
050	0.50	6.00	57	0.50	10.97	0.250	2	●
060	0.60	6.00	57	0.60	10.91	0.300	2	●
080	0.80	6.00	57	0.80	10.77	0.400	2	●
100	1.00	6.00	57	1.00	10.66	0.500	2	●
120	1.50	6.00	57	1.50	10.33	0.750	2	●
140	2.00	6.00	57	2.00	10.00	1.000	2	●

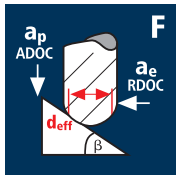
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	346	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	520	1.7
0.40	2	38	0.010	0.060	0.120	0.29	41710	810	5.9
0.50	2	47	0.012	0.075	0.150	0.36	41557	1009	11.4
0.60	2	57	0.015	0.090	0.180	0.43	42195	1229	19.9
0.80	2	75	0.019	0.120	0.240	0.57	41883	1627	46.9
1.00	2	94	0.024	0.150	0.300	0.71	42142	2047	92.1
1.50	2	152	0.039	0.270	0.375	1.15	42072	3297	333.9
2.00	2	160	0.052	0.360	0.500	1.54	33071	3456	622.1
Hardened tool steel 48 - 52 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
0.30	2	24	0.007	0.030	0.105	0.18	42441	565	1.8
0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
0.60	2	57	0.016	0.090	0.180	0.43	42195	1338	21.7
0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2
1.50	2	140	0.043	0.270	0.375	1.15	38751	3305	334.7
2.00	2	140	0.057	0.360	0.500	1.54	28937	3291	592.4
Hardened tool steel 52 - 56 HRC									
0.20	2	16	0.003	0.020	0.070	0.12	42441	255	0.4
0.30	2	24	0.005	0.030	0.105	0.18	42441	382	1.2
0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
1.50	2	110	0.029	0.270	0.375	1.15	30447	1755	177.7
2.00	2	110	0.038	0.360	0.500	1.54	22736	1747	314.5
Hardened tool steel 56 - 60 HRC									
0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
0.30	2	20	0.003	0.021	0.090	0.15	42441	260	0.5
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
1.50	2	70	0.019	0.180	0.300	0.97	22971	896	48.4
2.00	2	70	0.026	0.240	0.400	1.30	17140	891	85.6

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	195	0.078	0.040	0.120	1.75	35469	5533	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	175	0.078	0.040	0.120	1.75	31831	4966	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	160	0.068	0.030	0.105	1.32	38583	5247	45°
2.00	2	160	0.078	0.040	0.120	1.75	29103	4540	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°
1.50	2	80	0.053	0.020	0.105	1.28	19894	2109	45°
2.00	2	80	0.060	0.020	0.120	1.67	15248	1830	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 2xd

X-Generation

II

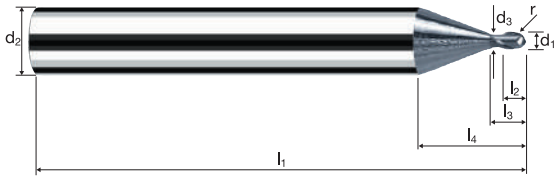
HM
XA

λ 30°
γ -10°

h4

d1

r



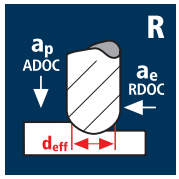
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6561** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6561
010	0.10	6.00	0.09	57	0.10	0.20	0.27	17.05	0.050	2		●
020	0.20	6.00	0.18	57	0.20	0.40	0.50	16.99	0.100	2		●
030	0.30	6.00	0.25	57	0.30	0.60	0.80	16.99	0.150	2		●
040	0.40	6.00	0.35	57	0.40	0.80	1.00	16.91	0.200	2		●
050	0.50	6.00	0.45	57	0.50	1.00	1.20	11.49	0.250	2		●
060	0.60	6.00	0.55	57	0.60	1.20	1.40	11.50	0.300	2		●
080	0.80	6.00	0.75	57	0.80	1.60	1.80	11.53	0.400	2		●
100	1.00	6.00	0.95	57	1.00	2.00	2.20	11.56	0.500	2		●
120	1.50	6.00	1.40	57	1.50	3.00	3.30	11.72	0.750	2		●
140	2.00	6.00	1.90	57	2.00	4.00	4.30	11.78	1.000	2		●

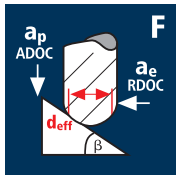
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.10	2	8	0.002	0.010	0.035	0.06	42441	173	0.1
0.20	2	16	0.004	0.020	0.070	0.12	42441	346	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	520	1.7
0.40	2	38	0.010	0.060	0.120	0.29	41710	810	5.9
0.50	2	47	0.012	0.075	0.150	0.36	41557	1009	11.4
0.60	2	57	0.015	0.090	0.180	0.43	42195	1229	19.9
0.80	2	75	0.019	0.120	0.240	0.57	41883	1627	46.9
1.00	2	94	0.024	0.150	0.300	0.71	42142	2047	92.1
Hardened tool steel 48 - 52 HRC									
0.10	2	8	0.002	0.010	0.035	0.06	42441	188	0.1
0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
0.30	2	24	0.007	0.030	0.105	0.18	42441	565	1.8
0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
0.60	2	57	0.016	0.090	0.180	0.43	42195	1338	21.7
0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2
Hardened tool steel 52 - 56 HRC									
0.10	2	8	0.002	0.010	0.035	0.06	42441	127	0.1
0.20	2	16	0.003	0.020	0.070	0.12	42441	255	0.4
0.30	2	24	0.005	0.030	0.105	0.18	42441	382	1.2
0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
Hardened tool steel 56 - 60 HRC									
0.10	2	7	0.001	0.007	0.030	0.05	44563	91	0.0
0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
0.30	2	20	0.003	0.021	0.090	0.15	42441	260	0.5
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
Hardened tool steel 48 - 52 HRC									
0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
Hardened tool steel 52 - 56 HRC									
0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
Hardened tool steel 56 - 60 HRC									
0.10	2	13	0.015	0.010	0.030	0.10	41380	1241	45°
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 2.5xd

X-Generation

II

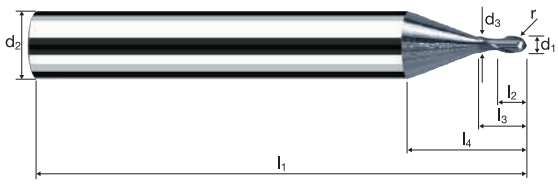
HM
XA

λ 30°
γ -10°

h4

d1

r



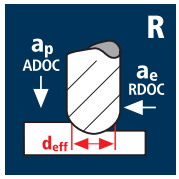
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6581** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6581
010	0.10	6.00	0.09	57	0.10	0.25	0.32	17.10	0.050	2		●
020	0.20	6.00	0.18	57	0.20	0.50	0.60	17.09	0.100	2		●
030	0.30	6.00	0.25	57	0.30	0.75	0.95	17.14	0.150	2		●
040	0.40	6.00	0.35	57	0.40	1.00	1.20	17.11	0.200	2		●
050	0.50	6.00	0.45	57	0.50	1.25	1.45	11.74	0.250	2		●
060	0.60	6.00	0.55	57	0.60	1.50	1.70	11.80	0.300	2		●
080	0.80	6.00	0.75	57	0.80	2.00	2.20	11.93	0.400	2		●
100	1.00	6.00	0.95	57	1.00	2.50	2.70	12.06	0.500	2		●

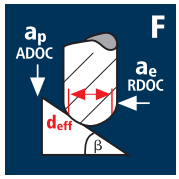
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	346	0.5
0.40	2	38	0.010	0.060	0.120	0.29	41710	810	5.9
0.50	2	47	0.012	0.075	0.150	0.36	41557	1009	11.4
0.80	2	75	0.019	0.120	0.240	0.57	41883	1627	46.9
1.00	2	94	0.024	0.150	0.300	0.71	42142	2047	92.1
1.50	2	152	0.039	0.270	0.375	1.15	42072	3297	333.9
2.00	2	160	0.052	0.360	0.500	1.54	33071	3456	622.1
2.50	2	160	0.065	0.450	0.625	1.92	26526	3465	974.5
3.00	2	160	0.078	0.540	0.750	2.31	22047	3456	1399.6
Hardened tool steel 48 - 52 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2
1.50	2	140	0.043	0.270	0.375	1.15	38751	3305	334.7
2.00	2	140	0.057	0.360	0.500	1.54	28937	3291	592.4
2.50	2	140	0.071	0.450	0.625	1.92	23210	3299	928.0
3.00	2	140	0.085	0.540	0.750	2.31	19292	3291	1332.8
Hardened tool steel 52 - 56 HRC									
0.20	2	16	0.003	0.020	0.070	0.12	42441	255	0.4
0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
1.50	2	110	0.029	0.270	0.375	1.15	30447	1755	177.7
2.00	2	110	0.038	0.360	0.500	1.54	22736	1747	314.5
2.50	2	110	0.048	0.450	0.625	1.92	18237	1752	492.7
3.00	2	110	0.058	0.540	0.750	2.31	15158	1747	707.6
Hardened tool steel 56 - 60 HRC									
0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3
1.50	2	70	0.019	0.180	0.300	0.97	22971	896	48.4
2.00	2	70	0.026	0.240	0.400	1.30	17140	891	85.6
2.50	2	70	0.032	0.300	0.500	1.62	13754	894	134.1
3.00	2	70	0.039	0.360	0.600	1.95	11427	891	192.5

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	195	0.078	0.040	0.120	1.75	35469	5533	45°
2.50	2	195	0.088	0.040	0.135	2.15	28870	5081	45°
3.00	2	195	0.098	0.050	0.150	2.59	23965	4697	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	175	0.078	0.040	0.120	1.75	31831	4966	45°
2.50	2	175	0.088	0.040	0.135	2.15	25909	4560	45°
3.00	2	175	0.098	0.050	0.150	2.59	21507	4215	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	160	0.068	0.030	0.105	1.32	38583	5247	45°
2.00	2	160	0.078	0.040	0.120	1.75	29103	4540	45°
2.50	2	160	0.088	0.040	0.135	2.15	23688	4169	45°
3.00	2	160	0.098	0.050	0.150	2.59	19664	3854	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.80	2	64	0.040	0.010	0.080	0.68	29959	2397	45°
1.00	2	80	0.045	0.020	0.090	0.88	28937	2604	45°
1.50	2	80	0.053	0.020	0.105	1.28	19894	2109	45°
2.00	2	80	0.060	0.020	0.120	1.67	15248	1830	45°
2.50	2	80	0.068	0.030	0.135	2.11	12069	1641	45°
3.00	2	80	0.075	0.030	0.150	2.50	10186	1528	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 3xd

X-Generation

II

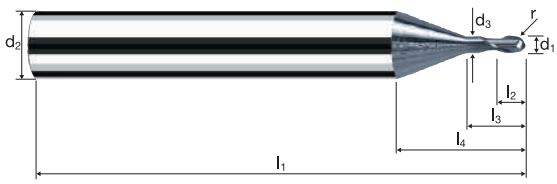
HM
XA

λ 30°
γ -10°

h4

d1

r

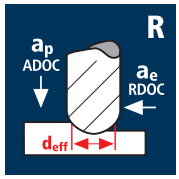


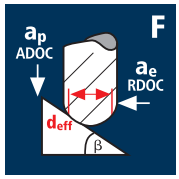
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6562** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6562
010	0.10	6.00	0.09	57	0.10	0.30	0.37	17.15	0.050	2		●
020	0.20	6.00	0.18	57	0.20	0.60	0.70	17.19	0.100	2		●
030	0.30	6.00	0.25	57	0.30	0.90	1.10	17.29	0.150	2		●
040	0.40	6.00	0.35	57	0.40	1.20	1.40	17.31	0.200	2		●
050	0.50	6.00	0.45	57	0.50	1.50	1.70	11.99	0.250	2		●
060	0.60	6.00	0.55	57	0.60	1.80	2.00	12.10	0.300	2		●
080	0.80	6.00	0.75	57	0.80	2.40	2.60	12.33	0.400	2		●
100	1.00	6.00	0.95	57	1.00	3.00	3.20	12.56	0.500	2		●
108	1.20	6.00	1.10	57	1.20	3.60	3.90	12.88	0.600	2		●
120	1.50	6.00	1.40	57	1.50	4.50	4.80	13.22	0.750	2		●
140	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	1.000	2		●
152	2.30	6.00	2.10	57	2.30	6.90	7.33	14.31	1.150	2		●
160	2.50	6.00	2.30	57	2.50	7.50	7.93	14.54	1.250	2		●
172	2.80	6.00	2.60	57	2.80	8.40	8.83	14.88	1.400	2		●
180	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	1.500	2		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
	Hardened tool steel 42 - 48 HRC	0.10	2	8	0.002	0.010	0.035	0.06	42441	173	0.1
		0.20	2	16	0.004	0.020	0.070	0.12	42441	346	0.5
		0.30	2	24	0.006	0.030	0.105	0.18	42441	520	1.7
		0.40	2	38	0.010	0.060	0.120	0.29	41710	810	5.9
		0.50	2	47	0.012	0.075	0.150	0.36	41557	1009	11.4
		0.60	2	57	0.015	0.090	0.180	0.43	42195	1229	19.9
		0.80	2	75	0.019	0.120	0.240	0.57	41883	1627	46.9
		1.00	2	94	0.024	0.150	0.300	0.71	42142	2047	92.1
	Hardened tool steel 48 - 52 HRC	0.10	2	8	0.002	0.010	0.035	0.06	42441	188	0.1
		0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
		0.30	2	24	0.007	0.030	0.105	0.18	42441	565	1.8
		0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
		0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
		0.60	2	57	0.016	0.090	0.180	0.43	42195	1338	21.7
		0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
		1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2
	Hardened tool steel 52 - 56 HRC	0.10	2	8	0.002	0.010	0.035	0.06	42441	127	0.1
		0.20	2	16	0.003	0.020	0.070	0.12	42441	255	0.4
		0.30	2	24	0.005	0.030	0.105	0.18	42441	382	1.2
		0.40	2	38	0.007	0.060	0.120	0.29	41710	596	4.3
		0.50	2	47	0.009	0.075	0.150	0.36	41557	742	8.4
		0.60	2	57	0.011	0.090	0.180	0.43	42195	904	14.7
		0.80	2	75	0.014	0.120	0.240	0.57	41883	1196	34.5
		1.00	2	94	0.018	0.150	0.300	0.71	42142	1505	67.7
	Hardened tool steel 56 - 60 HRC	0.10	2	7	0.001	0.007	0.030	0.05	44563	91	0.0
		0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
		0.30	2	20	0.003	0.021	0.090	0.15	42441	260	0.5
		0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
		0.50	2	40	0.006	0.050	0.125	0.30	42441	509	3.2
		0.60	2	48	0.007	0.060	0.150	0.36	42441	611	5.5
		0.80	2	63	0.010	0.080	0.200	0.48	41778	802	12.9
		1.00	2	70	0.012	0.100	0.250	0.60	37136	891	22.3

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
		0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
		0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
		0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
		0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
		0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
		0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
		1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	Hardened tool steel 48 - 52 HRC	0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
		0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
		0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
		0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
		0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
		0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
		0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
		1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	Hardened tool steel 52 - 56 HRC	0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
		0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
		0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
		0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
		0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
		0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
		0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
		1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
	Hardened tool steel 56 - 60 HRC	0.10	2	13	0.015	0.010	0.030	0.10	41380	1241	45°
		0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
		0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
		0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
		0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
		0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
		0.80	2	62	0.040	0.010	0.080	0.68	29022	2322	45°
		1.00	2	78	0.045	0.020	0.090	0.88	28214	2539	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 3.5xd

X-Generation

II

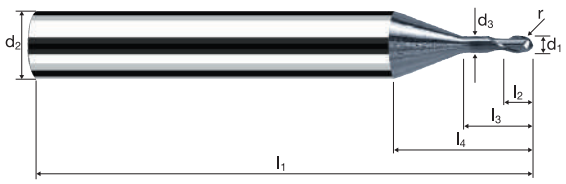
HM
XA

λ 30°
γ -10°

h4

d1

r



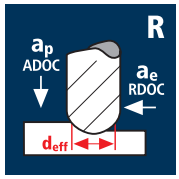
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6582** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6582
010	0.10	6.00	0.09	57	0.10	0.35	0.42	17.20	0.050	2		●
020	0.20	6.00	0.18	57	0.20	0.70	0.80	17.29	0.100	2		●
030	0.30	6.00	0.25	57	0.30	1.05	1.25	17.44	0.150	2		●
040	0.40	6.00	0.35	57	0.40	1.40	1.60	17.51	0.200	2		●
050	0.50	6.00	0.45	57	0.50	1.75	1.95	12.24	0.250	2		●
060	0.60	6.00	0.55	57	0.60	2.10	2.30	12.40	0.300	2		●
080	0.80	6.00	0.75	57	0.80	2.80	3.00	12.73	0.400	2		●
100	1.00	6.00	0.95	57	1.00	3.50	3.70	13.06	0.500	2		●

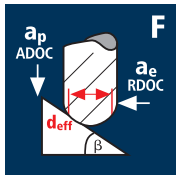
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	367	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	550	1.8
0.40	2	38	0.010	0.060	0.120	0.29	41710	858	6.2
0.50	2	47	0.013	0.075	0.150	0.36	41557	1068	12.0
0.60	2	57	0.015	0.090	0.180	0.43	42195	1302	21.1
0.80	2	75	0.021	0.120	0.240	0.57	41883	1723	49.6
1.00	2	94	0.026	0.150	0.300	0.71	42142	2167	97.5
1.50	2	121	0.041	0.270	0.375	1.15	33492	2779	281.4
2.00	2	121	0.055	0.360	0.500	1.54	25010	2767	498.1
Hardened tool steel 48 - 52 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
0.30	2	24	0.007	0.030	0.105	0.18	42441	565	1.8
0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
0.60	2	57	0.016	0.090	0.180	0.43	42195	1338	21.7
0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2
1.50	2	105	0.043	0.270	0.375	1.15	29063	2479	251.0
2.00	2	105	0.057	0.360	0.500	1.54	21703	2468	444.3
Hardened tool steel 52 - 56 HRC									
0.20	2	16	0.004	0.020	0.070	0.12	42441	336	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	504	1.6
0.40	2	38	0.009	0.060	0.120	0.29	41710	786	5.7
0.50	2	47	0.012	0.075	0.150	0.36	41557	979	11.0
0.60	2	57	0.014	0.090	0.180	0.43	42195	1193	19.4
0.80	2	75	0.019	0.120	0.240	0.57	41883	1579	45.5
1.00	2	88	0.024	0.150	0.300	0.71	39452	1860	83.7
1.50	2	88	0.038	0.270	0.375	1.15	24358	1853	187.6
2.00	2	88	0.051	0.360	0.500	1.54	18189	1845	332.1
Hardened tool steel 56 - 60 HRC									
0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
0.30	2	20	0.003	0.021	0.090	0.15	42441	260	0.5
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	39	0.006	0.050	0.125	0.30	41380	497	3.1
0.60	2	39	0.007	0.060	0.150	0.36	34484	497	4.5
0.80	2	39	0.010	0.080	0.200	0.48	25863	497	8.0
1.00	2	39	0.012	0.100	0.250	0.60	20690	497	12.4
1.50	2	39	0.019	0.180	0.300	0.97	12798	499	27.0
2.00	2	39	0.026	0.240	0.400	1.30	9549	497	47.7

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	185	0.078	0.040	0.120	1.75	33650	5249	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	166	0.068	0.030	0.105	1.32	40030	5444	45°
2.00	2	166	0.078	0.040	0.120	1.75	30194	4710	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	152	0.068	0.030	0.105	1.32	36654	4985	45°
2.00	2	152	0.078	0.040	0.120	1.75	27647	4313	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
0.80	2	61	0.040	0.010	0.080	0.68	28554	2284	45°
1.00	2	76	0.045	0.020	0.090	0.88	27490	2474	45°
1.50	2	76	0.053	0.020	0.105	1.28	18900	2003	45°
2.00	2	76	0.060	0.020	0.120	1.67	14486	1738	45°

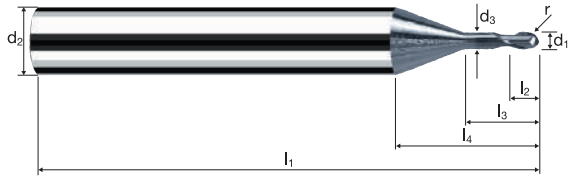
Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 4xd

HM
XA

λ **30°**
γ **-10°**

h4



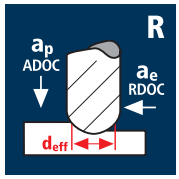
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6563** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6563
010	0.10	6.00	0.09	57	0.10	0.40	0.47	17.25	0.050	2		●
020	0.20	6.00	0.18	57	0.20	0.80	0.90	17.39	0.100	2		●
030	0.30	6.00	0.25	57	0.30	1.20	1.40	17.59	0.150	2		●
040	0.40	6.00	0.35	57	0.40	1.60	1.80	17.71	0.200	2		●
050	0.50	6.00	0.45	57	0.50	2.00	2.20	12.49	0.250	2		●
060	0.60	6.00	0.55	57	0.60	2.40	2.60	12.70	0.300	2		●
080	0.80	6.00	0.75	57	0.80	3.20	3.40	13.13	0.400	2		●
100	1.00	6.00	0.95	57	1.00	4.00	4.20	13.56	0.500	2		●
120	1.50	6.00	1.40	57	1.50	6.00	6.30	14.72	0.750	2		●
140	2.00	6.00	1.90	61	2.00	8.00	8.30	15.78	1.000	2		●

Application



Material

Hardened tool steel 42 - 48 HRC

X X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.10	2	8	0.002	0.010	0.035	0.06	42441	183	0.1
0.20	2	16	0.004	0.020	0.070	0.12	42441	367	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	550	1.8
0.40	2	38	0.010	0.060	0.120	0.29	41710	858	6.2
0.50	2	47	0.013	0.075	0.150	0.36	41557	1068	12.0
0.60	2	57	0.015	0.090	0.180	0.43	42195	1302	21.1
0.80	2	75	0.021	0.120	0.240	0.57	41883	1723	49.6
1.00	2	94	0.026	0.150	0.300	0.71	42142	2167	97.5

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.10	2	8	0.002	0.010	0.035	0.06	42441	188	0.1
0.20	2	16	0.004	0.020	0.070	0.12	42441	377	0.6
0.30	2	24	0.007	0.030	0.105	0.18	42441	565	1.8
0.40	2	38	0.011	0.060	0.120	0.29	41710	882	6.4
0.50	2	47	0.013	0.075	0.150	0.36	41557	1098	12.4
0.60	2	57	0.016	0.090	0.180	0.43	42195	1338	21.7
0.80	2	75	0.021	0.120	0.240	0.57	41883	1771	51.0
1.00	2	94	0.026	0.150	0.300	0.71	42142	2227	100.2

Hardened tool steel 52 - 56 HRC

X

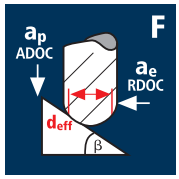
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.10	2	8	0.002	0.010	0.035	0.06	42441	168	0.1
0.20	2	16	0.004	0.020	0.070	0.12	42441	336	0.5
0.30	2	24	0.006	0.030	0.105	0.18	42441	504	1.6
0.40	2	38	0.009	0.060	0.120	0.29	41710	786	5.7
0.50	2	47	0.012	0.075	0.150	0.36	41557	979	11.0
0.60	2	57	0.014	0.090	0.180	0.43	42195	1193	19.4
0.80	2	75	0.019	0.120	0.240	0.57	41883	1579	45.5
1.00	2	84	0.024	0.150	0.300	0.71	37659	1775	79.9

Hardened tool steel 56 - 60 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.10	2	7	0.001	0.007	0.030	0.05	44563	91	0.0
0.20	2	13	0.002	0.014	0.060	0.10	41380	169	0.2
0.30	2	20	0.003	0.021	0.090	0.15	42441	260	0.5
0.40	2	27	0.004	0.028	0.120	0.20	42972	351	1.2
0.50	2	37	0.006	0.050	0.125	0.30	39258	471	3.0
0.60	2	37	0.007	0.060	0.150	0.36	32715	471	4.3
0.80	2	37	0.010	0.080	0.200	0.48	24536	471	7.6
1.00	2	37	0.012	0.100	0.250	0.60	19629	471	11.8

Application



Material

Hardened tool steel 42 - 48 HRC

X X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°

Hardened tool steel 52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.10	2	13	0.020	0.010	0.030	0.10	41380	1655	45°
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°

Hardened tool steel 56 - 60 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.10	2	13	0.015	0.010	0.030	0.10	41380	1241	45°
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	55	0.035	0.010	0.070	0.52	33667	2357	45°
0.80	2	59	0.040	0.010	0.080	0.68	27618	2209	45°
1.00	2	74	0.045	0.020	0.090	0.88	26767	2409	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 4.5xd

X-Generation

II

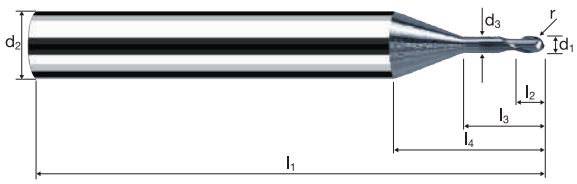
HM
XA

λ 30°
γ -10°

h4

d1

r



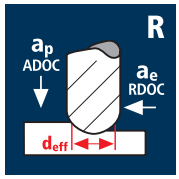
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6583** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6583
010	0.10	6.00	0.09	57	0.10	0.45	0.52	17.30	0.050	2		●
020	0.20	6.00	0.18	57	0.20	0.90	1.00	17.49	0.100	2		●
030	0.30	6.00	0.25	57	0.30	1.35	1.55	17.74	0.150	2		●
040	0.40	6.00	0.35	57	0.40	1.80	2.00	17.91	0.200	2		●
050	0.50	6.00	0.45	57	0.50	2.25	2.45	12.74	0.250	2		●
060	0.60	6.00	0.55	57	0.60	2.70	2.90	13.00	0.300	2		●
080	0.80	6.00	0.75	57	0.80	3.60	3.80	13.53	0.400	2		●
100	1.00	6.00	0.95	57	1.00	4.50	4.70	14.06	0.500	2		●

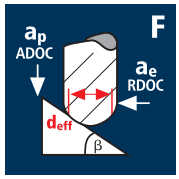
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	14	0.004	0.016	0.080	0.11	40512	317	0.4
0.40	2	34	0.009	0.048	0.140	0.26	41625	779	5.3
0.50	2	43	0.012	0.060	0.175	0.32	42773	1001	10.5
0.80	2	69	0.019	0.096	0.280	0.52	42237	1581	42.5
1.00	2	86	0.023	0.120	0.350	0.65	42115	1971	82.8
1.50	2	110	0.039	0.225	0.450	1.07	32723	2524	255.6
2.00	2	110	0.051	0.300	0.600	1.43	24485	2518	453.3
2.50	2	110	0.064	0.375	0.750	1.79	19561	2515	707.2
3.00	2	110	0.077	0.450	0.900	2.14	16362	2524	1022.2
Hardened tool steel 48 - 52 HRC									
0.20	2	14	0.004	0.016	0.080	0.11	40512	325	0.4
0.40	2	34	0.010	0.048	0.140	0.26	41625	801	5.4
0.50	2	43	0.012	0.060	0.175	0.32	42773	1029	10.8
0.80	2	69	0.019	0.096	0.280	0.52	42237	1625	43.7
1.00	2	86	0.024	0.120	0.350	0.65	42115	2026	85.1
1.50	2	95	0.040	0.225	0.450	1.07	28261	2240	226.8
2.00	2	95	0.053	0.300	0.600	1.43	21146	2235	402.3
2.50	2	95	0.066	0.375	0.750	1.79	16894	2232	627.8
3.00	2	95	0.079	0.450	0.900	2.14	14131	2240	907.3
Hardened tool steel 52 - 56 HRC									
0.20	2	14	0.004	0.016	0.080	0.11	40512	290	0.4
0.40	2	34	0.009	0.048	0.140	0.26	41625	714	4.8
0.50	2	43	0.011	0.060	0.175	0.32	42773	917	9.7
0.80	2	69	0.017	0.096	0.280	0.52	42237	1449	39.0
1.00	2	80	0.021	0.120	0.350	0.65	39177	1681	70.6
1.50	2	80	0.035	0.225	0.450	1.07	23799	1683	170.4
2.00	2	80	0.047	0.300	0.600	1.43	17808	1679	302.2
2.50	2	80	0.059	0.375	0.750	1.79	14226	1676	471.5
3.00	2	80	0.071	0.450	0.900	2.14	11899	1683	681.4
Hardened tool steel 56 - 60 HRC									
0.20	2	12	0.002	0.010	0.060	0.09	42441	148	0.1
0.40	2	23	0.003	0.020	0.120	0.17	43065	300	0.7
0.50	2	35	0.005	0.040	0.125	0.27	41262	448	2.3
0.80	2	35	0.009	0.064	0.200	0.43	25909	450	5.8
1.00	2	35	0.011	0.080	0.250	0.54	20631	448	9.0
1.50	2	35	0.019	0.180	0.300	0.97	11485	448	24.2
2.00	2	35	0.026	0.240	0.400	1.30	8570	446	42.8
2.50	2	35	0.032	0.300	0.500	1.62	6877	447	67.1
3.00	2	35	0.039	0.360	0.600	1.95	5713	446	96.3

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	174	0.068	0.030	0.105	1.32	41959	5706	45°
2.00	2	176	0.078	0.040	0.120	1.75	32013	4994	45°
2.50	2	176	0.088	0.040	0.135	2.15	26057	4586	45°
3.00	2	176	0.098	0.050	0.150	2.59	21630	4240	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	158	0.068	0.030	0.105	1.32	38101	5182	45°
2.00	2	158	0.078	0.040	0.120	1.75	28739	4483	45°
2.50	2	158	0.088	0.040	0.135	2.15	23392	4117	45°
3.00	2	158	0.098	0.050	0.150	2.59	19418	3806	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	144	0.068	0.030	0.105	1.32	34725	4723	45°
2.00	2	144	0.078	0.040	0.120	1.75	26192	4086	45°
2.50	2	144	0.088	0.040	0.135	2.15	21319	3752	45°
3.00	2	144	0.098	0.050	0.150	2.59	17698	3469	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.80	2	58	0.040	0.010	0.080	0.68	27150	2172	45°
1.00	2	72	0.045	0.020	0.090	0.88	26044	2344	45°
1.50	2	72	0.053	0.020	0.105	1.28	17905	1898	45°
2.00	2	72	0.060	0.020	0.120	1.67	13724	1647	45°
2.50	2	72	0.068	0.030	0.135	2.11	10862	1477	45°
3.00	2	72	0.075	0.030	0.150	2.50	9167	1375	45°

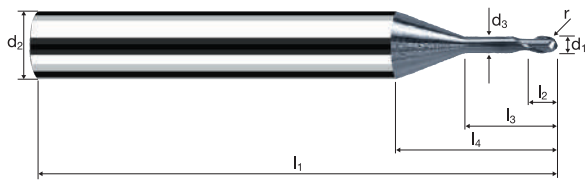
Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

HM
XA

λ **30°**
γ **-10°**

h4



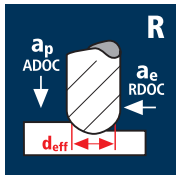
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6564** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6564
010	0.10	6.00	0.09	57	0.10	0.50	0.57	17.35	0.050	2		●
020	0.20	6.00	0.18	57	0.20	1.00	1.10	17.59	0.100	2		●
030	0.30	6.00	0.25	57	0.30	1.50	1.70	17.89	0.150	2		●
040	0.40	6.00	0.35	57	0.40	2.00	2.20	18.11	0.200	2		●
050	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.250	2		●
060	0.60	6.00	0.55	57	0.60	3.00	3.20	13.30	0.300	2		●
080	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.400	2		●
100	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.500	2		●
108	1.20	6.00	1.10	57	1.20	6.00	6.30	15.28	0.600	2		●
120	1.50	6.00	1.40	61	1.50	7.50	7.80	16.22	0.750	2		●
140	2.00	6.00	1.90	61	2.00	10.00	10.30	17.78	1.000	2		●
152	2.30	6.00	2.10	61	2.30	11.50	11.93	18.91	1.150	2		●
160	2.50	6.00	2.30	61	2.50	12.50	12.93	19.54	1.250	2		●
172	2.80	6.00	2.60	61	2.80	14.00	14.43	20.48	1.400	2		●
180	3.00	6.00	2.80	66	3.00	15.00	15.43	21.10	1.500	2		●

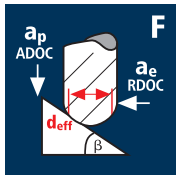
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	14	0.004	0.016	0.080	0.11	40512	317	0.4
0.30	2	21	0.006	0.024	0.120	0.16	41778	490	1.4
0.40	2	34	0.009	0.048	0.140	0.26	41625	779	5.3
0.50	2	43	0.012	0.060	0.175	0.32	42773	1001	10.5
0.60	2	51	0.014	0.072	0.210	0.39	41625	1169	17.7
0.80	2	69	0.019	0.096	0.280	0.52	42237	1581	42.5
1.00	2	86	0.023	0.120	0.350	0.65	42115	1971	82.8
1.50	2	105	0.039	0.225	0.450	1.07	31236	2409	244.0
2.00	2	105	0.051	0.300	0.600	1.43	23372	2404	432.7
Hardened tool steel 48 - 52 HRC									
0.20	2	14	0.004	0.016	0.080	0.11	40512	325	0.4
0.30	2	21	0.006	0.024	0.120	0.16	41778	503	1.5
0.40	2	34	0.010	0.048	0.140	0.26	41625	801	5.4
0.50	2	43	0.012	0.060	0.175	0.32	42773	1029	10.8
0.60	2	51	0.014	0.072	0.210	0.39	41625	1201	18.2
0.80	2	69	0.019	0.096	0.280	0.52	42237	1625	43.7
1.00	2	86	0.024	0.120	0.350	0.65	42115	2026	85.1
1.50	2	90	0.040	0.225	0.450	1.07	26774	2122	214.9
2.00	2	90	0.053	0.300	0.600	1.43	20033	2117	381.2
Hardened tool steel 52 - 56 HRC									
0.20	2	14	0.004	0.016	0.080	0.11	40512	290	0.4
0.30	2	21	0.005	0.024	0.120	0.16	41778	449	1.3
0.40	2	34	0.009	0.048	0.140	0.26	41625	714	4.8
0.50	2	43	0.011	0.060	0.175	0.32	42773	917	9.7
0.60	2	51	0.013	0.072	0.210	0.39	41625	1071	16.2
0.80	2	69	0.017	0.096	0.280	0.52	42237	1449	39.0
1.00	2	76	0.021	0.120	0.350	0.65	37218	1597	67.1
1.50	2	76	0.035	0.225	0.450	1.07	22609	1599	161.9
2.00	2	76	0.047	0.300	0.600	1.43	16917	1595	287.1
Hardened tool steel 56 - 60 HRC									
0.20	2	12	0.002	0.010	0.060	0.09	42441	148	0.1
0.30	2	17	0.003	0.015	0.090	0.13	41625	218	0.3
0.40	2	23	0.003	0.020	0.120	0.17	43065	300	0.7
0.50	2	33	0.005	0.040	0.125	0.27	38905	422	2.1
0.60	2	33	0.007	0.048	0.150	0.33	31831	415	3.0
0.80	2	33	0.009	0.064	0.200	0.43	24428	424	5.5
1.00	2	33	0.011	0.080	0.250	0.54	19452	422	8.5
1.50	2	33	0.019	0.180	0.300	0.97	10829	422	22.8
2.00	2	33	0.026	0.240	0.400	1.30	8080	420	40.4

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	166	0.068	0.030	0.105	1.32	40030	5444	45°
2.00	2	166	0.078	0.040	0.120	1.75	30194	4710	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	149	0.068	0.030	0.105	1.32	35930	4887	45°
2.00	2	149	0.078	0.040	0.120	1.75	27102	4228	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	136	0.068	0.030	0.105	1.32	32796	4460	45°
2.00	2	136	0.078	0.040	0.120	1.75	24737	3859	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	54	0.035	0.010	0.070	0.52	33055	2314	45°
0.80	2	54	0.040	0.010	0.080	0.68	25278	2022	45°
1.00	2	68	0.045	0.020	0.090	0.88	24597	2214	45°
1.50	2	68	0.053	0.020	0.105	1.28	16910	1793	45°
2.00	2	68	0.060	0.020	0.120	1.67	12961	1555	45°

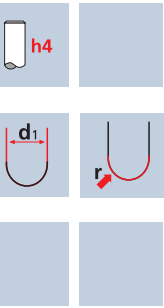
Ball nose end mills MicroX

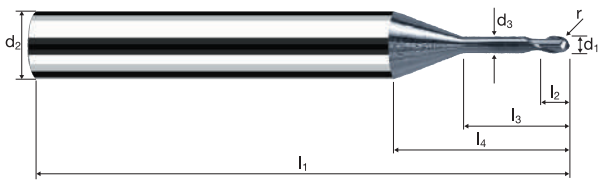
Shank ø 6mm, cylindrical neck, 6xd

X-Generation

II

HM XA	λ 30° γ -10°





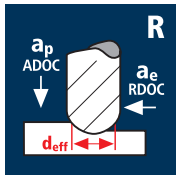
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6565** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6565
020	0.20	6.00	0.18	57	0.20	1.20	1.30	17.79	0.100	2		●
030	0.30	6.00	0.25	57	0.30	1.80	2.00	18.19	0.150	2		●
040	0.40	6.00	0.35	57	0.40	2.40	2.60	18.51	0.200	2		●
050	0.50	6.00	0.45	57	0.50	3.00	3.20	13.49	0.250	2		●
060	0.60	6.00	0.55	57	0.60	3.60	3.80	13.90	0.300	2		●
080	0.80	6.00	0.75	57	0.80	4.80	5.00	14.73	0.400	2		●
100	1.00	6.00	0.95	57	1.00	6.00	6.20	15.56	0.500	2		●
120	1.50	6.00	1.40	61	1.50	9.00	9.30	17.72	0.750	2		●
140	2.00	6.00	1.90	66	2.00	12.00	12.30	19.78	1.000	2		●

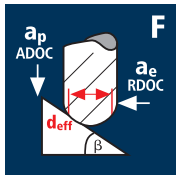
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	12	0.003	0.010	0.060	0.09	42441	252	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	370	0.5
0.40	2	27	0.007	0.028	0.100	0.20	42972	597	1.7
0.50	2	34	0.009	0.035	0.125	0.26	41625	722	3.2
0.60	2	40	0.010	0.042	0.150	0.31	41072	855	5.4
0.80	2	54	0.014	0.056	0.200	0.41	41924	1164	13.1
1.00	2	67	0.017	0.070	0.250	0.51	41817	1451	25.4
1.50	2	100	0.031	0.150	0.300	0.90	35368	2165	97.4
2.00	2	100	0.041	0.200	0.400	1.20	26526	2165	173.2
Hardened tool steel 48 - 52 HRC									
0.20	2	12	0.003	0.010	0.060	0.09	42441	244	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	359	0.5
0.40	2	27	0.007	0.028	0.100	0.20	42972	579	1.6
0.50	2	34	0.008	0.035	0.125	0.26	41625	701	3.1
0.60	2	40	0.010	0.042	0.150	0.31	41072	830	5.3
0.80	2	54	0.013	0.056	0.200	0.41	41924	1130	12.7
1.00	2	67	0.017	0.070	0.250	0.51	41817	1408	24.7
1.50	2	79	0.030	0.150	0.300	0.90	27941	1660	74.7
2.00	2	79	0.040	0.200	0.400	1.20	20955	1660	132.8
Hardened tool steel 52 - 56 HRC									
0.20	2	12	0.003	0.010	0.060	0.09	42441	222	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	327	0.5
0.40	2	27	0.006	0.028	0.100	0.20	42972	526	1.5
0.50	2	34	0.008	0.035	0.125	0.26	41625	637	2.8
0.60	2	40	0.009	0.042	0.150	0.31	41072	755	4.8
0.80	2	54	0.012	0.056	0.200	0.41	41924	1027	11.5
1.00	2	67	0.015	0.070	0.250	0.51	41817	1280	22.4
1.50	2	68	0.027	0.150	0.300	0.90	24050	1299	58.5
2.00	2	68	0.036	0.200	0.400	1.20	18038	1299	103.9
Hardened tool steel 56 - 60 HRC									
0.20	2	9	0.001	0.006	0.050	0.07	40926	101	0.1
0.30	2	14	0.002	0.009	0.075	0.10	44563	164	0.1
0.40	2	18	0.002	0.012	0.100	0.14	40926	201	0.3
0.50	2	29	0.004	0.025	0.100	0.22	41959	329	0.8
0.60	2	32	0.005	0.030	0.120	0.26	39177	369	1.4
0.80	2	32	0.006	0.040	0.160	0.35	29103	365	2.4
1.00	2	32	0.008	0.050	0.200	0.44	23150	363	3.7
1.50	2	32	0.015	0.120	0.225	0.81	12575	368	10.0
2.00	2	32	0.020	0.160	0.300	1.09	9345	365	17.5

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	156	0.068	0.030	0.105	1.32	37618	5116	45°
2.00	2	156	0.078	0.040	0.120	1.75	28375	4427	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	140	0.068	0.030	0.105	1.32	33760	4591	45°
2.00	2	140	0.078	0.040	0.120	1.75	25465	3973	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	128	0.068	0.030	0.105	1.32	30866	4198	45°
2.00	2	128	0.078	0.040	0.120	1.75	23282	3632	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	51	0.035	0.010	0.070	0.52	31219	2185	45°
0.80	2	51	0.040	0.010	0.080	0.68	23873	1910	45°
1.00	2	64	0.045	0.020	0.090	0.88	23150	2084	45°
1.50	2	64	0.053	0.020	0.105	1.28	15915	1687	45°
2.00	2	64	0.060	0.020	0.120	1.67	12199	1464	45°

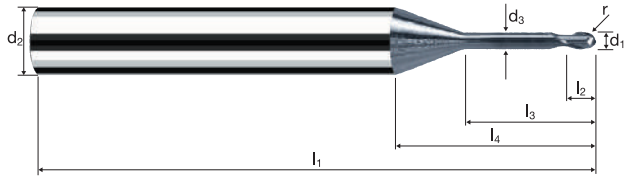
Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 7xd

X-Generation X

II

HM XA	λ 30° γ -10°



h4

d1

r

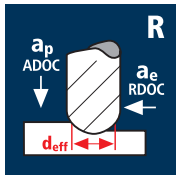
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6579** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6579
020	0.20	6.00	0.18	57	0.12	1.40	1.50	17.99	0.100	2		●
030	0.30	6.00	0.25	57	0.18	2.10	2.30	18.49	0.150	2		●
040	0.40	6.00	0.35	57	0.24	2.80	3.00	18.91	0.200	2		●
050	0.50	6.00	0.45	57	0.50	3.50	3.70	13.99	0.250	2		●
060	0.60	6.00	0.55	57	0.60	4.20	4.40	14.50	0.300	2		●
080	0.80	6.00	0.75	57	0.80	5.60	5.80	15.53	0.400	2		●
100	1.00	6.00	0.95	61	1.00	7.00	7.20	16.56	0.500	2		●
120	1.50	6.00	1.40	61	1.50	10.50	10.80	19.22	0.750	2		●
140	2.00	6.00	1.90	66	2.00	14.00	14.30	21.78	1.000	2		●

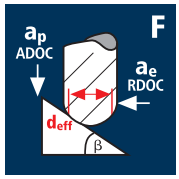
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	12	0.003	0.010	0.060	0.09	42441	252	0.2
0.40	2	27	0.007	0.028	0.100	0.20	42972	597	1.7
0.50	2	34	0.009	0.035	0.125	0.26	41625	722	3.2
0.80	2	54	0.014	0.056	0.200	0.41	41924	1164	13.1
1.00	2	67	0.017	0.070	0.250	0.51	41817	1451	25.4
1.20	2	95	0.024	0.120	0.240	0.72	41999	2056	59.2
1.50	2	95	0.031	0.150	0.300	0.90	33599	2056	92.6
2.00	2	95	0.041	0.200	0.400	1.20	25200	2056	164.5
2.50	2	95	0.051	0.250	0.500	1.50	20160	2056	257.1
Hardened tool steel 48 - 52 HRC									
0.20	2	12	0.003	0.010	0.060	0.09	42441	244	0.2
0.40	2	27	0.007	0.028	0.100	0.20	42972	579	1.6
0.50	2	34	0.008	0.035	0.125	0.26	41625	701	3.1
0.80	2	54	0.013	0.056	0.200	0.41	41924	1130	12.7
1.00	2	67	0.017	0.070	0.250	0.51	41817	1408	24.7
1.20	2	75	0.024	0.120	0.240	0.72	33157	1576	45.4
1.50	2	75	0.030	0.150	0.300	0.90	26526	1576	70.9
2.00	2	75	0.040	0.200	0.400	1.20	19894	1576	126.1
2.50	2	75	0.050	0.250	0.500	1.50	15915	1576	197.0
Hardened tool steel 52 - 56 HRC									
0.20	2	12	0.003	0.010	0.060	0.09	42441	222	0.2
0.40	2	27	0.006	0.028	0.100	0.20	42972	526	1.5
0.50	2	34	0.008	0.035	0.125	0.26	41625	637	2.8
0.80	2	54	0.012	0.056	0.200	0.41	41924	1027	11.5
1.00	2	65	0.015	0.070	0.250	0.51	40569	1242	21.8
1.20	2	65	0.022	0.120	0.240	0.72	28736	1241	35.8
1.50	2	65	0.027	0.150	0.300	0.90	22989	1241	55.9
2.00	2	65	0.036	0.200	0.400	1.20	17242	1241	99.3
2.50	2	65	0.045	0.250	0.500	1.50	13793	1241	155.2
Hardened tool steel 56 - 60 HRC									
0.20	2	9	0.001	0.006	0.050	0.07	40926	101	0.1
0.40	2	18	0.002	0.012	0.100	0.14	40926	201	0.3
0.50	2	29	0.004	0.025	0.100	0.22	41959	329	0.8
0.80	2	30	0.006	0.040	0.160	0.35	27284	343	2.2
1.00	2	30	0.008	0.050	0.200	0.44	21703	341	3.4
1.20	2	30	0.012	0.096	0.180	0.65	14691	344	6.0
1.50	2	30	0.015	0.120	0.225	0.81	11789	345	9.4
2.00	2	30	0.020	0.160	0.300	1.09	8761	342	16.5
2.50	2	30	0.024	0.200	0.375	1.36	7022	343	25.7

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	141	0.062	0.030	0.095	1.07	41946	5201	45°
1.50	2	146	0.068	0.030	0.105	1.32	35207	4788	45°
2.00	2	146	0.078	0.040	0.120	1.75	26556	4143	45°
2.50	2	146	0.088	0.040	0.135	2.15	21615	3804	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	131	0.062	0.030	0.095	1.07	38971	4832	45°
1.50	2	131	0.068	0.030	0.105	1.32	31590	4296	45°
2.00	2	131	0.078	0.040	0.120	1.75	23828	3717	45°
2.50	2	131	0.088	0.040	0.135	2.15	19395	3414	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	120	0.062	0.030	0.095	1.07	35698	4427	45°
1.50	2	120	0.068	0.030	0.105	1.32	28937	3935	45°
2.00	2	120	0.078	0.040	0.120	1.75	21827	3405	45°
2.50	2	120	0.088	0.040	0.135	2.15	17766	3127	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.80	2	48	0.040	0.010	0.080	0.68	22469	1798	45°
1.00	2	60	0.045	0.020	0.090	0.88	21703	1953	45°
1.20	2	60	0.048	0.020	0.095	1.04	18364	1763	45°
1.50	2	60	0.053	0.020	0.105	1.28	14921	1582	45°
2.00	2	60	0.060	0.020	0.120	1.67	11436	1372	45°
2.50	2	60	0.068	0.030	0.135	2.11	9051	1231	45°

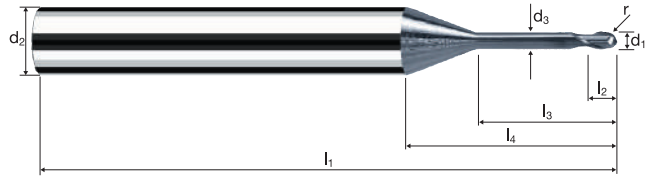
Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

X-Generation

II

HM XA	λ 30° γ -10°



h4

d1

r

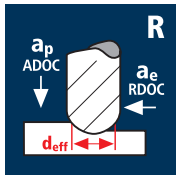
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6566** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6566
020	0.20	6.00	0.18	57	0.12	1.60	1.70	18.19	0.100	2		●
030	0.30	6.00	0.25	57	0.18	2.40	2.60	18.79	0.150	2		●
040	0.40	6.00	0.35	57	0.24	3.20	3.40	19.31	0.200	2		●
050	0.50	6.00	0.45	57	0.50	4.00	4.20	14.49	0.250	2		●
060	0.60	6.00	0.55	57	0.60	4.80	5.00	15.10	0.300	2		●
080	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.400	2		●
100	1.00	6.00	0.95	61	1.00	8.00	8.20	17.56	0.500	2		●
108	1.20	6.00	1.10	61	1.20	9.60	9.90	18.88	0.600	2		●
120	1.50	6.00	1.40	61	1.50	12.00	12.30	20.72	0.750	2		●
140	2.00	6.00	1.90	66	2.00	16.00	16.30	23.78	1.000	2		●
160	2.50	6.00	2.30	69	2.50	20.00	20.43	27.04	1.250	2		●
180	3.00	6.00	2.80	75	3.00	24.00	24.43	30.10	1.500	2		●

Application



Material

Hardened tool steel 42 - 48 HRC

X X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.003	0.010	0.060	0.09	42441	226	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	333	0.5
0.40	2	27	0.006	0.028	0.100	0.20	42972	537	1.5
0.50	2	34	0.008	0.035	0.125	0.26	41625	650	2.9
0.60	2	40	0.009	0.042	0.150	0.31	41072	770	4.9
0.80	2	54	0.012	0.056	0.200	0.41	41924	1047	11.8
1.00	2	67	0.016	0.070	0.250	0.51	41817	1306	22.9
1.50	2	90	0.028	0.150	0.300	0.90	31831	1753	78.9
2.00	2	90	0.037	0.200	0.400	1.20	23873	1753	140.3

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.003	0.010	0.060	0.09	42441	220	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	323	0.5
0.40	2	27	0.006	0.028	0.100	0.20	42972	521	1.5
0.50	2	34	0.008	0.035	0.125	0.26	41625	631	2.8
0.60	2	40	0.009	0.042	0.150	0.31	41072	747	4.7
0.80	2	54	0.012	0.056	0.200	0.41	41924	1017	11.4
1.00	2	67	0.015	0.070	0.250	0.51	41817	1268	22.2
1.50	2	71	0.027	0.150	0.300	0.90	25111	1342	60.4
2.00	2	71	0.036	0.200	0.400	1.20	18833	1342	107.4

Hardened tool steel 52 - 56 HRC

X

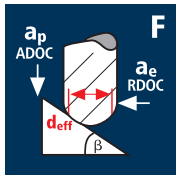
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.002	0.010	0.060	0.09	42441	200	0.1
0.30	2	17	0.004	0.015	0.090	0.13	41625	294	0.4
0.40	2	27	0.006	0.028	0.100	0.20	42972	474	1.4
0.50	2	34	0.007	0.035	0.125	0.26	41625	574	2.5
0.60	2	40	0.008	0.042	0.150	0.31	41072	679	4.3
0.80	2	54	0.011	0.056	0.200	0.41	41924	924	10.4
1.00	2	62	0.014	0.070	0.250	0.51	38696	1066	18.7
1.50	2	62	0.024	0.150	0.300	0.90	21928	1066	48.0
2.00	2	62	0.032	0.200	0.400	1.20	16446	1066	85.3

Hardened tool steel 56 - 60 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
0.20	2	9	0.001	0.006	0.050	0.07	40926	91	0.1
0.30	2	14	0.002	0.009	0.075	0.10	44563	148	0.1
0.40	2	18	0.002	0.012	0.100	0.14	40926	181	0.2
0.50	2	29	0.004	0.025	0.100	0.22	41959	296	0.8
0.60	2	29	0.004	0.030	0.120	0.26	35504	301	1.1
0.80	2	29	0.006	0.040	0.160	0.35	26374	298	1.9
1.00	2	29	0.007	0.050	0.200	0.44	20980	296	3.0
1.50	2	29	0.013	0.120	0.225	0.81	11396	301	8.1
2.00	2	29	0.018	0.160	0.300	1.09	8469	298	14.3

Application



Material

Hardened tool steel 42 - 48 HRC

X X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	137	0.068	0.030	0.105	1.32	33037	4493	45°
2.00	2	137	0.078	0.040	0.120	1.75	24919	3887	45°

Hardened tool steel 48 - 52 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	122	0.068	0.030	0.105	1.32	29420	4001	45°
2.00	2	122	0.078	0.040	0.120	1.75	22191	3462	45°

Hardened tool steel 52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	112	0.058	0.030	0.090	0.91	39177	4545	45°
1.50	2	112	0.068	0.030	0.105	1.32	27008	3673	45°
2.00	2	112	0.078	0.040	0.120	1.75	20372	3178	45°

Hardened tool steel 56 - 60 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
0.20	2	25	0.020	0.010	0.040	0.19	41883	1675	45°
0.30	2	36	0.025	0.010	0.050	0.27	42441	2122	45°
0.40	2	38	0.029	0.010	0.057	0.36	33599	1949	45°
0.50	2	45	0.033	0.010	0.065	0.44	32554	2149	45°
0.60	2	45	0.035	0.010	0.070	0.52	27546	1928	45°
0.80	2	45	0.040	0.010	0.080	0.68	21065	1685	45°
1.00	2	56	0.045	0.020	0.090	0.88	20256	1823	45°
1.50	2	56	0.053	0.020	0.105	1.28	13926	1476	45°
2.00	2	56	0.060	0.020	0.120	1.67	10674	1281	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 9xd

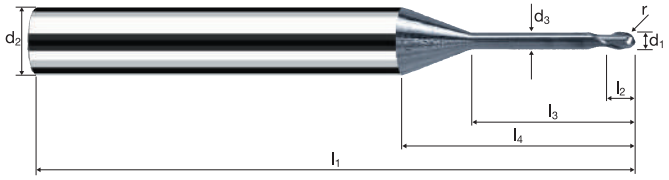
X-Generation X

II

HM
XA

λ 30°
γ -10°

h4



d1

r

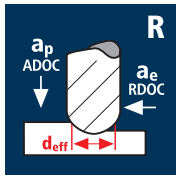
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6567** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6567
020	0.20	6.00	0.18	57	0.12	1.80	1.90	18.39	0.100	2		●
030	0.30	6.00	0.25	57	0.18	2.70	2.90	19.09	0.150	2		●
040	0.40	6.00	0.35	57	0.24	3.60	3.80	19.71	0.200	2		●
050	0.50	6.00	0.45	57	0.50	4.50	4.70	14.99	0.250	2		●
060	0.60	6.00	0.55	57	0.60	5.40	5.60	15.70	0.300	2		●
080	0.80	6.00	0.75	61	0.80	7.20	7.40	17.13	0.400	2		●
100	1.00	6.00	0.95	61	1.00	9.00	9.20	18.56	0.500	2		●
120	1.50	6.00	1.40	66	1.50	13.50	13.80	22.22	0.750	2		●
140	2.00	6.00	1.90	69	2.00	18.00	18.30	25.78	1.000	2		●

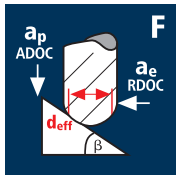
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.20	2	8	0.002	0.005	0.050	0.06	42441	146	0.1
0.30	2	12	0.003	0.008	0.075	0.09	42441	219	0.1
0.40	2	23	0.005	0.020	0.080	0.17	43065	414	0.7
0.50	2	29	0.006	0.025	0.100	0.22	41959	504	1.3
0.60	2	35	0.007	0.030	0.120	0.26	42849	617	2.2
0.80	2	46	0.010	0.040	0.160	0.35	41835	804	5.2
1.00	2	58	0.012	0.050	0.200	0.44	41959	1007	10.1
1.20	2	83	0.017	0.090	0.180	0.63	41936	1460	23.7
1.50	2	86	0.022	0.113	0.225	0.79	34651	1508	38.2
Hardened tool steel 48 - 52 HRC									
0.20	2	8	0.002	0.005	0.050	0.06	42441	142	0.1
0.30	2	12	0.003	0.008	0.075	0.09	42441	213	0.1
0.40	2	23	0.005	0.020	0.080	0.17	43065	401	0.7
0.50	2	29	0.006	0.025	0.100	0.22	41959	489	1.2
0.60	2	35	0.007	0.030	0.120	0.26	42849	599	2.2
0.80	2	46	0.009	0.040	0.160	0.35	41835	780	5.0
1.00	2	58	0.012	0.050	0.200	0.44	41959	978	9.8
1.20	2	68	0.017	0.090	0.180	0.63	34357	1161	18.8
1.50	2	68	0.021	0.113	0.225	0.79	27399	1157	29.3
Hardened tool steel 52 - 56 HRC									
0.20	2	8	0.002	0.005	0.050	0.06	42441	129	0.1
0.30	2	12	0.002	0.008	0.075	0.09	42441	193	0.1
0.40	2	23	0.004	0.020	0.080	0.17	43065	365	0.6
0.50	2	29	0.005	0.025	0.100	0.22	41959	444	1.1
0.60	2	35	0.006	0.030	0.120	0.26	42849	545	2.0
0.80	2	46	0.008	0.040	0.160	0.35	41835	709	4.6
1.00	2	58	0.011	0.050	0.200	0.44	41959	889	8.9
1.20	2	59	0.015	0.090	0.180	0.63	29810	916	14.9
1.50	2	59	0.019	0.113	0.225	0.79	23773	913	23.1
Hardened tool steel 56 - 60 HRC									
0.20	2	7	0.001	0.004	0.050	0.06	37136	61	0.0
0.30	2	11	0.001	0.006	0.075	0.08	43768	107	0.1
0.40	2	15	0.002	0.008	0.100	0.11	43406	142	0.1
0.50	2	23	0.002	0.015	0.100	0.17	43065	214	0.3
0.60	2	27	0.003	0.018	0.120	0.20	42972	257	0.6
0.80	2	27	0.004	0.024	0.160	0.27	31831	253	1.0
1.00	2	27	0.005	0.030	0.200	0.34	25278	252	1.5
1.20	2	27	0.008	0.060	0.180	0.52	16528	252	2.7
1.50	2	27	0.010	0.075	0.225	0.65	13222	252	4.3

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	127	0.062	0.030	0.095	1.07	37781	4685	45°
1.50	2	127	0.068	0.030	0.105	1.32	30625	4165	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	114	0.058	0.030	0.090	0.91	39876	4626	45°
1.20	2	114	0.062	0.030	0.095	1.07	33913	4205	45°
1.50	2	114	0.068	0.030	0.105	1.32	27490	3739	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	104	0.058	0.030	0.090	0.91	36378	4220	45°
1.20	2	104	0.062	0.030	0.095	1.07	30939	3836	45°
1.50	2	104	0.068	0.030	0.105	1.32	25079	3411	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.026	0.010	0.040	0.19	41883	2178	45°
0.30	2	36	0.033	0.010	0.050	0.27	42441	2801	45°
0.40	2	47	0.037	0.010	0.057	0.36	41557	3075	45°
0.50	2	42	0.042	0.020	0.065	0.46	29063	2441	45°
0.60	2	42	0.046	0.020	0.070	0.55	24307	2236	45°
0.80	2	42	0.052	0.020	0.080	0.71	18830	1958	45°
1.00	2	52	0.058	0.030	0.090	0.91	18189	2110	45°
1.20	2	52	0.062	0.030	0.095	1.07	15469	1918	45°
1.50	2	52	0.068	0.030	0.105	1.32	12539	1705	45°

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

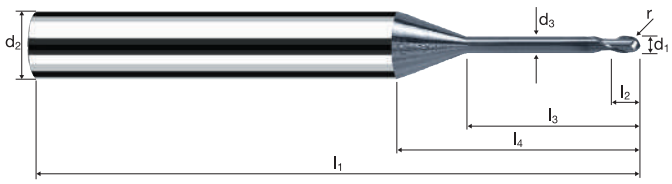
X-Generation X

II

HM
XA

λ 30°
γ -10°

h4



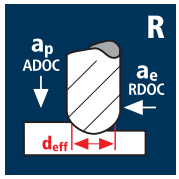
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6568** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6568
020	0.20	6.00	0.18	57	0.12	2.00	2.10	18.59	0.100	2		●
030	0.30	6.00	0.25	57	0.18	3.00	3.20	19.39	0.150	2		●
040	0.40	6.00	0.35	57	0.24	4.00	4.20	20.11	0.200	2		●
050	0.50	6.00	0.45	57	0.50	5.00	5.20	15.49	0.250	2		●
060	0.60	6.00	0.55	57	0.60	6.00	6.20	16.30	0.300	2		●
080	0.80	6.00	0.75	61	0.80	8.00	8.20	17.93	0.400	2		●
100	1.00	6.00	0.95	61	1.00	10.00	10.20	19.56	0.500	2		●
108	1.20	6.00	1.10	66	1.20	12.00	12.30	21.28	0.600	2		●
120	1.50	6.00	1.40	66	1.50	15.00	15.30	23.72	0.750	2		●
140	2.00	6.00	1.90	69	2.00	20.00	20.30	27.78	1.000	2		●
160	2.50	6.00	2.30	75	2.50	25.00	25.43	32.04	1.250	2		●
180	3.00	6.00	2.80	80	3.00	30.00	30.43	36.10	1.500	2		●

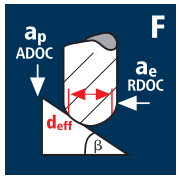
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.50	2	43	0.012	0.060	0.175	0.32	42773	1001	10.5
0.60	2	51	0.014	0.072	0.210	0.39	41625	1169	17.7
0.80	2	69	0.019	0.096	0.280	0.52	42237	1581	42.5
1.00	2	86	0.023	0.120	0.350	0.65	42115	1971	82.8
1.50	2	105	0.039	0.225	0.450	1.07	31236	2409	244.0
2.00	2	105	0.051	0.300	0.600	1.43	23372	2404	432.7
Hardened tool steel 48 - 52 HRC									
0.50	2	43	0.012	0.060	0.175	0.32	42773	1029	10.8
0.60	2	51	0.014	0.072	0.210	0.39	41625	1201	18.2
0.80	2	69	0.019	0.096	0.280	0.52	42237	1625	43.7
1.00	2	86	0.024	0.120	0.350	0.65	42115	2026	85.1
1.50	2	90	0.040	0.225	0.450	1.07	26774	2122	214.9
2.00	2	90	0.053	0.300	0.600	1.43	20033	2117	381.2
Hardened tool steel 52 - 56 HRC									
0.50	2	43	0.011	0.060	0.175	0.32	42773	917	9.7
0.60	2	51	0.013	0.072	0.210	0.39	41625	1071	16.2
0.80	2	69	0.017	0.096	0.280	0.52	42237	1449	39.0
1.00	2	76	0.021	0.120	0.350	0.65	37218	1597	67.1
1.50	2	76	0.035	0.225	0.450	1.07	22609	1599	161.9
2.00	2	76	0.047	0.300	0.600	1.43	16917	1595	287.1
Hardened tool steel 56 - 60 HRC									
0.50	2	33	0.005	0.040	0.125	0.27	38905	422	2.1
0.60	2	33	0.007	0.048	0.150	0.33	31831	415	3.0
0.80	2	33	0.009	0.064	0.200	0.43	24428	424	5.5
1.00	2	33	0.011	0.080	0.250	0.54	19452	422	8.5
1.50	2	33	0.019	0.180	0.300	0.97	10829	422	22.8
2.00	2	33	0.026	0.240	0.400	1.30	8080	420	40.4

Application



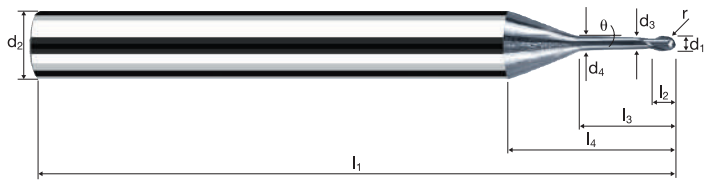
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	166	0.068	0.030	0.105	1.32	40030	5444	45°
2.00	2	166	0.078	0.040	0.120	1.75	30194	4710	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	149	0.068	0.030	0.105	1.32	35930	4887	45°
2.00	2	149	0.078	0.040	0.120	1.75	27102	4228	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.50	2	136	0.068	0.030	0.105	1.32	32796	4460	45°
2.00	2	136	0.078	0.040	0.120	1.75	24737	3859	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	46	0.033	0.010	0.065	0.44	33278	2196	45°
0.60	2	54	0.035	0.010	0.070	0.52	33055	2314	45°
0.80	2	54	0.040	0.010	0.080	0.68	25278	2022	45°
1.00	2	68	0.045	0.020	0.090	0.88	24597	2214	45°
1.50	2	68	0.053	0.020	0.105	1.28	16910	1793	45°
2.00	2	68	0.060	0.020	0.120	1.67	12961	1555	45°

Ball nose end mills MicroX

Shank ø 6mm, conical neck 0.9°, 6xd

HM XA	λ 30° γ -10°



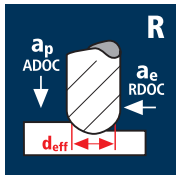
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6765** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r ±0.005	z	X-AL X6765
050	0.50	6.00	0.45	0.53	57	0.40	3.00	3.00	13.34	0.9°	0.250	2	●
060	0.60	6.00	0.55	0.65	57	0.50	3.60	3.60	13.71	0.9°	0.300	2	●
080	0.80	6.00	0.75	0.88	57	0.65	4.80	4.80	14.49	0.9°	0.400	2	●
100	1.00	6.00	0.95	1.11	57	0.80	6.00	6.00	15.26	0.9°	0.500	2	●
120	1.50	6.00	1.40	1.65	61	1.20	9.00	9.00	17.25	0.9°	0.750	2	●
140	2.00	6.00	1.90	2.23	66	1.60	12.00	12.00	19.17	0.9°	1.000	2	●

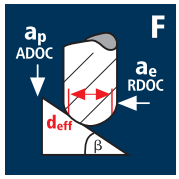
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.50	2	34	0.009	0.035	0.125	0.26	41625	722	3.2
0.60	2	40	0.010	0.042	0.150	0.31	41072	855	5.4
0.80	2	54	0.014	0.056	0.200	0.41	41924	1164	13.1
1.00	2	67	0.017	0.070	0.250	0.51	41817	1451	25.4
1.20	2	95	0.024	0.120	0.240	0.72	41999	2056	59.2
1.50	2	95	0.031	0.150	0.300	0.90	33599	2056	92.6
2.00	2	95	0.041	0.200	0.400	1.20	25200	2056	164.5
2.50	2	95	0.051	0.250	0.500	1.50	20160	2056	257.1
3.00	2	95	0.061	0.300	0.600	1.80	16800	2056	370.2
Hardened tool steel 48 - 52 HRC									
0.50	2	34	0.008	0.035	0.125	0.26	41625	701	3.1
0.60	2	40	0.010	0.042	0.150	0.31	41072	830	5.3
0.80	2	54	0.013	0.056	0.200	0.41	41924	1130	12.7
1.00	2	67	0.017	0.070	0.250	0.51	41817	1408	24.7
1.20	2	75	0.024	0.120	0.240	0.72	33157	1576	45.4
1.50	2	75	0.030	0.150	0.300	0.90	26526	1576	70.9
2.00	2	75	0.040	0.200	0.400	1.20	19894	1576	126.1
2.50	2	75	0.050	0.250	0.500	1.50	15915	1576	197.0
3.00	2	75	0.059	0.300	0.600	1.80	13263	1576	283.6
Hardened tool steel 52 - 56 HRC									
0.50	2	34	0.008	0.035	0.125	0.26	41625	637	2.8
0.60	2	40	0.009	0.042	0.150	0.31	41072	755	4.8
0.80	2	54	0.012	0.056	0.200	0.41	41924	1027	11.5
1.00	2	65	0.015	0.070	0.250	0.51	40569	1242	21.8
1.20	2	65	0.022	0.120	0.240	0.72	28736	1241	35.8
1.50	2	65	0.027	0.150	0.300	0.90	22989	1241	55.9
2.00	2	65	0.036	0.200	0.400	1.20	17242	1241	99.3
2.50	2	65	0.045	0.250	0.500	1.50	13793	1241	155.2
3.00	2	65	0.054	0.300	0.600	1.80	11495	1242	223.5
Hardened tool steel 56 - 60 HRC									
0.50	2	29	0.004	0.025	0.100	0.22	41959	329	0.8
0.60	2	30	0.005	0.030	0.120	0.26	36728	346	1.3
0.80	2	30	0.006	0.040	0.160	0.35	27284	343	2.2
1.00	2	30	0.008	0.050	0.200	0.44	21703	341	3.4
1.20	2	30	0.012	0.096	0.180	0.65	14691	344	6.0
1.50	2	30	0.015	0.120	0.225	0.81	11789	345	9.4
2.00	2	30	0.020	0.160	0.300	1.09	8761	342	16.5
2.50	2	30	0.024	0.200	0.375	1.36	7022	343	25.7
3.00	2	30	0.029	0.240	0.450	1.63	5858	343	37.1

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	141	0.062	0.030	0.095	1.07	41946	5201	45°
1.50	2	146	0.068	0.030	0.105	1.32	35207	4788	45°
2.00	2	146	0.078	0.040	0.120	1.75	26556	4143	45°
2.50	2	146	0.088	0.040	0.135	2.15	21615	3804	45°
3.00	2	146	0.098	0.050	0.150	2.59	17943	3517	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	131	0.062	0.030	0.095	1.07	38971	4832	45°
1.50	2	131	0.068	0.030	0.105	1.32	31590	4296	45°
2.00	2	131	0.078	0.040	0.120	1.75	23828	3717	45°
2.50	2	131	0.088	0.040	0.135	2.15	19395	3414	45°
3.00	2	131	0.098	0.050	0.150	2.59	16100	3156	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	120	0.062	0.030	0.095	1.07	35698	4427	45°
1.50	2	120	0.068	0.030	0.105	1.32	28937	3935	45°
2.00	2	120	0.078	0.040	0.120	1.75	21827	3405	45°
2.50	2	120	0.088	0.040	0.135	2.15	17766	3127	45°
3.00	2	120	0.098	0.050	0.150	2.59	14748	2891	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	48	0.042	0.020	0.065	0.46	33215	2790	45°
0.60	2	48	0.046	0.020	0.070	0.55	27780	2556	45°
0.80	2	48	0.052	0.020	0.080	0.71	21520	2238	45°
1.00	2	60	0.058	0.030	0.090	0.91	20987	2435	45°
1.20	2	60	0.062	0.030	0.095	1.07	17849	2213	45°
1.50	2	60	0.068	0.030	0.105	1.32	14469	1968	45°
2.00	2	60	0.078	0.040	0.120	1.75	10913	1702	45°
2.50	2	60	0.088	0.040	0.135	2.15	8883	1563	45°
3.00	2	60	0.098	0.050	0.150	2.59	7374	1445	45°

Ball nose end mills MicroX

Shank ø 6mm, conical neck 0.9°, 8xd

X-Generation X

II

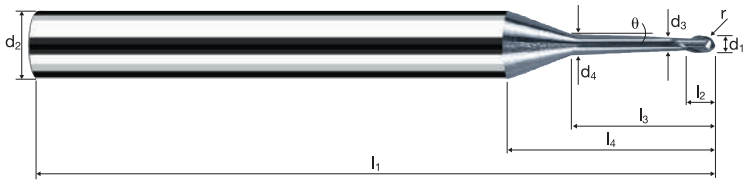
HM
XA

λ 30°
γ -10°

h4

d1

r



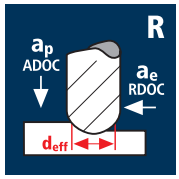
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6766** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r ±0.005	z	X-AL	X6766
050	0.50	6.00	0.45	0.56	57	0.40	4.00	4.00	14.28	0.9°	0.250	2		●
060	0.60	6.00	0.55	0.69	57	0.50	4.80	4.80	14.84	0.9°	0.300	2		●
080	0.80	6.00	0.75	0.93	57	0.65	6.40	6.40	15.99	0.9°	0.400	2		●
100	1.00	6.00	0.95	1.18	61	0.80	8.00	8.00	17.13	0.9°	0.500	2		●
108	1.20	6.00	1.10	1.37	61	1.00	9.60	9.60	18.37	0.9°	0.600	2		●
120	1.50	6.00	1.40	1.74	61	1.20	12.00	12.00	20.08	0.9°	0.750	2		●
140	2.00	6.00	1.90	2.35	66	1.60	16.00	16.00	22.94	0.9°	1.000	2		●
160	2.50	6.00	2.30	2.87	69	2.00	20.00	20.00	25.97	0.9°	1.250	2		●
180	3.00	6.00	2.80	3.48	75	2.40	24.00	24.00	28.83	0.9°	1.500	2		●

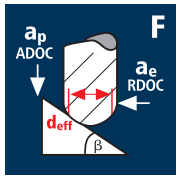
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.50	2	29	0.006	0.025	0.100	0.22	41959	504	1.3
0.60	2	35	0.007	0.030	0.120	0.26	42849	617	2.2
0.80	2	46	0.010	0.040	0.160	0.35	41835	804	5.2
1.00	2	58	0.012	0.050	0.200	0.44	41959	1007	10.1
1.20	2	83	0.017	0.090	0.180	0.63	41936	1460	23.7
1.50	2	86	0.022	0.113	0.225	0.79	34651	1508	38.2
2.00	2	86	0.029	0.150	0.300	1.05	26071	1513	68.1
2.50	2	86	0.036	0.188	0.375	1.32	20738	1504	105.8
3.00	2	86	0.044	0.225	0.450	1.58	17326	1508	152.7
Hardened tool steel 48 - 52 HRC									
0.50	2	29	0.006	0.025	0.100	0.22	41959	489	1.2
0.60	2	35	0.007	0.030	0.120	0.26	42849	599	2.2
0.80	2	46	0.009	0.040	0.160	0.35	41835	780	5.0
1.00	2	58	0.012	0.050	0.200	0.44	41959	978	9.8
1.20	2	68	0.017	0.090	0.180	0.63	34357	1161	18.8
1.50	2	68	0.021	0.113	0.225	0.79	27399	1157	29.3
2.00	2	68	0.028	0.150	0.300	1.05	20614	1161	52.3
2.50	2	68	0.035	0.188	0.375	1.32	16398	1155	81.2
3.00	2	68	0.042	0.225	0.450	1.58	13699	1157	117.2
Hardened tool steel 52 - 56 HRC									
0.50	2	29	0.005	0.025	0.100	0.22	41959	444	1.1
0.60	2	35	0.006	0.030	0.120	0.26	42849	545	2.0
0.80	2	46	0.008	0.040	0.160	0.35	41835	709	4.6
1.00	2	58	0.011	0.050	0.200	0.44	41959	889	8.9
1.20	2	59	0.015	0.090	0.180	0.63	29810	916	14.9
1.50	2	59	0.019	0.113	0.225	0.79	23773	913	23.1
2.00	2	59	0.026	0.150	0.300	1.05	17886	916	41.2
2.50	2	59	0.032	0.188	0.375	1.32	14227	911	64.1
3.00	2	59	0.038	0.225	0.450	1.58	11886	913	92.5
Hardened tool steel 56 - 60 HRC									
0.50	2	23	0.002	0.015	0.100	0.17	43065	214	0.3
0.60	2	27	0.003	0.018	0.120	0.20	42972	257	0.6
0.80	2	27	0.004	0.024	0.160	0.27	31831	253	1.0
1.00	2	27	0.005	0.030	0.200	0.34	25278	252	1.5
1.20	2	27	0.008	0.060	0.180	0.52	16528	252	2.7
1.50	2	27	0.010	0.075	0.225	0.65	13222	252	4.3
2.00	2	27	0.013	0.100	0.300	0.87	9879	251	7.6
2.50	2	27	0.016	0.125	0.375	1.09	7885	251	11.8
3.00	2	27	0.019	0.150	0.450	1.31	6561	250	16.9

Application



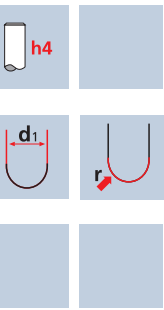
Material

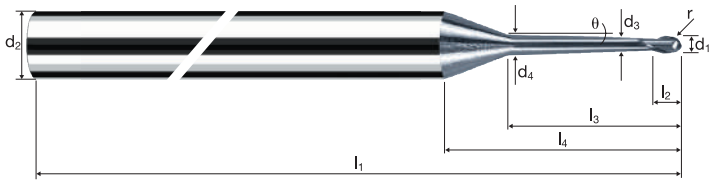
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	120	0.058	0.030	0.090	0.91	41975	4869	45°
1.20	2	127	0.062	0.030	0.095	1.07	37781	4685	45°
1.50	2	127	0.068	0.030	0.105	1.32	30625	4165	45°
2.00	2	127	0.078	0.040	0.120	1.75	23100	3604	45°
2.50	2	127	0.088	0.040	0.135	2.15	18802	3309	45°
3.00	2	127	0.098	0.050	0.150	2.59	15608	3059	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	114	0.058	0.030	0.090	0.91	39876	4626	45°
1.20	2	114	0.062	0.030	0.095	1.07	33913	4205	45°
1.50	2	114	0.068	0.030	0.105	1.32	27490	3739	45°
2.00	2	114	0.078	0.040	0.120	1.75	20736	3235	45°
2.50	2	114	0.088	0.040	0.135	2.15	16878	2971	45°
3.00	2	114	0.098	0.050	0.150	2.59	14011	2746	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	104	0.058	0.030	0.090	0.91	36378	4220	45°
1.20	2	104	0.062	0.030	0.095	1.07	30939	3836	45°
1.50	2	104	0.068	0.030	0.105	1.32	25079	3411	45°
2.00	2	104	0.078	0.040	0.120	1.75	18917	2951	45°
2.50	2	104	0.088	0.040	0.135	2.15	15397	2710	45°
3.00	2	104	0.098	0.050	0.150	2.59	12782	2505	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	42	0.042	0.020	0.065	0.46	29063	2441	45°
0.60	2	42	0.046	0.020	0.070	0.55	24307	2236	45°
0.80	2	42	0.052	0.020	0.080	0.71	18830	1958	45°
1.00	2	52	0.058	0.030	0.090	0.91	18189	2110	45°
1.20	2	52	0.062	0.030	0.095	1.07	15469	1918	45°
1.50	2	52	0.068	0.030	0.105	1.32	12539	1705	45°
2.00	2	52	0.078	0.040	0.120	1.75	9458	1475	45°
2.50	2	52	0.088	0.040	0.135	2.15	7699	1355	45°
3.00	2	52	0.098	0.050	0.150	2.59	6391	1253	45°

Ball nose end mills MicroX

Shank ø 6mm, conical neck 0.9°, 10xd

HM XA	λ 30° γ -10°





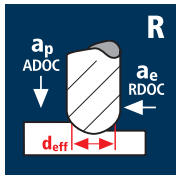
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6768** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r ±0.005	z	X-AL	X6768
050	0.50	6.00	0.45	0.59	57	0.40	5.00	5.00	15.23	0.9°	0.250	2		●
060	0.60	6.00	0.55	0.72	57	0.50	6.00	6.00	15.98	0.9°	0.300	2		●
080	0.80	6.00	0.75	0.98	61	0.65	8.00	8.00	17.50	0.9°	0.400	2		●
100	1.00	6.00	0.95	1.24	61	0.80	10.00	10.00	19.01	0.9°	0.500	2		●
108	1.20	6.00	1.10	1.45	66	1.00	12.00	12.00	20.62	0.9°	0.600	2		●
120	1.50	6.00	1.40	1.83	66	1.20	15.00	15.00	22.91	0.9°	0.750	2		●
140	2.00	6.00	1.90	2.48	69	1.60	20.00	20.00	26.70	0.9°	1.000	2		●
160	2.50	6.00	2.30	3.02	75	2.00	25.00	25.00	30.69	0.9°	1.250	2		●
180	3.00	6.00	2.80	3.67	75	2.40	30.00	30.00	34.48	0.9°	1.500	2		●

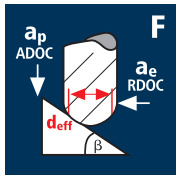
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.50	2	21	0.004	0.013	0.075	0.16	41778	341	0.3
0.60	2	25	0.005	0.015	0.090	0.19	41883	411	0.6
0.80	2	33	0.007	0.020	0.120	0.25	42017	549	1.3
1.00	2	41	0.008	0.025	0.150	0.31	42099	688	2.6
1.20	2	69	0.014	0.060	0.120	0.52	42237	1156	8.3
1.50	2	77	0.017	0.075	0.150	0.65	37707	1290	14.5
2.00	2	77	0.023	0.100	0.200	0.87	28172	1285	25.7
2.50	2	77	0.029	0.125	0.250	1.09	22486	1282	40.1
3.00	2	77	0.034	0.150	0.300	1.31	18710	1280	57.6
Hardened tool steel 48 - 52 HRC									
0.50	2	21	0.004	0.013	0.075	0.16	41778	331	0.3
0.60	2	25	0.005	0.015	0.090	0.19	41883	399	0.6
0.80	2	33	0.006	0.020	0.120	0.25	42017	533	1.3
1.00	2	41	0.008	0.025	0.150	0.31	42099	668	2.5
1.20	2	61	0.013	0.060	0.120	0.52	37340	992	7.2
1.50	2	61	0.017	0.075	0.150	0.65	29872	992	11.2
2.00	2	61	0.022	0.100	0.200	0.87	22318	988	19.8
2.50	2	61	0.028	0.125	0.250	1.09	17814	986	30.8
3.00	2	61	0.033	0.150	0.300	1.31	14822	984	44.3
Hardened tool steel 52 - 56 HRC									
0.50	2	21	0.004	0.013	0.075	0.16	41778	301	0.3
0.60	2	25	0.004	0.015	0.090	0.19	41883	362	0.5
0.80	2	33	0.006	0.020	0.120	0.25	42017	485	1.2
1.00	2	41	0.007	0.025	0.150	0.31	42099	607	2.3
1.20	2	53	0.012	0.060	0.120	0.52	32443	784	5.7
1.50	2	53	0.015	0.075	0.150	0.65	25954	784	8.8
2.00	2	53	0.020	0.100	0.200	0.87	19391	781	15.6
2.50	2	53	0.025	0.125	0.250	1.09	15477	779	24.4
3.00	2	53	0.030	0.150	0.300	1.31	12878	778	35.0
Hardened tool steel 56 - 60 HRC									
0.50	2	16	0.002	0.008	0.075	0.12	42441	143	0.1
0.60	2	19	0.002	0.009	0.090	0.15	40319	163	0.2
0.80	2	24	0.003	0.012	0.120	0.19	40208	217	0.3
1.00	2	24	0.003	0.015	0.150	0.24	31831	214	0.5
1.20	2	24	0.005	0.030	0.120	0.37	20647	214	0.8
1.50	2	24	0.006	0.038	0.150	0.47	16254	211	1.2
2.00	2	24	0.009	0.050	0.200	0.62	12322	213	2.2
2.50	2	24	0.011	0.063	0.250	0.78	9794	212	3.3
3.00	2	24	0.013	0.075	0.300	0.94	8127	211	4.8

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	107	0.058	0.030	0.090	0.91	37428	4342	45°
1.20	2	107	0.062	0.030	0.095	1.07	31831	3947	45°
1.50	2	107	0.068	0.030	0.105	1.32	25802	3509	45°
2.00	2	107	0.078	0.040	0.120	1.75	19462	3036	45°
2.50	2	107	0.088	0.040	0.135	2.15	15841	2788	45°
3.00	2	107	0.098	0.050	0.150	2.59	13150	2577	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	94	0.052	0.020	0.080	0.71	42142	4383	45°
1.00	2	96	0.058	0.030	0.090	0.91	33580	3895	45°
1.20	2	96	0.062	0.030	0.095	1.07	28559	3541	45°
1.50	2	96	0.068	0.030	0.105	1.32	23150	3148	45°
2.00	2	96	0.078	0.040	0.120	1.75	17462	2724	45°
2.50	2	96	0.088	0.040	0.135	2.15	14213	2502	45°
3.00	2	96	0.098	0.050	0.150	2.59	11798	2312	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	70	0.052	0.020	0.080	0.71	31383	3264	45°
1.00	2	88	0.058	0.030	0.090	0.91	30782	3571	45°
1.20	2	88	0.062	0.030	0.095	1.07	26179	3246	45°
1.50	2	88	0.068	0.030	0.105	1.32	21221	2886	45°
2.00	2	88	0.078	0.040	0.120	1.75	16006	2497	45°
2.50	2	88	0.088	0.040	0.135	2.15	13028	2293	45°
3.00	2	88	0.098	0.050	0.150	2.59	10815	2120	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	35	0.042	0.020	0.065	0.46	24219	2034	45°
0.60	2	35	0.046	0.020	0.070	0.55	20256	1864	45°
0.80	2	35	0.052	0.020	0.080	0.71	15691	1632	45°
1.00	2	44	0.058	0.030	0.090	0.91	15391	1785	45°
1.20	2	44	0.062	0.030	0.095	1.07	13089	1623	45°
1.50	2	44	0.068	0.030	0.105	1.32	10610	1443	45°
2.00	2	44	0.078	0.040	0.120	1.75	8003	1249	45°
2.50	2	44	0.088	0.040	0.135	2.15	6514	1147	45°
3.00	2	44	0.098	0.050	0.150	2.59	5408	1060	45°

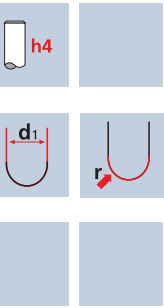
Ball nose end mills MicroX

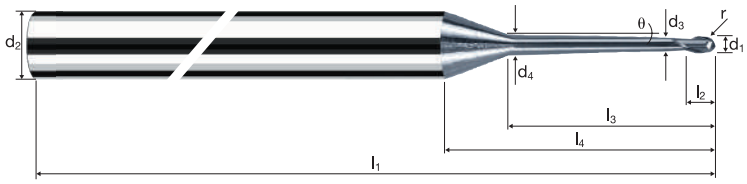
Shank ø 6mm, conical neck 0.9°, 12xd

X-Generation X

II

HM XA	λ 30° γ -10°





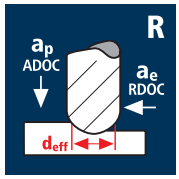
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6770** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r ±0.005	z	X-AL	X6770
050	0.50	6.00	0.45	0.63	57	0.40	6.00	6.00	16.15	0.9°	0.250	2		●
060	0.60	6.00	0.55	0.76	57	0.50	7.20	7.20	17.11	0.9°	0.300	2		●
080	0.80	6.00	0.75	1.03	61	0.65	9.60	9.60	19.01	0.9°	0.400	2		●
100	1.00	6.00	0.95	1.30	66	0.80	12.00	12.00	20.90	0.9°	0.500	2		●
108	1.20	6.00	1.10	1.52	66	1.00	14.40	14.40	22.89	0.9°	0.600	2		●
120	1.50	6.00	1.40	1.93	69	1.20	18.00	18.00	25.73	0.9°	0.750	2		●
140	2.00	6.00	1.90	2.60	75	1.60	24.00	24.00	30.48	0.9°	1.000	2		●
160	2.50	6.00	2.30	3.18	80	2.00	30.00	30.00	35.39	0.9°	1.250	2		●
180	3.00	6.00	2.80	3.86	87	2.40	36.00	36.00	40.12	0.9°	1.500	2		●

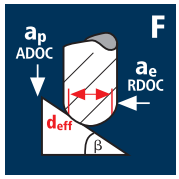
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
Hardened tool steel 42 - 48 HRC									
0.50	2	21	0.004	0.013	0.075	0.16	41778	324	0.3
0.60	2	25	0.005	0.015	0.090	0.19	41883	390	0.6
0.80	2	33	0.006	0.020	0.120	0.25	42017	522	1.3
1.00	2	41	0.008	0.025	0.150	0.31	42099	654	2.5
1.20	2	69	0.013	0.060	0.120	0.52	42237	1098	7.9
1.50	2	69	0.016	0.075	0.150	0.65	33790	1098	12.4
2.00	2	69	0.022	0.100	0.200	0.87	25245	1094	21.9
2.50	2	69	0.027	0.125	0.250	1.09	20150	1092	34.1
3.00	2	69	0.033	0.150	0.300	1.31	16766	1090	49.1
Hardened tool steel 48 - 52 HRC									
0.50	2	21	0.004	0.013	0.075	0.16	41778	315	0.3
0.60	2	25	0.005	0.015	0.090	0.19	41883	379	0.5
0.80	2	33	0.006	0.020	0.120	0.25	42017	506	1.2
1.00	2	41	0.008	0.025	0.150	0.31	42099	634	2.4
1.20	2	55	0.013	0.060	0.120	0.52	33667	850	6.1
1.50	2	55	0.016	0.075	0.150	0.65	26934	850	9.6
2.00	2	55	0.021	0.100	0.200	0.87	20123	846	17.0
2.50	2	55	0.026	0.125	0.250	1.09	16062	845	26.4
3.00	2	55	0.032	0.150	0.300	1.31	13364	843	38.0
Hardened tool steel 52 - 56 HRC									
0.50	2	21	0.003	0.013	0.075	0.16	41778	286	0.3
0.60	2	25	0.004	0.015	0.090	0.19	41883	344	0.5
0.80	2	33	0.005	0.020	0.120	0.25	42017	460	1.1
1.00	2	41	0.007	0.025	0.150	0.31	42099	577	2.2
1.20	2	48	0.011	0.060	0.120	0.52	29382	674	4.9
1.50	2	48	0.014	0.075	0.150	0.65	23506	674	7.6
2.00	2	48	0.019	0.100	0.200	0.87	17562	672	13.5
2.50	2	48	0.024	0.125	0.250	1.09	14017	670	21.0
3.00	2	48	0.029	0.150	0.300	1.31	11663	669	30.1
Hardened tool steel 56 - 60 HRC									
0.50	2	16	0.002	0.008	0.075	0.12	42441	136	0.1
0.60	2	19	0.002	0.009	0.090	0.15	40319	155	0.2
0.80	2	22	0.003	0.012	0.120	0.19	36857	189	0.3
1.00	2	22	0.003	0.015	0.150	0.24	29178	187	0.4
1.20	2	22	0.005	0.030	0.120	0.37	18927	187	0.7
1.50	2	22	0.006	0.038	0.150	0.47	14900	184	1.1
2.00	2	22	0.008	0.050	0.200	0.62	11295	186	1.9
2.50	2	22	0.010	0.063	0.250	0.78	8978	184	2.9
3.00	2	22	0.012	0.075	0.300	0.94	7450	184	4.2

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	72	0.046	0.020	0.070	0.55	41670	3834	45°
0.80	2	62	0.052	0.020	0.080	0.71	27796	2891	45°
1.00	2	78	0.058	0.030	0.090	0.91	27284	3165	45°
1.20	2	78	0.062	0.030	0.095	1.07	23204	2877	45°
1.50	2	78	0.068	0.030	0.105	1.32	18809	2558	45°
2.00	2	78	0.078	0.040	0.120	1.75	14188	2213	45°
2.50	2	78	0.088	0.040	0.135	2.15	11548	2032	45°
3.00	2	78	0.098	0.050	0.150	2.59	9586	1879	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	56	0.046	0.020	0.070	0.55	32410	2982	45°
0.80	2	56	0.052	0.020	0.080	0.71	25106	2611	45°
1.00	2	70	0.058	0.030	0.090	0.91	24485	2840	45°
1.20	2	70	0.062	0.030	0.095	1.07	20824	2582	45°
1.50	2	70	0.068	0.030	0.105	1.32	16880	2296	45°
2.00	2	70	0.078	0.040	0.120	1.75	12732	1986	45°
2.50	2	70	0.088	0.040	0.135	2.15	10364	1824	45°
3.00	2	70	0.098	0.050	0.150	2.59	8603	1686	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	61	0.042	0.020	0.065	0.46	42211	3546	45°
0.60	2	51	0.046	0.020	0.070	0.55	29516	2716	45°
0.80	2	51	0.052	0.020	0.080	0.71	22865	2378	45°
1.00	2	64	0.058	0.030	0.090	0.91	22387	2597	45°
1.20	2	64	0.062	0.030	0.095	1.07	19039	2361	45°
1.50	2	64	0.068	0.030	0.105	1.32	15433	2099	45°
2.00	2	64	0.078	0.040	0.120	1.75	11641	1816	45°
2.50	2	64	0.088	0.040	0.135	2.15	9475	1668	45°
3.00	2	64	0.098	0.050	0.150	2.59	7866	1542	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	26	0.042	0.020	0.065	0.46	17991	1511	45°
0.60	2	26	0.046	0.020	0.070	0.55	15047	1384	45°
0.80	2	26	0.052	0.020	0.080	0.71	11656	1212	45°
1.00	2	32	0.058	0.030	0.090	0.91	11193	1298	45°
1.20	2	32	0.062	0.030	0.095	1.07	9520	1181	45°
1.50	2	32	0.068	0.030	0.105	1.32	7717	1050	45°
2.00	2	32	0.078	0.040	0.120	1.75	5821	908	45°
2.50	2	32	0.088	0.040	0.135	2.15	4738	834	45°
3.00	2	32	0.098	0.050	0.150	2.59	3933	771	45°

Ball nose end mills MicroX

Shank ø 6mm, conical neck 0.9°, 15xd

X-Generation X

II

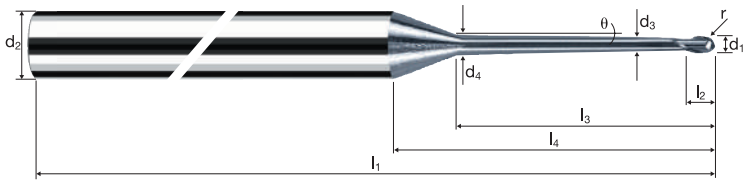
HM
XA

λ 30°
γ -10°

h4

d1

r



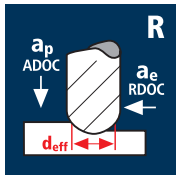
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6772** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r ±0.005	z	X-AL	X6772
050	0.50	6.00	0.45	0.67	61	0.40	7.50	7.50	17.58	0.9°	0.250	2		●
060	0.60	6.00	0.55	0.82	61	0.50	9.00	9.00	18.80	0.9°	0.300	2		●
080	0.80	6.00	0.75	1.11	66	0.65	12.00	12.00	21.26	0.9°	0.400	2		●
100	1.00	6.00	0.95	1.40	66	0.80	15.00	15.00	23.72	0.9°	0.500	2		●
108	1.20	6.00	1.10	1.63	69	1.00	18.00	18.00	26.29	0.9°	0.600	2		●
120	1.50	6.00	1.40	2.07	75	1.20	22.50	22.50	29.97	0.9°	0.750	2		●
140	2.00	6.00	1.90	2.79	80	1.60	30.00	30.00	36.12	0.9°	1.000	2		●
160	2.50	6.00	2.30	3.42	87	2.00	37.50	37.50	42.45	0.9°	1.250	2		●
180	3.00	6.00	2.80	4.14	100	2.40	45.00	45.00	48.60	0.9°	1.500	2		●

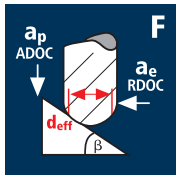
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Hardened tool steel 42 - 48 HRC									
0.50	2	18	0.003	0.010	0.050	0.14	40926	271	0.2
0.60	2	22	0.004	0.012	0.060	0.17	41193	327	0.3
0.80	2	30	0.005	0.016	0.080	0.22	43406	459	0.6
1.00	2	37	0.007	0.020	0.100	0.28	42062	556	1.1
1.50	2	56	0.011	0.038	0.150	0.47	37926	839	4.7
2.00	2	56	0.015	0.050	0.200	0.62	28751	848	8.5
2.50	2	56	0.018	0.063	0.250	0.78	22853	843	13.2
3.00	2	56	0.022	0.075	0.300	0.94	18963	839	18.9
Hardened tool steel 48 - 52 HRC									
0.50	2	18	0.003	0.010	0.050	0.14	40926	263	0.2
0.60	2	22	0.004	0.012	0.060	0.17	41193	317	0.3
0.80	2	30	0.005	0.016	0.080	0.22	43406	446	0.6
1.00	2	37	0.006	0.020	0.100	0.28	42062	540	1.1
1.50	2	44	0.011	0.038	0.150	0.47	29799	640	3.6
2.00	2	44	0.014	0.050	0.200	0.62	22590	647	6.5
2.50	2	44	0.018	0.063	0.250	0.78	17956	643	10.1
3.00	2	44	0.021	0.075	0.300	0.94	14900	640	14.4
Hardened tool steel 52 - 56 HRC									
0.50	2	18	0.003	0.010	0.050	0.14	40926	239	0.1
0.60	2	22	0.004	0.012	0.060	0.17	41193	288	0.2
0.80	2	30	0.005	0.016	0.080	0.22	43406	405	0.5
1.00	2	37	0.006	0.020	0.100	0.28	42062	491	1.0
1.50	2	38	0.010	0.038	0.150	0.47	25736	502	2.9
2.00	2	38	0.013	0.050	0.200	0.62	19509	508	5.1
2.50	2	38	0.016	0.063	0.250	0.78	15507	504	7.9
3.00	2	38	0.020	0.075	0.300	0.94	12868	502	11.3
Hardened tool steel 56 - 60 HRC									
0.50	2	18	0.002	0.010	0.050	0.14	40926	143	0.1
0.60	2	18	0.002	0.012	0.060	0.17	33703	142	0.1
0.80	2	18	0.003	0.016	0.080	0.22	26044	146	0.2
1.00	2	18	0.004	0.020	0.100	0.28	20463	143	0.3
1.50	2	18	0.006	0.038	0.150	0.47	12191	143	0.8
2.00	2	18	0.008	0.050	0.200	0.62	9241	144	1.5
2.50	2	18	0.010	0.063	0.250	0.78	7346	143	2.3
3.00	2	18	0.012	0.075	0.300	0.94	6095	143	3.2

Application



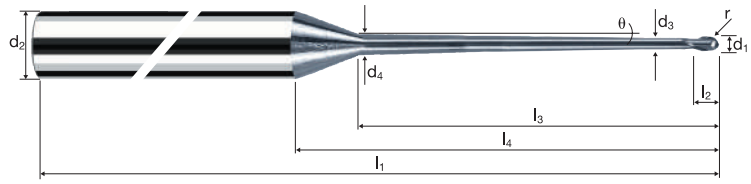
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	23	0.042	0.020	0.065	0.46	15915	1337	45°
0.60	2	23	0.046	0.020	0.070	0.55	13311	1225	45°
0.80	2	23	0.052	0.020	0.080	0.71	10311	1072	45°
1.00	2	29	0.058	0.030	0.090	0.91	10144	1177	45°
1.50	2	29	0.068	0.030	0.105	1.32	6993	951	45°
2.00	2	29	0.078	0.040	0.120	1.75	5275	823	45°
2.50	2	29	0.088	0.040	0.135	2.15	4293	756	45°
3.00	2	29	0.098	0.050	0.150	2.59	3564	699	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	21	0.042	0.020	0.065	0.46	14532	1221	45°
0.60	2	21	0.046	0.020	0.070	0.55	12154	1118	45°
0.80	2	21	0.052	0.020	0.080	0.71	9415	979	45°
1.00	2	26	0.058	0.030	0.090	0.91	9095	1055	45°
1.50	2	26	0.068	0.030	0.105	1.32	6270	853	45°
2.00	2	26	0.078	0.040	0.120	1.75	4729	738	45°
2.50	2	26	0.088	0.040	0.135	2.15	3849	677	45°
3.00	2	26	0.098	0.050	0.150	2.59	3195	626	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	19	0.042	0.020	0.065	0.46	13148	1104	45°
0.60	2	19	0.046	0.020	0.070	0.55	10996	1012	45°
0.80	2	19	0.052	0.020	0.080	0.71	8518	886	45°
1.00	2	24	0.058	0.030	0.090	0.91	8395	974	45°
1.50	2	24	0.068	0.030	0.105	1.32	5787	787	45°
2.00	2	24	0.078	0.040	0.120	1.75	4365	681	45°
2.50	2	24	0.088	0.040	0.135	2.15	3553	625	45°
3.00	2	24	0.098	0.050	0.150	2.59	2950	578	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	10	0.042	0.020	0.065	0.46	6920	581	45°
0.60	2	10	0.046	0.020	0.070	0.55	5787	532	45°
0.80	2	10	0.052	0.020	0.080	0.71	4483	466	45°
1.00	2	12	0.058	0.030	0.090	0.91	4197	487	45°
1.50	2	12	0.068	0.030	0.105	1.32	2894	394	45°
2.00	2	12	0.078	0.040	0.120	1.75	2183	341	45°
2.50	2	12	0.088	0.040	0.135	2.15	1777	313	45°
3.00	2	12	0.098	0.050	0.150	2.59	1475	289	45°

Ball nose end mills MicroX

Shank ø 6mm, conical neck 0.9°, 20xd

HM XA	λ 30° γ -10°



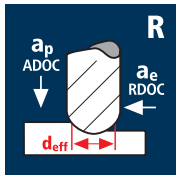
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6774** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r ±0.005	z	X-AL	X6774
050	0.50	6.00	0.45	0.75	61	0.40	10.00	10.00	19.93	0.9°	0.250	2		●
060	0.60	6.00	0.55	0.91	66	0.50	12.00	12.00	21.63	0.9°	0.300	2		●
080	0.80	6.00	0.75	1.23	69	0.65	16.00	16.00	25.03	0.9°	0.400	2		●
100	1.00	6.00	0.95	1.55	69	0.80	20.00	20.00	28.44	0.9°	0.500	2		●
120	1.50	6.00	1.40	2.30	80	1.20	30.00	30.00	37.04	0.9°	0.750	2		●
140	2.00	6.00	1.90	3.11	87	1.60	40.00	40.00	45.52	0.9°	1.000	2		●
160	2.50	6.00	2.30	3.81	100	2.00	50.00	50.00	54.22	0.9°	1.250	2		●
180	3.00	6.00	2.80	4.61	100	2.40	60.00	60.00	62.73	0.9°	1.500	2		●

Application



Material

Steel
850 - 1100 N/mm²

X
X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	14	0.005	0.016	0.070	0.11	40512	429	0.5
0.30	2	21	0.008	0.024	0.105	0.16	41778	668	1.7
0.40	2	34	0.013	0.048	0.120	0.26	41625	1057	6.1
0.50	2	43	0.016	0.060	0.150	0.32	42773	1360	12.3
0.60	2	51	0.019	0.072	0.180	0.39	41625	1590	20.6
0.80	2	69	0.026	0.096	0.240	0.52	42237	2154	49.7
1.00	2	86	0.032	0.120	0.300	0.65	42115	2679	96.5
1.50	2	145	0.054	0.240	0.375	1.10	41959	4523	407.1
2.00	2	160	0.072	0.320	0.500	1.47	34646	4982	797.2

Hardened tool steel
52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	14	0.003	0.016	0.070	0.11	40512	203	0.3
0.30	2	21	0.004	0.024	0.105	0.16	41778	309	0.8
0.40	2	34	0.006	0.048	0.120	0.26	41625	500	2.9
0.50	2	43	0.008	0.060	0.150	0.32	42773	642	5.8
0.60	2	51	0.009	0.072	0.180	0.39	41625	749	9.7
0.80	2	69	0.012	0.096	0.240	0.52	42237	1014	23.4
1.00	2	86	0.015	0.120	0.300	0.65	42115	1255	45.2
1.50	2	90	0.025	0.240	0.375	1.10	26044	1318	118.6
2.00	2	90	0.034	0.320	0.500	1.47	19488	1314	210.2

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

X

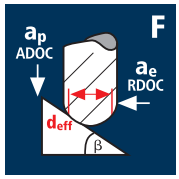
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.003	0.010	0.060	0.09	42441	246	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	358	0.5
0.40	2	23	0.006	0.020	0.120	0.17	43065	500	1.2
0.50	2	36	0.009	0.040	0.125	0.27	42441	764	3.8
0.60	2	43	0.011	0.048	0.150	0.33	41477	888	6.4
0.80	2	57	0.014	0.064	0.200	0.43	42195	1207	15.5
1.00	2	72	0.018	0.080	0.250	0.54	42441	1519	30.4
1.50	2	100	0.032	0.180	0.300	0.97	32815	2113	114.1
2.00	2	100	0.043	0.240	0.400	1.30	24485	2101	201.7

Titanium alloys
> 300 HB
[Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.003	0.010	0.060	0.09	42441	255	0.2
0.30	2	17	0.004	0.015	0.090	0.13	41625	366	0.5
0.40	2	23	0.006	0.020	0.120	0.17	43065	508	1.2
0.50	2	36	0.009	0.040	0.125	0.27	42441	781	3.9
0.60	2	43	0.011	0.048	0.150	0.33	41477	921	6.7
0.80	2	57	0.015	0.064	0.200	0.43	42195	1249	16.0
1.00	2	72	0.018	0.080	0.250	0.54	42441	1562	31.3
1.50	2	75	0.033	0.180	0.300	0.97	24612	1629	88.0
2.00	2	75	0.044	0.240	0.400	1.30	18364	1623	155.9

Application



Material

Steel
850 - 1100 N/mm²

X
X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.30	2	33	0.033	0.010	0.050	0.27	38905	2568	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	156	0.068	0.030	0.105	1.32	37618	5116	45°
2.00	2	208	0.078	0.040	0.120	1.75	37833	5902	45°

Hardened tool steel
52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.30	2	33	0.033	0.010	0.050	0.27	38905	2568	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	144	0.068	0.030	0.105	1.32	34725	4723	45°
2.00	2	144	0.078	0.040	0.120	1.75	26192	4086	45°

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.30	2	33	0.033	0.010	0.050	0.27	38905	2568	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	144	0.068	0.030	0.105	1.32	34725	4723	45°
2.00	2	144	0.078	0.040	0.120	1.75	26192	4086	45°

Titanium alloys
> 300 HB
[Ti6Al4V]

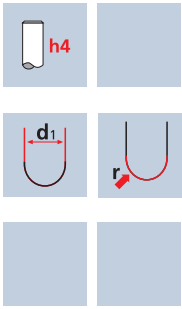
X

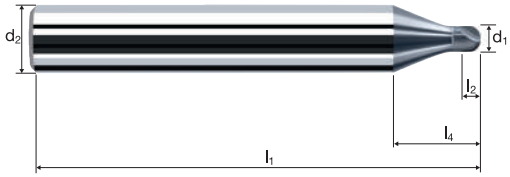
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.30	2	33	0.033	0.010	0.050	0.27	38905	2568	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	108	0.068	0.030	0.105	1.32	26044	3542	45°
2.00	2	108	0.078	0.040	0.120	1.75	19644	3065	45°

Ball nose end mills Microcut

Shank ø 4mm, 1xd

HM XA	λ 0° γ 0°



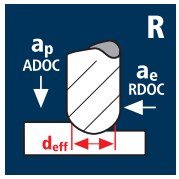


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6832** ø-Code **020**

Ø Code	d_1	d_2 h4	l_1	l_2	l_4	r ±0.005	z	X-AL	X6832
020	0.20	4.00	50	0.12	11.06	0.100	2		●
030	0.30	4.00	50	0.18	10.88	0.150	2		●
040	0.40	4.00	50	0.24	10.70	0.200	2		●
050	0.50	4.00	50	0.30	7.16	0.250	2		●
060	0.60	4.00	50	0.36	7.08	0.300	2		●
080	0.80	4.00	50	0.48	6.90	0.400	2		●
100	1.00	4.00	50	0.60	6.73	0.500	2		●
120	1.50	4.00	50	0.90	6.30	0.750	2		●
140	2.00	4.00	50	1.20	5.86	1.000	2		●

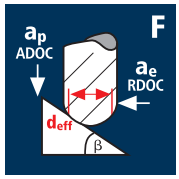
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm² — X X									
0.20	2	14	0.005	0.016	0.070	0.11	40512	429	0.5
0.40	2	34	0.013	0.048	0.120	0.26	41625	1057	6.1
0.50	2	43	0.016	0.060	0.150	0.32	42773	1360	12.3
0.80	2	69	0.026	0.096	0.240	0.52	42237	2154	49.7
1.00	2	86	0.032	0.120	0.300	0.65	42115	2679	96.5
1.50	2	145	0.054	0.240	0.375	1.10	41959	4523	407.1
2.00	2	160	0.072	0.320	0.500	1.47	34646	4982	797.2
2.50	2	160	0.090	0.400	0.625	1.83	27830	4998	1249.6
3.00	2	160	0.108	0.480	0.750	2.20	23150	4991	1796.8
Hardened tool steel 52 - 56 HRC — X									
0.20	2	14	0.003	0.016	0.070	0.11	40512	203	0.3
0.40	2	34	0.006	0.048	0.120	0.26	41625	500	2.9
0.50	2	43	0.008	0.060	0.150	0.32	42773	642	5.8
0.80	2	69	0.012	0.096	0.240	0.52	42237	1014	23.4
1.00	2	86	0.015	0.120	0.300	0.65	42115	1255	45.2
1.50	2	90	0.025	0.240	0.375	1.10	26044	1318	118.6
2.00	2	90	0.034	0.320	0.500	1.47	19488	1314	210.2
2.50	2	90	0.042	0.400	0.625	1.83	15655	1321	330.4
3.00	2	90	0.051	0.480	0.750	2.20	13022	1318	474.4
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] — X									
0.20	2	12	0.003	0.010	0.060	0.09	42441	246	0.2
0.40	2	23	0.006	0.020	0.120	0.17	43065	500	1.2
0.50	2	36	0.009	0.040	0.125	0.27	42441	764	3.8
0.80	2	57	0.014	0.064	0.200	0.43	42195	1207	15.5
1.00	2	72	0.018	0.080	0.250	0.54	42441	1519	30.4
1.50	2	100	0.032	0.180	0.300	0.97	32815	2113	114.1
2.00	2	100	0.043	0.240	0.400	1.30	24485	2101	201.7
2.50	2	100	0.054	0.300	0.500	1.62	19649	2106	316.0
3.00	2	100	0.064	0.360	0.600	1.95	16324	2099	453.5
Titanium alloys > 300 HB [Ti6Al4V] — X									
0.20	2	12	0.003	0.010	0.060	0.09	42441	255	0.2
0.40	2	23	0.006	0.020	0.120	0.17	43065	508	1.2
0.50	2	36	0.009	0.040	0.125	0.27	42441	781	3.9
0.80	2	57	0.015	0.064	0.200	0.43	42195	1249	16.0
1.00	2	72	0.018	0.080	0.250	0.54	42441	1562	31.3
1.50	2	75	0.033	0.180	0.300	0.97	24612	1629	88.0
2.00	2	75	0.044	0.240	0.400	1.30	18364	1623	155.9
2.50	2	75	0.055	0.300	0.500	1.62	14737	1627	244.1
3.00	2	75	0.066	0.360	0.600	1.95	12243	1623	350.7

Application



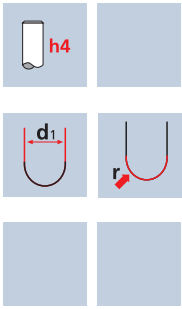
Material

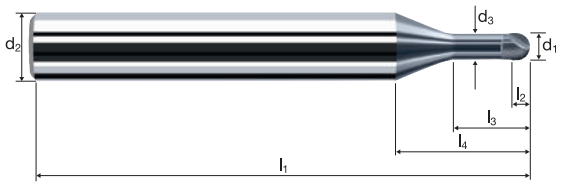
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm² — X X									
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	156	0.068	0.030	0.105	1.32	37618	5116	45°
2.00	2	208	0.078	0.040	0.120	1.75	37833	5902	45°
2.50	2	230	0.088	0.040	0.135	2.15	34052	5993	45°
3.00	2	230	0.098	0.050	0.150	2.59	28267	5540	45°
Hardened tool steel 52 - 56 HRC — X									
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	144	0.068	0.030	0.105	1.32	34725	4723	45°
2.00	2	144	0.078	0.040	0.120	1.75	26192	4086	45°
2.50	2	144	0.088	0.040	0.135	2.15	21319	3752	45°
3.00	2	144	0.098	0.050	0.150	2.59	17698	3469	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] — X									
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	144	0.068	0.030	0.105	1.32	34725	4723	45°
2.00	2	144	0.078	0.040	0.120	1.75	26192	4086	45°
2.50	2	144	0.088	0.040	0.135	2.15	21319	3752	45°
3.00	2	144	0.098	0.050	0.150	2.59	17698	3469	45°
Titanium alloys > 300 HB [Ti6Al4V] — X									
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	108	0.068	0.030	0.105	1.32	26044	3542	45°
2.00	2	108	0.078	0.040	0.120	1.75	19644	3065	45°
2.50	2	108	0.088	0.040	0.135	2.15	15990	2814	45°
3.00	2	108	0.098	0.050	0.150	2.59	13273	2602	45°

Ball nose end mills Microcut

Shank ø 4mm, cylindrical neck, 3xd

HM XA	λ 0° γ 0°



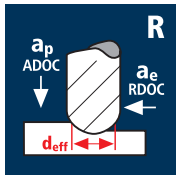


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6836** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z		X-AL X6836
020	0.20	4.00	0.18	50	0.12	0.60	0.70	11.52	0.100	2		●
030	0.30	4.00	0.25	50	0.18	0.90	1.10	11.62	0.150	2		●
040	0.40	4.00	0.35	50	0.24	1.20	1.40	11.64	0.200	2		●
050	0.50	4.00	0.45	50	0.30	1.50	1.70	8.26	0.250	2		●
060	0.60	4.00	0.55	50	0.36	1.80	2.00	8.37	0.300	2		●
080	0.80	4.00	0.75	50	0.48	2.40	2.60	8.60	0.400	2		●
100	1.00	4.00	0.95	50	0.60	3.00	3.20	8.82	0.500	2		●
108	1.20	4.00	1.10	50	0.72	3.60	3.90	9.14	0.600	2		●
120	1.50	4.00	1.40	50	0.90	4.50	4.80	9.48	0.750	2		●
140	2.00	4.00	1.90	50	1.20	6.00	6.30	10.05	1.000	2		●
160	2.50	4.00	2.30	50	1.50	7.50	7.93	10.80	1.250	2		●
180	3.00	4.00	2.80	50	1.80	9.00	9.43	11.37	1.500	2		●

Application



Material

Steel
850 - 1100 N/mm²

X
X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.004	0.010	0.070	0.09	42441	314	0.2
0.40	2	32	0.010	0.040	0.120	0.24	42441	874	4.2
0.50	2	40	0.013	0.050	0.150	0.30	42441	1095	8.2
0.80	2	63	0.021	0.080	0.240	0.48	41778	1721	33.1
1.00	2	79	0.026	0.100	0.300	0.60	41911	2163	64.9
1.50	2	133	0.043	0.195	0.375	1.01	41916	3638	266.1
2.00	2	145	0.058	0.260	0.500	1.35	34189	3952	513.8
2.50	2	145	0.072	0.325	0.625	1.68	27473	3973	807.0
3.00	2	145	0.087	0.390	0.750	2.02	22849	3967	1160.3

Hardened tool steel
52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	12	0.003	0.010	0.070	0.09	42441	221	0.2
0.40	2	32	0.007	0.040	0.120	0.24	42441	611	3.0
0.50	2	40	0.009	0.050	0.150	0.30	42441	764	5.8
0.80	2	63	0.014	0.080	0.240	0.48	41778	1203	23.1
1.00	2	70	0.018	0.100	0.300	0.60	37136	1337	40.1
1.50	2	70	0.030	0.195	0.375	1.01	22061	1337	97.8
2.00	2	70	0.040	0.260	0.500	1.35	16505	1334	173.4
2.50	2	70	0.050	0.325	0.625	1.68	13263	1337	271.6
3.00	2	70	0.061	0.390	0.750	2.02	11031	1335	390.5

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

X

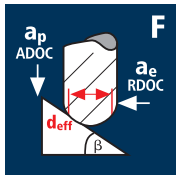
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	9	0.002	0.006	0.060	0.07	40926	188	0.1
0.40	2	18	0.005	0.012	0.120	0.14	40926	368	0.6
0.50	2	36	0.009	0.040	0.125	0.27	42441	764	3.8
0.80	2	57	0.014	0.064	0.200	0.43	42195	1207	15.5
1.00	2	70	0.018	0.080	0.250	0.54	41262	1477	29.6
1.50	2	70	0.033	0.195	0.300	1.01	22061	1469	86.0
2.00	2	70	0.044	0.260	0.400	1.35	16505	1466	152.4
2.50	2	70	0.056	0.325	0.500	1.68	13263	1472	239.3
3.00	2	70	0.067	0.390	0.600	2.02	11031	1469	343.8

Titanium alloys
> 300 HB
[Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.20	2	9	0.002	0.006	0.060	0.07	40926	188	0.1
0.40	2	18	0.005	0.012	0.120	0.14	40926	368	0.6
0.50	2	36	0.009	0.040	0.125	0.27	42441	764	3.8
0.80	2	45	0.014	0.064	0.200	0.43	33311	953	12.2
1.00	2	45	0.018	0.080	0.250	0.54	26526	950	19.0
1.50	2	45	0.033	0.195	0.300	1.01	14182	945	55.3
2.00	2	45	0.044	0.260	0.400	1.35	10610	942	98.0
2.50	2	45	0.056	0.325	0.500	1.68	8526	946	153.8
3.00	2	45	0.067	0.390	0.600	2.02	7091	945	221.0

Application



Material

Steel
850 - 1100 N/mm²

X
X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	156	0.068	0.030	0.105	1.32	37618	5116	45°
2.00	2	207	0.078	0.040	0.120	1.75	37652	5874	45°
2.50	2	207	0.088	0.040	0.135	2.15	30647	5394	45°
3.00	2	207	0.098	0.050	0.150	2.59	25440	4986	45°

Hardened tool steel
52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	130	0.068	0.030	0.105	1.32	31349	4264	45°
2.00	2	130	0.078	0.040	0.120	1.75	23646	3689	45°
2.50	2	130	0.088	0.040	0.135	2.15	19247	3388	45°
3.00	2	130	0.098	0.050	0.150	2.59	15977	3132	45°

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	130	0.068	0.030	0.105	1.32	31349	4264	45°
2.00	2	130	0.078	0.040	0.120	1.75	23646	3689	45°
2.50	2	130	0.088	0.040	0.135	2.15	19247	3388	45°
3.00	2	130	0.098	0.050	0.150	2.59	15977	3132	45°

Titanium alloys
> 300 HB
[Ti6Al4V]

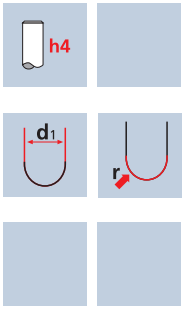
X

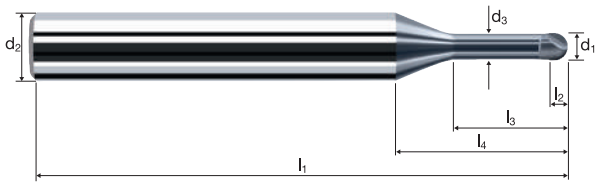
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.20	2	22	0.026	0.010	0.040	0.19	36857	1917	45°
0.40	2	42	0.037	0.010	0.057	0.36	37136	2748	45°
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	97	0.058	0.030	0.090	0.91	33930	3936	45°
1.50	2	97	0.068	0.030	0.105	1.32	23391	3181	45°
2.00	2	97	0.078	0.040	0.120	1.75	17643	2752	45°
2.50	2	97	0.088	0.040	0.135	2.15	14361	2528	45°
3.00	2	97	0.098	0.050	0.150	2.59	11921	2337	45°

Ball nose end mills Microcut

Shank ø 4mm, cylindrical neck, 5xd

HM XA	λ 0° γ 0°



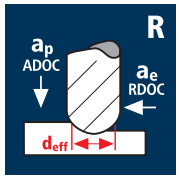


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6840** ø-Code **020**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z		X-AL
												X6840
020	0.20	4.00	0.18	50	0.12	1.00	1.10	11.92	0.100	2		●
030	0.30	4.00	0.25	50	0.18	1.50	1.70	12.22	0.150	2		●
040	0.40	4.00	0.35	50	0.24	2.00	2.20	12.44	0.200	2		●
050	0.50	4.00	0.45	50	0.30	2.50	2.70	9.26	0.250	2		●
060	0.60	4.00	0.55	50	0.36	3.00	3.20	9.57	0.300	2		●
080	0.80	4.00	0.75	50	0.48	4.00	4.20	10.20	0.400	2		●
100	1.00	4.00	0.95	50	0.60	5.00	5.20	10.82	0.500	2		●
108	1.20	4.00	1.10	50	0.72	6.00	6.30	11.54	0.600	2		●
120	1.50	4.00	1.40	50	0.90	7.50	7.80	12.48	0.750	2		●
140	2.00	4.00	1.90	50	1.20	10.00	10.30	14.05	1.000	2		●
160	2.50	4.00	2.30	50	1.50	12.50	12.93	15.80	1.250	2		●
180	3.00	4.00	2.80	50	1.80	15.00	15.43	17.37	1.500	2		●

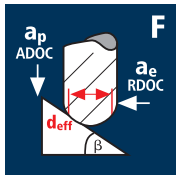
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm² — X X									
0.50	2	29	0.009	0.025	0.110	0.22	41959	747	2.1
0.60	2	35	0.011	0.030	0.132	0.26	42849	917	3.7
0.80	2	46	0.014	0.040	0.176	0.35	41835	1197	8.4
1.00	2	58	0.018	0.050	0.220	0.44	41959	1502	16.5
1.20	2	86	0.027	0.096	0.204	0.65	42115	2249	44.1
1.50	2	107	0.033	0.120	0.255	0.81	42048	2809	86.0
2.00	2	120	0.045	0.160	0.340	1.09	35043	3119	169.7
2.50	2	120	0.056	0.200	0.425	1.36	28086	3123	265.5
3.00	2	120	0.067	0.240	0.510	1.63	23434	3126	382.7
Hardened tool steel 52 - 56 HRC — X									
0.50	2	29	0.006	0.025	0.110	0.22	41959	529	1.5
0.60	2	35	0.008	0.030	0.132	0.26	42849	651	2.6
0.80	2	46	0.010	0.040	0.176	0.35	41835	845	6.0
1.00	2	58	0.013	0.050	0.220	0.44	41959	1057	11.7
1.20	2	60	0.019	0.096	0.204	0.65	29382	1111	21.8
1.50	2	60	0.024	0.120	0.255	0.81	23579	1113	34.1
2.00	2	60	0.032	0.160	0.340	1.09	17522	1104	60.1
2.50	2	60	0.039	0.200	0.425	1.36	14043	1104	93.8
3.00	2	60	0.047	0.240	0.510	1.63	11717	1106	135.4
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] — X									
0.50	2	29	0.007	0.025	0.110	0.22	41959	546	1.5
0.60	2	35	0.008	0.030	0.132	0.26	42849	668	2.7
0.80	2	46	0.011	0.040	0.176	0.35	41835	879	6.2
1.00	2	58	0.013	0.050	0.220	0.44	41959	1099	12.1
1.20	2	60	0.020	0.096	0.204	0.65	29382	1146	22.5
1.50	2	60	0.024	0.120	0.255	0.81	23579	1151	35.2
2.00	2	60	0.033	0.160	0.340	1.09	17522	1142	62.2
2.50	2	60	0.041	0.200	0.425	1.36	14043	1143	97.2
3.00	2	60	0.049	0.240	0.510	1.63	11717	1144	140.0
Titanium alloys > 300 HB [Ti6Al4V] — X									
0.50	2	29	0.007	0.025	0.110	0.22	41959	587	1.6
0.60	2	35	0.008	0.030	0.132	0.26	42849	720	2.9
0.80	2	40	0.011	0.040	0.176	0.35	36378	815	5.8
1.00	2	40	0.014	0.050	0.220	0.44	28937	804	8.9
1.20	2	40	0.021	0.096	0.204	0.65	19588	815	16.0
1.50	2	40	0.026	0.120	0.255	0.81	15719	817	25.0
2.00	2	40	0.035	0.160	0.340	1.09	11681	811	44.1
2.50	2	40	0.043	0.200	0.425	1.36	9362	813	69.1
3.00	2	40	0.052	0.240	0.510	1.63	7811	814	99.6

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm² — X X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.20	2	127	0.062	0.030	0.095	1.07	37781	4685	45°
1.50	2	156	0.068	0.030	0.105	1.32	37618	5116	45°
2.00	2	173	0.078	0.040	0.120	1.75	31467	4909	45°
2.50	2	173	0.088	0.040	0.135	2.15	25613	4508	45°
3.00	2	173	0.098	0.050	0.150	2.59	21262	4167	45°
Hardened tool steel 52 - 56 HRC — X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.20	2	108	0.062	0.030	0.095	1.07	32128	3984	45°
1.50	2	108	0.068	0.030	0.105	1.32	26044	3542	45°
2.00	2	108	0.078	0.040	0.120	1.75	19644	3065	45°
2.50	2	108	0.088	0.040	0.135	2.15	15990	2814	45°
3.00	2	108	0.098	0.050	0.150	2.59	13273	2602	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] — X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.20	2	108	0.062	0.030	0.095	1.07	32128	3984	45°
1.50	2	108	0.068	0.030	0.105	1.32	26044	3542	45°
2.00	2	108	0.078	0.040	0.120	1.75	19644	3065	45°
2.50	2	108	0.088	0.040	0.135	2.15	15990	2814	45°
3.00	2	108	0.098	0.050	0.150	2.59	13273	2602	45°
Titanium alloys > 300 HB [Ti6Al4V] — X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	65	0.052	0.020	0.080	0.71	29141	3031	45°
1.00	2	81	0.058	0.030	0.090	0.91	28333	3287	45°
1.20	2	81	0.062	0.030	0.095	1.07	24096	2988	45°
1.50	2	81	0.068	0.030	0.105	1.32	19533	2657	45°
2.00	2	81	0.078	0.040	0.120	1.75	14733	2298	45°
2.50	2	81	0.088	0.040	0.135	2.15	11992	2111	45°
3.00	2	81	0.098	0.050	0.150	2.59	9955	1951	45°

Ball nose end mills Microcut

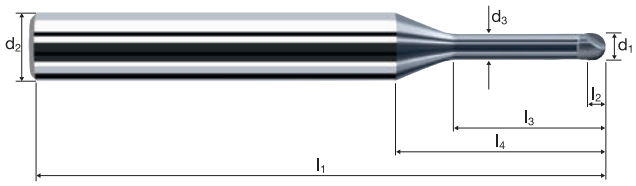
Shank ø 4mm, cylindrical neck, 8xd

HM XA	λ 0° γ 0°

h4

d1

r

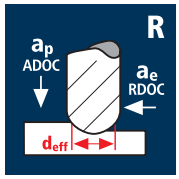


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6844** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6844
050	0.50	4.00	0.45	50	0.30	4.00	4.20	10.76	0.250	2		●
060	0.60	4.00	0.55	50	0.36	4.80	5.00	11.37	0.300	2		●
080	0.80	4.00	0.75	50	0.48	6.40	6.60	12.60	0.400	2		●
100	1.00	4.00	0.95	50	0.60	8.00	8.20	13.82	0.500	2		●
108	1.20	4.00	1.10	50	0.72	9.60	9.90	15.14	0.600	2		●
120	1.50	4.00	1.40	50	0.90	12.00	12.30	16.98	0.750	2		●
140	2.00	4.00	1.90	50	1.20	16.00	16.30	20.05	1.000	2		●
160	2.50	4.00	2.30	57	1.50	20.00	20.43	23.30	1.250	2		●
180	3.00	4.00	2.80	57	1.80	24.00	24.43	26.37	1.500	2		●

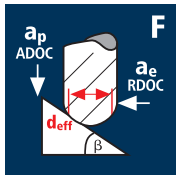
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm² — X / X									
0.50	2	26	0.007	0.020	0.100	0.20	41380	596	1.2
0.60	2	31	0.009	0.024	0.120	0.24	41115	715	2.1
0.80	2	41	0.012	0.032	0.160	0.31	42099	977	5.0
1.00	2	52	0.015	0.040	0.200	0.39	42441	1231	9.9
1.50	2	101	0.028	0.105	0.225	0.77	41752	2355	55.7
2.00	2	108	0.038	0.140	0.300	1.02	33703	2541	106.8
2.50	2	108	0.047	0.175	0.375	1.28	26857	2530	166.0
3.00	2	108	0.057	0.210	0.450	1.53	22469	2539	240.0
Hardened tool steel 52 - 56 HRC — X									
0.50	2	26	0.005	0.020	0.100	0.20	41380	422	0.9
0.60	2	31	0.006	0.024	0.120	0.24	41115	502	1.5
0.80	2	41	0.008	0.032	0.160	0.31	42099	690	3.6
1.00	2	52	0.010	0.040	0.200	0.39	42441	866	7.0
1.50	2	54	0.020	0.105	0.225	0.77	22323	893	21.1
2.00	2	54	0.027	0.140	0.300	1.02	16852	897	37.7
2.50	2	54	0.033	0.175	0.375	1.28	13429	894	58.7
3.00	2	54	0.040	0.210	0.450	1.53	11234	899	85.0
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] — X									
0.50	2	26	0.005	0.020	0.100	0.20	41380	439	0.9
0.60	2	31	0.006	0.024	0.120	0.24	41115	518	1.5
0.80	2	41	0.009	0.032	0.160	0.31	42099	716	3.7
1.00	2	52	0.011	0.040	0.200	0.39	42441	900	7.2
1.50	2	54	0.021	0.105	0.225	0.77	22323	924	21.9
2.00	2	54	0.028	0.140	0.300	1.02	16852	930	39.1
2.50	2	54	0.034	0.175	0.375	1.28	13429	924	60.7
3.00	2	54	0.041	0.210	0.450	1.53	11234	928	87.7
Titanium alloys > 300 HB [Ti6Al4V] — X									
0.50	2	26	0.006	0.020	0.100	0.20	41380	464	1.0
0.60	2	31	0.007	0.024	0.120	0.24	41115	559	1.6
0.80	2	36	0.009	0.032	0.160	0.31	36965	665	3.4
1.00	2	36	0.011	0.040	0.200	0.39	29382	664	5.3
1.50	2	36	0.022	0.105	0.225	0.77	14882	655	15.5
2.00	2	36	0.029	0.140	0.300	1.02	11234	661	27.8
2.50	2	36	0.037	0.175	0.375	1.28	8952	657	43.1
3.00	2	36	0.044	0.210	0.450	1.53	7490	661	62.5

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm² — X / X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	150	0.068	0.030	0.105	1.32	36172	4919	45°
2.00	2	150	0.078	0.040	0.120	1.75	27284	4256	45°
2.50	2	150	0.088	0.040	0.135	2.15	22208	3909	45°
3.00	2	150	0.098	0.050	0.150	2.59	18435	3613	45°
Hardened tool steel 52 - 56 HRC — X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	94	0.058	0.030	0.090	0.91	32880	3814	45°
1.50	2	94	0.068	0.030	0.105	1.32	22668	3083	45°
2.00	2	94	0.078	0.040	0.120	1.75	17098	2667	45°
2.50	2	94	0.088	0.040	0.135	2.15	13917	2449	45°
3.00	2	94	0.098	0.050	0.150	2.59	11553	2264	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] — X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	85	0.052	0.020	0.080	0.71	38108	3963	45°
1.00	2	94	0.058	0.030	0.090	0.91	32880	3814	45°
1.50	2	94	0.068	0.030	0.105	1.32	22668	3083	45°
2.00	2	94	0.078	0.040	0.120	1.75	17098	2667	45°
2.50	2	94	0.088	0.040	0.135	2.15	13917	2449	45°
3.00	2	94	0.098	0.050	0.150	2.59	11553	2264	45°
Titanium alloys > 300 HB [Ti6Al4V] — X									
0.50	2	55	0.042	0.020	0.065	0.46	38059	3197	45°
0.60	2	65	0.046	0.020	0.070	0.55	37618	3461	45°
0.80	2	56	0.052	0.020	0.080	0.71	25106	2611	45°
1.00	2	70	0.058	0.030	0.090	0.91	24485	2840	45°
1.50	2	70	0.068	0.030	0.105	1.32	16880	2296	45°
2.00	2	70	0.078	0.040	0.120	1.75	12732	1986	45°
2.50	2	70	0.088	0.040	0.135	2.15	10364	1824	45°
3.00	2	70	0.098	0.050	0.150	2.59	8603	1686	45°

Ball nose end mills Microcut

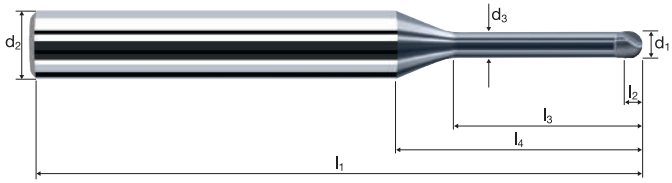
Shank ø 4mm, cylindrical neck, 10xd

HM XA	λ 0° γ 0°

h4

d1

r

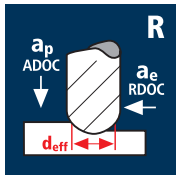


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6846** ø-Code **050**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	X-AL	X6846
050	0.50	4.00	0.45	50	0.30	5.00	5.20	11.76	0.250	2		●
060	0.60	4.00	0.55	50	0.36	6.00	6.20	12.57	0.300	2		●
080	0.80	4.00	0.75	50	0.48	8.00	8.20	14.20	0.400	2		●
100	1.00	4.00	0.95	50	0.60	10.00	10.20	15.82	0.500	2		●
120	1.50	4.00	1.40	50	0.90	15.00	15.30	19.98	0.750	2		●
140	2.00	4.00	1.90	57	1.20	20.00	20.30	24.05	1.000	2		●
160	2.50	4.00	2.30	57	1.50	25.00	25.43	28.30	1.250	2		●
180	3.00	4.00	2.80	61	1.80	30.00	30.43	32.37	1.500	2		●

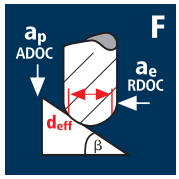
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm²									
1.00	2	37	0.010	0.020	0.150	0.28	42062	824	2.5
1.50	2	78	0.021	0.060	0.150	0.59	42082	1734	15.6
2.00	2	97	0.028	0.080	0.200	0.78	39585	2177	34.9
3.00	2	97	0.041	0.120	0.300	1.18	26166	2156	77.6
Hardened tool steel 52 - 56 HRC									
1.00	2	37	0.007	0.020	0.150	0.28	42062	581	1.8
1.50	2	49	0.015	0.060	0.150	0.59	26436	772	7.0
2.00	2	49	0.019	0.080	0.200	0.78	19996	776	12.4
3.00	2	49	0.029	0.120	0.300	1.18	13218	772	27.8
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	37	0.007	0.020	0.150	0.28	42062	606	1.8
1.50	2	49	0.015	0.060	0.150	0.59	26436	798	7.2
2.00	2	49	0.020	0.080	0.200	0.78	19996	804	12.9
3.00	2	49	0.030	0.120	0.300	1.18	13218	798	28.8
Titanium alloys > 300 HB [Ti6Al4V]									
1.00	2	32	0.008	0.020	0.150	0.28	36378	560	1.7
1.50	2	32	0.016	0.060	0.150	0.59	17264	556	5.0
2.00	2	32	0.021	0.080	0.200	0.78	13059	559	9.0
3.00	2	32	0.032	0.120	0.300	1.18	8632	556	20.0

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
1.00	2	108	0.058	0.030	0.090	0.91	37777	4382	45°
1.50	2	127	0.068	0.030	0.105	1.32	30625	4165	45°
2.00	2	127	0.078	0.040	0.120	1.75	23100	3604	45°
3.00	2	127	0.098	0.050	0.150	2.59	15608	3059	45°
Hardened tool steel 52 - 56 HRC									
1.00	2	79	0.058	0.030	0.090	0.91	27633	3205	45°
1.50	2	79	0.068	0.030	0.105	1.32	19050	2591	45°
2.00	2	79	0.078	0.040	0.120	1.75	14369	2242	45°
3.00	2	79	0.098	0.050	0.150	2.59	9709	1903	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	79	0.058	0.030	0.090	0.91	27633	3205	45°
1.50	2	79	0.068	0.030	0.105	1.32	19050	2591	45°
2.00	2	79	0.078	0.040	0.120	1.75	14369	2242	45°
3.00	2	79	0.098	0.050	0.150	2.59	9709	1903	45°
Titanium alloys > 300 HB [Ti6Al4V]									
1.00	2	59	0.058	0.030	0.090	0.91	20638	2394	45°
1.50	2	59	0.068	0.030	0.105	1.32	14227	1935	45°
2.00	2	59	0.078	0.040	0.120	1.75	10732	1674	45°
3.00	2	59	0.098	0.050	0.150	2.59	7251	1421	45°

Ball nose end mills Microcut

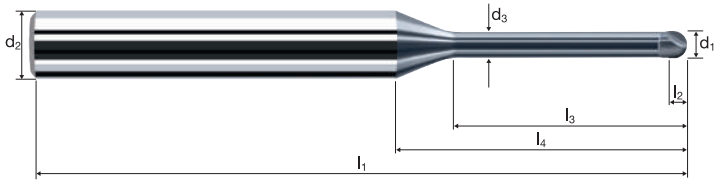
Shank ø 4mm, cylindrical neck, 12xd

HM XA	λ 0° γ 0°

h4

d1

r

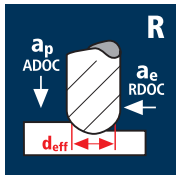


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6847** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z		X-AL
												X6847
100	1.00	4.00	0.95	50	0.60	12.00	12.20	17.82	0.500	2		●
120	1.50	4.00	1.40	57	0.90	18.00	18.30	22.98	0.750	2		●
140	2.00	4.00	1.90	57	1.20	24.00	24.30	28.05	1.000	2		●
180	3.00	4.00	2.80	75	1.80	36.00	36.43	38.37	1.500	2		●

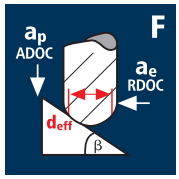
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm²									
1.00	2	37	0.009	0.020	0.150	0.28	42062	782	2.4
1.50	2	78	0.020	0.060	0.150	0.59	42082	1650	14.9
2.00	2	87	0.026	0.080	0.200	0.78	35504	1853	29.7
3.00	2	87	0.039	0.120	0.300	1.18	23469	1840	66.3
Hardened tool steel 52 - 56 HRC									
1.00	2	37	0.007	0.020	0.150	0.28	42062	555	1.7
1.50	2	44	0.014	0.060	0.150	0.59	23738	655	5.9
2.00	2	44	0.019	0.080	0.200	0.78	17956	664	10.7
3.00	2	44	0.028	0.120	0.300	1.18	11869	658	23.7
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	37	0.007	0.020	0.150	0.28	42062	572	1.7
1.50	2	44	0.014	0.060	0.150	0.59	23738	679	6.1
2.00	2	44	0.019	0.080	0.200	0.78	17956	686	11.0
3.00	2	44	0.029	0.120	0.300	1.18	11869	681	24.6
Titanium alloys > 300 HB [Ti6Al4V]									
1.00	2	29	0.007	0.020	0.150	0.28	32968	481	1.5
1.50	2	29	0.015	0.060	0.150	0.59	15646	479	4.3
2.00	2	29	0.020	0.080	0.200	0.78	11835	483	7.8
3.00	2	29	0.031	0.120	0.300	1.18	7823	479	17.3

Application



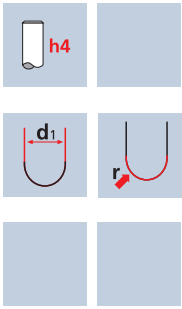
Material

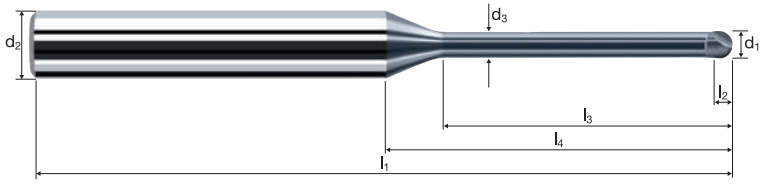
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
1.00	2	92	0.058	0.030	0.090	0.91	32181	3733	45°
1.50	2	92	0.068	0.030	0.105	1.32	22185	3017	45°
2.00	2	92	0.078	0.040	0.120	1.75	16734	2611	45°
3.00	2	92	0.098	0.050	0.150	2.59	11307	2216	45°
Hardened tool steel 52 - 56 HRC									
1.00	2	58	0.058	0.030	0.090	0.91	20288	2353	45°
1.50	2	58	0.068	0.030	0.105	1.32	13986	1902	45°
2.00	2	58	0.078	0.040	0.120	1.75	10550	1646	45°
3.00	2	58	0.098	0.050	0.150	2.59	7128	1397	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	58	0.058	0.030	0.090	0.91	20288	2353	45°
1.50	2	58	0.068	0.030	0.105	1.32	13986	1902	45°
2.00	2	58	0.078	0.040	0.120	1.75	10550	1646	45°
3.00	2	58	0.098	0.050	0.150	2.59	7128	1397	45°
Titanium alloys > 300 HB [Ti6Al4V]									
1.00	2	43	0.058	0.030	0.090	0.91	15041	1745	45°
1.50	2	43	0.068	0.030	0.105	1.32	10369	1410	45°
2.00	2	43	0.078	0.040	0.120	1.75	7821	1220	45°
3.00	2	43	0.098	0.050	0.150	2.59	5285	1036	45°

Ball nose end mills Microcut

Shank ø 4mm, cylindrical neck, 15xd

HM XA	λ 0° γ 0°



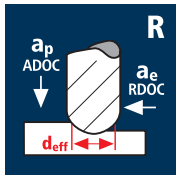


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6848** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z		X-AL
												X6848
100	1.00	4.00	0.95	50	0.60	15.00	15.20	20.82	0.500	2		●
120	1.50	4.00	1.40	57	0.90	22.50	22.80	27.48	0.750	2		●
140	2.00	4.00	1.90	61	1.20	30.00	30.30	34.05	1.000	2		●
180	3.00	4.00	2.80	75	1.80	45.00	45.43	47.37	1.500	2		●

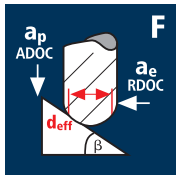
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm²									
1.00	2	32	0.008	0.015	0.100	0.24	42441	654	1.0
1.50	2	55	0.013	0.030	0.150	0.42	41683	1109	5.0
2.00	2	70	0.018	0.040	0.200	0.56	39789	1409	11.3
3.00	2	70	0.027	0.060	0.300	0.84	26526	1411	25.4
Hardened tool steel 52 - 56 HRC									
1.00	2	32	0.005	0.015	0.100	0.24	42441	458	0.7
1.50	2	35	0.009	0.030	0.150	0.42	26526	499	2.3
2.00	2	35	0.013	0.040	0.200	0.56	19894	497	4.0
3.00	2	35	0.019	0.060	0.300	0.84	13263	499	9.0
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	32	0.006	0.015	0.100	0.24	42441	475	0.7
1.50	2	35	0.010	0.030	0.150	0.42	26526	515	2.3
2.00	2	35	0.013	0.040	0.200	0.56	19894	517	4.2
3.00	2	35	0.019	0.060	0.300	0.84	13263	515	9.3
Titanium alloys > 300 HB [Ti6Al4V]									
1.00	2	23	0.006	0.015	0.100	0.24	30505	366	0.6
1.50	2	23	0.010	0.030	0.150	0.42	17431	363	1.7
2.00	2	23	0.014	0.040	0.200	0.56	13073	361	2.9
3.00	2	23	0.021	0.060	0.300	0.84	8716	361	6.5

Application



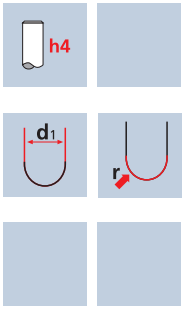
Material

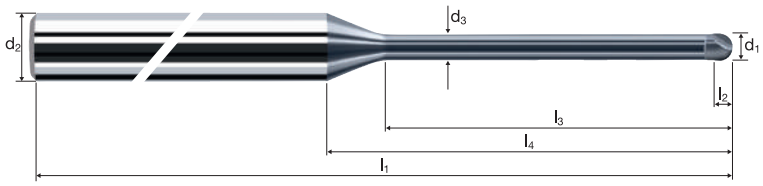
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
1.00	2	35	0.058	0.030	0.090	0.91	12243	1420	45°
1.50	2	35	0.068	0.030	0.105	1.32	8440	1148	45°
2.00	2	35	0.078	0.040	0.120	1.75	6366	993	45°
3.00	2	35	0.098	0.050	0.150	2.59	4301	843	45°
Hardened tool steel 52 - 56 HRC									
1.00	2	22	0.058	0.030	0.090	0.91	7695	893	45°
1.50	2	22	0.068	0.030	0.105	1.32	5305	722	45°
2.00	2	22	0.078	0.040	0.120	1.75	4002	624	45°
3.00	2	22	0.098	0.050	0.150	2.59	2704	530	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	22	0.058	0.030	0.090	0.91	7695	893	45°
1.50	2	22	0.068	0.030	0.105	1.32	5305	722	45°
2.00	2	22	0.078	0.040	0.120	1.75	4002	624	45°
3.00	2	22	0.098	0.050	0.150	2.59	2704	530	45°
Titanium alloys > 300 HB [Ti6Al4V]									
1.00	2	16	0.058	0.030	0.090	0.91	5597	649	45°
1.50	2	16	0.068	0.030	0.105	1.32	3858	525	45°
2.00	2	16	0.078	0.040	0.120	1.75	2910	454	45°
3.00	2	16	0.098	0.050	0.150	2.59	1966	385	45°

Ball nose end mills Microcut

Shank ø 4mm, cylindrical neck, 20xd

HM XA	λ 0° γ 0°



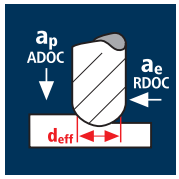


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6849** ø-Code **100**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z		X-AL
												X6849
100	1.00	4.00	0.95	57	0.60	20.00	20.20	25.82	0.500	2		●
120	1.50	4.00	1.40	66	0.90	30.00	30.30	34.98	0.750	2		●
140	2.00	4.00	1.90	75	1.20	40.00	40.30	44.05	1.000	2		●
180	3.00	4.00	2.80	100	1.80	60.00	60.43	62.37	1.500	2		●

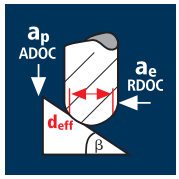
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel 850 - 1100 N/mm²									
0.30	2	180	0.010	0.020	0.060	0.15	60000	1200	1.4
0.50	2	180	0.018	0.040	0.100	0.27	60000	2160	8.6
0.80	2	180	0.028	0.060	0.160	0.42	60000	3360	32.3
1.00	2	180	0.036	0.080	0.200	0.54	60000	4320	69.1
1.20	2	180	0.042	0.100	0.240	0.66	60000	5040	121.0
1.50	2	180	0.054	0.120	0.300	0.81	60000	6480	233.3
2.00	2	180	0.072	0.160	0.400	1.09	52565	7569	484.4
2.50	2	180	0.090	0.200	0.500	1.36	42129	7583	758.3
3.00	2	180	0.108	0.240	0.600	1.63	35151	7593	1093.3
Steel 1100 - 1300 N/mm²									
0.30	2	160	0.010	0.020	0.060	0.15	60000	1200	1.4
0.50	2	160	0.016	0.040	0.100	0.27	60000	1920	7.7
0.80	2	160	0.026	0.060	0.160	0.42	60000	3120	30.0
1.00	2	160	0.032	0.080	0.200	0.54	60000	3840	61.4
1.20	2	160	0.038	0.100	0.240	0.66	60000	4560	109.4
1.50	2	160	0.048	0.120	0.300	0.81	60000	5760	207.4
2.00	2	160	0.064	0.160	0.400	1.09	46724	5981	382.8
2.50	2	160	0.082	0.200	0.500	1.36	37448	6142	614.2
3.00	2	160	0.098	0.240	0.600	1.63	31245	6124	881.9
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
0.30	2	80	0.010	0.020	0.060	0.15	60000	1200	1.4
0.50	2	80	0.016	0.040	0.100	0.27	60000	1920	7.7
0.80	2	80	0.026	0.060	0.160	0.42	60000	3120	30.0
1.00	2	80	0.032	0.080	0.200	0.54	47157	3018	48.3
1.20	2	80	0.038	0.100	0.240	0.66	38583	2932	70.4
1.50	2	80	0.048	0.120	0.300	0.81	31438	3018	108.6
2.00	2	80	0.064	0.160	0.400	1.09	23362	2990	191.4
2.50	2	80	0.082	0.200	0.500	1.36	18724	3071	307.1
3.00	2	80	0.098	0.240	0.600	1.63	15623	3062	440.9
Titanium alloys up to 300 HB [Ti5Al2.5Sn]									
0.30	2	60	0.008	0.020	0.060	0.15	60000	960	1.2
0.50	2	60	0.012	0.040	0.100	0.27	60000	1440	5.8
0.80	2	60	0.020	0.060	0.160	0.42	45473	1819	17.5
1.00	2	60	0.026	0.080	0.200	0.54	35368	1839	29.4
1.20	2	60	0.030	0.100	0.240	0.66	28937	1736	41.7
1.50	2	60	0.038	0.120	0.300	0.81	23579	1792	64.5
2.00	2	60	0.050	0.160	0.400	1.09	17522	1752	112.1
2.50	2	60	0.064	0.200	0.500	1.36	14043	1798	179.8
3.00	2	60	0.076	0.240	0.600	1.63	11717	1781	256.5

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
0.30	2	300	0.012	0.012	0.012	0.28	60000	1440	45°
0.50	2	300	0.020	0.022	0.022	0.47	60000	2400	45°
0.80	2	300	0.022	0.034	0.034	0.75	60000	2640	45°
1.00	2	300	0.028	0.042	0.042	0.93	60000	3360	45°
1.20	2	300	0.030	0.050	0.050	1.12	60000	3600	45°
1.50	2	300	0.034	0.064	0.064	1.40	60000	4080	45°
2.00	2	300	0.038	0.084	0.084	1.86	51340	3902	45°
2.50	2	300	0.040	0.106	0.106	2.33	40984	3279	45°
3.00	2	300	0.046	0.126	0.126	2.79	34227	3149	45°
Steel 1100 - 1300 N/mm²									
0.30	2	250	0.010	0.012	0.012	0.28	60000	1200	45°
0.50	2	250	0.018	0.022	0.022	0.47	60000	2160	45°
0.80	2	250	0.020	0.034	0.034	0.75	60000	2400	45°
1.00	2	250	0.026	0.042	0.042	0.93	60000	3120	45°
1.20	2	250	0.028	0.050	0.050	1.12	60000	3360	45°
1.50	2	250	0.030	0.064	0.064	1.40	56841	3411	45°
2.00	2	250	0.034	0.084	0.084	1.86	42784	2909	45°
2.50	2	250	0.036	0.106	0.106	2.33	34153	2459	45°
3.00	2	250	0.042	0.126	0.126	2.79	28522	2396	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
0.30	2	120	0.010	0.012	0.012	0.28	60000	1200	45°
0.50	2	120	0.016	0.022	0.022	0.47	60000	1920	45°
0.80	2	120	0.018	0.034	0.034	0.75	50930	1834	45°
1.00	2	120	0.022	0.042	0.042	0.93	41072	1807	45°
1.20	2	120	0.024	0.050	0.050	1.12	34105	1637	45°
1.50	2	120	0.028	0.064	0.064	1.40	27284	1528	45°
2.00	2	120	0.030	0.084	0.084	1.86	20536	1232	45°
2.50	2	120	0.032	0.106	0.106	2.33	16394	1049	45°
3.00	2	120	0.036	0.126	0.126	2.79	13691	986	45°
Titanium alloys up to 300 HB [Ti5Al2.5Sn]									
0.30	2	100	0.008	0.012	0.012	0.28	60000	960	45°
0.50	2	100	0.014	0.022	0.022	0.47	60000	1680	45°
0.80	2	100	0.016	0.034	0.034	0.75	42441	1358	45°
1.00	2	100	0.020	0.042	0.042	0.93	34227	1369	45°
1.20	2	100	0.022	0.050	0.050	1.12	28421	1251	45°
1.50	2	100	0.024	0.064	0.064	1.40	22736	1091	45°
2.00	2	100	0.026	0.084	0.084	1.86	17113	890	45°
2.50	2	100	0.028	0.106	0.106	2.33	13661	765	45°
3.00	2	100	0.032	0.126	0.126	2.79	11409	730	45°

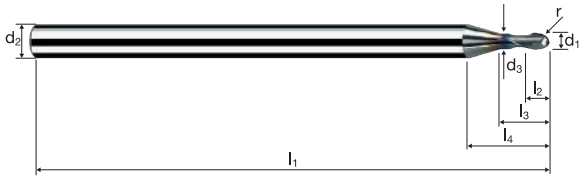
Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 3xd

Performance **P**

II

HM MG10 | λ **30°** γ **5°**



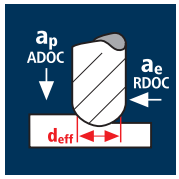
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5782** ø-Code **020**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	MICRO M5782
020	0.20	3.00	0.18	40	0.24	0.60	0.60	8.86	0.100	2	●
030	0.30	3.00	0.25	40	0.36	0.90	0.90	8.96	0.150	2	●
040	0.40	3.00	0.35	40	0.48	1.20	1.20	8.98	0.200	2	●
050	0.50	3.00	0.45	40	0.60	1.50	1.50	6.65	0.250	2	●
060	0.60	3.00	0.55	40	0.72	1.80	1.80	6.77	0.300	2	●
080	0.80	3.00	0.75	40	0.96	2.40	2.40	6.99	0.400	2	●
100	1.00	3.00	0.95	50	1.20	3.00	3.00	7.22	0.500	2	●
108	1.20	3.00	1.10	50	1.44	3.60	3.60	7.54	0.600	2	●
120	1.50	3.00	1.40	50	1.80	4.50	4.50	7.88	0.750	2	●
140	2.00	3.00	1.90	50	2.40	6.00	6.00	8.45	1.000	2	●
160	2.50	3.00	2.30	50	3.00	7.50	7.50	9.20	1.250	2	●
180	3.00	3.00	2.80	50	3.60	8.56	8.56	9.00	1.500	2	●

Application



Material

Steel
850 - 1100 N/mm²

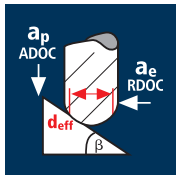
Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.50	2	180	0.018	0.040	0.100	0.27	60000	2160	8.6
0.60	2	180	0.022	0.040	0.120	0.30	60000	2640	12.7
0.80	2	180	0.028	0.060	0.160	0.42	60000	3360	32.3
1.00	2	180	0.036	0.070	0.200	0.51	60000	4320	60.5
1.20	2	180	0.042	0.080	0.240	0.60	60000	5040	96.8
1.50	2	180	0.054	0.110	0.300	0.78	60000	6480	213.8
2.00	2	180	0.072	0.140	0.400	1.02	56172	8089	453.0
2.50	2	180	0.090	0.180	0.500	1.29	44415	7995	719.5
3.00	2	180	0.108	0.210	0.600	1.53	37448	8089	1019.2
0.50	2	160	0.016	0.040	0.100	0.27	60000	1920	7.7
0.60	2	160	0.020	0.040	0.120	0.30	60000	2400	11.5
0.80	2	160	0.026	0.060	0.160	0.42	60000	3120	30.0
1.00	2	160	0.032	0.070	0.200	0.51	60000	3840	53.8
1.20	2	160	0.038	0.080	0.240	0.60	60000	4560	87.6
1.50	2	160	0.048	0.110	0.300	0.78	60000	5760	190.1
2.00	2	160	0.064	0.140	0.400	1.02	49931	6391	357.9
2.50	2	160	0.082	0.180	0.500	1.29	39480	6475	582.7
3.00	2	160	0.098	0.210	0.600	1.53	33287	6524	822.1
0.50	2	80	0.016	0.040	0.100	0.27	60000	1920	7.7
0.60	2	80	0.020	0.040	0.120	0.30	60000	2400	11.5
0.80	2	80	0.026	0.060	0.160	0.42	60000	3120	30.0
1.00	2	80	0.032	0.070	0.200	0.51	49931	3196	44.7
1.20	2	80	0.038	0.080	0.240	0.60	42441	3226	61.9
1.50	2	80	0.048	0.110	0.300	0.78	32647	3134	103.4
2.00	2	80	0.064	0.140	0.400	1.02	24965	3196	178.9
2.50	2	80	0.082	0.180	0.500	1.29	19740	3237	291.4
3.00	2	80	0.098	0.210	0.600	1.53	16644	3262	411.0
0.50	2	60	0.012	0.040	0.100	0.27	60000	1440	5.8
0.60	2	60	0.016	0.040	0.120	0.30	60000	1920	9.2
0.80	2	60	0.020	0.060	0.160	0.42	45473	1819	17.5
1.00	2	60	0.026	0.070	0.200	0.51	37448	1947	27.3
1.20	2	60	0.030	0.080	0.240	0.60	31831	1910	36.7
1.50	2	60	0.038	0.110	0.300	0.78	24485	1861	61.4
2.00	2	60	0.050	0.140	0.400	1.02	18724	1872	104.9
2.50	2	60	0.064	0.180	0.500	1.29	14805	1895	170.6
3.00	2	60	0.076	0.210	0.600	1.53	12483	1897	239.1

Application



Material

Steel
850 - 1100 N/mm²

Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.50	2	300	0.014	0.020	0.020	0.46	60000	1680	45°
0.60	2	300	0.016	0.024	0.024	0.56	60000	1920	45°
0.80	2	300	0.018	0.032	0.032	0.74	60000	2160	45°
1.00	2	300	0.022	0.040	0.040	0.93	60000	2640	45°
1.20	2	300	0.024	0.048	0.048	1.11	60000	2880	45°
1.50	2	300	0.028	0.060	0.060	1.39	60000	3360	45°
2.00	2	300	0.030	0.080	0.080	1.86	51340	3080	45°
2.50	2	300	0.032	0.100	0.100	2.32	41161	2634	45°
3.00	2	300	0.036	0.120	0.120	2.78	34350	2473	45°
0.50	2	250	0.012	0.008	0.008	0.43	60000	1440	45°
0.60	2	250	0.014	0.020	0.020	0.55	60000	1680	45°
0.80	2	250	0.016	0.032	0.032	0.74	60000	1920	45°
1.00	2	250	0.020	0.040	0.040	0.93	60000	2400	45°
1.20	2	250	0.022	0.048	0.048	1.11	60000	2640	45°
1.50	2	250	0.026	0.060	0.060	1.39	57250	2977	45°
2.00	2	250	0.028	0.080	0.080	1.86	42784	2396	45°
2.50	2	250	0.028	0.100	0.100	2.32	34301	1921	45°
3.00	2	250	0.032	0.120	0.120	2.78	28625	1832	45°
0.50	2	120	0.012	0.008	0.008	0.43	60000	1440	45°
0.60	2	120	0.012	0.020	0.020	0.55	60000	1440	45°
0.80	2	120	0.014	0.032	0.032	0.74	51618	1445	45°
1.00	2	120	0.018	0.040	0.040	0.93	41072	1479	45°
1.20	2	120	0.020	0.048	0.048	1.11	34412	1377	45°
1.50	2	120	0.022	0.060	0.060	1.39	27480	1209	45°
2.00	2	120	0.024	0.080	0.080	1.86	20536	986	45°
2.50	2	120	0.026	0.100	0.100	2.32	16464	856	45°
3.00	2	120	0.028	0.120	0.120	2.78	13740	769	45°
0.50	2	100	0.010	0.008	0.008	0.43	60000	1200	45°
0.60	2	100	0.012	0.020	0.020	0.55	57875	1389	45°
0.80	2	100	0.012	0.032	0.032	0.74	43015	1032	45°
1.00	2	100	0.016	0.040	0.040	0.93	34227	1095	45°
1.20	2	100	0.016	0.048	0.048	1.11	28677	918	45°
1.50	2	100	0.020	0.060	0.060	1.39	22900	916	45°
2.00	2	100	0.022	0.080	0.080	1.86	17113	753	45°
2.50	2	100	0.022	0.100	0.100	2.32	13720	604	45°
3.00	2	100	0.026	0.120	0.120	2.78	11450	595	45°

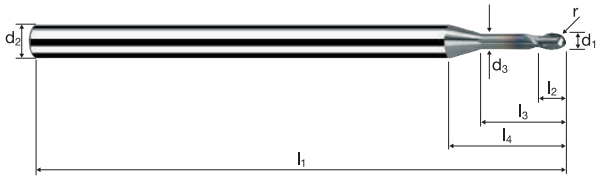
Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

Performance **P**

II

HM MG10	λ 30° γ 5°



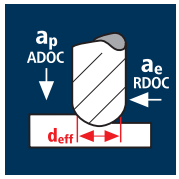
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5784** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	MICRO M5784
050	0.50	3.00	0.45	40	0.60	2.50	2.50	7.65	0.250	2	●
060	0.60	3.00	0.55	40	0.72	3.00	3.00	7.97	0.300	2	●
070	0.70	3.00	0.65	40	0.84	3.50	3.50	8.28	0.350	2	●
080	0.80	3.00	0.75	40	0.96	4.00	4.00	8.59	0.400	2	●
090	0.90	3.00	0.85	40	1.08	4.50	4.50	8.91	0.450	2	●
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	0.500	2	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	0.600	2	●
120	1.50	3.00	1.40	50	1.80	7.50	7.50	10.88	0.750	2	●
132	1.80	3.00	1.70	50	2.16	9.00	9.00	11.82	0.900	2	●
140	2.00	3.00	1.90	50	2.40	10.00	10.00	12.45	1.000	2	●
152	2.30	3.00	2.10	50	2.76	11.50	11.50	13.57	1.150	2	●
160	2.50	3.00	2.30	50	3.00	12.50	12.50	14.20	1.250	2	●
172	2.80	3.00	2.60	50	3.36	14.00	14.00	15.14	1.400	2	●
180	3.00	3.00	2.80	50	3.60	14.56	14.56	15.00	1.500	2	●

Application



Material

Steel
850 - 1100 N/mm²

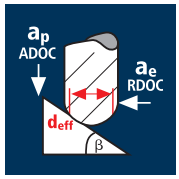
Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	Q [mm³/min]
0.50	2	180	0.018	0.030	0.100	0.24	60000	2160	6.5
0.60	2	180	0.022	0.030	0.120	0.26	60000	2640	9.5
0.80	2	180	0.028	0.040	0.160	0.35	60000	3360	21.5
1.00	2	180	0.036	0.050	0.200	0.44	60000	4320	43.2
1.20	2	180	0.042	0.060	0.240	0.52	60000	5040	72.6
1.50	2	180	0.054	0.080	0.300	0.67	60000	6480	155.5
2.00	2	180	0.072	0.100	0.400	0.87	60000	8640	345.6
2.50	2	180	0.090	0.130	0.500	1.11	51618	9291	603.9
3.00	2	180	0.108	0.150	0.600	1.31	43737	9447	850.2
0.50	2	160	0.016	0.030	0.100	0.24	60000	1920	5.8
0.60	2	160	0.020	0.030	0.120	0.26	60000	2400	8.6
0.80	2	160	0.026	0.040	0.160	0.35	60000	3120	20.0
1.00	2	160	0.032	0.050	0.200	0.44	60000	3840	38.4
1.20	2	160	0.038	0.060	0.240	0.52	60000	4560	65.7
1.50	2	160	0.048	0.080	0.300	0.67	60000	5760	138.2
2.00	2	160	0.064	0.100	0.400	0.87	58540	7493	299.7
2.50	2	160	0.082	0.130	0.500	1.11	45883	7525	489.1
3.00	2	160	0.098	0.150	0.600	1.31	38878	7620	685.8
0.50	2	80	0.016	0.030	0.100	0.24	60000	1920	5.8
0.60	2	80	0.020	0.030	0.120	0.26	60000	2400	8.6
0.80	2	80	0.026	0.040	0.160	0.35	60000	3120	20.0
1.00	2	80	0.032	0.050	0.200	0.44	57875	3704	37.0
1.20	2	80	0.038	0.060	0.240	0.52	48971	3722	53.6
1.50	2	80	0.048	0.080	0.300	0.67	38007	3649	87.6
2.00	2	80	0.064	0.100	0.400	0.87	29270	3747	149.9
2.50	2	80	0.082	0.130	0.500	1.11	22941	3762	244.5
3.00	2	80	0.098	0.150	0.600	1.31	19439	3810	342.9
0.50	2	60	0.012	0.030	0.100	0.24	60000	1440	4.3
0.60	2	60	0.016	0.030	0.120	0.26	60000	1920	6.9
0.80	2	60	0.020	0.040	0.160	0.35	54567	2183	14.0
1.00	2	60	0.026	0.050	0.200	0.44	43406	2257	22.6
1.20	2	60	0.030	0.060	0.240	0.52	36728	2204	31.7
1.50	2	60	0.038	0.080	0.300	0.67	28505	2166	52.0
2.00	2	60	0.050	0.100	0.400	0.87	21952	2195	87.8
2.50	2	60	0.064	0.130	0.500	1.11	17206	2202	143.2
3.00	2	60	0.076	0.150	0.600	1.31	14579	2216	199.4

Application



Material

Steel
850 - 1100 N/mm²

Steel
1100 - 1300 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.50	2	300	0.014	0.020	0.020	0.46	60000	1680	45°
0.60	2	300	0.016	0.022	0.022	0.55	60000	1920	45°
0.80	2	300	0.018	0.030	0.030	0.74	60000	2160	45°
1.00	2	300	0.022	0.038	0.038	0.92	60000	2640	45°
1.20	2	300	0.024	0.046	0.046	1.11	60000	2880	45°
1.50	2	300	0.028	0.058	0.058	1.39	60000	3360	45°
2.00	2	300	0.030	0.076	0.076	1.85	51618	3097	45°
2.50	2	300	0.032	0.096	0.096	2.31	41339	2646	45°
3.00	2	300	0.036	0.114	0.114	2.77	34474	2482	45°
0.50	2	250	0.012	0.020	0.020	0.46	60000	1440	45°
0.60	2	250	0.014	0.022	0.022	0.55	60000	1680	45°
0.80	2	250	0.016	0.030	0.030	0.74	60000	1920	45°
1.00	2	250	0.020	0.038	0.038	0.92	60000	2400	45°
1.20	2	250	0.022	0.046	0.046	1.11	60000	2640	45°
1.50	2	250	0.026	0.058	0.058	1.39	57250	2977	45°
2.00	2	250	0.028	0.076	0.076	1.85	43015	2409	45°
2.50	2	250	0.028	0.096	0.096	2.31	34449	1929	45°
3.00	2	250	0.032	0.114	0.114	2.77	28728	1839	45°
0.50	2	120	0.012	0.020	0.020	0.46	60000	1440	45°
0.60	2	120	0.012	0.022	0.022	0.55	60000	1440	45°
0.80	2	120	0.014	0.030	0.030	0.74	51618	1445	45°
1.00	2	120	0.018	0.038	0.038	0.92	41519	1495	45°
1.20	2	120	0.020	0.046	0.046	1.11	34412	1377	45°
1.50	2	120	0.022	0.058	0.058	1.39	27480	1209	45°
2.00	2	120	0.024	0.076	0.076	1.85	20647	991	45°
2.50	2	120	0.026	0.096	0.096	2.31	16536	860	45°
3.00	2	120	0.028	0.114	0.114	2.77	13790	772	45°
0.50	2	100	0.010	0.020	0.020	0.46	60000	1200	45°
0.60	2	100	0.012	0.022	0.022	0.55	57875	1389	45°
0.80	2	100	0.012	0.030	0.030	0.74	43015	1032	45°
1.00	2	100	0.016	0.038	0.038	0.92	34599	1107	45°
1.20	2	100	0.016	0.046	0.046	1.11	28677	918	45°
1.50	2	100	0.020	0.058	0.058	1.39	22900	916	45°
2.00	2	100	0.022	0.076	0.076	1.85	17206	757	45°
2.50	2	100	0.022	0.096	0.096	2.31	13780	606	45°
3.00	2	100	0.026	0.114	0.114	2.77	11491	598	45°

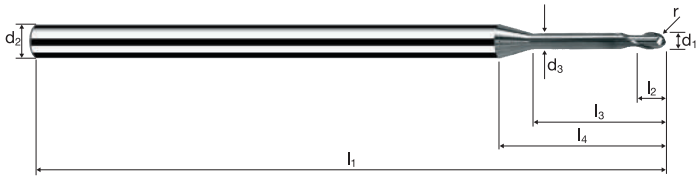
Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 8xd

Performance **P**

II

HM MG10	λ 30° γ 5°



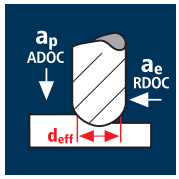
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5786** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	MICRO M5786
050	0.50	3.00	0.45	40	0.60	4.00	4.00	9.15	0.250	2	●
060	0.60	3.00	0.55	40	0.72	4.80	4.80	9.77	0.300	2	●
080	0.80	3.00	0.75	40	0.96	6.40	6.40	10.99	0.400	2	●
100	1.00	3.00	0.95	50	1.20	8.00	8.00	12.22	0.500	2	●
108	1.20	3.00	1.10	50	1.44	9.60	9.60	13.54	0.600	2	●
120	1.50	3.00	1.40	60	1.80	12.00	12.00	15.38	0.750	2	●
140	2.00	3.00	1.90	60	2.40	16.00	16.00	18.45	1.000	2	●
160	2.50	3.00	2.30	60	3.00	20.00	20.00	21.70	1.250	2	●
180	3.00	3.00	2.80	60	3.60	23.56	23.56	24.00	1.500	2	●

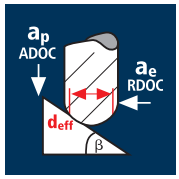
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	Q [mm^3/min]
Steel < 850 N/mm²									
0.50	2	120	0.014	0.030	0.100	0.24	60000	1680	5.0
0.60	2	120	0.020	0.040	0.140	0.30	60000	2400	13.4
0.80	2	120	0.022	0.050	0.160	0.39	60000	2640	21.1
1.00	2	120	0.028	0.060	0.200	0.47	60000	3360	40.3
1.20	2	120	0.034	0.070	0.240	0.56	60000	4080	68.5
1.50	2	120	0.042	0.090	0.300	0.71	53799	4519	122.0
2.00	2	120	0.058	0.120	0.400	0.95	40208	4664	223.9
2.50	2	120	0.072	0.150	0.500	1.19	32098	4622	346.7
3.00	2	120	0.086	0.180	0.600	1.42	26899	4627	499.7
Steel 850 - 1100 N/mm²									
0.50	2	80	0.012	0.030	0.100	0.24	60000	1440	4.3
0.60	2	80	0.016	0.040	0.120	0.30	60000	1920	9.2
0.80	2	80	0.020	0.050	0.160	0.39	60000	2400	19.2
1.00	2	80	0.026	0.060	0.200	0.47	54180	2817	33.8
1.20	2	80	0.030	0.070	0.240	0.56	45473	2728	45.8
1.50	2	80	0.038	0.090	0.300	0.71	35866	2726	73.6
2.00	2	80	0.052	0.120	0.400	0.95	26805	2788	133.8
2.50	2	80	0.064	0.150	0.500	1.19	21399	2739	205.4
3.00	2	80	0.078	0.180	0.600	1.42	17933	2798	302.1
Unalloyed copper									
0.50	2	230	0.016	0.030	0.100	0.24	60000	1920	5.8
0.60	2	230	0.020	0.040	0.120	0.30	60000	2400	11.5
0.80	2	230	0.024	0.050	0.160	0.39	60000	2880	23.0
1.00	2	230	0.030	0.060	0.200	0.47	60000	3600	43.2
1.20	2	230	0.038	0.070	0.240	0.56	60000	4560	76.6
1.50	2	230	0.046	0.090	0.300	0.71	60000	5520	149.0
2.00	2	230	0.064	0.120	0.400	0.95	60000	7680	368.6
2.50	2	230	0.080	0.150	0.500	1.19	60000	9600	720.0
3.00	2	230	0.094	0.180	0.600	1.42	51557	9693	1046.8
Wrought aluminium Construction aluminium									
0.50	2	250	0.016	0.030	0.100	0.24	60000	1920	5.8
0.60	2	250	0.020	0.040	0.120	0.30	60000	2400	11.5
0.80	2	250	0.024	0.050	0.160	0.39	60000	2880	23.0
1.00	2	250	0.030	0.060	0.200	0.47	60000	3600	43.2
1.20	2	250	0.038	0.070	0.240	0.56	60000	4560	76.6
1.50	2	250	0.046	0.090	0.300	0.71	60000	5520	149.0
2.00	2	250	0.064	0.120	0.400	0.95	60000	7680	368.6
2.50	2	250	0.080	0.150	0.500	1.19	60000	9600	720.0
3.00	2	250	0.094	0.180	0.600	1.42	56040	10536	1137.8

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel < 850 N/mm²									
0.50	2	220	0.016	0.020	0.020	0.46	60000	1920	45°
0.60	2	220	0.018	0.028	0.028	0.56	60000	2160	45°
0.80	2	220	0.020	0.032	0.032	0.74	60000	2400	45°
1.00	2	220	0.022	0.040	0.040	0.93	60000	2640	45°
1.20	2	220	0.024	0.048	0.048	1.11	60000	2880	45°
1.50	2	220	0.028	0.060	0.060	1.39	50380	2821	45°
2.00	2	220	0.030	0.080	0.080	1.86	37650	2259	45°
2.50	2	220	0.032	0.100	0.100	2.32	30185	1932	45°
3.00	2	220	0.036	0.120	0.120	2.78	25190	1814	45°
Steel 850 - 1100 N/mm²									
0.50	2	150	0.014	0.020	0.020	0.46	60000	1680	45°
0.60	2	150	0.016	0.024	0.024	0.56	60000	1920	45°
0.80	2	150	0.018	0.032	0.032	0.74	60000	2160	45°
1.00	2	150	0.020	0.040	0.040	0.93	51340	2054	45°
1.20	2	150	0.022	0.048	0.048	1.11	43015	1893	45°
1.50	2	150	0.026	0.060	0.060	1.39	34350	1786	45°
2.00	2	150	0.028	0.080	0.080	1.86	25670	1438	45°
2.50	2	150	0.028	0.100	0.100	2.32	20580	1153	45°
3.00	2	150	0.032	0.120	0.120	2.78	17175	1099	45°
Unalloyed copper									
0.50	2	400	0.018	0.020	0.020	0.46	60000	2160	45°
0.60	2	400	0.020	0.024	0.024	0.56	60000	2400	45°
0.80	2	400	0.022	0.032	0.032	0.74	60000	2640	45°
1.00	2	400	0.024	0.040	0.040	0.93	60000	2880	45°
1.20	2	400	0.026	0.048	0.048	1.11	60000	3120	45°
1.50	2	400	0.030	0.060	0.060	1.39	60000	3600	45°
2.00	2	400	0.034	0.080	0.080	1.86	60000	4080	45°
2.50	2	400	0.036	0.100	0.100	2.32	54881	3951	45°
3.00	2	400	0.040	0.120	0.120	2.78	45800	3664	45°
Wrought aluminium Construction aluminium									
0.50	2	400	0.018	0.020	0.020	0.46	60000	2160	45°
0.60	2	400	0.020	0.024	0.024	0.56	60000	2400	45°
0.80	2	400	0.022	0.032	0.032	0.74	60000	2640	45°
1.00	2	400	0.024	0.040	0.040	0.93	60000	2880	45°
1.20	2	400	0.026	0.048	0.048	1.11	60000	3120	45°
1.50	2	400	0.030	0.060	0.060	1.39	60000	3600	45°
2.00	2	400	0.034	0.080	0.080	1.86	60000	4080	45°
2.50	2	400	0.036	0.100	0.100	2.32	54881	3951	45°
3.00	2	400	0.040	0.120	0.120	2.78	45800	3664	45°

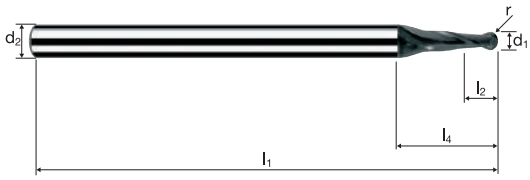
Ball nose end mills

Shank ø 3mm, 3xd

Favora® F

II

HM MG10	λ 30° γ 10°



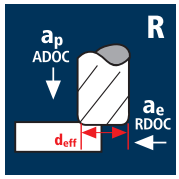
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	Copper Aluminium

Example: **Order-N°.** Coating **M** Article-N°. **45785** ø-Code **030**

Ø Code	d_1 ±0.01	d_2 h6	l_1	l_2	l_4	r ±0.01	z	MICRO M45785
030	0.30	3.00	40	1.00	9.00	0.150	2	●
040	0.40	3.00	40	1.00	8.70	0.200	2	●
050	0.50	3.00	40	1.50	8.90	0.250	2	●
060	0.60	3.00	40	1.50	8.60	0.300	2	●
070	0.70	3.00	40	2.00	8.80	0.350	2	●
080	0.80	3.00	40	2.00	8.60	0.400	2	●
090	0.90	3.00	40	2.50	8.80	0.450	2	●
100	1.00	3.00	40	3.00	9.00	0.500	2	●
108	1.20	3.00	40	4.00	9.50	0.600	2	●
120	1.50	3.00	40	4.00	8.60	0.750	2	●
130	1.80	3.00	40	5.00	7.30	0.900	2	●
140	2.00	3.00	40	5.00	7.00	1.000	2	●
160	2.50	3.00	40	7.00	8.30	1.250	2	●
180	3.00	4.00	44	10.00	12.40	1.500	2	●

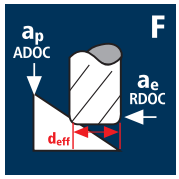
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	127	0.050
0.40	2	51	0.003	0.025	0.240	0.39	41625	260	0.050
0.50	2	66	0.005	0.035	0.340	0.50	42017	378	0.050
0.60	2	78	0.005	0.070	0.340	0.59	42082	447	0.100
0.80	2	104	0.007	0.070	0.510	0.79	41904	596	0.100
1.00	2	131	0.009	0.070	0.680	0.99	42120	751	0.100
1.50	2	135	0.015	0.160	0.990	1.49	28840	859	0.200
2.00	2	135	0.020	0.160	1.440	1.99	21594	859	0.200
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	153	0.050
0.40	2	51	0.004	0.025	0.240	0.39	41625	312	0.050
0.50	2	66	0.005	0.035	0.340	0.50	42017	454	0.050
0.60	2	78	0.006	0.070	0.340	0.59	42082	536	0.100
0.80	2	104	0.009	0.070	0.510	0.79	41904	715	0.100
1.00	2	131	0.011	0.070	0.680	0.99	42120	901	0.100
1.50	2	150	0.018	0.160	0.990	1.49	32045	1146	0.200
2.00	2	150	0.024	0.160	1.440	1.99	23993	1146	0.200
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	127	0.050
0.40	2	51	0.003	0.025	0.240	0.39	41625	260	0.050
0.50	2	66	0.005	0.035	0.340	0.50	42017	378	0.050
0.60	2	78	0.005	0.070	0.340	0.59	42082	447	0.100
0.80	2	104	0.007	0.070	0.510	0.79	41904	596	0.100
1.00	2	131	0.009	0.070	0.680	0.99	42120	751	0.100
1.50	2	140	0.015	0.160	0.990	1.49	29908	891	0.200
2.00	2	140	0.020	0.160	1.440	1.99	22394	891	0.200
Hardened tool steel 56 - 60 HRC									
0.20	2	22	0.001	0.015	0.060	0.17	41193	78	0.050
0.40	2	49	0.002	0.015	0.180	0.37	42155	175	0.050
0.50	2	65	0.003	0.025	0.280	0.49	42225	265	0.050
0.60	2	70	0.004	0.050	0.280	0.57	39091	285	0.100
0.80	2	70	0.005	0.050	0.420	0.77	28937	285	0.100
1.00	2	70	0.006	0.050	0.560	0.97	22971	285	0.100
1.50	2	70	0.012	0.120	0.880	1.47	15158	357	0.200
2.00	2	70	0.016	0.120	1.280	1.97	11311	357	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.020	0.030	0.020	0.49	34429	1343	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
1.50	2	195	0.037	0.057	0.030	1.50	41380	3066	45°
2.00	2	195	0.037	0.057	0.030	2.00	31035	2300	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.020	0.030	0.020	0.49	34429	1343	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
1.50	2	175	0.037	0.057	0.030	1.50	37136	2752	45°
Hardened tool steel 52 - 56 HRC									
2.00	2	175	0.037	0.057	0.030	2.00	27852	2064	45°
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.020	0.030	0.020	0.49	34429	1343	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
1.50	2	160	0.037	0.057	0.030	1.50	33953	2516	45°
2.00	2	160	0.037	0.057	0.030	2.00	25465	1887	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	26	0.015	0.030	0.010	0.19	43558	1307	45°
0.40	2	53	0.015	0.030	0.010	0.39	43257	1298	45°
0.50	2	53	0.015	0.030	0.020	0.49	34429	1033	45°
0.60	2	63	0.020	0.040	0.020	0.60	33423	1337	45°
0.80	2	64	0.020	0.040	0.020	0.80	25465	1019	45°
1.00	2	64	0.020	0.040	0.020	1.00	20372	815	45°
1.50	2	80	0.029	0.057	0.030	1.50	16977	968	45°
2.00	2	80	0.029	0.057	0.030	2.00	12732	726	45°

Corner radius end mills MicroX

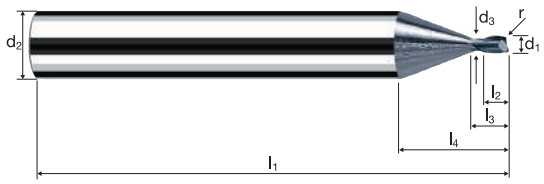
Shank ø 6mm, cylindrical neck, 2xd

X-Generation X

II

HM
XA

λ 25°
γ -10°



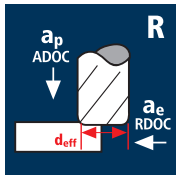
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6531** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6531
020	0.20	6.00	0.18	57	0.20	0.40	0.50	16.99	0.050	2	●
040	0.40	6.00	0.35	57	0.40	0.80	1.00	16.91	0.050	2	●
048	0.50	6.00	0.45	57	0.50	1.00	1.20	11.49	0.050	2	●
042	0.40	6.00	0.35	57	0.40	0.80	1.00	16.91	0.100	2	●
050	0.50	6.00	0.45	57	0.50	1.00	1.20	11.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	1.20	1.40	11.50	0.100	2	●
080	0.80	6.00	0.75	57	0.80	1.60	1.80	11.53	0.100	2	●
098	1.00	6.00	0.95	57	1.00	2.00	2.20	11.56	0.100	2	●
082	0.80	6.00	0.75	57	0.80	1.60	1.80	11.53	0.200	2	●
100	1.00	6.00	0.95	57	1.00	2.00	2.20	11.56	0.200	2	●
120	1.50	6.00	1.40	57	1.50	3.00	3.30	11.72	0.200	2	●
140	2.00	6.00	1.90	57	2.00	4.00	4.30	11.78	0.200	2	●
101	1.00	6.00	0.95	57	1.00	2.00	2.20	11.56	0.300	2	●
145	2.00	6.00	1.90	57	2.00	4.00	4.30	11.78	0.500	2	●

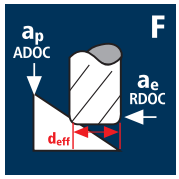
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	127	0.050
0.40	2	51	0.003	0.025	0.240	0.39	41625	260	0.050
0.50	2	65	0.004	0.070	0.255	0.49	42225	372	0.100
0.80	2	104	0.007	0.070	0.510	0.79	41904	596	0.100
1.00	2	131	0.009	0.070	0.680	0.99	42120	751	0.100
1.50	2	135	0.015	0.160	0.990	1.49	28840	859	0.200
2.00	2	135	0.020	0.160	1.440	1.99	21594	859	0.200
2.50	2	135	0.025	0.160	1.890	2.49	17258	859	0.200
3.00	2	135	0.030	0.160	2.340	2.99	14372	859	0.200
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	153	0.050
0.40	2	51	0.004	0.025	0.240	0.39	41625	312	0.050
0.50	2	65	0.005	0.070	0.255	0.49	42225	447	0.100
0.80	2	104	0.009	0.070	0.510	0.79	41904	715	0.100
1.00	2	131	0.011	0.070	0.680	0.99	42120	901	0.100
1.50	2	150	0.018	0.160	0.990	1.49	32045	1146	0.200
2.00	2	150	0.024	0.160	1.440	1.99	23993	1146	0.200
2.50	2	150	0.030	0.160	1.890	2.49	19175	1146	0.200
3.00	2	150	0.036	0.160	2.340	2.99	15969	1146	0.200
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	127	0.050
0.40	2	51	0.003	0.025	0.240	0.39	41625	260	0.050
0.50	2	65	0.004	0.070	0.255	0.49	42225	372	0.100
0.80	2	104	0.007	0.070	0.510	0.79	41904	596	0.100
1.00	2	131	0.009	0.070	0.680	0.99	42120	751	0.100
1.50	2	140	0.015	0.160	0.990	1.49	29908	891	0.200
2.00	2	140	0.020	0.160	1.440	1.99	22394	891	0.200
2.50	2	140	0.025	0.160	1.890	2.49	17897	891	0.200
3.00	2	140	0.030	0.160	2.340	2.99	14904	891	0.200
Hardened tool steel 56 - 60 HRC									
0.20	2	22	0.001	0.015	0.060	0.17	41193	78	0.050
0.40	2	49	0.002	0.015	0.180	0.37	42155	175	0.050
0.50	2	61	0.003	0.040	0.210	0.46	42211	249	0.100
0.80	2	70	0.005	0.040	0.420	0.76	29318	285	0.100
1.00	2	70	0.006	0.040	0.560	0.96	23210	285	0.100
1.50	2	70	0.012	0.100	0.880	1.45	15367	357	0.200
2.00	2	70	0.016	0.100	1.280	1.95	11427	357	0.200
2.50	2	70	0.020	0.100	1.680	2.45	9095	357	0.200
3.00	2	70	0.024	0.100	2.080	2.95	7553	357	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
1.50	2	195	0.037	0.057	0.030	1.50	41380	3066	45°
2.00	2	195	0.037	0.057	0.030	2.00	31035	2300	45°
2.50	2	195	0.037	0.057	0.030	2.50	24828	1840	45°
3.00	2	195	0.037	0.057	0.030	3.00	20690	1533	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
1.50	2	175	0.037	0.057	0.030	1.50	37136	2752	45°
2.00	2	175	0.037	0.057	0.030	2.00	27852	2064	45°
2.50	2	175	0.037	0.057	0.030	2.50	22282	1651	45°
3.00	2	175	0.037	0.057	0.030	3.00	18568	1376	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
1.50	2	160	0.037	0.057	0.030	1.50	33953	2516	45°
2.00	2	160	0.037	0.057	0.030	2.00	25465	1887	45°
2.50	2	160	0.037	0.057	0.030	2.50	20372	1510	45°
3.00	2	160	0.037	0.057	0.030	3.00	16977	1258	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	26	0.015	0.030	0.010	0.19	43558	1307	45°
0.40	2	53	0.015	0.030	0.010	0.39	43257	1298	45°
0.50	2	53	0.020	0.040	0.020	0.50	33741	1350	45°
0.80	2	64	0.020	0.040	0.020	0.80	25465	1019	45°
1.00	2	64	0.020	0.040	0.020	1.00	20372	815	45°
1.50	2	80	0.029	0.057	0.030	1.50	16977	968	45°
2.00	2	80	0.029	0.057	0.030	2.00	12732	726	45°
2.50	2	80	0.029	0.057	0.030	2.50	10186	581	45°
3.00	2	80	0.029	0.057	0.030	3.00	8488	484	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 3xd

X-Generation X

II

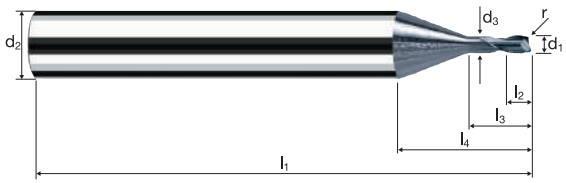
HM XA	λ 25° γ -10°







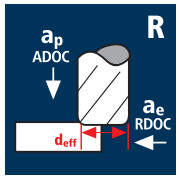


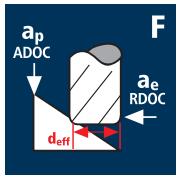


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6532** ø-Code **020**

ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6532
020	0.20	6.00	0.18	57	0.20	0.60	0.70	17.19	0.050	2	●
040	0.40	6.00	0.35	57	0.40	1.20	1.40	17.31	0.050	2	●
048	0.50	6.00	0.45	57	0.50	1.50	1.70	11.99	0.050	2	●
042	0.40	6.00	0.35	57	0.40	1.20	1.40	17.31	0.100	2	●
050	0.50	6.00	0.45	57	0.50	1.50	1.70	11.99	0.100	2	●
060	0.60	6.00	0.55	57	0.60	1.80	2.00	12.10	0.100	2	●
080	0.80	6.00	0.75	57	0.80	2.40	2.60	12.33	0.100	2	●
098	1.00	6.00	0.95	57	1.00	3.00	3.20	12.56	0.100	2	●
082	0.80	6.00	0.75	57	0.80	2.40	2.60	12.33	0.200	2	●
100	1.00	6.00	0.95	57	1.00	3.00	3.20	12.56	0.200	2	●
108	1.20	6.00	1.10	57	1.20	3.60	3.90	12.88	0.200	2	●
120	1.50	6.00	1.40	57	1.50	4.50	4.80	13.22	0.200	2	●
140	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	0.200	2	●
160	2.50	6.00	2.30	57	2.50	7.50	7.93	14.54	0.200	2	●
180	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	0.200	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
	Hardened tool steel 42 - 48 HRC	1.00	2	128	0.009	0.210	0.340	0.97	42004	733	0.300
		2.00	2	135	0.020	0.400	0.900	1.98	21703	859	0.500
		2.50	2	135	0.025	0.400	1.350	2.48	17327	859	0.500
		3.00	2	135	0.030	0.400	1.800	2.98	14420	859	0.500
	Hardened tool steel 48 - 52 HRC	1.00	2	128	0.010	0.210	0.340	0.97	42004	880	0.300
		2.00	2	150	0.024	0.400	0.900	1.98	24114	1146	0.500
		2.50	2	150	0.030	0.400	1.350	2.48	19253	1146	0.500
		3.00	2	150	0.036	0.400	1.800	2.98	16022	1146	0.500
	Hardened tool steel 52 - 56 HRC	1.00	2	128	0.009	0.210	0.340	0.97	42004	733	0.300
		2.00	2	140	0.020	0.400	0.900	1.98	22507	891	0.500
		2.50	2	140	0.025	0.400	1.350	2.48	17969	891	0.500
		3.00	2	140	0.030	0.400	1.800	2.98	14954	891	0.500
	Hardened tool steel 56 - 60 HRC	1.00	2	70	0.006	0.120	0.280	0.88	25320	285	0.300
		2.00	2	70	0.015	0.250	0.800	1.87	11915	357	0.500
		2.50	2	70	0.019	0.250	1.200	2.37	9402	357	0.500
		3.00	2	70	0.023	0.250	1.600	2.87	7764	357	0.500

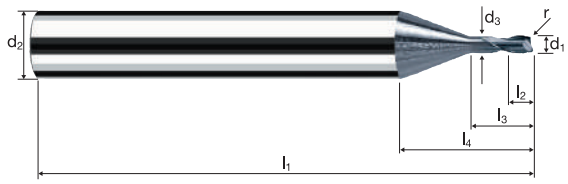
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	1.00	2	105	0.046	0.070	0.020	1.00	33423	3042	45°
		2.00	2	195	0.059	0.090	0.030	1.98	31349	3668	45°
		2.50	2	195	0.059	0.090	0.030	2.48	25028	2928	45°
		3.00	2	195	0.059	0.090	0.030	2.98	20829	2437	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	105	0.046	0.070	0.020	1.00	33423	3042	45°
		2.00	2	175	0.059	0.090	0.030	1.98	28133	3292	45°
		2.50	2	175	0.059	0.090	0.030	2.48	22461	2628	45°
		3.00	2	175	0.059	0.090	0.030	2.98	18693	2187	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	105	0.046	0.070	0.020	1.00	33423	3042	45°
		2.00	2	160	0.059	0.090	0.030	1.98	25722	3010	45°
		2.50	2	160	0.059	0.090	0.030	2.48	20536	2403	45°
		3.00	2	160	0.059	0.090	0.030	2.98	17090	2000	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	64	0.035	0.070	0.020	1.00	20372	1426	45°
		2.00	2	80	0.045	0.090	0.030	1.98	12861	1158	45°
		2.50	2	80	0.045	0.090	0.030	2.48	10268	924	45°
		3.00	2	80	0.045	0.090	0.030	2.98	8545	769	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 3xd

HM
XA

λ 25°
γ -10°

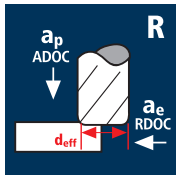


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6532** ø-Code **101**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6532
101	1.00	6.00	0.95	57	1.00	3.00	3.20	12.56	0.300	2	●
145	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	0.500	2	●
165	2.50	6.00	2.30	57	2.50	7.50	7.93	14.54	0.500	2	●
185	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	0.500	2	●

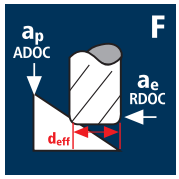
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	127	0.050
0.40	2	51	0.003	0.025	0.240	0.39	41625	260	0.050
0.50	2	66	0.005	0.035	0.340	0.50	42017	378	0.050
0.60	2	78	0.005	0.070	0.340	0.59	42082	447	0.100
0.80	2	104	0.007	0.070	0.510	0.79	41904	596	0.100
1.00	2	128	0.009	0.070	0.680	0.99	41155	733	0.100
1.50	2	128	0.015	0.160	0.990	1.49	27345	815	0.200
2.00	2	128	0.020	0.160	1.440	1.99	20474	815	0.200
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	153	0.050
0.40	2	51	0.004	0.025	0.240	0.39	41625	312	0.050
0.50	2	66	0.005	0.035	0.340	0.50	42017	454	0.050
0.60	2	78	0.006	0.070	0.340	0.59	42082	536	0.100
0.80	2	104	0.009	0.070	0.510	0.79	41904	715	0.100
1.00	2	131	0.011	0.070	0.680	0.99	42120	901	0.100
1.50	2	143	0.018	0.160	0.990	1.49	30549	1092	0.200
2.00	2	143	0.024	0.160	1.440	1.99	22874	1093	0.200
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.002	0.025	0.080	0.19	41883	127	0.050
0.40	2	51	0.003	0.025	0.240	0.39	41625	260	0.050
0.50	2	66	0.005	0.035	0.340	0.50	42017	378	0.050
0.60	2	78	0.005	0.070	0.340	0.59	42082	447	0.100
0.80	2	104	0.007	0.070	0.510	0.79	41904	596	0.100
1.00	2	131	0.009	0.070	0.680	0.99	42120	751	0.100
1.50	2	133	0.015	0.160	0.990	1.49	28413	847	0.200
2.00	2	133	0.020	0.160	1.440	1.99	21274	847	0.200
Hardened tool steel 56 - 60 HRC									
0.20	2	22	0.001	0.015	0.060	0.17	41193	78	0.050
0.40	2	49	0.002	0.015	0.180	0.37	42155	175	0.050
0.50	2	63	0.003	0.020	0.280	0.48	41778	257	0.050
0.60	2	67	0.004	0.040	0.280	0.56	38084	273	0.100
0.80	2	67	0.005	0.040	0.420	0.76	28062	273	0.100
1.00	2	67	0.006	0.040	0.560	0.96	22215	273	0.100
1.50	2	67	0.012	0.100	0.880	1.45	14708	341	0.200
2.00	2	67	0.016	0.100	1.280	1.95	10937	341	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	25	0.020	0.030	0.010	0.19	41883	1633	45°
0.40	2	52	0.020	0.030	0.010	0.39	42441	1655	45°
0.50	2	52	0.020	0.030	0.020	0.49	33780	1317	45°
0.60	2	60	0.026	0.040	0.020	0.60	31831	1655	45°
0.80	2	81	0.026	0.040	0.020	0.80	32229	1676	45°
1.00	2	102	0.026	0.040	0.020	1.00	32468	1688	45°
1.50	2	184	0.037	0.057	0.030	1.50	39046	2893	45°
2.00	2	185	0.037	0.057	0.030	2.00	29444	2182	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	25	0.020	0.030	0.010	0.19	41883	1633	45°
0.40	2	52	0.020	0.030	0.010	0.39	42441	1655	45°
0.50	2	52	0.020	0.030	0.020	0.49	33780	1317	45°
0.60	2	60	0.026	0.040	0.020	0.60	31831	1655	45°
0.80	2	81	0.026	0.040	0.020	0.80	32229	1676	45°
1.00	2	102	0.026	0.040	0.020	1.00	32468	1688	45°
1.50	2	166	0.037	0.057	0.030	1.50	35226	2610	45°
2.00	2	166	0.037	0.057	0.030	2.00	26420	1958	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	25	0.020	0.030	0.010	0.19	41883	1633	45°
0.40	2	52	0.020	0.030	0.010	0.39	42441	1655	45°
0.50	2	52	0.020	0.030	0.020	0.49	33780	1317	45°
0.60	2	60	0.026	0.040	0.020	0.60	31831	1655	45°
0.80	2	81	0.026	0.040	0.020	0.80	32229	1676	45°
1.00	2	102	0.026	0.040	0.020	1.00	32468	1688	45°
1.50	2	152	0.037	0.057	0.030	1.50	32255	2390	45°
2.00	2	152	0.037	0.057	0.030	2.00	24192	1793	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	25	0.015	0.030	0.010	0.19	41883	1257	45°
0.40	2	52	0.015	0.030	0.010	0.39	42441	1273	45°
0.50	2	52	0.015	0.030	0.020	0.49	33780	1013	45°
0.60	2	60	0.020	0.040	0.020	0.60	31831	1273	45°
0.80	2	61	0.020	0.040	0.020	0.80	24271	971	45°
1.00	2	61	0.020	0.040	0.020	1.00	19417	777	45°
1.50	2	76	0.029	0.057	0.030	1.50	16128	919	45°
2.00	2	76	0.029	0.057	0.030	2.00	12096	690	45°

Corner radius end mills MicroX

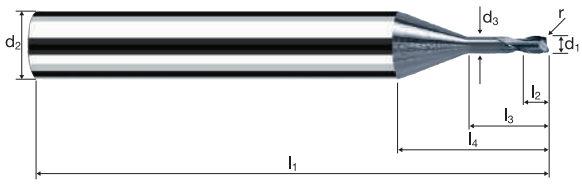
Shank ø 6mm, cylindrical neck, 4xd

X-Generation

II

HM
XA

λ 25°
γ -10°



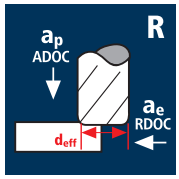
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6533** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6533
020	0.20	6.00	0.18	57	0.20	0.80	0.90	17.39	0.050	2	●
040	0.40	6.00	0.35	57	0.40	1.60	1.80	17.71	0.050	2	●
048	0.50	6.00	0.45	57	0.50	2.00	2.20	12.49	0.050	2	●
042	0.40	6.00	0.35	57	0.40	1.60	1.80	17.71	0.100	2	●
050	0.50	6.00	0.45	57	0.50	2.00	2.20	12.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	2.40	2.60	12.70	0.100	2	●
080	0.80	6.00	0.75	57	0.80	3.20	3.40	13.13	0.100	2	●
098	1.00	6.00	0.95	57	1.00	4.00	4.20	13.56	0.100	2	●
082	0.80	6.00	0.75	57	0.80	3.20	3.40	13.13	0.200	2	●
100	1.00	6.00	0.95	57	1.00	4.00	4.20	13.56	0.200	2	●
120	1.50	6.00	1.40	57	1.50	6.00	6.30	14.72	0.200	2	●
140	2.00	6.00	1.90	61	2.00	8.00	8.30	15.78	0.200	2	●
101	1.00	6.00	0.95	57	1.00	4.00	4.20	13.56	0.300	2	●
145	2.00	6.00	1.90	61	2.00	8.00	8.30	15.78	0.500	2	●

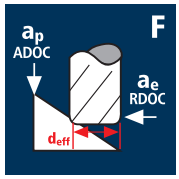
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.20	2	24	0.001	0.020	0.060	0.18	42441	110	0.050
0.40	2	50	0.003	0.020	0.180	0.38	41883	229	0.050
0.50	2	62	0.004	0.050	0.210	0.47	41990	320	0.100
0.80	2	102	0.006	0.050	0.420	0.77	42166	526	0.100
1.00	2	115	0.008	0.100	0.420	0.95	38532	593	0.200
1.50	2	115	0.013	0.120	0.880	1.47	24902	659	0.200
2.00	2	115	0.018	0.120	1.280	1.97	18582	659	0.200
2.50	2	115	0.022	0.120	1.680	2.47	14820	659	0.200
3.00	2	115	0.027	0.120	2.080	2.97	12325	659	0.200
Hardened tool steel 48 - 52 HRC									
0.20	2	24	0.002	0.020	0.060	0.18	42441	132	0.050
0.40	2	50	0.003	0.020	0.180	0.38	41883	275	0.050
0.50	2	62	0.005	0.050	0.210	0.47	41990	384	0.100
0.80	2	102	0.007	0.050	0.420	0.77	42166	631	0.100
1.00	2	125	0.009	0.100	0.420	0.95	41883	774	0.200
1.50	2	128	0.016	0.120	0.880	1.47	27717	880	0.200
2.00	2	128	0.021	0.120	1.280	1.97	20682	880	0.200
2.50	2	128	0.027	0.120	1.680	2.47	16495	880	0.200
3.00	2	128	0.032	0.120	2.080	2.97	13718	880	0.200
Hardened tool steel 52 - 56 HRC									
0.20	2	24	0.001	0.020	0.060	0.18	42441	110	0.050
0.40	2	50	0.003	0.020	0.180	0.38	41883	229	0.050
0.50	2	62	0.004	0.050	0.210	0.47	41990	320	0.100
0.80	2	102	0.006	0.050	0.420	0.77	42166	526	0.100
1.00	2	119	0.008	0.100	0.420	0.95	39873	614	0.200
1.50	2	119	0.013	0.120	0.880	1.47	25768	682	0.200
2.00	2	119	0.018	0.120	1.280	1.97	19228	682	0.200
2.50	2	119	0.022	0.120	1.680	2.47	15336	682	0.200
3.00	2	119	0.027	0.120	2.080	2.97	12754	682	0.200
Hardened tool steel 56 - 60 HRC									
0.20	2	21	0.001	0.010	0.050	0.16	41778	67	0.050
0.40	2	48	0.002	0.010	0.150	0.36	42441	154	0.050
0.50	2	58	0.003	0.030	0.180	0.44	41959	213	0.100
0.80	2	60	0.004	0.030	0.360	0.74	25809	220	0.100
1.00	2	60	0.005	0.060	0.360	0.89	21459	220	0.200
1.50	2	60	0.010	0.080	0.770	1.42	13450	275	0.200
2.00	2	60	0.014	0.080	1.120	1.92	9947	275	0.200
2.50	2	60	0.017	0.080	1.470	2.42	7892	275	0.200
3.00	2	60	0.021	0.080	1.820	2.92	6541	275	0.200

Application



Material

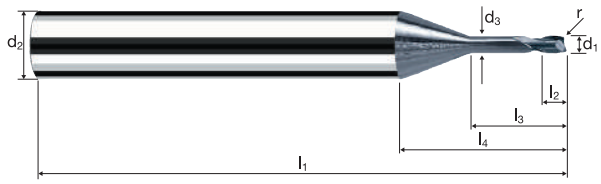
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.037	0.057	0.020	1.00	33741	2500	45°
1.50	2	157	0.037	0.057	0.030	1.50	33316	2469	45°
2.00	2	157	0.037	0.057	0.030	2.00	24987	1852	45°
2.50	2	157	0.037	0.057	0.030	2.50	19990	1481	45°
3.00	2	157	0.037	0.057	0.030	3.00	16658	1234	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.037	0.057	0.020	1.00	33741	2500	45°
1.50	2	141	0.037	0.057	0.030	1.50	29921	2217	45°
2.00	2	141	0.037	0.057	0.030	2.00	22441	1663	45°
2.50	2	141	0.037	0.057	0.030	2.50	17953	1330	45°
3.00	2	141	0.037	0.057	0.030	3.00	14961	1109	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	103	0.037	0.057	0.020	1.00	32786	2429	45°
1.50	2	129	0.037	0.057	0.030	1.50	27375	2029	45°
2.00	2	129	0.037	0.057	0.030	2.00	20531	1521	45°
2.50	2	129	0.037	0.057	0.030	2.50	16425	1217	45°
3.00	2	129	0.037	0.057	0.030	3.00	13687	1014	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	26	0.015	0.030	0.010	0.19	43558	1307	45°
0.40	2	53	0.015	0.030	0.010	0.39	43257	1298	45°
0.50	2	52	0.020	0.040	0.020	0.50	33104	1324	45°
0.80	2	52	0.020	0.040	0.020	0.80	20690	828	45°
1.00	2	52	0.029	0.057	0.020	1.00	16552	944	45°
1.50	2	65	0.029	0.057	0.030	1.50	13793	786	45°
2.00	2	65	0.029	0.057	0.030	2.00	10345	590	45°
2.50	2	65	0.029	0.057	0.030	2.50	8276	472	45°
3.00	2	65	0.029	0.057	0.030	3.00	6897	393	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

HM
XA

λ 25°
γ -10°

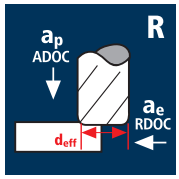


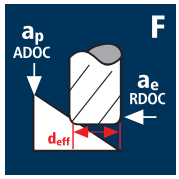
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6534** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6534
020	0.20	6.00	0.18	57	0.20	1.00	1.10	17.59	0.050	2	●
040	0.40	6.00	0.35	57	0.40	2.00	2.20	18.11	0.050	2	●
048	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.050	2	●
042	0.40	6.00	0.35	57	0.40	2.00	2.20	18.11	0.100	2	●
050	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.100	2	●
060	0.60	6.00	0.55	57	0.60	3.00	3.20	13.30	0.100	2	●
080	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.100	2	●
098	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.100	2	●
082	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.200	2	●
100	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.200	2	●
108	1.20	6.00	1.10	57	1.20	6.00	6.30	15.28	0.200	2	●
120	1.50	6.00	1.40	61	1.50	7.50	7.80	16.22	0.200	2	●
140	2.00	6.00	1.90	61	2.00	10.00	10.30	17.78	0.200	2	●
160	2.50	6.00	2.30	61	2.50	12.50	12.93	19.54	0.200	2	●
180	3.00	6.00	2.80	66	3.00	15.00	15.43	21.10	0.200	2	●

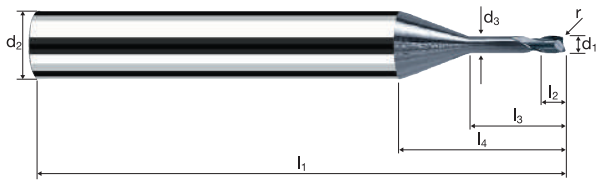
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
	Hardened tool steel 42 - 48 HRC	1.00	2	115	0.007	0.150	0.280	0.92	39789	593	0.300
		2.00	2	115	0.017	0.300	0.800	1.92	19065	659	0.500
		2.50	2	115	0.022	0.300	1.200	2.42	15126	659	0.500
		3.00	2	115	0.026	0.300	1.600	2.92	12536	659	0.500
	Hardened tool steel 48 - 52 HRC	1.00	2	121	0.009	0.150	0.280	0.92	41865	749	0.300
		2.00	2	128	0.021	0.300	0.800	1.92	21221	880	0.500
		2.50	2	128	0.026	0.300	1.200	2.42	16836	880	0.500
		3.00	2	128	0.032	0.300	1.600	2.92	13953	880	0.500
	Hardened tool steel 52 - 56 HRC	1.00	2	119	0.007	0.150	0.280	0.92	41173	614	0.300
		2.00	2	119	0.017	0.300	0.800	1.92	19729	682	0.500
		2.50	2	119	0.022	0.300	1.200	2.42	15652	682	0.500
		3.00	2	119	0.026	0.300	1.600	2.92	12972	682	0.500
	Hardened tool steel 56 - 60 HRC	1.00	2	60	0.005	0.090	0.240	0.83	23010	220	0.300
		2.00	2	60	0.013	0.200	0.700	1.80	10610	275	0.500
		2.50	2	60	0.017	0.200	1.050	2.30	8304	275	0.500
		3.00	2	60	0.020	0.200	1.400	2.80	6821	275	0.500

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	1.00	2	105	0.046	0.070	0.020	1.00	33423	3042	45°
		2.00	2	157	0.059	0.090	0.030	1.98	25240	2953	45°
		2.50	2	157	0.059	0.090	0.030	2.48	20151	2358	45°
		3.00	2	157	0.059	0.090	0.030	2.98	16770	1962	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	105	0.046	0.070	0.020	1.00	33423	3042	45°
		2.00	2	141	0.059	0.090	0.030	1.98	22668	2652	45°
		2.50	2	141	0.059	0.090	0.030	2.48	18097	2117	45°
		3.00	2	141	0.059	0.090	0.030	2.98	15061	1762	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	103	0.046	0.070	0.020	1.00	32786	2984	45°
		2.00	2	129	0.059	0.090	0.030	1.98	20738	2426	45°
		2.50	2	129	0.059	0.090	0.030	2.48	16557	1937	45°
		3.00	2	129	0.059	0.090	0.030	2.98	13779	1612	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	52	0.035	0.070	0.020	1.00	16552	1159	45°
		2.00	2	65	0.045	0.090	0.030	1.98	10450	941	45°
		2.50	2	65	0.045	0.090	0.030	2.48	8343	751	45°
		3.00	2	65	0.045	0.090	0.030	2.98	6943	625	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

HM XA	λ 25° γ -10°



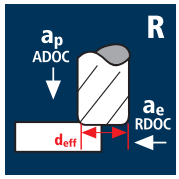
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6534** ø-Code **101**

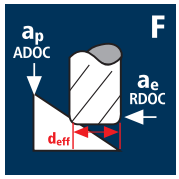
Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL	X6534
101	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.300	2		●
145	2.00	6.00	1.90	61	2.00	10.00	10.30	17.78	0.500	2		●
165	2.50	6.00	2.30	61	2.50	12.50	12.93	19.54	0.500	2		●
185	3.00	6.00	2.80	66	3.00	15.00	15.43	21.10	0.500	2		●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC	0.20	2	24	0.001	0.020	0.060	0.18	42441	110	0.050
	0.40	2	50	0.003	0.020	0.180	0.38	41883	229	0.050
	0.50	2	65	0.004	0.025	0.280	0.49	42225	335	0.050
	0.60	2	75	0.005	0.050	0.280	0.57	41883	387	0.100
	0.80	2	102	0.006	0.050	0.420	0.77	42166	526	0.100
	1.00	2	109	0.008	0.050	0.560	0.97	35769	562	0.100
	1.50	2	109	0.013	0.120	0.880	1.47	23603	625	0.200
	2.00	2	109	0.018	0.120	1.280	1.97	17612	625	0.200
Hardened tool steel 48 - 52 HRC	0.20	2	24	0.002	0.020	0.060	0.18	42441	132	0.050
	0.40	2	50	0.003	0.020	0.180	0.38	41883	275	0.050
	0.50	2	65	0.005	0.025	0.280	0.49	42225	402	0.050
	0.60	2	75	0.006	0.050	0.280	0.57	41883	464	0.100
	0.80	2	102	0.007	0.050	0.420	0.77	42166	631	0.100
	1.00	2	121	0.009	0.050	0.560	0.97	39707	749	0.100
	1.50	2	121	0.016	0.120	0.880	1.47	26201	832	0.200
	2.00	2	121	0.021	0.120	1.280	1.97	19551	832	0.200
Hardened tool steel 52 - 56 HRC	0.20	2	24	0.001	0.020	0.060	0.18	42441	110	0.050
	0.40	2	50	0.003	0.020	0.180	0.38	41883	229	0.050
	0.50	2	65	0.004	0.025	0.280	0.49	42225	335	0.050
	0.60	2	75	0.005	0.050	0.280	0.57	41883	387	0.100
	0.80	2	102	0.006	0.050	0.420	0.77	42166	526	0.100
	1.00	2	113	0.008	0.050	0.560	0.97	37081	583	0.100
	1.50	2	113	0.013	0.120	0.880	1.47	24469	647	0.200
	2.00	2	113	0.018	0.120	1.280	1.97	18258	647	0.200
Hardened tool steel 56 - 60 HRC	0.20	2	21	0.001	0.010	0.050	0.16	41778	67	0.050
	0.40	2	48	0.002	0.010	0.150	0.36	42441	154	0.050
	0.50	2	57	0.003	0.015	0.240	0.47	38604	209	0.050
	0.60	2	57	0.003	0.030	0.240	0.54	33599	209	0.100
	0.80	2	57	0.004	0.030	0.360	0.74	24518	209	0.100
	1.00	2	57	0.005	0.030	0.480	0.94	19302	209	0.100
	1.50	2	57	0.010	0.080	0.770	1.42	12777	261	0.200
	2.00	2	57	0.014	0.080	1.120	1.92	9450	261	0.200

Application



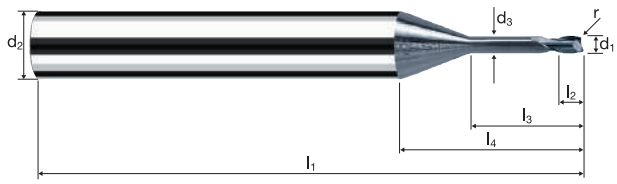
Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC	0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
	0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
	0.50	2	53	0.020	0.030	0.020	0.49	34429	1343	45°
	0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
	0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
	1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
	1.50	2	150	0.037	0.057	0.030	1.50	31831	2359	45°
	2.00	2	150	0.037	0.057	0.030	2.00	23873	1769	45°
Hardened tool steel 48 - 52 HRC	0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
	0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
	0.50	2	53	0.020	0.030	0.020	0.49	34429	1343	45°
	0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
	0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
	1.00	2	106	0.026	0.040	0.020	1.00	33741	1755	45°
	1.50	2	134	0.037	0.057	0.030	1.50	28436	2107	45°
	2.00	2	134	0.037	0.057	0.030	2.00	21327	1580	45°
Hardened tool steel 52 - 56 HRC	0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
	0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
	0.50	2	53	0.020	0.030	0.020	0.49	34429	1343	45°
	0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
	0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
	1.00	2	98	0.026	0.040	0.020	1.00	31194	1622	45°
	1.50	2	123	0.037	0.057	0.030	1.50	26101	1934	45°
	2.00	2	123	0.037	0.057	0.030	2.00	19576	1451	45°
Hardened tool steel 56 - 60 HRC	0.20	2	26	0.015	0.030	0.010	0.19	43558	1307	45°
	0.40	2	53	0.015	0.030	0.010	0.39	43257	1298	45°
	0.50	2	49	0.015	0.030	0.020	0.49	31831	955	45°
	0.60	2	49	0.020	0.040	0.020	0.60	25995	1040	45°
	0.80	2	49	0.020	0.040	0.020	0.80	19496	780	45°
	1.00	2	49	0.020	0.040	0.020	1.00	15597	624	45°
	1.50	2	61	0.029	0.057	0.030	1.50	12945	738	45°
	2.00	2	61	0.029	0.057	0.030	2.00	9708	553	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 6xd

HM
XA

λ 25°
γ -10°



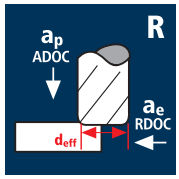
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6535** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6535
020	0.20	6.00	0.18	57	0.20	1.20	1.30	17.79	0.050	2	●
040	0.40	6.00	0.35	57	0.40	2.40	2.60	18.51	0.050	2	●
048	0.50	6.00	0.45	57	0.50	3.00	3.20	13.49	0.050	2	●
042	0.40	6.00	0.35	57	0.40	2.40	2.60	18.51	0.100	2	●
050	0.50	6.00	0.45	57	0.50	3.00	3.20	13.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	3.60	3.80	13.90	0.100	2	●
080	0.80	6.00	0.75	57	0.80	4.80	5.00	14.73	0.100	2	●
098	1.00	6.00	0.95	57	1.00	6.00	6.20	15.56	0.100	2	●
082	0.80	6.00	0.75	57	0.80	4.80	5.00	14.73	0.200	2	●
100	1.00	6.00	0.95	57	1.00	6.00	6.20	15.56	0.200	2	●
120	1.50	6.00	1.40	61	1.50	9.00	9.30	17.72	0.200	2	●
140	2.00	6.00	1.90	66	2.00	12.00	12.30	19.78	0.200	2	●
101	1.00	6.00	0.95	57	1.00	6.00	6.20	15.56	0.300	2	●
145	2.00	6.00	1.90	66	2.00	12.00	12.30	19.78	0.500	2	●

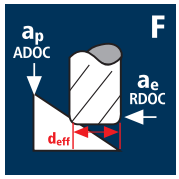
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.20	2	21	0.001	0.010	0.040	0.16	41778	87	0.050
0.40	2	48	0.002	0.010	0.120	0.36	42441	198	0.050
0.50	2	61	0.003	0.040	0.150	0.46	42211	283	0.100
0.80	2	87	0.006	0.040	0.300	0.76	36438	404	0.100
1.00	2	87	0.007	0.080	0.300	0.92	30101	404	0.200
1.50	2	87	0.012	0.100	0.660	1.45	19099	449	0.200
2.00	2	87	0.016	0.100	0.960	1.95	14202	449	0.200
2.50	2	87	0.020	0.100	1.260	2.45	11303	449	0.200
3.00	2	87	0.024	0.100	1.560	2.95	9387	449	0.200
Hardened tool steel 48 - 52 HRC									
0.20	2	21	0.001	0.010	0.040	0.16	41778	104	0.050
0.40	2	48	0.003	0.010	0.120	0.36	42441	238	0.050
0.50	2	61	0.004	0.040	0.150	0.46	42211	340	0.100
0.80	2	97	0.007	0.040	0.300	0.76	40626	540	0.100
1.00	2	97	0.008	0.080	0.300	0.92	33561	540	0.200
1.50	2	97	0.014	0.100	0.660	1.45	21294	600	0.200
2.00	2	97	0.019	0.100	0.960	1.95	15834	600	0.200
2.50	2	97	0.024	0.100	1.260	2.45	12602	600	0.200
3.00	2	97	0.029	0.100	1.560	2.95	10466	600	0.200
Hardened tool steel 52 - 56 HRC									
0.20	2	21	0.001	0.010	0.040	0.16	41778	87	0.050
0.40	2	48	0.002	0.010	0.120	0.36	42441	198	0.050
0.50	2	61	0.003	0.040	0.150	0.46	42211	283	0.100
0.80	2	90	0.006	0.040	0.300	0.76	37695	418	0.100
1.00	2	90	0.007	0.080	0.300	0.92	31139	418	0.200
1.50	2	90	0.012	0.100	0.660	1.45	19757	464	0.200
2.00	2	90	0.016	0.100	0.960	1.95	14691	464	0.200
2.50	2	90	0.020	0.100	1.260	2.45	11693	464	0.200
3.00	2	90	0.024	0.100	1.560	2.95	9711	464	0.200
Hardened tool steel 56 - 60 HRC									
0.20	2	20	0.001	0.008	0.030	0.15	42441	58	0.050
0.40	2	45	0.002	0.008	0.090	0.35	40926	130	0.050
0.50	2	45	0.002	0.020	0.120	0.42	34105	149	0.100
0.80	2	45	0.004	0.020	0.240	0.72	19894	149	0.100
1.00	2	45	0.004	0.040	0.240	0.84	17052	149	0.200
1.50	2	45	0.009	0.060	0.550	1.39	10305	186	0.200
2.00	2	45	0.012	0.060	0.800	1.89	7579	186	0.200
2.50	2	45	0.015	0.060	1.050	2.39	5993	186	0.200
3.00	2	45	0.019	0.060	1.300	2.89	4956	186	0.200

Application



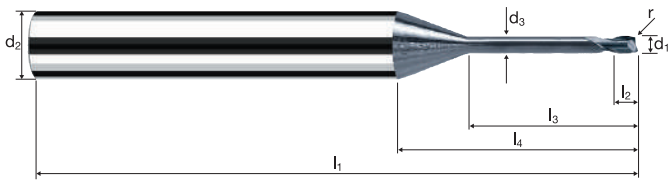
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	96	0.037	0.057	0.020	1.00	30558	2264	45°
1.50	2	120	0.037	0.057	0.030	1.50	25465	1887	45°
2.00	2	120	0.037	0.057	0.030	2.00	19099	1415	45°
2.50	2	120	0.037	0.057	0.030	2.50	15279	1132	45°
3.00	2	120	0.037	0.057	0.030	3.00	12732	943	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	86	0.037	0.057	0.020	1.00	27375	2029	45°
1.50	2	107	0.037	0.057	0.030	1.50	22706	1683	45°
2.00	2	107	0.037	0.057	0.030	2.00	17030	1262	45°
2.50	2	107	0.037	0.057	0.030	2.50	13624	1010	45°
3.00	2	107	0.037	0.057	0.030	3.00	11353	841	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.020	0.030	0.010	0.39	43257	1687	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	79	0.037	0.057	0.020	1.00	25146	1863	45°
1.50	2	98	0.037	0.057	0.030	1.50	20796	1541	45°
2.00	2	98	0.037	0.057	0.030	2.00	15597	1156	45°
2.50	2	98	0.037	0.057	0.030	2.50	12478	925	45°
3.00	2	98	0.037	0.057	0.030	3.00	10398	771	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	26	0.015	0.030	0.010	0.19	43558	1307	45°
0.40	2	49	0.015	0.030	0.010	0.39	39993	1200	45°
0.50	2	39	0.020	0.040	0.020	0.50	24828	993	45°
0.80	2	39	0.020	0.040	0.020	0.80	15518	621	45°
1.00	2	39	0.029	0.057	0.020	1.00	12414	708	45°
1.50	2	49	0.029	0.057	0.030	1.50	10398	593	45°
2.00	2	49	0.029	0.057	0.030	2.00	7799	445	45°
2.50	2	49	0.029	0.057	0.030	2.50	6239	356	45°
3.00	2	49	0.029	0.057	0.030	3.00	5199	296	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

HM XA	λ 25° γ -10°



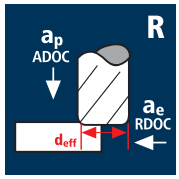
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6536** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6536
020	0.20	6.00	0.18	57	0.12	1.60	1.70	18.19	0.050	2	●
040	0.40	6.00	0.35	57	0.24	3.20	3.40	19.31	0.050	2	●
048	0.50	6.00	0.45	57	0.50	4.00	4.20	14.49	0.050	2	●
042	0.40	6.00	0.35	57	0.24	3.20	3.40	19.31	0.100	2	●
050	0.50	6.00	0.45	57	0.50	4.00	4.20	14.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	4.80	5.00	15.10	0.100	2	●
080	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.100	2	●
098	1.00	6.00	0.95	61	1.00	8.00	8.20	17.56	0.100	2	●
082	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.200	2	●
100	1.00	6.00	0.95	61	1.00	8.00	8.20	17.56	0.200	2	●
108	1.20	6.00	1.10	61	1.20	9.60	9.90	18.88	0.200	2	●
120	1.50	6.00	1.40	61	1.50	12.00	12.30	20.72	0.200	2	●
140	2.00	6.00	1.90	66	2.00	16.00	16.30	23.78	0.200	2	●
160	2.50	6.00	2.30	69	2.50	20.00	20.43	27.04	0.200	2	●
180	3.00	6.00	2.80	75	3.00	24.00	24.43	30.10	0.200	2	●

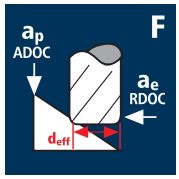
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
1.00	2	87	0.006	0.120	0.200	0.88	31469	404	0.300
2.00	2	87	0.015	0.250	0.600	1.87	14809	449	0.500
2.50	2	87	0.019	0.250	0.900	2.37	11685	449	0.500
3.00	2	87	0.023	0.250	1.200	2.87	9649	449	0.500
Hardened tool steel 48 - 52 HRC									
1.00	2	97	0.008	0.120	0.200	0.88	35086	540	0.300
2.00	2	97	0.018	0.250	0.600	1.87	16511	600	0.500
2.50	2	97	0.023	0.250	0.900	2.37	13028	600	0.500
3.00	2	97	0.028	0.250	1.200	2.87	10758	600	0.500
Hardened tool steel 52 - 56 HRC									
1.00	2	90	0.006	0.120	0.200	0.88	32554	418	0.300
2.00	2	90	0.015	0.250	0.600	1.87	15320	464	0.500
2.50	2	90	0.019	0.250	0.900	2.37	12088	464	0.500
3.00	2	90	0.023	0.250	1.200	2.87	9982	464	0.500
Hardened tool steel 56 - 60 HRC									
1.00	2	45	0.004	0.060	0.160	0.76	18847	149	0.300
2.00	2	45	0.011	0.150	0.500	1.71	8377	186	0.500
2.50	2	45	0.014	0.150	0.750	2.21	6481	186	0.500
3.00	2	45	0.018	0.150	1.000	2.71	5286	186	0.500

Application



Material

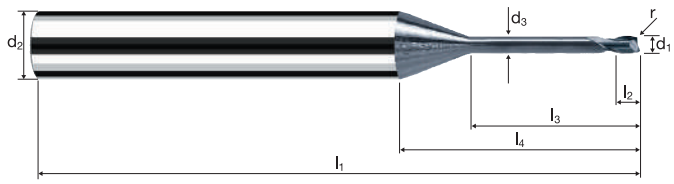
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
1.00	2	96	0.046	0.070	0.020	1.00	30558	2781	45°
2.00	2	120	0.059	0.090	0.030	1.98	19292	2257	45°
2.50	2	120	0.059	0.090	0.030	2.48	15402	1802	45°
3.00	2	120	0.059	0.090	0.030	2.98	12818	1500	45°
Hardened tool steel 48 - 52 HRC									
1.00	2	86	0.046	0.070	0.020	1.00	27375	2491	45°
2.00	2	107	0.059	0.090	0.030	1.98	17202	2013	45°
2.50	2	107	0.059	0.090	0.030	2.48	13734	1607	45°
3.00	2	107	0.059	0.090	0.030	2.98	11429	1337	45°
Hardened tool steel 52 - 56 HRC									
1.00	2	79	0.046	0.070	0.020	1.00	25146	2288	45°
2.00	2	98	0.059	0.090	0.030	1.98	15755	1843	45°
2.50	2	98	0.059	0.090	0.030	2.48	12578	1472	45°
3.00	2	98	0.059	0.090	0.030	2.98	10468	1225	45°
Hardened tool steel 56 - 60 HRC									
1.00	2	39	0.035	0.070	0.020	1.00	12414	869	45°
2.00	2	49	0.045	0.090	0.030	1.98	7877	709	45°
2.50	2	49	0.045	0.090	0.030	2.48	6289	566	45°
3.00	2	49	0.045	0.090	0.030	2.98	5234	471	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

HM
XA

λ 25°
γ -10°



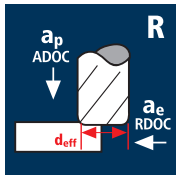
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6536** ø-Code **101**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6536
101	1.00	6.00	0.95	61	1.00	8.00	8.20	17.56	0.300	2	●
145	2.00	6.00	1.90	66	2.00	16.00	16.30	23.78	0.500	2	●
165	2.50	6.00	2.30	69	2.50	20.00	20.43	27.04	0.500	2	●
185	3.00	6.00	2.80	75	3.00	24.00	24.43	30.10	0.500	2	●

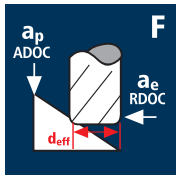
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.20	2	20	0.001	0.008	0.030	0.15	42441	78	0.050
0.40	2	41	0.002	0.015	0.060	0.31	42099	161	0.100
0.50	2	58	0.003	0.030	0.120	0.44	41959	256	0.100
0.80	2	70	0.005	0.030	0.240	0.74	30110	309	0.100
1.00	2	70	0.006	0.060	0.240	0.89	25036	309	0.200
1.50	2	70	0.011	0.080	0.550	1.42	15691	343	0.200
2.00	2	70	0.015	0.080	0.800	1.92	11605	343	0.200
2.50	2	70	0.019	0.080	1.050	2.42	9207	343	0.200
3.00	2	70	0.022	0.080	1.300	2.92	7631	343	0.200
Hardened tool steel 48 - 52 HRC									
0.20	2	20	0.001	0.008	0.030	0.15	42441	94	0.050
0.40	2	41	0.002	0.015	0.060	0.31	42099	193	0.100
0.50	2	58	0.004	0.030	0.120	0.44	41959	307	0.100
0.80	2	78	0.006	0.030	0.240	0.74	33552	413	0.100
1.00	2	78	0.007	0.060	0.240	0.89	27897	413	0.200
1.50	2	78	0.013	0.080	0.550	1.42	17485	459	0.200
2.00	2	78	0.018	0.080	0.800	1.92	12931	459	0.200
2.50	2	78	0.022	0.080	1.050	2.42	10260	459	0.200
3.00	2	78	0.027	0.080	1.300	2.92	8503	459	0.200
Hardened tool steel 52 - 56 HRC									
0.20	2	20	0.001	0.008	0.030	0.15	42441	78	0.050
0.40	2	41	0.002	0.015	0.060	0.31	42099	161	0.100
0.50	2	58	0.003	0.030	0.120	0.44	41959	256	0.100
0.80	2	72	0.005	0.030	0.240	0.74	30971	317	0.100
1.00	2	72	0.006	0.060	0.240	0.89	25751	317	0.200
1.50	2	72	0.011	0.080	0.550	1.42	16140	353	0.200
2.00	2	72	0.015	0.080	0.800	1.92	11937	353	0.200
2.50	2	72	0.019	0.080	1.050	2.42	9470	353	0.200
3.00	2	72	0.022	0.080	1.300	2.92	7849	353	0.200
Hardened tool steel 56 - 60 HRC									
0.20	2	18	0.001	0.005	0.020	0.14	40926	49	0.050
0.40	2	36	0.001	0.010	0.040	0.29	39514	99	0.100
0.50	2	36	0.002	0.015	0.090	0.41	27949	113	0.100
0.80	2	36	0.003	0.015	0.180	0.71	16140	113	0.100
1.00	2	36	0.004	0.030	0.180	0.81	14147	113	0.200
1.50	2	36	0.008	0.040	0.440	1.34	8552	141	0.200
2.00	2	36	0.011	0.040	0.640	1.84	6228	141	0.200
2.50	2	36	0.014	0.040	0.840	2.34	4897	141	0.200
3.00	2	36	0.017	0.040	1.040	2.84	4035	141	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.026	0.040	0.010	0.40	42176	2193	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	77	0.026	0.040	0.020	0.80	30637	1593	45°
1.00	2	77	0.037	0.057	0.020	1.00	24510	1816	45°
1.50	2	96	0.037	0.057	0.030	1.50	20372	1510	45°
2.00	2	96	0.037	0.057	0.030	2.00	15279	1132	45°
2.50	2	96	0.037	0.057	0.030	2.50	12223	906	45°
3.00	2	96	0.037	0.057	0.030	3.00	10186	755	45°
Hardened tool steel 48 - 52 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.026	0.040	0.010	0.40	42176	2193	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	69	0.026	0.040	0.020	0.80	27454	1428	45°
1.00	2	69	0.037	0.057	0.020	1.00	21963	1628	45°
1.50	2	86	0.037	0.057	0.030	1.50	18250	1352	45°
2.00	2	86	0.037	0.057	0.030	2.00	13687	1014	45°
2.50	2	86	0.037	0.057	0.030	2.50	10950	811	45°
3.00	2	86	0.037	0.057	0.030	3.00	9125	676	45°
Hardened tool steel 52 - 56 HRC									
0.20	2	26	0.020	0.030	0.010	0.19	43558	1699	45°
0.40	2	53	0.026	0.040	0.010	0.40	42176	2193	45°
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.80	2	63	0.026	0.040	0.020	0.80	25067	1304	45°
1.00	2	63	0.037	0.057	0.020	1.00	20054	1486	45°
1.50	2	79	0.037	0.057	0.030	1.50	16764	1242	45°
2.00	2	79	0.037	0.057	0.030	2.00	12573	932	45°
2.50	2	79	0.037	0.057	0.030	2.50	10059	745	45°
3.00	2	79	0.037	0.057	0.030	3.00	8382	621	45°
Hardened tool steel 56 - 60 HRC									
0.20	2	26	0.015	0.030	0.010	0.19	43558	1307	45°
0.40	2	39	0.020	0.040	0.010	0.40	31035	1241	45°
0.50	2	31	0.020	0.040	0.020	0.50	19735	789	45°
0.80	2	31	0.020	0.040	0.020	0.80	12335	493	45°
1.00	2	31	0.029	0.057	0.020	1.00	9868	563	45°
1.50	2	39	0.029	0.057	0.030	1.50	8276	472	45°
2.00	2	39	0.029	0.057	0.030	2.00	6207	354	45°
2.50	2	39	0.029	0.057	0.030	2.50	4966	283	45°
3.00	2	39	0.029	0.057	0.030	3.00	4138	236	45°

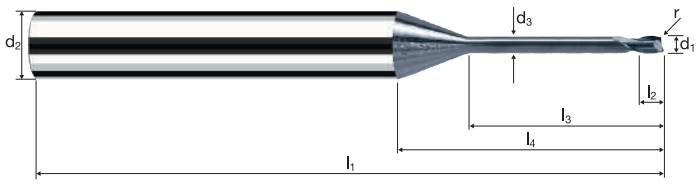
Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

X-Generation

II

HM XA	λ 25° γ -10°

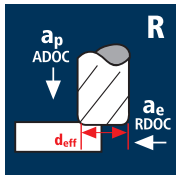


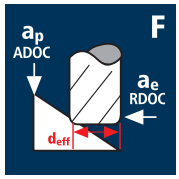
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6538** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6538
020	0.20	6.00	0.18	57	0.12	2.00	2.10	18.59	0.050	2	●
040	0.40	6.00	0.35	57	0.24	4.00	4.20	20.11	0.050	2	●
048	0.50	6.00	0.45	57	0.50	5.00	5.20	15.49	0.050	2	●
042	0.40	6.00	0.35	57	0.24	4.00	4.20	20.11	0.100	2	●
050	0.50	6.00	0.45	57	0.50	5.00	5.20	15.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	6.00	6.20	16.30	0.100	2	●
080	0.80	6.00	0.75	61	0.80	8.00	8.20	17.93	0.100	2	●
098	1.00	6.00	0.95	61	1.00	10.00	10.20	19.56	0.100	2	●
082	0.80	6.00	0.75	61	0.80	8.00	8.20	17.93	0.200	2	●
100	1.00	6.00	0.95	61	1.00	10.00	10.20	19.56	0.200	2	●
120	1.50	6.00	1.40	66	1.50	15.00	15.30	23.72	0.200	2	●
140	2.00	6.00	1.90	69	2.00	20.00	20.30	27.78	0.200	2	●
160	2.50	6.00	2.30	75	2.50	25.00	25.43	32.04	0.200	2	●
180	3.00	6.00	2.80	80	3.00	30.00	30.43	36.10	0.200	2	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
	Hardened tool steel 42 - 48 HRC	1.00	2	70	0.006	0.090	0.160	0.83	26845	309	0.300
		2.00	2	70	0.014	0.200	0.500	1.80	12379	343	0.500
		2.50	2	70	0.018	0.200	0.750	2.30	9688	343	0.500
		3.00	2	70	0.022	0.200	1.000	2.80	7958	343	0.500
	Hardened tool steel 48 - 52 HRC	1.00	2	78	0.007	0.090	0.160	0.83	29913	413	0.300
		2.00	2	78	0.017	0.200	0.500	1.80	13793	459	0.500
		2.50	2	78	0.021	0.200	0.750	2.30	10795	459	0.500
		3.00	2	78	0.026	0.200	1.000	2.80	8867	459	0.500
	Hardened tool steel 52 - 56 HRC	1.00	2	72	0.006	0.090	0.160	0.83	27612	317	0.300
		2.00	2	72	0.014	0.200	0.500	1.80	12732	353	0.500
		2.50	2	72	0.018	0.200	0.750	2.30	9964	353	0.500
		3.00	2	72	0.022	0.200	1.000	2.80	8185	353	0.500
	Hardened tool steel 56 - 60 HRC	1.00	2	36	0.004	0.045	0.120	0.72	15915	113	0.300
		2.00	2	36	0.010	0.100	0.400	1.60	7162	141	0.500
		2.50	2	36	0.013	0.100	0.600	2.10	5457	141	0.500
		3.00	2	36	0.016	0.100	0.800	2.60	4407	141	0.500

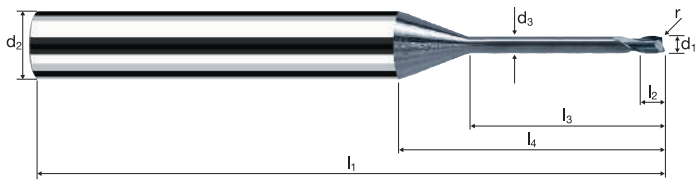
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
	Hardened tool steel 42 - 48 HRC	1.00	2	77	0.046	0.070	0.020	1.00	24510	2230	45°
		2.00	2	96	0.059	0.090	0.030	1.98	15433	1806	45°
		2.50	2	96	0.059	0.090	0.030	2.48	12322	1442	45°
		3.00	2	96	0.059	0.090	0.030	2.98	10254	1200	45°
	Hardened tool steel 48 - 52 HRC	1.00	2	69	0.046	0.070	0.020	1.00	21963	1999	45°
		2.00	2	86	0.059	0.090	0.030	1.98	13826	1618	45°
		2.50	2	86	0.059	0.090	0.030	2.48	11038	1291	45°
		3.00	2	86	0.059	0.090	0.030	2.98	9186	1075	45°
	Hardened tool steel 52 - 56 HRC	1.00	2	63	0.046	0.070	0.020	1.00	20054	1825	45°
		2.00	2	79	0.059	0.090	0.030	1.98	12700	1486	45°
		2.50	2	79	0.059	0.090	0.030	2.48	10140	1186	45°
		3.00	2	79	0.059	0.090	0.030	2.98	8438	987	45°
	Hardened tool steel 56 - 60 HRC	1.00	2	31	0.035	0.070	0.020	1.00	9868	691	45°
		2.00	2	39	0.045	0.090	0.030	1.98	6270	564	45°
		2.50	2	39	0.045	0.090	0.030	2.48	5006	451	45°
		3.00	2	39	0.045	0.090	0.030	2.98	4166	375	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

HM
XA

λ 25°
γ -10°



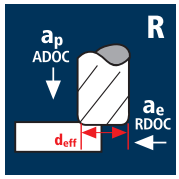
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6538** ø-Code **101**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6538
101	1.00	6.00	0.95	61	1.00	10.00	10.20	19.56	0.300	2	●
145	2.00	6.00	1.90	69	2.00	20.00	20.30	27.78	0.500	2	●
165	2.50	6.00	2.30	75	2.50	25.00	25.43	32.04	0.500	2	●
185	3.00	6.00	2.80	80	3.00	30.00	30.43	36.10	0.500	2	●

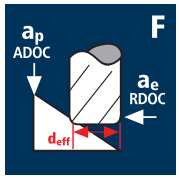
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	2	62	0.004	0.050	0.210	0.47	41990	320	0.100
0.60	2	75	0.005	0.050	0.280	0.57	41883	387	0.100
0.80	2	102	0.006	0.050	0.420	0.77	42166	526	0.100
1.00	2	109	0.008	0.100	0.420	0.95	36522	562	0.200
1.50	2	109	0.013	0.120	0.880	1.47	23603	625	0.200
2.00	2	109	0.018	0.120	1.280	1.97	17612	625	0.200
Hardened tool steel 48 - 52 HRC									
0.50	2	62	0.005	0.050	0.210	0.47	41990	384	0.100
0.60	2	75	0.006	0.050	0.280	0.57	41883	464	0.100
0.80	2	102	0.007	0.050	0.420	0.77	42166	631	0.100
1.00	2	121	0.009	0.100	0.420	0.95	40543	749	0.200
1.50	2	121	0.016	0.120	0.880	1.47	26201	832	0.200
2.00	2	121	0.021	0.120	1.280	1.97	19551	832	0.200
Hardened tool steel 52 - 56 HRC									
0.50	2	62	0.004	0.050	0.210	0.47	41990	320	0.100
0.60	2	75	0.005	0.050	0.280	0.57	41883	387	0.100
0.80	2	102	0.006	0.050	0.420	0.77	42166	526	0.100
1.00	2	113	0.008	0.100	0.420	0.95	37862	583	0.200
1.50	2	113	0.013	0.120	0.880	1.47	24469	647	0.200
2.00	2	113	0.018	0.120	1.280	1.97	18258	647	0.200
Hardened tool steel 56 - 60 HRC									
0.50	2	57	0.003	0.030	0.180	0.44	41236	209	0.100
0.60	2	57	0.003	0.030	0.240	0.54	33599	209	0.100
0.80	2	57	0.004	0.030	0.360	0.74	24518	209	0.100
1.00	2	57	0.005	0.060	0.360	0.89	20386	209	0.200
1.50	2	57	0.010	0.080	0.770	1.42	12777	261	0.200
2.00	2	57	0.014	0.080	1.120	1.92	9450	261	0.200

Application



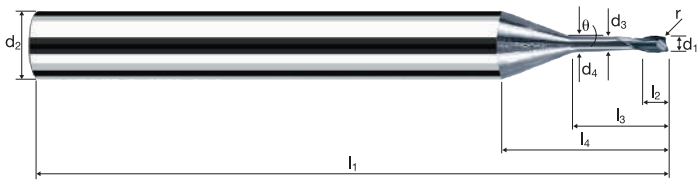
Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.037	0.057	0.020	1.00	33741	2500	45°
1.50	2	150	0.037	0.057	0.030	1.50	31831	2359	45°
2.00	2	150	0.037	0.057	0.030	2.00	23873	1769	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	106	0.037	0.057	0.020	1.00	33741	2500	45°
1.50	2	134	0.037	0.057	0.030	1.50	28436	2107	45°
2.00	2	134	0.037	0.057	0.030	2.00	21327	1580	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	98	0.037	0.057	0.020	1.00	31194	2312	45°
1.50	2	123	0.037	0.057	0.030	1.50	26101	1934	45°
2.00	2	123	0.037	0.057	0.030	2.00	19576	1451	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	49	0.020	0.040	0.020	0.50	31194	1248	45°
0.60	2	49	0.020	0.040	0.020	0.60	25995	1040	45°
0.80	2	49	0.020	0.040	0.020	0.80	19496	780	45°
1.00	2	49	0.029	0.057	0.020	1.00	15597	889	45°
1.50	2	61	0.029	0.057	0.030	1.50	12945	738	45°
2.00	2	61	0.029	0.057	0.030	2.00	9708	553	45°

Corner radius end mills MicroX

Shank ø 6mm, conical neck 0.9°, 6xd

HM XA	λ 25° γ -10°



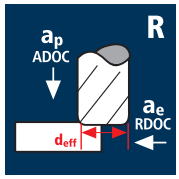
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6735** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r 0/+0.01	z	X-AL X6735
050	0.50	6.00	0.45	0.53	57	0.40	3.00	3.00	13.34	0.9°	0.100	2	●
060	0.60	6.00	0.55	0.65	57	0.50	3.60	3.60	13.71	0.9°	0.100	2	●
080	0.80	6.00	0.75	0.88	57	0.65	4.80	4.80	14.49	0.9°	0.100	2	●
100	1.00	6.00	0.95	1.11	57	0.80	6.00	6.00	15.26	0.9°	0.200	2	●
120	1.50	6.00	1.40	1.65	61	1.20	9.00	9.00	17.25	0.9°	0.200	2	●
140	2.00	6.00	1.90	2.23	66	1.60	12.00	12.00	19.17	0.9°	0.200	2	●
145	2.00	6.00	1.90	2.23	66	1.60	12.00	12.00	19.17	0.9°	0.500	2	●

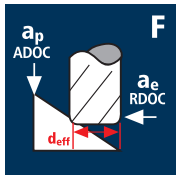
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	2	61	0.003	0.040	0.150	0.46	42211	283	0.100
0.60	2	74	0.004	0.040	0.200	0.56	42062	343	0.100
0.80	2	87	0.006	0.040	0.300	0.76	36438	404	0.100
1.00	2	87	0.007	0.080	0.300	0.92	30101	404	0.200
1.20	2	87	0.009	0.100	0.480	1.15	24081	449	0.200
1.50	2	87	0.012	0.100	0.660	1.45	19099	449	0.200
2.00	2	87	0.016	0.100	0.960	1.95	14202	449	0.200
2.50	2	87	0.020	0.100	1.260	2.45	11303	449	0.200
3.00	2	87	0.024	0.100	1.560	2.95	9387	449	0.200
Hardened tool steel 48 - 52 HRC									
0.50	2	61	0.004	0.040	0.150	0.46	42211	340	0.100
0.60	2	74	0.005	0.040	0.200	0.56	42062	412	0.100
0.80	2	97	0.007	0.040	0.300	0.76	40626	540	0.100
1.00	2	97	0.008	0.080	0.300	0.92	33561	540	0.200
1.20	2	97	0.011	0.100	0.480	1.15	26849	600	0.200
1.50	2	97	0.014	0.100	0.660	1.45	21294	600	0.200
2.00	2	97	0.019	0.100	0.960	1.95	15834	600	0.200
2.50	2	97	0.024	0.100	1.260	2.45	12602	600	0.200
3.00	2	97	0.029	0.100	1.560	2.95	10466	600	0.200
Hardened tool steel 52 - 56 HRC									
0.50	2	61	0.003	0.040	0.150	0.46	42211	283	0.100
0.60	2	74	0.004	0.040	0.200	0.56	42062	343	0.100
0.80	2	90	0.006	0.040	0.300	0.76	37695	418	0.100
1.00	2	90	0.007	0.080	0.300	0.92	31139	418	0.200
1.20	2	90	0.009	0.100	0.480	1.15	24911	464	0.200
1.50	2	90	0.012	0.100	0.660	1.45	19757	464	0.200
2.00	2	90	0.016	0.100	0.960	1.95	14691	464	0.200
2.50	2	90	0.020	0.100	1.260	2.45	11693	464	0.200
3.00	2	90	0.024	0.100	1.560	2.95	9711	464	0.200
Hardened tool steel 56 - 60 HRC									
0.50	2	45	0.002	0.020	0.120	0.42	34105	149	0.100
0.60	2	45	0.003	0.020	0.160	0.52	27546	149	0.100
0.80	2	45	0.004	0.020	0.240	0.72	19894	149	0.100
1.00	2	45	0.004	0.040	0.240	0.84	17052	149	0.200
1.20	2	45	0.007	0.060	0.400	1.09	13141	186	0.200
1.50	2	45	0.009	0.060	0.550	1.39	10305	186	0.200
2.00	2	45	0.012	0.060	0.800	1.89	7579	186	0.200
2.50	2	45	0.015	0.060	1.050	2.39	5993	186	0.200
3.00	2	45	0.019	0.060	1.300	2.89	4956	186	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	96	0.037	0.057	0.020	1.00	30558	2264	45°
1.20	2	96	0.037	0.057	0.020	1.20	25465	1887	45°
1.50	2	120	0.037	0.057	0.030	1.50	25465	1887	45°
2.00	2	120	0.037	0.057	0.030	2.00	19099	1415	45°
2.50	2	120	0.037	0.057	0.030	2.50	15279	1132	45°
3.00	2	120	0.037	0.057	0.030	3.00	12732	943	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	84	0.026	0.040	0.020	0.80	33423	1738	45°
1.00	2	86	0.037	0.057	0.020	1.00	27375	2029	45°
1.20	2	86	0.037	0.057	0.020	1.20	22812	1690	45°
1.50	2	107	0.037	0.057	0.030	1.50	22706	1683	45°
2.00	2	107	0.037	0.057	0.030	2.00	17030	1262	45°
2.50	2	107	0.037	0.057	0.030	2.50	13624	1010	45°
3.00	2	107	0.037	0.057	0.030	3.00	11353	841	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	79	0.037	0.057	0.020	1.00	25146	1863	45°
1.20	2	79	0.037	0.057	0.020	1.20	20955	1553	45°
1.50	2	98	0.037	0.057	0.030	1.50	20796	1541	45°
2.00	2	98	0.037	0.057	0.030	2.00	15597	1156	45°
2.50	2	98	0.037	0.057	0.030	2.50	12478	925	45°
3.00	2	98	0.037	0.057	0.030	3.00	10398	771	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	39	0.020	0.040	0.020	0.50	24828	993	45°
0.60	2	39	0.020	0.040	0.020	0.60	20690	828	45°
0.80	2	39	0.020	0.040	0.020	0.80	15518	621	45°
1.00	2	39	0.029	0.057	0.020	1.00	12414	708	45°
1.20	2	49	0.029	0.057	0.030	1.20	12998	741	45°
1.50	2	49	0.029	0.057	0.030	1.50	10398	593	45°
2.00	2	49	0.029	0.057	0.030	2.00	7799	445	45°
2.50	2	49	0.029	0.057	0.030	2.50	6239	356	45°
3.00	2	49	0.029	0.057	0.030	3.00	5199	296	45°

Corner radius end mills MicroX

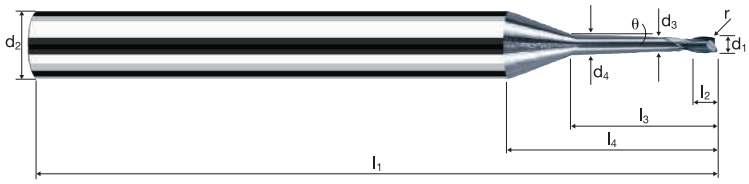
Shank ø 6mm, conical neck 0.9°, 8xd

X-Generation

II

HM
XA

λ 25°
γ -10°



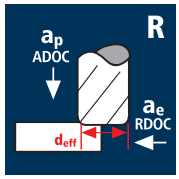
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6736** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r 0/+0.01	z	X-AL X6736
050	0.50	6.00	0.45	0.56	57	0.40	4.00	4.00	14.28	0.9°	0.100	2	●
060	0.60	6.00	0.55	0.69	57	0.50	4.80	4.80	14.84	0.9°	0.100	2	●
080	0.80	6.00	0.75	0.93	57	0.65	6.40	6.40	15.99	0.9°	0.100	2	●
100	1.00	6.00	0.95	1.18	61	0.80	8.00	8.00	17.13	0.9°	0.200	2	●
108	1.20	6.00	1.10	1.37	61	1.00	9.60	9.60	18.37	0.9°	0.200	2	●
120	1.50	6.00	1.40	1.74	61	1.20	12.00	12.00	20.08	0.9°	0.200	2	●
140	2.00	6.00	1.90	2.35	66	1.60	16.00	16.00	22.94	0.9°	0.200	2	●
160	2.50	6.00	2.30	2.87	69	2.00	20.00	20.00	25.97	0.9°	0.200	2	●
180	3.00	6.00	2.80	3.48	75	2.40	24.00	24.00	28.83	0.9°	0.200	2	●
145	2.00	6.00	1.90	2.35	66	1.60	16.00	16.00	22.94	0.9°	0.500	2	●
165	2.50	6.00	2.30	2.87	69	2.00	20.00	20.00	25.97	0.9°	0.500	2	●
185	3.00	6.00	2.80	3.48	75	2.40	24.00	24.00	28.83	0.9°	0.500	2	●

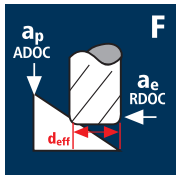
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	2	58	0.003	0.030	0.120	0.44	41959	256	0.100
0.60	2	70	0.004	0.030	0.160	0.54	41262	309	0.100
0.80	2	70	0.005	0.030	0.240	0.74	30110	309	0.100
1.00	2	70	0.006	0.060	0.240	0.89	25036	309	0.200
1.20	2	70	0.009	0.080	0.400	1.12	19894	343	0.200
1.50	2	70	0.011	0.080	0.550	1.42	15691	343	0.200
2.00	2	70	0.015	0.080	0.800	1.92	11605	343	0.200
2.50	2	70	0.019	0.080	1.050	2.42	9207	343	0.200
3.00	2	70	0.022	0.080	1.300	2.92	7631	343	0.200
Hardened tool steel 48 - 52 HRC									
0.50	2	58	0.004	0.030	0.120	0.44	41959	307	0.100
0.60	2	71	0.004	0.030	0.160	0.54	41852	376	0.100
0.80	2	78	0.006	0.030	0.240	0.74	33552	413	0.100
1.00	2	78	0.007	0.060	0.240	0.89	27897	413	0.200
1.20	2	78	0.010	0.080	0.400	1.12	22168	459	0.200
1.50	2	78	0.013	0.080	0.550	1.42	17485	459	0.200
2.00	2	78	0.018	0.080	0.800	1.92	12931	459	0.200
2.50	2	78	0.022	0.080	1.050	2.42	10260	459	0.200
3.00	2	78	0.027	0.080	1.300	2.92	8503	459	0.200
Hardened tool steel 52 - 56 HRC									
0.50	2	58	0.003	0.030	0.120	0.44	41959	256	0.100
0.60	2	71	0.004	0.030	0.160	0.54	41852	313	0.100
0.80	2	72	0.005	0.030	0.240	0.74	30971	317	0.100
1.00	2	72	0.006	0.060	0.240	0.89	25751	317	0.200
1.20	2	72	0.009	0.080	0.400	1.12	20463	353	0.200
1.50	2	72	0.011	0.080	0.550	1.42	16140	353	0.200
2.00	2	72	0.015	0.080	0.800	1.92	11937	353	0.200
2.50	2	72	0.019	0.080	1.050	2.42	9470	353	0.200
3.00	2	72	0.022	0.080	1.300	2.92	7849	353	0.200
Hardened tool steel 56 - 60 HRC									
0.50	2	36	0.002	0.015	0.090	0.41	27949	113	0.100
0.60	2	36	0.003	0.015	0.120	0.51	22469	113	0.100
0.80	2	36	0.003	0.015	0.180	0.71	16140	113	0.100
1.00	2	36	0.004	0.030	0.180	0.81	14147	113	0.200
1.20	2	36	0.006	0.040	0.320	1.04	11018	141	0.200
1.50	2	36	0.008	0.040	0.440	1.34	8552	141	0.200
2.00	2	36	0.011	0.040	0.640	1.84	6228	141	0.200
2.50	2	36	0.014	0.040	0.840	2.34	4897	141	0.200
3.00	2	36	0.017	0.040	1.040	2.84	4035	141	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	77	0.026	0.040	0.020	0.80	30637	1593	45°
1.00	2	77	0.037	0.057	0.020	1.00	24510	1816	45°
1.20	2	77	0.037	0.057	0.020	1.20	20425	1514	45°
1.50	2	96	0.037	0.057	0.030	1.50	20372	1510	45°
2.00	2	96	0.037	0.057	0.030	2.00	15279	1132	45°
2.50	2	96	0.037	0.057	0.030	2.50	12223	906	45°
3.00	2	96	0.037	0.057	0.030	3.00	10186	755	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	69	0.026	0.040	0.020	0.80	27454	1428	45°
1.00	2	69	0.037	0.057	0.020	1.00	21963	1628	45°
1.20	2	69	0.037	0.057	0.020	1.20	18303	1356	45°
1.50	2	86	0.037	0.057	0.030	1.50	18250	1352	45°
2.00	2	86	0.037	0.057	0.030	2.00	13687	1014	45°
2.50	2	86	0.037	0.057	0.030	2.50	10950	811	45°
3.00	2	86	0.037	0.057	0.030	3.00	9125	676	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	63	0.026	0.040	0.020	0.80	25067	1304	45°
1.00	2	63	0.037	0.057	0.020	1.00	20054	1486	45°
1.20	2	63	0.037	0.057	0.020	1.20	16711	1238	45°
1.50	2	79	0.037	0.057	0.030	1.50	16764	1242	45°
2.00	2	79	0.037	0.057	0.030	2.00	12573	932	45°
2.50	2	79	0.037	0.057	0.030	2.50	10059	745	45°
3.00	2	79	0.037	0.057	0.030	3.00	8382	621	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	31	0.020	0.040	0.020	0.50	19735	789	45°
0.60	2	31	0.020	0.040	0.020	0.60	16446	658	45°
0.80	2	31	0.020	0.040	0.020	0.80	12335	493	45°
1.00	2	31	0.029	0.057	0.020	1.00	9868	563	45°
1.20	2	39	0.029	0.057	0.030	1.20	10345	590	45°
1.50	2	39	0.029	0.057	0.030	1.50	8276	472	45°
2.00	2	39	0.029	0.057	0.030	2.00	6207	354	45°
2.50	2	39	0.029	0.057	0.030	2.50	4966	283	45°
3.00	2	39	0.029	0.057	0.030	3.00	4138	236	45°

Corner radius end mills MicroX

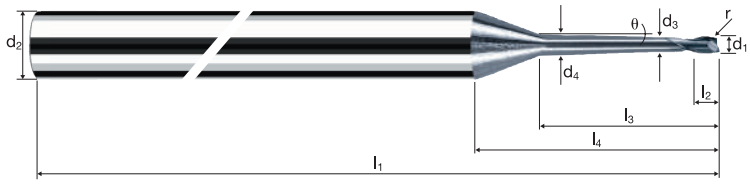
Shank ø 6mm, conical neck 0.9°, 10xd

X-Generation X

II

HM
XA

λ 25°
γ -10°



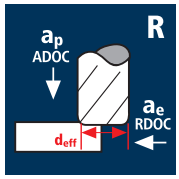
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6738** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r 0/+0.01	z	X-AL	X6738
050	0.50	6.00	0.45	0.59	57	0.40	5.00	5.00	15.23	0.9°	0.100	2		●
060	0.60	6.00	0.55	0.72	57	0.50	6.00	6.00	15.98	0.9°	0.100	2		●
080	0.80	6.00	0.75	0.98	61	0.65	8.00	8.00	17.50	0.9°	0.100	2		●
100	1.00	6.00	0.95	1.24	61	0.80	10.00	10.00	19.01	0.9°	0.200	2		●
108	1.20	6.00	1.10	1.45	66	1.00	12.00	12.00	20.62	0.9°	0.200	2		●
120	1.50	6.00	1.40	1.83	66	1.20	15.00	15.00	22.91	0.9°	0.200	2		●
140	2.00	6.00	1.90	2.48	69	1.60	20.00	20.00	26.70	0.9°	0.200	2		●
160	2.50	6.00	2.30	3.02	75	2.00	25.00	25.00	30.69	0.9°	0.200	2		●
180	3.00	6.00	2.80	3.67	75	2.40	30.00	30.00	34.48	0.9°	0.200	2		●
145	2.00	6.00	1.90	2.48	69	1.60	20.00	20.00	26.70	0.9°	0.500	2		●
165	2.50	6.00	2.30	3.02	75	2.00	25.00	25.00	30.69	0.9°	0.500	2		●
185	3.00	6.00	2.80	3.67	75	2.40	30.00	30.00	34.48	0.9°	0.500	2		●

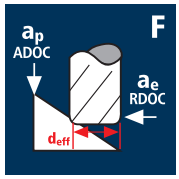
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	2	55	0.003	0.020	0.090	0.42	41683	218	0.100
0.60	2	63	0.003	0.020	0.120	0.52	38564	250	0.100
0.80	2	63	0.004	0.020	0.180	0.72	27852	250	0.100
1.00	2	63	0.005	0.040	0.180	0.84	23873	250	0.200
1.20	2	63	0.008	0.060	0.320	1.09	18398	278	0.200
1.50	2	63	0.010	0.060	0.440	1.39	14427	278	0.200
2.00	2	63	0.013	0.060	0.640	1.89	10610	278	0.200
2.50	2	63	0.017	0.060	0.840	2.39	8391	278	0.200
3.00	2	63	0.020	0.060	1.040	2.89	6939	278	0.200
Hardened tool steel 48 - 52 HRC									
0.50	2	55	0.003	0.020	0.090	0.42	41683	262	0.100
0.60	2	69	0.004	0.020	0.120	0.52	42237	329	0.100
0.80	2	70	0.005	0.020	0.180	0.72	30947	333	0.100
1.00	2	70	0.006	0.040	0.180	0.84	26526	333	0.200
1.20	2	70	0.009	0.060	0.320	1.09	20442	370	0.200
1.50	2	70	0.012	0.060	0.440	1.39	16030	370	0.200
2.00	2	70	0.016	0.060	0.640	1.89	11789	370	0.200
2.50	2	70	0.020	0.060	0.840	2.39	9323	370	0.200
3.00	2	70	0.024	0.060	1.040	2.89	7710	370	0.200
Hardened tool steel 52 - 56 HRC									
0.50	2	55	0.003	0.020	0.090	0.42	41683	218	0.100
0.60	2	65	0.003	0.020	0.120	0.52	39789	258	0.100
0.80	2	65	0.004	0.020	0.180	0.72	28736	258	0.100
1.00	2	65	0.005	0.040	0.180	0.84	24631	258	0.200
1.20	2	65	0.008	0.060	0.320	1.09	18982	287	0.200
1.50	2	65	0.010	0.060	0.440	1.39	14885	287	0.200
2.00	2	65	0.013	0.060	0.640	1.89	10947	287	0.200
2.50	2	65	0.017	0.060	0.840	2.39	8657	287	0.200
3.00	2	65	0.020	0.060	1.040	2.89	7159	287	0.200
Hardened tool steel 56 - 60 HRC									
0.50	2	33	0.002	0.010	0.060	0.39	26934	93	0.100
0.60	2	33	0.002	0.010	0.080	0.49	21437	93	0.100
0.80	2	33	0.003	0.010	0.120	0.69	15224	93	0.100
1.00	2	33	0.003	0.020	0.120	0.77	13642	93	0.200
1.20	2	33	0.006	0.030	0.240	1.01	10400	116	0.200
1.50	2	33	0.007	0.030	0.330	1.31	8018	116	0.200
2.00	2	33	0.010	0.030	0.480	1.81	5803	116	0.200
2.50	2	33	0.013	0.030	0.630	2.31	4547	116	0.200
3.00	2	33	0.016	0.030	0.780	2.81	3738	116	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	63	0.026	0.040	0.020	0.60	33423	1738	45°
0.80	2	69	0.026	0.040	0.020	0.80	27454	1428	45°
1.00	2	69	0.037	0.057	0.020	1.00	21963	1628	45°
1.20	2	69	0.037	0.057	0.020	1.20	18303	1356	45°
1.50	2	86	0.037	0.057	0.030	1.50	18250	1352	45°
2.00	2	86	0.037	0.057	0.030	2.00	13687	1014	45°
2.50	2	86	0.037	0.057	0.030	2.50	10950	811	45°
3.00	2	86	0.037	0.057	0.030	3.00	9125	676	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	62	0.026	0.040	0.020	0.60	32892	1710	45°
0.80	2	62	0.026	0.040	0.020	0.80	24669	1283	45°
1.00	2	62	0.037	0.057	0.020	1.00	19735	1462	45°
1.20	2	62	0.037	0.057	0.020	1.20	16446	1219	45°
1.50	2	77	0.037	0.057	0.030	1.50	16340	1211	45°
2.00	2	77	0.037	0.057	0.030	2.00	12255	908	45°
2.50	2	77	0.037	0.057	0.030	2.50	9804	727	45°
3.00	2	77	0.037	0.057	0.030	3.00	8170	605	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	53	0.026	0.040	0.020	0.50	33741	1755	45°
0.60	2	57	0.026	0.040	0.020	0.60	30239	1572	45°
0.80	2	57	0.026	0.040	0.020	0.80	22680	1179	45°
1.00	2	57	0.037	0.057	0.020	1.00	18144	1345	45°
1.20	2	57	0.037	0.057	0.020	1.20	15120	1120	45°
1.50	2	71	0.037	0.057	0.030	1.50	15067	1117	45°
2.00	2	71	0.037	0.057	0.030	2.00	11300	837	45°
2.50	2	71	0.037	0.057	0.030	2.50	9040	670	45°
3.00	2	71	0.037	0.057	0.030	3.00	7533	558	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	28	0.020	0.040	0.020	0.50	17825	713	45°
0.60	2	28	0.020	0.040	0.020	0.60	14854	594	45°
0.80	2	28	0.020	0.040	0.020	0.80	11141	446	45°
1.00	2	28	0.029	0.057	0.020	1.00	8913	508	45°
1.20	2	35	0.029	0.057	0.030	1.20	9284	529	45°
1.50	2	35	0.029	0.057	0.030	1.50	7427	423	45°
2.00	2	35	0.029	0.057	0.030	2.00	5570	318	45°
2.50	2	35	0.029	0.057	0.030	2.50	4456	254	45°
3.00	2	35	0.029	0.057	0.030	3.00	3714	212	45°

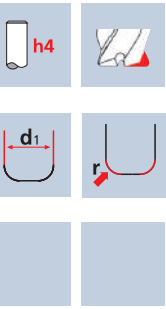
Corner radius end mills MicroX

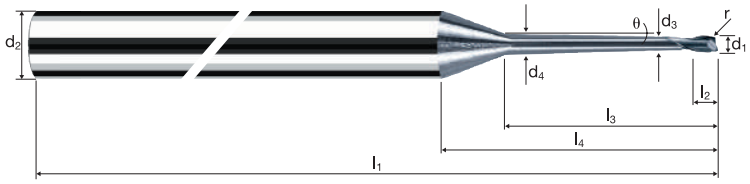
Shank ø 6mm, conical neck 0.9°, 12xd

X-Generation

II

HM XA	λ 25° γ -10°



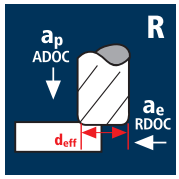


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6740** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r 0/+0.01	z	X-AL X6740
050	0.50	6.00	0.45	0.63	57	0.40	6.00	6.00	16.15	0.9°	0.100	2	●
060	0.60	6.00	0.55	0.76	57	0.50	7.20	7.20	17.11	0.9°	0.100	2	●
080	0.80	6.00	0.75	1.03	61	0.65	9.60	9.60	19.01	0.9°	0.100	2	●
100	1.00	6.00	0.95	1.30	66	0.80	12.00	12.00	20.90	0.9°	0.200	2	●
108	1.20	6.00	1.10	1.52	66	1.00	14.40	14.40	22.89	0.9°	0.200	2	●
120	1.50	6.00	1.40	1.93	69	1.20	18.00	18.00	25.73	0.9°	0.200	2	●
140	2.00	6.00	1.90	2.60	75	1.60	24.00	24.00	30.48	0.9°	0.200	2	●
160	2.50	6.00	2.30	3.18	80	2.00	30.00	30.00	35.39	0.9°	0.200	2	●
180	3.00	6.00	2.80	3.86	87	2.40	36.00	36.00	40.12	0.9°	0.200	2	●
145	2.00	6.00	1.90	2.60	75	1.60	24.00	24.00	30.48	0.9°	0.500	2	●
165	2.50	6.00	2.30	3.18	80	2.00	30.00	30.00	35.39	0.9°	0.500	2	●
185	3.00	6.00	2.80	3.86	87	2.40	36.00	36.00	40.12	0.9°	0.500	2	●

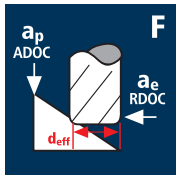
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	2	44	0.002	0.010	0.060	0.39	35912	157	0.100
0.60	2	44	0.003	0.010	0.080	0.49	28583	157	0.100
0.80	2	44	0.004	0.010	0.120	0.69	20298	157	0.100
1.00	2	44	0.004	0.020	0.120	0.77	18189	157	0.200
1.20	2	44	0.006	0.040	0.240	1.04	13467	175	0.200
1.50	2	44	0.008	0.040	0.330	1.34	10452	175	0.200
2.00	2	44	0.011	0.040	0.480	1.84	7612	175	0.200
2.50	2	44	0.015	0.040	0.630	2.34	5985	175	0.200
3.00	2	44	0.018	0.040	0.780	2.84	4932	175	0.200
Hardened tool steel 48 - 52 HRC									
0.50	2	49	0.003	0.010	0.060	0.39	39993	210	0.100
0.60	2	49	0.003	0.010	0.080	0.49	31831	210	0.100
0.80	2	49	0.005	0.010	0.120	0.69	22605	210	0.100
1.00	2	49	0.005	0.020	0.120	0.77	20256	210	0.200
1.20	2	49	0.008	0.040	0.240	1.04	14997	233	0.200
1.50	2	49	0.010	0.040	0.330	1.34	11640	233	0.200
2.00	2	49	0.014	0.040	0.480	1.84	8477	233	0.200
2.50	2	49	0.018	0.040	0.630	2.34	6665	233	0.200
3.00	2	49	0.021	0.040	0.780	2.84	5492	233	0.200
Hardened tool steel 52 - 56 HRC									
0.50	2	46	0.002	0.010	0.060	0.39	37544	164	0.100
0.60	2	46	0.003	0.010	0.080	0.49	29882	164	0.100
0.80	2	46	0.004	0.010	0.120	0.69	21221	164	0.100
1.00	2	46	0.004	0.020	0.120	0.77	19016	164	0.200
1.20	2	46	0.006	0.040	0.240	1.04	14079	183	0.200
1.50	2	46	0.008	0.040	0.330	1.34	10927	183	0.200
2.00	2	46	0.011	0.040	0.480	1.84	7958	183	0.200
2.50	2	46	0.015	0.040	0.630	2.34	6257	183	0.200
3.00	2	46	0.018	0.040	0.780	2.84	5156	183	0.200
Hardened tool steel 56 - 60 HRC									
0.50	2	23	0.001	0.005	0.030	0.36	20336	58	0.100
0.60	2	23	0.002	0.005	0.040	0.46	15915	58	0.100
0.80	2	23	0.003	0.005	0.060	0.66	11093	58	0.100
1.00	2	23	0.003	0.010	0.060	0.72	10168	58	0.200
1.20	2	23	0.005	0.020	0.160	0.97	7548	73	0.200
1.50	2	23	0.006	0.020	0.220	1.27	5765	73	0.200
2.00	2	23	0.009	0.020	0.320	1.77	4136	73	0.200
2.50	2	23	0.011	0.020	0.420	2.27	3225	73	0.200
3.00	2	23	0.014	0.020	0.520	2.77	2643	73	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	48	0.026	0.040	0.020	0.50	30558	1589	45°
0.60	2	48	0.026	0.040	0.020	0.60	25465	1324	45°
0.80	2	48	0.026	0.040	0.020	0.80	19099	993	45°
1.00	2	48	0.037	0.057	0.020	1.00	15279	1132	45°
1.20	2	48	0.037	0.057	0.020	1.20	12732	943	45°
1.50	2	60	0.037	0.057	0.030	1.50	12732	943	45°
2.00	2	60	0.037	0.057	0.030	2.00	9549	708	45°
2.50	2	60	0.037	0.057	0.030	2.50	7639	566	45°
3.00	2	60	0.037	0.057	0.030	3.00	6366	472	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	43	0.026	0.040	0.020	0.50	27375	1424	45°
0.60	2	43	0.026	0.040	0.020	0.60	22812	1186	45°
0.80	2	43	0.026	0.040	0.020	0.80	17109	890	45°
1.00	2	43	0.037	0.057	0.020	1.00	13687	1014	45°
1.20	2	43	0.037	0.057	0.020	1.20	11406	845	45°
1.50	2	54	0.037	0.057	0.030	1.50	11459	849	45°
2.00	2	54	0.037	0.057	0.030	2.00	8594	637	45°
2.50	2	54	0.037	0.057	0.030	2.50	6875	509	45°
3.00	2	54	0.037	0.057	0.030	3.00	5730	425	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	40	0.026	0.040	0.020	0.50	25465	1324	45°
0.60	2	40	0.026	0.040	0.020	0.60	21221	1104	45°
0.80	2	40	0.026	0.040	0.020	0.80	15915	828	45°
1.00	2	40	0.037	0.057	0.020	1.00	12732	943	45°
1.20	2	40	0.037	0.057	0.020	1.20	10610	786	45°
1.50	2	49	0.037	0.057	0.030	1.50	10398	771	45°
2.00	2	49	0.037	0.057	0.030	2.00	7799	578	45°
2.50	2	49	0.037	0.057	0.030	2.50	6239	462	45°
3.00	2	49	0.037	0.057	0.030	3.00	5199	385	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	20	0.020	0.040	0.020	0.50	12732	509	45°
0.60	2	20	0.020	0.040	0.020	0.60	10610	424	45°
0.80	2	20	0.020	0.040	0.020	0.80	7958	318	45°
1.00	2	20	0.029	0.057	0.020	1.00	6366	363	45°
1.20	2	25	0.029	0.057	0.030	1.20	6631	378	45°
1.50	2	25	0.029	0.057	0.030	1.50	5305	302	45°
2.00	2	25	0.029	0.057	0.030	2.00	3979	227	45°
2.50	2	25	0.029	0.057	0.030	2.50	3183	181	45°
3.00	2	25	0.029	0.057	0.030	3.00	2653	151	45°

Corner radius end mills MicroX

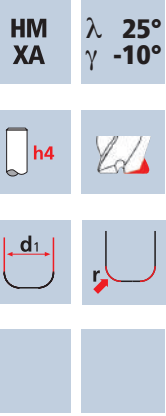
Shank ø 6mm, conical neck 0.9°, 15xd

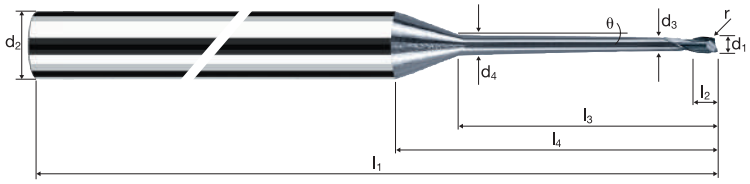
X-Generation X

II

HM
XA

λ 25°
γ -10°



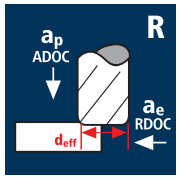


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6742** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r 0/+0.01	z	X-AL X6742
050	0.50	6.00	0.45	0.67	61	0.40	7.50	7.50	17.58	0.9°	0.100	2	●
060	0.60	6.00	0.55	0.82	61	0.50	9.00	9.00	18.80	0.9°	0.100	2	●
080	0.80	6.00	0.75	1.11	66	0.65	12.00	12.00	21.26	0.9°	0.100	2	●
100	1.00	6.00	0.95	1.40	66	0.80	15.00	15.00	23.72	0.9°	0.200	2	●
108	1.20	6.00	1.10	1.63	69	1.00	18.00	18.00	26.29	0.9°	0.200	2	●
120	1.50	6.00	1.40	2.07	75	1.20	22.50	22.50	29.97	0.9°	0.200	2	●
140	2.00	6.00	1.90	2.79	80	1.60	30.00	30.00	36.12	0.9°	0.200	2	●
160	2.50	6.00	2.30	3.42	87	2.00	37.50	37.50	42.45	0.9°	0.200	2	●
180	3.00	6.00	2.80	4.14	100	2.40	45.00	45.00	48.60	0.9°	0.200	2	●
145	2.00	6.00	1.90	2.79	80	1.60	30.00	30.00	36.12	0.9°	0.500	2	●
165	2.50	6.00	2.30	3.42	87	2.00	37.50	37.50	42.45	0.9°	0.500	2	●
185	3.00	6.00	2.80	4.14	100	2.40	45.00	45.00	48.60	0.9°	0.500	2	●

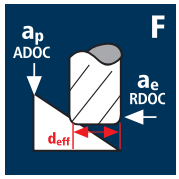
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	2	31	0.002	0.010	0.060	0.39	25302	100	0.100
0.60	2	31	0.002	0.010	0.080	0.49	20138	100	0.100
0.80	2	31	0.003	0.010	0.120	0.69	14301	100	0.100
1.00	2	31	0.004	0.020	0.120	0.77	12815	100	0.200
1.50	2	31	0.007	0.020	0.220	1.27	7770	111	0.200
2.00	2	31	0.010	0.020	0.320	1.77	5575	111	0.200
2.50	2	31	0.013	0.020	0.420	2.27	4347	111	0.200
3.00	2	31	0.016	0.020	0.520	2.77	3562	111	0.200
Hardened tool steel 48 - 52 HRC									
0.50	2	34	0.002	0.010	0.060	0.39	27750	131	0.100
0.60	2	34	0.003	0.010	0.080	0.49	22087	131	0.100
0.80	2	34	0.004	0.010	0.120	0.69	15685	131	0.100
1.00	2	34	0.005	0.020	0.120	0.77	14055	131	0.200
1.50	2	34	0.009	0.020	0.220	1.27	8522	146	0.200
2.00	2	34	0.012	0.020	0.320	1.77	6114	146	0.200
2.50	2	34	0.015	0.020	0.420	2.27	4768	146	0.200
3.00	2	34	0.019	0.020	0.520	2.77	3907	146	0.200
Hardened tool steel 52 - 56 HRC									
0.50	2	32	0.002	0.010	0.060	0.39	26118	103	0.100
0.60	2	32	0.002	0.010	0.080	0.49	20788	103	0.100
0.80	2	32	0.003	0.010	0.120	0.69	14762	103	0.100
1.00	2	32	0.004	0.020	0.120	0.77	13228	103	0.200
1.50	2	32	0.007	0.020	0.220	1.27	8020	114	0.200
2.00	2	32	0.010	0.020	0.320	1.77	5755	114	0.200
2.50	2	32	0.013	0.020	0.420	2.27	4487	114	0.200
3.00	2	32	0.016	0.020	0.520	2.77	3677	114	0.200
Hardened tool steel 56 - 60 HRC									
0.50	2	16	0.001	0.005	0.030	0.36	14147	37	0.100
0.60	2	16	0.002	0.005	0.040	0.46	11072	37	0.100
0.80	2	16	0.002	0.005	0.060	0.66	7717	37	0.100
1.00	2	16	0.003	0.010	0.060	0.72	7074	37	0.200
1.50	2	16	0.006	0.020	0.220	1.27	4010	46	0.200
2.00	2	16	0.008	0.020	0.320	1.77	2877	46	0.200
2.50	2	16	0.010	0.020	0.420	2.27	2244	46	0.200
3.00	2	16	0.012	0.020	0.520	2.77	1839	46	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	2	34	0.026	0.040	0.020	0.50	21645	1126	45°
0.60	2	34	0.026	0.040	0.020	0.60	18038	938	45°
0.80	2	34	0.026	0.040	0.020	0.80	13528	704	45°
1.00	2	34	0.037	0.057	0.020	1.00	10823	802	45°
1.50	2	42	0.037	0.057	0.030	1.50	8913	661	45°
2.00	2	42	0.037	0.057	0.030	2.00	6685	495	45°
2.50	2	42	0.037	0.057	0.030	2.50	5348	396	45°
3.00	2	42	0.037	0.057	0.030	3.00	4456	330	45°
Hardened tool steel 48 - 52 HRC									
0.50	2	30	0.026	0.040	0.020	0.50	19099	993	45°
0.60	2	30	0.026	0.040	0.020	0.60	15915	828	45°
0.80	2	30	0.026	0.040	0.020	0.80	11937	621	45°
1.00	2	30	0.037	0.057	0.020	1.00	9549	708	45°
1.50	2	38	0.037	0.057	0.030	1.50	8064	598	45°
2.00	2	38	0.037	0.057	0.030	2.00	6048	448	45°
2.50	2	38	0.037	0.057	0.030	2.50	4838	359	45°
3.00	2	38	0.037	0.057	0.030	3.00	4032	299	45°
Hardened tool steel 52 - 56 HRC									
0.50	2	28	0.026	0.040	0.020	0.50	17825	927	45°
0.60	2	28	0.026	0.040	0.020	0.60	14854	772	45°
0.80	2	28	0.026	0.040	0.020	0.80	11141	579	45°
1.00	2	28	0.037	0.057	0.020	1.00	8913	661	45°
1.50	2	35	0.037	0.057	0.030	1.50	7427	550	45°
2.00	2	35	0.037	0.057	0.030	2.00	5570	413	45°
2.50	2	35	0.037	0.057	0.030	2.50	4456	330	45°
3.00	2	35	0.037	0.057	0.030	3.00	3714	275	45°
Hardened tool steel 56 - 60 HRC									
0.50	2	14	0.020	0.040	0.020	0.50	8913	357	45°
0.60	2	14	0.020	0.040	0.020	0.60	7427	297	45°
0.80	2	14	0.020	0.040	0.020	0.80	5570	223	45°
1.00	2	14	0.029	0.057	0.020	1.00	4456	254	45°
1.50	2	17	0.029	0.057	0.030	1.50	3608	206	45°
2.00	2	17	0.029	0.057	0.030	2.00	2706	154	45°
2.50	2	17	0.029	0.057	0.030	2.50	2165	123	45°
3.00	2	17	0.029	0.057	0.030	3.00	1804	103	45°

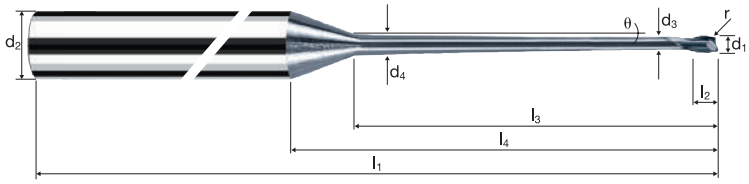
Corner radius end mills MicroX

Shank ø 6mm, conical neck 0.9°, 20xd

X-Generation X

II

HM XA	λ 25° γ -10°



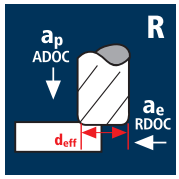
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper

Example: **Order-N°.** Coating **X** Article-N°. **6744** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	d_4	l_1	l_2	l_3	l_{3max}	l_4	θ	r 0/+0.01	z	X-AL X6744
050	0.50	6.00	0.45	0.75	61	0.40	10.00	10.00	19.93	0.9°	0.100	2	●
060	0.60	6.00	0.55	0.91	66	0.50	12.00	12.00	21.63	0.9°	0.100	2	●
080	0.80	6.00	0.75	1.23	69	0.65	16.00	16.00	25.03	0.9°	0.100	2	●
100	1.00	6.00	0.95	1.55	69	0.80	20.00	20.00	28.44	0.9°	0.200	2	●
120	1.50	6.00	1.40	2.30	80	1.20	30.00	30.00	37.04	0.9°	0.200	2	●
140	2.00	6.00	1.90	3.11	87	1.60	40.00	40.00	45.52	0.9°	0.200	2	●
160	2.50	6.00	2.30	3.81	100	2.00	50.00	50.00	54.22	0.9°	0.200	2	●
180	3.00	6.00	2.80	4.61	100	2.40	60.00	60.00	62.73	0.9°	0.200	2	●
145	2.00	6.00	1.90	3.11	87	1.60	40.00	40.00	45.52	0.9°	0.500	2	●
165	2.50	6.00	2.30	3.81	100	2.00	50.00	50.00	54.22	0.9°	0.500	2	●
185	3.00	6.00	2.80	4.61	100	2.40	60.00	60.00	62.73	0.9°	0.500	2	●

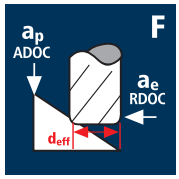
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	4	65	0.003	0.070	0.210	0.49	42225	447	0.100
0.80	4	104	0.004	0.070	0.420	0.79	41904	715	0.100
1.00	4	129	0.005	0.140	0.420	0.98	41900	887	0.200
1.20	4	135	0.007	0.160	0.600	1.19	36111	1031	0.200
1.50	4	135	0.009	0.160	0.825	1.49	28840	1031	0.200
2.00	4	135	0.012	0.160	1.200	1.99	21594	1031	0.200
2.50	4	135	0.015	0.160	1.575	2.49	17258	1031	0.200
3.00	4	135	0.018	0.160	1.950	2.99	14372	1031	0.200
Hardened tool steel 48 - 52 HRC									
0.50	4	65	0.003	0.070	0.210	0.49	42225	536	0.100
0.80	4	104	0.005	0.070	0.420	0.79	41904	858	0.100
1.00	4	129	0.006	0.140	0.420	0.98	41900	1064	0.200
1.20	4	150	0.009	0.160	0.600	1.19	40123	1375	0.200
1.50	4	150	0.011	0.160	0.825	1.49	32045	1375	0.200
2.00	4	150	0.014	0.160	1.200	1.99	23993	1375	0.200
2.50	4	150	0.018	0.160	1.575	2.49	19175	1375	0.200
3.00	4	150	0.022	0.160	1.950	2.99	15969	1375	0.200
Hardened tool steel 52 - 56 HRC									
0.50	4	65	0.003	0.070	0.210	0.49	42225	447	0.100
0.80	4	104	0.004	0.070	0.420	0.79	41904	715	0.100
1.00	4	129	0.005	0.140	0.420	0.98	41900	887	0.200
1.20	4	140	0.007	0.160	0.600	1.19	37448	1070	0.200
1.50	4	140	0.009	0.160	0.825	1.49	29908	1070	0.200
2.00	4	140	0.012	0.160	1.200	1.99	22394	1070	0.200
2.50	4	140	0.015	0.160	1.575	2.49	17897	1070	0.200
3.00	4	140	0.018	0.160	1.950	2.99	14904	1070	0.200
Hardened tool steel 56 - 60 HRC									
0.50	4	61	0.002	0.040	0.180	0.46	42211	298	0.100
0.80	4	70	0.003	0.040	0.360	0.76	29318	342	0.100
1.00	4	70	0.004	0.080	0.360	0.92	24219	342	0.200
1.20	4	70	0.006	0.100	0.560	1.15	19375	428	0.200
1.50	4	70	0.007	0.100	0.770	1.45	15367	428	0.200
2.00	4	70	0.009	0.100	1.120	1.95	11427	428	0.200
2.50	4	70	0.012	0.100	1.470	2.45	9095	428	0.200
3.00	4	70	0.014	0.100	1.820	2.95	7553	428	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	4	53	0.016	0.040	0.020	0.50	33741	2159	45°
0.80	4	84	0.016	0.040	0.020	0.80	33423	2139	45°
1.00	4	106	0.023	0.057	0.020	1.00	33741	3077	45°
1.20	4	127	0.023	0.057	0.020	1.20	33688	3072	45°
1.50	4	195	0.023	0.057	0.030	1.50	41380	3774	45°
2.00	4	195	0.023	0.057	0.030	2.00	31035	2830	45°
2.50	4	195	0.023	0.057	0.030	2.50	24828	2264	45°
3.00	4	195	0.023	0.057	0.030	3.00	20690	1887	45°
Hardened tool steel 48 - 52 HRC									
0.50	4	53	0.016	0.040	0.020	0.50	33741	2159	45°
0.80	4	84	0.016	0.040	0.020	0.80	33423	2139	45°
1.00	4	106	0.023	0.057	0.020	1.00	33741	3077	45°
1.20	4	127	0.023	0.057	0.020	1.20	33688	3072	45°
1.50	4	175	0.023	0.057	0.030	1.50	37136	3387	45°
2.00	4	175	0.023	0.057	0.030	2.00	27852	2540	45°
2.50	4	175	0.023	0.057	0.030	2.50	22282	2032	45°
3.00	4	175	0.023	0.057	0.030	3.00	18568	1693	45°
Hardened tool steel 52 - 56 HRC									
0.50	4	53	0.016	0.040	0.020	0.50	33741	2159	45°
0.80	4	84	0.016	0.040	0.020	0.80	33423	2139	45°
1.00	4	106	0.023	0.057	0.020	1.00	33741	3077	45°
1.20	4	127	0.023	0.057	0.020	1.20	33688	3072	45°
1.50	4	160	0.023	0.057	0.030	1.50	33953	3097	45°
2.00	4	160	0.023	0.057	0.030	2.00	25465	2322	45°
2.50	4	160	0.023	0.057	0.030	2.50	20372	1858	45°
3.00	4	160	0.023	0.057	0.030	3.00	16977	1548	45°
Hardened tool steel 56 - 60 HRC									
0.50	4	53	0.010	0.040	0.020	0.50	33741	1350	45°
0.80	4	64	0.010	0.040	0.020	0.80	25465	1019	45°
1.00	4	64	0.014	0.057	0.020	1.00	20372	1161	45°
1.20	4	80	0.014	0.057	0.030	1.20	21221	1210	45°
1.50	4	80	0.014	0.057	0.030	1.50	16977	968	45°
2.00	4	80	0.014	0.057	0.030	2.00	12732	726	45°
2.50	4	80	0.014	0.057	0.030	2.50	10186	581	45°
3.00	4	80	0.014	0.057	0.030	3.00	8488	484	45°

Corner radius end mills MicroX

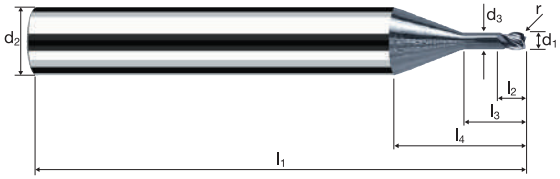
Shank ø 6mm, cylindrical neck, 3xd

X-Generation

II

HM
XA

λ 30°
γ -5°



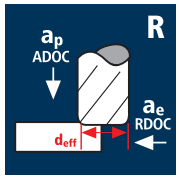
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)

Example: **Order-N°.** Coating **X** Article-N°. **6632** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6632
050	0.50	6.00	0.45	57	0.50	1.50	1.70	11.99	0.100	4	●
080	0.80	6.00	0.75	57	0.80	2.40	2.60	12.33	0.100	4	●
100	1.00	6.00	0.95	57	1.00	3.00	3.20	12.56	0.200	4	●
108	1.20	6.00	1.10	57	1.20	3.60	3.90	12.88	0.200	4	●
120	1.50	6.00	1.40	57	1.50	4.50	4.80	13.22	0.200	4	●
140	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	0.200	4	●
160	2.50	6.00	2.30	57	2.50	7.50	7.93	14.54	0.200	4	●
180	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	0.200	4	●
145	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	0.500	4	●
165	2.50	6.00	2.30	57	2.50	7.50	7.93	14.54	0.500	4	●
185	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	0.500	4	●

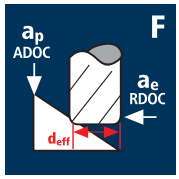
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
Hardened tool steel 42 - 48 HRC									
0.50	4	62	0.003	0.050	0.150	0.47	41990	426	0.100
0.80	4	102	0.004	0.050	0.300	0.77	42166	701	0.100
1.00	4	115	0.005	0.100	0.300	0.95	38532	791	0.200
1.20	4	115	0.007	0.120	0.480	1.17	31287	879	0.200
1.50	4	115	0.009	0.120	0.660	1.47	24902	879	0.200
2.00	4	115	0.012	0.120	0.960	1.97	18582	879	0.200
2.50	4	115	0.015	0.120	1.260	2.47	14820	879	0.200
3.00	4	115	0.018	0.120	1.560	2.97	12325	879	0.200
Hardened tool steel 48 - 52 HRC									
0.50	4	62	0.003	0.050	0.150	0.47	41990	512	0.100
0.80	4	102	0.005	0.050	0.300	0.77	42166	842	0.100
1.00	4	125	0.006	0.100	0.300	0.95	41883	1031	0.200
1.20	4	128	0.008	0.120	0.480	1.17	34824	1173	0.200
1.50	4	128	0.011	0.120	0.660	1.47	27717	1173	0.200
2.00	4	128	0.014	0.120	0.960	1.97	20682	1173	0.200
2.50	4	128	0.018	0.120	1.260	2.47	16495	1173	0.200
3.00	4	128	0.021	0.120	1.560	2.97	13718	1173	0.200
Hardened tool steel 52 - 56 HRC									
0.50	4	62	0.003	0.050	0.150	0.47	41990	426	0.100
0.80	4	102	0.004	0.050	0.300	0.77	42166	701	0.100
1.00	4	119	0.005	0.100	0.300	0.95	39873	818	0.200
1.20	4	119	0.007	0.120	0.480	1.17	32375	909	0.200
1.50	4	119	0.009	0.120	0.660	1.47	25768	909	0.200
2.00	4	119	0.012	0.120	0.960	1.97	19228	909	0.200
2.50	4	119	0.015	0.120	1.260	2.47	15336	909	0.200
3.00	4	119	0.018	0.120	1.560	2.97	12754	909	0.200
Hardened tool steel 56 - 60 HRC									
0.50	4	58	0.002	0.030	0.120	0.44	41959	284	0.100
0.80	4	60	0.003	0.030	0.240	0.74	25809	293	0.100
1.00	4	60	0.003	0.060	0.240	0.89	21459	293	0.200
1.20	4	60	0.005	0.080	0.400	1.12	17052	367	0.200
1.50	4	60	0.007	0.080	0.550	1.42	13450	367	0.200
2.00	4	60	0.009	0.080	0.800	1.92	9947	367	0.200
2.50	4	60	0.012	0.080	1.050	2.42	7892	367	0.200
3.00	4	60	0.014	0.080	1.300	2.92	6541	367	0.200

Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
Hardened tool steel 42 - 48 HRC									
0.50	4	53	0.016	0.040	0.020	0.50	33741	2159	45°
0.80	4	84	0.016	0.040	0.020	0.80	33423	2139	45°
1.00	4	106	0.023	0.057	0.020	1.00	33741	3077	45°
1.20	4	127	0.023	0.057	0.020	1.20	33688	3072	45°
1.50	4	166	0.023	0.057	0.030	1.50	35226	3213	45°
2.00	4	166	0.023	0.057	0.030	2.00	26420	2410	45°
2.50	4	166	0.023	0.057	0.030	2.50	21136	1928	45°
3.00	4	166	0.023	0.057	0.030	3.00	17613	1606	45°
Hardened tool steel 48 - 52 HRC									
0.50	4	53	0.016	0.040	0.020	0.50	33741	2159	45°
0.80	4	84	0.016	0.040	0.020	0.80	33423	2139	45°
1.00	4	106	0.023	0.057	0.020	1.00	33741	3077	45°
1.20	4	119	0.023	0.057	0.020	1.20	31566	2879	45°
1.50	4	149	0.023	0.057	0.030	1.50	31619	2884	45°
2.00	4	149	0.023	0.057	0.030	2.00	23714	2163	45°
2.50	4	149	0.023	0.057	0.030	2.50	18971	1730	45°
3.00	4	149	0.023	0.057	0.030	3.00	15809	1442	45°
Hardened tool steel 52 - 56 HRC									
0.50	4	53	0.016	0.040	0.020	0.50	33741	2159	45°
0.80	4	84	0.016	0.040	0.020	0.80	33423	2139	45°
1.00	4	106	0.023	0.057	0.020	1.00	33741	3077	45°
1.20	4	109	0.023	0.057	0.020	1.20	28913	2637	45°
1.50	4	136	0.023	0.057	0.030	1.50	28860	2632	45°
2.00	4	136	0.023	0.057	0.030	2.00	21645	1974	45°
2.50	4	136	0.023	0.057	0.030	2.50	17316	1579	45°
3.00	4	136	0.023	0.057	0.030	3.00	14430	1316	45°
Hardened tool steel 56 - 60 HRC									
0.50	4	53	0.010	0.040	0.020	0.50	33741	1350	45°
0.80	4	54	0.010	0.040	0.020	0.80	21486	859	45°
1.00	4	54	0.014	0.057	0.020	1.00	17189	980	45°
1.20	4	68	0.014	0.057	0.030	1.20	18038	1028	45°
1.50	4	68	0.014	0.057	0.030	1.50	14430	823	45°
2.00	4	68	0.014	0.057	0.030	2.00	10823	617	45°
2.50	4	68	0.014	0.057	0.030	2.50	8658	494	45°
3.00	4	68	0.014	0.057	0.030	3.00	7215	411	45°

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

X-Generation

II

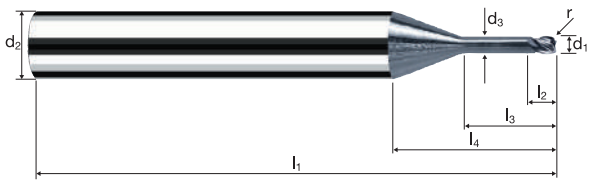
HM
XA

λ 30°
γ -5°

h4

d1

r



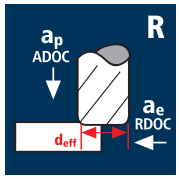
ReTool®

	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)

Example: **Order-N°.** Coating **X** Article-N°. **6634** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6634
050	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.100	4	●
080	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.100	4	●
100	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.200	4	●
108	1.20	6.00	1.10	57	1.20	6.00	6.30	15.28	0.200	4	●
120	1.50	6.00	1.40	61	1.50	7.50	7.80	16.22	0.200	4	●
140	2.00	6.00	1.90	61	2.00	10.00	10.30	17.78	0.200	4	●
160	2.50	6.00	2.30	61	2.50	12.50	12.93	19.54	0.200	4	●
180	3.00	6.00	2.80	66	3.00	15.00	15.43	21.10	0.200	4	●
145	2.00	6.00	1.90	61	2.00	10.00	10.30	17.78	0.500	4	●
165	2.50	6.00	2.30	61	2.50	12.50	12.93	19.54	0.500	4	●
185	3.00	6.00	2.80	66	3.00	15.00	15.43	21.10	0.500	4	●

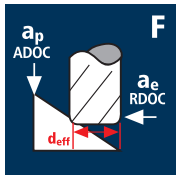
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Steel 850 - 1100 N/mm²									
0.40	2	48	0.003	0.040	0.120	0.36	42441	246	0.100
0.50	2	63	0.004	0.060	0.210	0.48	41778	359	0.100
0.60	2	77	0.005	0.060	0.280	0.58	42258	440	0.100
0.80	2	103	0.007	0.060	0.420	0.78	42033	589	0.100
1.00	2	129	0.009	0.060	0.560	0.98	41900	737	0.100
1.00	2	128	0.009	0.120	0.420	0.97	42004	731	0.200
1.50	2	195	0.015	0.140	0.880	1.48	41939	1241	0.200
2.00	2	210	0.020	0.140	1.280	1.98	33760	1337	0.200
Hardened tool steel 52 - 56 HRC									
0.40	2	48	0.003	0.040	0.120	0.36	42441	221	0.100
0.50	2	63	0.004	0.060	0.210	0.48	41778	326	0.100
0.60	2	77	0.005	0.060	0.280	0.58	42258	397	0.100
0.80	2	103	0.006	0.060	0.420	0.78	42033	530	0.100
1.00	2	129	0.008	0.060	0.560	0.98	41900	662	0.100
1.00	2	128	0.008	0.120	0.420	0.97	42004	664	0.200
1.50	2	130	0.013	0.140	0.880	1.48	27960	744	0.200
2.00	2	130	0.018	0.140	1.280	1.98	20899	744	0.200
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
0.40	2	48	0.002	0.040	0.120	0.36	42441	195	0.100
0.50	2	63	0.004	0.060	0.210	0.48	41778	292	0.100
0.60	2	77	0.004	0.060	0.280	0.58	42258	355	0.100
0.80	2	103	0.006	0.060	0.420	0.78	42033	471	0.100
1.00	2	105	0.007	0.060	0.560	0.98	34105	484	0.100
1.00	2	105	0.007	0.120	0.420	0.97	34456	482	0.200
1.50	2	105	0.012	0.140	0.880	1.48	22583	533	0.200
2.00	2	105	0.016	0.140	1.280	1.98	16880	533	0.200
Titanium alloys > 300 HB [Ti6Al4V]									
0.40	2	45	0.002	0.040	0.120	0.36	39789	183	0.100
0.50	2	45	0.004	0.060	0.210	0.48	29842	209	0.100
0.60	2	45	0.004	0.060	0.280	0.58	24696	207	0.100
0.80	2	45	0.006	0.060	0.420	0.78	18364	206	0.100
1.00	2	45	0.007	0.060	0.560	0.98	14616	208	0.100
1.00	2	45	0.007	0.120	0.420	0.97	14767	207	0.200
1.50	2	45	0.012	0.140	0.880	1.48	9678	228	0.200
2.00	2	45	0.016	0.140	1.280	1.98	7234	229	0.200

Application



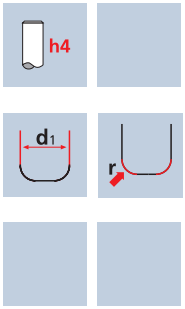
Material

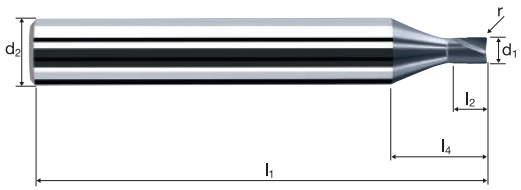
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	99	0.026	0.040	0.020	1.00	31513	1639	45°
1.00	2	99	0.037	0.057	0.020	1.00	31513	2338	45°
1.50	2	198	0.037	0.057	0.030	1.50	42017	3118	45°
2.00	2	255	0.037	0.057	0.030	2.00	40585	3011	45°
Hardened tool steel 52 - 56 HRC									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	99	0.026	0.040	0.020	1.00	31513	1639	45°
1.00	2	99	0.037	0.057	0.020	1.00	31513	2338	45°
1.50	2	160	0.037	0.057	0.030	1.50	33953	2519	45°
2.00	2	160	0.037	0.057	0.030	2.00	25465	1890	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	99	0.026	0.040	0.020	1.00	31513	1639	45°
1.00	2	99	0.037	0.057	0.020	1.00	31513	2338	45°
1.50	2	160	0.037	0.057	0.030	1.50	33953	2519	45°
2.00	2	160	0.037	0.057	0.030	2.00	25465	1890	45°
Titanium alloys > 300 HB [Ti6Al4V]									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	90	0.026	0.040	0.020	1.00	28648	1490	45°
1.00	2	90	0.037	0.057	0.020	1.00	28648	2126	45°
1.50	2	120	0.037	0.057	0.030	1.50	25465	1890	45°
2.00	2	120	0.037	0.057	0.030	2.00	19099	1417	45°

Corner radius end mills Microcut

Shank ø 4mm, 1xd

HM XA	λ 0° γ 0°



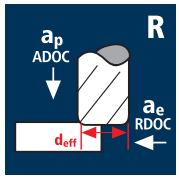


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6816** ø-Code **042**

Ø Code	d_1 0/-0.01	d_2 h4	l_1	l_2	l_4	r 0/+0.01	z	X-AL X6816
042	0.40	4.00	50	0.32	10.68	0.100	2	●
050	0.50	4.00	50	0.40	7.14	0.100	2	●
060	0.60	4.00	50	0.48	7.06	0.100	2	●
080	0.80	4.00	50	0.64	6.88	0.100	2	●
098	1.00	4.00	50	1.20	7.13	0.100	2	●
100	1.00	4.00	50	1.20	7.13	0.200	2	●
120	1.50	4.00	50	1.80	6.90	0.200	2	●
140	2.00	4.00	50	2.40	6.66	0.200	2	●

Application



Material

Steel
850 - 1100 N/mm²

X
X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.40	2	48	0.003	0.040	0.120	0.36	42441	246	0.100
0.50	2	63	0.004	0.060	0.210	0.48	41778	359	0.100
0.60	2	77	0.005	0.060	0.280	0.58	42258	440	0.100
0.80	2	103	0.007	0.060	0.420	0.78	42033	589	0.100
1.00	2	128	0.009	0.120	0.420	0.97	42004	731	0.200
1.50	2	195	0.015	0.140	0.880	1.48	41939	1241	0.200
2.00	2	210	0.020	0.140	1.280	1.98	33760	1337	0.200
2.50	2	210	0.025	0.140	1.680	2.48	26954	1337	0.200
3.00	2	210	0.030	0.140	2.080	2.98	22431	1337	0.200

Hardened tool steel
52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.40	2	48	0.003	0.040	0.120	0.36	42441	221	0.100
0.50	2	63	0.004	0.060	0.210	0.48	41778	326	0.100
0.60	2	77	0.005	0.060	0.280	0.58	42258	397	0.100
0.80	2	103	0.006	0.060	0.420	0.78	42033	530	0.100
1.00	2	128	0.008	0.120	0.420	0.97	42004	664	0.200
1.50	2	130	0.013	0.140	0.880	1.48	27960	744	0.200
2.00	2	130	0.018	0.140	1.280	1.98	20899	744	0.200
2.50	2	130	0.022	0.140	1.680	2.48	16686	744	0.200
3.00	2	130	0.027	0.140	2.080	2.98	13886	744	0.200

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

X

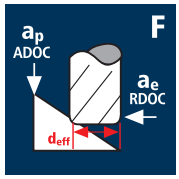
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.40	2	48	0.002	0.040	0.120	0.36	42441	195	0.100
0.50	2	63	0.004	0.060	0.210	0.48	41778	292	0.100
0.60	2	77	0.004	0.060	0.280	0.58	42258	355	0.100
0.80	2	103	0.006	0.060	0.420	0.78	42033	471	0.100
1.00	2	105	0.007	0.120	0.420	0.97	34456	482	0.200
1.50	2	105	0.012	0.140	0.880	1.48	22583	533	0.200
2.00	2	105	0.016	0.140	1.280	1.98	16880	533	0.200
2.50	2	105	0.020	0.140	1.680	2.48	13477	534	0.200
3.00	2	105	0.024	0.140	2.080	2.98	11216	534	0.200

Titanium alloys
> 300 HB
[Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.40	2	45	0.002	0.040	0.120	0.36	39789	183	0.100
0.50	2	45	0.004	0.060	0.210	0.48	29842	209	0.100
0.60	2	45	0.004	0.060	0.280	0.58	24696	207	0.100
0.80	2	45	0.006	0.060	0.420	0.78	18364	206	0.100
1.00	2	45	0.007	0.120	0.420	0.97	14767	207	0.200
1.50	2	45	0.012	0.140	0.880	1.48	9678	228	0.200
2.00	2	45	0.016	0.140	1.280	1.98	7234	229	0.200
2.50	2	45	0.020	0.140	1.680	2.48	5776	229	0.200
3.00	2	45	0.024	0.140	2.080	2.98	4807	229	0.200

Application



Material

Steel
850 - 1100 N/mm²

X
X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.40	2	43	0.026	0.040	0.010	0.40	34218	1779	45°
0.50	2	46	0.026	0.040	0.020	0.50	29285	1523	45°
0.60	2	56	0.026	0.040	0.020	0.60	29709	1545	45°
0.80	2	76	0.026	0.040	0.020	0.80	30239	1572	45°
1.00	2	88	0.037	0.057	0.020	1.00	28011	2078	45°
1.50	2	184	0.037	0.057	0.030	1.50	39046	2897	45°
2.00	2	235	0.037	0.057	0.030	2.00	37401	2775	45°
2.50	2	235	0.037	0.057	0.030	2.50	29921	2220	45°
3.00	2	235	0.037	0.057	0.030	3.00	24934	1850	45°

Hardened tool steel
52 - 56 HRC

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.40	2	43	0.026	0.040	0.010	0.40	34218	1779	45°
0.50	2	46	0.026	0.040	0.020	0.50	29285	1523	45°
0.60	2	56	0.026	0.040	0.020	0.60	29709	1545	45°
0.80	2	76	0.026	0.040	0.020	0.80	30239	1572	45°
1.00	2	88	0.037	0.057	0.020	1.00	28011	2078	45°
1.50	2	140	0.037	0.057	0.030	1.50	29709	2204	45°
2.00	2	140	0.037	0.057	0.030	2.00	22282	1653	45°
2.50	2	140	0.037	0.057	0.030	2.50	17825	1323	45°
3.00	2	140	0.037	0.057	0.030	3.00	14854	1102	45°

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.40	2	43	0.026	0.040	0.010	0.40	34218	1779	45°
0.50	2	46	0.026	0.040	0.020	0.50	29285	1523	45°
0.60	2	56	0.026	0.040	0.020	0.60	29709	1545	45°
0.80	2	76	0.026	0.040	0.020	0.80	30239	1572	45°
1.00	2	88	0.037	0.057	0.020	1.00	28011	2078	45°
1.50	2	140	0.037	0.057	0.030	1.50	29709	2204	45°
2.00	2	140	0.037	0.057	0.030	2.00	22282	1653	45°
2.50	2	140	0.037	0.057	0.030	2.50	17825	1323	45°
3.00	2	140	0.037	0.057	0.030	3.00	14854	1102	45°

Titanium alloys
> 300 HB
[Ti6Al4V]

X

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.40	2	43	0.026	0.040	0.010	0.40	34218	1779	45°
0.50	2	46	0.026	0.040	0.020	0.50	29285	1523	45°
0.60	2	56	0.026	0.040	0.020	0.60	29709	1545	45°
0.80	2	75	0.026	0.040	0.020	0.80	29842	1552	45°
1.00	2	75	0.037	0.057	0.020	1.00	23873	1771	45°
1.50	2	100	0.037	0.057	0.030	1.50	21221	1575	45°
2.00	2	100	0.037	0.057	0.030	2.00	15915	1181	45°
2.50	2	100	0.037	0.057	0.030	2.50	12732	945	45°
3.00	2	100	0.037	0.057	0.030	3.00	10610	787	45°

Corner radius end mills Microcut

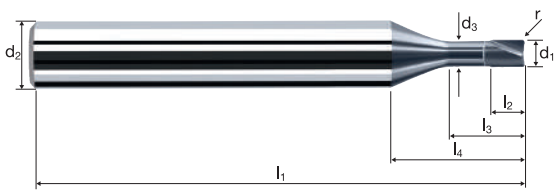
Shank ø 4mm, cylindrical neck, 3xd

HM XA	λ 0° γ 0°

h4

d_1

r

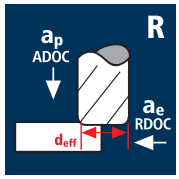


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6818** ø-Code **042**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6818
042	0.40	4.00	0.35	50	0.32	1.20	1.40	11.64	0.100	2	●
050	0.50	4.00	0.45	50	0.40	1.50	1.70	8.26	0.100	2	●
060	0.60	4.00	0.55	50	0.48	1.80	2.00	8.37	0.100	2	●
080	0.80	4.00	0.75	50	0.64	2.40	2.60	8.60	0.100	2	●
098	1.00	4.00	0.95	50	1.20	3.00	3.20	8.82	0.100	2	●
100	1.00	4.00	0.95	50	1.20	3.00	3.20	8.82	0.200	2	●
108	1.20	4.00	1.10	50	1.44	3.60	3.90	9.14	0.200	2	●
120	1.50	4.00	1.40	50	1.80	4.50	4.80	9.48	0.200	2	●
140	2.00	4.00	1.90	50	2.40	6.00	6.30	10.05	0.200	2	●
160	2.50	4.00	2.30	50	3.00	7.50	7.93	10.80	0.200	2	●
180	3.00	4.00	2.80	50	3.60	9.00	9.43	11.37	0.200	2	●

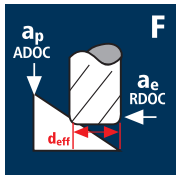
Application



Material

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	r [mm]
Steel 850 - 1100 N/mm²									
0.40	2	45	0.002	0.030	0.100	0.34	42129	202	0.100
0.50	2	62	0.004	0.050	0.180	0.47	41990	319	0.100
0.60	2	75	0.005	0.050	0.240	0.57	41883	385	0.100
0.80	2	102	0.006	0.050	0.360	0.77	42166	523	0.100
1.00	2	125	0.008	0.100	0.360	0.95	41883	645	0.200
1.50	2	168	0.013	0.120	0.770	1.47	36378	960	0.200
2.00	2	168	0.018	0.120	1.120	1.97	27145	961	0.200
2.50	2	168	0.022	0.120	1.470	2.47	21650	961	0.200
3.00	2	168	0.027	0.120	1.820	2.97	18005	962	0.200
Hardened tool steel 52 - 56 HRC									
0.40	2	45	0.002	0.030	0.100	0.34	42129	185	0.100
0.50	2	62	0.003	0.050	0.180	0.47	41990	286	0.100
0.60	2	75	0.004	0.050	0.240	0.57	41883	352	0.100
0.80	2	102	0.006	0.050	0.360	0.77	42166	472	0.100
1.00	2	104	0.007	0.100	0.360	0.95	34847	481	0.200
1.50	2	104	0.012	0.120	0.770	1.47	22520	536	0.200
2.00	2	104	0.016	0.120	1.120	1.97	16804	538	0.200
2.50	2	104	0.020	0.120	1.470	2.47	13403	536	0.200
3.00	2	104	0.024	0.120	1.820	2.97	11146	537	0.200
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
0.40	2	45	0.002	0.030	0.100	0.34	42129	169	0.100
0.50	2	62	0.003	0.050	0.180	0.47	41990	252	0.100
0.60	2	75	0.004	0.050	0.240	0.57	41883	310	0.100
0.80	2	84	0.005	0.050	0.360	0.77	34725	347	0.100
1.00	2	84	0.006	0.100	0.360	0.95	28145	349	0.200
1.50	2	84	0.011	0.120	0.770	1.47	18189	386	0.200
2.00	2	84	0.014	0.120	1.120	1.97	13573	386	0.200
2.50	2	84	0.018	0.120	1.470	2.47	10825	385	0.200
3.00	2	84	0.021	0.120	1.820	2.97	9003	385	0.200
Titanium alloys > 300 HB [Ti6Al4V]									
0.40	2	36	0.002	0.030	0.100	0.34	33703	135	0.100
0.50	2	36	0.003	0.050	0.180	0.47	24381	146	0.100
0.60	2	36	0.004	0.050	0.240	0.57	20104	149	0.100
0.80	2	36	0.005	0.050	0.360	0.77	14882	149	0.100
1.00	2	36	0.006	0.100	0.360	0.95	12062	150	0.200
1.50	2	36	0.011	0.120	0.770	1.47	7795	165	0.200
2.00	2	36	0.014	0.120	1.120	1.97	5817	165	0.200
2.50	2	36	0.018	0.120	1.470	2.47	4639	165	0.200
3.00	2	36	0.021	0.120	1.820	2.97	3858	165	0.200

Application



Material

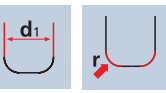
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min^{-1}]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	99	0.037	0.057	0.020	1.00	31513	2338	45°
1.50	2	188	0.037	0.057	0.030	1.50	39895	2960	45°
2.00	2	188	0.037	0.057	0.030	2.00	29921	2220	45°
2.50	2	188	0.037	0.057	0.030	2.50	23937	1776	45°
3.00	2	188	0.037	0.057	0.030	3.00	19947	1480	45°
Hardened tool steel 52 - 56 HRC									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	84	0.037	0.057	0.020	1.00	26738	1984	45°
1.50	2	112	0.037	0.057	0.030	1.50	23767	1764	45°
2.00	2	112	0.037	0.057	0.030	2.00	17825	1323	45°
2.50	2	112	0.037	0.057	0.030	2.50	14260	1058	45°
3.00	2	112	0.037	0.057	0.030	3.00	11884	882	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	84	0.037	0.057	0.020	1.00	26738	1984	45°
1.50	2	112	0.037	0.057	0.030	1.50	23767	1764	45°
2.00	2	112	0.037	0.057	0.030	2.00	17825	1323	45°
2.50	2	112	0.037	0.057	0.030	2.50	14260	1058	45°
3.00	2	112	0.037	0.057	0.030	3.00	11884	882	45°
Titanium alloys > 300 HB [Ti6Al4V]									
0.40	2	48	0.026	0.040	0.010	0.40	38197	1986	45°
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	60	0.026	0.040	0.020	0.80	23873	1241	45°
1.00	2	60	0.037	0.057	0.020	1.00	19099	1417	45°
1.50	2	80	0.037	0.057	0.030	1.50	16977	1260	45°
2.00	2	80	0.037	0.057	0.030	2.00	12732	945	45°
2.50	2	80	0.037	0.057	0.030	2.50	10186	756	45°
3.00	2	80	0.037	0.057	0.030	3.00	8488	630	45°

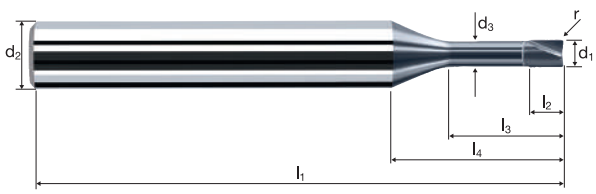
Corner radius end mills Microcut

Shank ø 4mm, cylindrical neck, 5xd

HM XA	λ 0° γ 0°

h4



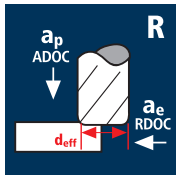


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6820** ø-Code **042**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6820
042	0.40	4.00	0.35	50	0.32	2.00	2.20	12.44	0.100	2	●
050	0.50	4.00	0.45	50	0.40	2.50	2.70	9.26	0.100	2	●
060	0.60	4.00	0.55	50	0.48	3.00	3.20	9.57	0.100	2	●
080	0.80	4.00	0.75	50	0.64	4.00	4.20	10.20	0.100	2	●
098	1.00	4.00	0.95	50	1.20	5.00	5.20	10.82	0.100	2	●
100	1.00	4.00	0.95	50	1.20	5.00	5.20	10.82	0.200	2	●
108	1.20	4.00	1.10	50	1.44	6.00	6.30	11.54	0.200	2	●
120	1.50	4.00	1.40	50	1.80	7.50	7.80	12.48	0.200	2	●
140	2.00	4.00	1.90	50	2.40	10.00	10.30	14.05	0.200	2	●
160	2.50	4.00	2.30	50	3.00	12.50	12.93	15.80	0.200	2	●
180	3.00	4.00	2.80	50	3.60	15.00	15.43	17.37	0.200	2	●

Application



Material

Steel
850 - 1100 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.50	2	61	0.003	0.040	0.150	0.46	42211	287	0.100
0.60	2	74	0.004	0.040	0.200	0.56	42062	345	0.100
0.80	2	100	0.006	0.040	0.300	0.76	41883	461	0.100
1.00	2	121	0.007	0.080	0.300	0.92	41865	561	0.200
1.20	2	126	0.009	0.100	0.480	1.15	34876	649	0.200
1.50	2	126	0.012	0.100	0.660	1.45	27660	647	0.200
2.00	2	126	0.016	0.100	0.960	1.95	20568	650	0.200
2.50	2	126	0.020	0.100	1.260	2.45	16370	648	0.200
3.00	2	126	0.024	0.100	1.560	2.95	13596	650	0.200

Hardened tool steel
52 - 56 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.50	2	61	0.003	0.040	0.150	0.46	42211	253	0.100
0.60	2	74	0.004	0.040	0.200	0.56	42062	311	0.100
0.80	2	78	0.005	0.040	0.300	0.76	32669	327	0.100
1.00	2	78	0.006	0.080	0.300	0.92	26987	324	0.200
1.20	2	78	0.008	0.100	0.480	1.15	21590	363	0.200
1.50	2	78	0.011	0.100	0.660	1.45	17123	363	0.200
2.00	2	78	0.014	0.100	0.960	1.95	12732	362	0.200
2.50	2	78	0.018	0.100	1.260	2.45	10134	363	0.200
3.00	2	78	0.022	0.100	1.560	2.95	8416	362	0.200

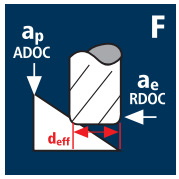
Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.50	2	61	0.003	0.040	0.150	0.46	42211	228	0.100
0.60	2	63	0.003	0.040	0.200	0.56	35810	236	0.100
0.80	2	63	0.004	0.040	0.300	0.76	26386	232	0.100
1.00	2	63	0.005	0.080	0.300	0.92	21797	235	0.200
1.20	2	63	0.008	0.100	0.480	1.15	17438	262	0.200
1.50	2	63	0.009	0.100	0.660	1.45	13830	260	0.200
2.00	2	63	0.013	0.100	0.960	1.95	10284	259	0.200
2.50	2	63	0.016	0.100	1.260	2.45	8185	260	0.200
3.00	2	63	0.019	0.100	1.560	2.95	6798	260	0.200

Titanium alloys
> 300 HB
[Ti6Al4V]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	r [mm]
0.50	2	27	0.003	0.040	0.150	0.46	18683	101	0.100
0.60	2	27	0.003	0.040	0.200	0.56	15347	101	0.100
0.80	2	27	0.004	0.040	0.300	0.76	11308	100	0.100
1.00	2	27	0.005	0.080	0.300	0.92	9342	101	0.200
1.20	2	27	0.008	0.100	0.480	1.15	7473	112	0.200
1.50	2	27	0.009	0.100	0.660	1.45	5927	111	0.200
2.00	2	27	0.013	0.100	0.960	1.95	4407	111	0.200
2.50	2	27	0.016	0.100	1.260	2.45	3508	112	0.200
3.00	2	27	0.019	0.100	1.560	2.95	2913	111	0.200

Application



Material

Steel
850 - 1100 N/mm²

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	79	0.026	0.040	0.020	0.80	31433	1635	45°
1.00	2	99	0.037	0.057	0.020	1.00	31513	2338	45°
1.20	2	141	0.037	0.057	0.030	1.20	37401	2775	45°
1.50	2	141	0.037	0.057	0.030	1.50	29921	2220	45°
2.00	2	141	0.037	0.057	0.030	2.00	22441	1665	45°
2.50	2	141	0.037	0.057	0.030	2.50	17953	1332	45°
3.00	2	141	0.037	0.057	0.030	3.00	14961	1110	45°

Hardened tool steel
52 - 56 HRC

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	63	0.026	0.040	0.020	0.80	25067	1304	45°
1.00	2	63	0.037	0.057	0.020	1.00	20054	1488	45°
1.20	2	84	0.037	0.057	0.030	1.20	22282	1653	45°
1.50	2	84	0.037	0.057	0.030	1.50	17825	1323	45°
2.00	2	84	0.037	0.057	0.030	2.00	13369	992	45°
2.50	2	84	0.037	0.057	0.030	2.50	10695	794	45°
3.00	2	84	0.037	0.057	0.030	3.00	8913	661	45°

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.50	2	49	0.026	0.040	0.020	0.50	31194	1622	45°
0.60	2	59	0.026	0.040	0.020	0.60	31300	1628	45°
0.80	2	63	0.026	0.040	0.020	0.80	25067	1304	45°
1.00	2	63	0.037	0.057	0.020	1.00	20054	1488	45°
1.20	2	84	0.037	0.057	0.030	1.20	22282	1653	45°
1.50	2	84	0.037	0.057	0.030	1.50	17825	1323	45°
2.00	2	84	0.037	0.057	0.030	2.00	13369	992	45°
2.50	2	84	0.037	0.057	0.030	2.50	10695	794	45°
3.00	2	84	0.037	0.057	0.030	3.00	8913	661	45°

Titanium alloys
> 300 HB
[Ti6Al4V]

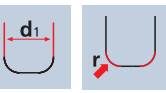
d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min⁻¹]	v_f [mm/min]	β [°]
0.50	2	45	0.026	0.040	0.020	0.50	28648	1490	45°
0.60	2	45	0.026	0.040	0.020	0.60	23873	1241	45°
0.80	2	45	0.026	0.040	0.020	0.80	17905	931	45°
1.00	2	45	0.037	0.057	0.020	1.00	14324	1063	45°
1.20	2	60	0.037	0.057	0.030	1.20	15915	1181	45°
1.50	2	60	0.037	0.057	0.030	1.50	12732	945	45°
2.00	2	60	0.037	0.057	0.030	2.00	9549	709	45°
2.50	2	60	0.037	0.057	0.030	2.50	7639	567	45°
3.00	2	60	0.037	0.057	0.030	3.00	6366	472	45°

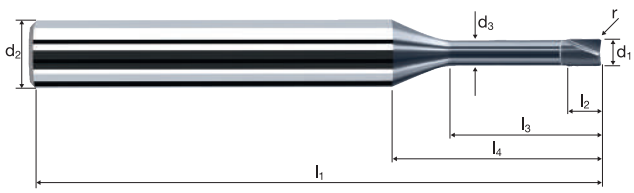
Corner radius end mills Microcut

Shank ø 4mm, cylindrical neck, 8xd

HM XA	λ 0° γ 0°

h4



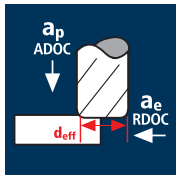


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60		Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **X** Article-N°. **6823** ø-Code **050**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.01	z	X-AL X6823
050	0.50	4.00	0.45	50	0.40	4.00	4.20	10.76	0.100	2	●
060	0.60	4.00	0.55	50	0.48	4.80	5.00	11.37	0.100	2	●
080	0.80	4.00	0.75	50	0.64	6.40	6.60	12.60	0.100	2	●
098	1.00	4.00	0.95	50	1.20	8.00	8.20	13.82	0.100	2	●
100	1.00	4.00	0.95	50	1.20	8.00	8.20	13.82	0.200	2	●
108	1.20	4.00	1.10	50	1.44	9.60	9.90	15.14	0.200	2	●
120	1.50	4.00	1.40	50	1.80	12.00	12.30	16.98	0.200	2	●
140	2.00	4.00	1.90	50	2.40	16.00	16.30	20.05	0.200	2	●
160	2.50	4.00	2.30	57	3.00	20.00	20.43	23.30	0.200	2	●
180	3.00	4.00	2.80	57	3.60	24.00	24.43	26.37	0.200	2	●

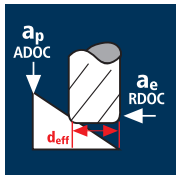
Application



Material

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	r [mm]
Steel 850 - 1100 N/mm²									
1.00	2	180	0.036	0.080	0.200	0.92	60000	4320	0.200
1.20	2	180	0.042	0.100	0.240	1.15	49822	4185	0.200
1.50	2	180	0.054	0.120	0.300	1.47	38977	4210	0.200
2.00	2	180	0.072	0.160	0.400	1.99	28792	4146	0.200
2.50	2	180	0.090	0.200	0.500	2.50	22918	4125	0.200
3.00	2	180	0.108	0.240	0.600	2.99	19162	4139	0.200
Steel 1100 - 1300 N/mm²									
1.00	2	160	0.032	0.080	0.200	0.92	55358	3543	0.200
1.20	2	160	0.038	0.100	0.240	1.15	44287	3366	0.200
1.50	2	160	0.048	0.120	0.300	1.47	34646	3326	0.200
2.00	2	160	0.064	0.160	0.400	1.99	25593	3276	0.200
2.50	2	160	0.082	0.200	0.500	2.50	20372	3341	0.200
3.00	2	160	0.098	0.240	0.600	2.99	17033	3339	0.200
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	80	0.032	0.080	0.200	0.92	27679	1772	0.200
1.20	2	80	0.038	0.100	0.240	1.15	22143	1683	0.200
1.50	2	80	0.048	0.120	0.300	1.47	17323	1663	0.200
2.00	2	80	0.064	0.160	0.400	1.99	12796	1638	0.200
2.50	2	80	0.082	0.200	0.500	2.50	10186	1671	0.200
3.00	2	80	0.098	0.240	0.600	2.99	8517	1669	0.200
Titanium alloys up to 300 HB [Ti5Al2.5Sn]									
1.00	2	60	0.026	0.080	0.200	0.92	20759	1080	0.200
1.20	2	60	0.030	0.100	0.240	1.15	16607	996	0.200
1.50	2	60	0.038	0.120	0.300	1.47	12992	987	0.200
2.00	2	60	0.050	0.160	0.400	1.99	9597	960	0.200
2.50	2	60	0.064	0.200	0.500	2.50	7639	978	0.200
3.00	2	60	0.076	0.240	0.600	2.99	6387	971	0.200

Application



Material

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min-1]	vf [mm/min]	β [°]
Steel 850 - 1100 N/mm²									
1.00	2	300	0.028	0.042	0.042	1.00	60000	3360	45°
1.20	2	300	0.030	0.050	0.050	1.20	60000	3600	45°
1.50	2	300	0.034	0.064	0.064	1.50	60000	4080	45°
2.00	2	300	0.038	0.084	0.084	1.99	47986	3647	45°
2.50	2	300	0.040	0.106	0.106	2.48	38505	3080	45°
3.00	2	300	0.046	0.126	0.126	2.97	32153	2958	45°
Steel 1100 - 1300 N/mm²									
1.00	2	250	0.026	0.042	0.042	1.00	60000	3120	45°
1.20	2	250	0.028	0.050	0.050	1.20	60000	3360	45°
1.50	2	250	0.030	0.064	0.064	1.50	53052	3183	45°
2.00	2	250	0.034	0.084	0.084	1.99	39989	2719	45°
2.50	2	250	0.036	0.106	0.106	2.48	32088	2310	45°
3.00	2	250	0.042	0.126	0.126	2.97	26794	2251	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]									
1.00	2	120	0.022	0.042	0.042	1.00	38197	1681	45°
1.20	2	120	0.024	0.050	0.050	1.20	31831	1528	45°
1.50	2	120	0.028	0.064	0.064	1.50	25465	1426	45°
2.00	2	120	0.030	0.084	0.084	1.99	19195	1152	45°
2.50	2	120	0.032	0.106	0.106	2.48	15402	986	45°
3.00	2	120	0.036	0.126	0.126	2.97	12861	926	45°
Titanium alloys up to 300 HB [Ti5Al2.5Sn]									
1.00	2	100	0.020	0.042	0.042	1.00	31831	1273	45°
1.20	2	100	0.022	0.050	0.050	1.20	26526	1167	45°
1.50	2	100	0.024	0.064	0.064	1.50	21221	1019	45°
2.00	2	100	0.026	0.084	0.084	1.99	15995	832	45°
2.50	2	100	0.028	0.106	0.106	2.48	12835	719	45°
3.00	2	100	0.032	0.126	0.126	2.97	10718	686	45°

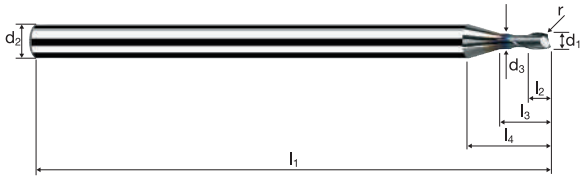
Corner radius end mills Microcut

Shank ø 3mm, cylindrical neck, 3xd

Performance **P**

II

HM MG10	λ 25° γ 6°



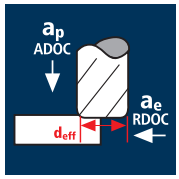
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5752** ø-Code **100**

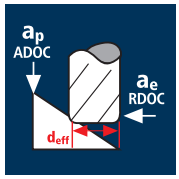
Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.03	z	MICRO M5752
100	1.00	3.00	0.95	50	1.20	3.00	3.00	7.22	0.200	2	●
108	1.20	3.00	1.10	50	1.44	3.60	3.60	7.54	0.200	2	●
120	1.50	3.00	1.40	50	1.80	4.50	4.50	7.88	0.200	2	●
140	2.00	3.00	1.90	50	2.40	6.00	6.00	8.45	0.200	2	●
160	2.50	3.00	2.30	50	3.00	7.50	7.50	9.20	0.200	2	●
180	3.00	3.00	2.80	50	3.60	8.56	8.56	9.00	0.200	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Steel 850 - 1100 N/mm²	1.00	2	180	0.036	0.070	0.200	0.90	60000	4320	0.200
	1.20	2	180	0.042	0.080	0.240	1.12	51157	4297	0.200
	1.50	2	180	0.054	0.110	0.300	1.46	39244	4238	0.200
	2.00	2	180	0.072	0.140	0.400	1.98	28937	4167	0.200
	2.50	2	180	0.090	0.180	0.500	2.50	22918	4125	0.200
	3.00	2	180	0.108	0.210	0.600	3.00	19099	4125	0.200
Steel 1100 - 1300 N/mm²	1.00	2	160	0.032	0.070	0.200	0.90	56588	3622	0.200
	1.20	2	160	0.038	0.080	0.240	1.12	45473	3456	0.200
	1.50	2	160	0.048	0.110	0.300	1.46	34883	3349	0.200
	2.00	2	160	0.064	0.140	0.400	1.98	25722	3292	0.200
	2.50	2	160	0.082	0.180	0.500	2.50	20372	3341	0.200
	3.00	2	160	0.098	0.210	0.600	3.00	16977	3328	0.200
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	80	0.032	0.070	0.200	0.90	28294	1811	0.200
	1.20	2	80	0.038	0.080	0.240	1.12	22736	1728	0.200
	1.50	2	80	0.048	0.110	0.300	1.46	17442	1674	0.200
	2.00	2	80	0.064	0.140	0.400	1.98	12861	1646	0.200
	2.50	2	80	0.082	0.180	0.500	2.50	10186	1671	0.200
	3.00	2	80	0.098	0.210	0.600	3.00	8488	1664	0.200
Titanium alloys up to 300 HB [Ti5Al2.5Sn]	1.00	2	60	0.026	0.070	0.200	0.90	21221	1104	0.200
	1.20	2	60	0.030	0.080	0.240	1.12	17052	1023	0.200
	1.50	2	60	0.038	0.110	0.300	1.46	13081	994	0.200
	2.00	2	60	0.050	0.140	0.400	1.98	9646	965	0.200
	2.50	2	60	0.064	0.180	0.500	2.50	7639	978	0.200
	3.00	2	60	0.076	0.210	0.600	3.00	6366	968	0.200

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²	1.00	2	300	0.022	0.040	0.040	1.00	60000	2640	45°
	1.20	2	300	0.024	0.048	0.048	1.20	60000	2880	45°
	1.50	2	300	0.028	0.060	0.060	1.50	60000	3360	45°
	2.00	2	300	0.030	0.080	0.080	2.00	47746	2865	45°
	2.50	2	300	0.032	0.100	0.100	2.49	38351	2455	45°
	3.00	2	300	0.036	0.120	0.120	2.97	32153	2315	45°
Steel 1100 - 1300 N/mm²	1.00	2	250	0.020	0.040	0.040	1.00	60000	2400	45°
	1.20	2	250	0.022	0.048	0.048	1.20	60000	2640	45°
	1.50	2	250	0.026	0.060	0.060	1.50	53052	2759	45°
	2.00	2	250	0.028	0.080	0.080	2.00	39789	2228	45°
	2.50	2	250	0.028	0.100	0.100	2.49	31959	1790	45°
	3.00	2	250	0.032	0.120	0.120	2.97	26794	1715	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	120	0.018	0.040	0.040	1.00	38197	1375	45°
	1.20	2	120	0.020	0.048	0.048	1.20	31831	1273	45°
	1.50	2	120	0.022	0.060	0.060	1.50	25465	1121	45°
	2.00	2	120	0.024	0.080	0.080	2.00	19099	917	45°
	2.50	2	120	0.026	0.100	0.100	2.49	15340	798	45°
	3.00	2	120	0.028	0.120	0.120	2.97	12861	720	45°
Titanium alloys up to 300 HB [Ti5Al2.5Sn]	1.00	2	100	0.016	0.040	0.040	1.00	31831	1019	45°
	1.20	2	100	0.016	0.048	0.048	1.20	26526	849	45°
	1.50	2	100	0.020	0.060	0.060	1.50	21221	849	45°
	2.00	2	100	0.022	0.080	0.080	2.00	15915	700	45°
	2.50	2	100	0.022	0.100	0.100	2.49	12784	563	45°
	3.00	2	100	0.026	0.120	0.120	2.97	10718	557	45°

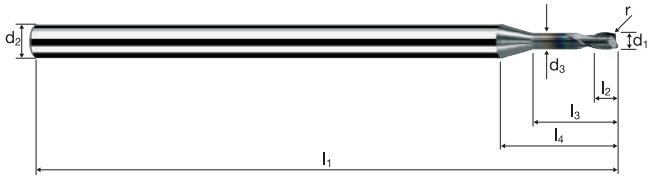
Corner radius end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

Performance **P**

II

HM MG10 | λ 25° γ 6°



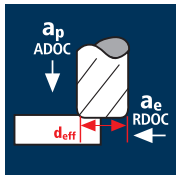
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5754** ø-Code **100**

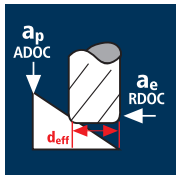
Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.03	z	MICRO M5754
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	0.200	2	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	0.200	2	●
120	1.50	3.00	1.40	50	1.80	7.50	7.50	10.88	0.200	2	●
140	2.00	3.00	1.90	50	2.40	10.00	10.00	12.45	0.200	2	●
160	2.50	3.00	2.30	50	3.00	12.50	12.50	14.20	0.200	2	●
180	3.00	3.00	2.80	50	3.60	14.56	14.56	15.00	0.200	2	●

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	r [mm]
Steel 850 - 1100 N/mm²	1.00	2	180	0.036	0.050	0.200	0.86	60000	4320	0.200
	1.20	2	180	0.042	0.060	0.240	1.09	52565	4416	0.200
	1.50	2	180	0.054	0.080	0.300	1.42	40349	4358	0.200
	2.00	2	180	0.072	0.100	0.400	1.95	29382	4231	0.200
	2.50	2	180	0.090	0.130	0.500	2.47	23197	4176	0.200
	3.00	2	180	0.108	0.150	0.600	2.99	19162	4139	0.200
Steel 1100 - 1300 N/mm²	1.00	2	160	0.032	0.050	0.200	0.86	59220	3790	0.200
	1.20	2	160	0.038	0.060	0.240	1.09	46724	3551	0.200
	1.50	2	160	0.048	0.080	0.300	1.42	35866	3443	0.200
	2.00	2	160	0.064	0.100	0.400	1.95	26118	3343	0.200
	2.50	2	160	0.082	0.130	0.500	2.47	20619	3382	0.200
	3.00	2	160	0.098	0.150	0.600	2.99	17033	3339	0.200
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	80	0.032	0.050	0.200	0.86	29610	1895	0.200
	1.20	2	80	0.038	0.060	0.240	1.09	23362	1776	0.200
	1.50	2	80	0.048	0.080	0.300	1.42	17933	1722	0.200
	2.00	2	80	0.064	0.100	0.400	1.95	13059	1672	0.200
	2.50	2	80	0.082	0.130	0.500	2.47	10310	1691	0.200
	3.00	2	80	0.098	0.150	0.600	2.99	8517	1669	0.200
Titanium alloys up to 300 HB [Ti5Al2.5Sn]	1.00	2	60	0.026	0.050	0.200	0.86	22208	1155	0.200
	1.20	2	60	0.030	0.060	0.240	1.09	17522	1051	0.200
	1.50	2	60	0.038	0.080	0.300	1.42	13450	1022	0.200
	2.00	2	60	0.050	0.100	0.400	1.95	9794	979	0.200
	2.50	2	60	0.064	0.130	0.500	2.47	7732	990	0.200
	3.00	2	60	0.076	0.150	0.600	2.99	6387	971	0.200

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	d_{eff} [mm]	n [min-1]	v_f [mm/min]	β [°]
Steel 850 - 1100 N/mm²	1.00	2	300	0.022	0.038	0.038	0.99	60000	2640	45°
	1.20	2	300	0.024	0.046	0.046	1.20	60000	2880	45°
	1.50	2	300	0.028	0.058	0.058	1.50	60000	3360	45°
	2.00	2	300	0.030	0.076	0.076	2.00	47746	2865	45°
	2.50	2	300	0.032	0.096	0.096	2.49	38351	2455	45°
	3.00	2	300	0.036	0.114	0.114	2.98	32045	2307	45°
Steel 1100 - 1300 N/mm²	1.00	2	250	0.020	0.038	0.038	0.99	60000	2400	45°
	1.20	2	250	0.022	0.046	0.046	1.20	60000	2640	45°
	1.50	2	250	0.026	0.058	0.058	1.50	53052	2759	45°
	2.00	2	250	0.028	0.076	0.076	2.00	39789	2228	45°
	2.50	2	250	0.028	0.096	0.096	2.49	31959	1790	45°
	3.00	2	250	0.032	0.114	0.114	2.98	26704	1709	45°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	1.00	2	120	0.018	0.038	0.038	0.99	38583	1389	45°
	1.20	2	120	0.020	0.046	0.046	1.20	31831	1273	45°
	1.50	2	120	0.022	0.058	0.058	1.50	25465	1121	45°
	2.00	2	120	0.024	0.076	0.076	2.00	19099	917	45°
	2.50	2	120	0.026	0.096	0.096	2.49	15340	798	45°
	3.00	2	120	0.028	0.114	0.114	2.98	12818	718	45°
Titanium alloys up to 300 HB [Ti5Al2.5Sn]	1.00	2	100	0.016	0.038	0.038	0.99	32153	1029	45°
	1.20	2	100	0.016	0.046	0.046	1.20	26526	849	45°
	1.50	2	100	0.020	0.058	0.058	1.50	21221	849	45°
	2.00	2	100	0.022	0.076	0.076	2.00	15915	700	45°
	2.50	2	100	0.022	0.096	0.096	2.49	12784	563	45°
	3.00	2	100	0.026	0.114	0.114	2.98	10682	556	45°

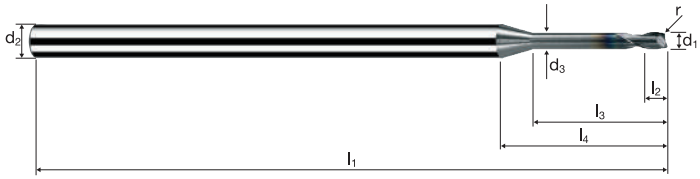
Corner radius end mills Microcut

Shank ø 3mm, cylindrical neck, 8xd

Performance **P**

II

HM MG10	λ 25° γ 6°



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper

Example: **Order-N°.** Coating **M** Article-N°. **5756** ø-Code **100**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.03	z	MICRO M5756
100	1.00	3.00	0.95	50	1.20	8.00	8.00	12.22	0.200	2	●
108	1.20	3.00	1.10	50	1.44	9.60	9.60	13.54	0.200	2	●
120	1.50	3.00	1.40	60	1.80	12.00	12.00	15.38	0.200	2	●
140	2.00	3.00	1.90	60	2.40	16.00	16.00	18.45	0.200	2	●
160	2.50	3.00	2.30	60	3.00	20.00	20.00	21.70	0.200	2	●
180	3.00	3.00	2.80	60	3.60	23.56	23.56	24.00	0.200	2	●


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End milling tools for aluminium and copper
Smooth-edged, cylindrical

Normal version

N° 15530 / 15630 — **AX**



X-Generation X — Roughing, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 575

N° 15535 / 15635 — **AX**



X-Generation X — Roughing, Finishing — d_1 6 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 577

N° 8565 / 8665 — **MFC Alu**



$l_2 = 2.2xd_1$, $l_3 = 3.0xd_1$

Performance P — Roughing HPC, Roughing HDC, Finishing — d_1 4 – 20 — r — Al Aluminium Alloy — 579

N° 8560 / 8660 — **E-Cut Alu**



$l_2 = 2.2xd_1$, $l_3 = 3.0xd_1$

Performance P — Roughing HPC, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 581

N° 15520 / 15620 — **AX**



X-Generation X — Roughing, Finishing — d_1 2 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 583

N° 15525 / 15625 — **AX**



X-Generation X — Roughing, Finishing — d_1 6 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 585

N° 8561 / 8661 — **E-Cut Alu**



$l_2 = 2.2xd_1$, $l_3 = 3.0xd_1$

Performance P — Roughing HPC, Finishing — d_1 1 – 10 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 587

Medium length version

N° 15557 / 15657 — **AX**



X-Generation X — Roughing, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 589

N° 15560 / 15660 — **AX**



X-Generation X — Roughing, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 591

N° 8575 / 8675 — **MFC Alu**



$l_2 = 3.7xd_1$, $l_3 = 4.5xd_1$

Performance P — Roughing HPC, Roughing HDC, Finishing — d_1 4 – 20 — r — Al Aluminium Alloy — 593

N° 8578 / 8678 — **E-Cut Alu**



$l_2 = 3.7xd_1$

Performance P — Roughing HPC, Roughing HDC, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 595

N° 8570 / 8670 — **E-Cut Alu**



$l_2 = 2.2xd_1$, $l_3 = 4.5xd_1$

Performance P — Roughing HPC, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 597

N° 15550 / 15650 — **AX**



X-Generation X — Roughing, Finishing — d_1 3 – 20 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 599

N° 8571 / 8671 — **E-Cut Alu**



$l_2 = 2.2xd_1$, $l_3 = 4.5xd_1$

Performance P — Roughing HPC, Finishing — d_1 1 – 10 — 90° — Al Aluminium Alloy — Cu Copper — Plastic Thermoplast — 601

End milling tools for aluminium and copper
Smooth-edged, cylindrical

Long version

N° 15559 / 15659



AX

X-Generation **X**

Roughing
Finishing
d, 6 – 20
90°

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

603

N° 15561 / 15661



AX

X-Generation **X**

Roughing
Finishing
d, 6 – 20
90°

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

605

N° 8580 / 8680



E-Cut Alu

Performance **P**

Roughing HPC
Finishing
d, 3 – 20
90°

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

607

l_2 = 2.2xd, l_3 = 5.6xd,

5.2xd version

N° 8585 / 8685



MFC Alu

Performance **P**

Roughing HPC
Roughing HDC
Finishing
d, 6 – 20
r

Al Aluminium Alloy

609

End milling tools for aluminium and copper
Smooth-edged, with corner radius

Normal version

N° 8567 / 8667 **E-Cut Alu**



$l_2 = 2.2xd_1$ $l_3 = 3.0xd_1$

Performance **P**

Roughing HPC
Finishing

r 0.2, 0.5, 1.0, 2.0, 3.0

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

611

Medium length version

N° 8576 / 8676 **E-Cut Alu**



$l_2 = 3.7xd_1$

Performance **P**

Roughing HPC
Roughing HDC
Finishing

r 0.2, 0.5, 1.0, 2.0, 3.0

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

615

N° 8577 / 8677 **E-Cut Alu**



$l_2 = 2.2xd_1$ $l_3 = 4.5xd_1$

Performance **P**

Roughing HPC
Finishing

r 0.2, 0.5, 1.0, 2.0, 3.0

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

619

Long version

N° 8587 / 8687 **E-Cut Alu**



$l_2 = 2.2xd_1$ $l_3 = 5.6xd_1$

Performance **P**

Roughing HPC
Finishing

r 0.2, 0.5, 1.0

Al Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast

623

III

End milling tools for aluminium and copper
Smooth-edged, with corner radius

3xd and 5xd

N° 15583



N° 15573



N° 15585



N° 15575



AX	X-Generation X	Roughing Finishing	r	0.5, 1.0, 1.5, 2.0, 2.5, 4.0	Al Aluminium Alloy			627
AX	X-Generation X	Roughing Finishing	r	0.5, 1.0, 1.5, 2.0, 2.5, 4.0	Al Aluminium Alloy			631
AX	X-Generation X	Roughing Finishing	r	1.0, 2.5, 4.0	Al Aluminium Alloy			635
AX	X-Generation X	Roughing Finishing	r	1.0, 2.5, 4.0	Al Aluminium Alloy			637

End milling tools for aluminium and copper
Ball nose

Tolerance r ±0.005

N° 7550



Sphericut | Performance **P** | **3xd** | **HDC** | **R/F** | d, 2 – 20 | **Al** Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast | 351

N° 7554



Sphericut | Performance **P** | **6xd** | **HDC** | **R/F** | d, 3 – 16 | **Al** Aluminium Alloy | **Cu** Copper | **Plastic** Thermoplast | 367

III

End milling tools for aluminium and copper
Profiled, cylindrical

Normal version

N° 15500 / 15600 — **AX-FPS**



X-Generation X — Roughing, Finishing — d, 6 – 25 — r — Al Aluminium Alloy — 639

N° 5297 / 5397 — ToolSchool — **AX**



X-Generation X — Roughing, Finishing — d, 6 – 20 — 45° — Al Aluminium Alloy, Cu Copper — 641

N° 8563 / 8663



l_2 = 2.2xd, l_3 = 3.0xd,

Performance P — Roughing, Finishing — d, 6 – 20 — r — Al Aluminium Alloy, Cu Copper — 643

N° 1392



HSS — Roughing, Finishing — d, 6 – 20 — 45° — Al Aluminium Alloy, Cu Copper — 645

Medium length version

N° 15506 / 15606 — **AX-FPS**



X-Generation X — Roughing, Finishing — d, 6 – 20 — r — Al Aluminium Alloy — 647

N° 15297 / 15397 — ToolSchool — **AX**



X-Generation X — Roughing, Finishing — d, 6 – 20 — 45° — Al Aluminium Alloy, Cu Copper — 649

Medium length version with neck

N° 15505 / 15605 — **AX-FPS**



X-Generation X — Roughing, Finishing — d, 6 – 25 — r — Al Aluminium Alloy — 651

N° 15298 / 15398 — ToolSchool — **AX**



X-Generation X — Roughing, Finishing — d, 6 – 25 — 45° — Al Aluminium Alloy, Cu Copper — 653

N° 8573 / 8673



l_2 = 2.2xd, l_3 = 4.5xd,

Performance P — Roughing, Finishing — d, 6 – 20 — r — Al Aluminium Alloy, Cu Copper — 655

5.2xd version

N° 15507 / 15607 — **AX-FPS**



X-Generation X — Roughing, Finishing — d, 6 – 20 — r — Al Aluminium Alloy — 657

End milling tools for aluminium and copper
Profiled, with corner radius

Normal version

N° 15502



AX-FPS

X-Generation

Roughing

Finishing

r 1.0, 2.0, 2.5, 3.0

Al
Aluminium Alloy

659

End milling tools for aluminium and copper
Finishing, cylindrical

Normal version

N° 15589



MulticutXA

X-Generation | Roughing | Finishing | d, 6 – 20 | r | Al Aluminium Alloy | 661

Medium length version

N° 15590



MulticutXA

X-Generation | Roughing | Finishing | d, 6 – 20 | r | Al Aluminium Alloy | 663

5.2xd version

N° 15510



AX

X-Generation | Roughing | Finishing | d, 6 – 20 | r | Al Aluminium Alloy | Cu Copper | 665

End milling tools for aluminium and copper
Finishing, with corner radius

5.2xd version

N° 15512



AX

X-Generation **X**

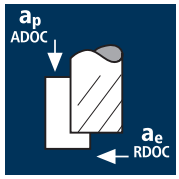
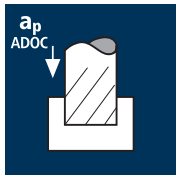
Roughing r 1.0, 2.5

Finishing

Al Aluminium Alloy

Cu Copper

667

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	550	0.050	4.500	1.400	58355	8753	55.1
		4.00	3	550	0.065	6.000	1.800	43770	8535	92.2
		5.00	3	550	0.085	7.500	2.300	35015	8929	154.0
		6.00	3	550	0.110	9.000	2.700	29180	9629	234.0
		8.00	3	550	0.135	12.000	3.600	21885	8863	382.9
		10.00	3	550	0.165	15.000	4.500	17505	8665	584.9
		12.00	3	550	0.200	18.000	5.400	14590	8754	850.9
		16.00	3	550	0.215	24.000	7.200	10940	7056	1219.3
		20.00	3	550	0.250	30.000	9.000	8755	6566	1772.9
	Unalloyed copper	3.00	3	400	0.040	4.500	1.350	42440	5093	30.9
		4.00	3	400	0.050	6.000	1.800	31830	4775	51.6
		5.00	3	400	0.070	7.500	2.250	25465	5348	90.2
		6.00	3	400	0.090	9.000	2.700	21220	5729	139.2
		8.00	3	400	0.110	12.000	3.600	15915	5252	226.9
		10.00	3	400	0.130	15.000	4.500	12730	4965	335.1
		12.00	3	400	0.160	18.000	5.400	10610	5093	495.0
		16.00	3	400	0.170	24.000	7.200	7960	4060	701.5
		20.00	3	400	0.200	30.000	9.000	6365	3819	1031.1
	Thermoplastics	3.00	3	1000	0.050	4.500	1.350	60000	9000	54.7
		4.00	3	1000	0.065	6.000	1.800	60000	11700	126.4
		5.00	3	1000	0.085	7.500	2.250	60000	15300	258.2
		6.00	3	1000	0.110	9.000	2.700	53050	17507	425.4
		8.00	3	1000	0.135	12.000	3.600	39790	16115	696.2
		10.00	3	1000	0.165	15.000	4.500	31830	15756	1063.5
		12.00	3	1000	0.200	18.000	5.400	26525	15915	1546.9
		16.00	3	1000	0.215	24.000	7.200	19895	12832	2217.4
		20.00	3	1000	0.250	30.000	9.000	15915	11936	3222.8
	Cast aluminium	3.00	3	396	0.050	4.500	1.350	42015	6302	38.3
		4.00	3	440	0.065	6.000	1.800	35015	6828	73.7
		5.00	3	440	0.085	7.500	2.250	28010	7143	120.5
		6.00	3	440	0.110	9.000	2.700	23345	7704	187.2
		8.00	3	440	0.135	12.000	3.600	17505	7090	306.3
		10.00	3	440	0.165	15.000	4.500	14005	6933	467.9
		12.00	3	440	0.200	18.000	5.400	11670	7002	680.6
		16.00	3	440	0.215	24.000	7.200	8755	5647	975.8
		20.00	3	440	0.250	30.000	9.000	7005	5254	1418.5
	Wrought aluminium Construction aluminium	3.00	3	450	0.035	1.800	3.000	47745	5013	27.1
		4.00	3	450	0.045	2.400	4.000	35810	4834	46.4
		5.00	3	450	0.060	3.000	5.000	28650	5157	77.4
		6.00	3	450	0.075	3.600	6.000	23875	5372	116.0
		8.00	3	450	0.095	4.800	8.000	17905	5103	196.0
		10.00	3	450	0.115	6.000	10.000	14325	4942	296.5
		12.00	3	450	0.140	7.200	12.000	11935	5013	433.1
		16.00	3	450	0.150	9.600	16.000	8950	4028	618.6
		20.00	3	450	0.175	12.000	20.000	7160	3759	902.2
	Unalloyed copper	3.00	3	350	0.030	1.800	3.000	37135	3342	18.0
		4.00	3	350	0.035	2.400	4.000	27850	2924	28.1
		5.00	3	350	0.050	3.000	5.000	22280	3342	50.1
		6.00	3	350	0.060	3.600	6.000	18570	3343	72.2
		8.00	3	350	0.075	4.800	8.000	13925	3133	120.3
		10.00	3	350	0.090	6.000	10.000	11140	3008	180.5
		12.00	3	350	0.110	7.200	12.000	9285	3064	264.7
		16.00	3	350	0.120	9.600	16.000	6965	2507	385.1
		20.00	3	350	0.140	12.000	20.000	5570	2339	561.5
	Thermoplastics	3.00	3	800	0.035	1.800	3.000	60000	6300	34.0
		4.00	3	800	0.045	2.400	4.000	60000	8100	77.8
		5.00	3	800	0.060	3.000	5.000	50930	9167	137.5
		6.00	3	800	0.075	3.600	6.000	42440	9549	206.3
		8.00	3	800	0.095	4.800	8.000	31830	9072	348.3
		10.00	3	800	0.115	6.000	10.000	25465	8785	527.1
		12.00	3	800	0.140	7.200	12.000	21220	8912	770.0
		16.00	3	800	0.150	9.600	16.000	15915	7162	1100.1
		20.00	3	800	0.175	12.000	20.000	12730	6683	1604.0
	Cast aluminium	3.00	3	360	0.035	1.800	3.000	38195	4011	21.7
		4.00	3	360	0.045	2.400	4.000	28650	3868	37.1
		5.00	3	360	0.060	3.000	5.000	22920	4126	61.9
		6.00	3	360	0.075	3.600	6.000	19100	4298	92.8
		8.00	3	360	0.095	4.800	8.000	14325	4083	156.8
		10.00	3	360	0.115	6.000	10.000	11460	3954	237.2
		12.00	3	360	0.140	7.200	12.000	9550	4011	346.6
		16.00	3	360	0.150	9.600	16.000	7160	3222	494.9
		20.00	3	360	0.175	12.000	20.000	5730	3008	722.0

Cylindrical/Square end mills AX

Smooth-edged, normal version, short neck

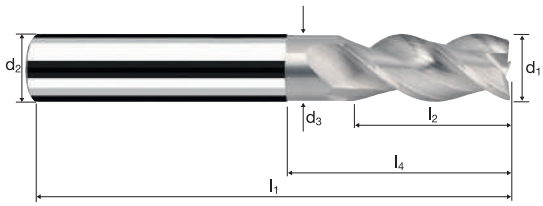
X-Generation

HM
MG10

λ 40°
γ 20°

90°

Vario



Roughing

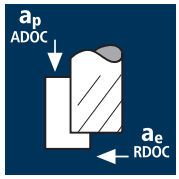
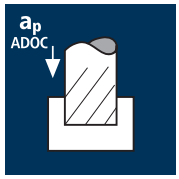
Finishing

ReTool®

Rm <850 HRC <24			Al Aluminium >99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating **C** Article-N°. **15630** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z	15630	CELERO C15630
									15530	C15530
180	3.00	6.00	2.80	57	8.00	14.00	20.63	3	●	●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	3	●	●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	3	●	●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	3	●	●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	3	●	●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	3	●	●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	3	●	●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	3	●	●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	3	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	650	0.060	9.000	2.400	34485	6207	134.1
		8.00	3	650	0.075	12.000	3.200	25865	5820	223.5
		10.00	3	650	0.090	15.000	4.000	20690	5586	335.2
		12.00	3	650	0.110	18.000	4.800	17240	5689	491.5
		16.00	3	650	0.120	24.000	6.400	12930	4655	715.0
		20.00	3	650	0.140	30.000	8.000	10345	4345	1042.8
	Unalloyed copper	6.00	3	500	0.050	9.000	2.400	26525	3979	85.9
		8.00	3	500	0.060	12.000	3.200	19895	3581	137.5
		10.00	3	500	0.070	15.000	4.000	15915	3342	200.5
		12.00	3	500	0.090	18.000	4.800	13265	3582	309.5
		16.00	3	500	0.095	24.000	6.400	9945	2834	435.3
		20.00	3	500	0.110	30.000	8.000	7960	2627	630.4
	Thermoplastics	6.00	3	1200	0.060	9.000	2.400	60000	10800	233.3
		8.00	3	1200	0.075	12.000	3.200	47745	10743	412.5
		10.00	3	1200	0.090	15.000	4.000	38195	10313	618.8
		12.00	3	1200	0.110	18.000	4.800	31830	10504	907.5
		16.00	3	1200	0.120	24.000	6.400	23875	8595	1320.2
		20.00	3	1200	0.140	30.000	8.000	19100	8022	1925.3
	Cast aluminium	6.00	3	520	0.060	9.000	2.400	27585	4965	107.3
		8.00	3	520	0.075	12.000	3.200	20690	4655	178.8
		10.00	3	520	0.090	15.000	4.000	16550	4469	268.1
		12.00	3	520	0.110	18.000	4.800	13795	4552	393.3
		16.00	3	520	0.120	24.000	6.400	10345	3724	572.0
		20.00	3	520	0.140	30.000	8.000	8275	3476	834.1
	Wrought aluminium Construction aluminium	6.00	3	550	0.040	3.000	6.000	29180	3502	63.0
		8.00	3	550	0.050	4.000	8.000	21885	3283	105.0
		10.00	3	550	0.065	5.000	10.000	17505	3414	170.7
		12.00	3	550	0.075	6.000	12.000	14590	3283	236.4
		16.00	3	550	0.085	8.000	16.000	10940	2790	357.1
		20.00	3	550	0.095	10.000	20.000	8755	2495	499.0
	Unalloyed copper	6.00	3	450	0.035	3.000	6.000	23875	2507	45.1
		8.00	3	450	0.040	4.000	8.000	17905	2149	68.8
		10.00	3	450	0.050	5.000	10.000	14325	2149	107.4
		12.00	3	450	0.060	6.000	12.000	11935	2148	154.7
		16.00	3	450	0.065	8.000	16.000	8950	1745	223.4
		20.00	3	450	0.075	10.000	20.000	7160	1611	322.2
	Thermoplastics	6.00	3	1000	0.040	3.000	6.000	53050	6366	114.6
		8.00	3	1000	0.050	4.000	8.000	39790	5969	191.0
		10.00	3	1000	0.065	5.000	10.000	31830	6207	310.3
		12.00	3	1000	0.075	6.000	12.000	26525	5968	429.7
		16.00	3	1000	0.085	8.000	16.000	19895	5073	649.4
		20.00	3	1000	0.095	10.000	20.000	15915	4536	907.2
	Cast aluminium	6.00	3	440	0.040	3.000	6.000	23345	2801	50.4
		8.00	3	440	0.050	4.000	8.000	17505	2626	84.0
		10.00	3	440	0.065	5.000	10.000	14005	2731	136.6
		12.00	3	440	0.075	6.000	12.000	11670	2626	189.1
		16.00	3	440	0.085	8.000	16.000	8755	2233	285.8
		20.00	3	440	0.095	10.000	20.000	7005	1996	399.3

Cylindrical/Square end mills AX

Smooth-edged, normal version, short neck
Integral cooling channel

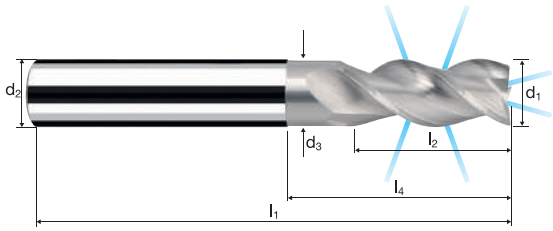
X-Generation

HM
MG10

λ 40°
γ 20°

90°

Vario



Roughing

Finishing

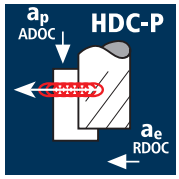
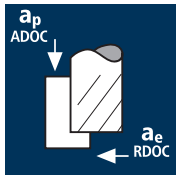
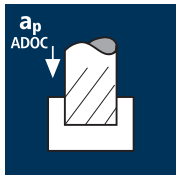
ReTool®

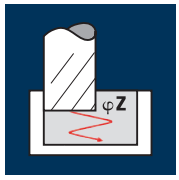
III

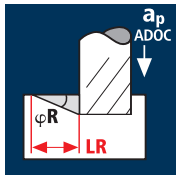
Rm <850 HRC <24			Al Aluminium >99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

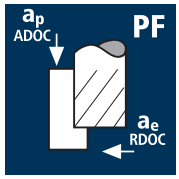
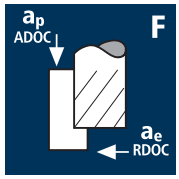
Example: **Order-N°.** Coating **C** Article-N°. **15635** ø-Code **300**

									CELERO
								15635	C15635
								15535	C15535
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z		
300	6.00	6.00	5.50	57	13.00	19.34	20.00	3	●	●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	3	●	●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	3	●	●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	3	●	●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	3	●	●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	3	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	4.00	4	523	0.053	9.000	1.400	41620	8823	111.2
		5.00	4	523	0.071	11.000	1.750	33295	9456	182.0
		6.00	4	523	0.090	13.500	2.100	27745	9988	283.2
		8.00	4	523	0.127	18.000	2.800	20810	10571	532.8
		10.00	4	523	0.167	22.000	3.500	16650	11122	856.4
		12.00	4	523	0.200	27.000	4.200	13875	11100	1258.7
		16.00	4	523	0.213	36.000	5.600	10405	8865	1787.2
		20.00	4	523	0.250	44.000	7.000	8325	8325	2564.1
	Wrought aluminium Construction aluminium	4.00	4	528	0.062	6.000	1.600	42015	10420	100.0
		5.00	4	550	0.078	7.500	2.000	35015	10925	163.9
		6.00	4	550	0.093	9.000	2.400	29180	10855	234.5
		8.00	4	600	0.124	12.000	3.200	23875	11842	454.7
		10.00	4	600	0.155	15.000	4.000	19100	11842	710.5
		12.00	4	600	0.186	18.000	4.800	15915	11841	1023.1
		16.00	4	600	0.198	24.000	6.400	11935	9472	1454.9
		20.00	4	600	0.233	30.000	8.000	9550	8882	2131.7
	Wrought aluminium Construction aluminium	4.00	4	384	0.036	6.000	4.000	30560	4401	105.6
		5.00	4	384	0.045	7.500	5.000	24445	4400	165.0
		6.00	4	384	0.053	9.000	6.000	20370	4318	233.2
		8.00	4	384	0.071	12.000	8.000	15280	4340	416.6
		10.00	4	384	0.089	15.000	10.000	12225	4352	652.8
		12.00	4	384	0.107	18.000	12.000	10185	4359	941.5
		16.00	4	384	0.114	16.000	16.000	7640	3484	891.9
		20.00	4	384	0.134	20.000	20.000	6110	3275	1310.0

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
	Wrought aluminium Construction aluminium	4.00	4	528	0.062	9.000	3.600	42015	10420	10.0°
		5.00	4	550	0.078	11.000	4.500	35015	10925	10.0°
		6.00	4	550	0.093	13.500	5.400	29180	10855	10.0°
		8.00	4	600	0.124	18.000	7.200	23875	11842	10.0°
		10.00	4	600	0.155	22.000	9.000	19100	11842	10.0°
		12.00	4	600	0.186	27.000	10.800	15915	11841	10.0°
		16.00	4	600	0.198	36.000	14.400	11935	9472	10.0°
		20.00	4	600	0.233	44.000	18.000	9550	8882	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φR [°]
	Wrought aluminium Construction aluminium	4.00	4	384	0.036	6.000	4.000	30560	4401	10.0°
		5.00	4	384	0.045	7.500	5.000	24445	4400	10.0°
		6.00	4	384	0.053	9.000	6.000	20370	4318	10.0°
		8.00	4	384	0.071	12.000	8.000	15280	4340	10.0°
		10.00	4	384	0.089	15.000	10.000	12225	4352	10.0°
		12.00	4	384	0.107	18.000	12.000	10185	4359	10.0°
		16.00	4	384	0.114	16.000	16.000	7640	3484	10.0°
		20.00	4	384	0.134	20.000	20.000	6110	3275	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Wrought aluminium Construction aluminium	4.00	4	473	0.046	9.000	0.100	37640	6926
		5.00	4	473	0.051	11.000	0.160	30110	6142
		6.00	4	473	0.056	13.500	0.160	25095	5621
		8.00	4	473	0.065	18.000	0.200	18820	4893
		10.00	4	473	0.073	22.000	0.200	15055	4396
		12.00	4	473	0.080	27.000	0.240	12545	4014
		16.00	4	473	0.092	36.000	0.240	9410	3463
		20.00	4	473	0.103	44.000	0.300	7530	3102
	Wrought aluminium Construction aluminium	4.00	4	525	0.030	9.000	0.060	41780	5014
		5.00	4	525	0.034	11.000	0.100	33425	4546
		6.00	4	525	0.037	13.500	0.100	27850	4122
		8.00	4	525	0.043	18.000	0.140	20890	3593
		10.00	4	525	0.048	22.000	0.140	16710	3208
		12.00	4	525	0.053	27.000	0.170	13925	2952
		16.00	4	525	0.061	36.000	0.170	10445	2549
		20.00	4	525	0.068	44.000	0.200	8355	2273

Cylindrical/Square end mills MFC Alu

Smooth-edged, chip breaker, normal version, short neck
High-performance penetration edge, central air/cooling channel

Performance **P**

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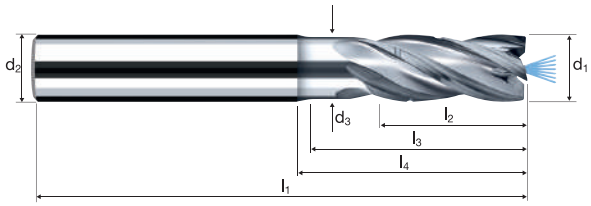
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HM
MG10

λ **30°**
γ **20°**

r

G 2.5



Roughing HPC

Roughing HDC

Finishing

ReTool®

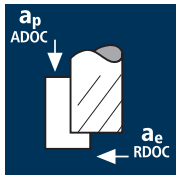
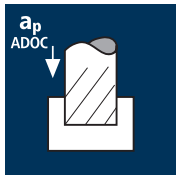
III

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast			

Example: **Order-N°.** Coating **8665** ø-Code **220**

	Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	8665	8565
new!	**220***	4.00	6.00	3.70	54	9.00	12.00	14.54	0.050	4	●	
new!	**260***	5.00	6.00	4.60	57	11.00	15.00	16.72	0.100	4	●	
	300*	6.00	6.00	5.50	57	13.50	18.00	19.85	0.100	4	●	
	391*	8.00	8.00	7.40	63	18.00	24.00	26.37	0.150	4	●	
	450*	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	4	●	
	501*	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	4	●	
	610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.200	4	●	
	682	20.00	20.00	19.00	115	44.00	60.00	64.77	0.250	4	●	

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	396	0.056	4.500	1.350	42015	6996	42.5
		4.00	3	500	0.074	6.000	1.800	39790	8833	95.4
		5.00	3	500	0.093	7.500	2.250	31830	8833	149.1
		6.00	3	500	0.111	9.000	2.700	26525	8833	214.6
		8.00	3	500	0.148	12.000	3.600	19895	8833	381.6
		10.00	3	500	0.185	15.000	4.500	15915	8833	596.2
		12.00	3	500	0.222	18.000	5.400	13265	8835	858.7
		16.00	3	500	0.237	24.000	7.200	9945	7065	1220.8
		20.00	3	500	0.278	30.000	9.000	7960	6627	1789.2
	Unalloyed copper	3.00	3	375	0.041	4.500	1.350	39790	4942	30.0
		4.00	3	375	0.055	6.000	1.800	29840	4942	53.4
		5.00	3	375	0.069	7.500	2.250	23875	4942	83.4
		6.00	3	375	0.083	9.000	2.700	19895	4942	120.1
		8.00	3	375	0.110	12.000	3.600	14920	4942	213.5
		10.00	3	375	0.138	15.000	4.500	11935	4941	333.5
		12.00	3	375	0.166	18.000	5.400	9945	4941	480.2
		16.00	3	375	0.177	24.000	7.200	7460	3953	683.1
		20.00	3	375	0.207	30.000	9.000	5970	3707	1001.0
	Thermoplastics	3.00	3	396	0.067	4.500	1.350	42015	8395	51.0
		4.00	3	500	0.089	6.000	1.800	39790	10600	114.5
		5.00	3	500	0.111	7.500	2.250	31830	10599	178.9
		6.00	3	500	0.133	9.000	2.700	26525	10599	257.6
		8.00	3	500	0.178	12.000	3.600	19895	10600	457.9
		10.00	3	500	0.222	15.000	4.500	15915	10599	715.5
		12.00	3	500	0.266	18.000	5.400	13265	10601	1030.5
		16.00	3	500	0.284	24.000	7.200	9945	8478	1465.0
		20.00	3	500	0.333	30.000	9.000	7960	7952	2147.0
	Cast aluminium	3.00	3	396	0.044	4.500	1.350	42015	5596	34.0
		4.00	3	400	0.059	6.000	1.800	31830	5653	61.1
		5.00	3	400	0.074	7.500	2.250	25465	5653	95.4
		6.00	3	400	0.089	9.000	2.700	21220	5653	137.4
		8.00	3	400	0.118	12.000	3.600	15915	5653	244.2
		10.00	3	400	0.148	15.000	4.500	12730	5652	381.5
		12.00	3	400	0.178	18.000	5.400	10610	5653	549.5
		16.00	3	400	0.189	24.000	7.200	7960	4524	781.7
		20.00	3	400	0.222	30.000	9.000	6365	4239	1144.6
	Wrought aluminium Construction aluminium	3.00	3	395	0.032	4.500	3.000	41910	4012	54.2
		4.00	3	400	0.043	6.000	4.000	31830	4063	97.5
		5.00	3	400	0.053	7.500	5.000	25465	4063	152.4
		6.00	3	400	0.064	9.000	6.000	21220	4063	219.4
		8.00	3	400	0.085	12.000	8.000	15915	4063	390.1
		10.00	3	400	0.106	15.000	10.000	12730	4063	609.4
		12.00	3	400	0.128	18.000	12.000	10610	4063	877.6
		16.00	3	400	0.136	24.000	16.000	7960	3252	1248.6
		20.00	3	400	0.160	30.000	20.000	6365	3047	1828.1
	Unalloyed copper	3.00	3	300	0.024	4.500	3.000	31830	2273	30.7
		4.00	3	300	0.032	6.000	4.000	23875	2273	54.6
		5.00	3	300	0.040	7.500	5.000	19100	2273	85.3
		6.00	3	300	0.048	9.000	6.000	15915	2273	122.7
		8.00	3	300	0.063	12.000	8.000	11935	2273	218.2
		10.00	3	300	0.079	15.000	10.000	9550	2273	341.0
		12.00	3	300	0.095	18.000	12.000	7960	2274	491.2
		16.00	3	300	0.102	24.000	16.000	5970	1819	698.5
		20.00	3	300	0.119	30.000	20.000	4775	1705	1023.0
	Thermoplastics	3.00	3	400	0.038	4.500	3.000	42440	4876	65.8
		4.00	3	400	0.051	6.000	4.000	31830	4876	117.0
		5.00	3	400	0.064	7.500	5.000	25465	4876	182.8
		6.00	3	400	0.077	9.000	6.000	21220	4876	263.3
		8.00	3	400	0.102	12.000	8.000	15915	4876	468.1
		10.00	3	400	0.128	15.000	10.000	12730	4875	731.3
		12.00	3	400	0.153	18.000	12.000	10610	4876	1053.2
		16.00	3	400	0.163	24.000	16.000	7960	3902	1498.3
		20.00	3	400	0.191	30.000	20.000	6365	3656	2193.7
	Cast aluminium	3.00	3	320	0.026	4.500	3.000	33955	2601	35.1
		4.00	3	320	0.034	6.000	4.000	25465	2601	62.4
		5.00	3	320	0.043	7.500	5.000	20370	2600	97.5
		6.00	3	320	0.051	9.000	6.000	16975	2600	140.4
		8.00	3	320	0.068	12.000	8.000	12730	2600	249.6
		10.00	3	320	0.085	15.000	10.000	10185	2600	390.0
		12.00	3	320	0.102	18.000	12.000	8490	2601	561.8
		16.00	3	320	0.109	24.000	16.000	6365	2080	798.7
		20.00	3	320	0.128	30.000	20.000	5095	1951	1170.7

Cylindrical/Square end mills E-Cut Alu

Smooth-edged, normal version, short neck

Performance **P**

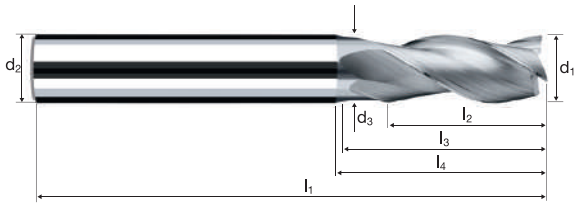
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HM MG10 | λ **34°** γ **24°**

90° | G 2.5

Vario



Roughing

Finishing

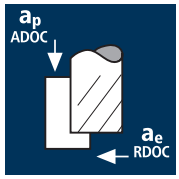
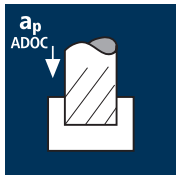
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating **8660** ø-Code **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	z	**8660**	**8560**
180	3.00	6.00	2.80	54	6.60	9.00	12.33	3	●	
220	4.00	6.00	3.70	54	9.00	12.00	14.54	3	●	
260	5.00	6.00	4.60	57	11.00	15.00	16.72	3	●	
300	6.00	6.00	5.50	57	13.50	18.00	19.85	3	●	
391	8.00	8.00	7.40	63	18.00	24.00	26.37	3	●	
450	10.00	10.00	9.20	74	22.00	30.00	33.01	3	●	
501	12.00	12.00	11.00	85	27.00	36.00	39.71	3	●	
610	16.00	16.00	15.00	102	36.00	48.00	52.27	3	●	
682	20.00	20.00	19.00	115	44.00	60.00	64.77	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	2	550	0.055	4.500	1.800	58355	6419	52.0
		4.00	2	550	0.075	6.000	2.400	43770	6566	94.5
		5.00	2	550	0.090	7.500	3.000	35015	6303	141.8
		6.00	2	550	0.120	9.000	3.600	29180	7003	226.9
		8.00	2	550	0.160	12.000	4.800	21885	7003	403.4
		10.00	2	550	0.200	15.000	6.000	17505	7002	630.2
		12.00	2	550	0.220	18.000	7.200	14590	6420	832.0
		16.00	2	550	0.245	24.000	9.600	10940	5361	1235.1
		20.00	2	550	0.285	30.000	12.000	8755	4990	1796.5
	Unalloyed copper	3.00	2	400	0.030	4.500	1.800	42440	2546	20.6
		4.00	2	400	0.060	6.000	2.400	31830	3820	55.0
		5.00	2	400	0.070	7.500	3.000	25465	3565	80.2
		6.00	2	400	0.095	9.000	3.600	21220	4032	130.6
		8.00	2	400	0.130	12.000	4.800	15915	4138	238.3
		10.00	2	400	0.160	15.000	6.000	12730	4074	366.6
		12.00	2	400	0.175	18.000	7.200	10610	3714	481.3
		16.00	2	400	0.195	24.000	9.600	7960	3104	715.3
		20.00	2	400	0.230	30.000	12.000	6365	2928	1054.0
	Thermoplastics	3.00	2	1000	0.035	4.500	1.800	60000	4200	34.0
		4.00	2	1000	0.075	6.000	2.400	60000	9000	129.6
		5.00	2	1000	0.090	7.500	3.000	60000	10800	243.0
		6.00	2	1000	0.120	9.000	3.600	53050	12732	412.5
		8.00	2	1000	0.160	12.000	4.800	39790	12733	733.4
		10.00	2	1000	0.200	15.000	6.000	31830	12732	1145.9
		12.00	2	1000	0.220	18.000	7.200	26525	11671	1512.6
		16.00	2	1000	0.245	24.000	9.600	19895	9749	2246.1
		20.00	2	1000	0.285	30.000	12.000	15915	9072	3265.8
	Cast aluminium	3.00	2	396	0.055	4.500	1.800	42015	4622	37.4
		4.00	2	440	0.075	6.000	2.400	35015	5252	75.6
		5.00	2	440	0.090	7.500	3.000	28010	5042	113.4
		6.00	2	440	0.120	9.000	3.600	23345	5603	181.5
		8.00	2	440	0.160	12.000	4.800	17505	5602	322.7
		10.00	2	440	0.200	15.000	6.000	14005	5602	504.2
		12.00	2	440	0.220	18.000	7.200	11670	5135	665.5
		16.00	2	440	0.245	24.000	9.600	8755	4290	988.4
		20.00	2	440	0.285	30.000	12.000	7005	3993	1437.4
	Wrought aluminium Construction aluminium	3.00	2	450	0.025	3.000	3.000	47745	2387	21.5
		4.00	2	450	0.055	4.000	4.000	35810	3939	63.0
		5.00	2	450	0.065	5.000	5.000	28650	3725	93.1
		6.00	2	450	0.085	6.000	6.000	23875	4059	146.1
		8.00	2	450	0.110	8.000	8.000	17905	3939	252.1
		10.00	2	450	0.140	10.000	10.000	14325	4011	401.1
		12.00	2	450	0.155	12.000	12.000	11935	3700	532.8
		16.00	2	450	0.170	16.000	16.000	8950	3043	779.0
		20.00	2	450	0.200	20.000	20.000	7160	2864	1145.6
	Unalloyed copper	3.00	2	350	0.020	3.000	3.000	37135	1485	13.4
		4.00	2	350	0.045	4.000	4.000	27850	2507	40.1
		5.00	2	350	0.050	5.000	5.000	22280	2228	55.7
		6.00	2	350	0.070	6.000	6.000	18570	2600	93.6
		8.00	2	350	0.090	8.000	8.000	13925	2507	160.4
		10.00	2	350	0.110	10.000	10.000	11140	2451	245.1
		12.00	2	350	0.125	12.000	12.000	9285	2321	334.3
		16.00	2	350	0.135	16.000	16.000	6965	1881	481.4
		20.00	2	350	0.160	20.000	20.000	5570	1782	713.0
	Thermoplastics	3.00	2	800	0.025	3.000	3.000	60000	3000	27.0
		4.00	2	800	0.055	4.000	4.000	60000	6600	105.6
		5.00	2	800	0.065	5.000	5.000	50930	6621	165.5
		6.00	2	800	0.085	6.000	6.000	42440	7215	259.7
		8.00	2	800	0.110	8.000	8.000	31830	7003	448.2
		10.00	2	800	0.140	10.000	10.000	25465	7130	713.0
		12.00	2	800	0.155	12.000	12.000	21220	6578	947.3
		16.00	2	800	0.170	16.000	16.000	15915	5411	1385.2
		20.00	2	800	0.200	20.000	20.000	12730	5092	2036.8
	Cast aluminium	3.00	2	360	0.025	3.000	3.000	38195	1910	17.2
		4.00	2	360	0.055	4.000	4.000	28650	3152	50.4
		5.00	2	360	0.065	5.000	5.000	22920	2980	74.5
		6.00	2	360	0.085	6.000	6.000	19100	3247	116.9
		8.00	2	360	0.110	8.000	8.000	14325	3152	201.7
		10.00	2	360	0.140	10.000	10.000	11460	3209	320.9
		12.00	2	360	0.155	12.000	12.000	9550	2961	426.3
		16.00	2	360	0.170	16.000	16.000	7160	2434	623.2
		20.00	2	360	0.200	20.000	20.000	5730	2292	916.8

Cylindrical/Square end mills AX

Smooth-edged, normal version, short neck

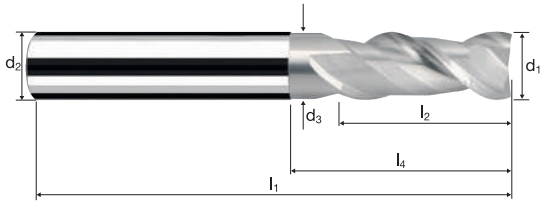
X-Generation

HM
MG10

λ **40°**
γ **20°**

90°

Vario



Roughing

Finishing

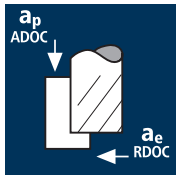
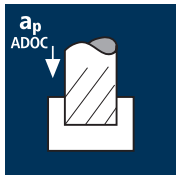
ReTool®

III

Rm <850 HRC <24			Al Aluminium >99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating **C** Article-N°. **15620** ø-Code **140**

									CELERO
								15620	C15620
								15520	C15520
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z		
140	2.00	6.00	1.90	57	7.00	10.00	18.31	2	●	●
180	3.00	6.00	2.80	57	8.00	14.00	20.63	2	●	●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	2	●	●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	2	●	●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	2	●	●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	2	●	●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	2	●	●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	2	●	●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	2	●	●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	2	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	2	650	0.065	9.000	3.300	34485	4483	133.1
		8.00	2	650	0.090	12.000	4.400	25865	4656	245.8
		10.00	2	650	0.110	15.000	5.500	20690	4552	375.5
		12.00	2	650	0.120	18.000	6.600	17240	4138	491.5
		16.00	2	650	0.135	24.000	8.800	12930	3491	737.3
		20.00	2	650	0.155	30.000	11.000	10345	3207	1058.3
	Unalloyed copper	6.00	2	500	0.050	9.000	3.300	26525	2653	78.8
		8.00	2	500	0.070	12.000	4.400	19895	2785	147.1
		10.00	2	500	0.090	15.000	5.500	15915	2865	236.3
		12.00	2	500	0.095	18.000	6.600	13265	2520	299.4
		16.00	2	500	0.105	24.000	8.800	9945	2089	441.1
		20.00	2	500	0.125	30.000	11.000	7960	1990	656.7
	Thermoplastics	6.00	2	1200	0.065	9.000	3.300	60000	7800	231.7
		8.00	2	1200	0.090	12.000	4.400	47745	8594	453.8
		10.00	2	1200	0.110	15.000	5.500	38195	8403	693.2
		12.00	2	1200	0.120	18.000	6.600	31830	7639	907.5
		16.00	2	1200	0.135	24.000	8.800	23875	6446	1361.5
		20.00	2	1200	0.155	30.000	11.000	19100	5921	1953.9
	Cast aluminium	6.00	2	520	0.065	9.000	3.300	27585	3586	106.5
		8.00	2	520	0.090	12.000	4.400	20690	3724	196.6
		10.00	2	520	0.110	15.000	5.500	16550	3641	300.4
		12.00	2	520	0.120	18.000	6.600	13795	3311	393.3
		16.00	2	520	0.135	24.000	8.800	10345	2793	589.9
		20.00	2	520	0.155	30.000	11.000	8275	2565	846.5
	Wrought aluminium Construction aluminium	6.00	2	550	0.045	5.400	6.000	29180	2626	85.1
		8.00	2	550	0.060	7.200	8.000	21885	2626	151.3
		10.00	2	550	0.075	9.000	10.000	17505	2626	236.3
		12.00	2	550	0.085	10.800	12.000	14590	2480	321.4
		16.00	2	550	0.095	14.400	16.000	10940	2079	478.9
		20.00	2	550	0.110	18.000	20.000	8755	1926	693.4
	Unalloyed copper	6.00	2	450	0.040	5.400	6.000	23875	1910	61.9
		8.00	2	450	0.050	7.200	8.000	17905	1791	103.1
		10.00	2	450	0.060	9.000	10.000	14325	1719	154.7
		12.00	2	450	0.070	10.800	12.000	11935	1671	216.5
		16.00	2	450	0.075	14.400	16.000	8950	1343	309.3
		20.00	2	450	0.090	18.000	20.000	7160	1289	464.0
	Thermoplastics	6.00	2	1000	0.045	5.400	6.000	53050	4775	154.7
		8.00	2	1000	0.060	7.200	8.000	39790	4775	275.0
		10.00	2	1000	0.075	9.000	10.000	31830	4775	429.7
		12.00	2	1000	0.085	10.800	12.000	26525	4509	584.4
		16.00	2	1000	0.095	14.400	16.000	19895	3780	870.9
		20.00	2	1000	0.110	18.000	20.000	15915	3501	1260.5
	Cast aluminium	6.00	2	440	0.045	5.400	6.000	23345	2101	68.1
		8.00	2	440	0.060	7.200	8.000	17505	2101	121.0
		10.00	2	440	0.075	9.000	10.000	14005	2101	189.1
		12.00	2	440	0.085	10.800	12.000	11670	1984	257.1
		16.00	2	440	0.095	14.400	16.000	8755	1664	383.3
		20.00	2	440	0.110	18.000	20.000	7005	1541	554.8

Cylindrical/Square end mills AX

Smooth-edged, normal version, short neck
Integral cooling channel

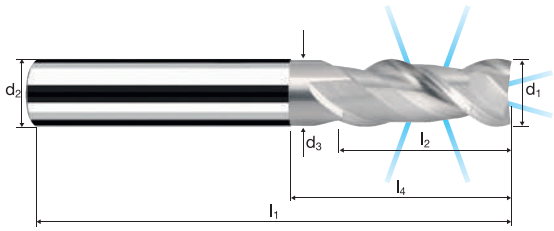
X-Generation

HM
MG10

λ **40°**
γ **20°**

90°

Vario



Roughing

Finishing

ReTool®

III

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

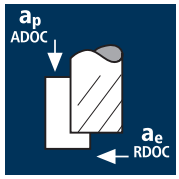
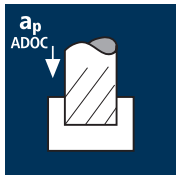
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15625** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z	15625	CELERO C15625
									15525	C15525
300	6.00	6.00	5.50	57	13.00	19.34	20.00	2	●	●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	2	●	●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	2	●	●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	2	●	●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	2	●	●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	2	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	1.00	2	132	0.020	1.500	0.650	42000	1680	1.6
		2.00	2	264	0.040	3.000	1.300	42000	3360	13.1
		3.00	2	396	0.060	4.500	1.950	42000	5040	44.2
		4.00	2	500	0.080	6.000	2.600	39790	6366	99.3
		5.00	2	500	0.100	7.500	3.250	31830	6366	155.2
		6.00	2	500	0.120	9.000	3.900	26525	6366	223.4
		8.00	2	500	0.160	12.000	5.200	19895	6366	397.3
		10.00	2	500	0.200	15.000	6.500	15915	6366	620.7
	Unalloyed copper	1.00	2	132	0.014	1.500	0.650	42000	1176	1.1
		2.00	2	264	0.028	3.000	1.300	42000	2352	9.2
		3.00	2	350	0.042	4.500	1.950	37135	3119	27.4
		4.00	2	350	0.056	6.000	2.600	27850	3119	48.7
		5.00	2	350	0.070	7.500	3.250	22280	3119	76.0
		6.00	2	350	0.084	9.000	3.900	18570	3120	109.5
		8.00	2	350	0.112	12.000	5.200	13925	3119	194.6
		10.00	2	350	0.140	15.000	6.500	11140	3119	304.1
	Thermoplastics	1.00	2	132	0.024	1.500	0.650	42000	2016	2.0
		2.00	2	264	0.048	3.000	1.300	42000	4032	15.7
		3.00	2	396	0.072	4.500	1.950	42000	6048	53.1
		4.00	2	500	0.096	6.000	2.600	39790	7640	119.2
		5.00	2	500	0.120	7.500	3.250	31830	7639	186.2
		6.00	2	500	0.144	9.000	3.900	26525	7639	268.1
		8.00	2	500	0.192	12.000	5.200	19895	7640	476.7
		10.00	2	500	0.240	15.000	6.500	15915	7639	744.8
	Cast aluminium	1.00	2	132	0.020	1.500	0.650	42000	1680	1.6
		2.00	2	264	0.040	3.000	1.300	42000	3360	13.1
		3.00	2	396	0.060	4.500	1.950	42000	5040	44.2
		4.00	2	400	0.080	6.000	2.600	31830	5093	79.4
		5.00	2	400	0.100	7.500	3.250	25465	5093	124.1
		6.00	2	400	0.120	9.000	3.900	21220	5093	178.8
		8.00	2	400	0.160	12.000	5.200	15915	5093	317.8
		10.00	2	400	0.200	15.000	6.500	12730	5092	496.5
	Wrought aluminium Construction aluminium	1.00	2	132	0.016	1.500	1.000	42000	1344	2.0
		2.00	2	264	0.032	3.000	2.000	42000	2688	16.1
		3.00	2	396	0.048	4.500	3.000	42000	4032	54.4
		4.00	2	425	0.064	6.000	4.000	33820	4329	103.9
		5.00	2	425	0.080	7.500	5.000	27055	4329	162.3
		6.00	2	425	0.096	9.000	6.000	22545	4329	233.7
		8.00	2	425	0.128	12.000	8.000	16910	4329	415.6
		10.00	2	425	0.160	15.000	10.000	13530	4330	649.4
	Unalloyed copper	1.00	2	132	0.011	1.500	1.000	42000	941	1.4
		2.00	2	264	0.022	3.000	2.000	42000	1882	11.3
		3.00	2	300	0.034	4.500	3.000	31830	2139	28.9
		4.00	2	300	0.045	6.000	4.000	23875	2139	51.3
		5.00	2	300	0.056	7.500	5.000	19100	2139	80.2
		6.00	2	300	0.067	9.000	6.000	15915	2139	115.5
		8.00	2	300	0.090	12.000	8.000	11935	2139	205.3
		10.00	2	300	0.112	15.000	10.000	9550	2139	320.9
	Thermoplastics	1.00	2	132	0.019	1.500	1.000	42000	1613	2.4
		2.00	2	264	0.038	3.000	2.000	42000	3226	19.4
		3.00	2	396	0.058	4.500	3.000	42000	4838	65.3
		4.00	2	425	0.077	6.000	4.000	33820	5195	124.7
		5.00	2	425	0.096	7.500	5.000	27055	5195	194.8
		6.00	2	425	0.115	9.000	6.000	22545	5194	280.5
		8.00	2	425	0.154	12.000	8.000	16910	5195	498.7
		10.00	2	425	0.192	15.000	10.000	13530	5196	779.3
	Cast aluminium	1.00	2	132	0.016	1.500	1.000	42000	1344	2.0
		2.00	2	264	0.032	3.000	2.000	42000	2688	16.1
		3.00	2	396	0.048	4.500	3.000	42000	4032	54.4
		4.00	2	340	0.064	6.000	4.000	27055	3463	83.1
		5.00	2	340	0.080	7.500	5.000	21645	3463	129.9
		6.00	2	340	0.096	9.000	6.000	18040	3464	187.0
		8.00	2	340	0.128	12.000	8.000	13530	3464	332.5
		10.00	2	340	0.160	15.000	10.000	10825	3464	519.6

Cylindrical/Square end mills E-Cut Alu

Smooth-edged, normal version, short neck

Performance **P**

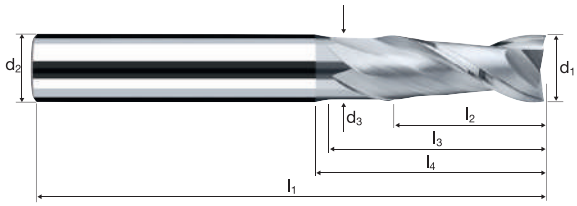
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HM MG10 | λ **34°** γ **24°**

90° | G 2.5

Vario



Roughing

Finishing

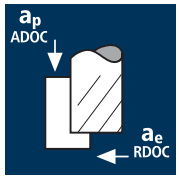
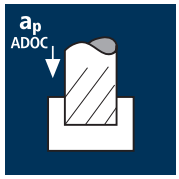
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8661** | ø-Code **100**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	z	**8661**	**8561**
100	1.00	6.00	0.95	50	2.20	3.00	8.41	2	●	
140	2.00	6.00	1.90	51	4.40	6.00	10.18	2	●	
180	3.00	6.00	2.80	54	6.60	9.00	12.33	2	●	
220	4.00	6.00	3.70	54	9.00	12.00	14.54	2	●	
260	5.00	6.00	4.60	57	11.00	15.00	16.72	2	●	
300	6.00	6.00	5.50	57	13.50	18.00	19.85	2	●	
391	8.00	8.00	7.40	63	18.00	24.00	26.37	2	●	
450	10.00	10.00	9.20	74	22.00	30.00	33.01	2	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	550	0.045	4.500	0.900	58355	7878	31.9
		4.00	3	550	0.060	6.000	1.200	43770	7879	56.7
		5.00	3	550	0.075	7.500	1.500	35015	7878	88.6
		6.00	3	550	0.100	9.000	1.800	29180	8754	141.8
		8.00	3	550	0.120	12.000	2.400	21885	7879	226.9
		10.00	3	550	0.150	15.000	3.000	17505	7877	354.5
		12.00	3	550	0.180	18.000	3.600	14590	7879	510.5
		16.00	3	550	0.190	24.000	4.800	10940	6236	718.4
		20.00	3	550	0.225	30.000	6.000	8755	5910	1063.7
	Unalloyed copper	3.00	3	400	0.035	4.500	0.900	42440	4456	18.0
		4.00	3	400	0.050	6.000	1.200	31830	4775	34.4
		5.00	3	400	0.060	7.500	1.500	25465	4584	51.6
		6.00	3	400	0.080	9.000	1.800	21220	5093	82.5
		8.00	3	400	0.095	12.000	2.400	15915	4536	130.6
		10.00	3	400	0.120	15.000	3.000	12730	4583	206.2
		12.00	3	400	0.145	18.000	3.600	10610	4615	299.1
		16.00	3	400	0.150	24.000	4.800	7960	3582	412.6
		20.00	3	400	0.180	30.000	6.000	6365	3437	618.7
	Thermoplastics	3.00	3	1000	0.045	4.500	0.900	60000	8100	32.8
		4.00	3	1000	0.060	6.000	1.200	60000	10800	77.8
		5.00	3	1000	0.075	7.500	1.500	60000	13500	151.9
		6.00	3	1000	0.100	9.000	1.800	53050	15915	257.8
		8.00	3	1000	0.120	12.000	2.400	39790	14324	412.5
		10.00	3	1000	0.150	15.000	3.000	31830	14324	644.6
		12.00	3	1000	0.180	18.000	3.600	26525	14324	928.2
		16.00	3	1000	0.190	24.000	4.800	19895	11340	1306.4
		20.00	3	1000	0.225	30.000	6.000	15915	10743	1933.7
	Cast aluminium	3.00	3	396	0.045	4.500	0.900	42015	5672	23.0
		4.00	3	440	0.060	6.000	1.200	35015	6303	45.4
		5.00	3	440	0.075	7.500	1.500	28010	6302	70.9
		6.00	3	440	0.100	9.000	1.800	23345	7004	113.5
		8.00	3	440	0.120	12.000	2.400	17505	6302	181.5
		10.00	3	440	0.150	15.000	3.000	14005	6302	283.6
		12.00	3	440	0.180	18.000	3.600	11670	6302	408.4
		16.00	3	440	0.190	24.000	4.800	8755	4990	574.9
		20.00	3	440	0.225	30.000	6.000	7005	4728	851.1
	Wrought aluminium Construction aluminium	3.00	3	450	0.030	1.350	3.000	47745	4297	17.4
		4.00	3	450	0.040	1.800	4.000	35810	4297	30.9
		5.00	3	450	0.055	2.250	5.000	28650	4727	53.2
		6.00	3	450	0.070	2.700	6.000	23875	5014	81.2
		8.00	3	450	0.085	3.600	8.000	17905	4566	131.5
		10.00	3	450	0.105	4.500	10.000	14325	4512	203.1
		12.00	3	450	0.125	5.400	12.000	11935	4476	290.0
		16.00	3	450	0.135	7.200	16.000	8950	3625	417.6
		20.00	3	450	0.160	9.000	20.000	7160	3437	618.6
	Unalloyed copper	3.00	3	350	0.025	1.350	3.000	37135	2785	11.3
		4.00	3	350	0.030	1.800	4.000	27850	2507	18.0
		5.00	3	350	0.045	2.250	5.000	22280	3008	33.8
		6.00	3	350	0.055	2.700	6.000	18570	3064	49.6
		8.00	3	350	0.070	3.600	8.000	13925	2924	84.2
		10.00	3	350	0.085	4.500	10.000	11140	2841	127.8
		12.00	3	350	0.100	5.400	12.000	9285	2786	180.5
		16.00	3	350	0.110	7.200	16.000	6965	2299	264.8
		20.00	3	350	0.130	9.000	20.000	5570	2172	391.0
	Thermoplastics	3.00	3	800	0.030	1.350	3.000	60000	5400	21.9
		4.00	3	800	0.040	1.800	4.000	60000	7200	51.8
		5.00	3	800	0.055	2.250	5.000	50930	8404	94.5
		6.00	3	800	0.070	2.700	6.000	42440	8912	144.4
		8.00	3	800	0.085	3.600	8.000	31830	8117	233.8
		10.00	3	800	0.105	4.500	10.000	25465	8022	361.0
		12.00	3	800	0.125	5.400	12.000	21220	7958	515.6
		16.00	3	800	0.135	7.200	16.000	15915	6446	742.5
		20.00	3	800	0.160	9.000	20.000	12730	6110	1099.9
	Cast aluminium	3.00	3	360	0.030	1.350	3.000	38195	3438	13.9
		4.00	3	360	0.040	1.800	4.000	28650	3438	24.8
		5.00	3	360	0.055	2.250	5.000	22920	3782	42.5
		6.00	3	360	0.070	2.700	6.000	19100	4011	65.0
		8.00	3	360	0.085	3.600	8.000	14325	3653	105.2
		10.00	3	360	0.105	4.500	10.000	11460	3610	162.4
		12.00	3	360	0.125	5.400	12.000	9550	3581	232.1
		16.00	3	360	0.135	7.200	16.000	7160	2900	334.1
		20.00	3	360	0.160	9.000	20.000	5730	2750	495.1

Cylindrical/Square end mills AX

Smooth-edged, medium version, neck

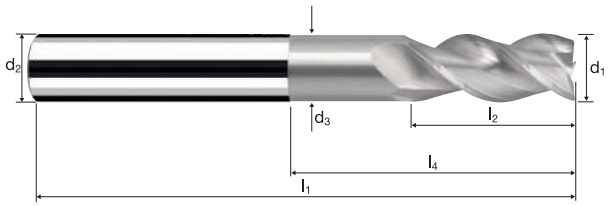
X-Generation

HM
MG10

λ 40°
γ 20°

90°

Vario



Roughing

Finishing

ReTool®

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

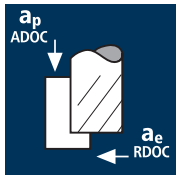
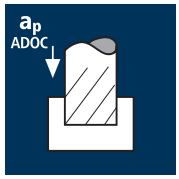
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15657** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z	15657	CELERO C15657
									15557	C15557
180	3.00	6.00	2.80	63	8.00	20.00	26.63	3	●	●
220	4.00	6.00	3.70	63	11.00	22.00	26.95	3	●	●
260	5.00	6.00	4.60	63	13.00	24.00	27.27	3	●	●
300	6.00	6.00	5.50	63	13.00	25.34	26.00	3	●	●
391	8.00	8.00	7.40	72	19.00	34.29	35.00	3	●	●
450	10.00	10.00	9.20	84	22.00	42.20	43.00	3	●	●
501	12.00	12.00	11.00	97	26.00	50.13	51.00	3	●	●
610	16.00	16.00	15.00	108	32.00	58.13	59.00	3	●	●
682	20.00	20.00	19.00	122	38.00	70.13	71.00	3	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	550	0.035	7.500	0.600	58355	6127	27.6
		4.00	3	550	0.045	10.000	0.800	43770	5909	47.3
		5.00	3	550	0.060	12.500	1.000	35015	6303	78.8
		6.00	3	550	0.075	15.000	1.200	29180	6566	118.2
		8.00	3	550	0.095	20.000	1.600	21885	6237	199.6
		10.00	3	550	0.115	25.000	2.000	17505	6039	302.0
		12.00	3	550	0.140	30.000	2.400	14590	6128	441.2
		16.00	3	550	0.150	40.000	3.200	10940	4923	630.1
		20.00	3	550	0.175	50.000	4.000	8755	4596	919.3
	Unalloyed copper	3.00	3	400	0.030	7.500	0.600	42440	3820	17.2
		4.00	3	400	0.035	10.000	0.800	31830	3342	26.7
		5.00	3	400	0.050	12.500	1.000	25465	3820	47.7
		6.00	3	400	0.060	15.000	1.200	21220	3820	68.8
		8.00	3	400	0.075	20.000	1.600	15915	3581	114.6
		10.00	3	400	0.090	25.000	2.000	12730	3437	171.9
		12.00	3	400	0.110	30.000	2.400	10610	3501	252.1
		16.00	3	400	0.120	40.000	3.200	7960	2866	366.8
		20.00	3	400	0.140	50.000	4.000	6365	2673	534.7
	Thermoplastics	3.00	3	1000	0.035	7.500	0.600	60000	6300	28.4
		4.00	3	1000	0.045	10.000	0.800	60000	8100	64.8
		5.00	3	1000	0.060	12.500	1.000	60000	10800	135.0
		6.00	3	1000	0.075	15.000	1.200	53050	11936	214.9
		8.00	3	1000	0.095	20.000	1.600	39790	11340	362.9
		10.00	3	1000	0.115	25.000	2.000	31830	10981	549.1
		12.00	3	1000	0.140	30.000	2.400	26525	11141	802.1
		16.00	3	1000	0.150	40.000	3.200	19895	8953	1146.0
		20.00	3	1000	0.175	50.000	4.000	15915	8355	1671.1
	Cast aluminium	3.00	3	396	0.035	7.500	0.600	42015	4412	19.9
		4.00	3	440	0.045	10.000	0.800	35015	4727	37.8
		5.00	3	440	0.060	12.500	1.000	28010	5042	63.0
		6.00	3	440	0.075	15.000	1.200	23345	5253	94.5
		8.00	3	440	0.095	20.000	1.600	17505	4989	159.6
		10.00	3	440	0.115	25.000	2.000	14005	4832	241.6
		12.00	3	440	0.140	30.000	2.400	11670	4901	352.9
		16.00	3	440	0.150	40.000	3.200	8755	3940	504.3
		20.00	3	440	0.175	50.000	4.000	7005	3678	735.5
	Wrought aluminium Construction aluminium	3.00	3	450	0.025	1.200	3.000	47745	3581	12.9
		4.00	3	450	0.030	1.600	4.000	35810	3223	20.6
		5.00	3	450	0.040	2.000	5.000	28650	3438	34.4
		6.00	3	450	0.055	2.400	6.000	23875	3939	56.7
		8.00	3	450	0.065	3.200	8.000	17905	3492	89.4
		10.00	3	450	0.080	4.000	10.000	14325	3438	137.5
		12.00	3	450	0.100	4.800	12.000	11935	3581	206.2
		16.00	3	450	0.105	6.400	16.000	8950	2819	288.7
		20.00	3	450	0.125	8.000	20.000	7160	2685	429.6
	Unalloyed copper	3.00	3	350	0.020	1.200	3.000	37135	2228	8.0
		4.00	3	350	0.025	1.600	4.000	27850	2089	13.4
		5.00	3	350	0.030	2.000	5.000	22280	2005	20.1
		6.00	3	350	0.045	2.400	6.000	18570	2507	36.1
		8.00	3	350	0.050	3.200	8.000	13925	2089	53.5
		10.00	3	350	0.065	4.000	10.000	11140	2172	86.9
		12.00	3	350	0.080	4.800	12.000	9285	2228	128.4
		16.00	3	350	0.085	6.400	16.000	6965	1776	181.9
		20.00	3	350	0.100	8.000	20.000	5570	1671	267.4
	Thermoplastics	3.00	3	800	0.025	1.200	3.000	60000	4500	16.2
		4.00	3	800	0.030	1.600	4.000	60000	5400	34.6
		5.00	3	800	0.040	2.000	5.000	50930	6112	61.1
		6.00	3	800	0.055	2.400	6.000	42440	7003	100.8
		8.00	3	800	0.065	3.200	8.000	31830	6207	158.9
		10.00	3	800	0.080	4.000	10.000	25465	6112	244.5
		12.00	3	800	0.100	4.800	12.000	21220	6366	366.7
		16.00	3	800	0.105	6.400	16.000	15915	5013	513.4
		20.00	3	800	0.125	8.000	20.000	12730	4774	763.8
	Cast aluminium	3.00	3	360	0.025	1.200	3.000	38195	2865	10.3
		4.00	3	360	0.030	1.600	4.000	28650	2579	16.5
		5.00	3	360	0.040	2.000	5.000	22920	2750	27.5
		6.00	3	360	0.055	2.400	6.000	19100	3152	45.4
		8.00	3	360	0.065	3.200	8.000	14325	2793	71.5
		10.00	3	360	0.080	4.000	10.000	11460	2750	110.0
		12.00	3	360	0.100	4.800	12.000	9550	2865	165.0
		16.00	3	360	0.105	6.400	16.000	7160	2255	231.0
		20.00	3	360	0.125	8.000	20.000	5730	2149	343.8

Cylindrical/Square end mills AX

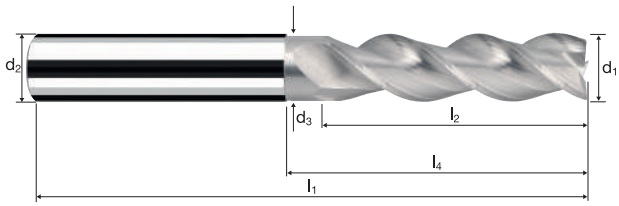
Smooth-edged, medium version, short neck

X-Generation

HM MG10	λ 40° γ 20°

90°

Vario



Roughing

Finishing

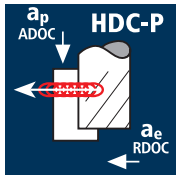
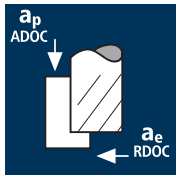
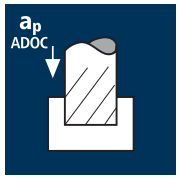
ReTool®

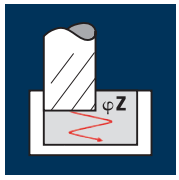
III

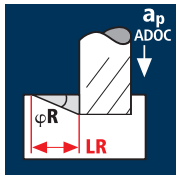
Rm <850 HRC <24			Al Aluminium >99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

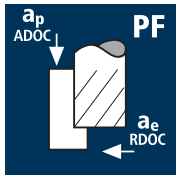
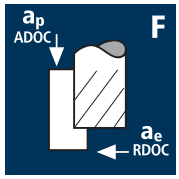
Example: **Order-N°.** Coating **C** Article-N°. **15660** ø-Code **180**

									CELERO
								15660	C15660
								15560	C15560
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z		
180	3.00	6.00	2.80	63	14.00	20.00	26.63	3	●	●
220	4.00	6.00	3.70	63	17.00	22.00	26.95	3	●	●
260	5.00	6.00	4.60	63	19.00	24.00	27.27	3	●	●
300	6.00	6.00	5.50	63	19.00	25.34	26.00	3	●	●
391	8.00	8.00	7.40	72	28.00	34.29	35.00	3	●	●
450	10.00	10.00	9.20	84	34.00	42.20	43.00	3	●	●
501	12.00	12.00	11.00	97	40.00	50.13	51.00	3	●	●
610	16.00	16.00	15.00	108	48.00	58.13	59.00	3	●	●
682	20.00	20.00	19.00	122	56.00	70.13	71.00	3	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	4.00	4	521	0.042	15.000	1.000	41460	6965	104.5
		5.00	4	521	0.057	18.500	1.250	33170	7563	174.9
		6.00	4	521	0.071	22.500	1.500	27640	7850	264.9
		8.00	4	521	0.101	30.000	2.000	20730	8375	502.5
		10.00	4	521	0.132	37.000	2.500	16585	8757	810.0
		12.00	4	521	0.159	45.000	3.000	13820	8790	1186.7
		16.00	4	521	0.169	60.000	4.000	10365	7007	1681.7
		20.00	4	521	0.198	74.000	5.000	8290	6566	2429.4
	Wrought aluminium Construction aluminium	4.00	4	523	0.047	6.000	1.600	41620	7825	75.1
		5.00	4	523	0.059	7.500	2.000	33295	7858	117.9
		6.00	4	523	0.071	9.000	2.400	27745	7880	170.2
		8.00	4	570	0.094	12.000	3.200	22680	8528	327.5
		10.00	4	570	0.118	15.000	4.000	18145	8564	513.8
		12.00	4	570	0.141	18.000	4.800	15120	8528	736.8
		16.00	4	570	0.188	24.000	5.200	11340	8528	1064.3
		20.00	4	570	0.221	30.000	6.500	9070	8018	1563.5
	Wrought aluminium Construction aluminium	4.00	4	295	0.024	6.000	4.000	23475	2254	54.1
		5.00	4	295	0.030	7.500	5.000	18780	2254	84.5
		6.00	4	328	0.036	9.000	6.000	17400	2506	135.3
		8.00	4	328	0.059	12.000	8.000	13050	3080	295.7
		10.00	4	328	0.074	15.000	10.000	10440	3090	463.5
		12.00	4	328	0.088	18.000	12.000	8700	3062	661.4
		16.00	4	328	0.117	16.000	16.000	6525	3054	781.8
		20.00	4	328	0.138	20.000	20.000	5220	2881	1152.4

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
	Wrought aluminium Construction aluminium	4.00	4	523	0.047	15.000	3.600	41620	7825	10.0°
		5.00	4	523	0.059	18.500	4.500	33295	7858	10.0°
		6.00	4	523	0.071	22.500	5.400	27745	7880	10.0°
		8.00	4	570	0.094	30.000	7.200	22680	8528	10.0°
		10.00	4	570	0.118	37.000	9.000	18145	8564	10.0°
		12.00	4	570	0.141	45.000	10.800	15120	8528	10.0°
		16.00	4	570	0.188	60.000	14.400	11340	8528	10.0°
		20.00	4	570	0.221	74.000	18.000	9070	8018	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φR [°]
	Wrought aluminium Construction aluminium	4.00	4	295	0.024	6.000	4.000	23475	2254	10.0°
		5.00	4	295	0.030	7.500	5.000	18780	2254	10.0°
		6.00	4	328	0.036	9.000	6.000	17400	2506	10.0°
		8.00	4	328	0.059	12.000	8.000	13050	3080	10.0°
		10.00	4	328	0.074	15.000	10.000	10440	3090	10.0°
		12.00	4	328	0.088	18.000	12.000	8700	3062	10.0°
		16.00	4	328	0.117	16.000	16.000	6525	3054	10.0°
		20.00	4	328	0.138	20.000	20.000	5220	2881	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Wrought aluminium Construction aluminium	4.00	4	426	0.046	15.000	0.100	33900	6238
		5.00	4	426	0.051	18.500	0.160	27120	5532
		6.00	4	426	0.056	22.500	0.160	22600	5062
		8.00	4	426	0.065	30.000	0.200	16950	4407
		10.00	4	426	0.073	37.000	0.200	13560	3960
		12.00	4	426	0.080	45.000	0.240	11300	3616
		16.00	4	426	0.092	60.000	0.240	8475	3119
		20.00	4	426	0.103	74.000	0.300	6780	2793
	Wrought aluminium Construction aluminium	4.00	4	473	0.030	15.000	0.060	37640	4517
		5.00	4	473	0.034	18.500	0.100	30110	4095
		6.00	4	473	0.037	22.500	0.100	25095	3714
		8.00	4	473	0.043	30.000	0.140	18820	3237
		10.00	4	473	0.048	37.000	0.140	15055	2891
		12.00	4	473	0.053	45.000	0.170	12545	2660
		16.00	4	473	0.061	60.000	0.170	9410	2296
		20.00	4	473	0.068	74.000	0.200	7530	2048

Cylindrical/Square end mills MFC Alu

Smooth-edged, chip breaker, medium version, short neck
High-performance penetration edge, central air/cooling channel

Performance **P**

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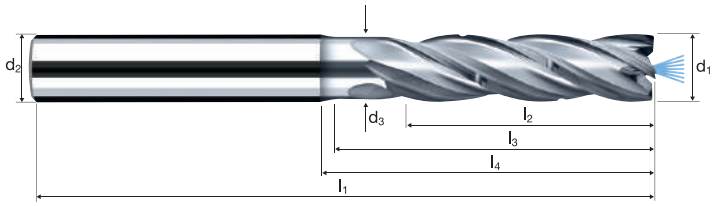
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HM
MG10

λ **30°**
γ **20°**

r

G 2.5



Roughing HPC

Roughing HDC

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

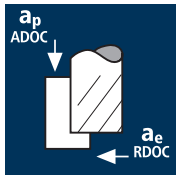
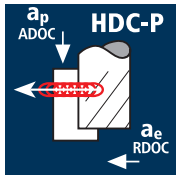
Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **8675** ø-Code **220**

	Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	8675	8575
new!	**220***	4.00	6.00	3.70	60	15.00	18.00	20.54	0.050	4	●	
new!	**260**	5.00	6.00	4.60	63	18.50	22.50	24.22	0.100	4	●	
	300	6.00	6.00	5.50	65	22.50	27.00	28.85	0.100	4	●	
	391	8.00	8.00	7.40	76	30.00	36.00	38.37	0.150	4	●	
	450	10.00	10.00	9.20	90	37.00	45.00	48.01	0.200	4	●	
	501	12.00	12.00	11.00	105	45.00	54.00	57.71	0.200	4	●	
	610	16.00	16.00	15.00	125	60.00	72.00	76.27	0.200	4	●	
	682	20.00	20.00	19.00	145	74.00	90.00	94.77	0.250	4	●	

* without chip breaker

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	396	0.042	4.500	1.350	42000	5292	32.1
		4.00	3	475	0.056	6.000	1.800	37800	6350	68.6
		5.00	3	475	0.070	7.500	2.250	30240	6350	107.2
		6.00	3	475	0.084	9.000	2.700	25200	6350	154.3
		8.00	3	475	0.112	12.000	3.600	18900	6350	274.3
		10.00	3	475	0.140	15.000	4.500	15120	6350	428.7
		12.00	3	475	0.168	18.000	5.400	12600	6350	617.3
		16.00	3	475	0.179	24.000	7.200	9450	5080	877.9
		20.00	3	475	0.210	30.000	9.000	7560	4763	1286.0
	Unalloyed copper	3.00	3	355	0.032	4.500	1.350	37665	3559	21.6
		4.00	3	355	0.042	6.000	1.800	28250	3560	38.4
		5.00	3	355	0.053	7.500	2.250	22600	3560	60.1
		6.00	3	355	0.063	9.000	2.700	18835	3560	86.5
		8.00	3	355	0.084	12.000	3.600	14125	3560	153.8
		10.00	3	355	0.105	15.000	4.500	11300	3560	240.3
		12.00	3	355	0.126	18.000	5.400	9415	3559	345.9
		16.00	3	355	0.134	24.000	7.200	7065	2849	492.2
		20.00	3	355	0.158	30.000	9.000	5650	2670	720.8
	Thermoplastics	3.00	3	396	0.050	4.500	1.350	42000	6350	38.6
		4.00	3	475	0.067	6.000	1.800	37800	7621	82.3
		5.00	3	475	0.084	7.500	2.250	30240	7621	128.6
		6.00	3	475	0.101	9.000	2.700	25200	7621	185.2
		8.00	3	475	0.134	12.000	3.600	18900	7621	329.2
		10.00	3	475	0.168	15.000	4.500	15120	7621	514.4
		12.00	3	475	0.202	18.000	5.400	12600	7621	740.7
		16.00	3	475	0.215	24.000	7.200	9450	6096	1053.5
		20.00	3	475	0.252	30.000	9.000	7560	5715	1543.2
	Cast aluminium	3.00	3	380	0.042	4.500	1.350	40320	5080	30.9
		4.00	3	380	0.056	6.000	1.800	30240	5080	54.9
		5.00	3	380	0.070	7.500	2.250	24190	5080	85.7
		6.00	3	380	0.084	9.000	2.700	20160	5080	123.5
		8.00	3	380	0.112	12.000	3.600	15120	5080	219.5
		10.00	3	380	0.140	15.000	4.500	12095	5080	342.9
		12.00	3	380	0.168	18.000	5.400	10080	5080	493.8
		16.00	3	380	0.179	24.000	7.200	7560	4064	702.3
		20.00	3	380	0.210	30.000	9.000	6050	3812	1029.1
	Wrought aluminium Construction aluminium	3.00	3	375	0.052	11.100	0.750	39790	6207	51.7
		4.00	3	375	0.070	15.000	1.000	29840	6266	94.0
		5.00	3	375	0.087	18.500	1.250	23875	6231	144.1
		6.00	3	375	0.104	22.500	1.500	19895	6207	209.5
		8.00	3	375	0.139	30.000	2.000	14920	6222	373.3
		10.00	3	375	0.174	37.000	2.500	11935	6230	576.3
		12.00	3	375	0.209	45.000	3.000	9945	6236	841.8
		16.00	3	375	0.222	60.000	4.000	7460	4968	1192.4
		20.00	3	375	0.261	74.000	5.000	5970	4675	1729.6
	Unalloyed copper	3.00	3	284	0.039	11.100	0.750	30135	3526	29.4
		4.00	3	284	0.052	15.000	1.000	22600	3526	52.9
		5.00	3	284	0.065	18.500	1.250	18080	3526	81.5
		6.00	3	284	0.078	22.500	1.500	15065	3525	119.0
		8.00	3	284	0.104	30.000	2.000	11300	3526	211.5
		10.00	3	284	0.130	37.000	2.500	9040	3526	326.1
		12.00	3	284	0.156	45.000	3.000	7535	3526	476.1
		16.00	3	284	0.166	60.000	4.000	5650	2814	675.3
		20.00	3	284	0.195	74.000	5.000	4520	2644	978.4
	Thermoplastics	3.00	3	375	0.062	11.100	0.750	39790	7401	61.6
		4.00	3	375	0.083	15.000	1.000	29840	7430	111.5
		5.00	3	375	0.104	18.500	1.250	23875	7449	172.3
		6.00	3	375	0.125	22.500	1.500	19895	7461	251.8
		8.00	3	375	0.166	30.000	2.000	14920	7430	445.8
		10.00	3	375	0.208	37.000	2.500	11935	7447	688.9
		12.00	3	375	0.249	45.000	3.000	9945	7429	1002.9
		16.00	3	375	0.266	60.000	4.000	7460	5953	1428.7
		20.00	3	375	0.311	74.000	5.000	5970	5570	2060.9
	Cast aluminium	3.00	3	301	0.052	11.100	0.750	31935	4982	41.5
		4.00	3	301	0.070	15.000	1.000	23955	5031	75.5
		5.00	3	301	0.087	18.500	1.250	19160	5001	115.6
		6.00	3	301	0.104	22.500	1.500	15970	4983	168.2
		8.00	3	301	0.139	30.000	2.000	11975	4994	299.6
		10.00	3	301	0.174	37.000	2.500	9580	5001	462.6
		12.00	3	301	0.209	45.000	3.000	7985	5007	675.9
		16.00	3	301	0.222	60.000	4.000	5990	3989	957.4
		20.00	3	301	0.261	74.000	5.000	4790	3751	1387.7

Cylindrical/Square end mills E-Cut Alu

Smooth-edged, medium version

Performance **P**

$l_2=3.7xd_1$

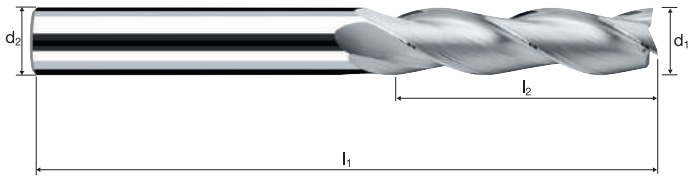
HM
MG10

λ **34°**
γ **24°**

90°

G 2.5

Vario



Roughing HPC

Roughing HDC

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

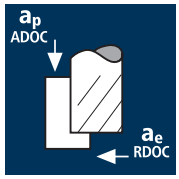
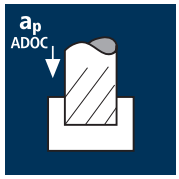
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **8678** Article-N°. ø-Code **180**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	z	**8678**	**8578**
180	3.00	6.00	57	11.10	17.05	3	●	
220	4.00	6.00	60	15.00	21.04	3	●	
260	5.00	6.00	63	18.50	24.37	3	●	
300	6.00	6.00	65	22.50	-	3	●	
391	8.00	8.00	76	30.00	-	3	●	
450	10.00	10.00	90	37.00	-	3	●	
501	12.00	12.00	105	45.00	-	3	●	
610	16.00	16.00	125	60.00	-	3	●	
682	20.00	20.00	145	74.00	-	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	396	0.042	4.500	1.350	42000	5292	32.1
		4.00	3	475	0.056	6.000	1.800	37800	6350	68.6
		5.00	3	475	0.070	7.500	2.250	30240	6350	107.2
		6.00	3	475	0.084	9.000	2.700	25200	6350	154.3
		8.00	3	475	0.112	12.000	3.600	18900	6350	274.3
		10.00	3	475	0.140	15.000	4.500	15120	6350	428.7
		12.00	3	475	0.168	18.000	5.400	12600	6350	617.3
		16.00	3	475	0.179	24.000	7.200	9450	5080	877.9
		20.00	3	475	0.210	30.000	9.000	7560	4763	1286.0
	Unalloyed copper	3.00	3	355	0.032	4.500	1.350	37665	3559	21.6
		4.00	3	355	0.042	6.000	1.800	28250	3560	38.4
		5.00	3	355	0.053	7.500	2.250	22600	3560	60.1
		6.00	3	355	0.063	9.000	2.700	18835	3560	86.5
		8.00	3	355	0.084	12.000	3.600	14125	3560	153.8
		10.00	3	355	0.105	15.000	4.500	11300	3560	240.3
		12.00	3	355	0.126	18.000	5.400	9415	3559	345.9
		16.00	3	355	0.134	24.000	7.200	7065	2849	492.2
		20.00	3	355	0.158	30.000	9.000	5650	2670	720.8
	Thermoplastics	3.00	3	396	0.050	4.500	1.350	42000	6350	38.6
		4.00	3	475	0.067	6.000	1.800	37800	7621	82.3
		5.00	3	475	0.084	7.500	2.250	30240	7621	128.6
		6.00	3	475	0.101	9.000	2.700	25200	7621	185.2
		8.00	3	475	0.134	12.000	3.600	18900	7621	329.2
		10.00	3	475	0.168	15.000	4.500	15120	7621	514.4
		12.00	3	475	0.202	18.000	5.400	12600	7621	740.7
		16.00	3	475	0.215	24.000	7.200	9450	6096	1053.5
		20.00	3	475	0.252	30.000	9.000	7560	5715	1543.2
	Cast aluminium	3.00	3	380	0.042	4.500	1.350	40320	5080	30.9
		4.00	3	380	0.056	6.000	1.800	30240	5080	54.9
		5.00	3	380	0.070	7.500	2.250	24190	5080	85.7
		6.00	3	380	0.084	9.000	2.700	20160	5080	123.5
		8.00	3	380	0.112	12.000	3.600	15120	5080	219.5
		10.00	3	380	0.140	15.000	4.500	12095	5080	342.9
		12.00	3	380	0.168	18.000	5.400	10080	5080	493.8
		16.00	3	380	0.179	24.000	7.200	7560	4064	702.3
		20.00	3	380	0.210	30.000	9.000	6050	3812	1029.1
	Wrought aluminium Construction aluminium	3.00	3	375	0.024	4.500	3.000	39790	2883	38.9
		4.00	3	375	0.032	6.000	4.000	29840	2883	69.2
		5.00	3	375	0.040	7.500	5.000	23875	2883	108.1
		6.00	3	375	0.048	9.000	6.000	19895	2883	155.7
		8.00	3	375	0.064	12.000	8.000	14920	2883	276.7
		10.00	3	375	0.081	15.000	10.000	11935	2882	432.3
		12.00	3	375	0.097	18.000	12.000	9945	2882	622.5
		16.00	3	375	0.103	24.000	16.000	7460	2306	885.5
		20.00	3	375	0.121	30.000	20.000	5970	2163	1297.6
	Unalloyed copper	3.00	3	280	0.018	4.500	3.000	29710	1614	21.8
		4.00	3	280	0.024	6.000	4.000	22280	1614	38.7
		5.00	3	280	0.030	7.500	5.000	17825	1614	60.5
		6.00	3	280	0.036	9.000	6.000	14855	1614	87.2
		8.00	3	280	0.048	12.000	8.000	11140	1614	155.0
		10.00	3	280	0.060	15.000	10.000	8915	1615	242.2
		12.00	3	280	0.072	18.000	12.000	7425	1614	348.6
		16.00	3	280	0.077	24.000	16.000	5570	1291	495.9
		20.00	3	280	0.091	30.000	20.000	4455	1210	726.2
	Thermoplastics	3.00	3	375	0.029	4.500	3.000	39790	3459	46.7
		4.00	3	375	0.039	6.000	4.000	29840	3459	83.0
		5.00	3	375	0.048	7.500	5.000	23875	3460	129.7
		6.00	3	375	0.058	9.000	6.000	19895	3459	186.8
		8.00	3	375	0.077	12.000	8.000	14920	3459	332.1
		10.00	3	375	0.097	15.000	10.000	11935	3459	518.8
		12.00	3	375	0.116	18.000	12.000	9945	3459	747.0
		16.00	3	375	0.124	24.000	16.000	7460	2767	1062.6
		20.00	3	375	0.145	30.000	20.000	5970	2595	1557.1
	Cast aluminium	3.00	3	300	0.024	4.500	3.000	31830	2306	31.1
		4.00	3	300	0.032	6.000	4.000	23875	2306	55.4
		5.00	3	300	0.040	7.500	5.000	19100	2306	86.5
		6.00	3	300	0.048	9.000	6.000	15915	2306	124.5
		8.00	3	300	0.064	12.000	8.000	11935	2306	221.4
		10.00	3	300	0.081	15.000	10.000	9550	2306	345.9
		12.00	3	300	0.097	18.000	12.000	7960	2307	498.3
		16.00	3	300	0.103	24.000	16.000	5970	1845	708.6
		20.00	3	300	0.121	30.000	20.000	4775	1730	1037.8

Cylindrical/Square end mills E-Cut Alu

Smooth-edged, medium version, neck

Performance **P**

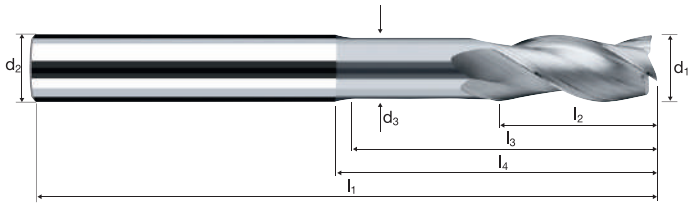
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HM MG10 | λ **34°** γ **24°**

90° | G 2.5

Vario



Roughing

Finishing

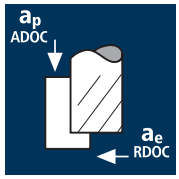
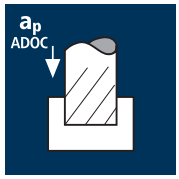
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating: – Article-N°.: **8670** ø-Code: **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	z	**8670**	**8570**
180	3.00	6.00	2.80	57	6.60	13.50	16.83	3	●	
220	4.00	6.00	3.70	60	9.00	18.00	20.54	3	●	
260	5.00	6.00	4.60	63	11.00	22.50	24.22	3	●	
300	6.00	6.00	5.50	65	13.50	27.00	28.85	3	●	
391	8.00	8.00	7.40	76	18.00	36.00	38.37	3	●	
450	10.00	10.00	9.20	90	22.00	45.00	48.01	3	●	
501	12.00	12.00	11.00	105	27.00	54.00	57.71	3	●	
610	16.00	16.00	15.00	125	36.00	72.00	76.27	3	●	
682	20.00	20.00	19.00	145	44.00	90.00	94.77	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	2	550	0.050	4.500	1.200	58355	5836	31.5
		4.00	2	550	0.065	6.000	1.600	43770	5690	54.6
		5.00	2	550	0.080	7.500	2.000	35015	5602	84.0
		6.00	2	550	0.110	9.000	2.400	29180	6420	138.7
		8.00	2	550	0.145	12.000	3.200	21885	6347	243.7
		10.00	2	550	0.180	15.000	4.000	17505	6302	378.1
		12.00	2	550	0.195	18.000	4.800	14590	5690	491.6
		16.00	2	550	0.220	24.000	6.400	10940	4814	739.4
		20.00	2	550	0.255	30.000	8.000	8755	4465	1071.6
	Unalloyed copper	3.00	2	400	0.040	4.500	1.200	42440	3395	18.3
		4.00	2	400	0.050	6.000	1.600	31830	3183	30.6
		5.00	2	400	0.065	7.500	2.000	25465	3311	49.7
		6.00	2	400	0.090	9.000	2.400	21220	3820	82.5
		8.00	2	400	0.115	12.000	3.200	15915	3661	140.6
		10.00	2	400	0.145	15.000	4.000	12730	3692	221.5
		12.00	2	400	0.155	18.000	4.800	10610	3289	284.2
		16.00	2	400	0.175	24.000	6.400	7960	2786	427.9
		20.00	2	400	0.205	30.000	8.000	6365	2610	626.3
	Thermoplastics	3.00	2	1000	0.050	4.500	1.200	60000	6000	32.4
		4.00	2	1000	0.065	6.000	1.600	60000	7800	74.9
		5.00	2	1000	0.080	7.500	2.000	60000	9600	144.0
		6.00	2	1000	0.110	9.000	2.400	53050	11671	252.1
		8.00	2	1000	0.145	12.000	3.200	39790	11539	443.1
		10.00	2	1000	0.180	15.000	4.000	31830	11459	687.5
		12.00	2	1000	0.195	18.000	4.800	26525	10345	893.8
		16.00	2	1000	0.220	24.000	6.400	19895	8754	1344.6
		20.00	2	1000	0.255	30.000	8.000	15915	8117	1948.0
	Cast aluminium	3.00	2	396	0.050	4.500	1.200	42015	4202	22.7
		4.00	2	440	0.065	6.000	1.600	35015	4552	43.7
		5.00	2	440	0.080	7.500	2.000	28010	4482	67.2
		6.00	2	440	0.110	9.000	2.400	23345	5136	110.9
		8.00	2	440	0.145	12.000	3.200	17505	5077	194.9
		10.00	2	440	0.180	15.000	4.000	14005	5042	302.5
		12.00	2	440	0.195	18.000	4.800	11670	4551	393.2
		16.00	2	440	0.220	24.000	6.400	8755	3852	591.7
		20.00	2	440	0.255	30.000	8.000	7005	3573	857.4
	Wrought aluminium Construction aluminium	3.00	2	450	0.035	2.100	3.000	47745	3342	21.1
		4.00	2	450	0.045	2.800	4.000	35810	3223	36.1
		5.00	2	450	0.055	3.500	5.000	28650	3152	55.2
		6.00	2	450	0.075	4.200	6.000	23875	3581	90.2
		8.00	2	450	0.100	5.600	8.000	17905	3581	160.4
		10.00	2	450	0.125	7.000	10.000	14325	3581	250.7
		12.00	2	450	0.135	8.400	12.000	11935	3223	324.8
		16.00	2	450	0.155	11.200	16.000	8950	2775	497.2
		20.00	2	450	0.180	14.000	20.000	7160	2578	721.7
	Unalloyed copper	3.00	2	350	0.030	2.100	3.000	37135	2228	14.0
		4.00	2	350	0.035	2.800	4.000	27850	1950	21.8
		5.00	2	350	0.045	3.500	5.000	22280	2005	35.1
		6.00	2	350	0.060	4.200	6.000	18570	2228	56.2
		8.00	2	350	0.080	5.600	8.000	13925	2228	99.8
		10.00	2	350	0.100	7.000	10.000	11140	2228	156.0
		12.00	2	350	0.110	8.400	12.000	9285	2043	205.9
		16.00	2	350	0.125	11.200	16.000	6965	1741	312.0
		20.00	2	350	0.145	14.000	20.000	5570	1615	452.3
	Thermoplastics	3.00	2	800	0.035	2.100	3.000	60000	4200	26.5
		4.00	2	800	0.045	2.800	4.000	60000	5400	60.5
		5.00	2	800	0.055	3.500	5.000	50930	5602	98.0
		6.00	2	800	0.075	4.200	6.000	42440	6366	160.4
		8.00	2	800	0.100	5.600	8.000	31830	6366	285.2
		10.00	2	800	0.125	7.000	10.000	25465	6366	445.6
		12.00	2	800	0.135	8.400	12.000	21220	5729	577.5
		16.00	2	800	0.155	11.200	16.000	15915	4934	884.1
		20.00	2	800	0.180	14.000	20.000	12730	4583	1283.2
	Cast aluminium	3.00	2	360	0.035	2.100	3.000	38195	2674	16.8
		4.00	2	360	0.045	2.800	4.000	28650	2579	28.9
		5.00	2	360	0.055	3.500	5.000	22920	2521	44.1
		6.00	2	360	0.075	4.200	6.000	19100	2865	72.2
		8.00	2	360	0.100	5.600	8.000	14325	2865	128.4
		10.00	2	360	0.125	7.000	10.000	11460	2865	200.6
		12.00	2	360	0.135	8.400	12.000	9550	2579	259.9
		16.00	2	360	0.155	11.200	16.000	7160	2220	397.8
		20.00	2	360	0.180	14.000	20.000	5730	2063	577.6

Cylindrical/Square end mills AX

Smooth-edged, medium version, neck

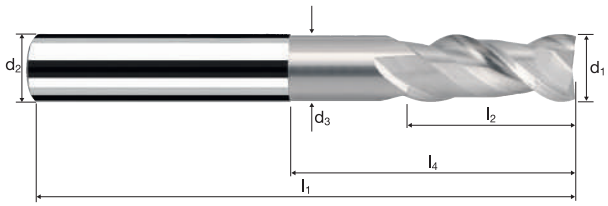
X-Generation

HM
MG10

λ **40°**
γ **20°**

90°

Vario



Roughing

Finishing

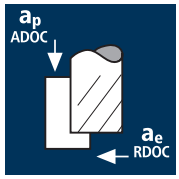
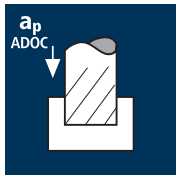
ReTool®

III

Rm <850 HRC <24			Al Aluminium >99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating **C** Article-N°. **15650** ø-Code **180**

									CELERO
								15650	C15650
								15550	C15550
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z		
180	3.00	6.00	2.80	63	8.00	20.00	26.63	2	●	●
220	4.00	6.00	3.70	63	11.00	22.00	26.95	2	●	●
260	5.00	6.00	4.60	63	13.00	24.00	27.27	2	●	●
300	6.00	6.00	5.50	63	13.00	25.34	26.00	2	●	●
391	8.00	8.00	7.40	72	19.00	34.29	35.00	2	●	●
450	10.00	10.00	9.20	84	22.00	42.20	43.00	2	●	●
501	12.00	12.00	11.00	97	26.00	50.13	51.00	2	●	●
610	16.00	16.00	15.00	108	32.00	58.13	59.00	2	●	●
682	20.00	20.00	19.00	122	38.00	70.13	71.00	2	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	1.00	2	132	0.015	1.500	0.650	42000	1260	1.2
		2.00	2	264	0.030	3.000	1.300	42000	2520	9.8
		3.00	2	396	0.045	4.500	1.950	42000	3780	33.2
		4.00	2	475	0.060	6.000	2.600	37800	4536	70.8
		5.00	2	475	0.075	7.500	3.250	30240	4536	110.6
		6.00	2	475	0.090	9.000	3.900	25200	4536	159.2
		8.00	2	475	0.120	12.000	5.200	18900	4536	283.0
		10.00	2	475	0.150	15.000	6.500	15120	4536	442.3
	Unalloyed copper	1.00	2	132	0.011	1.500	0.650	42000	924	0.9
		2.00	2	264	0.022	3.000	1.300	42000	1848	7.2
		3.00	2	355	0.033	4.500	1.950	37665	2486	21.8
		4.00	2	355	0.044	6.000	2.600	28250	2486	38.8
		5.00	2	355	0.055	7.500	3.250	22600	2486	60.6
		6.00	2	355	0.066	9.000	3.900	18835	2486	87.3
		8.00	2	355	0.088	12.000	5.200	14125	2486	155.1
		10.00	2	355	0.110	15.000	6.500	11300	2486	242.4
	Thermoplastics	1.00	2	132	0.018	1.500	0.650	42000	1512	1.5
		2.00	2	264	0.036	3.000	1.300	42000	3024	11.8
		3.00	2	396	0.054	4.500	1.950	42000	4536	39.8
		4.00	2	475	0.072	6.000	2.600	37800	5443	84.9
		5.00	2	475	0.090	7.500	3.250	30240	5443	132.7
		6.00	2	475	0.108	9.000	3.900	25200	5443	191.1
		8.00	2	475	0.144	12.000	5.200	18900	5443	339.7
		10.00	2	475	0.180	15.000	6.500	15120	5443	530.7
	Cast aluminium	1.00	2	132	0.015	1.500	0.650	42000	1260	1.2
		2.00	2	264	0.030	3.000	1.300	42000	2520	9.8
		3.00	2	380	0.045	4.500	1.950	40320	3629	31.8
		4.00	2	380	0.060	6.000	2.600	30240	3629	56.6
		5.00	2	380	0.075	7.500	3.250	24190	3629	88.4
		6.00	2	380	0.090	9.000	3.900	20160	3629	127.4
		8.00	2	380	0.120	12.000	5.200	15120	3629	226.4
		10.00	2	380	0.150	15.000	6.500	12095	3629	353.8
	Wrought aluminium Construction aluminium	1.00	2	132	0.013	1.500	1.000	42000	1058	1.6
		2.00	2	264	0.025	3.000	2.000	42000	2117	12.7
		3.00	2	375	0.038	4.500	3.000	39790	3008	40.6
		4.00	2	375	0.050	6.000	4.000	29840	3008	72.2
		5.00	2	375	0.063	7.500	5.000	23875	3008	112.8
		6.00	2	375	0.076	9.000	6.000	19895	3008	162.4
		8.00	2	375	0.101	12.000	8.000	14920	3008	288.8
		10.00	2	375	0.126	15.000	10.000	11935	3008	451.1
	Unalloyed copper	1.00	2	132	0.009	1.500	1.000	42000	776	1.2
		2.00	2	264	0.018	3.000	2.000	42000	1552	9.3
		3.00	2	280	0.028	4.500	3.000	29710	1647	22.2
		4.00	2	280	0.037	6.000	4.000	22280	1647	39.5
		5.00	2	280	0.046	7.500	5.000	17825	1647	61.8
		6.00	2	280	0.055	9.000	6.000	14855	1647	88.9
		8.00	2	280	0.074	12.000	8.000	11140	1647	158.1
		10.00	2	280	0.092	15.000	10.000	8915	1648	247.1
	Thermoplastics	1.00	2	132	0.015	1.500	1.000	42000	1270	1.9
		2.00	2	264	0.030	3.000	2.000	42000	2540	15.2
		3.00	2	375	0.045	4.500	3.000	39790	3610	48.7
		4.00	2	375	0.060	6.000	4.000	29840	3609	86.6
		5.00	2	375	0.076	7.500	5.000	23875	3610	135.4
		6.00	2	375	0.091	9.000	6.000	19895	3610	194.9
		8.00	2	375	0.121	12.000	8.000	14920	3609	346.5
		10.00	2	375	0.151	15.000	10.000	11935	3609	541.4
	Cast aluminium	1.00	2	132	0.013	1.500	1.000	42000	1058	1.6
		2.00	2	264	0.025	3.000	2.000	42000	2117	12.7
		3.00	2	300	0.038	4.500	3.000	31830	2406	32.5
		4.00	2	300	0.050	6.000	4.000	23875	2407	57.8
		5.00	2	300	0.063	7.500	5.000	19100	2407	90.2
		6.00	2	300	0.076	9.000	6.000	15915	2406	129.9
		8.00	2	300	0.101	12.000	8.000	11935	2406	231.0
		10.00	2	300	0.126	15.000	10.000	9550	2407	361.0

Cylindrical/Square end mills E-Cut Alu

Smooth-edged, medium version, neck

Performance **P**

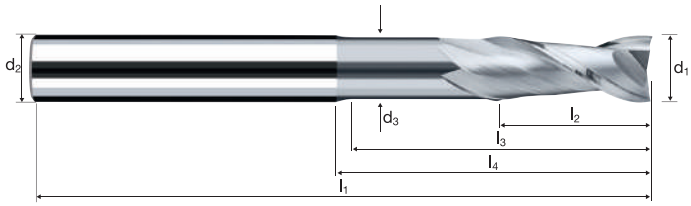
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HM MG10 | λ **34°** γ **24°**

90° | G 2.5

Vario



Roughing

Finishing

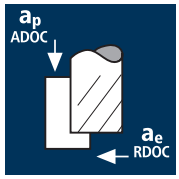
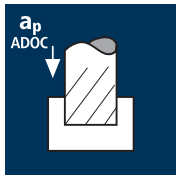
ReTool®

III

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating | Article-N°. **8671** | ø-Code **100**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	z	**8671**	**8571**
100	1.00	6.00	0.95	51	2.20	4.50	9.91	2	●	
140	2.00	6.00	1.90	54	4.40	9.00	13.18	2	●	
180	3.00	6.00	2.80	57	6.60	13.50	16.83	2	●	
220	4.00	6.00	3.70	60	9.00	18.00	20.54	2	●	
260	5.00	6.00	4.60	63	11.00	22.50	24.22	2	●	
300	6.00	6.00	5.50	65	13.50	27.00	28.85	2	●	
391	8.00	8.00	7.40	76	18.00	36.00	38.37	2	●	
450	10.00	10.00	9.20	90	22.00	45.00	48.01	2	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	550	0.085	9.000	1.500	29180	7441	100.5
		8.00	3	550	0.105	12.000	2.000	21885	6894	165.5
		10.00	3	550	0.135	15.000	2.500	17505	7090	265.9
		12.00	3	550	0.160	18.000	3.000	14590	7003	378.2
		16.00	3	550	0.170	24.000	4.000	10940	5579	535.6
		20.00	3	550	0.200	30.000	5.000	8755	5253	788.0
	Unalloyed copper	6.00	3	400	0.070	9.000	1.500	21220	4456	60.2
		8.00	3	400	0.085	12.000	2.000	15915	4058	97.4
		10.00	3	400	0.110	15.000	2.500	12730	4201	157.5
		12.00	3	400	0.130	18.000	3.000	10610	4138	223.4
		16.00	3	400	0.135	24.000	4.000	7960	3224	309.5
		20.00	3	400	0.160	30.000	5.000	6365	3055	458.3
	Thermoplastics	6.00	3	1000	0.085	9.000	1.500	53050	13528	182.6
		8.00	3	1000	0.105	12.000	2.000	39790	12534	300.8
		10.00	3	1000	0.135	15.000	2.500	31830	12891	483.4
		12.00	3	1000	0.160	18.000	3.000	26525	12732	687.5
		16.00	3	1000	0.170	24.000	4.000	19895	10147	974.1
		20.00	3	1000	0.200	30.000	5.000	15915	9549	1432.4
	Cast aluminium	6.00	3	440	0.085	9.000	1.500	23345	5953	80.4
		8.00	3	440	0.105	12.000	2.000	17505	5514	132.3
		10.00	3	440	0.135	15.000	2.500	14005	5672	212.7
		12.00	3	440	0.160	18.000	3.000	11670	5602	302.5
		16.00	3	440	0.170	24.000	4.000	8755	4465	428.6
		20.00	3	440	0.200	30.000	5.000	7005	4203	630.5
	Wrought aluminium Construction aluminium	6.00	3	450	0.060	2.100	6.000	23875	4298	54.1
		8.00	3	450	0.075	2.800	8.000	17905	4029	90.2
		10.00	3	450	0.095	3.500	10.000	14325	4083	142.9
		12.00	3	450	0.110	4.200	12.000	11935	3939	198.5
		16.00	3	450	0.120	5.600	16.000	8950	3222	288.7
		20.00	3	450	0.140	7.000	20.000	7160	3007	421.0
	Unalloyed copper	6.00	3	350	0.050	2.100	6.000	18570	2786	35.1
		8.00	3	350	0.060	2.800	8.000	13925	2507	56.1
		10.00	3	350	0.075	3.500	10.000	11140	2507	87.7
		12.00	3	350	0.090	4.200	12.000	9285	2507	126.4
		16.00	3	350	0.095	5.600	16.000	6965	1985	177.9
		20.00	3	350	0.110	7.000	20.000	5570	1838	257.3
	Thermoplastics	6.00	3	800	0.060	2.100	6.000	42440	7639	96.3
		8.00	3	800	0.075	2.800	8.000	31830	7162	160.4
		10.00	3	800	0.095	3.500	10.000	25465	7258	254.0
		12.00	3	800	0.110	4.200	12.000	21220	7003	352.9
		16.00	3	800	0.120	5.600	16.000	15915	5729	513.4
		20.00	3	800	0.140	7.000	20.000	12730	5347	748.5
	Cast aluminium	6.00	3	360	0.060	2.100	6.000	19100	3438	43.3
		8.00	3	360	0.075	2.800	8.000	14325	3223	72.2
		10.00	3	360	0.095	3.500	10.000	11460	3266	114.3
		12.00	3	360	0.110	4.200	12.000	9550	3152	158.8
		16.00	3	360	0.120	5.600	16.000	7160	2578	231.0
		20.00	3	360	0.140	7.000	20.000	5730	2407	336.9

Cylindrical/Square end mills AX

Smooth-edged, long version, neck

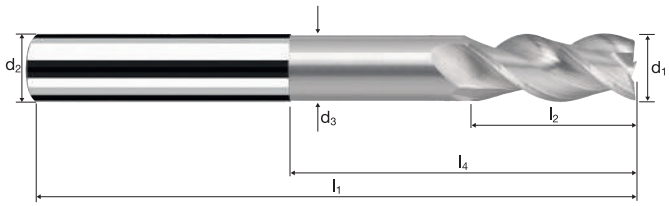
X-Generation

HM
MG10

λ **40°**
γ **20°**

90°

Vario



Roughing

Finishing

ReTool®

III

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

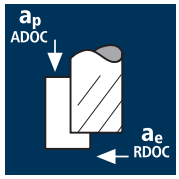
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15659** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	z	15659	CELERO C15659
									15559	C15559
300	6.00	6.00	5.50	70	13.00	32.34	33.00	3	●	●
391	8.00	8.00	7.40	80	19.00	42.29	43.00	3	●	●
450	10.00	10.00	9.20	100	22.00	58.20	59.00	3	●	●
501	12.00	12.00	11.00	110	26.00	63.13	64.00	3	●	●
610	16.00	16.00	15.00	123	32.00	73.13	74.00	3	●	●
682	20.00	20.00	19.00	141	38.00	89.13	90.00	3	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	350	0.065	18.000	0.900	18570	3621	58.7
		8.00	3	350	0.080	24.000	1.200	13925	3342	96.2
		10.00	3	350	0.100	30.000	1.500	11140	3342	150.4
		12.00	3	350	0.120	36.000	1.800	9285	3343	216.6
		16.00	3	350	0.130	48.000	2.400	6965	2716	312.9
		20.00	3	350	0.150	60.000	3.000	5570	2507	451.2
	Unalloyed copper	6.00	3	220	0.050	18.000	0.900	11670	1751	28.4
		8.00	3	220	0.065	24.000	1.200	8755	1707	49.2
		10.00	3	220	0.080	30.000	1.500	7005	1681	75.7
		12.00	3	220	0.095	36.000	1.800	5835	1663	107.8
		16.00	3	220	0.105	48.000	2.400	4375	1378	158.8
		20.00	3	220	0.120	60.000	3.000	3500	1260	226.8
	Thermoplastics	6.00	3	600	0.065	18.000	0.900	31830	6207	100.6
		8.00	3	600	0.080	24.000	1.200	23875	5730	165.0
		10.00	3	600	0.100	30.000	1.500	19100	5730	257.9
		12.00	3	600	0.120	36.000	1.800	15915	5729	371.3
		16.00	3	600	0.130	48.000	2.400	11935	4655	536.2
		20.00	3	600	0.150	60.000	3.000	9550	4298	773.6
	Cast aluminium	6.00	3	280	0.065	18.000	0.900	14855	2897	46.9
		8.00	3	280	0.080	24.000	1.200	11140	2674	77.0
		10.00	3	280	0.100	30.000	1.500	8915	2675	120.4
		12.00	3	280	0.120	36.000	1.800	7425	2673	173.2
		16.00	3	280	0.130	48.000	2.400	5570	2172	250.2
		20.00	3	280	0.150	60.000	3.000	4455	2005	360.9

Cylindrical/Square end mills AX

Smooth-edged, long version

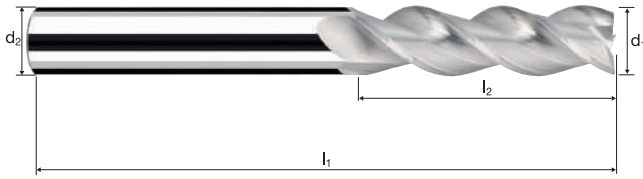
X-Generation

HM
MG10

λ **40°**
γ **20°**

90°

Vario



Roughing

Finishing

ReTool®

III

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

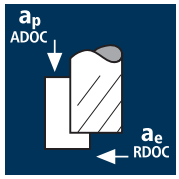
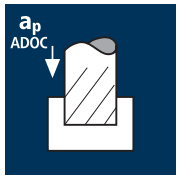
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15661** ø-Code **300**

							CELERO
						15661	**C15661**
						15561	**C15561**
Ø Code	**d_1** e8	**d_2** h6		**l_1**	**l_2**	**z**		
300	6.00	6.00		70	26.00	3	●	●
391	8.00	8.00		80	36.00	3	●	●
450	10.00	10.00		100	45.00	3	●	●
501	12.00	12.00		110	53.00	3	●	●
610	16.00	16.00		123	63.00	3	●	●
682	20.00	20.00		141	75.00	3	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	380	0.038	4.500	1.200	40320	4572	24.7
		4.00	3	380	0.050	6.000	1.600	30240	4572	43.9
		5.00	3	380	0.063	7.500	2.000	24190	4572	68.6
		6.00	3	380	0.076	9.000	2.400	20160	4572	98.8
		8.00	3	380	0.101	12.000	3.200	15120	4572	175.6
		10.00	3	380	0.126	15.000	4.000	12095	4572	274.3
		12.00	3	380	0.151	18.000	4.800	10080	4572	395.0
		16.00	3	380	0.161	24.000	6.400	7560	3658	561.8
		20.00	3	380	0.189	30.000	8.000	6050	3430	823.3
	Unalloyed copper	3.00	3	285	0.029	4.500	1.200	30240	2586	14.0
		4.00	3	285	0.038	6.000	1.600	22680	2586	24.8
		5.00	3	285	0.048	7.500	2.000	18145	2586	38.8
		6.00	3	285	0.057	9.000	2.400	15120	2586	55.8
		8.00	3	285	0.076	12.000	3.200	11340	2586	99.3
		10.00	3	285	0.095	15.000	4.000	9070	2585	155.1
		12.00	3	285	0.114	18.000	4.800	7560	2586	223.4
		16.00	3	285	0.122	24.000	6.400	5670	2068	317.7
		20.00	3	285	0.143	30.000	8.000	4535	1939	465.3
	Thermoplastics	3.00	3	380	0.045	4.500	1.200	40320	5480	29.6
		4.00	3	380	0.060	6.000	1.600	30240	5480	52.6
		5.00	3	380	0.076	7.500	2.000	24190	5479	82.2
		6.00	3	380	0.091	9.000	2.400	20160	5480	118.4
		8.00	3	380	0.121	12.000	3.200	15120	5480	210.4
		10.00	3	380	0.151	15.000	4.000	12095	5479	328.7
		12.00	3	380	0.181	18.000	4.800	10080	5480	473.4
		16.00	3	380	0.193	24.000	6.400	7560	4384	673.3
		20.00	3	380	0.227	30.000	8.000	6050	4111	986.6
	Cast aluminium	3.00	3	305	0.038	4.500	1.200	32360	3670	19.8
		4.00	3	305	0.050	6.000	1.600	24270	3670	35.2
		5.00	3	305	0.063	7.500	2.000	19415	3669	55.0
		6.00	3	305	0.076	9.000	2.400	16180	3670	79.3
		8.00	3	305	0.101	12.000	3.200	12135	3670	140.9
		10.00	3	305	0.126	15.000	4.000	9710	3670	220.2
		12.00	3	305	0.151	18.000	4.800	8090	3670	317.1
		16.00	3	305	0.161	24.000	6.400	6070	2937	451.1
		20.00	3	305	0.189	30.000	8.000	4855	2753	660.7
	Wrought aluminium Construction aluminium	3.00	3	300	0.022	3.000	3.000	31830	2076	18.7
		4.00	3	300	0.029	4.000	4.000	23875	2076	33.2
		5.00	3	300	0.036	5.000	5.000	19100	2076	51.9
		6.00	3	300	0.043	6.000	6.000	15915	2076	74.7
		8.00	3	300	0.058	8.000	8.000	11935	2075	132.8
		10.00	3	300	0.072	10.000	10.000	9550	2076	207.6
		12.00	3	300	0.087	12.000	12.000	7960	2076	299.0
		16.00	3	300	0.093	16.000	16.000	5970	1661	425.2
		20.00	3	300	0.109	20.000	20.000	4775	1557	622.7
	Unalloyed copper	3.00	3	225	0.016	3.000	3.000	23875	1174	10.6
		4.00	3	225	0.022	4.000	4.000	17905	1174	18.8
		5.00	3	225	0.027	5.000	5.000	14325	1174	29.3
		6.00	3	225	0.033	6.000	6.000	11935	1174	42.2
		8.00	3	225	0.044	8.000	8.000	8950	1173	75.1
		10.00	3	225	0.055	10.000	10.000	7160	1173	117.3
		12.00	3	225	0.066	12.000	12.000	5970	1174	169.1
		16.00	3	225	0.070	16.000	16.000	4475	939	240.3
		20.00	3	225	0.082	20.000	20.000	3580	880	352.0
	Thermoplastics	3.00	3	300	0.026	3.000	3.000	31830	2487	22.4
		4.00	3	300	0.035	4.000	4.000	23875	2488	39.8
		5.00	3	300	0.043	5.000	5.000	19100	2488	62.2
		6.00	3	300	0.052	6.000	6.000	15915	2487	89.5
		8.00	3	300	0.069	8.000	8.000	11935	2487	159.2
		10.00	3	300	0.087	10.000	10.000	9550	2488	248.8
		12.00	3	300	0.104	12.000	12.000	7960	2488	358.3
		16.00	3	300	0.111	16.000	16.000	5970	1990	509.5
		20.00	3	300	0.130	20.000	20.000	4775	1866	746.3
	Cast aluminium	3.00	3	240	0.022	3.000	3.000	25465	1660	14.9
		4.00	3	240	0.029	4.000	4.000	19100	1661	26.6
		5.00	3	240	0.036	5.000	5.000	15280	1661	41.5
		6.00	3	240	0.043	6.000	6.000	12730	1660	59.8
		8.00	3	240	0.058	8.000	8.000	9550	1661	106.3
		10.00	3	240	0.072	10.000	10.000	7640	1661	166.1
		12.00	3	240	0.087	12.000	12.000	6365	1660	239.1
		16.00	3	240	0.093	16.000	16.000	4775	1328	340.1
		20.00	3	240	0.109	20.000	20.000	3820	1245	498.2

Cylindrical/Square end mills E-Cut Alu

Smooth-edged, long version, neck

Performance **P**

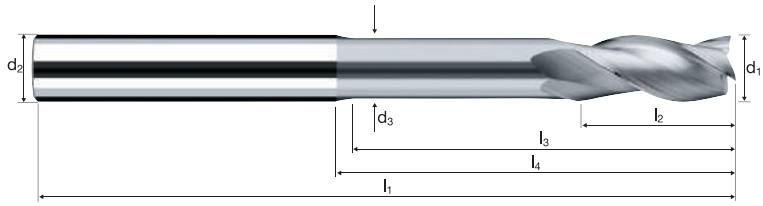
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$l_3=5.6xd_1$

HM MG10 | λ 34° γ 24°

90° | G 2.5

Vario



Roughing

Finishing

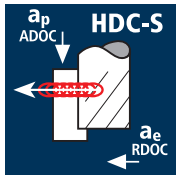
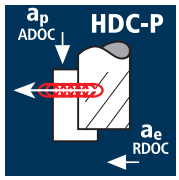
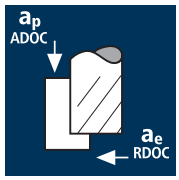
ReTool®

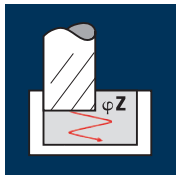
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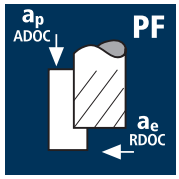
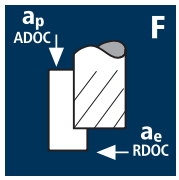
Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating: — Article-N°.: **8680** ø-Code: **180**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	z	**8680**	**8580**
180	3.00	6.00	2.80	60	6.60	16.80	20.13	3	●	
220	4.00	6.00	3.70	65	9.00	22.50	25.04	3	●	
260	5.00	6.00	4.60	68	11.00	28.00	29.72	3	●	
300	6.00	6.00	5.50	73	13.50	34.00	35.85	3	●	
391	8.00	8.00	7.40	84	18.00	45.00	47.37	3	●	
450	10.00	10.00	9.20	100	22.00	56.00	59.01	3	●	
501	12.00	12.00	11.00	117	27.00	67.50	71.21	3	●	
610	16.00	16.00	15.00	144	36.00	90.00	94.27	3	●	
682	20.00	20.00	19.00	169	44.00	112.00	116.77	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	4	482	0.081	32.000	0.750	25570	8285	198.8
		8.00	4	482	0.114	42.000	1.000	19180	8746	367.3
		10.00	4	482	0.150	53.000	1.250	15345	9207	610.0
		12.00	4	482	0.180	63.000	1.500	12785	9205	869.9
		16.00	4	482	0.192	84.000	2.000	9590	7365	1237.3
		20.00	4	482	0.225	105.000	2.500	7670	6903	1812.0
	Wrought aluminium Construction aluminium	6.00	4	418	0.058	32.000	1.200	22175	5145	197.6
		8.00	4	418	0.082	42.000	1.600	16630	5455	366.5
		10.00	4	418	0.108	53.000	2.000	13305	5748	609.3
		12.00	4	418	0.130	63.000	2.400	11090	5767	871.9
		16.00	4	418	0.138	84.000	3.200	8315	4590	1233.8
		20.00	4	418	0.162	105.000	4.000	6655	4312	1811.2
	Wrought aluminium Construction aluminium	6.00	4	399	0.053	9.000	2.400	21170	4488	96.9
		8.00	4	399	0.071	12.000	3.200	15875	4509	173.1
		10.00	4	399	0.089	15.000	4.000	12700	4521	271.3
		12.00	4	399	0.106	18.000	4.800	10585	4488	387.8
		16.00	4	399	0.141	24.000	5.200	7940	4478	558.9
		20.00	4	399	0.166	30.000	6.500	6350	4216	822.2

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
	Wrought aluminium Construction aluminium	6.00	4	399	0.053	32.000	5.400	21170	4488	10.0°
		8.00	4	399	0.071	42.000	7.200	15875	4509	10.0°
		10.00	4	399	0.089	53.000	9.000	12700	4521	10.0°
		12.00	4	399	0.106	63.000	10.800	10585	4488	10.0°
		16.00	4	399	0.141	84.000	14.400	7940	4478	10.0°
		20.00	4	399	0.166	105.000	18.000	6350	4216	10.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	4	380	0.040	32.000	0.160	20160	3226
		8.00	4	380	0.047	42.000	0.200	15120	2843
		10.00	4	380	0.052	53.000	0.200	12095	2516
		12.00	4	380	0.057	63.000	0.240	10080	2298
		16.00	4	380	0.066	84.000	0.240	7560	1996
		20.00	4	380	0.074	105.000	0.300	6050	1791
	Wrought aluminium Construction aluminium	6.00	4	420	0.027	32.000	0.100	22280	2406
		8.00	4	420	0.031	42.000	0.140	16710	2072
		10.00	4	420	0.034	53.000	0.140	13370	1818
		12.00	4	420	0.037	63.000	0.170	11140	1649
		16.00	4	420	0.044	84.000	0.170	8355	1471
		20.00	4	420	0.049	105.000	0.200	6685	1310

Cylindrical/Square end mills MFC Alu

Smooth-edged, chip breaker, 5.2xd version
High-performance penetration edge, central air/cooling channel

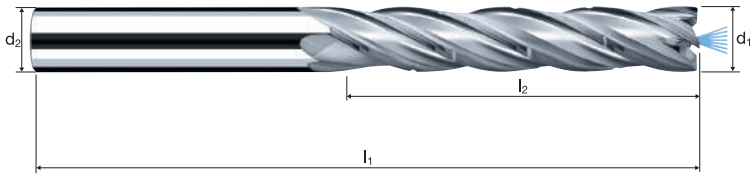
Performance **P**

HM
MG10

λ **30°**
γ **20°**

r

G 2.5



Roughing HPC

Roughing HDC

Finishing

ReTool®

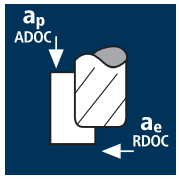
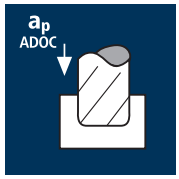
III

Al Aluminium > 99%
Al Aluminium Alloy
Al Aluminium Cast
Cu Copper
Plastic Thermoplast

Example: **Order-N°.** Coating **8685** ø-Code **300**

new!

Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z	**8685**	**8585**
300	6.00	6.00	73	32.00	0.100	4	●	
391	8.00	8.00	84	42.00	0.150	4	●	
450	10.00	10.00	100	53.00	0.200	4	●	
501	12.00	12.00	117	63.00	0.200	4	●	
610	16.00	16.00	144	84.00	0.200	4	●	
682	20.00	20.00	169	105.00	0.250	4	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	396	0.056	4.500	1.350	42000	6993	42.5
		4.00	3	500	0.074	6.000	1.800	39790	8833	95.4
		5.00	3	500	0.093	7.500	2.250	31830	8833	149.1
		6.00	3	500	0.111	9.000	2.700	26525	8833	214.6
		8.00	3	500	0.148	12.000	3.600	19895	8833	381.6
		10.00	3	500	0.185	15.000	4.500	15915	8833	596.2
		12.00	3	500	0.222	18.000	5.400	13265	8835	858.7
		16.00	3	500	0.237	24.000	7.200	9945	7065	1220.8
		20.00	3	500	0.278	30.000	9.000	7960	6627	1789.2
	Unalloyed copper	3.00	3	375	0.041	4.500	1.350	39790	4942	30.0
		4.00	3	375	0.055	6.000	1.800	29840	4942	53.4
		5.00	3	375	0.069	7.500	2.250	23875	4942	83.4
		6.00	3	375	0.083	9.000	2.700	19895	4942	120.1
		8.00	3	375	0.110	12.000	3.600	14920	4942	213.5
		10.00	3	375	0.138	15.000	4.500	11935	4941	333.5
		12.00	3	375	0.166	18.000	5.400	9945	4941	480.2
		16.00	3	375	0.177	24.000	7.200	7460	3953	683.1
		20.00	3	375	0.207	30.000	9.000	5970	3707	1001.0
	Thermoplastics	3.00	3	396	0.067	4.500	1.350	42000	8392	51.0
		4.00	3	500	0.089	6.000	1.800	39790	10600	114.5
		5.00	3	500	0.111	7.500	2.250	31830	10599	178.9
		6.00	3	500	0.133	9.000	2.700	26525	10599	257.6
		8.00	3	500	0.178	12.000	3.600	19895	10600	457.9
		10.00	3	500	0.222	15.000	4.500	15915	10599	715.5
		12.00	3	500	0.266	18.000	5.400	13265	10601	1030.5
		16.00	3	500	0.284	24.000	7.200	9945	8478	1465.0
		20.00	3	500	0.333	30.000	9.000	7960	7952	2147.0
	Cast aluminium	3.00	3	396	0.044	4.500	1.350	42000	5594	34.0
		4.00	3	400	0.059	6.000	1.800	31830	5653	61.1
		5.00	3	400	0.074	7.500	2.250	25465	5653	95.4
		6.00	3	400	0.089	9.000	2.700	21220	5653	137.4
		8.00	3	400	0.118	12.000	3.600	15915	5653	244.2
		10.00	3	400	0.148	15.000	4.500	12730	5652	381.5
		12.00	3	400	0.178	18.000	5.400	10610	5653	549.5
		16.00	3	400	0.189	24.000	7.200	7960	4524	781.7
		20.00	3	400	0.222	30.000	9.000	6365	4239	1144.6
	Wrought aluminium Construction aluminium	3.00	3	395	0.032	4.500	3.000	41910	4012	54.2
		4.00	3	400	0.043	6.000	4.000	31830	4063	97.5
		5.00	3	400	0.053	7.500	5.000	25465	4063	152.4
		6.00	3	400	0.064	9.000	6.000	21220	4063	219.4
		8.00	3	400	0.085	12.000	8.000	15915	4063	390.1
		10.00	3	400	0.106	15.000	10.000	12730	4063	609.4
		12.00	3	400	0.128	18.000	12.000	10610	4063	877.6
		16.00	3	400	0.136	24.000	16.000	7960	3252	1248.6
		20.00	3	400	0.160	30.000	20.000	6365	3047	1828.1
	Unalloyed copper	3.00	3	300	0.024	4.500	3.000	31830	2273	30.7
		4.00	3	300	0.032	6.000	4.000	23875	2273	54.6
		5.00	3	300	0.040	7.500	5.000	19100	2273	85.3
		6.00	3	300	0.048	9.000	6.000	15915	2273	122.7
		8.00	3	300	0.063	12.000	8.000	11935	2273	218.2
		10.00	3	300	0.079	15.000	10.000	9550	2273	341.0
		12.00	3	300	0.095	18.000	12.000	7960	2274	491.2
		16.00	3	300	0.102	24.000	16.000	5970	1819	698.5
		20.00	3	300	0.119	30.000	20.000	4775	1705	1023.0
	Thermoplastics	3.00	3	400	0.038	4.500	3.000	42440	4876	65.8
		4.00	3	400	0.051	6.000	4.000	31830	4876	117.0
		5.00	3	400	0.064	7.500	5.000	25465	4876	182.8
		6.00	3	400	0.077	9.000	6.000	21220	4876	263.3
		8.00	3	400	0.102	12.000	8.000	15915	4876	468.1
		10.00	3	400	0.128	15.000	10.000	12730	4875	731.3
		12.00	3	400	0.153	18.000	12.000	10610	4876	1053.2
		16.00	3	400	0.163	24.000	16.000	7960	3902	1498.3
		20.00	3	400	0.191	30.000	20.000	6365	3656	2193.7
	Cast aluminium	3.00	3	320	0.026	4.500	3.000	33955	2601	35.1
		4.00	3	320	0.034	6.000	4.000	25465	2601	62.4
		5.00	3	320	0.043	7.500	5.000	20370	2600	97.5
		6.00	3	320	0.051	9.000	6.000	16975	2600	140.4
		8.00	3	320	0.068	12.000	8.000	12730	2600	249.6
		10.00	3	320	0.085	15.000	10.000	10185	2600	390.0
		12.00	3	320	0.102	18.000	12.000	8490	2601	561.8
		16.00	3	320	0.109	24.000	16.000	6365	2080	798.7
		20.00	3	320	0.128	30.000	20.000	5095	1951	1170.7

Corner radius end mills E-Cut Alu

Smooth-edged, normal version, short neck

Performance **P**

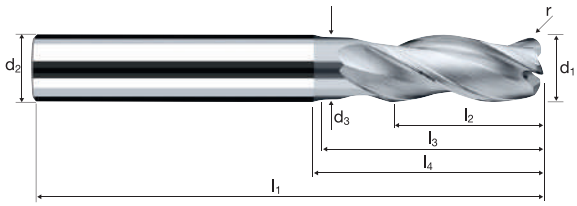
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HM MG10 | λ 34° γ 24°

G 2.5

Vario



Roughing

Finishing

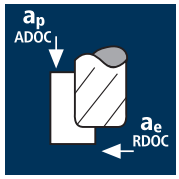
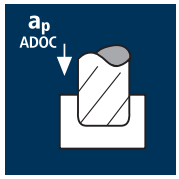
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8667** | ø-Code **178**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	8667	8567
178	3.00	6.00	2.80	54	6.60	9.00	12.33	0.200	3	●	
218	4.00	6.00	3.70	54	9.00	12.00	14.54	0.200	3	●	
258	5.00	6.00	4.60	57	11.00	15.00	16.72	0.200	3	●	
180	3.00	6.00	2.80	54	6.60	9.00	12.33	0.500	3	●	
220	4.00	6.00	3.70	54	9.00	12.00	14.54	0.500	3	●	
260	5.00	6.00	4.60	57	11.00	15.00	16.72	0.500	3	●	
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.500	3	●	
388	8.00	8.00	7.40	63	18.00	24.00	26.37	0.500	3	●	
448	10.00	10.00	9.20	74	22.00	30.00	33.01	0.500	3	●	
302	6.00	6.00	5.50	57	13.50	18.00	19.85	1.000	3	●	
391	8.00	8.00	7.40	63	18.00	24.00	26.37	1.000	3	●	
450	10.00	10.00	9.20	74	22.00	30.00	33.01	1.000	3	●	
501	12.00	12.00	11.00	85	27.00	36.00	39.71	1.000	3	●	
608	16.00	16.00	15.00	102	36.00	48.00	52.27	1.000	3	●	
455	10.00	10.00	9.20	74	22.00	30.00	33.01	2.000	3	●	
505	12.00	12.00	11.00	85	27.00	36.00	39.71	2.000	3	●	
611	16.00	16.00	15.00	102	36.00	48.00	52.27	2.000	3	●	
683	20.00	20.00	19.00	115	44.00	60.00	64.77	2.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	12.00	3	500	0.222	18.000	5.400	13265	8835	858.7
		16.00	3	500	0.237	24.000	7.200	9945	7065	1220.8
		20.00	3	500	0.278	30.000	9.000	7960	6627	1789.2
	Unalloyed copper	12.00	3	375	0.166	18.000	5.400	9945	4941	480.2
		16.00	3	375	0.177	24.000	7.200	7460	3953	683.1
		20.00	3	375	0.207	30.000	9.000	5970	3707	1001.0
	Thermoplastics	12.00	3	500	0.266	18.000	5.400	13265	10601	1030.5
		16.00	3	500	0.284	24.000	7.200	9945	8478	1465.0
		20.00	3	500	0.333	30.000	9.000	7960	7952	2147.0
	Cast aluminium	12.00	3	400	0.178	18.000	5.400	10610	5653	549.5
		16.00	3	400	0.189	24.000	7.200	7960	4524	781.7
		20.00	3	400	0.222	30.000	9.000	6365	4239	1144.6
	Wrought aluminium Construction aluminium	12.00	3	400	0.128	18.000	12.000	10610	4063	877.6
		16.00	3	400	0.136	24.000	16.000	7960	3252	1248.6
		20.00	3	400	0.160	30.000	20.000	6365	3047	1828.1
	Unalloyed copper	12.00	3	300	0.095	18.000	12.000	7960	2274	491.2
		16.00	3	300	0.102	24.000	16.000	5970	1819	698.5
		20.00	3	300	0.119	30.000	20.000	4775	1705	1023.0
	Thermoplastics	12.00	3	400	0.153	18.000	12.000	10610	4876	1053.2
		16.00	3	400	0.163	24.000	16.000	7960	3902	1498.3
		20.00	3	400	0.191	30.000	20.000	6365	3656	2193.7
	Cast aluminium	12.00	3	320	0.102	18.000	12.000	8490	2601	561.8
		16.00	3	320	0.109	24.000	16.000	6365	2080	798.7
		20.00	3	320	0.128	30.000	20.000	5095	1951	1170.7

Corner radius end mills E-Cut Alu

Smooth-edged, normal version, short neck

Performance **P**

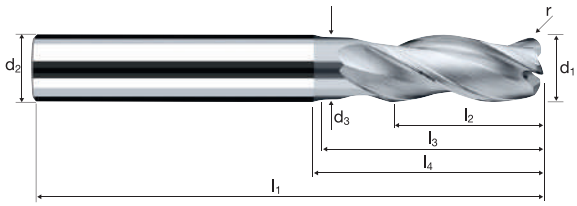
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$l_3=3.0xd_1$

HM MG10 | λ 34° γ 24°

G 2.5

Vario



Roughing

Finishing

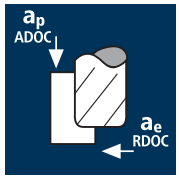
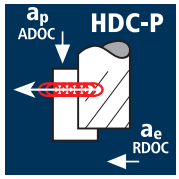
ReTool®

III

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating | Article-N°. **8667** | ø-Code **507**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	**8667**	**8567**
507	12.00	12.00	11.00	85	27.00	36.00	39.71	3.000	3	●	
613	16.00	16.00	15.00	102	36.00	48.00	52.27	3.000	3	●	
685	20.00	20.00	19.00	115	44.00	60.00	64.77	3.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	396	0.042	4.500	1.350	42000	5292	32.1
		4.00	3	475	0.056	6.000	1.800	37800	6350	68.6
		5.00	3	475	0.070	7.500	2.250	30240	6350	107.2
		6.00	3	475	0.084	9.000	2.700	25200	6350	154.3
		8.00	3	475	0.112	12.000	3.600	18900	6350	274.3
		10.00	3	475	0.140	15.000	4.500	15120	6350	428.7
		12.00	3	475	0.168	18.000	5.400	12600	6350	617.3
		16.00	3	475	0.179	24.000	7.200	9450	5080	877.9
		20.00	3	475	0.210	30.000	9.000	7560	4763	1286.0
	Unalloyed copper	3.00	3	355	0.032	4.500	1.350	37665	3559	21.6
		4.00	3	355	0.042	6.000	1.800	28250	3560	38.4
		5.00	3	355	0.053	7.500	2.250	22600	3560	60.1
		6.00	3	355	0.063	9.000	2.700	18835	3560	86.5
		8.00	3	355	0.084	12.000	3.600	14125	3560	153.8
		10.00	3	355	0.105	15.000	4.500	11300	3560	240.3
		12.00	3	355	0.126	18.000	5.400	9415	3559	345.9
		16.00	3	355	0.134	24.000	7.200	7065	2849	492.2
		20.00	3	355	0.158	30.000	9.000	5650	2670	720.8
	Thermoplastics	3.00	3	396	0.050	4.500	1.350	42000	6350	38.6
		4.00	3	475	0.067	6.000	1.800	37800	7621	82.3
		5.00	3	475	0.084	7.500	2.250	30240	7621	128.6
		6.00	3	475	0.101	9.000	2.700	25200	7621	185.2
		8.00	3	475	0.134	12.000	3.600	18900	7621	329.2
		10.00	3	475	0.168	15.000	4.500	15120	7621	514.4
		12.00	3	475	0.202	18.000	5.400	12600	7621	740.7
		16.00	3	475	0.215	24.000	7.200	9450	6096	1053.5
		20.00	3	475	0.252	30.000	9.000	7560	5715	1543.2
	Cast aluminium	3.00	3	380	0.042	4.500	1.350	40320	5080	30.9
		4.00	3	380	0.056	6.000	1.800	30240	5080	54.9
		5.00	3	380	0.070	7.500	2.250	24190	5080	85.7
		6.00	3	380	0.084	9.000	2.700	20160	5080	123.5
		8.00	3	380	0.112	12.000	3.600	15120	5080	219.5
		10.00	3	380	0.140	15.000	4.500	12095	5080	342.9
		12.00	3	380	0.168	18.000	5.400	10080	5080	493.8
		16.00	3	380	0.179	24.000	7.200	7560	4064	702.3
		20.00	3	380	0.210	30.000	9.000	6050	3812	1029.1
	Wrought aluminium Construction aluminium	3.00	3	375	0.052	11.100	0.750	39790	6207	51.7
		4.00	3	375	0.070	15.000	1.000	29840	6266	94.0
		5.00	3	375	0.087	18.500	1.250	23875	6231	144.1
		6.00	3	375	0.104	22.500	1.500	19895	6207	209.5
		8.00	3	375	0.139	30.000	2.000	14920	6222	373.3
		10.00	3	375	0.174	37.000	2.500	11935	6230	576.3
		12.00	3	375	0.209	44.500	3.000	9945	6236	832.4
		16.00	3	375	0.222	60.000	4.000	7460	4968	1192.4
		20.00	3	375	0.261	74.000	5.000	5970	4675	1729.6
	Unalloyed copper	3.00	3	284	0.039	11.100	0.750	30135	3526	29.4
		4.00	3	284	0.052	15.000	1.000	22600	3526	52.9
		5.00	3	284	0.065	18.500	1.250	18080	3526	81.5
		6.00	3	284	0.078	22.500	1.500	15065	3525	119.0
		8.00	3	284	0.104	30.000	2.000	11300	3526	211.5
		10.00	3	284	0.130	37.000	2.500	9040	3526	326.1
		12.00	3	284	0.156	44.500	3.000	7535	3526	470.8
		16.00	3	284	0.166	60.000	4.000	5650	2814	675.3
		20.00	3	284	0.195	74.000	5.000	4520	2644	978.4
	Thermoplastics	3.00	3	375	0.062	11.100	0.750	39790	7401	61.6
		4.00	3	375	0.083	15.000	1.000	29840	7430	111.5
		5.00	3	375	0.104	18.500	1.250	23875	7449	172.3
		6.00	3	375	0.125	22.500	1.500	19895	7461	251.8
		8.00	3	375	0.166	30.000	2.000	14920	7430	445.8
		10.00	3	375	0.208	37.000	2.500	11935	7447	688.9
		12.00	3	375	0.249	44.500	3.000	9945	7429	991.8
		16.00	3	375	0.266	60.000	4.000	7460	5953	1428.7
		20.00	3	375	0.311	74.000	5.000	5970	5570	2060.9
	Cast aluminium	3.00	3	301	0.052	11.100	0.750	31935	4982	41.5
		4.00	3	301	0.070	15.000	1.000	23955	5031	75.5
		5.00	3	301	0.087	18.500	1.250	19160	5001	115.6
		6.00	3	301	0.104	22.500	1.500	15970	4983	168.2
		8.00	3	301	0.139	30.000	2.000	11975	4994	299.6
		10.00	3	301	0.174	37.000	2.500	9580	5001	462.6
		12.00	3	301	0.209	44.500	3.000	7985	5007	668.4
		16.00	3	301	0.222	60.000	4.000	5990	3989	957.4
		20.00	3	301	0.261	74.000	5.000	4790	3751	1387.7

Corner radius end mills E-Cut Alu

Smooth-edged, medium version

Performance **P**

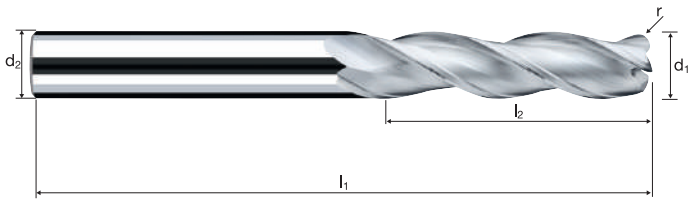
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HM
MG10

λ **34°**
γ **24°**

G 2.5

Vario



Roughing HPC

Roughing HDC

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

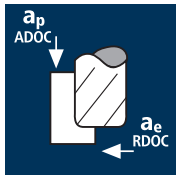
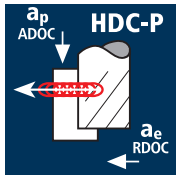
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **8676** ø-Code **178**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r 0/+0.03	z	**8676**	**8576**
178	3.00	6.00	57	11.10	17.05	0.200	3	●	
218	4.00	6.00	60	15.00	21.04	0.200	3	●	
258	5.00	6.00	63	18.50	24.37	0.200	3	●	
180	3.00	6.00	57	11.10	17.05	0.500	3	●	
220	4.00	6.00	60	15.00	21.04	0.500	3	●	
260	5.00	6.00	63	18.50	24.37	0.500	3	●	
300	6.00	6.00	65	22.50	-	0.500	3	●	
388	8.00	8.00	76	30.00	-	0.500	3	●	
448	10.00	10.00	90	37.00	-	0.500	3	●	
302	6.00	6.00	65	22.50	-	1.000	3	●	
391	8.00	8.00	76	30.00	-	1.000	3	●	
450	10.00	10.00	90	37.00	-	1.000	3	●	
501	12.00	12.00	105	45.00	-	1.000	3	●	
608	16.00	16.00	125	60.00	-	1.000	3	●	
455	10.00	10.00	90	37.00	-	2.000	3	●	
505	12.00	12.00	105	45.00	-	2.000	3	●	
611	16.00	16.00	125	60.00	-	2.000	3	●	
683	20.00	20.00	145	74.00	-	2.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	12.00	3	475	0.168	18.000	5.400	12600	6350	617.3
		16.00	3	475	0.179	24.000	7.200	9450	5080	877.9
		20.00	3	475	0.210	30.000	9.000	7560	4763	1286.0
	Unalloyed copper	12.00	3	355	0.126	18.000	5.400	9415	3559	345.9
		16.00	3	355	0.134	24.000	7.200	7065	2849	492.2
		20.00	3	355	0.158	30.000	9.000	5650	2670	720.8
	Thermoplastics	12.00	3	475	0.202	18.000	5.400	12600	7621	740.7
		16.00	3	475	0.215	24.000	7.200	9450	6096	1053.5
		20.00	3	475	0.252	30.000	9.000	7560	5715	1543.2
	Cast aluminium	12.00	3	380	0.168	18.000	5.400	10080	5080	493.8
		16.00	3	380	0.179	24.000	7.200	7560	4064	702.3
		20.00	3	380	0.210	30.000	9.000	6050	3812	1029.1
	Wrought aluminium Construction aluminium	12.00	3	375	0.209	44.500	3.000	9945	6236	832.4
		16.00	3	375	0.222	60.000	4.000	7460	4968	1192.4
		20.00	3	375	0.261	74.000	5.000	5970	4675	1729.6
	Unalloyed copper	12.00	3	284	0.156	44.500	3.000	7535	3526	470.8
		16.00	3	284	0.166	60.000	4.000	5650	2814	675.3
		20.00	3	284	0.195	74.000	5.000	4520	2644	978.4
	Thermoplastics	12.00	3	375	0.249	44.500	3.000	9945	7429	991.8
		16.00	3	375	0.266	60.000	4.000	7460	5953	1428.7
		20.00	3	375	0.311	74.000	5.000	5970	5570	2060.9
	Cast aluminium	12.00	3	301	0.209	44.500	3.000	7985	5007	668.4
		16.00	3	301	0.222	60.000	4.000	5990	3989	957.4
		20.00	3	301	0.261	74.000	5.000	4790	3751	1387.7

Corner radius end mills E-Cut Alu

Smooth-edged, medium version

Performance **P**

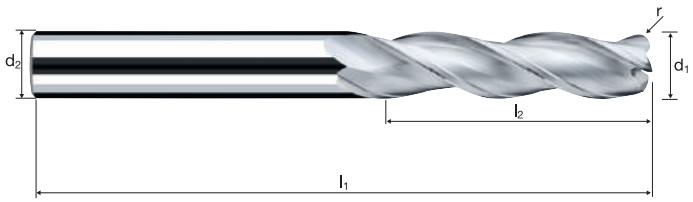
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HM MG10

λ **34°**
γ **24°**

G 2.5

Vario



Roughing HPC

Roughing HDC

Finishing

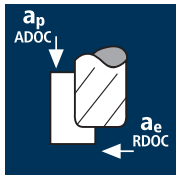
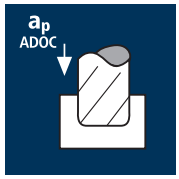
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating **8676** ø-Code **507**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	l_4	r 0/+0.03	z	8676	8576
507	12.00	12.00	105	45.00	-	3.000	3	●	
613	16.00	16.00	125	60.00	-	3.000	3	●	
685	20.00	20.00	145	74.00	-	3.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	396	0.042	4.500	1.350	42000	5292	32.1
		4.00	3	475	0.056	6.000	1.800	37800	6350	68.6
		5.00	3	475	0.070	7.500	2.250	30240	6350	107.2
		6.00	3	475	0.084	9.000	2.700	25200	6350	154.3
		8.00	3	475	0.112	12.000	3.600	18900	6350	274.3
		10.00	3	475	0.140	15.000	4.500	15120	6350	428.7
		12.00	3	475	0.168	18.000	5.400	12600	6350	617.3
		16.00	3	475	0.179	24.000	7.200	9450	5080	877.9
		20.00	3	475	0.210	30.000	9.000	7560	4763	1286.0
	Unalloyed copper	3.00	3	355	0.032	4.500	1.350	37665	3559	21.6
		4.00	3	355	0.042	6.000	1.800	28250	3560	38.4
		5.00	3	355	0.053	7.500	2.250	22600	3560	60.1
		6.00	3	355	0.063	9.000	2.700	18835	3560	86.5
		8.00	3	355	0.084	12.000	3.600	14125	3560	153.8
		10.00	3	355	0.105	15.000	4.500	11300	3560	240.3
		12.00	3	355	0.126	18.000	5.400	9415	3559	345.9
		16.00	3	355	0.134	24.000	7.200	7065	2849	492.2
		20.00	3	355	0.158	30.000	9.000	5650	2670	720.8
	Thermoplastics	3.00	3	396	0.050	4.500	1.350	42000	6350	38.6
		4.00	3	475	0.067	6.000	1.800	37800	7621	82.3
		5.00	3	475	0.084	7.500	2.250	30240	7621	128.6
		6.00	3	475	0.101	9.000	2.700	25200	7621	185.2
		8.00	3	475	0.134	12.000	3.600	18900	7621	329.2
		10.00	3	475	0.168	15.000	4.500	15120	7621	514.4
		12.00	3	475	0.202	18.000	5.400	12600	7621	740.7
		16.00	3	475	0.215	24.000	7.200	9450	6096	1053.5
		20.00	3	475	0.252	30.000	9.000	7560	5715	1543.2
	Cast aluminium	3.00	3	380	0.042	4.500	1.350	40320	5080	30.9
		4.00	3	380	0.056	6.000	1.800	30240	5080	54.9
		5.00	3	380	0.070	7.500	2.250	24190	5080	85.7
		6.00	3	380	0.084	9.000	2.700	20160	5080	123.5
		8.00	3	380	0.112	12.000	3.600	15120	5080	219.5
		10.00	3	380	0.140	15.000	4.500	12095	5080	342.9
		12.00	3	380	0.168	18.000	5.400	10080	5080	493.8
		16.00	3	380	0.179	24.000	7.200	7560	4064	702.3
		20.00	3	380	0.210	30.000	9.000	6050	3812	1029.1
	Wrought aluminium Construction aluminium	3.00	3	380	0.024	4.500	3.000	40320	2921	39.4
		4.00	3	380	0.032	6.000	4.000	30240	2921	70.1
		5.00	3	380	0.040	7.500	5.000	24190	2921	109.5
		6.00	3	380	0.048	9.000	6.000	20160	2921	157.7
		8.00	3	380	0.064	12.000	8.000	15120	2921	280.4
		10.00	3	380	0.081	15.000	10.000	12095	2921	438.1
		12.00	3	380	0.097	18.000	12.000	10080	2921	631.0
		16.00	3	380	0.103	24.000	16.000	7560	2337	897.4
		20.00	3	380	0.121	30.000	20.000	6050	2192	1315.0
	Unalloyed copper	3.00	3	284	0.018	4.500	3.000	30135	1638	22.1
		4.00	3	284	0.024	6.000	4.000	22600	1637	39.3
		5.00	3	284	0.030	7.500	5.000	18080	1637	61.4
		6.00	3	284	0.036	9.000	6.000	15065	1637	88.4
		8.00	3	284	0.048	12.000	8.000	11300	1637	157.2
		10.00	3	284	0.060	15.000	10.000	9040	1637	245.6
		12.00	3	284	0.072	18.000	12.000	7535	1638	353.7
		16.00	3	284	0.077	24.000	16.000	5650	1310	503.0
		20.00	3	284	0.091	30.000	20.000	4520	1228	736.8
	Thermoplastics	3.00	3	380	0.029	4.500	3.000	40320	3505	47.3
		4.00	3	380	0.039	6.000	4.000	30240	3505	84.1
		5.00	3	380	0.048	7.500	5.000	24190	3505	131.4
		6.00	3	380	0.058	9.000	6.000	20160	3505	189.3
		8.00	3	380	0.077	12.000	8.000	15120	3505	336.5
		10.00	3	380	0.097	15.000	10.000	12095	3505	525.8
		12.00	3	380	0.116	18.000	12.000	10080	3505	757.2
		16.00	3	380	0.124	24.000	16.000	7560	2804	1076.9
		20.00	3	380	0.145	30.000	20.000	6050	2630	1577.9
	Cast aluminium	3.00	3	304	0.024	4.500	3.000	32255	2337	31.5
		4.00	3	304	0.032	6.000	4.000	24190	2337	56.1
		5.00	3	304	0.040	7.500	5.000	19355	2337	87.6
		6.00	3	304	0.048	9.000	6.000	16130	2337	126.2
		8.00	3	304	0.064	12.000	8.000	12095	2337	224.3
		10.00	3	304	0.081	15.000	10.000	9675	2337	350.5
		12.00	3	304	0.097	18.000	12.000	8065	2337	504.8
		16.00	3	304	0.103	24.000	16.000	6050	1870	718.2
		20.00	3	304	0.121	30.000	20.000	4840	1753	1052.0

Corner radius end mills E-Cut Alu

Smooth-edged, medium version, neck

Performance **P**

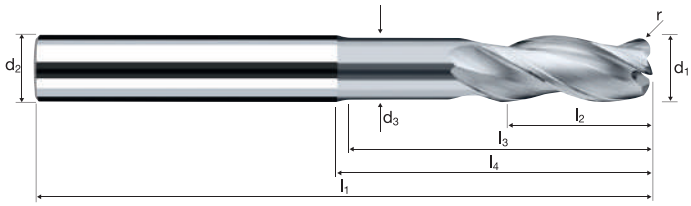
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HM MG10 | λ 34° γ 24°

G 2.5

Vario



Roughing

Finishing

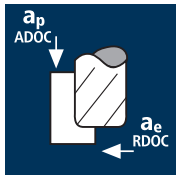
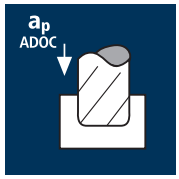
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating **8677** ø-Code **178**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	**8677**	**8577**
178	3.00	6.00	2.80	57	6.60	13.50	16.83	0.200	3	●	
218	4.00	6.00	3.70	60	9.00	18.00	20.54	0.200	3	●	
258	5.00	6.00	4.60	63	11.00	22.50	24.22	0.200	3	●	
180	3.00	6.00	2.80	57	6.60	13.50	16.83	0.500	3	●	
220	4.00	6.00	3.70	60	9.00	18.00	20.54	0.500	3	●	
260	5.00	6.00	4.60	63	11.00	22.50	24.22	0.500	3	●	
300	6.00	6.00	5.50	65	13.50	27.00	28.85	0.500	3	●	
388	8.00	8.00	7.40	76	18.00	36.00	38.37	0.500	3	●	
448	10.00	10.00	9.20	90	22.00	45.00	48.01	0.500	3	●	
302	6.00	6.00	5.50	65	13.50	27.00	28.85	1.000	3	●	
391	8.00	8.00	7.40	76	18.00	36.00	38.37	1.000	3	●	
450	10.00	10.00	9.20	90	22.00	45.00	48.01	1.000	3	●	
501	12.00	12.00	11.00	105	27.00	54.00	57.71	1.000	3	●	
608	16.00	16.00	15.00	125	36.00	72.00	76.27	1.000	3	●	
455	10.00	10.00	9.20	90	22.00	45.00	48.01	2.000	3	●	
505	12.00	12.00	11.00	105	27.00	54.00	57.71	2.000	3	●	
611	16.00	16.00	15.00	125	36.00	72.00	76.27	2.000	3	●	
683	20.00	20.00	19.00	145	44.00	90.00	94.77	2.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	12.00	3	475	0.168	18.000	5.400	12600	6350	617.3
		16.00	3	475	0.179	24.000	7.200	9450	5080	877.9
		20.00	3	475	0.210	30.000	9.000	7560	4763	1286.0
	Unalloyed copper	12.00	3	355	0.126	18.000	5.400	9415	3559	345.9
		16.00	3	355	0.134	24.000	7.200	7065	2849	492.2
		20.00	3	355	0.158	30.000	9.000	5650	2670	720.8
	Thermoplastics	12.00	3	475	0.202	18.000	5.400	12600	7621	740.7
		16.00	3	475	0.215	24.000	7.200	9450	6096	1053.5
		20.00	3	475	0.252	30.000	9.000	7560	5715	1543.2
	Cast aluminium	12.00	3	380	0.168	18.000	5.400	10080	5080	493.8
		16.00	3	380	0.179	24.000	7.200	7560	4064	702.3
		20.00	3	380	0.210	30.000	9.000	6050	3812	1029.1
	Wrought aluminium Construction aluminium	12.00	3	380	0.097	18.000	12.000	10080	2921	631.0
		16.00	3	380	0.103	24.000	16.000	7560	2337	897.4
		20.00	3	380	0.121	30.000	20.000	6050	2192	1315.0
	Unalloyed copper	12.00	3	284	0.072	18.000	12.000	7535	1638	353.7
		16.00	3	284	0.077	24.000	16.000	5650	1310	503.0
		20.00	3	284	0.091	30.000	20.000	4520	1228	736.8
	Thermoplastics	12.00	3	380	0.116	18.000	12.000	10080	3505	757.2
		16.00	3	380	0.124	24.000	16.000	7560	2804	1076.9
		20.00	3	380	0.145	30.000	20.000	6050	2630	1577.9
	Cast aluminium	12.00	3	304	0.097	18.000	12.000	8065	2337	504.8
		16.00	3	304	0.103	24.000	16.000	6050	1870	718.2
		20.00	3	304	0.121	30.000	20.000	4840	1753	1052.0

Corner radius end mills E-Cut Alu

Smooth-edged, medium version, neck

Performance **P**

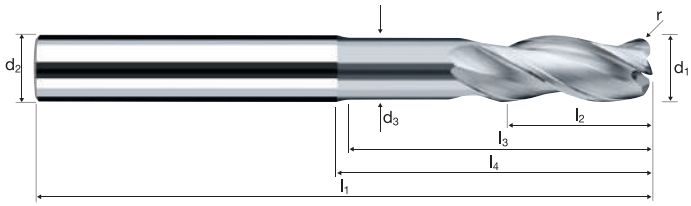
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HM MG10 | λ **34°** γ **24°**

G 2.5

Vario



Roughing

Finishing

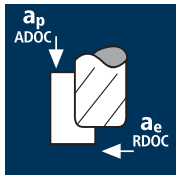
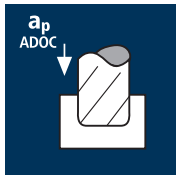
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8677** | ø-Code **507**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	**8677**	**8577**
507	12.00	12.00	11.00	105	27.00	54.00	57.71	3.000	3	●	
613	16.00	16.00	15.00	125	36.00	72.00	76.27	3.000	3	●	
685	20.00	20.00	19.00	145	44.00	90.00	94.77	3.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	3.00	3	380	0.038	4.500	1.200	40320	4572	24.7
		4.00	3	380	0.050	6.000	1.600	30240	4572	43.9
		5.00	3	380	0.063	7.500	2.000	24190	4572	68.6
		6.00	3	380	0.076	9.000	2.400	20160	4572	98.8
		8.00	3	380	0.101	12.000	3.200	15120	4572	175.6
		10.00	3	380	0.126	15.000	4.000	12095	4572	274.3
		12.00	3	380	0.151	18.000	4.800	10080	4572	395.0
		16.00	3	380	0.161	24.000	6.400	7560	3658	561.8
		20.00	3	380	0.189	30.000	8.000	6050	3430	823.3
	Unalloyed copper	3.00	3	285	0.029	4.500	1.200	30240	2586	14.0
		4.00	3	285	0.038	6.000	1.600	22680	2586	24.8
		5.00	3	285	0.048	7.500	2.000	18145	2586	38.8
		6.00	3	285	0.057	9.000	2.400	15120	2586	55.8
		8.00	3	285	0.076	12.000	3.200	11340	2586	99.3
		10.00	3	285	0.095	15.000	4.000	9070	2585	155.1
		12.00	3	285	0.114	18.000	4.800	7560	2586	223.4
		16.00	3	285	0.122	24.000	6.400	5670	2068	317.7
		20.00	3	285	0.143	30.000	8.000	4535	1939	465.3
	Thermoplastics	3.00	3	380	0.045	4.500	1.200	40320	5480	29.6
		4.00	3	380	0.060	6.000	1.600	30240	5480	52.6
		5.00	3	380	0.076	7.500	2.000	24190	5479	82.2
		6.00	3	380	0.091	9.000	2.400	20160	5480	118.4
		8.00	3	380	0.121	12.000	3.200	15120	5480	210.4
		10.00	3	380	0.151	15.000	4.000	12095	5479	328.7
		12.00	3	380	0.181	18.000	4.800	10080	5480	473.4
		16.00	3	380	0.193	24.000	6.400	7560	4384	673.3
		20.00	3	380	0.227	30.000	8.000	6050	4111	986.6
	Cast aluminium	3.00	3	305	0.041	4.500	1.200	32360	3961	21.4
		4.00	3	305	0.054	6.000	1.600	24270	3961	38.0
		5.00	3	305	0.068	7.500	2.000	19415	3961	59.4
		6.00	3	305	0.082	9.000	2.400	16180	3961	85.6
		8.00	3	305	0.109	12.000	3.200	12135	3961	152.1
		10.00	3	305	0.136	15.000	4.000	9710	3962	237.7
		12.00	3	305	0.163	18.000	4.800	8090	3961	342.2
		16.00	3	305	0.174	24.000	6.400	6070	3170	486.9
		20.00	3	305	0.204	30.000	8.000	4855	2971	713.1
	Wrought aluminium Construction aluminium	3.00	3	304	0.022	3.000	3.000	32255	2103	18.9
		4.00	3	304	0.029	4.000	4.000	24190	2103	33.6
		5.00	3	304	0.036	5.000	5.000	19355	2103	52.6
		6.00	3	304	0.043	6.000	6.000	16130	2104	75.7
		8.00	3	304	0.058	8.000	8.000	12095	2103	134.6
		10.00	3	304	0.072	10.000	10.000	9675	2103	210.3
		12.00	3	304	0.087	12.000	12.000	8065	2104	302.9
		16.00	3	304	0.093	16.000	16.000	6050	1683	430.9
		20.00	3	304	0.109	20.000	20.000	4840	1578	631.2
	Unalloyed copper	3.00	3	228	0.016	3.000	3.000	24190	1189	10.7
		4.00	3	228	0.022	4.000	4.000	18145	1189	19.0
		5.00	3	228	0.027	5.000	5.000	14515	1189	29.7
		6.00	3	228	0.033	6.000	6.000	12095	1189	42.8
		8.00	3	228	0.044	8.000	8.000	9070	1189	76.1
		10.00	3	228	0.055	10.000	10.000	7255	1189	118.9
		12.00	3	228	0.066	12.000	12.000	6050	1190	171.3
		16.00	3	228	0.070	16.000	16.000	4535	951	243.5
		20.00	3	228	0.082	20.000	20.000	3630	892	356.9
	Thermoplastics	3.00	3	304	0.026	3.000	3.000	32255	2521	22.7
		4.00	3	304	0.035	4.000	4.000	24190	2520	40.3
		5.00	3	304	0.043	5.000	5.000	19355	2521	63.0
		6.00	3	304	0.052	6.000	6.000	16130	2521	90.8
		8.00	3	304	0.069	8.000	8.000	12095	2520	161.3
		10.00	3	304	0.087	10.000	10.000	9675	2520	252.0
		12.00	3	304	0.104	12.000	12.000	8065	2521	363.0
		16.00	3	304	0.111	16.000	16.000	6050	2017	516.4
		20.00	3	304	0.130	20.000	20.000	4840	1891	756.4
	Cast aluminium	3.00	3	244	0.023	3.000	3.000	25890	1822	16.4
		4.00	3	244	0.031	4.000	4.000	19415	1822	29.2
		5.00	3	244	0.039	5.000	5.000	15535	1822	45.6
		6.00	3	244	0.047	6.000	6.000	12945	1822	65.6
		8.00	3	244	0.063	8.000	8.000	9710	1822	116.6
		10.00	3	244	0.078	10.000	10.000	7765	1822	182.2
		12.00	3	244	0.094	12.000	12.000	6470	1821	262.3
		16.00	3	244	0.100	16.000	16.000	4855	1458	373.2
		20.00	3	244	0.117	20.000	20.000	3885	1367	546.8

Corner radius end mills E-Cut Alu

Smooth-edged, long version, neck

Performance **P**

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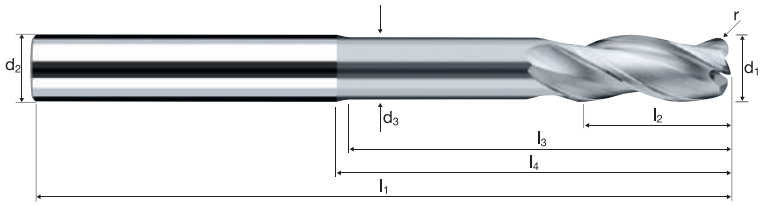
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HM
MG10

λ **34°**
γ **24°**

G 2.5

Vario



Roughing

Finishing

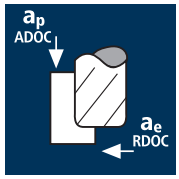
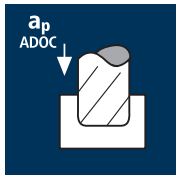
ReTool®

III

Al Aluminium > 99%
Al Aluminium Alloy
Al Aluminium Cast
Cu Copper
Plastic Thermoplast

Example: **Order-N°.** Coating Article-N°. ø-Code **8687** **178**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	**8687**	**8587**
178	3.00	6.00	2.80	60	6.60	16.80	20.13	0.200	3	●	
218	4.00	6.00	3.70	65	9.00	22.50	25.04	0.200	3	●	
258	5.00	6.00	4.60	68	11.00	28.00	29.72	0.200	3	●	
180	3.00	6.00	2.80	60	6.60	16.80	20.13	0.500	3	●	
220	4.00	6.00	3.70	65	9.00	22.50	25.04	0.500	3	●	
260	5.00	6.00	4.60	68	11.00	28.00	29.72	0.500	3	●	
300	6.00	6.00	5.50	73	13.50	34.00	35.85	0.500	3	●	
388	8.00	8.00	7.40	84	18.00	45.00	47.37	0.500	3	●	
448	10.00	10.00	9.20	100	22.00	56.00	59.01	0.500	3	●	
302	6.00	6.00	5.50	73	13.50	34.00	35.85	1.000	3	●	
391	8.00	8.00	7.40	84	18.00	45.00	47.37	1.000	3	●	
450	10.00	10.00	9.20	100	22.00	56.00	59.01	1.000	3	●	
501	12.00	12.00	11.00	117	27.00	67.50	71.21	1.000	3	●	
608	16.00	16.00	15.00	144	36.00	90.00	94.27	1.000	3	●	
455	10.00	10.00	9.20	100	22.00	56.00	59.01	2.000	3	●	
505	12.00	12.00	11.00	117	27.00	67.50	71.21	2.000	3	●	
611	16.00	16.00	15.00	144	36.00	90.00	94.27	2.000	3	●	
683	20.00	20.00	19.00	169	44.00	112.00	116.77	2.000	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	12.00	3	380	0.151	18.000	4.800	10080	4572	395.0
		16.00	3	380	0.161	24.000	6.400	7560	3658	561.8
		20.00	3	380	0.189	30.000	8.000	6050	3430	823.3
	Unalloyed copper	12.00	3	285	0.114	18.000	4.800	7560	2586	223.4
		16.00	3	285	0.122	24.000	6.400	5670	2068	317.7
		20.00	3	285	0.143	30.000	8.000	4535	1939	465.3
	Thermoplastics	12.00	3	380	0.181	18.000	4.800	10080	5480	473.4
		16.00	3	380	0.193	24.000	6.400	7560	4384	673.3
		20.00	3	380	0.227	30.000	8.000	6050	4111	986.6
	Cast aluminium	12.00	3	305	0.163	18.000	4.800	8090	3961	342.2
		16.00	3	305	0.174	24.000	6.400	6070	3170	486.9
		20.00	3	305	0.204	30.000	8.000	4855	2971	713.1
	Wrought aluminium Construction aluminium	12.00	3	304	0.087	12.000	12.000	8065	2104	302.9
		16.00	3	304	0.093	16.000	16.000	6050	1683	430.9
		20.00	3	304	0.109	20.000	20.000	4840	1578	631.2
	Unalloyed copper	12.00	3	228	0.066	12.000	12.000	6050	1190	171.3
		16.00	3	228	0.070	16.000	16.000	4535	951	243.5
		20.00	3	228	0.082	20.000	20.000	3630	892	356.9
	Thermoplastics	12.00	3	304	0.104	12.000	12.000	8065	2521	363.0
		16.00	3	304	0.111	16.000	16.000	6050	2017	516.4
		20.00	3	304	0.130	20.000	20.000	4840	1891	756.4
	Cast aluminium	12.00	3	244	0.094	12.000	12.000	6470	1821	262.3
		16.00	3	244	0.100	16.000	16.000	4855	1458	373.2
		20.00	3	244	0.117	20.000	20.000	3885	1367	546.8

Corner radius end mills E-Cut Alu

Smooth-edged, long version, neck

Performance **P**

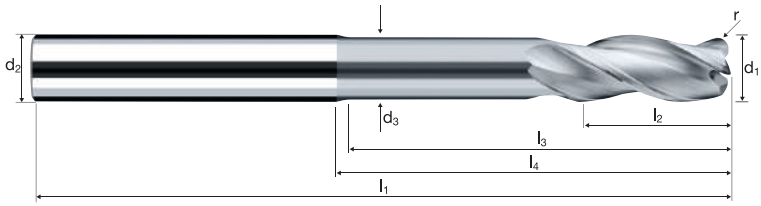
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HM MG10 | λ **34°** γ **24°**

G 2.5

Vario



Roughing

Finishing

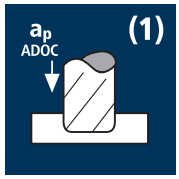
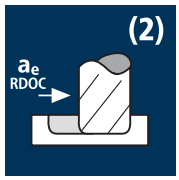
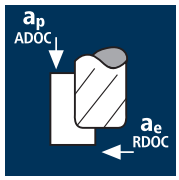
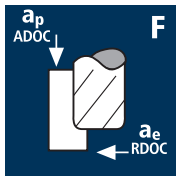
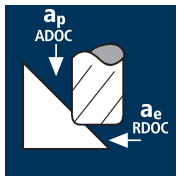
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8687** | ø-Code **507**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	**8687**	**8587**
507	12.00	12.00	11.00	117	27.00	67.50	71.21	3.000	3	●	
613	16.00	16.00	15.00	144	36.00	90.00	94.27	3.000	3	●	
685	20.00	20.00	19.00	169	44.00	112.00	116.77	3.000	3	●	

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	3.00	3	0.030	2.000	3.000	900	1350	1800	2700
		4.00	3	0.040	3.000	4.000	1200	1800	2400	3600
		6.00	3	0.060	4.000	6.000	1800	2700	3600	5400
		8.00	3	0.085	5.000	8.000	2550	3825	5100	7650
		10.00	3	0.105	5.500	10.000	3150	4725	6300	9450
		12.00	3	0.125	6.000	12.000	3750	5625	7500	11250
		16.00	3	0.135	6.500	16.000	4050	6075	8100	12150
		20.00	3	0.140	7.000	20.000	4200	6300	8400	12600
		25.00	3	0.150	7.000	25.000	4500	6750	9000	13500
	Wrought aluminium Construction aluminium	3.00	3	0.030	2.000	2.400	900	1350	1800	2700
		4.00	3	0.040	3.000	3.200	1200	1800	2400	3600
		6.00	3	0.060	4.000	4.800	1800	2700	3600	5400
		8.00	3	0.085	5.000	6.400	2550	3825	5100	7650
		10.00	3	0.105	5.500	8.000	3150	4725	6300	9450
		12.00	3	0.125	6.000	9.600	3750	5625	7500	11250
		16.00	3	0.135	6.500	12.800	4050	6075	8100	12150
		20.00	3	0.140	7.000	16.000	4200	6300	8400	12600
		25.00	3	0.150	7.000	20.000	4500	6750	9000	13500
	Wrought aluminium Construction aluminium	3.00	3	0.030	3.000	1.800	900	1350	1800	2700
		4.00	3	0.040	4.500	2.400	1200	1800	2400	3600
		6.00	3	0.060	6.000	3.600	1800	2700	3600	5400
		8.00	3	0.085	7.500	4.800	2550	3825	5100	7650
		10.00	3	0.105	8.300	6.000	3150	4725	6300	9450
		12.00	3	0.125	9.000	7.200	3750	5625	7500	11250
		16.00	3	0.135	9.800	9.600	4050	6075	8100	12150
		20.00	3	0.140	10.500	12.000	4200	6300	8400	12600
		25.00	3	0.150	10.500	15.000	4500	6750	9000	13500
	Wrought aluminium Construction aluminium	3.00	3	0.010	3.000	0.100	300	450	600	900
		4.00	3	0.010	4.500	0.100	300	450	600	900
		6.00	3	0.020	6.000	0.200	600	900	1200	1800
		8.00	3	0.025	7.500	0.250	750	1125	1500	2250
		10.00	3	0.030	8.300	0.300	900	1350	1800	2700
		12.00	3	0.040	9.000	0.350	1200	1800	2400	3600
		16.00	3	0.040	9.800	0.500	1200	1800	2400	3600
		20.00	3	0.040	10.500	0.600	1200	1800	2400	3600
		25.00	3	0.045	10.500	0.750	1350	2025	2700	4050
	Wrought aluminium Construction aluminium	3.00	3	0.065	0.400	0.400	1950	2925	3900	5850
		4.00	3	0.090	0.450	0.450	2700	4050	5400	8100
		6.00	3	0.130	0.400	0.400	3900	5850	7800	11700
		8.00	3	0.185	0.450	0.450	5550	8325	11100	16650
		10.00	3	0.230	0.500	0.500	6900	10350	13800	20700
		12.00	3	0.275	0.600	0.600	8250	12375	16500	24750
		16.00	3	0.295	0.750	0.750	8850	13275	17700	26550
		20.00	3	0.310	1.000	1.000	9300	13950	18600	27900
		25.00	3	0.330	1.200	1.200	9900	14850	19800	29700

Corner radius end mills AX

Smooth-edged, version 3xd, neck

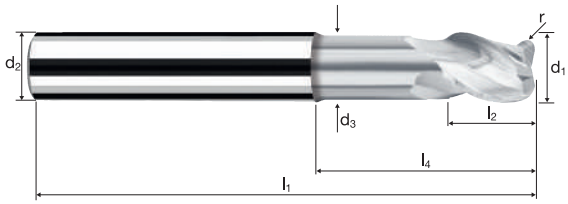
X-Generation

HM
MG10

λ 40°
γ 20°

G 2.5

Vario



Roughing

Finishing

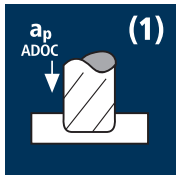
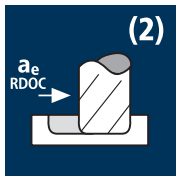
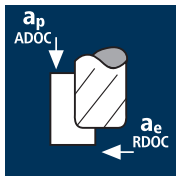
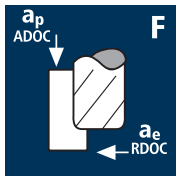
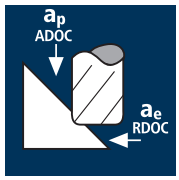
ReTool®

III

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating **C** Article-N°. **15583** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15583	CELERO C15583
180	3.00	6.00	2.80	54	4.00	9.00	15.37	0.500	3	●	●
220	4.00	6.00	3.70	54	5.00	12.00	16.82	0.500	3	●	●
260	5.00	6.00	4.60	54	6.00	15.00	18.27	0.500	3	●	●
300	6.00	6.00	5.50	54	7.00	16.15	18.00	0.500	3	●	●
302	6.00	6.00	5.50	54	7.00	16.15	18.00	1.000	3	●	●
391	8.00	8.00	7.40	63	9.00	21.63	24.00	1.000	3	●	●
450	10.00	10.00	9.20	72	11.00	26.99	30.00	1.000	3	●	●
501	12.00	12.00	11.00	83	13.00	32.29	36.00	1.000	3	●	●
608	16.00	16.00	15.00	97	18.00	43.73	48.00	1.000	3	●	●
680	20.00	20.00	19.00	111	22.00	55.23	60.00	1.000	3	●	●
770	25.00	25.00	24.00	132	27.00	69.68	75.00	1.000	3	●	●
453	10.00	10.00	9.20	72	11.00	26.99	30.00	1.500	3	●	–
503	12.00	12.00	11.00	83	13.00	32.29	36.00	1.500	3	●	–
611	16.00	16.00	15.00	97	18.00	43.73	48.00	2.000	3	●	–
683	20.00	20.00	19.00	111	22.00	55.23	60.00	2.000	3	●	–

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	3	0.060	4.000	6.000	1800	2700	3600	5400
		8.00	3	0.085	5.000	8.000	2550	3825	5100	7650
		10.00	3	0.105	5.500	10.000	3150	4725	6300	9450
		12.00	3	0.125	6.000	12.000	3750	5625	7500	11250
		16.00	3	0.135	6.500	16.000	4050	6075	8100	12150
		20.00	3	0.140	7.000	20.000	4200	6300	8400	12600
		25.00	3	0.150	7.000	25.000	4500	6750	9000	13500
	Wrought aluminium Construction aluminium	6.00	3	0.060	4.000	4.800	1800	2700	3600	5400
		8.00	3	0.085	5.000	6.400	2550	3825	5100	7650
		10.00	3	0.105	5.500	8.000	3150	4725	6300	9450
		12.00	3	0.125	6.000	9.600	3750	5625	7500	11250
		16.00	3	0.135	6.500	12.800	4050	6075	8100	12150
		20.00	3	0.140	7.000	16.000	4200	6300	8400	12600
		25.00	3	0.150	7.000	20.000	4500	6750	9000	13500
	Wrought aluminium Construction aluminium	6.00	3	0.060	6.000	3.600	1800	2700	3600	5400
		8.00	3	0.085	7.500	4.800	2550	3825	5100	7650
		10.00	3	0.105	8.300	6.000	3150	4725	6300	9450
		12.00	3	0.125	9.000	7.200	3750	5625	7500	11250
		16.00	3	0.135	9.800	9.600	4050	6075	8100	12150
		20.00	3	0.140	10.500	12.000	4200	6300	8400	12600
		25.00	3	0.150	10.500	15.000	4500	6750	9000	13500
	Wrought aluminium Construction aluminium	6.00	3	0.020	6.000	0.200	600	900	1200	1800
		8.00	3	0.025	7.500	0.250	750	1125	1500	2250
		10.00	3	0.030	8.300	0.300	900	1350	1800	2700
		12.00	3	0.040	9.000	0.350	1200	1800	2400	3600
		16.00	3	0.040	9.800	0.500	1200	1800	2400	3600
		20.00	3	0.040	10.500	0.600	1200	1800	2400	3600
		25.00	3	0.045	10.500	0.750	1350	2025	2700	4050
	Wrought aluminium Construction aluminium	6.00	3	0.130	0.400	0.400	3900	5850	7800	11700
		8.00	3	0.185	0.450	0.450	5550	8325	11100	16650
		10.00	3	0.230	0.500	0.500	6900	10350	13800	20700
		12.00	3	0.275	0.600	0.600	8250	12375	16500	24750
		16.00	3	0.295	0.750	0.750	8850	13275	17700	26550
		20.00	3	0.310	1.000	1.000	9300	13950	18600	27900
		25.00	3	0.330	1.200	1.200	9900	14850	19800	29700

Corner radius end mills AX

Smooth-edged, version 3xd, neck

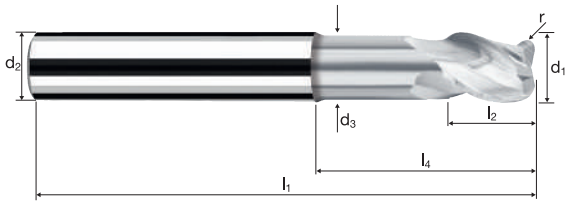
X-Generation

HM
MG10

λ 40°
γ 20°

G 2.5

Vario



Roughing

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

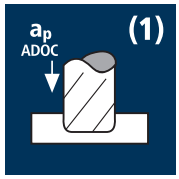
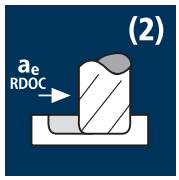
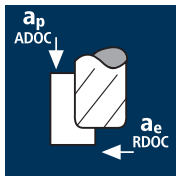
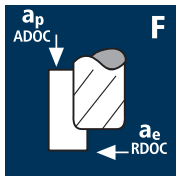
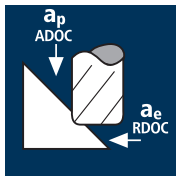
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15583** ø-Code **307**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15583	CELERO C15583
307	6.00	6.00	5.50	54	7.00	16.15	18.00	2.500	3	●	●
397	8.00	8.00	7.40	63	9.00	21.63	24.00	2.500	3	●	●
457	10.00	10.00	9.20	72	11.00	26.99	30.00	2.500	3	●	●
506	12.00	12.00	11.00	83	13.00	32.29	36.00	2.500	3	●	●
612	16.00	16.00	15.00	97	18.00	43.73	48.00	2.500	3	●	●
684	20.00	20.00	19.00	111	22.00	55.23	60.00	2.500	3	●	●
774	25.00	25.00	24.00	132	27.00	69.68	75.00	2.500	3	●	●
459	10.00	10.00	9.20	72	11.00	26.99	30.00	4.000	3	●	●
508	12.00	12.00	11.00	83	13.00	32.29	36.00	4.000	3	●	●
614	16.00	16.00	15.00	97	18.00	43.73	48.00	4.000	3	●	●
686	20.00	20.00	19.00	111	22.00	55.23	60.00	4.000	3	●	●
776	25.00	25.00	24.00	132	27.00	69.68	75.00	4.000	3	●	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	3.00	2	0.050	2.000	3.000	1000	1500	2000	3000
		4.00	2	0.065	3.000	4.000	1300	1950	2600	3900
		6.00	2	0.100	4.000	6.000	2000	3000	4000	6000
		8.00	2	0.130	5.000	8.000	2600	3900	5200	7800
		10.00	2	0.165	5.500	10.000	3300	4950	6600	9900
		12.00	2	0.195	6.000	12.000	3900	5850	7800	11700
		16.00	2	0.210	6.500	16.000	4200	6300	8400	12600
		20.00	2	0.220	7.000	20.000	4400	6600	8800	13200
		25.00	2	0.230	7.000	25.000	4600	6900	9200	13800
	Wrought aluminium Construction aluminium	3.00	2	0.050	2.000	2.400	1000	1500	2000	3000
		4.00	2	0.065	3.000	3.200	1300	1950	2600	3900
		6.00	2	0.100	4.000	4.800	2000	3000	4000	6000
		8.00	2	0.130	5.000	6.400	2600	3900	5200	7800
		10.00	2	0.165	5.500	8.000	3300	4950	6600	9900
		12.00	2	0.195	6.000	9.600	3900	5850	7800	11700
		16.00	2	0.210	6.500	12.800	4200	6300	8400	12600
		20.00	2	0.220	7.000	16.000	4400	6600	8800	13200
		25.00	2	0.230	7.000	20.000	4600	6900	9200	13800
	Wrought aluminium Construction aluminium	3.00	2	0.050	3.000	1.800	1000	1500	2000	3000
		4.00	2	0.065	4.500	2.400	1300	1950	2600	3900
		6.00	2	0.100	6.000	3.600	2000	3000	4000	6000
		8.00	2	0.130	7.500	4.800	2600	3900	5200	7800
		10.00	2	0.165	8.300	6.000	3300	4950	6600	9900
		12.00	2	0.195	9.000	7.200	3900	5850	7800	11700
		16.00	2	0.210	9.800	9.600	4200	6300	8400	12600
		20.00	2	0.220	10.500	12.000	4400	6600	8800	13200
		25.00	2	0.230	10.500	15.000	4600	6900	9200	13800
	Wrought aluminium Construction aluminium	3.00	2	0.015	3.000	0.100	300	450	600	900
		4.00	2	0.020	4.500	0.100	400	600	800	1200
		6.00	2	0.030	6.000	0.200	600	900	1200	1800
		8.00	2	0.040	7.500	0.250	800	1200	1600	2400
		10.00	2	0.050	8.300	0.300	1000	1500	2000	3000
		12.00	2	0.060	9.000	0.350	1200	1800	2400	3600
		16.00	2	0.065	9.800	0.500	1300	1950	2600	3900
		20.00	2	0.065	10.500	0.600	1300	1950	2600	3900
		25.00	2	0.070	10.500	0.750	1400	2100	2800	4200
	Wrought aluminium Construction aluminium	3.00	2	0.110	0.300	0.300	2200	3300	4400	6600
		4.00	2	0.145	0.350	0.350	2900	4350	5800	8700
		6.00	2	0.220	0.400	0.400	4400	6600	8800	13200
		8.00	2	0.285	0.450	0.450	5700	8550	11400	17100
		10.00	2	0.365	0.500	0.500	7300	10950	14600	21900
		12.00	2	0.430	0.600	0.600	8600	12900	17200	25800
		16.00	2	0.460	0.750	0.750	9200	13800	18400	27600
		20.00	2	0.485	1.000	1.000	9700	14550	19400	29100
		25.00	2	0.505	1.200	1.200	10100	15150	20200	30300

Corner radius end mills AX

Smooth-edged, version 3xd, neck

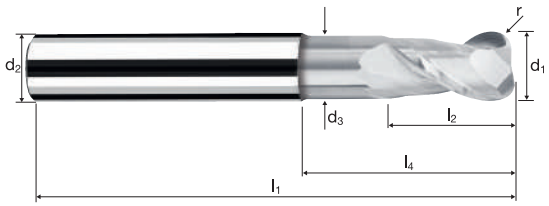
X-Generation

HM
MG10

λ 40°
γ 20°

G 2.5

Vario



Roughing

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

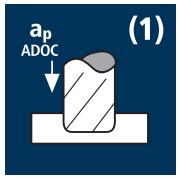
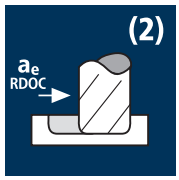
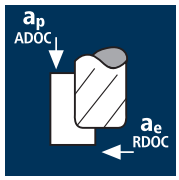
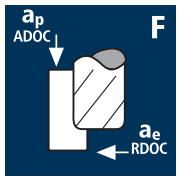
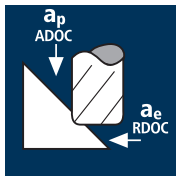
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15573** ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15573	CELERO C15573
180	3.00	6.00	2.80	54	4.00	9.00	15.37	0.500	2	●	●
220	4.00	6.00	3.70	54	5.00	12.00	16.82	0.500	2	●	●
260	5.00	6.00	4.60	54	6.00	15.00	18.27	0.500	2	●	●
300	6.00	6.00	5.50	54	7.00	16.15	18.00	0.500	2	●	●
302	6.00	6.00	5.50	54	7.00	16.15	18.00	1.000	2	●	●
391	8.00	8.00	7.40	63	9.00	21.63	24.00	1.000	2	●	●
450	10.00	10.00	9.20	72	11.00	26.99	30.00	1.000	2	●	●
501	12.00	12.00	11.00	83	13.00	32.29	36.00	1.000	2	●	●
608	16.00	16.00	15.00	97	18.00	43.73	48.00	1.000	2	●	●
680	20.00	20.00	19.00	111	22.00	55.23	60.00	1.000	2	●	●
770	25.00	25.00	24.00	132	27.00	69.68	75.00	1.000	2	●	●
453	10.00	10.00	9.20	72	11.00	26.99	30.00	1.500	2	●	–
503	12.00	12.00	11.00	83	13.00	32.29	36.00	1.500	2	●	–
611	16.00	16.00	15.00	97	18.00	43.73	48.00	2.000	2	●	–
683	20.00	20.00	19.00	111	22.00	55.23	60.00	2.000	2	●	–

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	2	0.100	4.000	6.000	2000	3000	4000	6000
		8.00	2	0.130	5.000	8.000	2600	3900	5200	7800
		10.00	2	0.165	5.500	10.000	3300	4950	6600	9900
		12.00	2	0.195	6.000	12.000	3900	5850	7800	11700
		16.00	2	0.210	6.500	16.000	4200	6300	8400	12600
		20.00	2	0.220	7.000	20.000	4400	6600	8800	13200
		25.00	2	0.230	7.000	25.000	4600	6900	9200	13800
	Wrought aluminium Construction aluminium	6.00	2	0.100	4.000	4.800	2000	3000	4000	6000
		8.00	2	0.130	5.000	6.400	2600	3900	5200	7800
		10.00	2	0.165	5.500	8.000	3300	4950	6600	9900
		12.00	2	0.195	6.000	9.600	3900	5850	7800	11700
		16.00	2	0.210	6.500	12.800	4200	6300	8400	12600
		20.00	2	0.220	7.000	16.000	4400	6600	8800	13200
		25.00	2	0.230	7.000	20.000	4600	6900	9200	13800
	Wrought aluminium Construction aluminium	6.00	2	0.100	6.000	3.600	2000	3000	4000	6000
		8.00	2	0.130	7.500	4.800	2600	3900	5200	7800
		10.00	2	0.165	8.300	6.000	3300	4950	6600	9900
		12.00	2	0.195	9.000	7.200	3900	5850	7800	11700
		16.00	2	0.210	9.800	9.600	4200	6300	8400	12600
		20.00	2	0.220	10.500	12.000	4400	6600	8800	13200
		25.00	2	0.230	10.500	15.000	4600	6900	9200	13800
	Wrought aluminium Construction aluminium	6.00	2	0.030	6.000	0.200	600	900	1200	1800
		8.00	2	0.040	7.500	0.250	800	1200	1600	2400
		10.00	2	0.050	8.300	0.300	1000	1500	2000	3000
		12.00	2	0.060	9.000	0.350	1200	1800	2400	3600
		16.00	2	0.065	9.800	0.500	1300	1950	2600	3900
		20.00	2	0.065	10.500	0.600	1300	1950	2600	3900
		25.00	2	0.070	10.500	0.750	1400	2100	2800	4200
	Wrought aluminium Construction aluminium	6.00	2	0.220	0.400	0.400	4400	6600	8800	13200
		8.00	2	0.285	0.450	0.450	5700	8550	11400	17100
		10.00	2	0.365	0.500	0.500	7300	10950	14600	21900
		12.00	2	0.430	0.600	0.600	8600	12900	17200	25800
		16.00	2	0.460	0.750	0.750	9200	13800	18400	27600
		20.00	2	0.485	1.000	1.000	9700	14550	19400	29100
		25.00	2	0.505	1.200	1.200	10100	15150	20200	30300

Corner radius end mills AX

Smooth-edged, version 3xd, neck

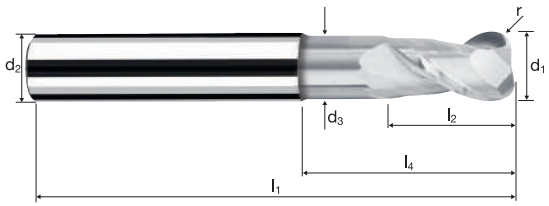
X-Generation

HM
MG10

λ 40°
γ 20°

G 2.5

Vario



Roughing

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

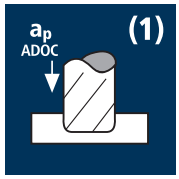
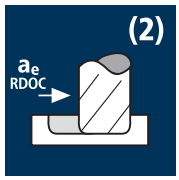
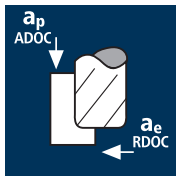
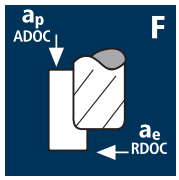
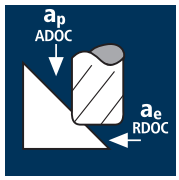
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15573** ø-Code **307**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15573	CELERO C15573
307	6.00	6.00	5.50	54	7.00	16.15	18.00	2.500	2	●	●
397	8.00	8.00	7.40	63	9.00	21.63	24.00	2.500	2	●	●
457	10.00	10.00	9.20	72	11.00	26.99	30.00	2.500	2	●	●
506	12.00	12.00	11.00	83	13.00	32.29	36.00	2.500	2	●	●
612	16.00	16.00	15.00	97	18.00	43.73	48.00	2.500	2	●	●
684	20.00	20.00	19.00	111	22.00	55.23	60.00	2.500	2	●	●
774	25.00	25.00	24.00	132	27.00	69.68	75.00	2.500	2	●	●
459	10.00	10.00	9.20	72	11.00	26.99	30.00	4.000	2	●	●
508	12.00	12.00	11.00	83	13.00	32.29	36.00	4.000	2	●	●
614	16.00	16.00	15.00	97	18.00	43.73	48.00	4.000	2	●	●
686	20.00	20.00	19.00	111	22.00	55.23	60.00	4.000	2	●	●
776	25.00	25.00	24.00	132	27.00	69.68	75.00	4.000	2	●	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	3	0.040	4.000	6.000	1200	1800	2400	3600
		8.00	3	0.055	4.500	8.000	1650	2475	3300	4950
		10.00	3	0.070	5.000	10.000	2100	3150	4200	6300
		12.00	3	0.075	5.000	12.000	2250	3375	4500	6750
		16.00	3	0.095	5.000	16.000	2850	4275	5700	8550
		20.00	3	0.115	5.000	20.000	3450	5175	6900	10350
		25.00	3	0.130	5.000	25.000	3900	5850	7800	11700
	Wrought aluminium Construction aluminium	6.00	3	0.040	4.000	3.600	1200	1800	2400	3600
		8.00	3	0.055	4.500	4.800	1650	2475	3300	4950
		10.00	3	0.070	5.000	6.000	2100	3150	4200	6300
		12.00	3	0.075	5.000	7.200	2250	3375	4500	6750
		16.00	3	0.095	5.000	9.600	2850	4275	5700	8550
		20.00	3	0.115	5.000	12.000	3450	5175	6900	10350
		25.00	3	0.130	5.000	15.000	3900	5850	7800	11700
	Wrought aluminium Construction aluminium	6.00	3	0.040	6.000	3.600	1200	1800	2400	3600
		8.00	3	0.055	6.800	4.800	1650	2475	3300	4950
		10.00	3	0.070	7.500	6.000	2100	3150	4200	6300
		12.00	3	0.075	7.500	7.200	2250	3375	4500	6750
		16.00	3	0.095	7.500	9.600	2850	4275	5700	8550
		20.00	3	0.115	7.500	12.000	3450	5175	6900	10350
		25.00	3	0.130	7.500	15.000	3900	5850	7800	11700
	Wrought aluminium Construction aluminium	6.00	3	0.010	6.000	0.200	300	450	600	900
		8.00	3	0.015	6.800	0.250	450	675	900	1350
		10.00	3	0.020	7.500	0.300	600	900	1200	1800
		12.00	3	0.025	7.500	0.350	750	1125	1500	2250
		16.00	3	0.030	7.500	0.500	900	1350	1800	2700
		20.00	3	0.035	7.500	0.600	1050	1575	2100	3150
		25.00	3	0.040	7.500	0.750	1200	1800	2400	3600
	Wrought aluminium Construction aluminium	6.00	3	0.090	0.450	0.450	2700	4050	5400	8100
		8.00	3	0.120	0.500	0.500	3600	5400	7200	10800
		10.00	3	0.155	0.450	0.450	4650	6975	9300	13950
		12.00	3	0.165	0.500	0.500	4950	7425	9900	14850
		16.00	3	0.210	0.600	0.600	6300	9450	12600	18900
		20.00	3	0.255	0.750	0.750	7650	11475	15300	22950
		25.00	3	0.285	0.800	0.800	8550	12825	17100	25650

Corner radius end mills AX

Smooth-edged, version 5xd, neck

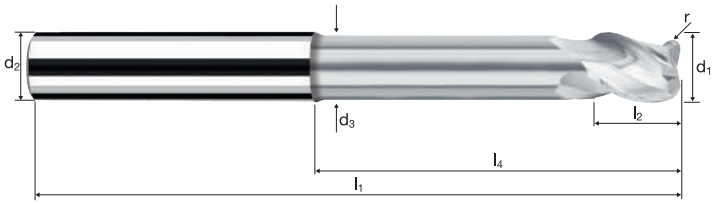
X-Generation

HM
MG10

λ 40°
γ 20°

G 2.5

Vario



Roughing

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

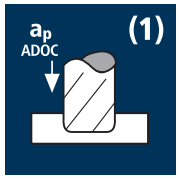
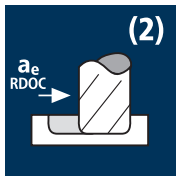
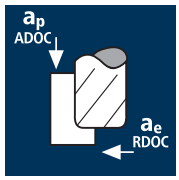
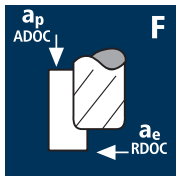
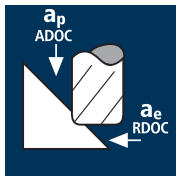
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15585** ø-Code **450**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15585	CELERO C15585
450	10.00	10.00	9.20	91	11.00	46.99	50.00	1.000	3	●	●
501	12.00	12.00	11.00	106	13.00	56.29	60.00	1.000	3	●	●
608	16.00	16.00	15.00	129	18.00	75.73	80.00	1.000	3	●	●
680	20.00	20.00	19.00	151	22.00	95.23	100.00	1.000	3	●	●
770	25.00	25.00	24.00	182	27.00	119.68	125.00	1.000	3	●	●
307	6.00	6.00	5.50	66	7.00	28.15	30.00	2.500	3	●	●
397	8.00	8.00	7.40	76	9.00	37.63	40.00	2.500	3	●	●
457	10.00	10.00	9.20	91	11.00	46.99	50.00	2.500	3	●	●
506	12.00	12.00	11.00	106	13.00	56.29	60.00	2.500	3	●	●
612	16.00	16.00	15.00	129	18.00	75.73	80.00	2.500	3	●	●
684	20.00	20.00	19.00	151	22.00	95.23	100.00	2.500	3	●	●
774	25.00	25.00	24.00	182	27.00	119.68	125.00	2.500	3	●	●
459	10.00	10.00	9.20	91	11.00	46.99	50.00	4.000	3	●	●
508	12.00	12.00	11.00	106	13.00	56.29	60.00	4.000	3	●	●
614	16.00	16.00	15.00	129	18.00	75.73	80.00	4.000	3	●	●
686	20.00	20.00	19.00	151	22.00	95.23	100.00	4.000	3	●	●
776	25.00	25.00	24.00	182	27.00	119.68	125.00	4.000	3	●	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	2	0.065	4.000	6.000	1300	1950	2600	3900
		8.00	2	0.085	4.500	8.000	1700	2550	3400	5100
		10.00	2	0.110	5.000	10.000	2200	3300	4400	6600
		12.00	2	0.120	5.000	12.000	2400	3600	4800	7200
		16.00	2	0.150	5.000	16.000	3000	4500	6000	9000
		20.00	2	0.180	5.000	20.000	3600	5400	7200	10800
		25.00	2	0.200	5.000	25.000	4000	6000	8000	12000
	Wrought aluminium Construction aluminium	6.00	2	0.065	4.000	3.600	1300	1950	2600	3900
		8.00	2	0.085	4.500	4.800	1700	2550	3400	5100
		10.00	2	0.110	5.000	6.000	2200	3300	4400	6600
		12.00	2	0.120	5.000	7.200	2400	3600	4800	7200
		16.00	2	0.150	5.000	9.600	3000	4500	6000	9000
		20.00	2	0.180	5.000	12.000	3600	5400	7200	10800
		25.00	2	0.200	5.000	15.000	4000	6000	8000	12000
	Wrought aluminium Construction aluminium	6.00	2	0.065	6.000	3.600	1300	1950	2600	3900
		8.00	2	0.085	6.800	4.800	1700	2550	3400	5100
		10.00	2	0.110	7.500	6.000	2200	3300	4400	6600
		12.00	2	0.120	7.500	7.200	2400	3600	4800	7200
		16.00	2	0.150	7.500	9.600	3000	4500	6000	9000
		20.00	2	0.180	7.500	12.000	3600	5400	7200	10800
		25.00	2	0.200	7.500	15.000	4000	6000	8000	12000
	Wrought aluminium Construction aluminium	6.00	2	0.020	6.000	0.200	400	600	800	1200
		8.00	2	0.025	6.800	0.250	500	750	1000	1500
		10.00	2	0.035	7.500	0.300	700	1050	1400	2100
		12.00	2	0.035	7.500	0.350	700	1050	1400	2100
		16.00	2	0.045	7.500	0.500	900	1350	1800	2700
		20.00	2	0.055	7.500	0.600	1100	1650	2200	3300
		25.00	2	0.060	7.500	0.750	1200	1800	2400	3600
	Wrought aluminium Construction aluminium	6.00	2	0.145	0.350	0.350	2900	4350	5800	8700
		8.00	2	0.185	0.400	0.400	3700	5550	7400	11100
		10.00	2	0.240	0.450	0.450	4800	7200	9600	14400
		12.00	2	0.265	0.500	0.500	5300	7950	10600	15900
		16.00	2	0.330	0.600	0.600	6600	9900	13200	19800
		20.00	2	0.395	0.750	0.750	7900	11850	15800	23700
		25.00	2	0.440	0.800	0.800	8800	13200	17600	26400

Corner radius end mills AX

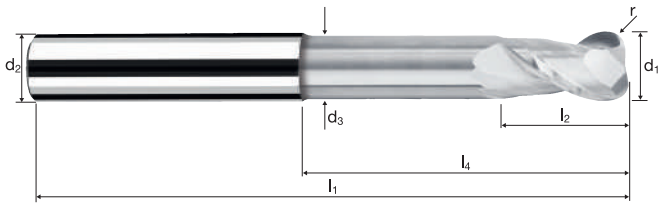
Smooth-edged, version 5xd, neck

X-Generation

HM MG10 | λ 40° γ 20°

G 2.5

Vario



Roughing

Finishing

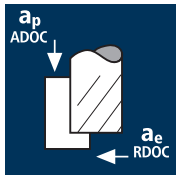
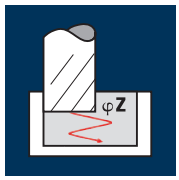
ReTool®

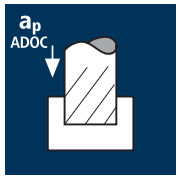
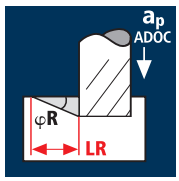
III

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating **C** | Article-N°. **15575** | ø-Code **302**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15575	CELERO C15575
302	6.00	6.00	5.50	66	7.00	28.15	30.00	1.000	2	●	–
391	8.00	8.00	7.40	76	9.00	37.63	40.00	1.000	2	●	–
450	10.00	10.00	9.20	91	11.00	46.99	50.00	1.000	2	●	●
501	12.00	12.00	11.00	106	13.00	56.29	60.00	1.000	2	●	●
608	16.00	16.00	15.00	129	18.00	75.73	80.00	1.000	2	●	●
680	20.00	20.00	19.00	151	22.00	95.23	100.00	1.000	2	●	●
770	25.00	25.00	24.00	182	27.00	119.68	125.00	1.000	2	●	●
307	6.00	6.00	5.50	66	7.00	28.15	30.00	2.500	2	●	●
397	8.00	8.00	7.40	76	9.00	37.63	40.00	2.500	2	●	●
457	10.00	10.00	9.20	91	11.00	46.99	50.00	2.500	2	●	●
506	12.00	12.00	11.00	106	13.00	56.29	60.00	2.500	2	●	●
612	16.00	16.00	15.00	129	18.00	75.73	80.00	2.500	2	●	●
684	20.00	20.00	19.00	151	22.00	95.23	100.00	2.500	2	●	●
774	25.00	25.00	24.00	182	27.00	119.68	125.00	2.500	2	●	●
459	10.00	10.00	9.20	91	11.00	46.99	50.00	4.000	2	●	●
508	12.00	12.00	11.00	106	13.00	56.29	60.00	4.000	2	●	●
614	16.00	16.00	15.00	129	18.00	75.73	80.00	4.000	2	●	●
686	20.00	20.00	19.00	151	22.00	95.23	100.00	4.000	2	●	●
776	25.00	25.00	24.00	182	27.00	119.68	125.00	4.000	2	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Wrought aluminium Construction aluminium	6.00	3	500	0.080	9.000	4.800	26525	6366	275.0	20.0°
		8.00	3	500	0.100	12.000	6.400	19895	5969	458.4	20.0°
		10.00	3	500	0.120	15.000	8.000	15915	5729	687.5	20.0°
		12.00	3	500	0.140	18.000	9.600	13265	5571	962.7	20.0°
		16.00	3	500	0.160	24.000	12.800	9945	4774	1466.4	20.0°
		20.00	3	500	0.180	30.000	16.000	7960	4298	2063.2	20.0°
		25.00	3	500	0.200	37.500	20.000	6365	3819	2864.3	20.0°
	Cast aluminium	6.00	3	450	0.080	9.000	4.800	23875	5730	247.5	20.0°
		8.00	3	450	0.100	12.000	6.400	17905	5372	412.5	20.0°
		10.00	3	450	0.120	15.000	8.000	14325	5157	618.8	20.0°
		12.00	3	450	0.140	18.000	9.600	11935	5013	866.2	20.0°
		16.00	3	450	0.160	24.000	12.800	8950	4296	1319.7	20.0°
		20.00	3	450	0.180	30.000	16.000	7160	3866	1855.9	20.0°
		25.00	3	450	0.200	37.500	20.000	5730	3438	2578.5	20.0°
	Unalloyed copper	6.00	3	400	0.072	9.000	4.800	21220	4584	198.0	12.0°
		8.00	3	400	0.090	12.000	6.400	15915	4297	330.0	12.0°
		10.00	3	400	0.108	15.000	8.000	12730	4125	494.9	12.0°
		12.00	3	400	0.126	18.000	9.600	10610	4011	693.0	12.0°
		16.00	3	400	0.144	24.000	12.800	7960	3439	1056.4	12.0°
		20.00	3	400	0.162	30.000	16.000	6365	3093	1484.8	12.0°
		25.00	3	400	0.180	37.500	20.000	5095	2751	2063.5	12.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Wrought aluminium Construction aluminium	6.00	3	450	0.072	9.000	6.000	23875	5157	278.5	25.0°	19.3
		8.00	3	450	0.090	12.000	8.000	17905	4834	464.1	25.0°	25.7
		10.00	3	450	0.108	15.000	10.000	14325	4641	696.2	25.0°	32.2
		12.00	3	450	0.126	18.000	12.000	11935	4511	974.5	25.0°	38.6
		16.00	3	450	0.144	24.000	16.000	8950	3866	1484.7	25.0°	51.5
		20.00	3	450	0.162	30.000	20.000	7160	3480	2087.9	25.0°	64.3
		25.00	3	450	0.180	37.500	25.000	5730	3094	2900.8	25.0°	80.4
	Cast aluminium	6.00	3	405	0.072	9.000	6.000	21485	4641	250.6	25.0°	19.3
		8.00	3	405	0.090	12.000	8.000	16115	4351	417.7	25.0°	25.7
		10.00	3	405	0.108	15.000	10.000	12890	4176	626.5	25.0°	32.2
		12.00	3	405	0.126	18.000	12.000	10745	4062	877.3	25.0°	38.6
		16.00	3	405	0.144	24.000	16.000	8055	3480	1336.2	25.0°	51.5
		20.00	3	405	0.162	30.000	20.000	6445	3132	1879.4	25.0°	64.3
		25.00	3	405	0.180	37.500	25.000	5155	2784	2609.7	25.0°	80.4
	Unalloyed copper	6.00	3	320	0.058	9.000	6.000	16975	2954	159.5	15.0°	33.6
		8.00	3	320	0.072	12.000	8.000	12730	2750	264.0	15.0°	44.8
		10.00	3	320	0.086	15.000	10.000	10185	2628	394.2	15.0°	56.0
		12.00	3	320	0.101	18.000	12.000	8490	2573	555.7	15.0°	67.2
		16.00	3	320	0.115	24.000	16.000	6365	2196	843.2	15.0°	89.6
		20.00	3	320	0.130	30.000	20.000	5095	1987	1192.3	15.0°	112.0
		25.00	3	320	0.140	37.500	25.000	4075	1712	1604.5	15.0°	140.0

Use **ToolExpert® AX-FPS** to determine the best possible cutting data for your machining environment!

Cylindrical/Square end mills AX-FPS

Profiled, normal version, short neck
High-performance penetration edge, central cooling channel

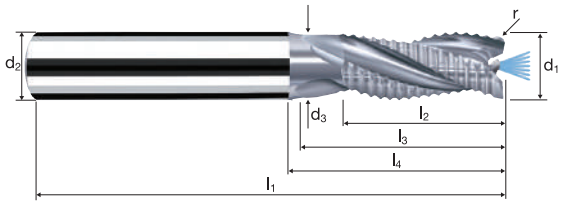
X-Generation

HM
MG10

λ 30°
γ 20°

r

G 2.5



Roughing

Finishing

ReTool®

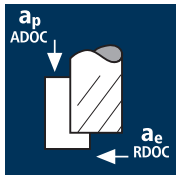
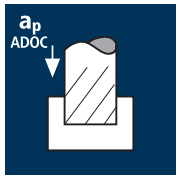
				Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast			

Example: **Order-N°.** Coating **15600** Article-N°. ø-Code **300**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	15600	15500
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.100	3	●	
391	8.00	8.00	7.40	63	18.00	23.63	26.00	0.150	3	●	
450	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	3	●	
501	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	3	●	
610	16.00	16.00	15.00	95	32.00	41.73	46.00	0.200	3	●	
682	20.00	20.00	19.00	104	40.00	48.23	53.00	0.200	3	●	
770**	25.00	25.00	24.00	121	44.00	58.68	64.00	0.250	3	●	
772*	25.00	25.00	24.00	121	50.00	64.68	70.00	0.250	3	●	

* Cylindrical shank HA, shank length = 50 mm

** Shank with side clamping according to DIN 6535 HB

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	600	0.065	9.000	3.600	31830	6207	201.1
		8.00	3	600	0.090	12.000	4.800	23875	6446	371.3
		10.00	3	600	0.110	15.000	6.000	19100	6303	567.3
		12.00	3	600	0.135	18.000	7.200	15915	6446	835.3
		16.00	3	600	0.180	24.000	9.600	11935	6445	1484.9
		20.00	3	600	0.220	30.000	12.000	9550	6303	2269.1
	Unalloyed copper	6.00	3	400	0.065	9.000	3.600	21220	4138	134.1
		8.00	3	400	0.090	12.000	4.800	15915	4297	247.5
		10.00	3	400	0.110	15.000	6.000	12730	4201	378.1
		12.00	3	400	0.135	18.000	7.200	10610	4297	556.9
		16.00	3	400	0.180	24.000	9.600	7960	4298	990.4
		20.00	3	400	0.220	30.000	12.000	6365	4201	1512.3
	Thermoplastics	6.00	3	650	0.065	9.000	3.600	34485	6725	217.9
		8.00	3	650	0.090	12.000	4.800	25865	6984	402.3
		10.00	3	650	0.110	15.000	6.000	20690	6828	614.5
		12.00	3	650	0.135	18.000	7.200	17240	6982	904.9
		16.00	3	650	0.180	24.000	9.600	12930	6982	1608.7
		20.00	3	650	0.220	30.000	12.000	10345	6828	2458.0
	Wrought aluminium Construction aluminium	6.00	3	500	0.060	9.000	6.000	26525	4775	257.8
		8.00	3	500	0.080	12.000	8.000	19895	4775	458.4
		10.00	3	500	0.100	15.000	10.000	15915	4775	716.2
		12.00	3	500	0.120	18.000	12.000	13265	4775	1031.5
		16.00	3	500	0.160	24.000	16.000	9945	4774	1833.1
		20.00	3	500	0.200	30.000	20.000	7960	4776	2865.6
	Unalloyed copper	6.00	3	270	0.060	9.000	6.000	14325	2579	139.2
		8.00	3	270	0.080	12.000	8.000	10745	2579	247.6
		10.00	3	270	0.100	15.000	10.000	8595	2579	386.8
		12.00	3	270	0.120	18.000	12.000	7160	2578	556.8
		16.00	3	270	0.160	24.000	16.000	5370	2578	989.8
		20.00	3	270	0.200	30.000	20.000	4295	2577	1546.2
	Thermoplastics	6.00	3	650	0.060	9.000	6.000	34485	6207	335.2
		8.00	3	650	0.080	12.000	8.000	25865	6208	595.9
		10.00	3	650	0.100	15.000	10.000	20690	6207	931.1
		12.00	3	650	0.120	18.000	12.000	17240	6206	1340.6
		16.00	3	650	0.160	24.000	16.000	12930	6206	2383.3
		20.00	3	650	0.200	30.000	20.000	10345	6207	3724.2

Cylindrical/Square end mills AX

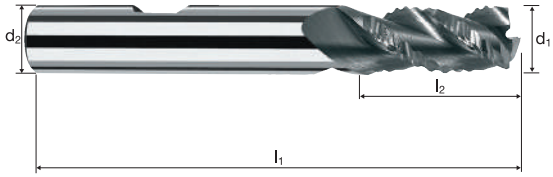
Profiled, normal version

X-Generation

HM
MG10

λ **40°**
γ **18°**

45°



Roughing

Finishing

ToolSchool 8563 / 8663

III

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

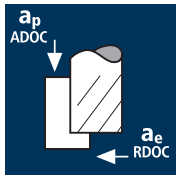
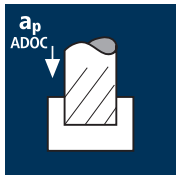
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **5397** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z	CELERO C5397	CELERO C5297
300	6.00	6.00	57	13.00	0.30	3		●
391	8.00	8.00	63	19.00	0.30	3		●
450	10.00	10.00	72	22.00	0.30	3		●
501	12.00	12.00	83	26.00	0.30	3		●
610	16.00	16.00	92	32.00	0.40	3		●
682	20.00	20.00	104	38.00	0.40	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	405	0.078	9.000	4.800	21485	5028	217.2
		8.00	3	428	0.104	12.000	6.400	17030	5313	408.1
		10.00	3	450	0.130	15.000	8.000	14325	5587	670.4
		12.00	3	450	0.156	18.000	9.600	11935	5586	965.2
		16.00	3	450	0.166	24.000	12.800	8950	4468	1372.5
		20.00	3	450	0.195	30.000	16.000	7160	4189	2010.5
	Cast aluminium	6.00	3	324	0.078	9.000	4.800	17190	4023	173.8
		8.00	3	342	0.104	12.000	6.400	13610	4246	326.1
		10.00	3	360	0.130	15.000	8.000	11460	4469	536.3
		12.00	3	360	0.156	18.000	9.600	9550	4469	772.3
		16.00	3	360	0.166	24.000	12.800	7160	3574	1098.0
		20.00	3	360	0.195	30.000	16.000	5730	3352	1609.0
	Unalloyed aluminium	6.00	3	405	0.078	9.000	4.800	21485	5028	217.2
		8.00	3	428	0.104	12.000	6.400	17030	5313	408.1
		10.00	3	450	0.130	15.000	8.000	14325	5587	670.4
		12.00	3	450	0.156	18.000	9.600	11935	5586	965.2
		16.00	3	450	0.166	24.000	12.800	8950	4468	1372.5
		20.00	3	450	0.195	30.000	16.000	7160	4189	2010.5
	Unalloyed copper	6.00	3	329	0.070	9.000	4.800	17455	3676	158.8
		8.00	3	347	0.094	12.000	6.400	13805	3876	297.7
		10.00	3	365	0.117	15.000	8.000	11620	4079	489.4
		12.00	3	365	0.140	18.000	9.600	9680	4077	704.5
		16.00	3	365	0.150	24.000	12.800	7260	3262	1002.0
		20.00	3	365	0.176	30.000	16.000	5810	3059	1468.3
	Wrought aluminium Construction aluminium	6.00	3	365	0.059	7.500	6.000	19365	3428	154.2
		8.00	3	385	0.078	10.000	8.000	15320	3585	286.8
		10.00	3	405	0.098	12.500	10.000	12890	3790	473.7
		12.00	3	405	0.117	15.000	12.000	10745	3772	678.9
		16.00	3	405	0.125	20.000	16.000	8055	3021	966.6
		20.00	3	405	0.146	25.000	20.000	6445	2823	1411.5
	Cast aluminium	6.00	3	292	0.059	7.500	6.000	15490	2742	123.4
		8.00	3	308	0.078	10.000	8.000	12255	2868	229.4
		10.00	3	324	0.098	12.500	10.000	10315	3033	379.1
		12.00	3	324	0.117	15.000	12.000	8595	3017	543.0
		16.00	3	324	0.125	20.000	16.000	6445	2417	773.4
		20.00	3	324	0.146	25.000	20.000	5155	2258	1129.0
	Unalloyed aluminium	6.00	3	365	0.059	7.500	6.000	19365	3428	154.2
		8.00	3	385	0.078	10.000	8.000	15320	3585	286.8
		10.00	3	405	0.098	12.500	10.000	12890	3790	473.7
		12.00	3	405	0.117	15.000	12.000	10745	3772	678.9
		16.00	3	405	0.125	20.000	16.000	8055	3021	966.6
		20.00	3	405	0.146	25.000	20.000	6445	2823	1411.5
	Unalloyed copper	6.00	3	296	0.053	7.500	6.000	15705	2497	112.4
		8.00	3	312	0.070	10.000	8.000	12415	2607	208.6
		10.00	3	329	0.088	12.500	10.000	10470	2764	345.5
		12.00	3	329	0.105	15.000	12.000	8725	2748	494.7
		16.00	3	329	0.112	20.000	16.000	6545	2199	703.7
		20.00	3	329	0.132	25.000	20.000	5235	2073	1036.6

Cylindrical/Square end mills

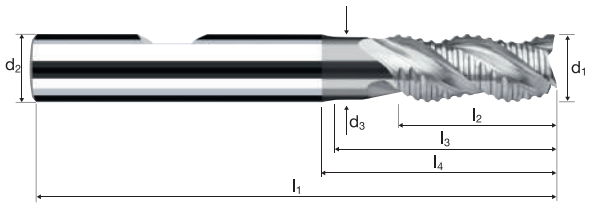
Profiled, normal version, short neck

Performance **P**

$l_2=2.2xd_1$

$l_3=3.0xd_1$

HM MG10 | λ **43°** γ **20°**



Roughing

Finishing

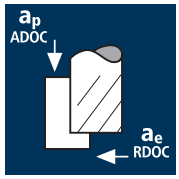
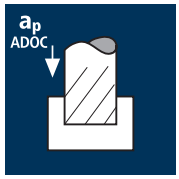
ReTool®

III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating **8663** ø-Code **300**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	**8663**	**8563**
300	6.00	6.00	5.50	57	13.50	18.00	19.85	0.100	3	●	
391	8.00	8.00	7.40	63	18.00	24.00	26.37	0.150	3	●	
450	10.00	10.00	9.20	74	22.00	30.00	33.01	0.200	3	●	
501	12.00	12.00	11.00	85	27.00	36.00	39.71	0.200	3	●	
610	16.00	16.00	15.00	102	36.00	48.00	52.27	0.200	3	●	
682	20.00	20.00	19.00	115	44.00	60.00	64.77	0.250	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	207	0.055	9.000	2.400	10980	1812	39.1
		8.00	3	207	0.070	12.000	3.200	8235	1729	66.4
		10.00	3	207	0.090	15.000	4.000	6590	1779	106.8
		12.00	3	207	0.125	18.000	4.800	5490	2059	177.9
		16.00	3	207	0.170	24.000	6.400	4120	2101	322.7
		20.00	3	207	0.210	30.000	8.000	3295	2076	498.2
	Unalloyed copper	6.00	3	88	0.055	9.000	2.400	4670	771	16.6
		8.00	3	88	0.070	12.000	3.200	3500	735	28.2
		10.00	3	88	0.090	15.000	4.000	2800	756	45.4
		12.00	3	88	0.125	18.000	4.800	2335	876	75.7
		16.00	3	88	0.170	24.000	6.400	1750	893	137.1
		20.00	3	88	0.210	30.000	8.000	1400	882	211.7
	Thermoplastics	6.00	3	224	0.055	9.000	2.400	11885	1961	42.4
		8.00	3	224	0.070	12.000	3.200	8915	1872	71.9
		10.00	3	224	0.090	15.000	4.000	7130	1925	115.5
		12.00	3	224	0.125	18.000	4.800	5940	2228	192.5
		16.00	3	224	0.170	24.000	6.400	4455	2272	349.0
		20.00	3	224	0.210	30.000	8.000	3565	2246	539.0
	Wrought aluminium Construction aluminium	6.00	3	189	0.045	6.000	6.000	10025	1353	48.7
		8.00	3	189	0.055	8.000	8.000	7520	1241	79.4
		10.00	3	189	0.070	10.000	10.000	6015	1263	126.3
		12.00	3	189	0.100	12.000	12.000	5015	1505	216.6
		16.00	3	189	0.135	16.000	16.000	3760	1523	389.8
		20.00	3	189	0.170	20.000	20.000	3010	1535	614.0
	Unalloyed copper	6.00	3	82	0.045	6.000	6.000	4350	587	21.1
		8.00	3	82	0.055	8.000	8.000	3265	539	34.5
		10.00	3	82	0.070	10.000	10.000	2610	548	54.8
		12.00	3	82	0.100	12.000	12.000	2175	653	94.0
		16.00	3	82	0.135	16.000	16.000	1630	660	169.0
		20.00	3	82	0.170	20.000	20.000	1305	666	266.2
	Thermoplastics	6.00	3	224	0.045	6.000	6.000	11885	1605	57.8
		8.00	3	224	0.055	8.000	8.000	8915	1471	94.1
		10.00	3	224	0.070	10.000	10.000	7130	1497	149.7
		12.00	3	224	0.100	12.000	12.000	5940	1782	256.6
		16.00	3	224	0.135	16.000	16.000	4455	1804	461.9
		20.00	3	224	0.170	20.000	20.000	3565	1818	727.3

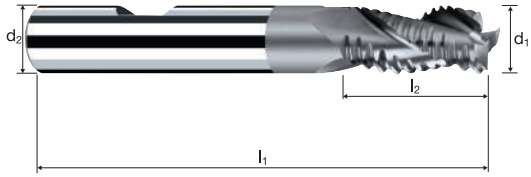
Cylindrical/Square end mills

Profiled, normal version

HSS

HSS-E Co8 | λ **35°** γ **18°**

45°



Roughing

Finishing

ReTool®

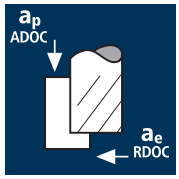
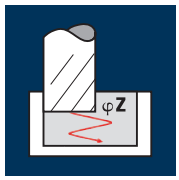
III

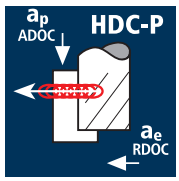
Al Aluminium > 99% | **Al Aluminium Alloy** | Al Aluminium Cast | **Cu Copper** | **Plastic Thermoplast**

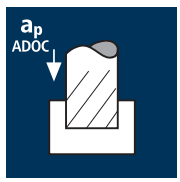
Example: **Order-N°.** Coating **1392** ø-Code **300**

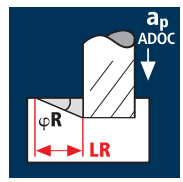
Ø Code	d_1 k12	d_2 h6	l_1	l_2	45°	z	1392	
300	6.00	6.00	57	13.00	0.40	3	●	
402	8.00	10.00	69	19.00	0.50	3	●	
450	10.00	10.00	72	22.00	0.50	3	●	
501	12.00	12.00	83	26.00	0.60	3	●	
610	16.00	16.00	92	32.00	1.10	3	●	
682	20.00	20.00	104	38.00	1.20	3	●	

Previous Article-N°. 0392

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Wrought aluminium Construction aluminium	6.00	3	450	0.064	9.000	3.600	23875	4584	148.5	15.0°
		8.00	3	450	0.080	12.000	4.800	17905	4297	247.5	15.0°
		10.00	3	450	0.096	15.000	6.000	14325	4126	371.3	15.0°
		12.00	3	450	0.112	18.000	7.200	11935	4010	519.7	15.0°
		16.00	3	450	0.128	24.000	9.600	8950	3437	791.8	15.0°
		20.00	3	450	0.144	30.000	12.000	7160	3093	1113.5	15.0°
	Cast aluminium	6.00	3	405	0.064	9.000	3.600	21485	4125	133.7	15.0°
		8.00	3	405	0.080	12.000	4.800	16115	3868	222.8	15.0°
		10.00	3	405	0.096	15.000	6.000	12890	3712	334.1	15.0°
		12.00	3	405	0.112	18.000	7.200	10745	3610	467.9	15.0°
		16.00	3	405	0.128	24.000	9.600	8055	3093	712.7	15.0°
		20.00	3	405	0.144	30.000	12.000	6445	2784	1002.3	15.0°
	Unalloyed copper	6.00	3	360	0.058	9.000	3.600	19100	3323	107.7	9.0°
		8.00	3	360	0.072	12.000	4.800	14325	3094	178.2	9.0°
		10.00	3	360	0.086	15.000	6.000	11460	2957	266.1	9.0°
		12.00	3	360	0.101	18.000	7.200	9550	2894	375.0	9.0°
		16.00	3	360	0.115	24.000	9.600	7160	2470	569.1	9.0°
		20.00	3	360	0.130	30.000	12.000	5730	2235	804.5	9.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	300	0.104	19.000	1.800	15915	4966	169.8
		8.00	3	350	0.134	28.000	2.400	13925	5598	376.2
		10.00	3	400	0.181	34.000	3.000	12730	6912	705.1
		12.00	3	400	0.259	40.000	3.600	10610	8244	1187.1
		16.00	3	500	0.300	48.000	4.800	9945	8951	2062.2
		20.00	3	500	0.340	56.000	6.000	7960	8119	2728.1
	Cast aluminium	6.00	3	270	0.104	19.000	1.800	14325	4469	152.9
		8.00	3	315	0.134	28.000	2.400	12535	5039	338.6
		10.00	3	360	0.181	34.000	3.000	11460	6223	634.7
		12.00	3	360	0.259	40.000	3.600	9550	7420	1068.5
		16.00	3	450	0.300	48.000	4.800	8950	8055	1855.9
		20.00	3	450	0.340	56.000	6.000	7160	7303	2453.9
	Unalloyed copper	6.00	3	240	0.083	19.000	1.800	12730	3170	108.4
		8.00	3	280	0.107	28.000	2.400	11140	3576	240.3
		10.00	3	320	0.145	34.000	3.000	10185	4431	451.9
		12.00	3	320	0.207	40.000	3.600	8490	5272	759.2
		16.00	3	400	0.239	48.000	4.800	7960	5707	1315.0
		20.00	3	400	0.273	56.000	6.000	6365	5213	1751.5





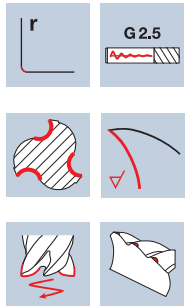
Use **ToolExpert® AX-FPS** to determine the best possible cutting data for your machining environment!

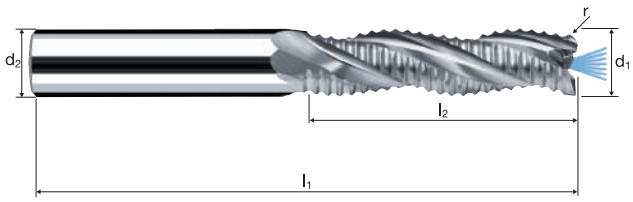
Cylindrical/Square end mills AX-FPS

Profiled, medium version
High-performance penetration edge, central cooling channel

X-Generation

HM MG10	λ 30° γ 20°





Roughing

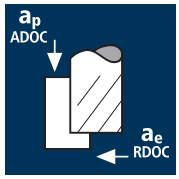
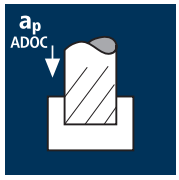
Finishing

ReTool®

Al Aluminium > 99% | **Al Aluminium Alloy** | Al Aluminium Cast | Cu Copper | Plastic Thermoplast

Example: **Order-N°.** Coating **15606** Article-N°. ø-Code **300**

Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z	15606	15506
300	6.00	6.00	63	19.00	0.100	3	●	
391	8.00	8.00	72	28.00	0.150	3	●	
450	10.00	10.00	84	34.00	0.200	3	●	
501	12.00	12.00	97	40.00	0.200	3	●	
610	16.00	16.00	108	48.00	0.200	3	●	
682	20.00	20.00	122	56.00	0.200	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	600	0.065	12.000	1.800	31830	6207	134.1
		8.00	3	600	0.090	16.000	2.400	23875	6446	247.5
		10.00	3	600	0.110	20.000	3.000	19100	6303	378.2
		12.00	3	600	0.135	24.000	3.600	15915	6446	556.9
		16.00	3	600	0.180	32.000	4.800	11935	6445	989.9
		20.00	3	600	0.220	40.000	6.000	9550	6303	1512.7
	Unalloyed copper	6.00	3	400	0.065	12.000	1.800	21220	4138	89.4
		8.00	3	400	0.090	16.000	2.400	15915	4297	165.0
		10.00	3	400	0.110	20.000	3.000	12730	4201	252.1
		12.00	3	400	0.135	24.000	3.600	10610	4297	371.3
		16.00	3	400	0.180	32.000	4.800	7960	4298	660.2
		20.00	3	400	0.220	40.000	6.000	6365	4201	1008.2
	Thermoplastics	6.00	3	650	0.065	12.000	1.800	34485	6725	145.3
		8.00	3	650	0.090	16.000	2.400	25865	6984	268.2
		10.00	3	650	0.110	20.000	3.000	20690	6828	409.7
		12.00	3	650	0.135	24.000	3.600	17240	6982	603.3
		16.00	3	650	0.180	32.000	4.800	12930	6982	1072.5
		20.00	3	650	0.220	40.000	6.000	10345	6828	1638.6
	Wrought aluminium Construction aluminium	6.00	3	500	0.060	4.200	6.000	26525	4775	120.3
		8.00	3	500	0.080	5.600	8.000	19895	4775	213.9
		10.00	3	500	0.100	7.000	10.000	15915	4775	334.2
		12.00	3	500	0.120	8.400	12.000	13265	4775	481.4
		16.00	3	500	0.160	11.200	16.000	9945	4774	855.4
		20.00	3	500	0.200	14.000	20.000	7960	4776	1337.3
	Unalloyed copper	6.00	3	270	0.060	4.200	6.000	14325	2579	65.0
		8.00	3	270	0.080	5.600	8.000	10745	2579	115.5
		10.00	3	270	0.100	7.000	10.000	8595	2579	180.5
		12.00	3	270	0.120	8.400	12.000	7160	2578	259.8
		16.00	3	270	0.160	11.200	16.000	5370	2578	461.9
		20.00	3	270	0.200	14.000	20.000	4295	2577	721.6
	Thermoplastics	6.00	3	650	0.060	4.200	6.000	34485	6207	156.4
		8.00	3	650	0.080	5.600	8.000	25865	6208	278.1
		10.00	3	650	0.100	7.000	10.000	20690	6207	434.5
		12.00	3	650	0.120	8.400	12.000	17240	6206	625.6
		16.00	3	650	0.160	11.200	16.000	12930	6206	1112.2
		20.00	3	650	0.200	14.000	20.000	10345	6207	1738.0

Cylindrical/Square end mills AX

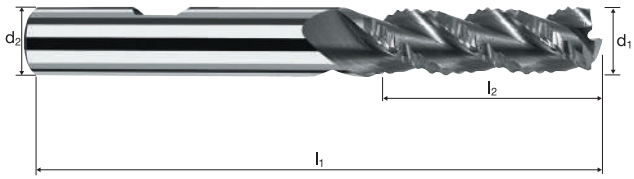
Profiled, medium version

X-Generation X

HM
MG10

λ **40°**
γ **18°**

45°



Roughing

Finishing

ToolSchool 8573 / 8673

III

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

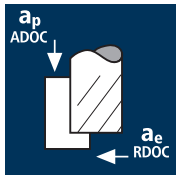
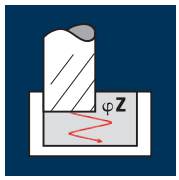
Al Aluminium Cast

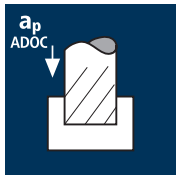
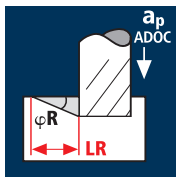
Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15397** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	45°	z	CELERO C15397	CELERO C15297
300	6.00	6.00	63	19.00	0.30	3	●	
391	8.00	8.00	72	28.00	0.30	3	●	
450	10.00	10.00	84	34.00	0.30	3	●	
501	12.00	12.00	97	40.00	0.30	3	●	
610	16.00	16.00	108	48.00	0.40	3	●	
682	20.00	20.00	122	56.00	0.40	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Wrought aluminium Construction aluminium	6.00	3	450	0.064	9.000	3.600	23875	4584	148.5	15.0°
		8.00	3	450	0.080	12.000	4.800	17905	4297	247.5	15.0°
		10.00	3	450	0.096	15.000	6.000	14325	4126	371.3	15.0°
		12.00	3	450	0.112	18.000	7.200	11935	4010	519.7	15.0°
		16.00	3	450	0.128	24.000	9.600	8950	3437	791.8	15.0°
		20.00	3	450	0.144	30.000	12.000	7160	3093	1113.5	15.0°
		25.00	3	450	0.160	37.500	15.000	5730	2750	1547.1	15.0°
	Cast aluminium	6.00	3	405	0.064	9.000	3.600	21485	4125	133.7	15.0°
		8.00	3	405	0.080	12.000	4.800	16115	3868	222.8	15.0°
		10.00	3	405	0.096	15.000	6.000	12890	3712	334.1	15.0°
		12.00	3	405	0.112	18.000	7.200	10745	3610	467.9	15.0°
		16.00	3	405	0.128	24.000	9.600	8055	3093	712.7	15.0°
		20.00	3	405	0.144	30.000	12.000	6445	2784	1002.3	15.0°
		25.00	3	405	0.160	37.500	15.000	5155	2474	1391.9	15.0°
	Unalloyed copper	6.00	3	360	0.058	9.000	3.600	19100	3323	107.7	9.0°
		8.00	3	360	0.072	12.000	4.800	14325	3094	178.2	9.0°
		10.00	3	360	0.086	15.000	6.000	11460	2957	266.1	9.0°
		12.00	3	360	0.101	18.000	7.200	9550	2894	375.0	9.0°
		16.00	3	360	0.115	24.000	9.600	7160	2470	569.1	9.0°
		20.00	3	360	0.130	30.000	12.000	5730	2235	804.5	9.0°
		25.00	3	360	0.140	37.500	15.000	4585	1926	1083.2	9.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Wrought aluminium Construction aluminium	6.00	3	315	0.051	9.000	6.000	16710	2557	138.1	15.0°	33.6
		8.00	3	315	0.064	12.000	8.000	12535	2407	231.0	15.0°	44.8
		10.00	3	315	0.077	15.000	10.000	10025	2316	347.4	15.0°	56.0
		12.00	3	315	0.090	18.000	12.000	8355	2256	487.3	15.0°	67.2
		16.00	3	315	0.102	24.000	16.000	6265	1917	736.2	15.0°	89.6
		20.00	3	315	0.115	30.000	20.000	5015	1730	1038.1	15.0°	112.0
		25.00	3	315	0.130	37.500	25.000	4010	1564	1466.2	15.0°	140.0
	Cast aluminium	6.00	3	285	0.051	9.000	6.000	15120	2322	125.4	15.0°	33.6
		8.00	3	285	0.064	12.000	8.000	11340	2177	209.0	15.0°	44.8
		10.00	3	285	0.077	15.000	10.000	9070	2090	313.5	15.0°	56.0
		12.00	3	285	0.090	18.000	12.000	7560	2032	438.9	15.0°	67.2
		16.00	3	285	0.102	24.000	16.000	5670	1742	668.9	15.0°	89.6
		20.00	3	285	0.115	30.000	20.000	4535	1567	940.4	15.0°	112.0
		25.00	3	285	0.128	37.500	25.000	3630	1394	1306.8	15.0°	140.0
	Unalloyed copper	6.00	3	216	0.040	9.000	6.000	11460	1375	74.3	9.0°	56.8
		8.00	3	216	0.050	12.000	8.000	8595	1289	123.8	9.0°	75.8
		10.00	3	216	0.060	15.000	10.000	6875	1238	185.6	9.0°	94.7
		12.00	3	216	0.071	18.000	12.000	5730	1221	263.6	9.0°	113.6
		16.00	3	216	0.081	24.000	16.000	4295	1044	400.8	9.0°	151.5
		20.00	3	216	0.091	30.000	20.000	3440	939	563.5	9.0°	189.4
		25.00	3	216	0.100	37.500	25.000	2750	825	773.4	9.0°	236.8

Use **ToolExpert® AX-FPS** to determine the best possible cutting data for your machining environment!

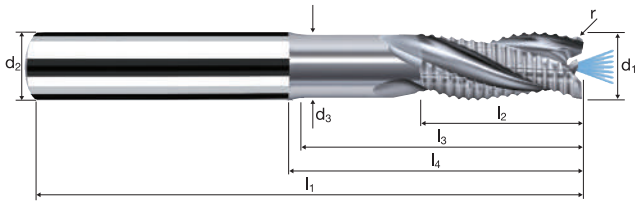
Cylindrical/Square end mills AX-FPS

Profiled, medium version, neck
High-performance penetration edge, central cooling channel

X-Generation

HM MG10	λ 30° γ 20°

r | G 2.5



Roughing

Finishing

ReTool®

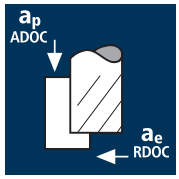
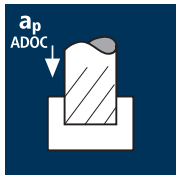
			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating | Article-N°. **15605** | ø-Code **300**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	15605	15505
300	6.00	6.00	5.50	63	13.00	24.15	26.00	0.100	3	●	
391	8.00	8.00	7.40	72	18.00	32.63	35.00	0.150	3	●	
450	10.00	10.00	9.20	84	22.00	39.99	43.00	0.200	3	●	
501	12.00	12.00	11.00	97	26.00	47.29	51.00	0.200	3	●	
610	16.00	16.00	15.00	108	32.00	54.73	59.00	0.200	3	●	
682	20.00	20.00	19.00	122	40.00	66.23	71.00	0.200	3	●	
770**	25.00	25.00	24.00	144	50.00	81.68	87.00	0.250	3	●	
772*	25.00	25.00	24.00	144	50.00	86.68	92.00	0.250	3	●	

* Cylindrical shank HA, shank length = 50 mm

** Shank with side clamping according to DIN 6535 HB

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	600	0.065	9.000	2.400	31830	6207	134.1
		8.00	3	600	0.090	12.000	3.200	23875	6446	247.5
		10.00	3	600	0.110	15.000	4.000	19100	6303	378.2
		12.00	3	600	0.135	18.000	4.800	15915	6446	556.9
		16.00	3	600	0.180	24.000	6.400	11935	6445	989.9
		20.00	3	600	0.220	30.000	8.000	9550	6303	1512.7
		25.00	3	600	0.280	37.500	10.000	7640	6418	2406.6
	Unalloyed copper	6.00	3	400	0.065	9.000	2.400	21220	4138	89.4
		8.00	3	400	0.090	12.000	3.200	15915	4297	165.0
		10.00	3	400	0.110	15.000	4.000	12730	4201	252.1
		12.00	3	400	0.135	18.000	4.800	10610	4297	371.3
		16.00	3	400	0.180	24.000	6.400	7960	4298	660.2
		20.00	3	400	0.220	30.000	8.000	6365	4201	1008.2
		25.00	3	400	0.280	37.500	10.000	5095	4280	1604.9
	Thermoplastics	6.00	3	650	0.065	9.000	2.400	34485	6725	145.3
		8.00	3	650	0.090	12.000	3.200	25865	6984	268.2
		10.00	3	650	0.110	15.000	4.000	20690	6828	409.7
		12.00	3	650	0.135	18.000	4.800	17240	6982	603.3
		16.00	3	650	0.180	24.000	6.400	12930	6982	1072.5
		20.00	3	650	0.220	30.000	8.000	10345	6828	1638.6
		25.00	3	650	0.280	37.500	10.000	8275	6951	2606.6
	Wrought aluminium Construction aluminium	6.00	3	500	0.060	4.800	6.000	26525	4775	137.5
		8.00	3	500	0.080	6.400	8.000	19895	4775	244.5
		10.00	3	500	0.100	8.000	10.000	15915	4775	382.0
		12.00	3	500	0.120	9.600	12.000	13265	4775	550.1
		16.00	3	500	0.160	12.800	16.000	9945	4774	977.6
		20.00	3	500	0.200	16.000	20.000	7960	4776	1528.3
		25.00	3	500	0.250	20.000	25.000	6365	4774	2386.9
	Unalloyed copper	6.00	3	270	0.060	4.800	6.000	14325	2579	74.3
		8.00	3	270	0.080	6.400	8.000	10745	2579	132.0
		10.00	3	270	0.100	8.000	10.000	8595	2579	206.3
		12.00	3	270	0.120	9.600	12.000	7160	2578	296.9
		16.00	3	270	0.160	12.800	16.000	5370	2578	527.9
		20.00	3	270	0.200	16.000	20.000	4295	2577	824.6
		25.00	3	270	0.250	20.000	25.000	3440	2580	1290.0
	Thermoplastics	6.00	3	650	0.060	4.800	6.000	34485	6207	178.8
		8.00	3	650	0.080	6.400	8.000	25865	6208	317.8
		10.00	3	650	0.100	8.000	10.000	20690	6207	496.6
		12.00	3	650	0.120	9.600	12.000	17240	6206	715.0
		16.00	3	650	0.160	12.800	16.000	12930	6206	1271.1
		20.00	3	650	0.200	16.000	20.000	10345	6207	1986.2
		25.00	3	650	0.250	20.000	25.000	8275	6206	3103.2

Cylindrical/Square end mills AX

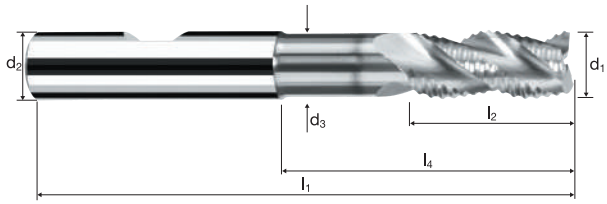
Profiled, medium version, neck

X-Generation

HM
MG10

λ **40°**
γ **18°**

45°



Roughing

Finishing

ToolSchool 8573 / 8673

III

Rm < 850
HRC < 24

Al Aluminium > 99%

Al Aluminium Alloy

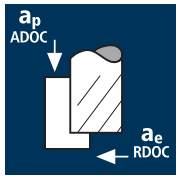
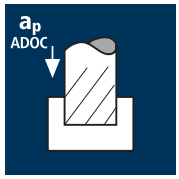
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15398** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	45°	z	CELERO C15398	CELERO C15298
300	6.00	6.00	5.50	63	13.00	25.34	26.00	0.30	3		●
391	8.00	8.00	7.40	72	19.00	34.29	35.00	0.30	3		●
450	10.00	10.00	9.20	84	22.00	42.20	43.00	0.30	3		●
501	12.00	12.00	11.00	97	26.00	50.13	51.00	0.30	3		●
610	16.00	16.00	15.00	108	32.00	58.13	59.00	0.40	3		●
682	20.00	20.00	19.00	122	38.00	70.13	71.00	0.40	3		●
772	25.00	25.00	24.00	144	45.00	86.13	87.00	0.60	3		●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Wrought aluminium Construction aluminium	6.00	3	369	0.062	9.000	4.800	19575	3641	157.3
		8.00	3	390	0.083	12.000	6.400	15520	3865	296.8
		10.00	3	410	0.104	15.000	8.000	13050	4072	488.6
		12.00	3	410	0.125	18.000	9.600	10875	4078	704.7
		16.00	3	410	0.133	24.000	12.800	8155	3254	999.6
		20.00	3	410	0.156	30.000	16.000	6525	3054	1465.8
	Cast aluminium	6.00	3	295	0.062	9.000	4.800	15650	2911	125.8
		8.00	3	312	0.083	12.000	6.400	12415	3091	237.4
		10.00	3	328	0.104	15.000	8.000	10440	3257	390.9
		12.00	3	328	0.125	18.000	9.600	8700	3263	563.8
		16.00	3	328	0.133	24.000	12.800	6525	2604	799.8
		20.00	3	328	0.156	30.000	16.000	5220	2443	1172.6
	Unalloyed aluminium	6.00	3	369	0.062	9.000	4.800	19575	3641	157.3
		8.00	3	390	0.083	12.000	6.400	15520	3865	296.8
		10.00	3	410	0.104	15.000	8.000	13050	4072	488.6
		12.00	3	410	0.125	18.000	9.600	10875	4078	704.7
		16.00	3	410	0.133	24.000	12.800	8155	3254	999.6
		20.00	3	410	0.156	30.000	16.000	6525	3054	1465.8
	Unalloyed copper	6.00	3	299	0.056	9.000	4.800	15860	2665	115.1
		8.00	3	315	0.075	12.000	6.400	12535	2820	216.6
		10.00	3	332	0.094	15.000	8.000	10570	2981	357.7
		12.00	3	332	0.112	18.000	9.600	8805	2959	511.2
		16.00	3	332	0.120	24.000	12.800	6605	2378	730.5
		20.00	3	332	0.140	30.000	16.000	5285	2220	1065.5
	Unalloyed aluminium	6.00	3	332	0.056	7.500	6.000	17615	2959	133.2
		8.00	3	351	0.075	10.000	8.000	13965	3142	251.4
		10.00	3	369	0.094	12.500	10.000	11745	3312	414.0
		12.00	3	369	0.113	15.000	12.000	9790	3319	597.4
		16.00	3	369	0.120	20.000	16.000	7340	2642	845.6
		20.00	3	369	0.140	25.000	20.000	5875	2468	1233.8
	Cast aluminium	6.00	3	266	0.056	7.500	6.000	14110	2371	106.7
		8.00	3	281	0.075	10.000	8.000	11180	2516	201.2
		10.00	3	295	0.094	12.500	10.000	9390	2648	331.0
		12.00	3	295	0.113	15.000	12.000	7825	2653	477.5
		16.00	3	295	0.120	20.000	16.000	5870	2113	676.2
		20.00	3	295	0.140	25.000	20.000	4695	1972	986.0
	Wrought aluminium Construction aluminium	6.00	3	332	0.056	7.500	6.000	17615	2959	133.2
		8.00	3	351	0.075	10.000	8.000	13965	3142	251.4
		10.00	3	369	0.094	12.500	10.000	11745	3312	414.0
		12.00	3	369	0.113	15.000	12.000	9790	3319	597.4
		16.00	3	369	0.120	20.000	16.000	7340	2642	845.6
		20.00	3	369	0.140	25.000	20.000	5875	2468	1233.8
	Unalloyed copper	6.00	3	269	0.050	7.500	6.000	14270	2141	96.3
		8.00	3	284	0.068	10.000	8.000	11300	2305	184.4
		10.00	3	299	0.085	12.500	10.000	9515	2426	303.3
		12.00	3	299	0.101	15.000	12.000	7930	2403	432.5
		16.00	3	299	0.108	20.000	16.000	5950	1928	616.9
		20.00	3	299	0.126	25.000	20.000	4760	1799	899.7

Cylindrical/Square end mills

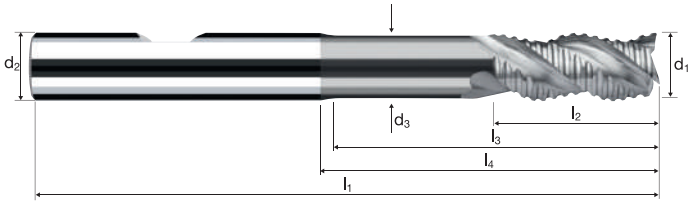
Profiled, medium version, neck

Performance **P**

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$l_3=4.5xd_1$

HM MG10 | λ 43° γ 20°



Roughing

Finishing

ReTool®

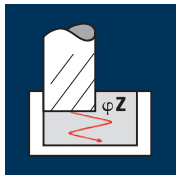
III

Al Aluminium > 99% | **Al** Aluminium Alloy | **Al** Aluminium Cast | **Cu** Copper | **Plastic** Thermoplast

Example: **Order-N°.** Coating | Article-N°. **8673** | ø-Code **300**

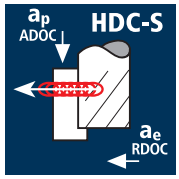
Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r	z	**8673**	**8573**
300	6.00	6.00	5.50	65	13.50	27.00	28.85	0.100	3	●	
391	8.00	8.00	7.40	76	18.00	36.00	38.37	0.150	3	●	
450	10.00	10.00	9.20	90	22.00	45.00	48.01	0.200	3	●	
501	12.00	12.00	11.00	105	27.00	54.00	57.71	0.200	3	●	
610	16.00	16.00	15.00	125	36.00	72.00	76.27	0.200	3	●	
682	20.00	20.00	19.00	145	44.00	90.00	94.77	0.250	3	●	

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	φZ [°]
Wrought aluminium Construction aluminium	6.00	3	300	0.065	32.000	5.400	15915	3103	5.0°
	8.00	3	300	0.080	42.000	7.200	11935	2864	5.0°
	10.00	3	350	0.095	53.000	9.000	11140	3175	5.0°
	12.00	3	350	0.110	63.000	10.800	9285	3064	5.0°
	16.00	3	400	0.130	84.000	14.400	7960	3104	5.0°
	20.00	3	400	0.145	105.000	18.000	6365	2769	5.0°
Cast aluminium	6.00	3	270	0.065	32.000	5.400	14325	2793	5.0°
	8.00	3	270	0.080	42.000	7.200	10745	2579	5.0°
	10.00	3	315	0.095	53.000	9.000	10025	2857	5.0°
	12.00	3	315	0.110	63.000	10.800	8355	2757	5.0°
	16.00	3	360	0.130	84.000	14.400	7160	2792	5.0°
	20.00	3	360	0.145	105.000	18.000	5730	2493	5.0°
Unalloyed copper	6.00	3	240	0.059	32.000	5.400	12730	2253	3.5°
	8.00	3	240	0.072	42.000	7.200	9550	2063	3.5°
	10.00	3	280	0.086	53.000	9.000	8915	2300	3.5°
	12.00	3	280	0.099	63.000	10.800	7425	2205	3.5°
	16.00	3	320	0.117	84.000	14.400	6365	2234	3.5°
	20.00	3	320	0.131	105.000	18.000	5095	2002	3.5°

Application



Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
Wrought aluminium Construction aluminium	6.00	3	300	0.106	32.000	0.600	15915	5061	97.2
	8.00	3	350	0.153	42.000	0.800	13925	6392	214.8
	10.00	3	401	0.175	53.000	1.000	12765	6702	355.2
	12.00	3	401	0.211	63.000	1.200	10635	6732	508.9
	16.00	3	500	0.215	84.000	1.600	9945	6415	862.1
	20.00	3	500	0.241	105.000	2.000	7960	5755	1208.6
Cast aluminium	6.00	3	270	0.106	32.000	0.600	14325	4555	87.5
	8.00	3	315	0.153	42.000	0.800	12535	5754	193.3
	10.00	3	360	0.175	53.000	1.000	11460	6017	318.9
	12.00	3	360	0.211	63.000	1.200	9550	6045	457.0
	16.00	3	450	0.215	84.000	1.600	8950	5773	775.9
	20.00	3	450	0.241	105.000	2.000	7160	5177	1087.1
Unalloyed copper	6.00	3	240	0.085	32.000	0.600	12730	3246	62.3
	8.00	3	279	0.123	42.000	0.800	11100	4096	137.6
	10.00	3	320	0.138	53.000	1.000	10185	4217	223.5
	12.00	3	320	0.168	63.000	1.200	8490	4279	323.5
	16.00	3	399	0.170	84.000	1.600	7940	4049	544.2
	20.00	3	399	0.192	105.000	2.000	6350	3658	768.1

Use **ToolExpert® AX-FPS** to determine the best possible cutting data for your machining environment!

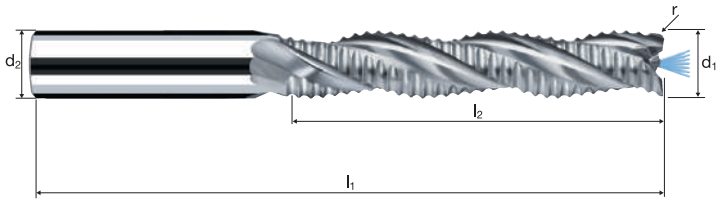
Cylindrical/Square end mills AX-FPS

Profiled, 5.2xd version
High-performance penetration edge, central cooling channel

X-Generation

HM MG10	λ 30° γ 20°

r | G 2.5



Roughing

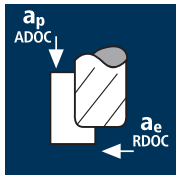
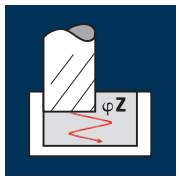
Finishing

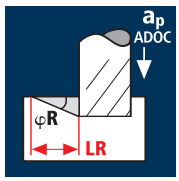
ReTool®

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast		

Example: **Order-N°.** Coating **15607** Article-N°. ø-Code **300**

							15607	
							15507	
Ø Code	d_1 e8	d_2 h5	l_1	l_2	r	z		
300	6.00	6.00	73	32.00	0.100	3	●	
391	8.00	8.00	84	42.00	0.150	3	●	
450	10.00	10.00	100	53.00	0.200	3	●	
501	12.00	12.00	117	63.00	0.200	3	●	
610	16.00	16.00	144	84.00	0.200	3	●	
682	20.00	20.00	169	105.00	0.200	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
	Wrought aluminium Construction aluminium	12.00	3	500	0.140	18.000	9.600	13265	5571	962.7	12.0°
		16.00	3	500	0.160	24.000	12.800	9945	4774	1466.4	13.0°
		20.00	3	500	0.180	30.000	16.000	7960	4298	2063.2	15.0°
	Cast aluminium	12.00	3	450	0.140	18.000	9.600	11935	5013	866.2	12.0°
		16.00	3	450	0.160	24.000	12.800	8950	4296	1319.7	13.0°
		20.00	3	450	0.180	30.000	16.000	7160	3866	1855.9	15.0°
	Unalloyed copper	12.00	3	400	0.126	18.000	9.600	10610	4011	693.0	7.0°
		16.00	3	400	0.144	24.000	12.800	7960	3439	1056.4	8.0°
		20.00	3	400	0.162	30.000	16.000	6365	3093	1484.8	9.0°

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
	Wrought aluminium Construction aluminium	12.00	3	450	0.126	18.000	12.000	11935	4511	974.5	15.0°	67.2
		16.00	3	450	0.144	24.000	16.000	8950	3866	1484.7	16.0°	83.7
		20.00	3	450	0.162	30.000	20.000	7160	3480	2087.9	19.0°	87.1
	Cast aluminium	12.00	3	405	0.126	18.000	12.000	10745	4062	877.3	15.0°	67.2
		16.00	3	405	0.144	24.000	16.000	8055	3480	1336.2	16.0°	83.7
		20.00	3	405	0.162	30.000	20.000	6445	3132	1879.4	19.0°	87.1
	Unalloyed copper	12.00	3	320	0.101	18.000	12.000	8490	2573	555.7	9.0°	113.6
		16.00	3	320	0.115	24.000	16.000	6365	2196	843.2	9.5°	143.4
		20.00	3	320	0.130	30.000	20.000	5095	1987	1192.3	11.5°	147.5

Use **ToolExpert® AX-FPS** to determine the best possible cutting data for your machining environment!

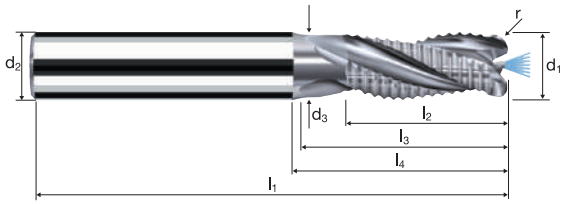
Corner radius end mills AX-FPS

Profiled, normal version, neck
High-performance penetration edge, central cooling channel

X-Generation

HM MG10	λ 30° γ 20°

h5 | G 2.5



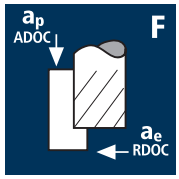
Roughing | Finishing

ReTool®

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating | Article-N°. **15502** | ø-Code **501**

Ø Code	d_1 e8	d_2 h5	d_3	l_1	l_2	l_3	l_4	r 0/+0.03	z	15502	
501	12.00	12.00	11.00	83	26.00	33.29	37.00	1.000	3	●	
608	16.00	16.00	15.00	95	32.00	41.73	46.00	1.000	3	●	
611	16.00	16.00	15.00	95	32.00	41.73	46.00	2.000	3	●	
506	12.00	12.00	11.00	83	26.00	33.29	37.00	2.500	3	●	
612	16.00	16.00	15.00	95	32.00	41.73	46.00	2.500	3	●	
684	20.00	20.00	19.00	104	40.00	48.23	53.00	2.500	3	●	
613	16.00	16.00	15.00	95	32.00	41.73	46.00	3.000	3	●	

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	6	0.020	12.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	16.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	20.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	24.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	32.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	40.000	0.300	1800	2700	3600	5400
	Unalloyed copper	6.00	6	0.020	12.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	16.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	20.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	24.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	32.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	40.000	0.300	1800	2700	3600	5400
	Thermoplastics	6.00	6	0.020	12.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	16.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	20.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	24.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	32.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	40.000	0.300	1800	2700	3600	5400
	Cast aluminium	6.00	6	0.020	12.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	16.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	20.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	24.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	32.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	40.000	0.300	1800	2700	3600	5400

Cylindrical/Square end mills MulticutXA

Finishing, normal version

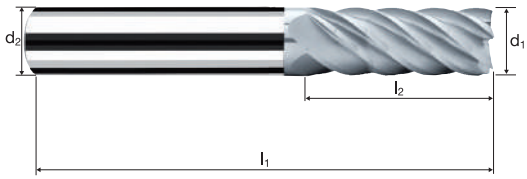
X-Generation

III

HM MG10	λ 40° γ 20°

r | G 2.5

Vario



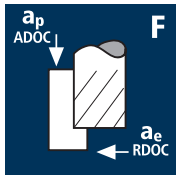
Roughing | Finishing

ReTool®

			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Example: **Order-N°.** Coating **C** | Article-N°. **15589** | ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z	15589	CELERO C15589
300	6.00	6.00	57	13.00	0.150	6	●	●
391	8.00	8.00	63	19.00	0.150	6	●	●
450	10.00	10.00	72	22.00	0.200	6	●	●
501	12.00	12.00	83	26.00	0.200	6	●	●
610	16.00	16.00	92	32.00	0.200	6	●	●
682	20.00	20.00	104	40.00	0.200	6	●	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	6	0.020	18.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	24.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	30.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	36.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	48.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	60.000	0.300	1800	2700	3600	5400
	Unalloyed copper	6.00	6	0.020	18.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	24.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	30.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	36.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	48.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	60.000	0.300	1800	2700	3600	5400
	Thermoplastics	6.00	6	0.020	18.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	24.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	30.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	36.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	48.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	60.000	0.300	1800	2700	3600	5400
	Cast aluminium	6.00	6	0.020	18.000	0.100	1200	1800	2400	3600
		8.00	6	0.020	24.000	0.100	1200	1800	2400	3600
		10.00	6	0.025	30.000	0.150	1500	2250	3000	4500
		12.00	6	0.025	36.000	0.200	1500	2250	3000	4500
		16.00	6	0.030	48.000	0.250	1800	2700	3600	5400
		20.00	6	0.030	60.000	0.300	1800	2700	3600	5400

Cylindrical/Square end mills MulticutXA

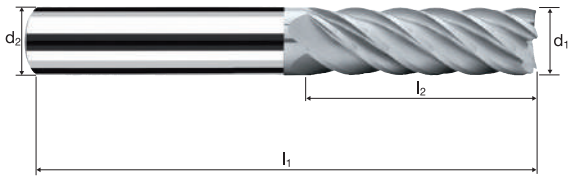
Finishing, medium version

X-Generation

HM MG10 | λ **40°** γ **20°**

r | G 2.5

Vario



Roughing

Finishing

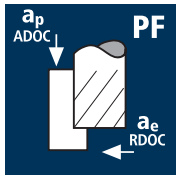
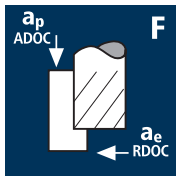
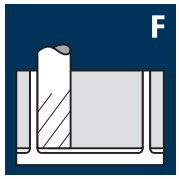
ReTool®

III

Al Aluminium > 99% | **Al Aluminium Alloy** | Al Aluminium Cast | Cu Copper | Plastic Thermoplast

Example: **Order-N°.** Coating **C** Article-N°. **15590** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z	15590	CELERO C15590
300	6.00	6.00	63	18.00	0.150	6	●	●
391	8.00	8.00	72	24.00	0.150	6	●	●
450	10.00	10.00	84	30.00	0.200	6	●	●
501	12.00	12.00	97	36.00	0.200	6	●	●
610	16.00	16.00	108	48.00	0.200	6	●	●
682	20.00	20.00	122	60.00	0.200	6	●	●

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	3	300	0.025	32.000	0.080	15915	1194
		8.00	3	300	0.030	42.000	0.100	11935	1074
		10.00	3	350	0.030	53.000	0.120	11140	1003
		12.00	3	350	0.030	63.000	0.120	9285	836
		16.00	3	400	0.035	84.000	0.150	7960	836
		20.00	3	400	0.035	105.000	0.150	6365	668
	Cast aluminium	6.00	3	270	0.025	32.000	0.080	14325	1074
		8.00	3	270	0.030	42.000	0.100	10745	967
		10.00	3	315	0.030	53.000	0.120	10025	902
		12.00	3	315	0.030	63.000	0.120	8355	752
		16.00	3	360	0.035	84.000	0.150	7160	752
		20.00	3	360	0.035	105.000	0.150	5730	602
	Wrought aluminium Construction aluminium	6.00	3	200	0.020	32.000	0.030	10610	637
		8.00	3	200	0.025	42.000	0.050	7960	597
		10.00	3	250	0.025	53.000	0.050	7960	597
		12.00	3	250	0.025	63.000	0.050	6630	497
		16.00	3	300	0.030	84.000	0.050	5970	537
		20.00	3	300	0.030	105.000	0.050	4775	430
	Cast aluminium	6.00	3	180	0.020	32.000	0.030	9550	573
		8.00	3	180	0.025	42.000	0.050	7160	537
		10.00	3	225	0.025	53.000	0.050	7160	537
		12.00	3	225	0.025	63.000	0.050	5970	448
		16.00	3	270	0.030	84.000	0.050	5370	483
		20.00	3	270	0.030	105.000	0.050	4295	387
	Wrought aluminium Construction aluminium	6.00	3	200	0.025	32.000	0.060	10610	796
		8.00	3	200	0.030	42.000	0.060	7960	716
		10.00	3	250	0.030	53.000	0.080	7960	716
		12.00	3	250	0.030	63.000	0.080	6630	597
		16.00	3	300	0.035	84.000	0.100	5970	627
		20.00	3	300	0.035	105.000	0.100	4775	501
	Unalloyed copper	6.00	3	120	0.025	32.000	0.060	6365	477
		8.00	3	120	0.030	42.000	0.060	4775	430
		10.00	3	150	0.030	53.000	0.080	4775	430
		12.00	3	150	0.030	63.000	0.080	3980	358
		16.00	3	180	0.035	84.000	0.100	3580	376
		20.00	3	180	0.035	105.000	0.100	2865	301
	Wrought aluminium Construction aluminium	6.00	3	150	0.020	32.000	0.030	7960	478
		8.00	3	150	0.025	42.000	0.030	5970	448
		10.00	3	200	0.025	53.000	0.040	6365	477
		12.00	3	200	0.025	63.000	0.040	5305	398
		16.00	3	250	0.030	84.000	0.050	4975	448
		20.00	3	250	0.030	105.000	0.050	3980	358
	Unalloyed copper	6.00	3	90	0.020	32.000	0.030	4775	287
		8.00	3	90	0.025	42.000	0.030	3580	269
		10.00	3	120	0.025	53.000	0.040	3820	287
		12.00	3	120	0.025	63.000	0.040	3185	239
		16.00	3	150	0.030	84.000	0.050	2985	269
		20.00	3	150	0.030	105.000	0.050	2385	215

Cylindrical/Square end mills AX

Finishing, 5.2xd version

X-Generation

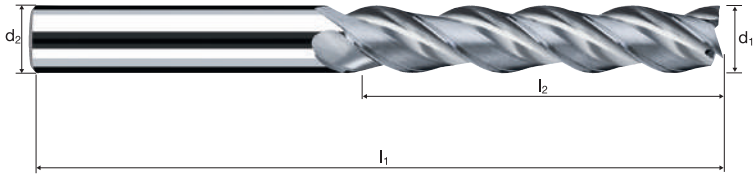
HM
MG10

λ 40°
γ 20°

r

G 2.5

Vario



Roughing

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

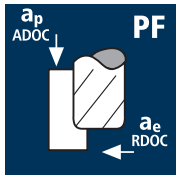
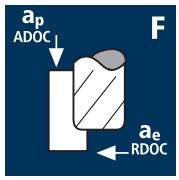
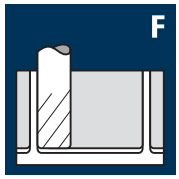
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating **15510** ø-Code **300**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	r	z	15510	
300	6.00	6.00	73	32.00	0.150	3	●	
391	8.00	8.00	84	42.00	0.150	3	●	
450	10.00	10.00	100	53.00	0.200	3	●	
501	12.00	12.00	117	63.00	0.200	3	●	
610	16.00	16.00	144	84.00	0.200	3	●	
682	20.00	20.00	169	105.00	0.200	3	●	

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Wrought aluminium Construction aluminium	6.00	3	300	0.025	32.000	0.080	15915	1194
		8.00	3	300	0.030	42.000	0.100	11935	1074
		10.00	3	350	0.030	53.000	0.120	11140	1003
		12.00	3	350	0.030	63.000	0.120	9285	836
		16.00	3	400	0.035	84.000	0.150	7960	836
		20.00	3	400	0.035	105.000	0.150	6365	668
	Cast aluminium	6.00	3	270	0.025	32.000	0.080	14325	1074
		8.00	3	270	0.030	42.000	0.100	10745	967
		10.00	3	315	0.030	53.000	0.120	10025	902
		12.00	3	315	0.030	63.000	0.120	8355	752
		16.00	3	360	0.035	84.000	0.150	7160	752
		20.00	3	360	0.035	105.000	0.150	5730	602
	Wrought aluminium Construction aluminium	6.00	3	200	0.020	32.000	0.030	10610	637
		8.00	3	200	0.025	42.000	0.050	7960	597
		10.00	3	250	0.025	53.000	0.050	7960	597
		12.00	3	250	0.025	63.000	0.050	6630	497
		16.00	3	300	0.030	84.000	0.050	5970	537
		20.00	3	300	0.030	105.000	0.050	4775	430
	Cast aluminium	6.00	3	180	0.020	32.000	0.030	9550	573
		8.00	3	180	0.025	42.000	0.050	7160	537
		10.00	3	225	0.025	53.000	0.050	7160	537
		12.00	3	225	0.025	63.000	0.050	5970	448
		16.00	3	270	0.030	84.000	0.050	5370	483
		20.00	3	270	0.030	105.000	0.050	4295	387
	Wrought aluminium Construction aluminium	6.00	3	200	0.025	32.000	0.060	10610	796
		8.00	3	200	0.030	42.000	0.060	7960	716
		10.00	3	250	0.030	53.000	0.080	7960	716
		12.00	3	250	0.030	63.000	0.080	6630	597
		16.00	3	300	0.035	84.000	0.100	5970	627
		20.00	3	300	0.035	105.000	0.100	4775	501
	Unalloyed copper	6.00	3	120	0.025	32.000	0.060	6365	477
		8.00	3	120	0.030	42.000	0.060	4775	430
		10.00	3	150	0.030	53.000	0.080	4775	430
		12.00	3	150	0.030	63.000	0.080	3980	358
		16.00	3	180	0.035	84.000	0.100	3580	376
		20.00	3	180	0.035	105.000	0.100	2865	301
	Wrought aluminium Construction aluminium	6.00	3	150	0.020	32.000	0.030	7960	478
		8.00	3	150	0.025	42.000	0.030	5970	448
		10.00	3	200	0.025	53.000	0.040	6365	477
		12.00	3	200	0.025	63.000	0.040	5305	398
		16.00	3	250	0.030	84.000	0.050	4975	448
		20.00	3	250	0.030	105.000	0.050	3980	358
	Unalloyed copper	6.00	3	90	0.020	32.000	0.030	4775	287
		8.00	3	90	0.025	42.000	0.030	3580	269
		10.00	3	120	0.025	53.000	0.040	3820	287
		12.00	3	120	0.025	63.000	0.040	3185	239
		16.00	3	150	0.030	84.000	0.050	2985	269
		20.00	3	150	0.030	105.000	0.050	2385	215

Corner radius end mills AX

Finishing, 5.2xd version

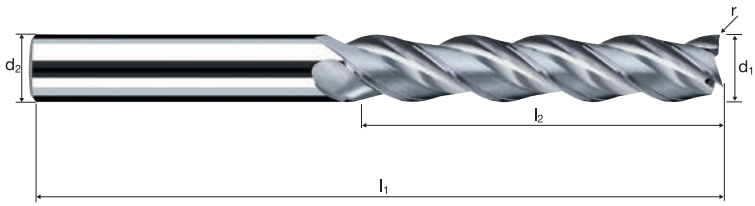
X-Generation

HM
MG10

λ 40°
γ 20°

G 2.5

Vario



Roughing

Finishing

ReTool®

III

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Example: **Order-N°.** Coating Article-N°. ø-Code **15512** **302**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	r 0/+0.03	z	15512
302	6.00	6.00	73	32.00	1.000	3	● I
391	8.00	8.00	84	42.00	1.000	3	● I
450	10.00	10.00	100	53.00	1.000	3	● I
501	12.00	12.00	117	63.00	1.000	3	● I
608	16.00	16.00	144	84.00	1.000	3	● I
457	10.00	10.00	100	53.00	2.500	3	● I
506	12.00	12.00	117	63.00	2.500	3	● I
612	16.00	16.00	144	84.00	2.500	3	● I
684	20.00	20.00	169	105.00	2.500	3	● I

I Availability and delivery dates on request


passion
for precision
fraisa

End milling tools for graphite
Micro with ball nose

Shank ø 6mm, tolerance r ±0.005

N° 6062 	MicroX	X-Generation X	3xd R F	d, 1.5 – 6.0	C Graphite				675
N° 6064 	MicroX	X-Generation X	5xd R F	d, 0.1 – 6.0	C Graphite				677
N° 6066 	MicroX	X-Generation X	8xd R F	d, 0.1 – 6.0	C Graphite				679
N° 6068 	MicroX	X-Generation X	10xd R F	d, 0.2 – 6.0	C Graphite				681
N° 6070 	MicroX	X-Generation X	12xd R F	d, 0.2 – 4.0	C Graphite				683
N° 6072 	MicroX	X-Generation X	15xd R F	d, 0.3 – 4.0	C Graphite				685
N° 6074 	MicroX	X-Generation X	20xd R F	d, 0.3– 4.0	C Graphite				687

Shank ø 3mm, tolerance r ±0.01

N° 5784 	Microcut	Performance P	5xd R F	d, 0.5 – 3.0	C Graphite				689
N° 5786 	Microcut	Performance P	8xd R F	d, 0.5 – 3.0	C Graphite				691
N° 5787 	Microcut	Performance P	10xd R F	d, 0.5 – 3.0	C Graphite				693
N° 5791 	Microcut	Performance P	12xd R F	d, 1.0 – 3.0	C Graphite				695
N° 5793 	Microcut	Performance P	15xd R F	d, 1.0 – 3.0	C Graphite				697
N° 15795 	Microcut	Performance P	20xd R F	d, 1.0 – 3.0	C Graphite				699

IV

End milling tools for graphite
Micro with corner radius

Shank ø 6mm, tolerance r ±0.005

N° 6032 	**MicroX**	X-Generation **X**	**3xd**	**R** **F**	r 0.2, 0.5	**C** Graphite				701
N° 6034 	**MicroX**	X-Generation **X**	**5xd**	**R** **F**	r 0.05, 0.1, 0.2, 0.5	**C** Graphite				703
N° 6036 	**MicroX**	X-Generation **X**	**8xd**	**R** **F**	r 0.05, 0.1, 0.2, 0.5	**C** Graphite				707
N° 6038 	**MicroX**	X-Generation **X**	**10xd**	**R** **F**	r 0.05, 0.1, 0.2, 0.5	**C** Graphite				711
N° 6040 	**MicroX**	X-Generation **X**	**12xd**	**R** **F**	r 0.05, 0.1, 0.2, 0.5	**C** Graphite				715
N° 6042 	**MicroX**	X-Generation **X**	**15xd**	**R** **F**	r 0.05, 0.1, 0.2, 0.5	**C** Graphite				717
N° 6044 	**MicroX**	X-Generation **X**	**20xd**	**R** **F**	r 0.05, 0.1, 0.2, 0.5	**C** Graphite				719

Shank ø 3mm, tolerance r ±0.03

N° 5754 	**Microcut**	Performance **P**	**5xd**	**R** **F**	r 0.2	**C** Graphite				721
N° 5756 	**Microcut**	Performance **P**	**8xd**	**R** **F**	r 0.2	**C** Graphite				723

End milling tools for graphite
Micro, cylindrical

Shank ø 3mm

N° 5714 	**Microcut**	Performance **P**	**5xd** R F	d1 0.5 – 3.0 45°	**C** Graphite				725
N° 5716 	**Microcut**	Performance **P**	**8xd** R F	d1 0.5 – 3.0 45°	**C** Graphite				727
N° 5717 	**Microcut**	Performance **P**	**10xd** R F	d1 0.5 – 3.0 45°	**C** Graphite				729

IV

End milling tools for graphite
Ball nose

Tolerance r ±0.005

N° 7484



SpheroX

X-Generation **X** | 6xd | R | F | d, 6 - 12 | C Graphite | 731

End milling tools for graphite
Corner radius

Tolerance r ±0.005

N° 7284



ToroX

X-Generation **X** | 6xd | R | F | r 0.5, 1.0 | C Graphite | 733

Tolerance r 0/+0.03

N° 5640



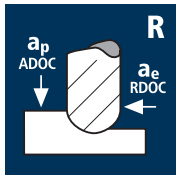
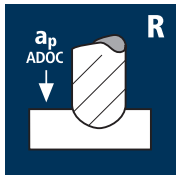
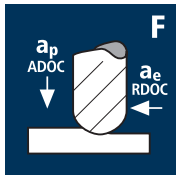
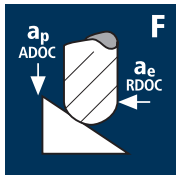
Performance **P** | R | F | r 0.15, 0.2, 0.3, 0.5 | C Graphite | 735

N° 5645



Performance **P** | R | F | r 0.15, 0.2, 0.3, 0.5 | C Graphite | 737

IV

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.50	2	0.018	0.750	0.900	540	900	1080	1620
		2.00	2	0.024	1.000	1.200	720	1200	1440	2160
		3.00	2	0.035	1.500	1.800	1050	1750	2100	3150
		4.00	2	0.047	2.000	2.400	1410	2350	2820	4230
		5.00	2	0.059	2.500	3.000	1770	2950	3540	5310
		6.00	2	0.071	3.000	3.600	2130	3550	4260	6390
	Graphite B B	1.50	2	0.014	0.750	1.500	420	700	840	1260
		2.00	2	0.018	1.000	2.000	540	900	1080	1620
		3.00	2	0.027	1.500	3.000	810	1350	1620	2430
		4.00	2	0.036	2.000	4.000	1080	1800	2160	3240
		5.00	2	0.045	2.500	5.000	1350	2250	2700	4050
		6.00	2	0.055	3.000	6.000	1650	2750	3300	4950
	Graphite B B	1.50	2	0.020	0.230	0.300	600	1000	1200	1800
		2.00	2	0.027	0.300	0.400	810	1350	1620	2430
		3.00	2	0.040	0.450	0.600	1200	2000	2400	3600
		4.00	2	0.053	0.600	0.800	1590	2650	3180	4770
		5.00	2	0.067	0.750	1.000	2010	3350	4020	6030
		6.00	2	0.080	0.900	1.200	2400	4000	4800	7200
	Graphite B B	1.50	2	0.020	0.300	0.300	600	1000	1200	1800
		2.00	2	0.027	0.400	0.400	810	1350	1620	2430
		3.00	2	0.040	0.600	0.600	1200	2000	2400	3600
		4.00	2	0.053	0.800	0.800	1590	2650	3180	4770
		5.00	2	0.067	1.000	1.000	2010	3350	4020	6030
		6.00	2	0.080	1.200	1.200	2400	4000	4800	7200

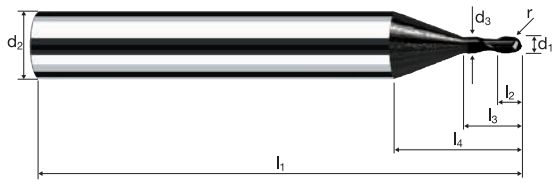
Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 3xd

X-Generation

HM
XA

λ 30°
γ 15°



h4

d1

r

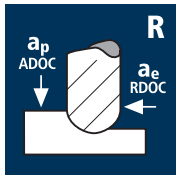
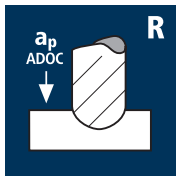
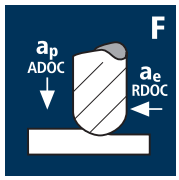
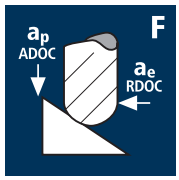
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6062** ø-Code **120**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6062
120	1.50	6.00	1.40	57	1.50	4.50	4.80	13.22	0.750	2	●
140	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	1.000	2	●
180	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	1.500	2	●
220	4.00	6.00	3.70	57	4.00	12.00	12.52	16.42	2.000	2	●
260	5.00	6.00	4.60	57	5.00	15.00	15.59	17.74	2.500	2	●
300	6.00	6.00	5.50	57	6.00	17.34	17.34	18.00	3.000	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.20	2	0.002	0.100	0.100	60	100	120	180
		0.50	2	0.006	0.250	0.300	180	300	360	540
		0.80	2	0.009	0.350	0.500	270	450	540	810
		1.00	2	0.012	0.450	0.600	360	600	720	1080
		2.00	2	0.024	0.900	1.200	720	1200	1440	2160
		3.00	2	0.035	1.350	1.800	1050	1750	2100	3150
		4.00	2	0.047	1.800	2.400	1410	2350	2820	4230
		5.00	2	0.059	2.250	3.000	1770	2950	3540	5310
		6.00	2	0.071	2.700	3.600	2130	3550	4260	6390
	Graphite B B	0.20	2	0.002	0.100	0.200	60	100	120	180
		0.50	2	0.005	0.250	0.500	150	250	300	450
		0.80	2	0.007	0.350	0.800	210	350	420	630
		1.00	2	0.009	0.450	1.000	270	450	540	810
		2.00	2	0.018	0.900	2.000	540	900	1080	1620
		3.00	2	0.027	1.350	3.000	810	1350	1620	2430
		4.00	2	0.036	1.800	4.000	1080	1800	2160	3240
		5.00	2	0.045	2.250	5.000	1350	2250	2700	4050
		6.00	2	0.055	2.700	6.000	1650	2750	3300	4950
	Graphite B B	0.20	2	0.003	0.030	0.040	90	150	180	270
		0.50	2	0.007	0.070	0.100	210	350	420	630
		0.80	2	0.011	0.110	0.160	330	550	660	990
		1.00	2	0.013	0.140	0.200	390	650	780	1170
		2.00	2	0.027	0.280	0.400	810	1350	1620	2430
		3.00	2	0.040	0.420	0.600	1200	2000	2400	3600
		4.00	2	0.053	0.560	0.800	1590	2650	3180	4770
		5.00	2	0.067	0.700	1.000	2010	3350	4020	6030
		6.00	2	0.080	0.840	1.200	2400	4000	4800	7200
	Graphite B B	0.20	2	0.003	0.040	0.040	90	150	180	270
		0.50	2	0.007	0.090	0.090	210	350	420	630
		0.80	2	0.011	0.140	0.140	330	550	660	990
		1.00	2	0.013	0.180	0.180	390	650	780	1170
		2.00	2	0.027	0.360	0.360	810	1350	1620	2430
		3.00	2	0.040	0.540	0.540	1200	2000	2400	3600
		4.00	2	0.053	0.720	0.720	1590	2650	3180	4770
		5.00	2	0.067	0.900	0.900	2010	3350	4020	6030
		6.00	2	0.080	1.080	1.080	2400	4000	4800	7200

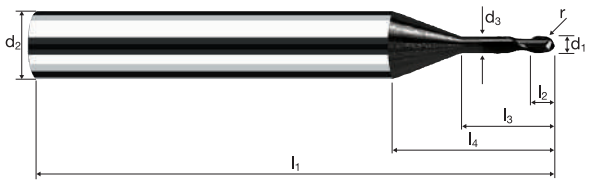
Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

X-Generation

HM XA	λ 30° γ 15°

h4



d1

r

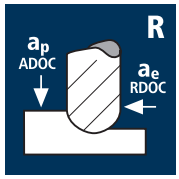
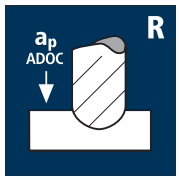
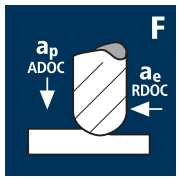
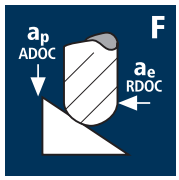
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6064** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6064
010	0.10	6.00	0.09	57	0.10	0.50	0.57	17.35	0.050	2	●
015	0.15	6.00	0.13	57	0.15	0.75	0.85	17.48	0.075	2	●
020	0.20	6.00	0.18	57	0.20	1.00	1.10	17.59	0.100	2	●
030	0.30	6.00	0.25	57	0.30	1.50	1.70	17.89	0.150	2	●
040	0.40	6.00	0.35	57	0.40	2.00	2.20	18.11	0.200	2	●
050	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.250	2	●
060	0.60	6.00	0.55	57	0.60	3.00	3.20	13.30	0.300	2	●
080	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.400	2	●
100	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.500	2	●
120	1.50	6.00	1.40	57	1.50	7.50	7.80	16.22	0.750	2	●
140	2.00	6.00	1.90	57	2.00	10.00	10.30	17.78	1.000	2	●
180	3.00	6.00	2.80	57	3.00	15.00	15.43	21.10	1.500	2	●
182	3.00	6.00	2.80	61	3.00	18.00	18.43	24.10	1.500	2	●
220	4.00	6.00	3.70	61	4.00	20.00	20.52	24.42	2.000	2	●
222	4.00	6.00	3.70	66	4.00	25.00	25.52	29.42	2.000	2	●
260	5.00	6.00	4.60	66	5.00	25.00	25.59	27.74	2.500	2	●
300	6.00	6.00	5.50	69	6.00	29.34	29.34	30.00	3.000	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite	0.20	2	0.002	0.100	0.100	60	100	120	180
		0.50	2	0.006	0.200	0.300	180	300	360	540
		0.80	2	0.009	0.300	0.500	270	450	540	810
		1.00	2	0.012	0.400	0.600	360	600	720	1080
		2.00	2	0.024	0.800	1.200	720	1200	1440	2160
		3.00	2	0.035	1.200	1.800	1050	1750	2100	3150
		4.00	2	0.047	1.600	2.400	1410	2350	2820	4230
		5.00	2	0.059	2.000	3.000	1770	2950	3540	5310
		6.00	2	0.071	2.400	3.600	2130	3550	4260	6390
	Graphite	0.20	2	0.002	0.100	0.200	60	100	120	180
		0.50	2	0.005	0.200	0.500	150	250	300	450
		0.80	2	0.007	0.300	0.800	210	350	420	630
		1.00	2	0.009	0.400	1.000	270	450	540	810
		2.00	2	0.018	0.800	2.000	540	900	1080	1620
		3.00	2	0.027	1.200	3.000	810	1350	1620	2430
		4.00	2	0.036	1.600	4.000	1080	1800	2160	3240
		5.00	2	0.045	2.000	5.000	1350	2250	2700	4050
		6.00	2	0.055	2.400	6.000	1650	2750	3300	4950
	Graphite	0.20	2	0.003	0.020	0.040	90	150	180	270
		0.50	2	0.007	0.060	0.090	210	350	420	630
		0.80	2	0.011	0.100	0.140	330	550	660	990
		1.00	2	0.013	0.120	0.180	390	650	780	1170
		2.00	2	0.027	0.240	0.360	810	1350	1620	2430
		3.00	2	0.040	0.360	0.540	1200	2000	2400	3600
		4.00	2	0.053	0.480	0.720	1590	2650	3180	4770
		5.00	2	0.067	0.600	0.900	2010	3350	4020	6030
		6.00	2	0.080	0.720	1.080	2400	4000	4800	7200
	Graphite	0.20	2	0.003	0.030	0.030	90	150	180	270
		0.50	2	0.007	0.080	0.080	210	350	420	630
		0.80	2	0.011	0.130	0.130	330	550	660	990
		1.00	2	0.013	0.160	0.160	390	650	780	1170
		2.00	2	0.027	0.320	0.320	810	1350	1620	2430
		3.00	2	0.040	0.480	0.480	1200	2000	2400	3600
		4.00	2	0.053	0.640	0.640	1590	2650	3180	4770
		5.00	2	0.067	0.800	0.800	2010	3350	4020	6030
		6.00	2	0.080	0.960	0.960	2400	4000	4800	7200

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

X-Generation X

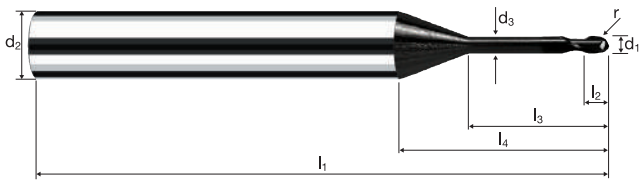
HM
XA

λ 30°
γ 15°

h4

d1

r



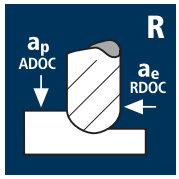
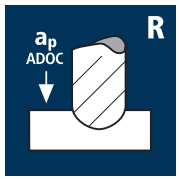
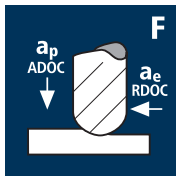
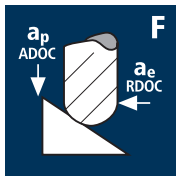
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6066** ø-Code **010**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6066
010	0.10	6.00	0.09	57	0.10	0.80	0.87	17.65	0.050	2	●
015	0.15	6.00	0.13	57	0.15	1.20	1.30	17.93	0.075	2	●
020	0.20	6.00	0.18	57	0.20	1.60	1.70	18.19	0.100	2	●
030	0.30	6.00	0.25	57	0.30	2.40	2.60	18.79	0.150	2	●
040	0.40	6.00	0.35	57	0.40	3.20	3.40	19.31	0.200	2	●
050	0.50	6.00	0.45	57	0.50	4.00	4.20	14.49	0.250	2	●
060	0.60	6.00	0.55	57	0.60	4.80	5.00	15.10	0.300	2	●
080	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.400	2	●
100	1.00	6.00	0.95	57	1.00	8.00	8.20	17.56	0.500	2	●
120	1.50	6.00	1.40	57	1.50	12.00	12.30	20.72	0.750	2	●
140	2.00	6.00	1.90	61	2.00	16.00	16.30	23.78	1.000	2	●
180	3.00	6.00	2.80	66	3.00	24.00	24.43	30.10	1.500	2	●
220	4.00	6.00	3.70	75	4.00	32.00	32.52	36.42	2.000	2	●
260	5.00	6.00	4.60	80	5.00	40.00	40.59	42.74	2.500	2	●
300	6.00	6.00	5.50	87	6.00	47.34	47.34	48.00	3.000	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.20	2	0.002	0.080	0.080	60	100	120	180
		0.50	2	0.006	0.200	0.200	180	300	360	540
		0.80	2	0.009	0.300	0.300	270	450	540	810
		1.00	2	0.012	0.400	0.400	360	600	720	1080
		2.00	2	0.024	0.800	0.800	720	1200	1440	2160
		3.00	2	0.035	1.200	1.200	1050	1750	2100	3150
		4.00	2	0.047	1.600	1.600	1410	2350	2820	4230
		5.00	2	0.059	2.000	2.000	1770	2950	3540	5310
		6.00	2	0.071	2.400	2.400	2130	3550	4260	6390
	Graphite B B	0.20	2	0.001	0.060	0.200	30	50	60	90
		0.50	2	0.004	0.150	0.500	120	200	240	360
		0.80	2	0.006	0.250	0.800	180	300	360	540
		1.00	2	0.007	0.300	1.000	210	350	420	630
		2.00	2	0.015	0.600	2.000	450	750	900	1350
		3.00	2	0.022	0.900	3.000	660	1100	1320	1980
		4.00	2	0.029	1.200	4.000	870	1450	1740	2610
		5.00	2	0.036	1.500	5.000	1080	1800	2160	3240
		6.00	2	0.044	1.800	6.000	1320	2200	2640	3960
	Graphite B B	0.20	2	0.003	0.020	0.030	90	150	180	270
		0.50	2	0.007	0.050	0.080	210	350	420	630
		0.80	2	0.011	0.080	0.130	330	550	660	990
		1.00	2	0.013	0.100	0.160	390	650	780	1170
		2.00	2	0.027	0.200	0.320	810	1350	1620	2430
		3.00	2	0.040	0.300	0.480	1200	2000	2400	3600
		4.00	2	0.053	0.400	0.640	1590	2650	3180	4770
		5.00	2	0.067	0.500	0.800	2010	3350	4020	6030
		6.00	2	0.080	0.600	0.960	2400	4000	4800	7200
	Graphite B B	0.20	2	0.003	0.030	0.030	90	150	180	270
		0.50	2	0.007	0.070	0.070	210	350	420	630
		0.80	2	0.011	0.110	0.110	330	550	660	990
		1.00	2	0.013	0.140	0.140	390	650	780	1170
		2.00	2	0.027	0.280	0.280	810	1350	1620	2430
		3.00	2	0.040	0.420	0.420	1200	2000	2400	3600
		4.00	2	0.053	0.560	0.560	1590	2650	3180	4770
		5.00	2	0.067	0.700	0.700	2010	3350	4020	6030
		6.00	2	0.080	0.840	0.840	2400	4000	4800	7200

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

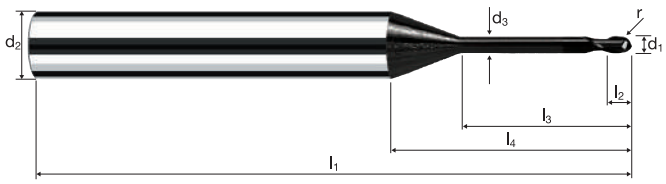
X-Generation X

HM XA	λ 30° γ 15°

h4

d1

r

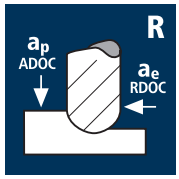
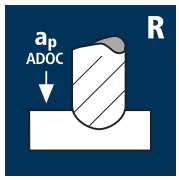
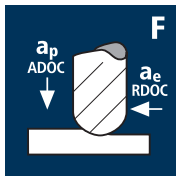
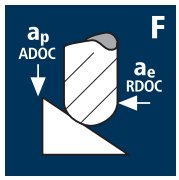


C Graphite	CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **6068** ø-Code **020**

Ø Code	d1	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z	DIAPLUS B6068
020	0.20	6.00	0.18	57	0.20	2.00	2.10	18.59	0.100	2	●
030	0.30	6.00	0.25	57	0.30	3.00	3.20	19.39	0.150	2	●
040	0.40	6.00	0.35	57	0.40	4.00	4.20	20.11	0.200	2	●
050	0.50	6.00	0.45	57	0.50	5.00	5.20	15.49	0.250	2	●
060	0.60	6.00	0.55	57	0.60	6.00	6.20	16.30	0.300	2	●
080	0.80	6.00	0.75	57	0.80	8.00	8.20	17.93	0.400	2	●
100	1.00	6.00	0.95	57	1.00	10.00	10.20	19.56	0.500	2	●
120	1.50	6.00	1.40	61	1.50	15.00	15.30	23.72	0.750	2	●
140	2.00	6.00	1.90	66	2.00	20.00	20.30	27.78	1.000	2	●
180	3.00	6.00	2.80	75	3.00	30.00	30.43	36.10	1.500	2	●
220	4.00	6.00	3.70	80	4.00	40.00	40.52	44.42	2.000	2	●
260	5.00	6.00	4.60	100	5.00	50.00	50.59	52.74	2.500	2	●
300	6.00	6.00	5.50	100	6.00	59.34	59.34	60.00	3.000	2	●

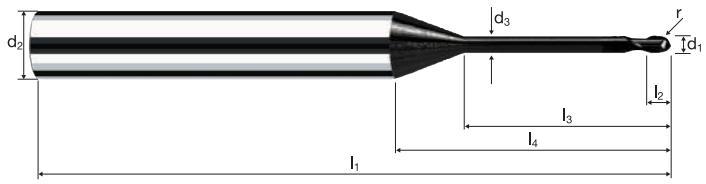
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.20	2	0.002	0.060	0.080	60	100	120	180
		0.50	2	0.005	0.150	0.200	150	250	300	450
		0.60	2	0.006	0.200	0.250	180	300	360	540
		0.80	2	0.008	0.250	0.300	240	400	480	720
		1.00	2	0.009	0.300	0.400	270	450	540	810
		1.50	2	0.014	0.450	0.600	420	700	840	1260
		2.00	2	0.019	0.600	0.800	570	950	1140	1710
		3.00	2	0.028	0.900	1.200	840	1400	1680	2520
		4.00	2	0.038	1.200	1.600	1140	1900	2280	3420
	Graphite B B	0.20	2	0.001	0.040	0.200	30	50	60	90
		0.50	2	0.004	0.100	0.500	120	200	240	360
		0.60	2	0.004	0.100	0.600	120	200	240	360
		0.80	2	0.006	0.150	0.800	180	300	360	540
		1.00	2	0.007	0.200	1.000	210	350	420	630
		1.50	2	0.011	0.300	1.500	330	550	660	990
		2.00	2	0.015	0.400	2.000	450	750	900	1350
		3.00	2	0.022	0.060	3.000	660	1100	1320	1980
		4.00	2	0.029	0.800	4.000	870	1450	1740	2610
	Graphite B B	0.20	2	0.002	0.020	0.030	60	100	120	180
		0.50	2	0.005	0.050	0.070	150	250	300	450
		0.60	2	0.006	0.060	0.080	180	300	360	540
		0.80	2	0.009	0.080	0.110	270	450	540	810
		1.00	2	0.011	0.100	0.140	330	550	660	990
		1.50	2	0.016	0.150	0.210	480	800	960	1440
		2.00	2	0.021	0.200	0.280	630	1050	1260	1890
		3.00	2	0.032	0.300	0.420	960	1600	1920	2880
		4.00	2	0.043	0.400	0.560	1290	2150	2580	3870
	Graphite B B	0.20	2	0.002	0.020	0.020	60	100	120	180
		0.50	2	0.005	0.050	0.050	150	250	300	450
		0.60	2	0.006	0.060	0.060	180	300	360	540
		0.80	2	0.009	0.080	0.080	270	450	540	810
		1.00	2	0.011	0.100	0.100	330	550	660	990
		1.50	2	0.016	0.150	0.150	480	800	960	1440
		2.00	2	0.021	0.200	0.200	630	1050	1260	1890
		3.00	2	0.032	0.300	0.300	960	1600	1920	2880
		4.00	2	0.043	0.400	0.400	1290	2150	2580	3870

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 12xd

X-Generation

HM XA	λ 30° γ 15°



h4

d1

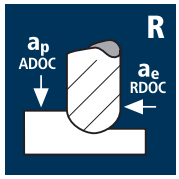
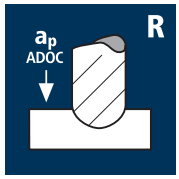
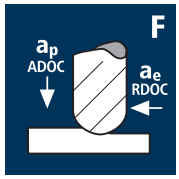
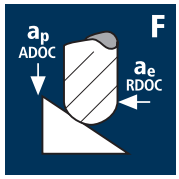
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C Graphite	CF/GF Fiber Reinforced Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6070** ø-Code **020**

Ø Code	d1	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z	DIAPLUS B6070
020	0.20	6.00	0.18	57	0.20	2.40	2.50	18.99	0.100	2	●
030	0.30	6.00	0.25	57	0.30	3.60	3.80	19.99	0.150	2	●
040	0.40	6.00	0.35	57	0.40	4.80	5.00	20.91	0.200	2	●
050	0.50	6.00	0.45	57	0.50	6.00	6.20	16.49	0.250	2	●
060	0.60	6.00	0.55	57	0.60	7.20	7.40	17.50	0.300	2	●
080	0.80	6.00	0.75	57	0.80	9.60	9.80	19.53	0.400	2	●
100	1.00	6.00	0.95	61	1.00	12.00	12.20	21.56	0.500	2	●
120	1.50	6.00	1.40	66	1.50	18.00	18.30	26.72	0.750	2	●
140	2.00	6.00	1.90	69	2.00	24.00	24.30	31.78	1.000	2	●
180	3.00	6.00	2.80	80	3.00	36.00	36.43	42.10	1.500	2	●
220	4.00	6.00	3.70	100	4.00	48.00	48.52	52.42	2.000	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.30	2	0.002	0.060	0.090	60	100	120	180
		0.50	2	0.004	0.100	0.150	120	200	240	360
		0.60	2	0.005	0.100	0.200	150	250	300	450
		0.80	2	0.007	0.150	0.250	210	350	420	630
		1.00	2	0.008	0.200	0.300	240	400	480	720
		1.50	2	0.012	0.300	0.450	360	600	720	1080
		2.00	2	0.016	0.400	0.600	480	800	960	1440
		3.00	2	0.025	0.600	0.900	750	1250	1500	2250
		4.00	2	0.033	0.800	1.200	990	1650	1980	2970
	Graphite B B	0.30	2	0.002	0.030	0.300	60	100	120	180
		0.50	2	0.003	0.050	0.500	90	150	180	270
		0.60	2	0.004	0.060	0.600	120	200	240	360
		0.80	2	0.005	0.080	0.800	150	250	300	450
		1.00	2	0.006	0.100	1.000	180	300	360	540
		1.50	2	0.010	0.150	1.500	300	500	600	900
		2.00	2	0.013	0.200	2.000	390	650	780	1170
		3.00	2	0.019	0.300	3.000	570	950	1140	1710
		4.00	2	0.025	0.400	4.000	750	1250	1500	2250
	Graphite B B	0.30	2	0.003	0.020	0.030	90	150	180	270
		0.50	2	0.005	0.040	0.050	150	250	300	450
		0.60	2	0.006	0.050	0.060	180	300	360	540
		0.80	2	0.007	0.060	0.080	210	350	420	630
		1.00	2	0.009	0.080	0.100	270	450	540	810
		1.50	2	0.014	0.120	0.150	420	700	840	1260
		2.00	2	0.019	0.160	0.200	570	950	1140	1710
		3.00	2	0.028	0.240	0.300	840	1400	1680	2520
		4.00	2	0.037	0.320	0.400	1110	1850	2220	3330
	Graphite B B	0.30	2	0.003	0.020	0.020	90	150	180	270
		0.50	2	0.005	0.040	0.040	150	250	300	450
		0.60	2	0.006	0.050	0.050	180	300	360	540
		0.80	2	0.007	0.060	0.060	210	350	420	630
		1.00	2	0.009	0.080	0.080	270	450	540	810
		1.50	2	0.014	0.120	0.120	420	700	840	1260
		2.00	2	0.019	0.160	0.160	570	950	1140	1710
		3.00	2	0.028	0.240	0.240	840	1400	1680	2520
		4.00	2	0.037	0.320	0.320	1110	1850	2220	3330

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 15xd

X-Generation X

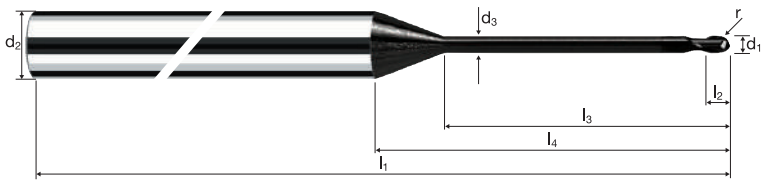
HM
XA

λ 30°
γ 15°

h4

d1

r



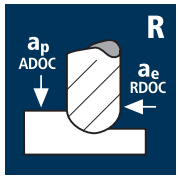
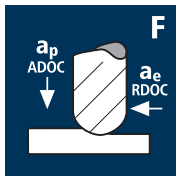
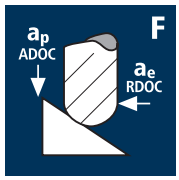
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6072** ø-Code **030**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6072
030	0.30	6.00	0.25	61	0.30	4.50	4.70	20.89	0.150	2	●
040	0.40	6.00	0.35	61	0.40	6.00	6.20	22.11	0.200	2	●
050	0.50	6.00	0.45	57	0.50	7.50	7.70	17.99	0.250	2	●
060	0.60	6.00	0.55	57	0.60	9.00	9.20	19.30	0.300	2	●
080	0.80	6.00	0.75	61	0.80	12.00	12.20	21.93	0.400	2	●
100	1.00	6.00	0.95	66	1.00	15.00	15.20	24.56	0.500	2	●
120	1.50	6.00	1.40	69	1.50	22.50	22.80	31.22	0.750	2	●
140	2.00	6.00	1.90	75	2.00	30.00	30.30	37.78	1.000	2	●
180	3.00	6.00	2.80	100	3.00	45.00	45.43	51.10	1.500	2	●
220	4.00	6.00	3.70	105	4.00	60.00	60.52	64.42	2.000	2	●

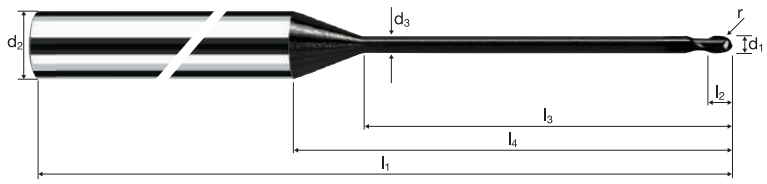
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite	0.30	2	0.002	0.050	0.060	60	100	120	180
		0.50	2	0.004	0.080	0.100	120	200	240	360
		0.60	2	0.005	0.100	0.100	150	250	300	450
		0.80	2	0.007	0.100	0.150	210	350	420	630
		1.00	2	0.008	0.150	0.200	240	400	480	720
		1.50	2	0.012	0.250	0.300	360	600	720	1080
		2.00	2	0.016	0.300	0.400	480	800	960	1440
		3.00	2	0.025	0.450	0.600	750	1250	1500	2250
		4.00	2	0.033	0.600	0.800	990	1650	1980	2970
	Graphite	0.30	2	0.003	0.020	0.020	90	150	180	270
		0.50	2	0.005	0.030	0.040	150	250	300	450
		0.60	2	0.006	0.040	0.050	180	300	360	540
		0.80	2	0.007	0.050	0.060	210	350	420	630
		1.00	2	0.009	0.060	0.080	270	450	540	810
		1.50	2	0.014	0.090	0.120	420	700	840	1260
		2.00	2	0.019	0.120	0.160	570	950	1140	1710
		3.00	2	0.028	0.180	0.240	840	1400	1680	2520
		4.00	2	0.037	0.240	0.320	1110	1850	2220	3330
	Graphite	0.30	2	0.003	0.020	0.020	90	150	180	270
		0.50	2	0.005	0.030	0.030	150	250	300	450
		0.60	2	0.006	0.040	0.040	180	300	360	540
		0.80	2	0.007	0.050	0.050	210	350	420	630
		1.00	2	0.009	0.060	0.060	270	450	540	810
		1.50	2	0.014	0.090	0.090	420	700	840	1260
		2.00	2	0.019	0.120	0.120	570	950	1140	1710
		3.00	2	0.028	0.180	0.180	840	1400	1680	2520
		4.00	2	0.037	0.240	0.240	1110	1850	2220	3330

Ball nose end mills MicroX

Shank ø 6mm, cylindrical neck, 20xd

X-Generation

HM XA	λ 30° γ 15°



h4

d1

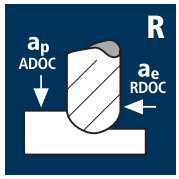
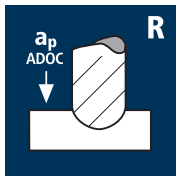
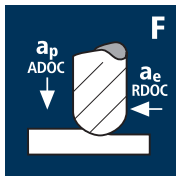
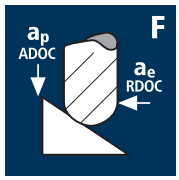
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C Graphite	CF/GF Fiber Reinforced Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6074** ø-Code **030**

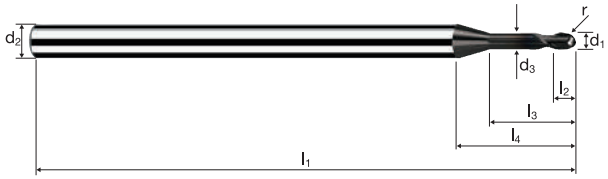
Ø Code	d1	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z	DIAPLUS B6074
030	0.30	6.00	0.25	61	0.30	6.00	6.20	22.39	0.150	2	●
040	0.40	6.00	0.35	61	0.40	8.00	8.20	24.11	0.200	2	●
050	0.50	6.00	0.45	61	0.50	10.00	10.20	20.49	0.250	2	●
060	0.60	6.00	0.55	61	0.60	12.00	12.20	22.30	0.300	2	●
080	0.80	6.00	0.75	66	0.80	16.00	16.20	25.93	0.400	2	●
100	1.00	6.00	0.95	69	1.00	20.00	20.20	29.56	0.500	2	●
120	1.50	6.00	1.40	80	1.50	30.00	30.30	38.72	0.750	2	●
140	2.00	6.00	1.90	87	2.00	40.00	40.30	47.78	1.000	2	●
180	3.00	6.00	2.80	105	3.00	60.00	60.43	66.10	1.500	2	●
220	4.00	6.00	3.70	122	4.00	80.00	80.52	84.42	2.000	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.50	2	0.005	0.250	0.300	150	250	300	450
		0.60	2	0.006	0.250	0.350	180	300	360	540
		0.80	2	0.008	0.350	0.500	240	400	480	720
		1.00	2	0.009	0.450	0.600	270	450	540	810
		1.20	2	0.011	0.550	0.700	330	550	660	990
		1.50	2	0.014	0.700	0.900	420	700	840	1260
		2.00	2	0.019	0.900	1.200	570	950	1140	1710
		2.50	2	0.024	1.150	1.500	720	1200	1440	2160
		3.00	2	0.028	1.350	1.800	840	1400	1680	2520
	Graphite B B	0.50	2	0.004	0.250	0.500	120	200	240	360
		0.60	2	0.004	0.250	0.600	120	200	240	360
		0.80	2	0.006	0.350	0.800	180	300	360	540
		1.00	2	0.007	0.450	1.000	210	350	420	630
		1.20	2	0.009	0.550	1.200	270	450	540	810
		1.50	2	0.011	0.700	1.500	330	550	660	990
		2.00	2	0.015	0.900	2.000	450	750	900	1350
		2.50	2	0.018	1.150	2.500	540	900	1080	1620
		3.00	2	0.022	1.350	3.000	660	1100	1320	1980
	Graphite B B	0.50	2	0.005	0.070	0.100	150	250	300	450
		0.60	2	0.006	0.080	0.120	180	300	360	540
		0.80	2	0.009	0.110	0.160	270	450	540	810
		1.00	2	0.011	0.140	0.200	330	550	660	990
		1.20	2	0.013	0.170	0.240	390	650	780	1170
		1.50	2	0.016	0.210	0.300	480	800	960	1440
		2.00	2	0.021	0.280	0.400	630	1050	1260	1890
		2.50	2	0.027	0.350	0.500	810	1350	1620	2430
		3.00	2	0.032	0.420	0.600	960	1600	1920	2880
	Graphite B B	0.50	2	0.005	0.090	0.090	150	250	300	450
		0.60	2	0.006	0.110	0.110	180	300	360	540
		0.80	2	0.009	0.140	0.140	270	450	540	810
		1.00	2	0.011	0.180	0.180	330	550	660	990
		1.20	2	0.013	0.220	0.220	390	650	780	1170
		1.50	2	0.016	0.270	0.270	480	800	960	1440
		2.00	2	0.021	0.360	0.360	630	1050	1260	1890
		2.50	2	0.027	0.450	0.450	810	1350	1620	2430
		3.00	2	0.032	0.540	0.540	960	1600	1920	2880

Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

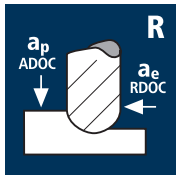
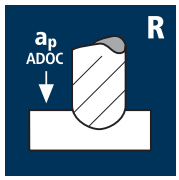
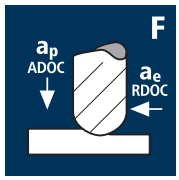
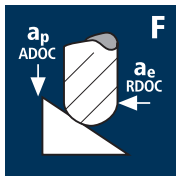
HM MG10	λ 30° γ 5°



				C Graphite					CF/GF Fiber Reinforced Plastics

Example: **Order-N°.** Coating **B** Article-N°. **5784** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	DIAMANT B5784
050	0.50	3.00	0.45	40	0.60	2.50	2.50	7.65	0.250	2	●
060	0.60	3.00	0.55	40	0.72	3.00	3.00	7.97	0.300	2	●
070	0.70	3.00	0.65	40	0.84	3.50	3.50	8.28	0.350	2	●
080	0.80	3.00	0.75	40	0.96	4.00	4.00	8.59	0.400	2	●
090	0.90	3.00	0.85	40	1.08	4.50	4.50	8.91	0.450	2	●
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	0.500	2	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	0.600	2	●
120	1.50	3.00	1.40	50	1.80	7.50	7.50	10.88	0.750	2	●
132	1.80	3.00	1.70	50	2.16	9.00	9.00	11.82	0.900	2	●
140	2.00	3.00	1.90	50	2.40	10.00	10.00	12.45	1.000	2	●
152	2.30	3.00	2.10	50	2.76	11.50	11.50	13.57	1.150	2	●
160	2.50	3.00	2.30	50	3.00	12.50	12.50	14.20	1.250	2	●
172	2.80	3.00	2.60	50	3.36	14.00	14.00	15.14	1.400	2	●
180	3.00	3.00	2.80	50	3.60	14.56	14.56	15.00	1.500	2	●

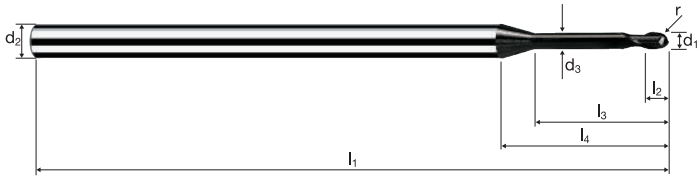
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.50	2	0.005	0.200	0.300	150	250	300	450
		0.60	2	0.006	0.250	0.350	180	300	360	540
		0.80	2	0.008	0.300	0.500	240	400	480	720
		1.00	2	0.009	0.400	0.600	270	450	540	810
		1.20	2	0.011	0.500	0.700	330	550	660	990
		1.50	2	0.014	0.600	0.900	420	700	840	1260
		2.00	2	0.019	0.800	1.200	570	950	1140	1710
		2.50	2	0.024	1.000	1.500	720	1200	1440	2160
		3.00	2	0.028	1.200	1.800	840	1400	1680	2520
	Graphite B B	0.50	2	0.004	0.200	0.500	120	200	240	360
		0.60	2	0.004	0.250	0.600	120	200	240	360
		0.80	2	0.006	0.300	0.800	180	300	360	540
		1.00	2	0.007	0.400	1.000	210	350	420	630
		1.20	2	0.009	0.500	1.200	270	450	540	810
		1.50	2	0.011	0.600	1.500	330	550	660	990
		2.00	2	0.015	0.800	2.000	450	750	900	1350
		2.50	2	0.018	1.000	2.500	540	900	1080	1620
		3.00	2	0.022	1.200	3.000	660	1100	1320	1980
	Graphite B B	0.50	2	0.005	0.060	0.090	150	250	300	450
		0.60	2	0.006	0.070	0.110	180	300	360	540
		0.80	2	0.009	0.100	0.140	270	450	540	810
		1.00	2	0.011	0.120	0.180	330	550	660	990
		1.20	2	0.013	0.140	0.220	390	650	780	1170
		1.50	2	0.016	0.180	0.270	480	800	960	1440
		2.00	2	0.021	0.240	0.360	630	1050	1260	1890
		2.50	2	0.027	0.300	0.450	810	1350	1620	2430
		3.00	2	0.032	0.360	0.540	960	1600	1920	2880
	Graphite B B	0.50	2	0.005	0.080	0.080	150	250	300	450
		0.60	2	0.006	0.100	0.100	180	300	360	540
		0.80	2	0.009	0.130	0.130	270	450	540	810
		1.00	2	0.011	0.160	0.160	330	550	660	990
		1.20	2	0.013	0.190	0.190	390	650	780	1170
		1.50	2	0.016	0.240	0.240	480	800	960	1440
		2.00	2	0.021	0.320	0.320	630	1050	1260	1890
		2.50	2	0.027	0.400	0.400	810	1350	1620	2430
		3.00	2	0.032	0.480	0.480	960	1600	1920	2880

Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 8xd

Performance **P**

HM MG10	λ 30° γ 5°



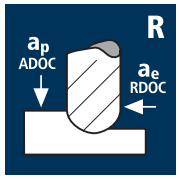
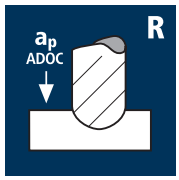
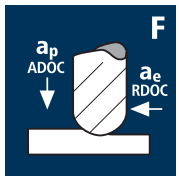
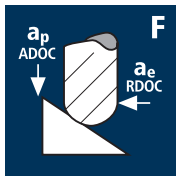
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **5786** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	DIAMANT B5786
050	0.50	3.00	0.45	40	0.60	4.00	4.00	9.15	0.250	2	●
060	0.60	3.00	0.55	40	0.72	4.80	4.80	9.77	0.300	2	●
080	0.80	3.00	0.75	40	0.96	6.40	6.40	10.99	0.400	2	●
100	1.00	3.00	0.95	50	1.20	8.00	8.00	12.22	0.500	2	●
108	1.20	3.00	1.10	50	1.44	9.60	9.60	13.54	0.600	2	●
120	1.50	3.00	1.40	60	1.80	12.00	12.00	15.38	0.750	2	●
140	2.00	3.00	1.90	60	2.40	16.00	16.00	18.45	1.000	2	●
160	2.50	3.00	2.30	60	3.00	20.00	20.00	21.70	1.250	2	●
180	3.00	3.00	2.80	60	3.60	23.56	23.56	24.00	1.500	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.50	2	0.005	0.200	0.200	150	250	300	450
		0.60	2	0.006	0.250	0.250	180	300	360	540
		0.80	2	0.008	0.300	0.300	240	400	480	720
		1.00	2	0.009	0.400	0.400	270	450	540	810
		1.20	2	0.011	0.500	0.500	330	550	660	990
		1.50	2	0.014	0.600	0.600	420	700	840	1260
		2.00	2	0.019	0.800	0.800	570	950	1140	1710
		2.50	2	0.024	1.000	1.000	720	1200	1440	2160
		3.00	2	0.028	1.200	1.200	840	1400	1680	2520
	Graphite B B	0.50	2	0.003	0.150	0.500	90	150	180	270
		0.60	2	0.003	0.200	0.600	90	150	180	270
		0.80	2	0.004	0.250	0.800	120	200	240	360
		1.00	2	0.005	0.300	1.000	150	250	300	450
		1.20	2	0.007	0.350	1.200	210	350	420	630
		1.50	2	0.008	0.450	1.500	240	400	480	720
		2.00	2	0.011	0.600	2.000	330	550	660	990
		2.50	2	0.014	0.750	2.500	420	700	840	1260
		3.00	2	0.016	0.900	3.000	480	800	960	1440
	Graphite B B	0.50	2	0.005	0.050	0.080	150	250	300	450
		0.60	2	0.006	0.060	0.100	180	300	360	540
		0.80	2	0.009	0.080	0.130	270	450	540	810
		1.00	2	0.011	0.100	0.160	330	550	660	990
		1.20	2	0.013	0.120	0.190	390	650	780	1170
		1.50	2	0.016	0.150	0.240	480	800	960	1440
		2.00	2	0.021	0.200	0.320	630	1050	1260	1890
		2.50	2	0.027	0.250	0.400	810	1350	1620	2430
		3.00	2	0.032	0.300	0.480	960	1600	1920	2880
	Graphite B B	0.50	2	0.005	0.070	0.070	150	250	300	450
		0.60	2	0.006	0.080	0.080	180	300	360	540
		0.80	2	0.009	0.110	0.110	270	450	540	810
		1.00	2	0.011	0.140	0.140	330	550	660	990
		1.20	2	0.013	0.170	0.170	390	650	780	1170
		1.50	2	0.016	0.210	0.210	480	800	960	1440
		2.00	2	0.021	0.280	0.280	630	1050	1260	1890
		2.50	2	0.027	0.350	0.350	810	1350	1620	2430
		3.00	2	0.032	0.420	0.420	960	1600	1920	2880

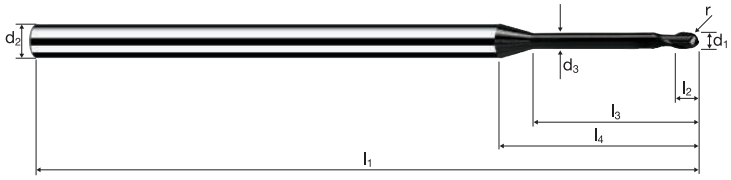
Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 10xd

Performance **P**

HM
MG10

λ **30°**
γ **5°**



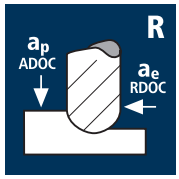
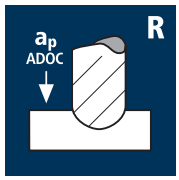
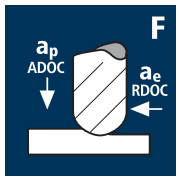
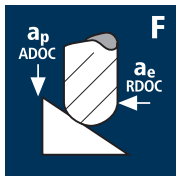
C
Graphite

CF/GF
Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **5787** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	DIAMANT B5787
050	0.50	3.00	0.45	40	0.60	5.00	5.00	10.15	0.250	2	●
060	0.60	3.00	0.55	40	0.72	6.00	6.00	10.97	0.300	2	●
080	0.80	3.00	0.75	40	0.96	8.00	8.00	12.59	0.400	2	●
100	1.00	3.00	0.95	50	1.20	10.00	10.00	14.22	0.500	2	●
108	1.20	3.00	1.10	50	1.44	12.00	12.00	15.94	0.600	2	●
120	1.50	3.00	1.40	60	1.80	15.00	15.00	18.38	0.750	2	●
140	2.00	3.00	1.90	60	2.40	20.00	20.00	22.45	1.000	2	●
160	2.50	3.00	2.30	60	3.00	25.00	25.00	26.70	1.250	2	●
180	3.00	3.00	2.80	60	3.60	29.56	29.56	30.00	1.500	2	●

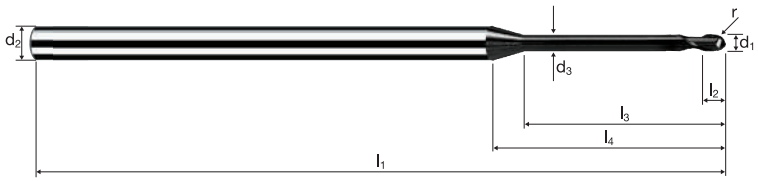
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.00	2	0.007	0.300	0.400	210	350	420	630
		1.20	2	0.008	0.350	0.500	240	400	480	720
		1.50	2	0.011	0.450	0.600	330	550	660	990
		2.00	2	0.014	0.600	0.800	420	700	840	1260
		2.50	2	0.018	0.750	1.000	540	900	1080	1620
		3.00	2	0.021	0.900	1.200	630	1050	1260	1890
	Graphite B B	1.00	2	0.005	0.200	1.000	150	250	300	450
		1.20	2	0.007	0.250	1.200	210	350	420	630
		1.50	2	0.008	0.300	1.500	240	400	480	720
		2.00	2	0.011	0.400	2.000	330	550	660	990
		2.50	2	0.014	0.500	2.500	420	700	840	1260
		3.00	2	0.016	0.600	3.000	480	800	960	1440
	Graphite B B	1.00	2	0.008	0.100	0.140	240	400	480	720
		1.20	2	0.010	0.120	0.170	300	500	600	900
		1.50	2	0.012	0.150	0.210	360	600	720	1080
		2.00	2	0.016	0.200	0.280	480	800	960	1440
		2.50	2	0.020	0.250	0.350	600	1000	1200	1800
		3.00	2	0.024	0.300	0.420	720	1200	1440	2160
	Graphite B B	1.00	2	0.008	0.100	0.100	240	400	480	720
		1.20	2	0.010	0.120	0.120	300	500	600	900
		1.50	2	0.012	0.150	0.150	360	600	720	1080
		2.00	2	0.016	0.200	0.200	480	800	960	1440
		2.50	2	0.020	0.250	0.250	600	1000	1200	1800
		3.00	2	0.024	0.300	0.300	720	1200	1440	2160

Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 12xd

Performance **P**

HM MG10	λ 30° γ 5°



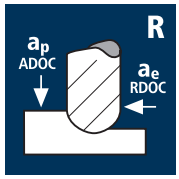
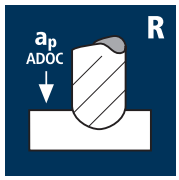
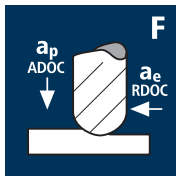
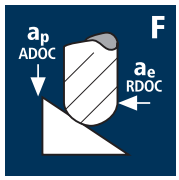
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **5791** ø-Code **100**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	DIAMANT B5791
100	1.00	3.00	0.95	50	1.20	12.00	12.00	16.22	0.500	2	●
108	1.20	3.00	1.10	60	1.44	14.40	14.40	18.34	0.600	2	●
120	1.50	3.00	1.40	60	1.80	18.00	18.00	21.38	0.750	2	●
140	2.00	3.00	1.90	60	2.40	24.00	24.00	26.45	1.000	2	●
160	2.50	3.00	2.30	70	3.00	30.00	30.00	31.70	1.250	2	●
180	3.00	3.00	2.80	70	3.60	35.56	35.56	36.00	1.500	2	●

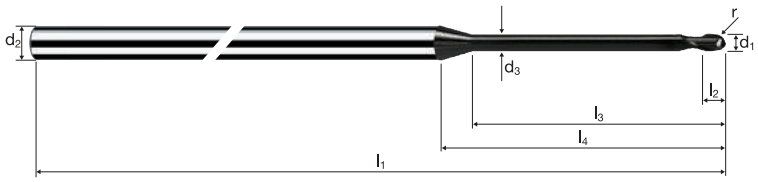
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.00	2	0.007	0.200	0.300	210	350	420	630
		1.20	2	0.008	0.250	0.350	240	400	480	720
		1.50	2	0.011	0.300	0.450	330	550	660	990
		2.00	2	0.014	0.400	0.600	420	700	840	1260
		2.50	2	0.018	0.500	0.750	540	900	1080	1620
		3.00	2	0.021	0.600	0.900	630	1050	1260	1890
	Graphite B B	1.00	2	0.005	0.100	1.000	150	250	300	450
		1.20	2	0.007	0.100	1.200	210	350	420	630
		1.50	2	0.008	0.150	1.500	240	400	480	720
		2.00	2	0.011	0.200	2.000	330	550	660	990
		2.50	2	0.014	0.250	2.500	420	700	840	1260
		3.00	2	0.016	0.300	3.000	480	800	960	1440
	Graphite B B	1.00	2	0.008	0.080	0.100	240	400	480	720
		1.20	2	0.010	0.100	0.120	300	500	600	900
		1.50	2	0.012	0.120	0.150	360	600	720	1080
		2.00	2	0.016	0.160	0.200	480	800	960	1440
		2.50	2	0.020	0.200	0.250	600	1000	1200	1800
		3.00	2	0.024	0.240	0.300	720	1200	1440	2160
	Graphite B B	1.00	2	0.008	0.080	0.080	240	400	480	720
		1.20	2	0.010	0.100	0.100	300	500	600	900
		1.50	2	0.012	0.120	0.120	360	600	720	1080
		2.00	2	0.016	0.160	0.160	480	800	960	1440
		2.50	2	0.020	0.200	0.200	600	1000	1200	1800
		3.00	2	0.024	0.240	0.240	720	1200	1440	2160

Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 15xd

Performance **P**

HM MG10	λ 30° γ 5°



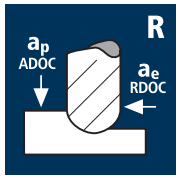
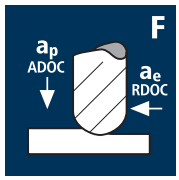
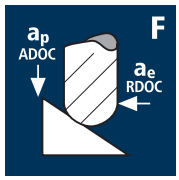
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **5793** ø-Code **100**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	DIAMANT B5793
100	1.00	3.00	0.95	60	1.20	15.00	15.00	19.22	0.500	2	●
108	1.20	3.00	1.10	60	1.44	18.00	18.00	21.94	0.600	2	●
120	1.50	3.00	1.40	70	1.80	22.50	22.50	25.88	0.750	2	●
140	2.00	3.00	1.90	70	2.40	30.00	30.00	32.45	1.000	2	●
160	2.50	3.00	2.30	70	3.00	37.50	37.50	39.20	1.250	2	●
180	3.00	3.00	2.80	80	3.60	44.56	44.56	45.00	1.500	2	●

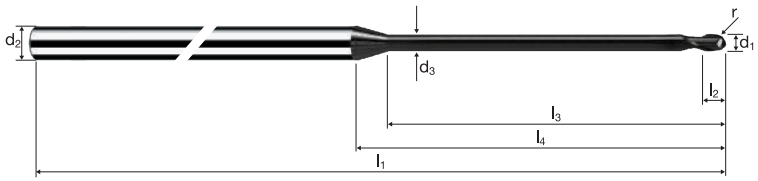
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.00	2	0.007	0.150	0.200	210	350	420	630
		1.20	2	0.008	0.200	0.250	240	400	480	720
		1.50	2	0.011	0.250	0.300	330	550	660	990
		2.00	2	0.014	0.300	0.400	420	700	840	1260
		2.50	2	0.018	0.400	0.500	540	900	1080	1620
		3.00	2	0.021	0.450	0.600	630	1050	1260	1890
	Graphite B B	1.00	2	0.008	0.060	0.080	240	400	480	720
		1.20	2	0.010	0.070	0.100	300	500	600	900
		1.50	2	0.012	0.090	0.120	360	600	720	1080
		2.00	2	0.016	0.120	0.160	480	800	960	1440
		2.50	2	0.020	0.150	0.200	600	1000	1200	1800
		3.00	2	0.024	0.180	0.240	720	1200	1440	2160
	Graphite B B	1.00	2	0.008	0.060	0.060	240	400	480	720
		1.20	2	0.010	0.070	0.070	300	500	600	900
		1.50	2	0.012	0.090	0.090	360	600	720	1080
		2.00	2	0.016	0.120	0.120	480	800	960	1440
		2.50	2	0.020	0.150	0.150	600	1000	1200	1800
		3.00	2	0.024	0.180	0.180	720	1200	1440	2160

Ball nose end mills Microcut

Shank ø 3mm, cylindrical neck, 20xd

Performance **P**

HM MG10	λ 30° γ 5°



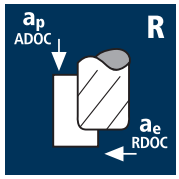
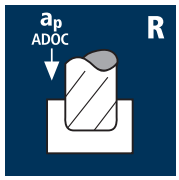
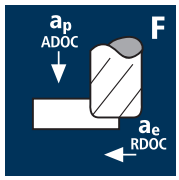
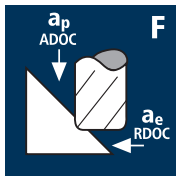
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **15795** ø-Code **100**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.01	z	DIAMANT B15795
100	1.00	3.00	0.95	60	1.20	20.00	20.00	24.22	0.500	2	●
108	1.20	3.00	1.10	60	1.44	24.00	24.00	27.94	0.600	2	●
120	1.50	3.00	1.40	70	1.80	30.00	30.00	33.38	0.750	2	●
140	2.00	3.00	1.90	80	2.40	40.00	40.00	42.45	1.000	2	●
160	2.50	3.00	2.30	80	3.00	50.00	50.00	51.70	1.250	2	●
180	3.00	3.00	2.80	90	3.60	59.56	59.56	60.00	1.500	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.50	2	0.018	0.750	0.900	540	900	1080	1620
		2.00	2	0.024	1.000	1.200	720	1200	1440	2160
		3.00	2	0.035	1.500	1.800	1050	1750	2100	3150
		4.00	2	0.047	2.000	2.400	1410	2350	2820	4230
		5.00	2	0.059	2.500	3.000	1770	2950	3540	5310
		6.00	2	0.071	3.000	3.600	2130	3550	4260	6390
	Graphite B B	1.50	2	0.014	0.750	1.500	420	700	840	1260
		2.00	2	0.018	1.000	2.000	540	900	1080	1620
		3.00	2	0.027	1.500	3.000	810	1350	1620	2430
		4.00	2	0.036	2.000	4.000	1080	1800	2160	3240
		5.00	2	0.045	2.500	5.000	1350	2250	2700	4050
		6.00	2	0.055	3.000	6.000	1650	2750	3300	4950
	Graphite B B	1.50	2	0.020	0.230	0.300	600	1000	1200	1800
		2.00	2	0.027	0.300	0.400	810	1350	1620	2430
		3.00	2	0.040	0.450	0.600	1200	2000	2400	3600
		4.00	2	0.053	0.600	0.800	1590	2650	3180	4770
		5.00	2	0.067	0.750	1.000	2010	3350	4020	6030
		6.00	2	0.080	0.900	1.200	2400	4000	4800	7200
	Graphite B B	1.50	2	0.020	0.300	0.300	600	1000	1200	1800
		2.00	2	0.027	0.400	0.400	810	1350	1620	2430
		3.00	2	0.040	0.600	0.600	1200	2000	2400	3600
		4.00	2	0.053	0.800	0.800	1590	2650	3180	4770
		5.00	2	0.067	1.000	1.000	2010	3350	4020	6030
		6.00	2	0.080	1.200	1.200	2400	4000	4800	7200

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 3xd

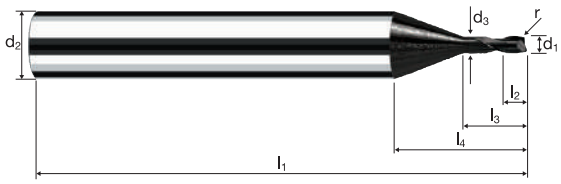
X-Generation

HM XA	λ 30° γ 15°

h4

d1

r



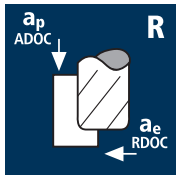
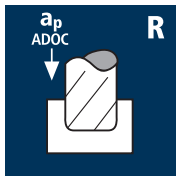
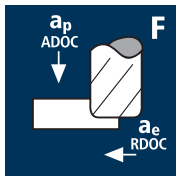
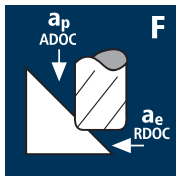
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6032** ø-Code **120**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6032
120	1.50	6.00	1.40	57	1.50	4.50	4.80	13.22	0.200	2	●
140	2.00	6.00	1.90	57	2.00	6.00	6.30	13.78	0.200	2	●
180	3.00	6.00	2.80	57	3.00	9.00	9.43	15.10	0.200	2	●
215	4.00	6.00	3.70	57	4.00	12.00	12.52	16.42	0.200	2	●
255	5.00	6.00	4.60	57	5.00	15.00	15.59	17.74	0.200	2	●
295	6.00	6.00	5.50	57	6.00	17.34	17.34	18.00	0.200	2	●
220	4.00	6.00	3.70	57	4.00	12.00	12.52	16.42	0.500	2	●
260	5.00	6.00	4.60	57	5.00	15.00	15.59	17.74	0.500	2	●
300	6.00	6.00	5.50	57	6.00	17.34	17.34	18.00	0.500	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.20	2	0.002	0.100	0.100	60	100	120	180
		0.30	2	0.004	0.150	0.200	120	200	240	360
		0.40	2	0.005	0.200	0.250	150	250	300	450
		0.50	2	0.006	0.250	0.300	180	300	360	540
		0.60	2	0.007	0.250	0.350	210	350	420	630
		0.80	2	0.009	0.350	0.500	270	450	540	810
		1.00	2	0.012	0.450	0.600	360	600	720	1080
		2.00	2	0.024	0.900	1.200	720	1200	1440	2160
	Graphite B B	0.20	2	0.002	0.100	0.200	60	100	120	180
		0.30	2	0.003	0.150	0.300	90	150	180	270
		0.40	2	0.004	0.200	0.400	120	200	240	360
		0.50	2	0.005	0.250	0.500	150	250	300	450
		0.60	2	0.005	0.250	0.600	150	250	300	450
		0.80	2	0.007	0.350	0.800	210	350	420	630
		1.00	2	0.009	0.450	1.000	270	450	540	810
		2.00	2	0.018	0.900	2.000	540	900	1080	1620
	Graphite B B	0.20	2	0.003	0.030	0.040	90	150	180	270
		0.30	2	0.004	0.040	0.060	120	200	240	360
		0.40	2	0.005	0.060	0.080	150	250	300	450
		0.50	2	0.007	0.070	0.100	210	350	420	630
		0.60	2	0.008	0.080	0.120	240	400	480	720
		0.80	2	0.011	0.110	0.160	330	550	660	990
		1.00	2	0.013	0.140	0.200	390	650	780	1170
		2.00	2	0.027	0.280	0.400	810	1350	1620	2430
	Graphite B B	0.20	2	0.003	0.040	0.040	90	150	180	270
		0.30	2	0.004	0.050	0.050	120	200	240	360
		0.40	2	0.005	0.070	0.070	150	250	300	450
		0.50	2	0.007	0.090	0.090	210	350	420	630
		0.60	2	0.008	0.110	0.110	240	400	480	720
		0.80	2	0.011	0.140	0.140	330	550	660	990
		1.00	2	0.013	0.180	0.180	390	650	780	1170
		2.00	2	0.027	0.360	0.360	810	1350	1620	2430

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

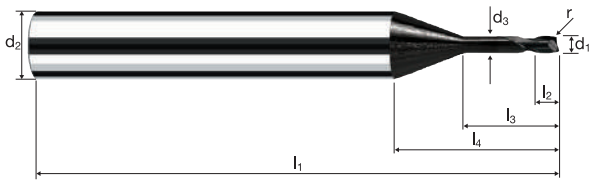
X-Generation X

HM XA	λ 30° γ 15°

h4

d1

r



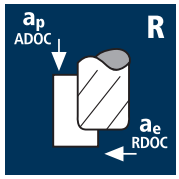
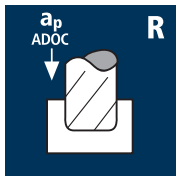
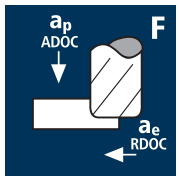
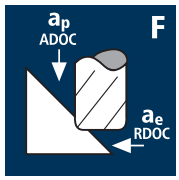
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6034** ø-Code **020**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6034
020	0.20	6.00	0.18	57	0.20	1.00	1.10	17.59	-	2	●
030	0.30	6.00	0.25	57	0.30	1.50	1.70	17.89	-	2	●
018	0.20	6.00	0.18	57	0.20	1.00	1.10	17.59	0.050	2	●
028	0.30	6.00	0.25	57	0.30	1.50	1.70	17.89	0.050	2	●
040	0.40	6.00	0.35	57	0.40	2.00	2.20	18.11	0.050	2	●
048	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.050	2	●
058	0.60	6.00	0.55	57	0.60	3.00	3.20	13.30	0.050	2	●
078	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.050	2	●
096	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.050	2	●
050	0.50	6.00	0.45	57	0.50	2.50	2.70	12.99	0.100	2	●
060	0.60	6.00	0.55	57	0.60	3.00	3.20	13.30	0.100	2	●
080	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.100	2	●
098	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.100	2	●
138	2.00	6.00	1.90	57	2.00	10.00	10.30	17.78	0.100	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.80	2	0.009	0.350	0.500	270	450	540	810
		1.00	2	0.012	0.450	0.600	360	600	720	1080
		1.50	2	0.018	0.700	0.900	540	900	1080	1620
		2.00	2	0.024	0.900	1.200	720	1200	1440	2160
		3.00	2	0.035	1.350	1.800	1050	1750	2100	3150
		4.00	2	0.047	1.800	2.400	1410	2350	2820	4230
		5.00	2	0.059	2.250	3.000	1770	2950	3540	5310
		6.00	2	0.071	2.700	3.600	2130	3550	4260	6390
	Graphite B B	0.80	2	0.007	0.350	0.800	210	350	420	630
		1.00	2	0.009	0.450	1.000	270	450	540	810
		1.50	2	0.014	0.700	1.500	420	700	840	1260
		2.00	2	0.018	0.900	2.000	540	900	1080	1620
		3.00	2	0.027	1.350	3.000	810	1350	1620	2430
		4.00	2	0.036	1.800	4.000	1080	1800	2160	3240
		5.00	2	0.045	2.250	5.000	1350	2250	2700	4050
		6.00	2	0.055	2.700	6.000	1650	2750	3300	4950
	Graphite B B	0.80	2	0.011	0.110	0.160	330	550	660	990
		1.00	2	0.013	0.140	0.200	390	650	780	1170
		1.50	2	0.020	0.210	0.300	600	1000	1200	1800
		2.00	2	0.027	0.280	0.400	810	1350	1620	2430
		3.00	2	0.040	0.420	0.600	1200	2000	2400	3600
		4.00	2	0.053	0.560	0.800	1590	2650	3180	4770
		5.00	2	0.067	0.700	1.000	2010	3350	4020	6030
		6.00	2	0.080	0.840	1.200	2400	4000	4800	7200
	Graphite B B	0.80	2	0.011	0.140	0.140	330	550	660	990
		1.00	2	0.013	0.180	0.180	390	650	780	1170
		1.50	2	0.020	0.270	0.270	600	1000	1200	1800
		2.00	2	0.027	0.360	0.360	810	1350	1620	2430
		3.00	2	0.040	0.540	0.540	1200	2000	2400	3600
		4.00	2	0.053	0.720	0.720	1590	2650	3180	4770
		5.00	2	0.067	0.900	0.900	2010	3350	4020	6030
		6.00	2	0.080	1.080	1.080	2400	4000	4800	7200

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 5xd

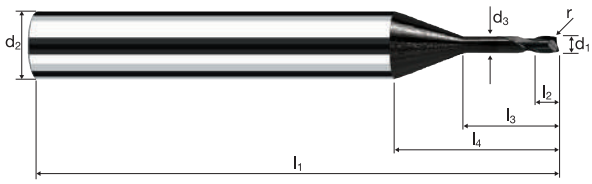
X-Generation X

HM XA	λ 30° γ 15°

h4

d1

r



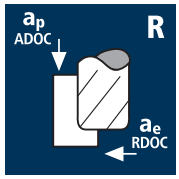
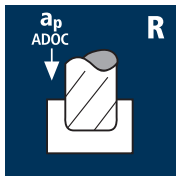
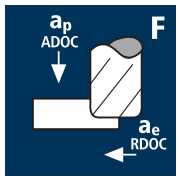
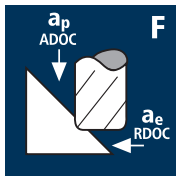
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6034** ø-Code **082**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6034
082	0.80	6.00	0.75	57	0.80	4.00	4.20	13.93	0.200	2	●
100	1.00	6.00	0.95	57	1.00	5.00	5.20	14.56	0.200	2	●
120	1.50	6.00	1.40	57	1.50	7.50	7.80	16.22	0.200	2	●
140	2.00	6.00	1.90	57	2.00	10.00	10.30	17.78	0.200	2	●
180	3.00	6.00	2.80	57	3.00	15.00	15.43	21.10	0.200	2	●
182	3.00	6.00	2.80	61	3.00	18.00	18.43	24.10	0.200	2	●
215	4.00	6.00	3.70	61	4.00	20.00	20.52	24.42	0.200	2	●
217	4.00	6.00	3.70	66	4.00	25.00	25.52	29.42	0.200	2	●
255	5.00	6.00	4.60	66	5.00	25.00	25.59	27.74	0.200	2	●
295	6.00	6.00	5.50	69	6.00	29.34	29.34	30.00	0.200	2	●
185	3.00	6.00	2.80	61	3.00	15.00	15.43	21.10	0.500	2	●
220	4.00	6.00	3.70	61	4.00	20.00	20.52	24.42	0.500	2	●
222	4.00	6.00	3.70	66	4.00	25.00	25.52	29.42	0.500	2	●
260	5.00	6.00	4.60	66	5.00	25.00	25.59	27.74	0.500	2	●
300	6.00	6.00	5.50	69	6.00	29.34	29.34	30.00	0.500	2	●

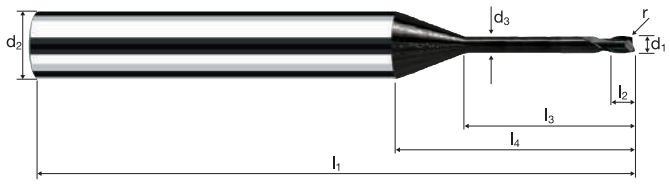
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.20	2	0.002	0.100	0.100	60	100	120	180
		0.30	2	0.004	0.100	0.200	120	200	240	360
		0.40	2	0.005	0.150	0.250	150	250	300	450
		0.50	2	0.006	0.200	0.300	180	300	360	540
		0.60	2	0.007	0.250	0.350	210	350	420	630
		0.80	2	0.009	0.300	0.500	270	450	540	810
		1.00	2	0.012	0.400	0.600	360	600	720	1080
		2.00	2	0.024	0.800	1.200	720	1200	1440	2160
	Graphite B B	0.20	2	0.002	0.100	0.200	60	100	120	180
		0.30	2	0.003	0.100	0.300	90	150	180	270
		0.40	2	0.004	0.150	0.400	120	200	240	360
		0.50	2	0.005	0.200	0.500	150	250	300	450
		0.60	2	0.005	0.250	0.600	150	250	300	450
		0.80	2	0.007	0.300	0.800	210	350	420	630
		1.00	2	0.009	0.400	1.000	270	450	540	810
		2.00	2	0.018	0.800	2.000	540	900	1080	1620
	Graphite B B	0.20	2	0.003	0.020	0.040	90	150	180	270
		0.30	2	0.004	0.040	0.050	120	200	240	360
		0.40	2	0.005	0.050	0.070	150	250	300	450
		0.50	2	0.007	0.060	0.090	210	350	420	630
		0.60	2	0.008	0.070	0.110	240	400	480	720
		0.80	2	0.011	0.100	0.140	330	550	660	990
		1.00	2	0.013	0.120	0.180	390	650	780	1170
		2.00	2	0.027	0.240	0.360	810	1350	1620	2430
	Graphite B B	0.20	2	0.003	0.030	0.030	90	150	180	270
		0.30	2	0.004	0.050	0.050	120	200	240	360
		0.40	2	0.005	0.060	0.060	150	250	300	450
		0.50	2	0.007	0.080	0.080	210	350	420	630
		0.60	2	0.008	0.100	0.100	240	400	480	720
		0.80	2	0.011	0.130	0.130	330	550	660	990
		1.00	2	0.013	0.160	0.160	390	650	780	1170
		2.00	2	0.027	0.320	0.320	810	1350	1620	2430

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

X-Generation X

HM XA	λ 30° γ 15°



h4

d1

r

C Graphite

CF/GF Fiber Reinforced Plastics

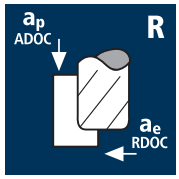
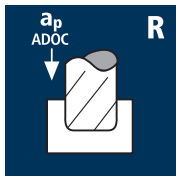
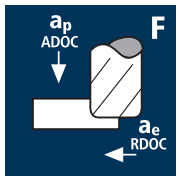
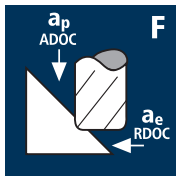
IV

DIAPLUS

Example: **Order-N°.** Coating **B** Article-N°. **6036** ø-Code **020**

B6036

Ø Code	d1 0/-0.01	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z		
020	0.20	6.00	0.18	57	0.20	1.60	1.70	18.19	-	2		●
030	0.30	6.00	0.25	57	0.30	2.40	2.60	18.79	-	2		●
018	0.20	6.00	0.18	57	0.20	1.60	1.70	18.19	0.050	2		●
028	0.30	6.00	0.25	57	0.30	2.40	2.60	18.79	0.050	2		●
040	0.40	6.00	0.35	57	0.40	3.20	3.40	19.31	0.050	2		●
048	0.50	6.00	0.45	57	0.50	4.00	4.20	14.49	0.050	2		●
058	0.60	6.00	0.55	57	0.60	4.80	5.00	15.10	0.050	2		●
078	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.050	2		●
096	1.00	6.00	0.95	57	1.00	8.00	8.20	17.56	0.050	2		●
050	0.50	6.00	0.45	57	0.50	4.00	4.20	14.49	0.100	2		●
060	0.60	6.00	0.55	57	0.60	4.80	5.00	15.10	0.100	2		●
080	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.100	2		●
098	1.00	6.00	0.95	57	1.00	8.00	8.20	17.56	0.100	2		●
138	2.00	6.00	1.90	61	2.00	16.00	16.30	23.78	0.100	2		●

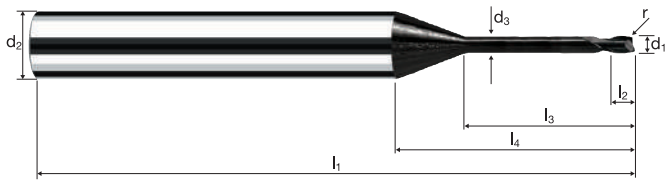
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.80	2	0.009	0.300	0.500	270	450	540	810
		1.00	2	0.012	0.400	0.600	360	600	720	1080
		1.50	2	0.018	0.600	0.900	540	900	1080	1620
		2.00	2	0.024	0.800	1.200	720	1200	1440	2160
		3.00	2	0.035	1.200	1.800	1050	1750	2100	3150
		4.00	2	0.047	1.600	2.400	1410	2350	2820	4230
		5.00	2	0.059	2.000	3.000	1770	2950	3540	5310
		6.00	2	0.071	2.400	3.600	2130	3550	4260	6390
	Graphite B B	0.80	2	0.007	0.300	0.800	210	350	420	630
		1.00	2	0.009	0.400	1.000	270	450	540	810
		1.50	2	0.014	0.600	1.500	420	700	840	1260
		2.00	2	0.018	0.800	2.000	540	900	1080	1620
		3.00	2	0.027	1.200	3.000	810	1350	1620	2430
		4.00	2	0.036	1.600	4.000	1080	1800	2160	3240
		5.00	2	0.045	2.000	5.000	1350	2250	2700	4050
		6.00	2	0.055	2.400	6.000	1650	2750	3300	4950
	Graphite B B	0.80	2	0.011	0.100	0.140	330	550	660	990
		1.00	2	0.013	0.120	0.180	390	650	780	1170
		1.50	2	0.020	0.180	0.270	600	1000	1200	1800
		2.00	2	0.027	0.240	0.360	810	1350	1620	2430
		3.00	2	0.040	0.360	0.540	1200	2000	2400	3600
		4.00	2	0.053	0.480	0.720	1590	2650	3180	4770
		5.00	2	0.067	0.600	0.900	2010	3350	4020	6030
		6.00	2	0.080	0.720	1.080	2400	4000	4800	7200
	Graphite B B	0.80	2	0.011	0.130	0.130	330	550	660	990
		1.00	2	0.013	0.160	0.160	390	650	780	1170
		1.50	2	0.020	0.240	0.240	600	1000	1200	1800
		2.00	2	0.027	0.320	0.320	810	1350	1620	2430
		3.00	2	0.040	0.480	0.480	1200	2000	2400	3600
		4.00	2	0.053	0.640	0.640	1590	2650	3180	4770
		5.00	2	0.067	0.800	0.800	2010	3350	4020	6030
		6.00	2	0.080	0.960	0.960	2400	4000	4800	7200

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 8xd

X-Generation X

HM XA	λ 30° γ 15°



h4

d1

r

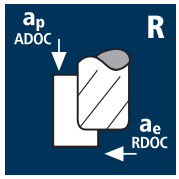
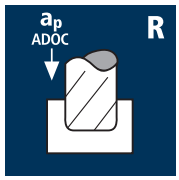
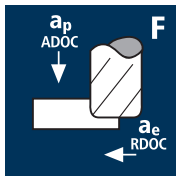
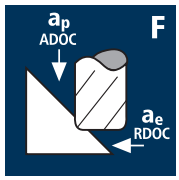
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **6036** ø-Code **082**

Ø Code	d1 0/-0.01	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z	DIAPLUS B6036
082	0.80	6.00	0.75	57	0.80	6.40	6.60	16.33	0.200	2	●
100	1.00	6.00	0.95	57	1.00	8.00	8.20	17.56	0.200	2	●
120	1.50	6.00	1.40	57	1.50	12.00	12.30	20.72	0.200	2	●
140	2.00	6.00	1.90	61	2.00	16.00	16.30	23.78	0.200	2	●
180	3.00	6.00	2.80	66	3.00	24.00	24.43	30.10	0.200	2	●
215	4.00	6.00	3.70	75	4.00	32.00	32.52	36.42	0.200	2	●
255	5.00	6.00	4.60	80	5.00	40.00	40.59	42.74	0.200	2	●
295	6.00	6.00	5.50	87	6.00	47.34	47.34	48.00	0.200	2	●
185	3.00	6.00	2.80	69	3.00	24.00	24.43	30.10	0.500	2	●
220	4.00	6.00	3.70	75	4.00	32.00	32.52	36.42	0.500	2	●
260	5.00	6.00	4.60	80	5.00	40.00	40.59	42.74	0.500	2	●
300	6.00	6.00	5.50	87	6.00	47.34	47.34	48.00	0.500	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.20	2	0.002	0.100	0.100	60	100	120	180
		0.30	2	0.004	0.100	0.100	120	200	240	360
		0.40	2	0.005	0.150	0.150	150	250	300	450
		0.50	2	0.006	0.200	0.200	180	300	360	540
		0.60	2	0.007	0.250	0.250	210	350	420	630
		0.80	2	0.009	0.300	0.300	270	450	540	810
		1.00	2	0.012	0.400	0.400	360	600	720	1080
		2.00	2	0.024	0.800	0.800	720	1200	1440	2160
	Graphite B B	0.20	2	0.002	0.050	0.200	60	100	120	180
		0.30	2	0.003	0.100	0.300	90	150	180	270
		0.40	2	0.004	0.100	0.400	120	200	240	360
		0.50	2	0.005	0.150	0.500	150	250	300	450
		0.60	2	0.005	0.200	0.600	150	250	300	450
		0.80	2	0.007	0.250	0.800	210	350	420	630
		1.00	2	0.009	0.300	1.000	270	450	540	810
		2.00	2	0.018	0.600	2.000	540	900	1080	1620
	Graphite B B	0.20	2	0.003	0.020	0.030	90	150	180	270
		0.30	2	0.004	0.030	0.050	120	200	240	360
		0.40	2	0.005	0.040	0.060	150	250	300	450
		0.50	2	0.007	0.050	0.080	210	350	420	630
		0.60	2	0.008	0.060	0.100	240	400	480	720
		0.80	2	0.011	0.080	0.130	330	550	660	990
		1.00	2	0.013	0.100	0.160	390	650	780	1170
		2.00	2	0.027	0.200	0.320	810	1350	1620	2430
	Graphite B B	0.20	2	0.003	0.030	0.030	90	150	180	270
		0.30	2	0.004	0.040	0.040	120	200	240	360
		0.40	2	0.005	0.060	0.060	150	250	300	450
		0.50	2	0.007	0.070	0.070	210	350	420	630
		0.60	2	0.008	0.080	0.080	240	400	480	720
		0.80	2	0.011	0.110	0.110	330	550	660	990
		1.00	2	0.013	0.140	0.140	390	650	780	1170
		2.00	2	0.027	0.280	0.280	810	1350	1620	2430

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

X-Generation X

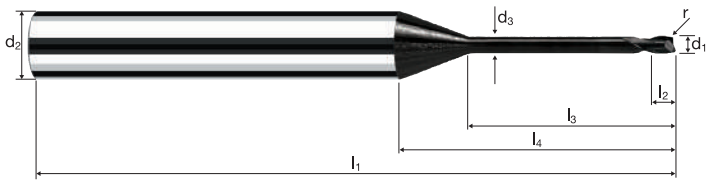
HM
XA

λ 30°
γ 15°

h4

d1

r



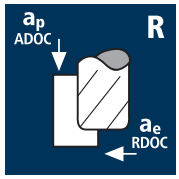
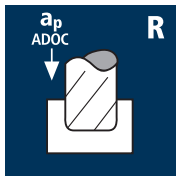
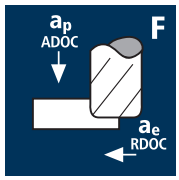
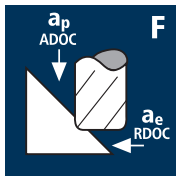
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6038** ø-Code **018**

Ø Code	d1 0/-0.01	d2 h4	d3	l1	l2	l3	l3max	l4	r ±0.005	z	DIAPLUS B6038
018	0.20	6.00	0.18	57	0.20	2.00	2.10	18.59	0.050	2	●
028	0.30	6.00	0.25	57	0.30	3.00	3.20	19.39	0.050	2	●
040	0.40	6.00	0.35	57	0.40	4.00	4.20	20.11	0.050	2	●
048	0.50	6.00	0.45	57	0.50	5.00	5.20	15.49	0.050	2	●
058	0.60	6.00	0.55	57	0.60	6.00	6.20	16.30	0.050	2	●
078	0.80	6.00	0.75	57	0.80	8.00	8.20	17.93	0.050	2	●
096	1.00	6.00	0.95	57	1.00	10.00	10.20	19.56	0.050	2	●
050	0.50	6.00	0.45	57	0.50	5.00	5.20	15.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	6.00	6.20	16.30	0.100	2	●
080	0.80	6.00	0.75	57	0.80	8.00	8.20	17.93	0.100	2	●
098	1.00	6.00	0.95	57	1.00	10.00	10.20	19.56	0.100	2	●
138	2.00	6.00	1.90	66	2.00	20.00	20.30	27.78	0.100	2	●

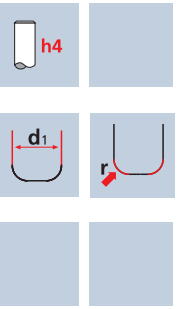
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.80	2	0.009	0.300	0.300	270	450	540	810
		1.00	2	0.012	0.400	0.400	360	600	720	1080
		1.50	2	0.018	0.600	0.600	540	900	1080	1620
		2.00	2	0.024	0.800	0.800	720	1200	1440	2160
		3.00	2	0.035	1.200	1.200	1050	1750	2100	3150
		4.00	2	0.047	1.600	1.600	1410	2350	2820	4230
		5.00	2	0.059	2.000	2.000	1770	2950	3540	5310
		6.00	2	0.071	2.400	2.400	2130	3550	4260	6390
	Graphite B B	0.80	2	0.007	0.250	0.800	210	350	420	630
		1.00	2	0.009	0.300	1.000	270	450	540	810
		1.50	2	0.014	0.450	1.500	420	700	840	1260
		2.00	2	0.018	0.600	2.000	540	900	1080	1620
		3.00	2	0.027	0.900	3.000	810	1350	1620	2430
		4.00	2	0.036	1.200	4.000	1080	1800	2160	3240
		5.00	2	0.045	1.500	5.000	1350	2250	2700	4050
		6.00	2	0.055	1.800	6.000	1650	2750	3300	4950
	Graphite B B	0.80	2	0.011	0.080	0.130	330	550	660	990
		1.00	2	0.013	0.100	0.160	390	650	780	1170
		1.50	2	0.020	0.150	0.240	600	1000	1200	1800
		2.00	2	0.027	0.200	0.320	810	1350	1620	2430
		3.00	2	0.040	0.300	0.480	1200	2000	2400	3600
		4.00	2	0.053	0.400	0.640	1590	2650	3180	4770
		5.00	2	0.067	0.500	0.800	2010	3350	4020	6030
		6.00	2	0.080	0.600	0.960	2400	4000	4800	7200
	Graphite B B	0.80	2	0.011	0.110	0.110	330	550	660	990
		1.00	2	0.013	0.140	0.140	390	650	780	1170
		1.50	2	0.020	0.210	0.210	600	1000	1200	1800
		2.00	2	0.027	0.280	0.280	810	1350	1620	2430
		3.00	2	0.040	0.420	0.420	1200	2000	2400	3600
		4.00	2	0.053	0.560	0.560	1590	2650	3180	4770
		5.00	2	0.067	0.700	0.700	2010	3350	4020	6030
		6.00	2	0.080	0.840	0.840	2400	4000	4800	7200

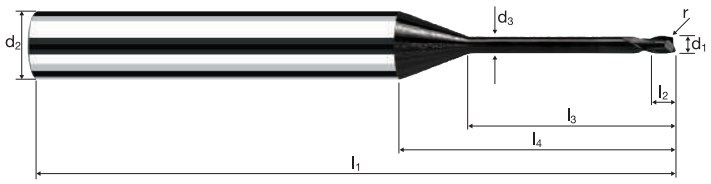
Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 10xd

X-Generation

HM XA	λ 30° γ 15°



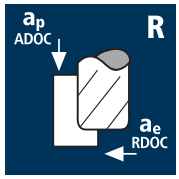
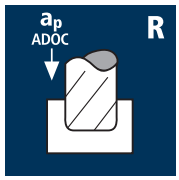
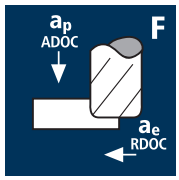
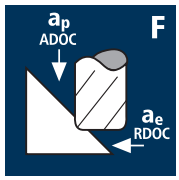


				C Graphite					CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **6038** ø-Code **082**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6038
082	0.80	6.00	0.75	57	0.80	8.00	8.20	17.93	0.200	2	●
100	1.00	6.00	0.95	57	1.00	10.00	10.20	19.56	0.200	2	●
120	1.50	6.00	1.40	61	1.50	15.00	15.30	23.72	0.200	2	●
140	2.00	6.00	1.90	66	2.00	20.00	20.30	27.78	0.200	2	●
180	3.00	6.00	2.80	75	3.00	30.00	30.43	36.10	0.200	2	●
215	4.00	6.00	3.70	80	4.00	40.00	40.52	44.42	0.200	2	●
255	5.00	6.00	4.60	100	5.00	50.00	50.59	52.74	0.200	2	●
295	6.00	6.00	5.50	100	6.00	59.34	59.34	60.00	0.200	2	●
185	3.00	6.00	2.80	75	3.00	30.00	30.43	36.10	0.500	2	●
220	4.00	6.00	3.70	80	4.00	40.00	40.52	44.42	0.500	2	●
260	5.00	6.00	4.60	100	5.00	50.00	50.59	52.74	0.500	2	●
300	6.00	6.00	5.50	100	6.00	59.34	59.34	60.00	0.500	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.30	2	0.003	0.100	0.100	90	150	180	270
		0.40	2	0.004	0.100	0.150	120	200	240	360
		0.50	2	0.005	0.150	0.200	150	250	300	450
		0.60	2	0.006	0.200	0.250	180	300	360	540
		0.80	2	0.008	0.250	0.300	240	400	480	720
		1.00	2	0.009	0.300	0.400	270	450	540	810
		1.50	2	0.014	0.450	0.600	420	700	840	1260
		2.00	2	0.019	0.600	0.800	570	950	1140	1710
		3.00	2	0.028	0.900	1.200	840	1400	1680	2520
	Graphite B B	0.30	2	0.002	0.050	0.300	60	100	120	180
		0.40	2	0.003	0.100	0.400	90	150	180	270
		0.50	2	0.004	0.100	0.500	120	200	240	360
		0.60	2	0.004	0.100	0.600	120	200	240	360
		0.80	2	0.006	0.150	0.800	180	300	360	540
		1.00	2	0.007	0.200	1.000	210	350	420	630
		1.50	2	0.011	0.300	1.500	330	550	660	990
		2.00	2	0.015	0.400	2.000	450	750	900	1350
		3.00	2	0.022	0.600	3.000	660	1100	1320	1980
	Graphite B B	0.30	2	0.003	0.030	0.040	90	150	180	270
		0.40	2	0.004	0.040	0.060	120	200	240	360
		0.50	2	0.005	0.050	0.070	150	250	300	450
		0.60	2	0.006	0.060	0.080	180	300	360	540
		0.80	2	0.009	0.080	0.110	270	450	540	810
		1.00	2	0.011	0.100	0.140	330	550	660	990
		1.50	2	0.016	0.150	0.210	480	800	960	1440
		2.00	2	0.021	0.200	0.280	630	1050	1260	1890
		3.00	2	0.032	0.300	0.420	960	1600	1920	2880
	Graphite B B	0.30	2	0.003	0.030	0.030	90	150	180	270
		0.40	2	0.004	0.040	0.040	120	200	240	360
		0.50	2	0.005	0.050	0.050	150	250	300	450
		0.60	2	0.006	0.060	0.060	180	300	360	540
		0.80	2	0.009	0.080	0.080	270	450	540	810
		1.00	2	0.011	0.100	0.100	330	550	660	990
		1.50	2	0.016	0.150	0.150	480	800	960	1440
		2.00	2	0.021	0.200	0.200	630	1050	1260	1890
		3.00	2	0.032	0.300	0.300	960	1600	1920	2880

Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 12xd

X-Generation

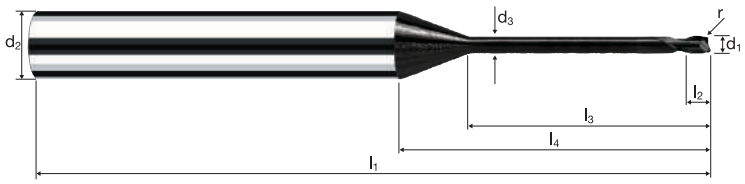
HM
XA

λ **30°**
γ **15°**

h4

d_1

r



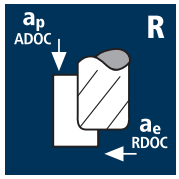
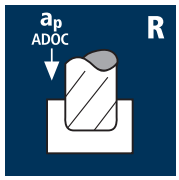
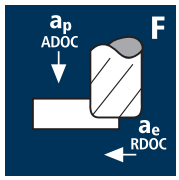
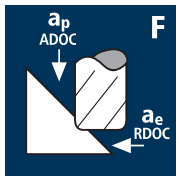
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **6040** ø-Code **028**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6040
028	0.30	6.00	0.25	57	0.30	3.60	3.80	19.99	0.050	2	●
040	0.40	6.00	0.35	57	0.40	4.80	5.00	20.91	0.050	2	●
048	0.50	6.00	0.45	57	0.50	6.00	6.20	16.49	0.050	2	●
058	0.60	6.00	0.55	57	0.60	7.20	7.40	17.50	0.050	2	●
078	0.80	6.00	0.75	57	0.80	9.60	9.80	19.53	0.050	2	●
096	1.00	6.00	0.95	61	1.00	12.00	12.20	21.56	0.050	2	●
050	0.50	6.00	0.45	57	0.50	6.00	6.20	16.49	0.100	2	●
060	0.60	6.00	0.55	57	0.60	7.20	7.40	17.50	0.100	2	●
080	0.80	6.00	0.75	57	0.80	9.60	9.80	19.53	0.100	2	●
098	1.00	6.00	0.95	61	1.00	12.00	12.20	21.56	0.100	2	●
138	2.00	6.00	1.90	69	2.00	24.00	24.30	31.78	0.100	2	●
082	0.80	6.00	0.75	57	0.80	9.60	9.80	19.53	0.200	2	●
100	1.00	6.00	0.95	61	1.00	12.00	12.20	21.56	0.200	2	●
120	1.50	6.00	1.40	66	1.50	18.00	18.30	26.72	0.200	2	●
140	2.00	6.00	1.90	69	2.00	24.00	24.30	31.78	0.200	2	●
180	3.00	6.00	2.80	80	3.00	36.00	36.43	42.10	0.200	2	●
185	3.00	6.00	2.80	80	3.00	36.00	36.43	42.10	0.500	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.40	2	0.003	0.080	0.100	90	150	180	270
		0.50	2	0.004	0.100	0.150	120	200	240	360
		0.60	2	0.005	0.100	0.200	150	250	300	450
		0.80	2	0.007	0.150	0.250	210	350	420	630
		1.00	2	0.008	0.200	0.300	240	400	480	720
		1.50	2	0.012	0.300	0.450	360	600	720	1080
		2.00	2	0.016	0.400	0.600	480	800	960	1440
		3.00	2	0.025	0.600	0.900	750	1250	1500	2250
	Graphite B B	0.40	2	0.003	0.040	0.400	90	150	180	270
		0.50	2	0.003	0.050	0.500	90	150	180	270
		0.60	2	0.004	0.060	0.600	120	200	240	360
		0.80	2	0.005	0.080	0.800	150	250	300	450
		1.00	2	0.006	0.100	1.000	180	300	360	540
		1.50	2	0.010	0.150	1.500	300	500	600	900
		2.00	2	0.013	0.200	2.000	390	650	780	1170
		3.00	2	0.019	0.300	3.000	570	950	1140	1710
	Graphite B B	0.40	2	0.004	0.030	0.040	120	200	240	360
		0.50	2	0.005	0.040	0.050	150	250	300	450
		0.60	2	0.006	0.050	0.060	180	300	360	540
		0.80	2	0.007	0.060	0.080	210	350	420	630
		1.00	2	0.009	0.080	0.100	270	450	540	810
		1.50	2	0.014	0.120	0.150	420	700	840	1260
		2.00	2	0.019	0.160	0.200	570	950	1140	1710
		3.00	2	0.028	0.240	0.300	840	1400	1680	2520
	Graphite B B	0.40	2	0.004	0.030	0.030	120	200	240	360
		0.50	2	0.005	0.040	0.040	150	250	300	450
		0.60	2	0.006	0.050	0.050	180	300	360	540
		0.80	2	0.007	0.060	0.060	210	350	420	630
		1.00	2	0.009	0.080	0.080	270	450	540	810
		1.50	2	0.014	0.120	0.120	420	700	840	1260
		2.00	2	0.019	0.160	0.160	570	950	1140	1710
		3.00	2	0.028	0.240	0.240	840	1400	1680	2520

Corner radius end mills MicroX

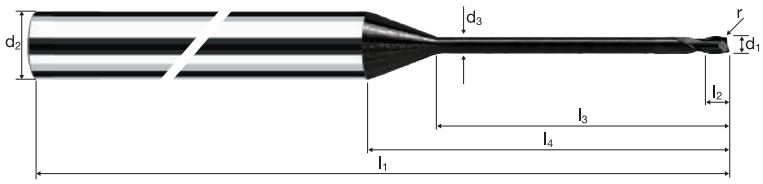
Shank ø 6mm, cylindrical neck, 15xd

X-Generation X

HM XA	λ 30° γ 15°

h4

d1 r



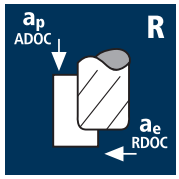
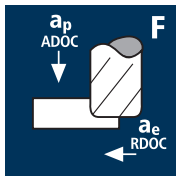
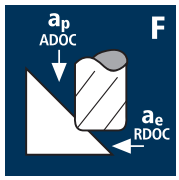
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **6042** ø-Code **040**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6042
040	0.40	6.00	0.35	61	0.40	6.00	6.20	22.11	0.050	2	●
048	0.50	6.00	0.45	57	0.50	7.50	7.70	17.99	0.050	2	●
058	0.60	6.00	0.55	57	0.60	9.00	9.20	19.30	0.050	2	●
078	0.80	6.00	0.75	61	0.80	12.00	12.20	21.93	0.050	2	●
096	1.00	6.00	0.95	66	1.00	15.00	15.20	24.56	0.050	2	●
050	0.50	6.00	0.45	57	0.50	7.50	7.70	17.99	0.100	2	●
060	0.60	6.00	0.55	57	0.60	9.00	9.20	19.30	0.100	2	●
080	0.80	6.00	0.75	61	0.80	12.00	12.20	21.93	0.100	2	●
098	1.00	6.00	0.95	66	1.00	15.00	15.20	24.56	0.100	2	●
138	2.00	6.00	1.90	75	2.00	30.00	30.30	37.78	0.100	2	●
082	0.80	6.00	0.75	61	0.80	12.00	12.20	21.93	0.200	2	●
100	1.00	6.00	0.95	66	1.00	15.00	15.20	24.56	0.200	2	●
120	1.50	6.00	1.40	69	1.50	22.50	22.80	31.22	0.200	2	●
140	2.00	6.00	1.90	75	2.00	30.00	30.30	37.78	0.200	2	●
180	3.00	6.00	2.80	100	3.00	45.00	45.43	51.10	0.200	2	●
185	3.00	6.00	2.80	100	3.00	45.00	45.43	51.10	0.500	2	●

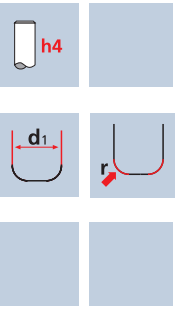
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.40	2	0.003	0.060	0.100	90	150	180	270
		0.50	2	0.004	0.080	0.100	120	200	240	360
		0.60	2	0.005	0.100	0.100	150	250	300	450
		0.80	2	0.007	0.100	0.150	210	350	420	630
		1.00	2	0.008	0.150	0.200	240	400	480	720
		1.50	2	0.012	0.250	0.300	360	600	720	1080
		2.00	2	0.016	0.300	0.400	480	800	960	1440
		3.00	2	0.025	0.450	0.600	750	1250	1500	2250
	Graphite B B	0.40	2	0.004	0.020	0.030	120	200	240	360
		0.50	2	0.005	0.030	0.040	150	250	300	450
		0.60	2	0.006	0.040	0.050	180	300	360	540
		0.80	2	0.007	0.050	0.060	210	350	420	630
		1.00	2	0.009	0.060	0.080	270	450	540	810
		1.50	2	0.014	0.090	0.120	420	700	840	1260
		2.00	2	0.019	0.120	0.160	570	950	1140	1710
		3.00	2	0.028	0.180	0.240	840	1400	1680	2520
	Graphite B B	0.40	2	0.004	0.020	0.020	120	200	240	360
		0.50	2	0.005	0.030	0.030	150	250	300	450
		0.60	2	0.006	0.040	0.040	180	300	360	540
		0.80	2	0.007	0.050	0.050	210	350	420	630
		1.00	2	0.009	0.060	0.060	270	450	540	810
		1.50	2	0.014	0.090	0.090	420	700	840	1260
		2.00	2	0.019	0.120	0.120	570	950	1140	1710
		3.00	2	0.028	0.180	0.180	840	1400	1680	2520

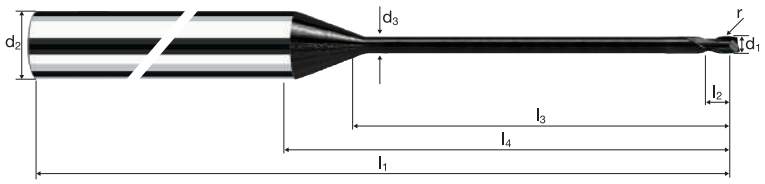
Corner radius end mills MicroX

Shank ø 6mm, cylindrical neck, 20xd

X-Generation

HM XA	λ 30° γ 15°



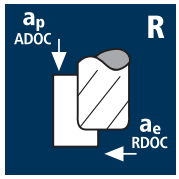
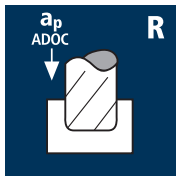
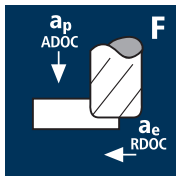
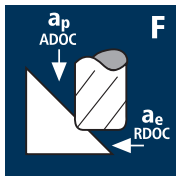


				C Graphite					CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **6044** ø-Code **040**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_{3max}	l_4	r ±0.005	z	DIAPLUS B6044
040	0.40	6.00	0.35	61	0.40	8.00	8.20	24.11	0.050	2	●
048	0.50	6.00	0.45	61	0.50	10.00	10.20	20.49	0.050	2	●
058	0.60	6.00	0.55	61	0.60	12.00	12.20	22.30	0.050	2	●
078	0.80	6.00	0.75	66	0.80	16.00	16.20	25.93	0.050	2	●
096	1.00	6.00	0.95	69	1.00	20.00	20.20	29.56	0.050	2	●
050	0.50	6.00	0.45	61	0.50	10.00	10.20	20.49	0.100	2	●
060	0.60	6.00	0.55	61	0.60	12.00	12.20	22.30	0.100	2	●
080	0.80	6.00	0.75	66	0.80	16.00	16.20	25.93	0.100	2	●
098	1.00	6.00	0.95	69	1.00	20.00	20.20	29.56	0.100	2	●
138	2.00	6.00	1.90	87	2.00	40.00	40.30	47.78	0.100	2	●
082	0.80	6.00	0.75	66	0.80	16.00	16.20	25.93	0.200	2	●
100	1.00	6.00	0.95	69	1.00	20.00	20.20	29.56	0.200	2	●
120	1.50	6.00	1.40	80	1.50	30.00	30.30	38.72	0.200	2	●
140	2.00	6.00	1.90	87	2.00	40.00	40.30	47.78	0.200	2	●
180	3.00	6.00	2.80	105	3.00	60.00	60.43	66.10	0.200	2	●
185	3.00	6.00	2.80	105	3.00	60.00	60.43	66.10	0.500	2	●

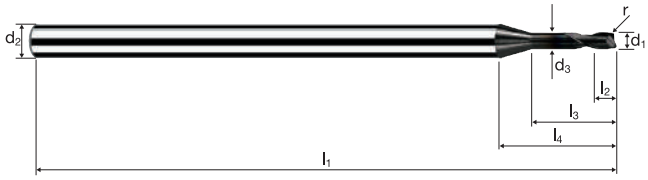
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.00	2	0.009	0.450	0.600	270	450	540	810
		1.20	2	0.011	0.550	0.700	330	550	660	990
		1.50	2	0.014	0.700	0.900	420	700	840	1260
		2.00	2	0.019	0.900	1.200	570	950	1140	1710
		2.50	2	0.024	1.150	1.500	720	1200	1440	2160
		3.00	2	0.028	1.350	1.800	840	1400	1680	2520
	Graphite B B	1.00	2	0.007	0.450	1.000	210	350	420	630
		1.20	2	0.009	0.550	1.200	270	450	540	810
		1.50	2	0.011	0.700	1.500	330	550	660	990
		2.00	2	0.015	0.900	2.000	450	750	900	1350
		2.50	2	0.018	1.150	2.500	540	900	1080	1620
		3.00	2	0.022	1.350	3.000	660	1100	1320	1980
	Graphite B B	1.00	2	0.011	0.140	0.200	330	550	660	990
		1.20	2	0.013	0.170	0.240	390	650	780	1170
		1.50	2	0.016	0.210	0.300	480	800	960	1440
		2.00	2	0.021	0.280	0.400	630	1050	1260	1890
		2.50	2	0.027	0.350	0.500	810	1350	1620	2430
		3.00	2	0.032	0.420	0.600	960	1600	1920	2880
	Graphite B B	1.00	2	0.011	0.180	0.180	330	550	660	990
		1.20	2	0.013	0.220	0.220	390	650	780	1170
		1.50	2	0.016	0.270	0.270	480	800	960	1440
		2.00	2	0.021	0.360	0.360	630	1050	1260	1890
		2.50	2	0.027	0.450	0.450	810	1350	1620	2430
		3.00	2	0.032	0.540	0.540	960	1600	1920	2880

Corner radius end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

Performance **P**

HM MG10 | λ 25° γ 6°



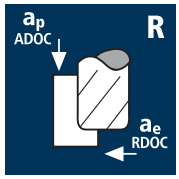
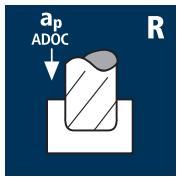
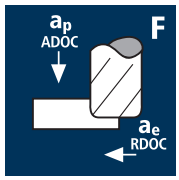
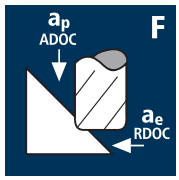
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** | Article-N°. **5754** | ø-Code **100**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.03	z	DIAMANT
											B5754
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	0.200	2	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	0.200	2	●
120	1.50	3.00	1.40	50	1.80	7.50	7.50	10.88	0.200	2	●
140	2.00	3.00	1.90	50	2.40	10.00	10.00	12.45	0.200	2	●
160	2.50	3.00	2.30	50	3.00	12.50	12.50	14.20	0.200	2	●
180	3.00	3.00	2.80	50	3.60	14.56	14.56	15.00	0.200	2	●

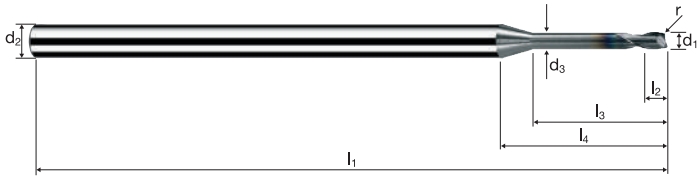
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	1.00	2	0.009	0.400	0.600	270	450	540	810
		1.20	2	0.011	0.500	0.700	330	550	660	990
		1.50	2	0.014	0.600	0.900	420	700	840	1260
		2.00	2	0.019	0.800	1.200	570	950	1140	1710
		2.50	2	0.024	1.000	1.500	720	1200	1440	2160
		3.00	2	0.028	1.200	1.800	840	1400	1680	2520
	Graphite B B	1.00	2	0.007	0.400	1.000	210	350	420	630
		1.20	2	0.009	0.500	1.200	270	450	540	810
		1.50	2	0.011	0.600	1.500	330	550	660	990
		2.00	2	0.015	0.800	2.000	450	750	900	1350
		2.50	2	0.018	1.000	2.500	540	900	1080	1620
		3.00	2	0.022	1.200	3.000	660	1100	1320	1980
	Graphite B B	1.00	2	0.011	0.120	0.180	330	550	660	990
		1.20	2	0.013	0.140	0.220	390	650	780	1170
		1.50	2	0.016	0.180	0.270	480	800	960	1440
		2.00	2	0.021	0.240	0.360	630	1050	1260	1890
		2.50	2	0.027	0.300	0.450	810	1350	1620	2430
		3.00	2	0.032	0.360	0.540	960	1600	1920	2880
	Graphite B B	1.00	2	0.011	0.160	0.160	330	550	660	990
		1.20	2	0.013	0.190	0.190	390	650	780	1170
		1.50	2	0.016	0.240	0.240	480	800	960	1440
		2.00	2	0.021	0.320	0.320	630	1050	1260	1890
		2.50	2	0.027	0.400	0.400	810	1350	1620	2430
		3.00	2	0.032	0.480	0.480	960	1600	1920	2880

Corner radius end mills Microcut

Shank ø 3mm, cylindrical neck, 8xd

Performance **P**

HM MG10 | λ 25° γ 6°



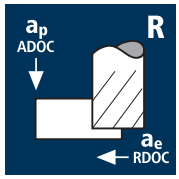
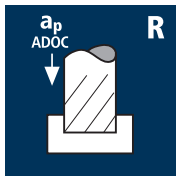
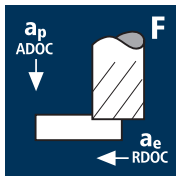
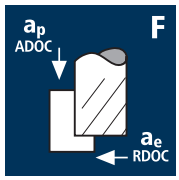
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** | Article-N°. **5756** | ø-Code **100**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	r 0/+0.03	z	DIAMANT B5756
100	1.00	3.00	0.95	50	1.20	8.00	8.00	12.22	0.200	2	●
108	1.20	3.00	1.10	50	1.44	9.60	9.60	13.54	0.200	2	●
120	1.50	3.00	1.40	60	1.80	12.00	12.00	15.38	0.200	2	●
140	2.00	3.00	1.90	60	2.40	16.00	16.00	18.45	0.200	2	●
160	2.50	3.00	2.30	60	3.00	20.00	20.00	21.70	0.200	2	●
180	3.00	3.00	2.80	60	3.60	23.56	23.56	24.00	0.200	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.50	2	0.005	0.250	0.300	150	250	300	450
		0.60	2	0.006	0.250	0.350	180	300	360	540
		0.80	2	0.008	0.350	0.500	240	400	480	720
		1.00	2	0.009	0.450	0.600	270	450	540	810
		1.20	2	0.011	0.550	0.700	330	550	660	990
		1.50	2	0.014	0.700	0.900	420	700	840	1260
		2.00	2	0.019	0.900	1.200	570	950	1140	1710
		2.50	2	0.024	1.150	1.500	720	1200	1440	2160
		3.00	2	0.028	1.350	1.800	840	1400	1680	2520
	Graphite B B	0.50	2	0.004	0.250	0.500	120	200	240	360
		0.60	2	0.004	0.250	0.600	120	200	240	360
		0.80	2	0.006	0.350	0.800	180	300	360	540
		1.00	2	0.007	0.450	1.000	210	350	420	630
		1.20	2	0.009	0.550	1.200	270	450	540	810
		1.50	2	0.011	0.700	1.500	330	550	660	990
		2.00	2	0.015	0.900	2.000	450	750	900	1350
		2.50	2	0.018	1.150	2.500	540	900	1080	1620
		3.00	2	0.022	1.350	3.000	660	1100	1320	1980
	Graphite B B	0.50	2	0.005	0.070	0.100	150	250	300	450
		0.60	2	0.006	0.080	0.120	180	300	360	540
		0.80	2	0.009	0.110	0.160	270	450	540	810
		1.00	2	0.011	0.140	0.200	330	550	660	990
		1.20	2	0.013	0.170	0.240	390	650	780	1170
		1.50	2	0.016	0.210	0.300	480	800	960	1440
		2.00	2	0.021	0.280	0.400	630	1050	1260	1890
		2.50	2	0.027	0.350	0.500	810	1350	1620	2430
		3.00	2	0.032	0.420	0.600	960	1600	1920	2880
	Graphite B B	0.50	2	0.005	0.090	0.090	150	250	300	450
		0.60	2	0.006	0.110	0.110	180	300	360	540
		0.80	2	0.009	0.140	0.140	270	450	540	810
		1.00	2	0.011	0.180	0.180	330	550	660	990
		1.20	2	0.013	0.220	0.220	390	650	780	1170
		1.50	2	0.016	0.270	0.270	480	800	960	1440
		2.00	2	0.021	0.360	0.360	630	1050	1260	1890
		2.50	2	0.027	0.450	0.450	810	1350	1620	2430
		3.00	2	0.032	0.540	0.540	960	1600	1920	2880

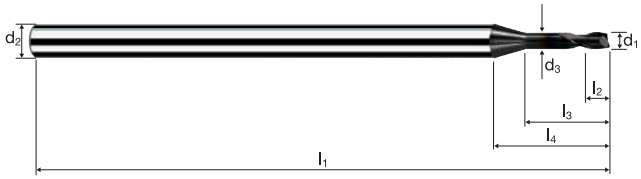
Cylindrical end mills Microcut

Shank ø 3mm, cylindrical neck, 5xd

Performance **P**

HM MG10 | λ 25° γ 6°





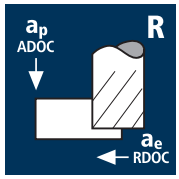
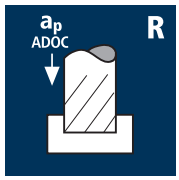
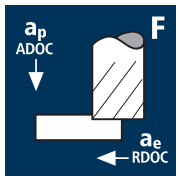
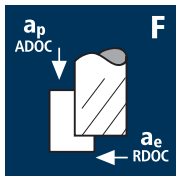
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** | Article-N°. **5714** | ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	DIAMANT B5714
050	0.50	3.00	0.45	40	0.60	2.50	2.50	7.65	-	2	●
060	0.60	3.00	0.55	40	0.72	3.00	3.00	7.97	-	2	●
070	0.70	3.00	0.65	40	0.84	3.50	3.50	8.28	-	2	●
080	0.80	3.00	0.75	40	0.96	4.00	4.00	8.59	-	2	●
090	0.90	3.00	0.85	40	1.08	4.50	4.50	8.91	-	2	●
100	1.00	3.00	0.95	50	1.20	5.00	5.00	9.22	0.04	2	●
108	1.20	3.00	1.10	50	1.44	6.00	6.00	9.94	0.04	2	●
120	1.50	3.00	1.40	50	1.80	7.50	7.50	10.88	0.04	2	●
132	1.80	3.00	1.70	50	2.16	9.00	9.00	11.82	0.04	2	●
140	2.00	3.00	1.90	50	2.40	10.00	10.00	12.45	0.05	2	●
152	2.30	3.00	2.10	50	2.76	11.50	11.50	13.57	0.05	2	●
160	2.50	3.00	2.30	50	3.00	12.50	12.50	14.20	0.05	2	●
172	2.80	3.00	2.60	50	3.36	14.00	14.00	15.14	0.05	2	●
180	3.00	3.00	2.80	50	3.60	14.56	14.56	15.00	0.05	2	●

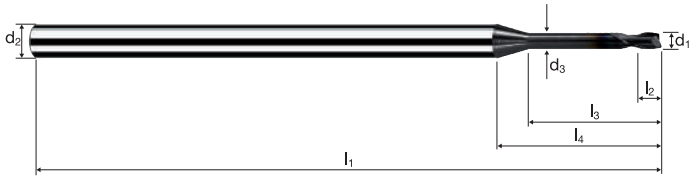
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.50	2	0.005	0.200	0.300	150	250	300	450
		0.60	2	0.006	0.250	0.350	180	300	360	540
		0.80	2	0.008	0.300	0.500	240	400	480	720
		1.00	2	0.009	0.400	0.600	270	450	540	810
		1.20	2	0.011	0.500	0.700	330	550	660	990
		1.50	2	0.014	0.600	0.900	420	700	840	1260
		2.00	2	0.019	0.800	1.200	570	950	1140	1710
		2.50	2	0.024	1.000	1.500	720	1200	1440	2160
		3.00	2	0.028	1.200	1.800	840	1400	1680	2520
	Graphite B B	0.50	2	0.004	0.200	0.500	120	200	240	360
		0.60	2	0.004	0.250	0.600	120	200	240	360
		0.80	2	0.006	0.300	0.800	180	300	360	540
		1.00	2	0.007	0.400	1.000	210	350	420	630
		1.20	2	0.009	0.500	1.200	270	450	540	810
		1.50	2	0.011	0.600	1.500	330	550	660	990
		2.00	2	0.015	0.800	2.000	450	750	900	1350
		2.50	2	0.018	1.000	2.500	540	900	1080	1620
		3.00	2	0.022	1.200	3.000	660	1100	1320	1980
	Graphite B B	0.50	2	0.005	0.060	0.090	150	250	300	450
		0.60	2	0.006	0.070	0.110	180	300	360	540
		0.80	2	0.009	0.100	0.140	270	450	540	810
		1.00	2	0.011	0.120	0.180	330	550	660	990
		1.20	2	0.013	0.140	0.220	390	650	780	1170
		1.50	2	0.016	0.180	0.270	480	800	960	1440
		2.00	2	0.021	0.240	0.360	630	1050	1260	1890
		2.50	2	0.027	0.300	0.450	810	1350	1620	2430
		3.00	2	0.032	0.360	0.540	960	1600	1920	2880
	Graphite B B	0.50	2	0.005	0.080	0.080	150	250	300	450
		0.60	2	0.006	0.100	0.100	180	300	360	540
		0.80	2	0.009	0.130	0.130	270	450	540	810
		1.00	2	0.011	0.160	0.160	330	550	660	990
		1.20	2	0.013	0.190	0.190	390	650	780	1170
		1.50	2	0.016	0.240	0.240	480	800	960	1440
		2.00	2	0.021	0.320	0.320	630	1050	1260	1890
		2.50	2	0.027	0.400	0.400	810	1350	1620	2430
		3.00	2	0.032	0.480	0.480	960	1600	1920	2880

Cylindrical end mills Microcut

Shank ø 3mm, cylindrical neck, 8xd

HM MG10 | λ 25° γ 6°

45°

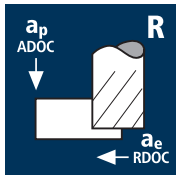
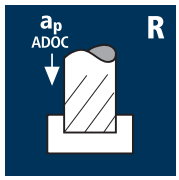
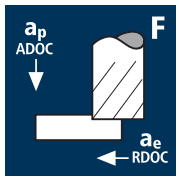
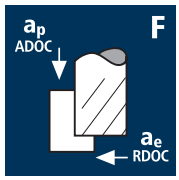


C Graphite

CF/GF Fiber Reinforced Plastics

Example: **Order-N°.** Coating **B** | Article-N°. **5716** | ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	DIAMANT B5716
050	0.50	3.00	0.45	40	0.60	4.00	4.00	9.15	-	2	●
060	0.60	3.00	0.55	40	0.72	4.80	4.80	9.77	-	2	●
080	0.80	3.00	0.75	40	0.96	6.40	6.40	10.99	-	2	●
100	1.00	3.00	0.95	50	1.20	8.00	8.00	12.22	0.04	2	●
108	1.20	3.00	1.10	50	1.44	9.60	9.60	13.54	0.04	2	●
120	1.50	3.00	1.40	60	1.80	12.00	12.00	15.38	0.04	2	●
140	2.00	3.00	1.90	60	2.40	16.00	16.00	18.45	0.05	2	●
160	2.50	3.00	2.30	60	3.00	20.00	20.00	21.70	0.05	2	●
180	3.00	3.00	2.80	60	3.60	23.56	23.56	24.00	0.05	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=15000min⁻¹ v_f [mm/min]	n=25000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]	n=45000min⁻¹ v_f [mm/min]
	Graphite B B	0.50	2	0.005	0.200	0.200	150	250	300	450
		0.60	2	0.006	0.250	0.250	180	300	360	540
		0.80	2	0.008	0.300	0.300	240	400	480	720
		1.00	2	0.009	0.400	0.400	270	450	540	810
		1.20	2	0.011	0.500	0.500	330	550	660	990
		1.50	2	0.014	0.600	0.600	420	700	840	1260
		2.00	2	0.019	0.800	0.800	570	950	1140	1710
		2.50	2	0.024	1.000	1.000	720	1200	1440	2160
		3.00	2	0.028	1.200	1.200	840	1400	1680	2520
	Graphite B B	0.50	2	0.003	0.150	0.500	90	150	180	270
		0.60	2	0.003	0.200	0.600	90	150	180	270
		0.80	2	0.004	0.250	0.800	120	200	240	360
		1.00	2	0.005	0.300	1.000	150	250	300	450
		1.20	2	0.007	0.350	1.200	210	350	420	630
		1.50	2	0.008	0.450	1.500	240	400	480	720
		2.00	2	0.011	0.600	2.000	330	550	660	990
		2.50	2	0.014	0.750	2.500	420	700	840	1260
		3.00	2	0.016	0.900	3.000	480	800	960	1440
	Graphite B B	0.50	2	0.005	0.050	0.080	150	250	300	450
		0.60	2	0.006	0.060	0.090	180	300	360	540
		0.80	2	0.009	0.080	0.120	270	450	540	810
		1.00	2	0.011	0.100	0.150	330	550	660	990
		1.20	2	0.013	0.120	0.180	390	650	780	1170
		1.50	2	0.016	0.150	0.230	480	800	960	1440
		2.00	2	0.021	0.200	0.300	630	1050	1260	1890
		2.50	2	0.027	0.250	0.380	810	1350	1620	2430
		3.00	2	0.032	0.300	0.450	960	1600	1920	2880
	Graphite B B	0.50	2	0.005	0.070	0.070	150	250	300	450
		0.60	2	0.006	0.080	0.080	180	300	360	540
		0.80	2	0.009	0.110	0.110	270	450	540	810
		1.00	2	0.011	0.140	0.140	330	550	660	990
		1.20	2	0.013	0.170	0.170	390	650	780	1170
		1.50	2	0.016	0.210	0.210	480	800	960	1440
		2.00	2	0.021	0.280	0.280	630	1050	1260	1890
		2.50	2	0.027	0.350	0.350	810	1350	1620	2430
		3.00	2	0.032	0.420	0.420	960	1600	1920	2880

Cylindrical end mills Microcut

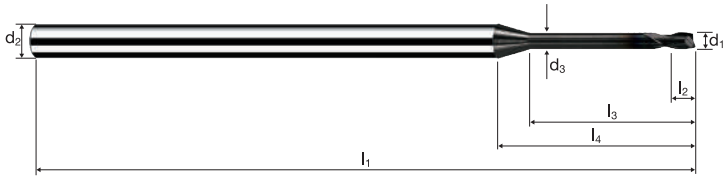
Shank ø 3mm, cylindrical neck, 10xd

Performance **P**

HM
MG10

λ **25°**
γ **6°**

45°



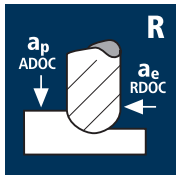
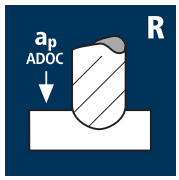
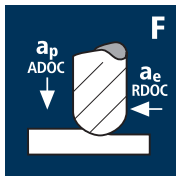
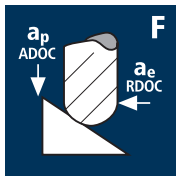
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **5717** ø-Code **050**

Ø Code	d_1 ±0.01	d_2 h6	d_3	l_1	l_2	l_3	l_{3max}	l_4	45°	z	DIAMANT B5717
050	0.50	3.00	0.45	40	0.60	5.00	5.00	10.15	-	2	●
060	0.60	3.00	0.55	40	0.72	6.00	6.00	10.97	-	2	●
080	0.80	3.00	0.75	40	0.96	8.00	8.00	12.59	-	2	●
100	1.00	3.00	0.95	50	1.20	10.00	10.00	14.22	0.04	2	●
108	1.20	3.00	1.10	50	1.44	12.00	12.00	15.94	0.04	2	●
120	1.50	3.00	1.40	60	1.80	15.00	15.00	18.38	0.04	2	●
140	2.00	3.00	1.90	60	2.40	20.00	20.00	22.45	0.05	2	●
160	2.50	3.00	2.30	60	3.00	25.00	25.00	26.70	0.05	2	●
180	3.00	3.00	2.80	60	3.60	29.56	29.56	30.00	0.05	2	●

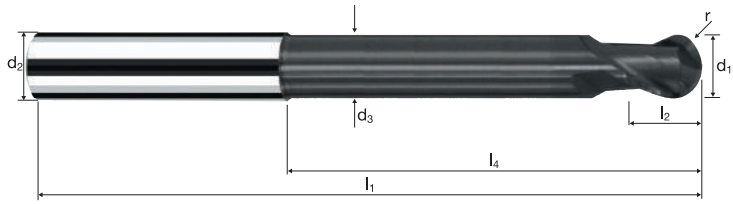
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Graphite B B	6.00	2	0.071	2.700	3.600	1420	2130	2840	4260
		8.00	2	0.094	3.600	4.800	1880	2820	3760	5640
		10.00	2	0.118	4.500	6.000	2360	3540	4720	7080
		12.00	2	0.141	5.400	7.200	2820	4230	5640	8460
	Graphite B B	6.00	2	0.055	2.700	6.000	1100	1650	2200	3300
		8.00	2	0.073	3.600	8.000	1460	2190	2920	4380
		10.00	2	0.091	4.500	10.000	1820	2730	3640	5460
		12.00	2	0.109	5.400	12.000	2180	3270	4360	6540
	Graphite B B	6.00	2	0.080	0.850	1.200	1600	2400	3200	4800
		8.00	2	0.107	1.100	1.600	2140	3210	4280	6420
		10.00	2	0.133	1.400	2.000	2660	3990	5320	7980
		12.00	2	0.160	1.700	2.400	3200	4800	6400	9600
	Graphite B B	6.00	2	0.080	1.100	0.350	1600	2400	3200	4800
		8.00	2	0.107	1.450	0.350	2140	3210	4280	6420
		10.00	2	0.133	1.800	0.350	2660	3990	5320	7980
		12.00	2	0.160	2.150	0.350	3200	4800	6400	9600

Ball nose end mills SpheroX

Tolerance r ±0.005, 6xd

X-Generation X

HM XA	λ 30° γ 15°









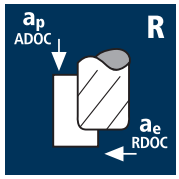
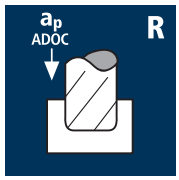
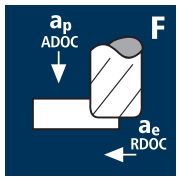
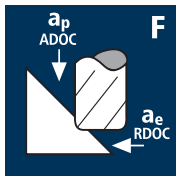
C Graphite

CF/GF Fiber Reinforced Plastics

IV

Example: **Order-N°.** Coating **B** Article-N°. **7484** ø-Code **300**

Ø Code	d_1	d_2 h4	d_3	l_1	l_2	l_3	l_4	r ±0.005	z	DIAPLUS B7484
300	6.00	6.00	5.50	80	7.00	42.34	43.00	3.000	2	●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	4.000	2	●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	5.000	2	●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	6.000	2	●

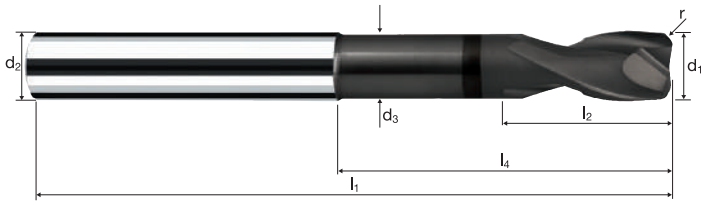
Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Graphite B B	6.00	2	0.056	4.800	2.400	1120	1680	2240	3360
		8.00	2	0.075	6.400	3.200	1500	2250	3000	4500
		10.00	2	0.094	8.000	4.000	1880	2820	3760	5640
		12.00	2	0.113	9.600	4.800	2260	3390	4520	6780
	Graphite B B	6.00	2	0.044	3.000	6.000	880	1320	1760	2640
		8.00	2	0.058	4.000	8.000	1160	1740	2320	3480
		10.00	2	0.073	5.000	10.000	1460	2190	2920	4380
		12.00	2	0.087	6.000	12.000	1740	2610	3480	5220
	Graphite B B	6.00	2	0.080	0.480	2.700	1600	2400	3200	4800
		8.00	2	0.107	0.640	3.600	2140	3210	4280	6420
		10.00	2	0.133	0.800	4.500	2660	3990	5320	7980
		12.00	2	0.160	0.960	5.400	3200	4800	6400	9600
	Graphite B B	6.00	2	0.080	0.900	0.900	1600	2400	3200	4800
		8.00	2	0.107	1.200	1.200	2140	3210	4280	6420
		10.00	2	0.133	1.500	1.500	2660	3990	5320	7980
		12.00	2	0.160	1.800	1.800	3200	4800	6400	9600

Corner radius end mills ToroX

Tolerance r ±0.005, 6xd

X-Generation X

HM XA	λ 30° γ 15°



h4

d1

r

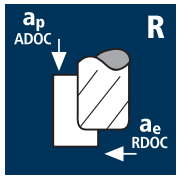
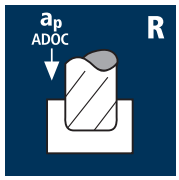
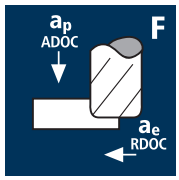
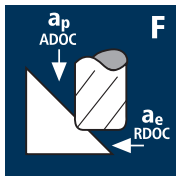
C
Graphite

CF/GF
Fiber Reinforced
Plastics

IV

Example:
Order-N°. Coating **B** Article-N°. **7284** ø-Code **300**

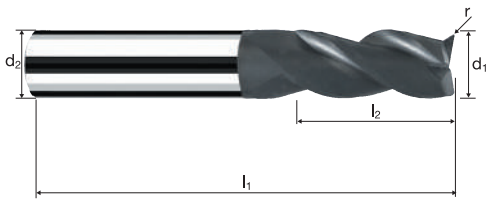
Ø Code	d1 0/-0.01	d2 h4	d3	l1	l2	l3	l4	r ±0.005	z	DIAPLUS B7284
300	6.00	6.00	5.50	80	7.00	42.34	43.00	0.500	2	●
391	8.00	8.00	7.40	90	9.00	52.29	53.00	0.500	2	●
450	10.00	10.00	9.20	105	11.00	63.20	64.00	0.500	2	●
501	12.00	12.00	11.00	120	13.00	73.13	74.00	0.500	2	●
297	6.00	6.00	5.50	80	7.00	42.34	43.00	1.000	2	●
388	8.00	8.00	7.40	90	9.00	52.29	53.00	1.000	2	●
445	10.00	10.00	9.20	105	11.00	63.20	64.00	1.000	2	●
496	12.00	12.00	11.00	120	13.00	73.13	74.00	1.000	2	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Graphite B B	2.00	3	0.024	4.000	0.500	720	1080	1440	2160
		3.00	3	0.035	6.000	0.750	1050	1575	2100	3150
		4.00	3	0.047	8.000	1.000	1410	2115	2820	4230
		5.00	3	0.059	10.000	1.250	1770	2655	3540	5310
		6.00	3	0.071	12.000	1.500	2130	3195	4260	6390
		8.00	3	0.094	16.000	2.000	2820	4230	5640	8460
		10.00	3	0.118	20.000	2.500	3540	5310	7080	10620
		12.00	3	0.141	24.000	3.000	4230	6345	8460	12690
	Graphite B B	2.00	3	0.018	0.600	2.000	540	810	1080	1620
		3.00	3	0.027	0.900	3.000	810	1215	1620	2430
		4.00	3	0.036	1.200	4.000	1080	1620	2160	3240
		5.00	3	0.045	1.500	5.000	1350	2025	2700	4050
		6.00	3	0.055	1.800	6.000	1650	2475	3300	4950
		8.00	3	0.073	2.400	8.000	2190	3285	4380	6570
		10.00	3	0.091	3.000	10.000	2730	4095	5460	8190
		12.00	3	0.109	3.600	12.000	3270	4905	6540	9810
	Graphite B B	2.00	3	0.027	0.200	0.800	810	1215	1620	2430
		3.00	3	0.040	0.300	1.200	1200	1800	2400	3600
		4.00	3	0.053	0.400	1.600	1590	2385	3180	4770
		5.00	3	0.067	0.500	2.000	2010	3015	4020	6030
		6.00	3	0.080	0.600	2.400	2400	3600	4800	7200
		8.00	3	0.107	0.800	3.200	3210	4815	6420	9630
		10.00	3	0.133	1.000	4.000	3990	5985	7980	11970
		12.00	3	0.160	1.200	4.800	4800	7200	9600	14400
	Graphite B B	2.00	3	0.027	4.000	0.300	810	1215	1620	2430
		3.00	3	0.040	6.000	0.450	1200	1800	2400	3600
		4.00	3	0.053	8.000	0.600	1590	2385	3180	4770
		5.00	3	0.067	10.000	0.750	2010	3015	4020	6030
		6.00	3	0.080	12.000	0.900	2400	3600	4800	7200
		8.00	3	0.107	16.000	1.200	3210	4815	6420	9630
		10.00	3	0.133	20.000	1.500	3990	5985	7980	11970
		12.00	3	0.160	24.000	1.800	4800	7200	9600	14400

Corner radius end mills

Tolerance r 0/+0.03

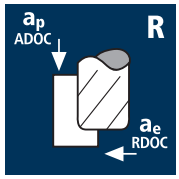
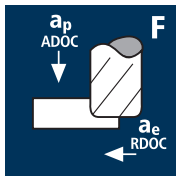
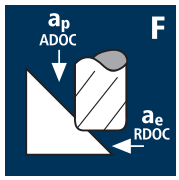
HM XA	λ 40° γ 15°



C Graphite	CF/GF Fiber Reinforced Plastics

Example: **Order-N°.** Coating **B** Article-N°. **5640** ø-Code **140**

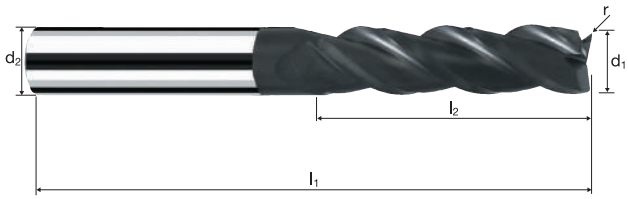
Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r 0/+0.03	z	DIAMANT B5640
140	2.00	3.00	40	6.00	9.06	0.150	3	●
180	3.00	3.00	40	12.00	-	0.150	3	●
220	4.00	4.00	50	14.00	-	0.200	3	●
260	5.00	5.00	50	16.00	-	0.300	3	●
300	6.00	6.00	63	19.00	-	0.300	3	●
391	8.00	8.00	63	19.00	-	0.500	3	●
450	10.00	10.00	72	22.00	-	0.500	3	●
501	12.00	12.00	75	25.00	-	0.500	3	●

Application	Material	d_1 [mm]	z	f_z [mm]	a_p [mm]	a_e [mm]	n=10000min⁻¹ v_f [mm/min]	n=15000min⁻¹ v_f [mm/min]	n=20000min⁻¹ v_f [mm/min]	n=30000min⁻¹ v_f [mm/min]
	Graphite B B	2.00	3	0.019	6.000	0.400	570	855	1140	1710
		3.00	3	0.028	9.000	0.600	840	1260	1680	2520
		4.00	3	0.038	12.000	0.800	1140	1710	2280	3420
		5.00	3	0.047	15.000	1.000	1410	2115	2820	4230
		6.00	3	0.056	18.000	1.200	1680	2520	3360	5040
		8.00	3	0.075	24.000	1.600	2250	3375	4500	6750
		10.00	3	0.094	30.000	2.000	2820	4230	5640	8460
		12.00	3	0.113	36.000	2.400	3390	5085	6780	10170
	Graphite B B	2.00	3	0.021	0.200	0.700	630	945	1260	1890
		3.00	3	0.032	0.300	1.050	960	1440	1920	2880
		4.00	3	0.043	0.400	1.400	1290	1935	2580	3870
		5.00	3	0.053	0.500	1.750	1590	2385	3180	4770
		6.00	3	0.064	0.600	2.100	1920	2880	3840	5760
		8.00	3	0.085	0.800	2.800	2550	3825	5100	7650
		10.00	3	0.107	1.000	3.500	3210	4815	6420	9630
		12.00	3	0.128	1.200	4.200	3840	5760	7680	11520
	Graphite B B	2.00	3	0.021	6.000	0.300	630	945	1260	1890
		3.00	3	0.032	9.000	0.450	960	1440	1920	2880
		4.00	3	0.043	12.000	0.600	1290	1935	2580	3870
		5.00	3	0.053	15.000	0.750	1590	2385	3180	4770
		6.00	3	0.064	18.000	0.900	1920	2880	3840	5760
		8.00	3	0.085	24.000	1.200	2550	3825	5100	7650
		10.00	3	0.107	30.000	1.500	3210	4815	6420	9630
		12.00	3	0.128	36.000	1.800	3840	5760	7680	11520

Corner radius end mills

Tolerance r 0/+0.03

HM XA | λ **40°** γ **15°**



C Graphite

CF/GF Fiber Reinforced Plastics

Example: **Order-N°.** Coating **B** | Article-N°. **5645** | ø-Code **140**

Ø Code	d_1 e8	d_2 h6	l_1	l_2	l_4	r 0/+0.03	z	DIAMANT B5645
140	2.00	3.00	60	9.00	12.06	0.150	3	●
180	3.00	3.00	60	30.00	-	0.150	3	●
220	4.00	4.00	60	30.00	-	0.200	3	●
260	5.00	5.00	70	35.00	-	0.300	3	●
300	6.00	6.00	100	40.00	-	0.300	3	●
391	8.00	8.00	100	40.00	-	0.500	3	●
450	10.00	10.00	100	40.00	-	0.500	3	●
501	12.00	12.00	97	42.00	-	0.500	3	●


passion
for precision
fraisa

End milling tools with special forms

Forming end mills

N° 7920 	Performance P		Rm <850-1300 HRC <24-42			743
N° 0921 	HSS		Rm <850-1100 HRC <24-34			745
N° 0916 	HSS		Rm <850-1100 HRC <24-34			747
N° 0911 	HSS		Rm <850-1100 HRC <24-34			749
N° 0906 	HSS		Rm <850-1100 HRC <24-34			751
N° 0891 	HSS		Rm <850-1100 HRC <24-34			755


passion
for precision
fraisa

End milling tools with special forms

Deburring end mills

N° 7932



Performance P		Rm <850-1100 HRC <24-34			757

N° 7940



Performance P		Rm <850-1100 HRC <24-34			759

N° 7942



Performance P		Rm <850-1100 HRC <24-34			761

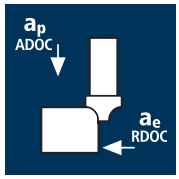
Shell end mills

N° 3491



HSS		Rm <850-1100 HRC <24-34			763

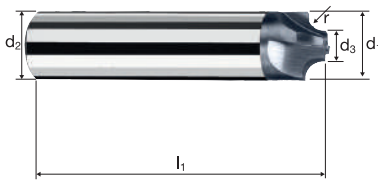
V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	6.00	4	120	0.025	0.500	0.500	6365	637
		8.00	4	120	0.030	1.000	1.000	4775	573
		10.00	4	120	0.040	2.000	2.000	3820	611
		12.00	4	120	0.050	3.000	3.000	3185	637
	Steel 850 - 1100 N/mm²	6.00	4	100	0.020	0.500	0.500	5305	424
		8.00	4	100	0.025	1.000	1.000	3980	398
		10.00	4	100	0.035	2.000	2.000	3185	446
		12.00	4	100	0.040	3.000	3.000	2655	425
	Steel 1100 - 1300 N/mm²	6.00	4	60	0.015	0.500	0.500	3185	191
		8.00	4	60	0.025	1.000	1.000	2385	239
		10.00	4	60	0.030	2.000	2.000	1910	229
		12.00	4	60	0.035	3.000	3.000	1590	223
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	50	0.015	0.500	0.500	2655	159
		8.00	4	50	0.025	1.000	1.000	1990	199
		10.00	4	50	0.030	2.000	2.000	1590	191
		12.00	4	50	0.035	3.000	3.000	1325	186
	Cast iron (lamellar / spheroidal)	6.00	4	140	0.025	0.500	0.500	7425	743
		8.00	4	140	0.030	1.000	1.000	5570	668
		10.00	4	140	0.040	2.000	2.000	4455	713
		12.00	4	140	0.050	3.000	3.000	3715	743
	Unalloyed copper	6.00	4	160	0.020	0.500	0.500	8490	679
		8.00	4	160	0.025	1.000	1.000	6365	637
		10.00	4	160	0.035	2.000	2.000	5095	713
		12.00	4	160	0.040	3.000	3.000	4245	679
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	6.00	4	60	0.015	0.500	0.500	3185	191
		8.00	4	60	0.025	1.000	1.000	2385	239
		10.00	4	60	0.030	2.000	2.000	1910	229
		12.00	4	60	0.035	3.000	3.000	1590	223
	Wrought aluminium Construction aluminium	6.00	4	180	0.025	0.500	0.500	9550	955
		8.00	4	180	0.030	1.000	1.000	7160	859
		10.00	4	180	0.040	2.000	2.000	5730	917
		12.00	4	180	0.050	3.000	3.000	4775	955

Quarter radius end mills

Performance **P**

HM MG10	λ 0° γ 0°



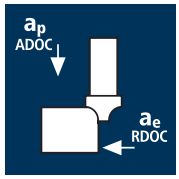
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **7920** ø-Code **300**

Ø Code	d_1 0/+0.1	d_2 h6	d_3 ±0.1	l_1	r JS10	z		POLYCHROM P7920
300	6.00	6.00	4.50	57	0.500	4		●
303	6.00	6.00	4.00	57	0.750	4		●
391	8.00	8.00	5.50	63	1.000	4		●
394	8.00	8.00	5.00	63	1.250	4		●
397	8.00	8.00	4.50	63	1.500	4		●
450	10.00	10.00	5.00	72	2.000	4		●
453	10.00	10.00	4.50	72	2.500	4		●
501	12.00	12.00	5.00	83	3.000	4		●

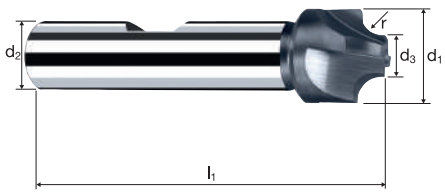
V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	8.00	4	50	0.005	1.000	1.000	1990	40
		10.00	4	50	0.010	2.000	2.000	1590	64
		11.00	4	50	0.010	2.500	2.500	1325	53
		14.00	4	50	0.025	4.000	4.000	995	100
		16.00	4	50	0.030	5.000	5.000	795	95
		20.00	4	50	0.035	6.000	6.000	725	102
		22.00	4	50	0.050	7.000	7.000	665	133
		24.00	4	50	0.056	8.000	8.000	570	128
		28.00	4	50	0.063	10.000	10.000	495	125
	Steel 850 - 1100 N/mm²	8.00	4	45	0.005	1.000	1.000	1790	36
		10.00	4	45	0.010	2.000	2.000	1430	57
		11.00	4	45	0.010	2.500	2.500	1195	48
		14.00	4	45	0.025	4.000	4.000	895	90
		16.00	4	45	0.030	5.000	5.000	715	86
		20.00	4	45	0.035	6.000	6.000	650	91
		22.00	4	45	0.050	7.000	7.000	595	119
		24.00	4	45	0.056	8.000	8.000	510	114
		28.00	4	45	0.063	10.000	10.000	450	113
	Steel 1100 - 1300 N/mm²	8.00	4	34	0.005	1.000	1.000	1355	27
		10.00	4	34	0.010	2.000	2.000	1080	43
		11.00	4	34	0.010	2.500	2.500	900	36
		14.00	4	34	0.025	4.000	4.000	675	68
		16.00	4	34	0.030	5.000	5.000	540	65
		20.00	4	34	0.035	6.000	6.000	490	69
		22.00	4	34	0.050	7.000	7.000	450	90
		24.00	4	34	0.056	8.000	8.000	385	86
		28.00	4	34	0.063	10.000	10.000	340	86
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	8.00	4	25	0.005	1.000	1.000	995	20
		10.00	4	25	0.010	2.000	2.000	795	32
		11.00	4	25	0.010	2.500	2.500	665	27
		14.00	4	25	0.025	4.000	4.000	495	50
		16.00	4	25	0.030	5.000	5.000	400	48
		20.00	4	25	0.035	6.000	6.000	360	50
		22.00	4	25	0.050	7.000	7.000	330	66
		24.00	4	25	0.056	8.000	8.000	285	64
		28.00	4	25	0.063	10.000	10.000	250	63
	Cast iron (lamellar / spheroidal)	8.00	4	42	0.005	1.000	1.000	1670	33
		10.00	4	42	0.010	2.000	2.000	1335	53
		11.00	4	42	0.010	2.500	2.500	1115	45
		14.00	4	42	0.025	4.000	4.000	835	84
		16.00	4	42	0.030	5.000	5.000	670	80
		20.00	4	42	0.035	6.000	6.000	610	85
		22.00	4	42	0.050	7.000	7.000	555	111
		24.00	4	42	0.056	8.000	8.000	475	106
		28.00	4	42	0.063	10.000	10.000	420	106
	Unalloyed copper	8.00	4	42	0.005	1.000	1.000	1670	33
		10.00	4	42	0.010	2.000	2.000	1335	53
		11.00	4	42	0.010	2.500	2.500	1115	45
		14.00	4	42	0.025	4.000	4.000	835	84
		16.00	4	42	0.030	5.000	5.000	670	80
		20.00	4	42	0.035	6.000	6.000	610	85
		22.00	4	42	0.050	7.000	7.000	555	111
		24.00	4	42	0.056	8.000	8.000	475	106
		28.00	4	42	0.063	10.000	10.000	420	106
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	8.00	4	15	0.005	1.000	1.000	595	12
		10.00	4	15	0.010	2.000	2.000	475	19
		11.00	4	15	0.010	2.500	2.500	400	16
		14.00	4	15	0.025	4.000	4.000	300	30
		16.00	4	15	0.030	5.000	5.000	240	29
		20.00	4	15	0.035	6.000	6.000	215	30
		22.00	4	15	0.050	7.000	7.000	200	40
		24.00	4	15	0.056	8.000	8.000	170	38
		28.00	4	15	0.063	10.000	10.000	150	38
	Wrought aluminium Construction aluminium	8.00	4	50	0.005	1.000	1.000	1990	40
		10.00	4	50	0.010	2.000	2.000	1590	64
		11.00	4	50	0.010	2.500	2.500	1325	53
		14.00	4	50	0.025	4.000	4.000	995	100
		16.00	4	50	0.030	5.000	5.000	795	95
		20.00	4	50	0.035	6.000	6.000	725	102
		22.00	4	50	0.050	7.000	7.000	665	133
		24.00	4	50	0.056	8.000	8.000	570	128
		28.00	4	50	0.063	10.000	10.000	495	125

Quarter radius end mills

HSS

HSS-E Co8	λ 0° γ 9°



ReTool®

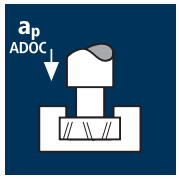
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0921** ø-Code **080**

Ø Code	d_1 js15	d_2 h6	d_3 js14	l_1	r H11	z		POLYCHROM P0921
080	8.00	10.00	6.00	60	1.000	4		●
090	9.00	10.00	6.00	60	1.500	4		●
100	10.00	10.00	6.00	60	2.000	4		●
120	11.00	10.00	6.00	60	2.500	4		●
140	12.00	12.00	6.00	60	3.000	4		●
160	14.00	12.00	6.00	60	4.000	4		●
200	16.00	12.00	6.00	60	5.000	4		●
220	20.00	16.00	8.00	67	6.000	4		●
240	22.00	16.00	8.00	71	7.000	4		●
280	24.00	16.00	8.00	71	8.000	4		●
320	28.00	25.00	8.00	85	10.000	4		●
460	46.00	25.00	16.00	100	15.000	6		●

V

Application

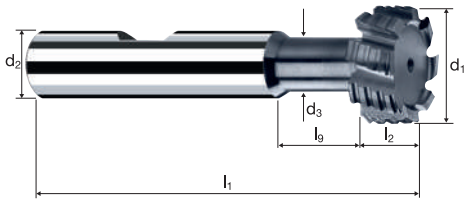


Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
Steel **< 850 N/mm²**	16.00	6	50	0.020	8.000	16.000	995	119
	18.00	6	50	0.020	8.000	18.000	885	106
	21.00	8	50	0.023	9.000	21.000	760	140
	25.00	8	50	0.030	11.000	25.000	635	152
	28.00	8	50	0.030	12.000	28.000	570	137
	32.00	8	50	0.038	14.000	32.000	495	151
	40.00	10	50	0.048	18.000	40.000	400	192
Steel **850 - 1100 N/mm²**	16.00	6	45	0.020	8.000	16.000	895	107
	18.00	6	45	0.020	8.000	18.000	795	95
	21.00	8	45	0.023	9.000	21.000	680	125
	25.00	8	45	0.030	11.000	25.000	575	138
	28.00	8	45	0.030	12.000	28.000	510	122
	32.00	8	45	0.038	14.000	32.000	450	137
	40.00	10	45	0.048	18.000	40.000	360	173
Steel **1100 - 1300 N/mm²**	16.00	6	34	0.020	8.000	16.000	675	81
	18.00	6	34	0.020	8.000	18.000	600	72
	21.00	8	34	0.023	9.000	21.000	515	95
	25.00	8	34	0.030	11.000	25.000	435	104
	28.00	8	34	0.030	12.000	28.000	385	92
	32.00	8	34	0.038	14.000	32.000	340	103
	40.00	10	34	0.048	18.000	40.000	270	130
Inox normal **[Cr-Ni/1.4301]** **[Cr-Ni-Mo/1.4571]**	16.00	6	25	0.020	8.000	16.000	495	59
	18.00	6	25	0.020	8.000	18.000	440	53
	21.00	8	25	0.023	9.000	21.000	380	70
	25.00	8	25	0.030	11.000	25.000	320	77
	28.00	8	25	0.030	12.000	28.000	285	68
	32.00	8	25	0.038	14.000	32.000	250	76
	40.00	10	25	0.048	18.000	40.000	200	96
Cast iron **(lamellar / spheroidal)**	16.00	6	42	0.020	8.000	16.000	835	100
	18.00	6	42	0.020	8.000	18.000	745	89
	21.00	8	42	0.023	9.000	21.000	635	117
	25.00	8	42	0.030	11.000	25.000	535	128
	28.00	8	42	0.030	12.000	28.000	475	114
	32.00	8	42	0.038	14.000	32.000	420	128
	40.00	10	42	0.048	18.000	40.000	335	161
Unalloyed copper	16.00	6	42	0.020	8.000	16.000	835	100
	18.00	6	42	0.020	8.000	18.000	745	89
	21.00	8	42	0.023	9.000	21.000	635	117
	25.00	8	42	0.030	11.000	25.000	535	128
	28.00	8	42	0.030	12.000	28.000	475	114
	32.00	8	42	0.038	14.000	32.000	420	128
	40.00	10	42	0.048	18.000	40.000	335	161
Titanium alloys **up to 300 HB** **[Ti5Al2.5Sn]**	16.00	6	15	0.020	8.000	16.000	300	36
	18.00	6	15	0.020	8.000	18.000	265	32
	21.00	8	15	0.023	9.000	21.000	225	41
	25.00	8	15	0.030	11.000	25.000	190	46
	28.00	8	15	0.030	12.000	28.000	170	41
	32.00	8	15	0.038	14.000	32.000	150	46
	40.00	10	15	0.048	18.000	40.000	120	58
Wrought aluminium **Construction aluminium**	16.00	6	50	0.020	8.000	16.000	995	119
	18.00	6	50	0.020	8.000	18.000	885	106
	21.00	8	50	0.023	9.000	21.000	760	140
	25.00	8	50	0.030	11.000	25.000	635	152
	28.00	8	50	0.030	12.000	28.000	570	137
	32.00	8	50	0.038	14.000	32.000	495	151
	40.00	10	50	0.048	18.000	40.000	400	192

T-groove end mills

HSS

HSS-E Co5 | λ 20° γ 10°



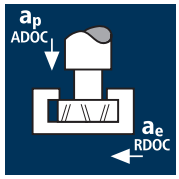
ReTool®

Rm <850 HRC <24 | Rm 850-1100 HRC 24-34 | Rm 1100-1300 HRC 34-42 | Inox Stainless | Ti Titanium | GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0916** ø-Code **140**

Ø Code	d_1 d11	d_2 h6	d_3 h12	l_1	l_2 d11	l_9	z	POLYCHROM P0916
140	16.00	10.00	7.00	62	8.00	14.00	6	●
160	18.00	12.00	8.00	70	8.00	17.00	6	●
180	21.00	12.00	10.00	74	9.00	20.00	8	●
200	25.00	16.00	12.00	82	11.00	23.00	8	●
220	28.00	16.00	13.00	85	12.00	25.00	8	●
240	32.00	16.00	15.00	90	14.00	28.00	8	●
260	40.00	25.00	19.00	108	18.00	34.00	10	●

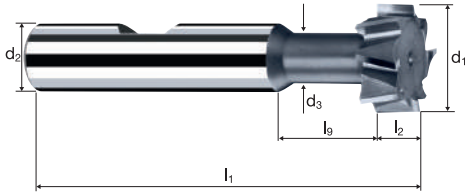
V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	11.00	6	50	0.007	4.000	1.100	1445	61
		12.50	6	50	0.007	6.000	1.250	1275	54
		16.00	6	50	0.017	8.000	1.600	995	102
		18.00	6	50	0.025	8.000	1.800	885	133
		21.00	6	50	0.040	9.000	2.100	760	182
		25.00	8	50	0.034	11.000	2.500	635	173
		32.00	8	50	0.045	14.000	3.200	495	178
		40.00	10	50	0.056	18.000	4.000	400	224
		50.00	10	50	0.072	22.000	5.000	320	230
	Steel 850 - 1100 N/mm²	11.00	6	45	0.007	4.000	1.100	1300	55
		12.50	6	45	0.007	6.000	1.250	1145	48
		16.00	6	45	0.017	8.000	1.600	895	91
		18.00	6	45	0.025	8.000	1.800	795	119
		21.00	6	45	0.040	9.000	2.100	680	163
		25.00	8	45	0.034	11.000	2.500	575	156
		32.00	8	45	0.045	14.000	3.200	450	162
		40.00	10	45	0.056	18.000	4.000	360	202
		50.00	10	45	0.072	22.000	5.000	285	205
	Steel 1100 - 1300 N/mm²	11.00	6	34	0.007	4.000	1.100	985	41
		12.50	6	34	0.007	6.000	1.250	865	36
		16.00	6	34	0.017	8.000	1.600	675	69
		18.00	6	34	0.025	8.000	1.800	600	90
		21.00	6	34	0.040	9.000	2.100	515	124
		25.00	8	34	0.034	11.000	2.500	435	118
		32.00	8	34	0.045	14.000	3.200	340	122
		40.00	10	34	0.056	18.000	4.000	270	151
		50.00	10	34	0.072	22.000	5.000	215	155
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	11.00	6	25	0.007	4.000	1.100	725	31
		12.50	6	25	0.007	6.000	1.250	635	27
		16.00	6	25	0.017	8.000	1.600	495	51
		18.00	6	25	0.025	8.000	1.800	440	66
		21.00	6	25	0.040	9.000	2.100	380	91
		25.00	8	25	0.034	11.000	2.500	320	87
		32.00	8	25	0.045	14.000	3.200	250	90
		40.00	10	25	0.056	18.000	4.000	200	112
		50.00	10	25	0.072	22.000	5.000	160	115
	Cast iron (lamellar / spheroidal)	11.00	6	42	0.007	4.000	1.100	1215	51
		12.50	6	42	0.007	6.000	1.250	1070	45
		16.00	6	42	0.017	8.000	1.600	835	85
		18.00	6	42	0.025	8.000	1.800	745	112
		21.00	6	42	0.040	9.000	2.100	635	152
		25.00	8	42	0.034	11.000	2.500	535	146
		32.00	8	42	0.045	14.000	3.200	420	151
		40.00	10	42	0.056	18.000	4.000	335	188
		50.00	10	42	0.072	22.000	5.000	265	191
	Unalloyed copper	11.00	6	42	0.007	4.000	1.100	1215	51
		12.50	6	42	0.007	6.000	1.250	1070	45
		16.00	6	42	0.017	8.000	1.600	835	85
		18.00	6	42	0.025	8.000	1.800	745	112
		21.00	6	42	0.040	9.000	2.100	635	152
		25.00	8	42	0.034	11.000	2.500	535	146
		32.00	8	42	0.045	14.000	3.200	420	151
		40.00	10	42	0.056	18.000	4.000	335	188
		50.00	10	42	0.072	22.000	5.000	265	191
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	11.00	6	15	0.007	4.000	1.100	435	18
		12.50	6	15	0.007	6.000	1.250	380	16
		16.00	6	15	0.017	8.000	1.600	300	31
		18.00	6	15	0.025	8.000	1.800	265	40
		21.00	6	15	0.040	9.000	2.100	225	54
		25.00	8	15	0.034	11.000	2.500	190	52
		32.00	8	15	0.045	14.000	3.200	150	54
		40.00	10	15	0.056	18.000	4.000	120	67
		50.00	10	15	0.072	22.000	5.000	95	68
	Wrought aluminium Construction aluminium	11.00	6	50	0.007	4.000	1.100	1445	61
		12.50	6	50	0.007	6.000	1.250	1275	54
		16.00	6	50	0.017	8.000	1.600	995	102
		18.00	6	50	0.025	8.000	1.800	885	133
		21.00	6	50	0.040	9.000	2.100	760	182
		25.00	8	50	0.034	11.000	2.500	635	173
		32.00	8	50	0.045	14.000	3.200	495	178
		40.00	10	50	0.056	18.000	4.000	400	224
		50.00	10	50	0.072	22.000	5.000	320	230

T-groove end mills

HSS

HSS-E Co5 | λ 10° γ 10°



ReTool®

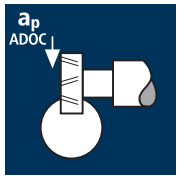
Rm <850 HRC <24 | Rm 850-1100 HRC 24-34 | Rm 1100-1300 HRC 34-42 | Inox Stainless | Ti Titanium | GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0911** ø-Code **100**

Ø Code	d_1 d11	d_2 h6	d_3	l_1	l_2 d11	l_9	z	POLYCHROM P0911
100	11.00	10.00	4.00	54	4.00	9.50	6	●
120	12.50	10.00	5.00	57	6.00	11.00	6	●
140	16.00	10.00	7.00	62	8.00	14.00	6	●
160	18.00	12.00	8.00	70	8.00	17.00	6	●
180	21.00	12.00	10.00	74	9.00	20.00	6	●
200	25.00	16.00	12.00	82	11.00	23.00	8	●
220	32.00	16.00	15.00	90	14.00	28.00	8	●
240	40.00	25.00	19.00	108	18.00	34.00	10	●
260	50.00	32.00	25.00	124	22.00	42.00	10	●
500*	12.00	8.00	5.00	54	2.50	15.00	8	●
520*	16.00	8.00	6.00	56	3.00	16.50	8	●
540*	20.00	10.00	8.00	62	4.00	17.50	8	●
560*	25.00	10.00	9.00	65	5.00	19.50	10	●
580*	32.00	12.00	10.00	73	6.00	21.50	12	●
600*	40.00	12.00	11.00	77	8.00	23.50	12	●
620*	50.00	16.00	14.00	84	10.00	25.50	14	●

* conical neck

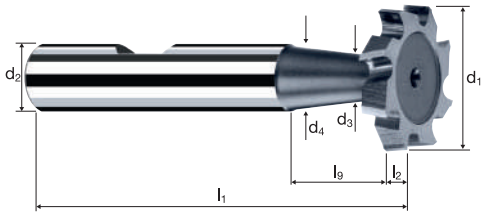
V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	4.50	6	55	0.007	0.800	1.000	3890	163
		7.50	6	55	0.007	2.000	1.500	2335	98
		10.50	6	55	0.013	2.900	2.000	1665	130
		13.50	6	55	0.013	3.800	2.500	1295	101
		16.50	6	55	0.033	5.000	3.000	1060	210
		19.50	8	55	0.044	5.500	3.000	900	317
		22.50	8	55	0.050	6.600	4.000	780	312
	Steel 850 - 1100 N/mm²	4.50	6	45	0.007	0.800	1.000	3185	134
		7.50	6	45	0.007	2.000	1.500	1910	80
		10.50	6	45	0.013	2.900	2.000	1365	107
		13.50	6	45	0.013	3.800	2.500	1060	83
		16.50	6	45	0.033	5.000	3.000	870	172
		19.50	8	45	0.044	5.500	3.000	735	259
		22.50	8	45	0.050	6.600	4.000	635	254
	Steel 1100 - 1300 N/mm²	4.50	6	34	0.007	0.800	1.000	2405	101
		7.50	6	34	0.007	2.000	1.500	1445	61
		10.50	6	34	0.013	2.900	2.000	1030	80
		13.50	6	34	0.013	3.800	2.500	800	62
		16.50	6	34	0.033	5.000	3.000	655	130
		19.50	8	34	0.044	5.500	3.000	555	195
		22.50	8	34	0.050	6.600	4.000	480	192
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	4.50	6	25	0.007	0.800	1.000	1770	74
		7.50	6	25	0.007	2.000	1.500	1060	45
		10.50	6	25	0.013	2.900	2.000	760	59
		13.50	6	25	0.013	3.800	2.500	590	46
		16.50	6	25	0.033	5.000	3.000	480	95
		19.50	8	25	0.044	5.500	3.000	410	144
		22.50	8	25	0.050	6.600	4.000	355	142
	Cast iron (lamellar / spheroidal)	4.50	6	21	0.007	0.800	1.000	1485	62
		7.50	6	21	0.007	2.000	1.500	890	37
		10.50	6	21	0.013	2.900	2.000	635	50
		13.50	6	21	0.013	3.800	2.500	495	39
		16.50	6	21	0.033	5.000	3.000	405	80
		19.50	8	21	0.044	5.500	3.000	345	121
		22.50	8	21	0.050	6.600	4.000	295	118
	Unalloyed copper	4.50	6	21	0.007	0.800	1.000	1485	62
		7.50	6	21	0.007	2.000	1.500	890	37
		10.50	6	21	0.013	2.900	2.000	635	50
		13.50	6	21	0.013	3.800	2.500	495	39
		16.50	6	21	0.033	5.000	3.000	405	80
		19.50	8	21	0.044	5.500	3.000	345	121
		22.50	8	21	0.050	6.600	4.000	295	118
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	4.50	6	15	0.007	0.800	1.000	1060	45
		7.50	6	15	0.007	2.000	1.500	635	27
		10.50	6	15	0.013	2.900	2.000	455	36
		13.50	6	15	0.013	3.800	2.500	355	28
		16.50	6	15	0.033	5.000	3.000	290	57
		19.50	8	15	0.044	5.500	3.000	245	86
		22.50	8	15	0.050	6.600	4.000	210	84
	Wrought aluminium Construction aluminium	4.50	6	26	0.007	0.800	1.000	1840	77
		7.50	6	26	0.007	2.000	1.500	1105	46
		10.50	6	26	0.013	2.900	2.000	790	62
		13.50	6	26	0.013	3.800	2.500	615	48
		16.50	6	26	0.033	5.000	3.000	500	99
		19.50	8	26	0.044	5.500	3.000	425	150
		22.50	8	26	0.050	6.600	4.000	370	148

Slotting end mills

HSS

HSS-E Co5 | λ 10° γ 10°



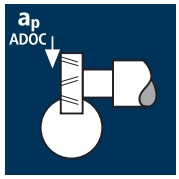
ReTool®

Rm <850 HRC <24 | Rm 850-1100 HRC 24-34 | Rm 1100-1300 HRC 34-42 | Inox Stainless | Ti Titanium | GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0906** ø-Code **100**

Ø Code	d_1 h12	d_2 h6	d_3	d_4	l_1	l_2 e8	l_9	z	POLYCHROM P0906
100	4.50	6.00	1.80	5.50	50	1.00	13.00	6	●
150	7.50	6.00	2.80	5.50	50	1.50	12.50	6	●
160	7.50	6.00	3.20	5.50	50	2.00	12.00	6	●
200	10.50	6.00	4.00	5.50	50	2.00	12.00	6	●
210	10.50	6.00	4.00	5.50	50	2.50	11.50	6	●
220	10.50	6.00	4.20	5.50	50	3.00	11.00	6	●
310	13.50	10.00	4.60	9.50	56	2.50	13.50	6	●
320	13.50	10.00	4.60	9.50	56	3.00	13.00	6	●
330	13.50	10.00	4.60	9.50	56	4.00	12.00	6	●
360	16.50	10.00	4.60	9.50	56	3.00	13.00	6	●
370	16.50	10.00	4.60	9.50	56	4.00	12.00	6	●
380	16.50	10.00	5.00	9.50	56	5.00	11.00	6	●
410	19.50	10.00	5.60	9.50	63	3.00	20.00	8	●
420	19.50	10.00	5.60	9.50	63	4.00	19.00	8	●
430	19.50	10.00	6.00	9.50	63	5.00	18.00	8	●
440	19.50	10.00	6.50	9.50	63	6.00	17.00	8	●
500	22.50	10.00	6.00	9.50	63	4.00	19.00	8	●
510	22.50	10.00	6.00	9.50	63	5.00	18.00	8	●
520	22.50	10.00	6.50	9.50	63	6.00	17.00	8	●
540	22.50	10.00	6.50	9.50	63	8.00	15.00	8	●

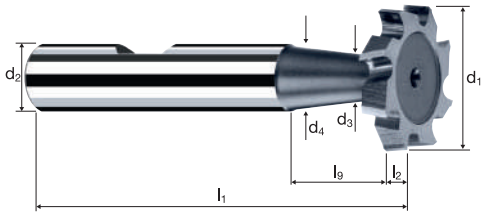
V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel < 850 N/mm²	25.50	10	55	0.054	7.000	5.000	685	370
		28.50	10	55	0.060	8.200	8.000	615	369
		32.50	10	55	0.072	9.800	6.000	540	389
		45.50	12	55	0.093	12.000	10.000	385	430
	Steel 850 - 1100 N/mm²	25.50	10	45	0.054	7.000	5.000	560	302
		28.50	10	45	0.060	8.200	6.000	505	303
		32.50	10	45	0.072	9.800	6.000	440	317
		45.50	12	45	0.093	12.000	10.000	315	352
	Steel 1100 - 1300 N/mm²	25.50	10	34	0.054	7.000	5.000	425	230
		28.50	10	34	0.060	8.200	6.000	380	228
		32.50	10	34	0.072	9.800	6.000	335	241
		45.50	12	34	0.093	12.000	10.000	240	268
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	25.50	10	25	0.054	7.000	5.000	310	167
		28.50	10	25	0.060	8.200	6.000	280	168
		32.50	10	25	0.072	9.800	6.000	245	176
		45.50	12	25	0.093	12.000	10.000	175	195
	Cast iron (lamellar / spheroidal)	25.50	10	21	0.054	7.000	5.000	260	140
		28.50	10	21	0.060	8.200	6.000	235	141
		32.50	10	21	0.072	9.800	6.000	205	148
		45.50	12	21	0.093	12.000	10.000	145	162
	Unalloyed copper	25.50	10	21	0.054	7.000	5.000	260	140
		28.50	10	21	0.060	8.200	6.000	235	141
		32.50	10	21	0.072	9.800	6.000	205	148
		45.50	12	21	0.093	12.000	10.000	145	162
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	25.50	10	15	0.054	7.000	5.000	185	100
		28.50	10	15	0.060	8.200	6.000	170	102
		32.50	10	15	0.072	9.800	6.000	145	104
		45.50	12	15	0.093	12.000	10.000	105	117
	Wrought aluminium Construction aluminium	25.50	10	26	0.054	7.000	5.000	325	176
		28.50	10	26	0.060	8.200	6.000	290	174
		32.50	10	26	0.072	9.800	6.000	255	184
		45.50	12	26	0.093	12.000	10.000	180	201

Slotting end mills

HSS

HSS-E Co5 | λ 10° γ 10°



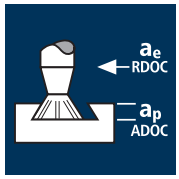
ReTool®

Rm <850 HRC <24 | Rm 850-1100 HRC 24-34 | Rm 1100-1300 HRC 34-42 | Inox Stainless | Ti Titanium | GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0906** ø-Code **600**

Ø Code	d_1 h12	d_2 h6	d_3	d_4	l_1	l_2 e8	l_9	z	POLYCHROM P0906
600	25.50	10.00	7.50	9.50	63	5.00	18.00	10	●
610	25.50	10.00	7.50	9.50	63	6.00	17.00	10	●
650	28.50	10.00	8.50	9.50	63	6.00	17.00	10	●
660	28.50	10.00	8.50	9.50	63	8.00	15.00	10	●
700	28.50	12.00	9.30	11.50	71	10.00	16.00	10	●
750	32.50	12.00	8.50	11.50	71	6.00	20.00	10	●
760	32.50	12.00	8.50	11.50	71	7.00	19.00	10	●
770	32.50	12.00	8.50	11.50	71	8.00	18.00	10	●
800	32.50	12.00	9.30	11.50	71	10.00	16.00	10	●
900	45.50	12.00	11.80	11.80	71	10.00	16.00	12	●

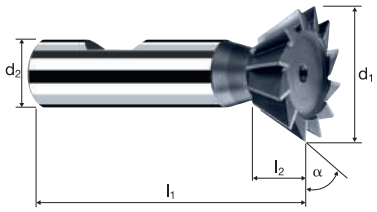
V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel < 850 N/mm²	16.00	10	55	0.015	4.000	2.200	1095	164
		20.00	10	55	0.022	6.000	2.400	875	193
		25.00	10	55	0.028	8.000	2.600	700	196
		32.00	12	55	0.033	10.000	3.000	545	216
		16.00	10	55	0.015	4.000	2.200	1095	164
		20.00	10	55	0.022	6.000	2.400	875	193
		25.00	10	55	0.028	8.000	2.600	700	196
		32.00	12	55	0.033	10.000	3.000	545	216
	Steel 850 - 1100 N/mm²	16.00	10	45	0.015	4.000	2.200	895	134
		20.00	10	45	0.022	6.000	2.400	715	157
		25.00	10	45	0.028	8.000	2.600	575	161
		32.00	12	45	0.033	10.000	3.000	450	178
		16.00	10	45	0.015	4.000	2.200	895	134
		20.00	10	45	0.022	6.000	2.400	715	157
		25.00	10	45	0.028	8.000	2.600	575	161
		32.00	12	45	0.033	10.000	3.000	450	178
	Steel 1100 - 1300 N/mm²	16.00	10	34	0.015	4.000	2.200	675	101
		20.00	10	34	0.022	6.000	2.400	540	119
		25.00	10	34	0.028	8.000	2.600	435	122
		32.00	12	34	0.033	10.000	3.000	340	135
		16.00	10	34	0.015	4.000	2.200	675	101
		20.00	10	34	0.022	6.000	2.400	540	119
		25.00	10	34	0.028	8.000	2.600	435	122
		32.00	12	34	0.033	10.000	3.000	340	135
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	16.00	10	21	0.015	4.000	2.200	420	63
		20.00	10	21	0.022	6.000	2.400	335	74
		25.00	10	21	0.028	8.000	2.600	265	74
		32.00	12	21	0.033	10.000	3.000	210	83
		16.00	10	21	0.015	4.000	2.200	420	63
		20.00	10	21	0.022	6.000	2.400	335	74
		25.00	10	21	0.028	8.000	2.600	265	74
		32.00	12	21	0.033	10.000	3.000	210	83
	Cast iron (lamellar / spheroidal)	16.00	10	42	0.015	4.000	2.200	835	125
		20.00	10	42	0.022	6.000	2.400	670	147
		25.00	10	42	0.028	8.000	2.600	535	150
		32.00	12	42	0.033	10.000	3.000	420	166
		16.00	10	42	0.015	4.000	2.200	835	125
		20.00	10	42	0.022	6.000	2.400	670	147
		25.00	10	42	0.028	8.000	2.600	535	150
		32.00	12	42	0.033	10.000	3.000	420	166
	Unalloyed copper	16.00	10	65	0.015	4.000	2.200	1295	194
		20.00	10	65	0.022	6.000	2.400	1035	228
		25.00	10	65	0.028	8.000	2.600	830	232
		32.00	12	65	0.033	10.000	3.000	645	255
		16.00	10	65	0.015	4.000	2.200	1295	194
		20.00	10	65	0.022	6.000	2.400	1035	228
		25.00	10	65	0.028	8.000	2.600	830	232
		32.00	12	65	0.033	10.000	3.000	645	255
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	16.00	10	23	0.015	4.000	2.200	460	69
		20.00	10	23	0.022	6.000	2.400	365	80
		25.00	10	23	0.028	8.000	2.600	295	83
		32.00	12	23	0.033	10.000	3.000	230	91
		16.00	10	23	0.015	4.000	2.200	460	69
		20.00	10	23	0.022	6.000	2.400	365	80
		25.00	10	23	0.028	8.000	2.600	295	83
		32.00	12	23	0.033	10.000	3.000	230	91
	Wrought aluminium Construction aluminium	16.00	10	80	0.015	4.000	2.200	1590	239
		20.00	10	80	0.022	6.000	2.400	1275	281
		25.00	10	80	0.028	8.000	2.600	1020	286
		32.00	12	80	0.033	10.000	3.000	795	315
		16.00	10	80	0.015	4.000	2.200	1590	239
		20.00	10	80	0.022	6.000	2.400	1275	281
		25.00	10	80	0.028	8.000	2.600	1020	286
		32.00	12	80	0.033	10.000	3.000	795	315

Angular end mills

HSS

HSS-E Co5	λ 0° γ 0°



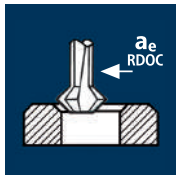
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **0891** ø-Code **120**

Ø Code	d_1 js16	d_2 h6	l_1	l_2	α	z	POLYCHROM P0891
120	16.00	12.00	60	4.00	45.0°	10	●
140	20.00	12.00	63	5.00	45.0°	10	●
160	25.00	12.00	67	6.30	45.0°	10	●
180	32.00	16.00	71	8.00	45.0°	12	●
340	16.00	12.00	60	6.30	60.0°	10	●
360	20.00	12.00	63	8.00	60.0°	10	●
380	25.00	12.00	67	10.00	60.0°	10	●
400	32.00	16.00	71	12.50	60.0°	12	●

V

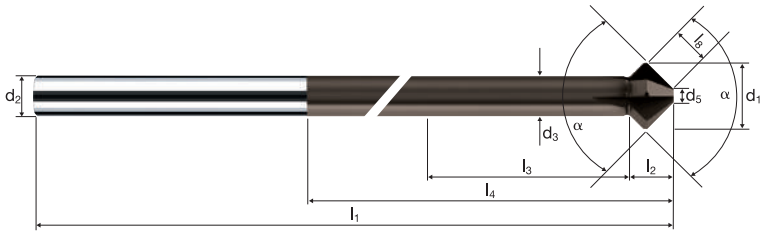
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	3.00	4	150	0.008	0.150	15915	509
		4.00	4	150	0.012	0.200	11935	573
		5.00	4	150	0.014	0.250	9550	535
		6.00	4	150	0.018	0.250	7960	573
		8.00	4	150	0.022	0.300	5970	525
		10.00	4	150	0.028	0.400	4775	535
		12.00	4	150	0.034	0.500	3980	541
	Steel 850 - 1100 N/mm²	3.00	4	120	0.008	0.150	12730	407
		4.00	4	120	0.012	0.200	9550	458
		5.00	4	120	0.014	0.250	7640	428
		6.00	4	120	0.018	0.250	6365	458
		8.00	4	120	0.022	0.300	4775	420
		10.00	4	120	0.028	0.400	3820	428
		12.00	4	120	0.034	0.500	3185	433
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	50	0.008	0.150	5305	170
		4.00	4	50	0.012	0.200	3980	191
		5.00	4	50	0.014	0.250	3185	178
		6.00	4	50	0.018	0.250	2655	191
		8.00	4	50	0.022	0.300	1990	175
		10.00	4	50	0.028	0.400	1590	178
		12.00	4	50	0.034	0.500	1325	180
	Cast iron (lamellar / spheroidal)	3.00	4	180	0.008	0.150	19100	611
		4.00	4	180	0.012	0.200	14325	688
		5.00	4	180	0.014	0.250	11460	642
		6.00	4	180	0.018	0.250	9550	688
		8.00	4	180	0.022	0.300	7160	630
		10.00	4	180	0.028	0.400	5730	642
		12.00	4	180	0.034	0.500	4775	649
	Steel < 850 N/mm²	3.00	4	150	0.008	0.150	15915	509
		4.00	4	150	0.012	0.200	11935	573
		5.00	4	150	0.014	0.250	9550	535
		6.00	4	150	0.018	0.250	7960	573
		8.00	4	150	0.022	0.300	5970	525
		10.00	4	150	0.028	0.400	4775	535
		12.00	4	150	0.034	0.500	3980	541
	Steel 850 - 1100 N/mm²	3.00	4	120	0.008	0.150	12730	407
		4.00	4	120	0.012	0.200	9550	458
		5.00	4	120	0.014	0.250	7640	428
		6.00	4	120	0.018	0.250	6365	458
		8.00	4	120	0.022	0.300	4775	420
		10.00	4	120	0.028	0.400	3820	428
		12.00	4	120	0.034	0.500	3185	433
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	50	0.008	0.150	5305	170
		4.00	4	50	0.012	0.200	3980	191
		5.00	4	50	0.014	0.250	3185	178
		6.00	4	50	0.018	0.250	2655	191
		8.00	4	50	0.022	0.300	1990	175
		10.00	4	50	0.028	0.400	1590	178
		12.00	4	50	0.034	0.500	1325	180
	Cast iron (lamellar / spheroidal)	3.00	4	180	0.008	0.150	19100	611
		4.00	4	180	0.012	0.200	14325	688
		5.00	4	180	0.014	0.250	11460	642
		6.00	4	180	0.018	0.250	9550	688
		8.00	4	180	0.022	0.300	7160	630
		10.00	4	180	0.028	0.400	5730	642
		12.00	4	180	0.034	0.500	4775	649

Forward and reverse deburring end mills

45° - Chamfer

Performance **P**

HM	λ 0° γ 1°



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **W** Article-N°. **7932** ø-Code **180**

Ø Code	d_1 ±0.022	d_2 h6	d_3	d_5	l_1	l_2	l_3	l_4	l_8	α	z	TiAlN **W7932**
180	3.00	4.00	2.20	0.6	75	2.10	9.34	13.00	1.70	90.0°	4	●
220	4.00	4.00	2.90	0.8	75	2.65	12.40	16.00	2.26	90.0°	4	●
260	5.00	5.00	3.90	1.0	75	3.05	15.00	19.00	2.83	90.0°	4	●
300	6.00	6.00	3.90	1.2	100	3.95	14.23	20.00	3.39	90.0°	4	●
391	8.00	6.00	6.00	1.6	100	4.69	-	-	4.53	90.0°	4	●
450	10.00	6.00	6.00	2.0	100	6.49	-	-	5.66	90.0°	4	●
501	12.00	6.00	6.00	2.4	100	8.29	-	-	6.79	90.0°	4	●

V

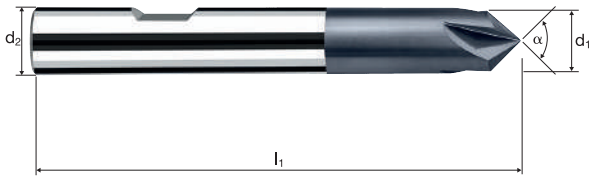
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]
	Steel < 850 N/mm²	6.00	4	150	0.020	0.200	0.200	7960	637
		8.00	4	150	0.025	0.250	0.250	5970	597
		10.00	4	150	0.030	0.300	0.300	4775	573
		12.00	4	150	0.035	0.400	0.400	3980	557
	Steel 850 - 1100 N/mm²	6.00	4	120	0.020	0.200	0.200	6365	509
		8.00	4	120	0.025	0.250	0.250	4775	478
		10.00	4	120	0.030	0.300	0.300	3820	458
		12.00	4	120	0.035	0.400	0.400	3185	446
	Steel 1100 - 1300 N/mm²	6.00	4	55	0.020	0.200	0.200	2920	234
		8.00	4	55	0.025	0.250	0.250	2190	219
		10.00	4	55	0.030	0.300	0.300	1750	210
		12.00	4	55	0.035	0.400	0.400	1460	204
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	6.00	4	60	0.020	0.200	0.200	3185	255
		8.00	4	60	0.025	0.250	0.250	2385	239
		10.00	4	60	0.030	0.300	0.300	1910	229
		12.00	4	60	0.035	0.400	0.400	1590	223
	Cast iron (lamellar / spheroidal)	6.00	4	160	0.020	0.200	0.200	8490	679
		8.00	4	160	0.025	0.250	0.250	6365	637
		10.00	4	160	0.030	0.300	0.300	5095	611
		12.00	4	160	0.035	0.400	0.400	4245	594
	Unalloyed copper	6.00	4	200	0.020	0.200	0.200	10610	849
		8.00	4	200	0.025	0.250	0.250	7960	796
		10.00	4	200	0.030	0.300	0.300	6365	764
		12.00	4	200	0.035	0.400	0.400	5305	743
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	6.00	4	70	0.020	0.200	0.200	3715	297
		8.00	4	70	0.025	0.250	0.250	2785	279
		10.00	4	70	0.030	0.300	0.300	2230	268
		12.00	4	70	0.035	0.400	0.400	1855	260
	Wrought aluminium Construction aluminium	6.00	4	300	0.020	0.200	0.200	15915	1273
		8.00	4	300	0.025	0.250	0.250	11935	1194
		10.00	4	300	0.030	0.300	0.300	9550	1146
		12.00	4	300	0.035	0.400	0.400	7960	1114

Deburring end mills

45° - Chamfer

Performance **P**

HM	λ 0°
	γ 0°



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **7940** ø-Code **300**

Ø Code	d_1 h6	d_2 h6	l_1	α	z		POLYCHROM P7940
300	6.00	6.00	57	90.0°	4		●
391	8.00	8.00	63	90.0°	4		●
450	10.00	10.00	72	90.0°	4		●
501	12.00	12.00	83	90.0°	4		●

V

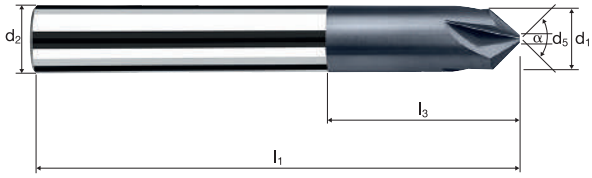
Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]
	Steel < 850 N/mm²	2.00	3	150	0.005	0.050	0.050	23875	358
		3.00	3	150	0.010	0.100	0.100	15915	478
		4.00	3	150	0.015	0.150	0.150	11935	537
		6.00	3	150	0.020	0.200	0.200	7960	478
	Steel 850 - 1100 N/mm²	2.00	3	120	0.005	0.050	0.050	19100	287
		3.00	3	120	0.010	0.100	0.100	12730	382
		4.00	3	120	0.015	0.150	0.150	9550	430
		6.00	3	120	0.020	0.200	0.200	6365	382
	Steel 1100 - 1300 N/mm²	2.00	3	70	0.005	0.050	0.050	11140	167
		3.00	3	70	0.010	0.100	0.100	7425	223
		4.00	3	70	0.015	0.150	0.150	5570	251
		6.00	3	70	0.020	0.200	0.200	3715	223
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	2.00	3	60	0.005	0.050	0.050	9550	143
		3.00	3	60	0.010	0.100	0.100	6365	191
		4.00	3	60	0.015	0.150	0.150	4775	215
		6.00	3	60	0.020	0.200	0.200	3185	191
	Cast iron (lamellar / spheroidal)	2.00	3	160	0.005	0.050	0.050	25465	382
		3.00	3	160	0.010	0.100	0.100	16975	509
		4.00	3	160	0.015	0.150	0.150	12730	573
		6.00	3	160	0.020	0.200	0.200	8490	509
	Unalloyed copper	2.00	3	180	0.005	0.050	0.050	28650	430
		3.00	3	180	0.010	0.100	0.100	19100	573
		4.00	3	180	0.015	0.150	0.150	14325	645
		6.00	3	180	0.020	0.200	0.200	9550	573
	Titanium alloys up to 300 HB [Ti5Al2.5Sn]	2.00	3	70	0.005	0.050	0.050	11140	167
		3.00	3	70	0.010	0.100	0.100	7425	223
		4.00	3	70	0.015	0.150	0.150	5570	251
		6.00	3	70	0.020	0.200	0.200	3715	223
	Wrought aluminium Construction aluminium	2.00	3	200	0.005	0.050	0.050	31830	478
		3.00	3	200	0.010	0.100	0.100	21220	637
		4.00	3	200	0.015	0.150	0.150	15915	716
		6.00	3	200	0.020	0.200	0.200	10610	637

Deburring end mills

45° - Chamfer

Performance **P**

HM	λ 0°
	γ 0°



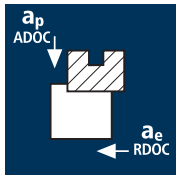
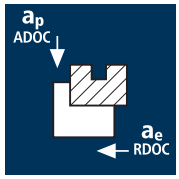
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **7942** ø-Code **140**

Ø Code	d_1 h6	d_2 h6	d_5 ±0.05	l_1	l_3	α	z		POLYCHROM P7942
140	2.00	3.00	0.2	40	7.20	90.0°	3		●
180	3.00	3.00	0.3	40	-	90.0°	3		●
220	4.00	4.00	0.4	50	-	90.0°	3		●
300	6.00	6.00	0.6	57	-	90.0°	3		●

V

Application	Material	d_1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]
	Steel < 850 N/mm²	40.00	8	65	0.080	8.000	30.000	515	330	79.1
		50.00	8	65	0.100	10.000	37.500	415	332	124.5
		63.00	10	65	0.120	12.600	47.250	330	396	235.8
		80.00	10	65	0.120	16.000	60.000	260	312	299.5
	Steel 850 - 1100 N/mm²	40.00	8	48	0.080	8.000	30.000	380	243	58.4
		50.00	8	48	0.100	10.000	37.500	305	244	91.5
		63.00	10	48	0.120	12.600	47.250	245	294	175.0
		80.00	10	48	0.120	16.000	60.000	190	228	218.9
	Steel 1100 - 1300 N/mm²	40.00	8	35	0.080	8.000	30.000	280	179	43.0
		50.00	8	35	0.100	10.000	37.500	225	180	67.5
		63.00	10	35	0.120	12.600	47.250	175	210	125.0
		80.00	10	35	0.120	16.000	60.000	140	168	161.3
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	40.00	8	26	0.080	8.000	30.000	205	131	31.5
		50.00	8	26	0.100	10.000	37.500	165	132	49.5
		63.00	10	26	0.120	12.600	47.250	130	156	92.9
		80.00	10	26	0.120	16.000	60.000	105	126	121.0
	Steel < 850 N/mm²	40.00	8	68	0.090	8.000	12.000	540	389	37.3
		50.00	8	68	0.110	10.000	15.000	435	383	57.4
		63.00	10	68	0.125	12.600	18.900	345	431	102.7
		80.00	10	68	0.145	16.000	24.000	270	392	150.3
	Steel 850 - 1100 N/mm²	40.00	8	55	0.090	8.000	12.000	440	317	30.4
		50.00	8	55	0.110	10.000	15.000	350	308	46.2
		63.00	10	55	0.125	12.600	18.900	280	350	83.3
		80.00	10	55	0.145	16.000	24.000	220	319	122.5
	Steel 1100 - 1300 N/mm²	40.00	8	40	0.090	8.000	12.000	320	230	22.1
		50.00	8	40	0.110	10.000	15.000	255	224	33.7
		63.00	10	40	0.125	12.600	18.900	200	250	59.5
		80.00	10	40	0.145	16.000	24.000	160	232	89.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	40.00	8	29	0.090	8.000	12.000	230	166	15.9
		50.00	8	29	0.110	10.000	15.000	185	163	24.4
		63.00	10	29	0.125	12.600	18.900	145	181	43.2
		80.00	10	29	0.145	16.000	24.000	115	167	64.1

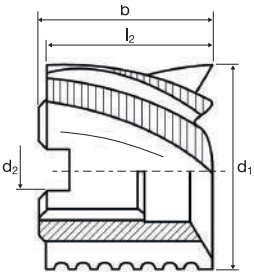
Shell end mills

Profiled

HSS

HSS-E Co8	λ 30° γ 10°





ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper

Example: **Order-N°.** Coating **P** Article-N°. **3491** ø-Code **110**

Ø Code	d_1 js16	d_2 h7	l_2	b k12	45°	z		POLYCHROM P3491
110	40.00	16.00	32.00	32.00	0.80	8		●
130	50.00	22.00	36.00	36.00	0.80	8		●
160	63.00	27.00	40.00	40.00	0.80	10		●
180	80.00	27.00	44.50	45.00	0.80	10		●

V


passion
for precision
fraisa

Round indexable insert milling tools

771 – 781

Indexable insert milling tools HFC

787 – 797

Indexable insert face milling tools

801 – 803

Corner/slot indexable insert milling tools

809 – 815

Accessories

816 – 817


passion
for precision
fraisa

Round insert end mill for indexable inserts 10mm

N° W03140



N° W03185



NX	λ 5° γ 15°	d, 20 – 32	Rm 850-1500 HRC 24-48			771
SX	λ 5° γ 20°	d, 20 – 32	Inox Stainless	Rm <850 HRC <24		
HX	λ 5° γ -4°	d, 20 – 32	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 5° γ 14°	d, 20 – 32	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	
AX	λ 5° γ 21°	d, 20 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Round insert end mill for indexable inserts 12mm

N° W03150



N° W03195



NX	λ 0° γ 14°	d, 25 – 32	Rm 850-1500 HRC 24-48			773
SX	λ 0° γ 19°	d, 25 – 32	Inox Stainless	Rm <850 HRC <24		
HX	λ 0° γ -4°	d, 25 – 32	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 0° γ 13°	d, 25 – 32	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	
AX	λ 0° γ 20°	d, 25 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Round insert end mill for indexable inserts 10mm

N° W03410



NX	λ 5° γ 15°	d, 40 – 52	Rm 850-1500 HRC 24-48			775
SX	λ 5° γ 20°	d, 40 – 52	Inox Stainless	Rm <850 HRC <24		
HX	λ 5° γ -4°	d, 40 – 52	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 5° γ 14°	d, 40 – 52	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	
AX	λ 5° γ 21°	d, 40 – 52	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Round insert end mill for indexable inserts 12mm

N° W03412



NX	λ 5° γ 15°	d, 40 – 100	Rm 850-1500 HRC 24-48			777
SX	λ 5° γ 20°	d, 40 – 100	Inox Stainless	Rm <850 HRC <24		
HX	λ 5° γ -4°	d, 40 – 100	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 5° γ 14°	d, 40 – 100	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	
AX	λ 5° γ 21°	d, 40 – 100	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Round insert end mill for indexable inserts 10mm

N° W03210



NX	λ 5° γ 15°	d, 25 – 35	Rm 850-1500 HRC 24-48			779
SX	λ 5° γ 20°	d, 25 – 35	Inox Stainless	Rm <850 HRC <24		
HX	λ 5° γ -4°	d, 25 – 35	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 5° γ 14°	d, 25 – 35	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	
AX	λ 5° γ 21°	d, 25 – 35	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Round insert end mill for indexable inserts 12mm

N° W03212



NX	λ 5° γ 15°	d, 35 – 42	Rm 850-1500 HRC 24-48			781
SX	λ 5° γ 20°	d, 35 – 42	Inox Stainless	Rm <850 HRC <24		
HX	λ 5° γ -4°	d, 35 – 42	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 5° γ 14°	d, 35 – 42	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	
AX	λ 5° γ 21°	d, 35 – 42	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Inserts

10mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W53110010	W53310010	W53210010	W53410010	W53510010

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	ISO-Norm	D_1	D	r	
W53110010	RPMX 10T3MOSN	10.0	4.0	5.000	●
W53310010	RPMX 10T3MOEN	10.0	4.0	5.000	●
W53210010	RDHW 10T3MOSN	10.0	4.0	5.000	●
W53410010	RPHX 10T3MOEN	10.0	4.0	5.000	●
W53510010	RDHX 10T3MOFN	10.0	4.0	5.000	●

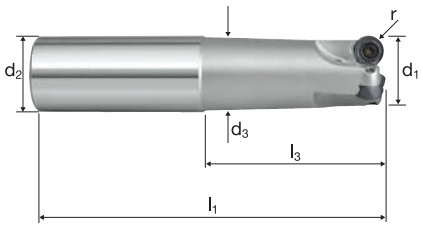
FRAISA ToolExpert®
The online cutting data tool for optimum tool use.

This way to the cutting data calculator ToolExpert

Round insert end mill

Inserts 10mm, integral air/cooling channel

HM



Round insert end mill	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	$d_{2\ h6}$	d_3	l_1	l_3	$ap_{max.}$	z	L-Typ	
W03140202	20.00	20.00	19.00	110	57.00	1.40	2	M	●
W03185202	20.00	20.00	19.00	185	57.00	1.40	2	XL	●
W03140253	25.00	25.00	24.00	124	65.00	1.40	3	M	●
W03185253	25.00	25.00	24.00	210	65.00	1.40	3	XL	●
W03140324	32.00	32.00	31.00	144	81.00	1.40	4	M	●
W03185324	32.00	32.00	31.00	250	81.00	1.40	4	XL	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W93110010	Torque screwdriver 2.0 Nm with blade Torx TX 10	●
W93111010	Interchangeable blade for torque screwdriver Torx TX 10	●
W93100010	Screwdriver Torx TX 10	●
W93500010	Clamping screws for inserts Torx TX 10 / M3 x 7.3	●

Inserts

12mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W53110012	**W53310012**	**W53210012**	**W53410012**	**W53510012**

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	**ISO-Norm**	**D_1**	**D**	**r**	
W53110012	RPMX 1204MOSN	12.0	4.8	6.000	●
W53310012	RPMX 1204MOEN	12.0	4.8	6.000	●
W53210012	RDHW 1204MOSN	12.0	4.8	6.000	●
W53410012	RPHX 1204MOEN	12.0	4.8	6.000	●
W53510012	RDHX 1204MOFN	12.0	4.8	6.000	●

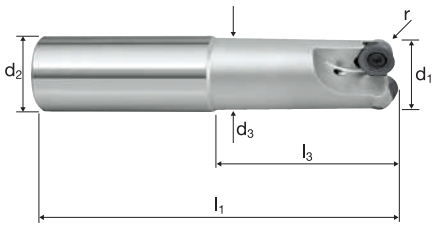
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Round insert end mill

Inserts 12mm, integral air/cooling channel

HM



Round insert end mill	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	d_2 h6	d_3	l_1	l_3	$ap_{max.}$	z	L-Typ	
W03150252	25.00	25.00	24.00	124	65.00	1.70	2	M	●
W03195252	25.00	25.00	24.00	210	65.00	1.70	2	XL	●
W03150323	32.00	32.00	31.00	144	81.00	1.70	3	M	●
W03195323	32.00	32.00	31.00	250	81.00	1.70	3	XL	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W93110012	Torque screwdriver 4.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W93500012	Clamping screws for inserts Torx TX 15 / M4 x 8.5	●

Inserts

10mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W53110010	W53310010	W53210010	W53410010	W53510010

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	ISO-Norm	D_1	D	r	
W53110010	RPMX 10T3MOSN	10.0	4.0	5.000	●
W53310010	RPMX 10T3MOEN	10.0	4.0	5.000	●
W53210010	RDHW 10T3MOSN	10.0	4.0	5.000	●
W53410010	RPHX 10T3MOEN	10.0	4.0	5.000	●
W53510010	RDHX 10T3MOFN	10.0	4.0	5.000	●

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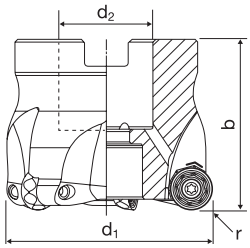
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Round insert end mill

Inserts 10mm, integral air/cooling channel

HM





Round insert end mill	Delivery range: Cutter body incl. clamping screws for inserts					
Order-N°.	**d_1**	**d_2**	**b**	**$ap_{max.}$**	**z**	
W03410404*	40.00	16.00	40.0	1.40	4	●
W03410424*	42.00	16.00	40.0	1.40	4	●
W03410505	50.00	22.00	40.0	1.40	5	●
W03410525	52.00	22.00	40.0	1.40	5	●
	*Delivery range with Powerscrew					

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W93110010	Torque screwdriver 2.0 Nm with blade Torx TX 10	●
W93111010	Interchangeable blade for torque screwdriver Torx TX 10	●
W93100010	Screwdriver Torx TX 10	●
W93500010	Clamping screws for inserts Torx TX 10 / M3 x 7.3	●
W99510010*	Powerscrew M8.0 x 30.0 (Torque 15.0 Nm)	●

Inserts

12mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W53110012	**W53310012**	**W53210012**	**W53410012**	**W53510012**

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	**ISO-Norm**	**D_1**	**D**	**r**	
W53110012	RPMX 1204MOSN	12.0	4.8	6.000	●
W53310012	RPMX 1204MOEN	12.0	4.8	6.000	●
W53210012	RDHW 1204MOSN	12.0	4.8	6.000	●
W53410012	RPHX 1204MOEN	12.0	4.8	6.000	●
W53510012	RDHX 1204MOFN	12.0	4.8	6.000	●

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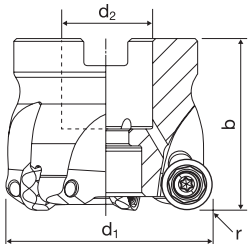
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Round insert end mill

Inserts 12mm, integral air/cooling channel

HM





Round insert end mill	Delivery range: Cutter body incl. clamping screws for inserts					
Order-N°.	**d_1**	**d_2**	**b**	**$ap_{max.}$**	**z**	
W03412404*	40.00	16.00	40.0	1.70	4	●
W03412424*	42.00	16.00	40.0	1.70	4	●
W03412505	50.00	22.00	40.0	1.70	5	●
W03412525	52.00	22.00	40.0	1.70	5	●
W03412636	63.00	22.00	40.0	1.70	6	●
W03412666	66.00	22.00	40.0	1.70	6	●
W03412808	80.00	27.00	50.0	1.70	8	●
W03412100	100.00	32.00	50.0	1.70	10	●
	*Delivery range with Powerscrew					

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W93110012	Torque screwdriver 4.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W93500012	Clamping screws for inserts Torx TX 15 / M4 x 8.5	●
W99510010*	Powerscrew M8.0 x 30.0 (Torque 15.0 Nm)	●

Inserts

10mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W53110010	W53310010	W53210010	W53410010	W53510010

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	ISO-Norm	D_1	D	r	
W53110010	RPMX 10T3MOSN	10.0	4.0	5.000	●
W53310010	RPMX 10T3MOEN	10.0	4.0	5.000	●
W53210010	RDHW 10T3MOSN	10.0	4.0	5.000	●
W53410010	RPHX 10T3MOEN	10.0	4.0	5.000	●
W53510010	RDHX 10T3MOFN	10.0	4.0	5.000	●

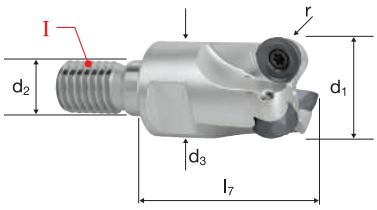
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Round insert end mill

Inserts 10mm, integral air/cooling channel

HM



Round insert end mill	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	d_2	d_3	l_7	$ap_{max.}$	z		I	
W03210253	25.00	12.50	21.00	35	1.40	3	17	M12	●
W03210354	35.00	17.00	29.00	35	1.40	4	24	M16	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W93110010	Torque screwdriver 2.0 Nm with blade Torx TX 10	●
W93111010	Interchangeable blade for torque screwdriver Torx TX 10	●
W93100010	Screwdriver Torx TX 10	●
W93500010	Clamping screws for inserts Torx TX 10 / M3 x 7.3	●

Inserts

12mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W53110012	W53310012	W53210012	W53410012	W53510012

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	ISO-Norm	D_1	D	r	
W53110012	RPMX 1204MOSN	12.0	4.8	6.000	●
W53310012	RPMX 1204MOEN	12.0	4.8	6.000	●
W53210012	RDHW 1204MOSN	12.0	4.8	6.000	●
W53410012	RPHX 1204MOEN	12.0	4.8	6.000	●
W53510012	RDHX 1204MOFN	12.0	4.8	6.000	●

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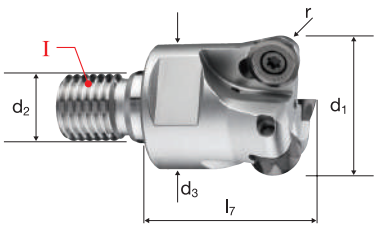
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Round insert end mill

Inserts 12mm, integral air/cooling channel

HM



Round insert end mill	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	d_2	d_3	l_7	$ap_{max.}$	z		I	
W03212353	35.00	17.00	29.00	35	1.70	3	24	M16	●
W03212424	42.00	17.00	31.00	40	1.70	4	24	M16	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W93110012	Torque screwdriver 4.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W93500012	Clamping screws for inserts Torx TX 15 / M4 x 8.5	●


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High feed end mills for inserts 10mm

N° W02140



N° W02180



NX	λ 2° γ 14°	d, 25	Rm 850-1500 HRC 24-48			787
SX	λ 2° γ 15°	d, 25	Inox Stainless	Rm <850 HRC <24		
HX	λ 2° γ 2°	d, 25	Rm 1300-1500 HRC 42-48	HRC 48- >60		
ZX	λ 2° γ 15°	d, 25	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	

High feed end mills for inserts 13mm

N° W02150



N° W02190



NX	λ 0° γ 12°	d, 35	Rm 850-1500 HRC 24-48			789
SX	λ 0° γ 13°	d, 35	Inox Stainless	Rm <850 HRC <24		
HX	λ 0° γ 0°	d, 35	Rm 1300-1500 HRC 42-48	HRC 48- >60		
ZX	λ 0° γ 13°	d, 35	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	

VI

High feed end mills for inserts 10mm

N° W02400



NX	λ 4° γ 16°	d, 40 – 63	Rm 850-1500 HRC 24-48			791
SX	λ 4° γ 17°	d, 40 – 63	Inox Stainless	Rm <850 HRC <24		
HX	λ 4° γ 4°	d, 40 – 63	Rm 1300-1500 HRC 42-48	HRC 48- >60		
ZX	λ 4° γ 17°	d, 40 – 63	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	

High feed end mills for inserts 13mm

N° W02410



NX	λ 4° γ 16°	d, 50 – 80	Rm 850-1500 HRC 24-48			793
SX	λ 4° γ 17°	d, 50 – 80	Inox Stainless	Rm <850 HRC <24		
HX	λ 4° γ 4°	d, 50 – 80	Rm 1300-1500 HRC 42-48	HRC 48- >60		
ZX	λ 4° γ 17°	d, 50 – 80	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	

High feed end mills for inserts 10mm

N° W02200



NX	λ 2° γ 14°	d, 25	Rm 850-1500 HRC 24-48			795
SX	λ 2° γ 15°	d, 25	Inox Stainless	Rm <850 HRC <24		
HX	λ 2° γ 2°	d, 25	Rm 1300-1500 HRC 42-48	HRC 48- >60		
ZX	λ 2° γ 15°	d, 25	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	

High feed end mills for inserts 13mm

N° W02210



NX	λ 0° γ 12°	d, 35	Rm 850-1500 HRC 24-48			797
SX	λ 0° γ 13°	d, 35	Inox Stainless	Rm <850 HRC <24		
HX	λ 0° γ 0°	d, 35	Rm 1300-1500 HRC 42-48	HRC 48- >60		
ZX	λ 0° γ 13°	d, 35	Ni Nickel Alloy	Inox Stainless	Rm <850 HRC <24	

Inserts

10mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials
			
W52110010	W52310010	W52210010	W52410010

Inserts	Delivery range: Packaging unit 10 pieces						
Order-N°.	ISO-Norm	H	B	D	r	$R_{theo.}$	
W52110010	XDLT 10T308SR	10.2	10.0	4.0	0.800	2.00	●
W52310010	XDLT 10T308ER	10.2	10.0	4.0	0.800	2.00	●
W52210010	XDLW 10T308SR	10.2	10.0	4.0	0.800	2.00	●
W52410010	XDLT 10T308ER	10.2	10.0	4.0	0.800	2.00	●

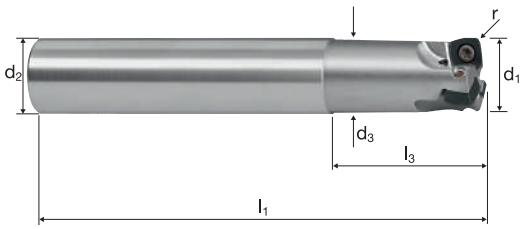
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High feed end mills

Inserts 10mm, integral air/cooling channel

HM



High feed end mills	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	d_2 h6	d_3	l_1	l_3	$ap_{max.}$	z	L-Typ	
W02140253*	25.00	25.00	24.00	125	65.00	1.00	3	M	●
W02180253	25.00	25.00	24.00	225	50.00	1.00	3	XL	●
	*with clamping flat								

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110013	Torque screwdriver 3.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W90500013	Clamping screws for inserts Torx TX 15 / M3.5 x 7.2	●

Inserts

13mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials
			
W52110013	**W52310013**	**W52210013**	**W52410013**

Inserts	Delivery range: Packaging unit 10 pieces						
Order-N°.	**ISO-Norm**	**H**	**B**	**D**	**r**	**$R_{theo.}$**	
W52110013	XOLT 130410SR	13.6	13.1	4.8	1.000	3.00	●
W52310013	XOLT 130410ER	13.6	13.1	4.8	1.000	3.00	●
W52210013	XOLW 130410SR	13.6	13.1	4.8	1.000	3.00	●
W52410013	XOLT 130410ER	13.6	13.1	4.8	1.000	3.00	●

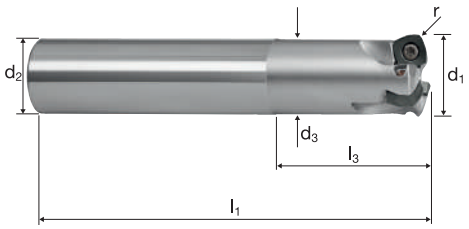
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High feed end mills

Inserts 13mm, integral air/cooling channel

HM



High feed end mills	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	$d_{2\ h6}$	d_3	l_1	l_3	$ap_{max.}$	z	L-Typ	
W02150353*	35.00	32.00	31.40	144	63.00	2.00	3	M	●
W02190353	35.00	32.00	31.40	250	63.00	2.00	3	XL	●

*with clamping flat only

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W91110013	Torque screwdriver 5.0 Nm with blade Torx TX 20	●
W91111013	Interchangeable blade for torque screwdriver TX 20	●
W91100013	Screwdriver Torx TX 20	●
W91500013	Clamping screws for inserts Torx TX 20 / M4.5 x 10.5	●

Inserts

10mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials
			
W52110010	**W52310010**	**W52210010**	**W52410010**

Inserts	Delivery range: Packaging unit 10 pieces						
Order-N°.	**ISO-Norm**	**H**	**B**	**D**	**r**	**$R_{theo.}$**	
W52110010	XDLT 10T308SR	10.2	10.0	4.0	0.800	2.00	●
W52310010	XDLT 10T308ER	10.2	10.0	4.0	0.800	2.00	●
W52210010	XDLW 10T308SR	10.2	10.0	4.0	0.800	2.00	●
W52410010	XDLT 10T308ER	10.2	10.0	4.0	0.800	2.00	●

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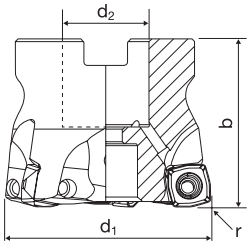
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High feed end mills

Inserts 10mm, integral air/cooling channel

HM





High feed end mills	Delivery range: Cutter body incl. clamping screws for inserts					
Order-N°.	d_1	d_2	b	$ap_{max.}$	z	
W02400404*	40.00	16.00	40.0	1.00	4	●
W02400505	50.00	22.00	40.0	1.00	5	●
W02400636	63.00	22.00	40.0	1.00	6	●
	*Delivery range with Powerscrew					

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110013	Torque screwdriver 3.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W92500010	Clamping screws for inserts Torx TX 15 / M3.5 x 8.6	●
W99510010*	Powerscrew M8.0 x 30.0 (Torque 15.0 Nm)	●

Inserts

13mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials
			
W52110013	**W52310013**	**W52210013**	**W52410013**

Inserts	Delivery range: Packaging unit 10 pieces						
Order-N°.	**ISO-Norm**	**H**	**B**	**D**	**r**	**$R_{theo.}$**	
W52110013	XOLT 130410SR	13.6	13.1	4.8	1.000	3.00	●
W52310013	XOLT 130410ER	13.6	13.1	4.8	1.000	3.00	●
W52210013	XOLW 130410SR	13.6	13.1	4.8	1.000	3.00	●
W52410013	XOLT 130410ER	13.6	13.1	4.8	1.000	3.00	●

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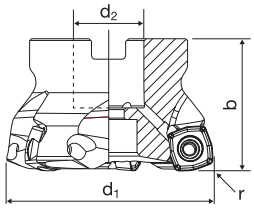
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High feed end mills

Inserts 13mm, integral air/cooling channel

HM





High feed end mills	Delivery range: Cutter body incl. clamping screws for inserts					
Order-N°.	d_1	d_2	b	$ap_{max.}$	z	
W02410504	50.00	22.00	40.0	2.00	4	●
W02410635	63.00	22.00	40.0	2.00	5	●
W02410807	80.00	27.00	50.0	2.00	7	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W91110013	Torque screwdriver 5.0 Nm with blade Torx TX 20	●
W91111013	Interchangeable blade for torque screwdriver TX 20	●
W91100013	Screwdriver Torx TX 20	●
W91500013	Clamping screws for inserts Torx TX 20 / M4.5 x 10.5	●

Inserts

10mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials
			
W52110010	W52310010	W52210010	W52410010

Inserts	Delivery range: Packaging unit 10 pieces						
Order-N°.	ISO-Norm	H	B	D	r	$R_{theo.}$	
W52110010	XDLT 10T308SR	10.2	10.0	4.0	0.800	2.00	●
W52310010	XDLT 10T308ER	10.2	10.0	4.0	0.800	2.00	●
W52210010	XDLW 10T308SR	10.2	10.0	4.0	0.800	2.00	●
W52410010	XDLT 10T308ER	10.2	10.0	4.0	0.800	2.00	●

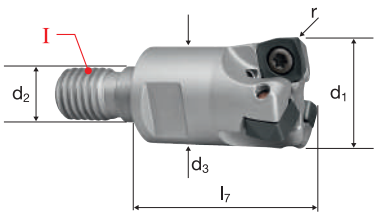
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High feed end mills

Inserts 10mm, integral air/cooling channel

HM



High feed end mills	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	d_2	d_3	l_7	$ap_{max.}$	z		I	
W02200253	25.00	12.50	21.00	35	1.00	3	17	M12	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110013	Torque screwdriver 3.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W90500013	Clamping screws for inserts Torx TX 15 / M3.5 x 7.2	●

Inserts

13mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials
			
W52110013	**W52310013**	**W52210013**	**W52410013**

Inserts	Delivery range: Packaging unit 10 pieces						
Order-N°.	**ISO-Norm**	**H**	**B**	**D**	**r**	**$R_{theo.}$**	
W52110013	XOLT 130410SR	13.6	13.1	4.8	1.000	3.00	●
W52310013	XOLT 130410ER	13.6	13.1	4.8	1.000	3.00	●
W52210013	XOLW 130410SR	13.6	13.1	4.8	1.000	3.00	●
W52410013	XOLT 130410ER	13.6	13.1	4.8	1.000	3.00	●

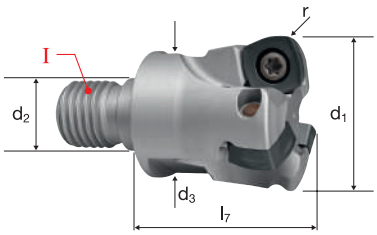
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High feed end mills

Inserts 13mm, integral air/cooling channel

HM



High feed end mills	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	d_1	d_2	d_3	l_7	$ap_{max.}$	z		I	
W02210353	35.00	17.00	29.00	35	2.00	3	24	M16	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W91110013	Torque screwdriver 5.0 Nm with blade Torx TX 20	●
W91111013	Interchangeable blade for torque screwdriver TX 20	●
W91100013	Screwdriver Torx TX 20	●
W91500013	Clamping screws for inserts Torx TX 20 / M4.5 x 10.5	●


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Face milling cutter for inserts 9mm

N° W01400



NX	λ 12° γ -6°	d, 40 – 125	Rm 850-1300 HRC 24-42			801
SX	λ 12° γ -6°	d, 40 – 125	Inox Stainless	Rm <850 HRC <24		
ZX	λ 12° γ -6°	d, 40 – 125	Ni-/Mn- Alloys	Inox Stainless	Rm <850 HRC <24	
AX	λ 12° γ 15°	d, 40 – 125	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Face milling cutter for inserts 13mm

N° W01410



NX	λ 13° γ -6°	d, 40 – 125	Rm 850-1300 HRC 24-42			803
SX	λ 13° γ -6°	d, 40 – 125	Inox Stainless	Rm <850 HRC <24		
ZX	λ 13° γ -6°	d, 40 – 125	Ni-/Mn- Alloys	Inox Stainless	Rm <850 HRC <24	
AX	λ 13° γ 13°	d, 40 – 125	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Inserts

9mm

NX Steel	SX Stainless Steel	ZX Difficult-to-cut materials	AX Aluminium
			
W51110009	W51310009	W51410009	W51510009

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	ISO-Norm	H	B	D	
W51110009	SDLT09T3AESN	9.5	9.5	4.0	●
W51310009	SDLT09T3AESN	9.5	9.5	4.0	●
W51410009	SDLT09T3AESN	9.5	9.5	4.0	●
W51510009	SDLT09T3AEFN	9.5	9.5	4.0	●

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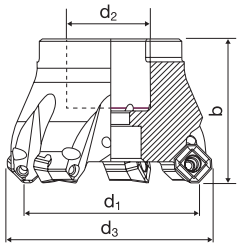
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Face milling cutter 45°

Inserts 9mm, integral air/cooling channel

HM



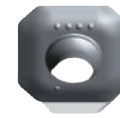


Face milling cutter 45°	Delivery range: Cutter body incl. clamping screws for inserts						
Order-N°.	d_1	d_2	d_3	b	$ap_{max.}$	z	
W01400406	40.00	16.00	48.40	40.0	4.00	6	●
W01400507	50.00	22.00	58.40	40.0	4.00	7	●
W01400638	63.00	22.00	71.40	40.0	4.00	8	●
W01400809	80.00	27.00	88.40	50.0	4.00	9	●
W01400100	100.00	32.00	108.40	50.0	4.00	11	●
W01400125	125.00	40.00	133.40	63.0	4.00	12	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110008	Torque screwdriver 1.2 Nm with blade Torx TX 08	●
W90111008	Interchangeable blade for torque screwdriver TX 08	●
W90100008	Screwdriver Torx TX 08	●
W91500009	Clamping screws for inserts Torx TX 08 / M3.0 x 7.3	●

Inserts

13mm

NX Steel	SX Stainless Steel	ZX Difficult-to-cut materials	AX Aluminium
			
W51110013	W51310013	W51410013	W51510013

Inserts	Delivery range: Packaging unit 10 pieces				
Order-N°.	ISO-Norm	H	B	D	
W51110013	SDLT1304AESN	13.0	13.0	4.8	●
W51310013	SDLT1304AESN	13.0	13.0	4.8	●
W51410013	SDLT1304AESN	13.0	13.0	4.8	●
W51510013	SDLT1304AEFN	12.7	12.7	4.8	●

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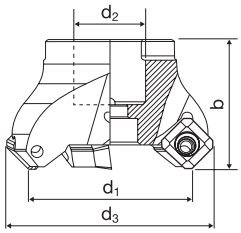
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Face milling cutter 45°

Inserts 13mm, integral air/cooling channel

HM





Face milling cutter 45°	Delivery range: Cutter body incl. clamping screws for inserts						
Order-N°.	**d_1**	**d_2**	**d_3**	**b**	**$ap_{max.}$**	**z**	
W01410403	40.00	16.00	54.00	40.0	6.00	3	●
W01410504	50.00	22.00	63.90	40.0	6.00	4	●
W01410635	63.00	22.00	76.90	40.0	6.00	5	●
W01410806	80.00	27.00	93.90	50.0	6.00	6	●
W01410100	100.00	32.00	113.90	50.0	6.00	7	●
W01410125	125.00	40.00	138.90	63.0	6.00	8	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W91110013	Torque screwdriver 5.0 Nm with blade Torx TX 20	●
W91111013	Interchangeable blade for torque screwdriver TX 20	●
W91100013	Screwdriver Torx TX 20	●
W91500013	Clamping screws for inserts Torx TX 20 / M4.5 x 10.5	●


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Corner/slot end mills 90° for inserts 8mm

N° W00100



N° W00140



N° W00180



NX	λ 8° γ 0°	d, 16 – 32	Rm 850-1300 HRC 24-42			809
SX	λ 8° γ 0°	d, 16 – 32	Inox Stainless	Rm <850 HRC <24		
HX	λ 8° γ -8°	d, 16 – 32	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 8° γ 0°	d, 16 – 32	Ni-/Mn- Alloys	Inox Stainless	Rm <850 HRC <24	
AX	λ 8° γ 20°	d, 16 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Corner/slot end mills 90° for inserts 13mm

N° W00110



N° W00150



N° W00190



NX	λ 8° γ 6°	d, 25 – 32	Rm 850-1300 HRC 24-42			811
SX	λ 8° γ 6°	d, 25 – 32	Inox Stainless	Rm <850 HRC <24		
HX	λ 8° γ -10°	d, 25 – 32	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 8° γ 6°	d, 25 – 32	Ni-/Mn- Alloys	Inox Stainless	Rm <850 HRC <24	
AX	λ 8° γ 20°	d, 25 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	


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Corner end mills 90° for inserts 8mm

N° W00400



NX	λ 8° γ 0°	d, 40 – 80	Rm 850-1300 HRC 24-42			813
SX	λ 8° γ 0°	d, 40 – 80	Inox Stainless	Rm <850 HRC <24		
HX	λ 8° γ -8°	d, 40 – 80	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 8° γ 0°	d, 40 – 80	Ni-/Mn- Alloys	Inox Stainless	Rm <850 HRC <24	
AX	λ 8° γ 20°	d, 40 – 80	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Corner end mills 90° for inserts 13mm

N° W00410



NX	λ 8° γ 6°	d, 40 – 80	Rm 850-1300 HRC 24-42			815
SX	λ 8° γ 6°	d, 40 – 80	Inox Stainless	Rm <850 HRC <24		
HX	λ 8° γ -10°	d, 40 – 80	Rm 1300-1500 HRC 42-48	HRC 48-60		
ZX	λ 8° γ 6°	d, 40 – 80	Ni-/Mn- Alloys	Inox Stainless	Rm <850 HRC <24	
AX	λ 8° γ 20°	d, 40 – 80	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	

Inserts

8mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W50111008	W50311008	W50210008	W50410008	W50510008

Inserts	Delivery range: Packaging unit 10 pieces					
Order-N°.	ISO-Norm	H	B	D	r	
W50111008	APKT 0803PD SR	8.4	6.4	3.4	0.600	●
W50311008	APKT 0803PD SR	8.4	6.4	3.4	0.600	●
W50210008	APKT 0803PD SR	8.5	6.4	3.5	0.600	●
W50410008	APKT 0803PD SR	8.4	6.4	3.4	0.600	●
W50510008	APHT 0803PDFR	8.3	6.4	3.4	0.600	●

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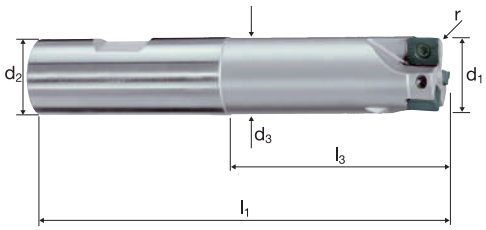
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Corner/Slot end mills 90°

Inserts 8mm, integral air/cooling channel

HM



Corner/Slot end mills 90°	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	**d_1**	**d_2 h6**	**d_3**	**l_1**	**l_3**	**$ap_{max.}$**	**z**	L-Typ	
W00100162	16.00	16.00	15.40	75	25.00	7.50	2	K	●
W00100203	20.00	20.00	19.40	77	25.00	7.50	3	K	●
W00100254	25.00	25.00	24.00	90	32.00	7.50	4	K	●
W00100325	32.00	32.00	31.00	102	40.00	7.50	5	K	●
W00140162	16.00	16.00	15.00	102	51.00	7.50	2	M	●
W00140203	20.00	20.00	19.40	110	57.00	7.50	3	M	●
W00140254	25.00	25.00	24.00	124	65.00	7.50	4	M	●
W00140325	32.00	32.00	31.00	144	81.00	7.50	5	M	●
W00180162	16.00	16.00	15.00	129	78.00	7.50	2	L	●
W00180203	20.00	20.00	19.40	140	87.00	7.50	3	L	●
W00180254	25.00	25.00	24.00	158	99.00	7.50	4	L	●
W00180325	32.00	32.00	31.00	186	123.00	7.50	5	L	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110008	Torque screwdriver 1.2 Nm with blade Torx TX 08	●
W90111008	Interchangeable blade for torque screwdriver TX 08	●
W90100008	Screwdriver Torx TX 08	●
W90500008	Clamping screws for inserts Torx TX 08 / M2.5 x 5.0	●

Inserts

13mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W50111013	W50311013	W50210013	W50410013	W50510013

Inserts	Delivery range: Packaging unit 10 pieces					
Order-N°.	ISO-Norm	H	B	D	r	
W50111013	APKT 1304PD SR	14.8	8.1	4.7	0.800	●
W50311013	APKT 1304PD SR	14.8	8.1	4.7	0.800	●
W50210013	APKT 1304PD SR	14.7	8.1	4.7	0.800	●
W50410013	APKT 1304PD SR	14.8	8.1	4.7	0.800	●
W50510013	APHT 1304PDFR	14.7	8.0	4.5	0.800	●

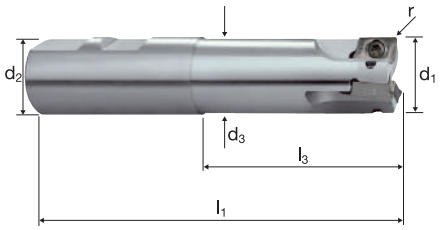
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Corner/Slot end mills 90°

Inserts 13mm, integral air/cooling channel

HM



Corner/Slot end mills 90°	Delivery range: Cutter body incl. clamping screws for inserts								
Order-N°.	**d_1**	**d_2 h6**	**d_3**	**l_1**	**l_3**	**$ap_{max.}$**	**z**	L-Typ	
W00110253	25.00	25.00	24.00	90	32.00	12.50	3	K	●
W00150253	25.00	25.00	24.00	124	65.00	12.50	3	M	●
W00190253	25.00	25.00	24.00	158	99.00	12.50	3	L	●
W00110324	32.00	32.00	31.00	102	40.00	12.50	4	K	●
W00150324	32.00	32.00	31.00	144	81.00	12.50	4	M	●
W00190324	32.00	32.00	31.00	186	123.00	12.50	4	L	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110013	Torque screwdriver 3.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W90500013	Clamping screws for inserts Torx TX 15 / M3.5 x 7.2	●

Inserts

8mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W50111008	W50311008	W50210008	W50410008	W50510008

Inserts	Delivery range: Packaging unit 10 pieces					
Order-N°.	ISO-Norm	H	B	D	r	
W50111008	APKT 0803PD SR	8.4	6.4	3.4	0.600	●
W50311008	APKT 0803PD SR	8.4	6.4	3.4	0.600	●
W50210008	APKT 0803PD SR	8.5	6.4	3.5	0.600	●
W50410008	APKT 0803PD SR	8.4	6.4	3.4	0.600	●
W50510008	APHT 0803PDFR	8.3	6.4	3.4	0.600	●

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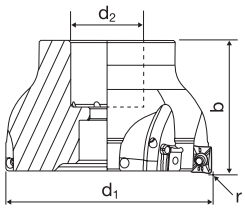
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Corner end mills 90°

Inserts 8mm, integral air/cooling channel

HM





Corner end mills 90°	Delivery range: Cutter body incl. clamping screws for inserts					
Order-N°.	**d_1**	**d_2**	**b**	**$ap_{max.}$**	**z**	
W00400405	40.00	16.00	40.0	7.50	5	●
W00400506	50.00	22.00	40.0	7.50	6	●
W00400637	63.00	22.00	40.0	7.50	7	●
W00400801	80.00	27.00	50.0	7.50	10	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110008	Torque screwdriver 1.2 Nm with blade Torx TX 08	●
W90111008	Interchangeable blade for torque screwdriver TX 08	●
W90100008	Screwdriver Torx TX 08	●
W90500008	Clamping screws for inserts Torx TX 08 / M2.5 x 5.0	●

Inserts

13mm

NX Steel	SX Stainless Steel	HX Hardened Steel	ZX Difficult-to-cut materials	AX Aluminium
				
W50111013	W50311013	W50210013	W50410013	W50510013

Inserts	Delivery range: Packaging unit 10 pieces					
Order-N°.	ISO-Norm	H	B	D	r	
W50111013	APKT 1304PD SR	14.8	8.1	4.7	0.800	●
W50311013	APKT 1304PD SR	14.8	8.1	4.7	0.800	●
W50210013	APKT 1304PD SR	14.7	8.1	4.7	0.800	●
W50410013	APKT 1304PD SR	14.8	8.1	4.7	0.800	●
W50510013	APHT 1304PDFR	14.7	8.0	4.5	0.800	●

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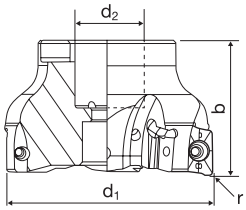
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Corner end mills 90°

Inserts 13mm, integral air/cooling channel

HM





Corner end mills 90°	Delivery range: Cutter body incl. clamping screws for inserts					
Order-N°.	d_1	d_2	b	$ap_{max.}$	z	
W00410404	40.00	16.00	40.0	12.50	4	●
W00410505	50.00	22.00	40.0	12.50	5	●
W00410636	63.00	22.00	40.0	12.50	6	●
W00410808	80.00	27.00	50.0	12.50	8	●

Accessories	Delivery range clamping screws for inserts: Packaging unit 10 pieces	
Order-N°.		
W90110013	Torque screwdriver 3.2 Nm with blade Torx TX 15	●
W90111013	Interchangeable blade for torque screwdriver TX 15	●
W90100013	Screwdriver Torx TX 15	●
W90500013	Clamping screws for inserts Torx TX 15 / M3.5 x 7.2	●

Torque screwdriver Torx with blade

Torque is pre-set according to table



Order-N°.	Torx-Dimension	Torque	
W90110008	TX 08	1.2 Nm	●
W93110010	TX 10	2.0 Nm	●
W90110013	TX 15	3.2 Nm	●
W93110012	TX 15	4.2 Nm	●
W91110013	TX 20	5.0 Nm	●

Interchangeable blade for torque screwdriver



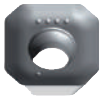
Order-N°.	Torx-Dimension		
W90111008	TX 08		●
W93111010	TX 10		●
W90111013	TX 15		●
W91111013	TX 20		●

Screwdriver Torx



Order-N°.	Torx-Dimension		
W90100008	TX 08		●
W93100010	TX 10		●
W90100013	TX 15		●
W91100013	TX 20		●

Marking and assembly of indexable inserts

Type	Corner end mills	Face milling cutter	High feed end mills	Round insert milling*
NX Steel ●	 Order-N° **W50111008** **W50111013**	 Order-N° **W51110009** **W51110013**	 Order-N° **W52110010** **W52110013**	 Order-N° **W53110010** **W53110012**
SX Stainless Steel ●●	 Order-N° **W50311008** **W50311013**	 Order-N° **W51310009** **W51310013**	 Order-N° **W52310010** **W52310013**	 Order-N° **W53310010** **W53310012**
HX Hardened Steel ●●●	 Order-N° **W50210008** **W50210013**		 Order-N° **W52210010** **W52210013**	 Order-N° **W53210010** **W53210012**
ZX Difficult to-cut materials ●●●●	 Order-N° **W50410008** **W50410013**	 Order-N° **W51410009** **W51410013**	 Order-N° **W52410010** **W52410013**	 Order-N° **W53410010** **W53410012**
AX Aluminium ●●●● ●	 Order-N° **W50510008** **W50510013**	 Order-N° **W51510009** **W51510013**		 Order-N° **W53510010** **W53510012**

- Clean the insert seats prior to assembly
- Ensure that all insert markings have the same orientation
- Use the turning moment screw driver to tighten the screws
- Ensure an exact positioning when tightening the indexable inserts

*The indexable round inserts may be used on eight positioning surfaces. It is not necessary to remove the screw completely to turn the insert to the next surface. Ensure a precise positioning when tightening the indexable round insert to the surface in order to prevent damage to the insert seat.

FRAISA offers you highly innovative products; products that are always state-of-the-art and right at the cutting edge of technological development.

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Our **"ToolSchool Recommendation"** clearly demonstrates how you can and should switch from the products you have been using until now to the new cutting-edge products from FRAISA. The ToolSchool logo has been used in this catalog to highlight selected products that offer a particularly good opportunity to upgrade from an existing tool to the latest technology.

By switching from "old" to "new", you benefit from increased productivity, cost reductions and genuine competitive advantages in the marketplace.

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- **Greater efficiency**
- **Lower costs**
- **Improved competitiveness**

Existing technology		Latest technology		
Article	**Page**	**Article**		**Page**
P45225 / P45325	**79**	P45270 / P45370 		**77**
P45217 / P45317	**81**	P46200 / P46300 		**75**
		K8330 / K8430 	**SteelCut**	**63**
P45226 / P45326	**131**	P45280 / P45380 		**129**
P45223 / P45323	**143**	P46220 / P46320 		**153**
HX P5249 / P5349 **POLYCHROM only, DURO-S remains**	**157**	P8308 / P8408 	**E-Cut**	**161**
SX P5213 / P5313 P5229 / P5329	**159** **165**	P8309 / P8409 	**E-Cut**	**163**
P45219 / P45319	**201**	P46207 / P46307 		**199**
		P8307 / P8407 		**193**
AX C5297 / C5397	**641**	8563 / 8663 		**643**
AX C15297 / C15397	**649**	8573 / 8673 		**655**
AX C15298 / C15398	**653**	8573 / 8673 		**655**

Note: Those articles that feature the latest technology are, in the majority of applications, superior to tools made using existing technology.


passion
for precision
fraisa

FRAISA ReTool® – Industrial tool reconditioning

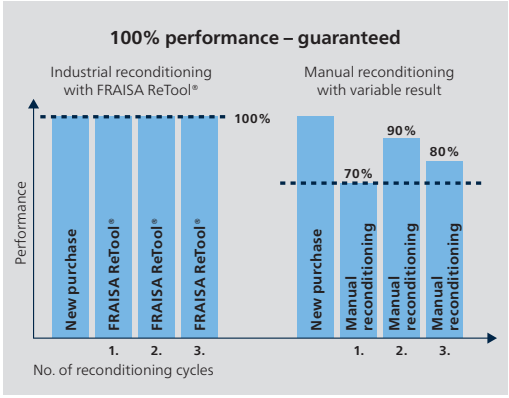


FRAISA ReTool® offers an all-round service that restores your used tools to their original performance level and optimises your processes. FRAISA and third-party tools are reconditioned using the very latest technology – and in a resource-friendly way. The outcome: mint-condition tools as productive as they were the first day they were used. And to make things even better, your level of investment is lower than if you were to buy new tools, you increase your productivity and you save costs.

FRAISA ReTool® – a performance guarantee founded on integrated development of the tools and the reconditioning process

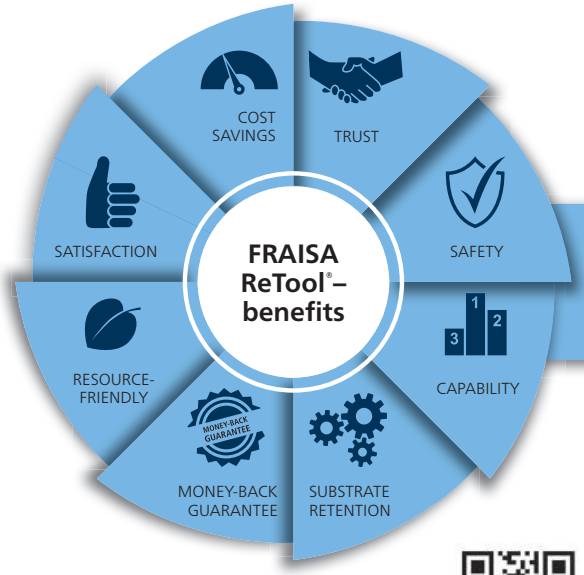
We guarantee that following their reconditioning with **FRAISA ReTool®**, your used tools will be restored to the original performance level they had when new. Our ability to provide this performance guarantee is a priority of our team of experts right from very early on in product development.

That's why the development of the reconditioning process is an integral part of the development phase, alongside the actual product tests and calculating the cutting data. Strict rules apply: the **FRAISA ReTool®** process is approved only if we are able to fulfil our performance guarantee 100%.



FRAISA ReToolBlue – recycle rather than throw away

With our **FRAISA ReToolBlue** service, we recycle the valuable carbide from tools that can no longer be reconditioned.



FRAISA ReTool® makes economic sense for you, too: After reconditioning them, we return your tools to you in mint condition. We restore them to their original performance level at a price that's more cost-effective for you than purchasing new ones or reconditioning them by hand.

Over 30 years' experience in tool reconditioning:

Our competence centre in Germany is Europe's largest service centre for carbide milling tools.

Video on our service product: FRAISA ReTool®

fraisa.com

Legend to the product page

Tool classes



Superior performance in challenging applications



Excellent performance and broad application range



Powerful and competitive



Allrounder for small jobs

Performance

Roughing



Roughing HPC



Roughing HDC



Finishing



This index describes the performance of the tool in comparison to other products in the respective chapter. The more boxes that are filled, the better it is suited for each operation.

Legend to the product page

Tool technologies



Milling tool with a variable helix angle
- Minimization of oscillation and vibrations
- Increase in material removal rates and tool life



Ball nose end mill with a variable helix angle
- Minimization of oscillation and vibrations
- Increase in material removal rates and tool life



Milling tool with a variable helix angle
- Axial and radial vibration damping, as well as smooth and gentle cutting
- Better component surfaces and lower noise levels
- Less stress on the spindle and energy consumption, despite high metal removal volume



High-performance penetration edge
- Easy-cutting high-performance penetration edge for high penetration angles
- Higher performance, tool life and process reliability for penetration
- High functionality with cutting data from ToolExpert HelixRamp



Milling tool with scaled slot
- Extension of swarf space
- Optimized chip removal
- Highest possible axial and radial infeeds



Milling tool with chip breaker
- Shorter chip lengths at high axial infeed rates, improving chip removal from both the component and the machine
- Improved optimization and process reliability
- High multi-functionality of the smooth-cutting tool is maintained



Milling tool with a special groove geometry
- Optimized swarf/groove geometry for improved swarf removal
- Optimized relationship between core diameter and swarf space for a high level of tool stability



Milling tool with a partially polished blade
- Reinforcement of the exposed cutting corner
- Absorption of high cutting forces



Milling tool with a special protective chamfer
- Reinforcement of the main cutting edge against chipping
- High tooth feed rates are possible in the case of smooth-edged tools
- High axial and radial infeeds are possible in the case of profiled tools



Milling tool with special edge conditioning
- Conditioning of the main cutting edge for increased stability
- Increase the mechanical and thermal load on the cutting edge
- General increase in the tool life

Legend to the product page

Tool technologies



Front chamfer
- Tool is supported in radial and axial directions
- Reduced vibrations
- Better surface quality from both side and end faces



Supporting chamfer
- Support for the tool in the radial and axial directions
- Reduced vibrations and higher performance
- Improved surface quality as a result of increased running smoothness



Milling tool with special free space design
- Significant reinforcement of the cutting edge
- Higher performance, less vibrations and improved component quality
- Longer tool life and more process safety - therefore higher degree of automation







High-gloss technology
- High gloss-ground tool faces and/or flanks and flutes
- Reduced adhesion tendency
- Improved surface finishes on the component
- Increased tool life and performance



Parabolic support face
- Support for the tool in the radial and axial directions
- Reduced vibration and higher performance



Finely balanced tools
- Finely balanced tools at least G2.5 at n=20,000 rpm or permissible residual imbalance <1gmm
- Reduction or elimination of the balancing process in the case of finely balanced clamping devices
- Improved surface quality as a result of increased running smoothness and fewer vibrations
- Increase in the service life of the machine spindle



Smooth transitions
- The shaft-neck-cutting edge transitions are fitted with smooth gradients and radii
- Improved tool rigidity and therefore less radial deflection
- Minimal step formation with several infeed depths
- Higher mechanical load and therefore improved performance



Optimized neck transitions <6 mm
- The transitions from the shank to the neck are short and their optimized shape
- Improved tool rigidity for diameters <6 mm
- Less deflection, greater precision
- Higher mechanical resilience can be translated into increased performance



Milling tool with increased core diameter
- Improved tool rigidity and less tool deflection
- Higher performance in the area of the infeeds ap, ae and of the feed rate fz
- Better component accuracy through less tool deflection

Legend to the product page

Tool technologies



Milling tool with shank of h4 tolerance
- High concentric and eccentric precision
- Optimal for modern precision chucks



Milling tool with shank of h5 tolerance
- High concentric and eccentric precision
- Optimal for modern precision chucks



Ball nose end mill with special edge conditioning for rough machining
- Conditioning of the main cutting edge for increased stability
- Significant increase in material removal rates compared to conventional ball nose mills
- General increase in the tool life



Ball nose end mill with special edge conditioning for finish machining
- Conditioning and smoothening of the main cutter profile
- Long term contour precision and surface quality
- General increase in the tool life



Corner radius end mill with special edge conditioning for roughing
- Conditioning of the main cutting edge for increased stability
- Significant increase of the material removal rate compared to standard corner radius end mills
- General increase in the tool life



Corner radius end mill with special edge conditioning for finishing
- Conditioning and smoothening of the main cutting edge
- Long-lasting contour accuracy and surface quality
- General increase in the tool life



Ball nose end mill with high-precision diameter
- High-precision tolerance zone across 180° of the ball for high dimensional accuracy
- Cutting edge diameter is twice the effective radius of the ball



Ball nose end mill with a highly precise radius tolerance
- Specially designed bearing tolerances simplify the programming and the secure finish of the end contour
- Highly precise tolerance field for high dimensional accuracy



Corner radius end mill with a highly precise diameter tolerance
- Specially designed bearing tolerances simplify the programming and the secure finish of the end contour
- Highly precise tolerance field for high dimensional accuracy



Corner radius end mill with a highly precise radius tolerance
- Specially designed tolerances simplify the programming and the secure finish of the end contour
- Highly precise tolerance field for high dimensional accuracy

Legend to the product page

Tool technologies



Cylindrical end mill with a highly precise diameter tolerance
- Specially designed bearing tolerances simplify the programming and the secure finish of the end contour
- Highly precise tolerance field for high dimensional accuracy

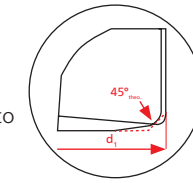


Dimensional accuracy
- Dimensional accuracy of up to +/–0.005 mm guarantees high component precision



Face finishing cutting edge
- Tool with special cutting edge for face finishing
- Top quality plane surfaces can be machined

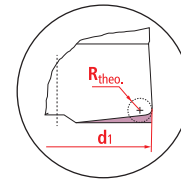
Tools with the face finishing cutting edge have a theoretical 45° chamfer ($45°_{theo.}$). This value is indicated for each diameter in the data table of the catalog page and is indicated as the tool chamfer for CNC/CAM programming. During machining, however, a minimal amount of rest material is produced due to the difference of $45°_{theo.}$ to the effective tool contour. (Observe the application related tips.)





High feed cutting (HFC) tool
- Tool with a special cutting geometry for high feed cutting
- High feeds are possible due to a defined swarf cross section distribution
- Large swarf space for quick and trouble-free removal of the swarf
- High removal volume with good contour convergency as well

The HFC tool has a theoretical programming radius ($R_{theo.}$). This value is stated for each diameter in the data table on the catalog page and, for the CNC/CAM programming, it is stated as a tool radius. However as a result of the $R_{theo.}$ difference to the effective tool contour, residual material arises in the machining.





Indexable insert
- Periphally ground, partially face polished on all sides
- Improved performance



New Safe-Center cutting edge geometry
- Counteracts chipping during the penetration process
- Good cutting-edge stability means good wear resistance and performance capability

Legend to the product page

Cutting tool substrate material

HM XT	Fine grain carbide. Hardness 1900 HV. Co content 9%. Characterised by a particularly high level of toughness.
HM XA	Fine grain carbide. Hardness 1950 HV. Co content 8%. Characterised by a particularly high level of abrasion resistance.
HM MG10	Fine grain carbide. Hardness 1600 HV. Co content 10%.
HM MG6	Fine grain carbide. Hardness 1800 HV. Co content 6%.
HM Plus	Ultrafine-grain carbide. Hardness 1800 HV. Co content 12%.
HM	Universal fine-grain carbide.
CBN	Cubic crystallized boron nitride (CBN). Hardness 4700 HV. Characterised by a particularly high level of abrasion resistance.
HSS PM/F	High-performance substrate material, powder metallurgically produced HSS alloys.
HSS-E Co8	High-performance high speed steel.
HSS-E Co5	High-performance high speed steel.

Legend to the product page

Form of the corner of the cutting edges



The corner between the front side blade and the circumference blade has a protective chamfer of 45°. The size of the protective chamfer is stated for each diameter in the data table on the catalog page.



The tool is furnished with a corner radius. For every diameter the size of the radius is listed in the corresponding data table of the catalog.



The corner between front cutting edge and circumferential cutting edge is executed sharp-edged.



High Feed Cutting (HFC) tool. Tool with a special cutting geometry for high feed milling.



High Feed Cutting (HFC) tool with corner radius. Tool with special cutting edge geometry for high feed machining.

Application suitability

A blue background means that the tool is particularly suitable for this material.

A light blue background means that the tool has good to adequate suitability for this material.

Chapter: Steel, stainless steel and titanium / 3D machining of steel / special shapes

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC >60	Inox Stainless	Ti Titanium	

Chapter: Aluminium and copper

Rm <850 HRC <24			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	

Additional material which can be machined is stated in the additional field

Legend to the product page

Shape of the shank / shank versions



Full carbide tools with a cylindrical shank: shank version in accordance with DIN 6535 HA



Full carbide tools with a cylindrical shank and a side clamping surface. Shank version in accordance with DIN 6535 HB



HSS tools with a cylindrical shank and a side clamping surface: Shank version in accordance with DIN 1835 B

Indexable insert milling tools



Shank version in accordance with DIN 1835 B



Bore receptacle with crosswise slot adherent to DIN 138

Helix angle and rake angle



Helix and rake angles are particularly important characteristics of milling tools. Due to this fact, helix angle λ and rake angle γ are specified for each tool. The exact values can vary with the tool diameter.

Legend to the product page

Abbreviations

d_1	Diameter of the cutting edge [mm]
d_2	Shank diameter or bore diameter [mm]
d_3	Neck diameter or external diameter (face milling cutter) [mm]
d_4	Diameter of the neck before the transition from the neck to the shank [mm]
d_5	End face diameter [mm]
l_1	Total length of the tool [mm]
l_2	Length of cutting edge [mm]
l_3	Distance from the front of the tool to the end of the neck [mm]
l_{3max}	Maximum insertion depth before the shank collides with the component. This value is shown for micro tools; l_3 can be used for the other milling tools in Chapters I - IV.
l_4	Distance from the edge of the tool to the beginning of the shank [mm]
l_5	Distance from the front of the shank to the end of the neck [mm]
l_6	Shank length [mm]
l_7	Head length [mm]
l_8	Flank length [mm]
l_9	Distance from the end of the cutting edge of the tool to the beginning of the shank [mm]
Θ	Tightening angle «Theta» between d_3 and d_4 [° - DEG]
45°	Size of the protective chamfer between the face end blade and the circumference blade [mm]
r	Corner radius [mm]
β	Minimum setting angle «Beta» [° - DEG]
z	Number of cutting edges
$45°_{theo.}$	Size of theoretical protective chamfer between end cutting edge and peripheral cutting edge [mm]
$R_{theo.}$	Theoretical programming radius ($R_{theo.}$) for HFC tools [mm] See information at Tool Technology HFC

Legend to the product page

$\alpha/2$	Conical angle [° - DEG]
r_1	Cutting edge radius [mm]
r_2	Curved surface radius [mm]
r_3	Run-out radius [mm]
ap_{max}	Maximum axial infeed [mm]
ap_{lim}	Axial infeed [mm] limited by the application or tool geometry [mm]
b	Tool height of shell end mills [mm]
φ_{max}	Maximum infeed angle
H	Height of the insert
B	Width of the insert
D	Thickness of the insert
D_1	Diameter of the indexable insert
L_A	Overall length from the spindle nose
L-Typ	Version: K = short; N = normal; M = medium; L = long; XL = extra long
I	Interface: Interface parameters

2.5D machining strategies

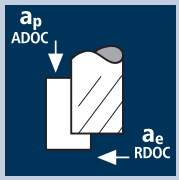
HPC High-Performance-Cutting
Characteristics of HPC:
- High machining volume with high cutting forces
- Large tool engagement angle of 66°–80°(ae) and small cutting depths (ap < 1.5 xd)
- Short tool path (tool always engaged)

HDC High-Dynamic-Cutting
Characteristics of HDC:
- Maximum machining volume with lower cutting forces
- Constant cutting forces / cutting conditions / tool engagement angle
- Small tool engagement angle of 25°–60°(ae) and large cutting depths (ap > 1.5 xd)

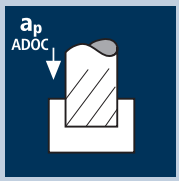
Applications for 2.5D machining

Cylindrical and Corner radius

Roughing HPC

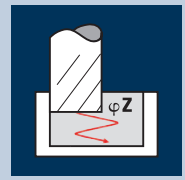


Roughing HPC, laterally (partial cut)

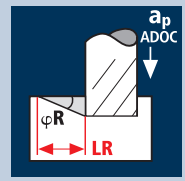


Roughing HPC, slots (full cut)

Penetration

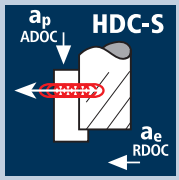


Penetration, helical interpolation

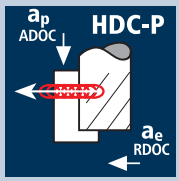


Penetration, ramping

Roughing HDC

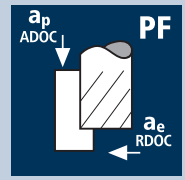


Roughing HDC-S (partial cut)

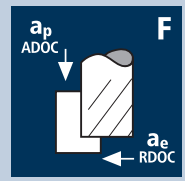


Roughing HDC-P (partial cut)

Finishing



Pre-finishing (partial cut) (Pre-Finishing PF)



Finishing (partial cut) (Finishing F)

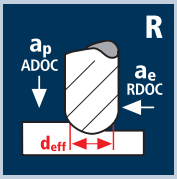
3D machining strategies

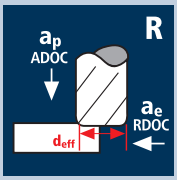
HSC High-Speed-Cutting
Characteristics of HSC:
- Machining with toric or spherical tools
- High surface quality & dimensional accuracy attainable
- Machining is performed with small depths of cut (ap & ae)
- High cutting speeds (vc)

HFC High-Feed-Cutting
Characteristics of HFC:
- Small depths of cut (ap)
- Very high feed per tooth (fz)
- High machining volume with low cutting forces
- Special cutting geometry of the tools

Application notes can be found in the chapter 3D

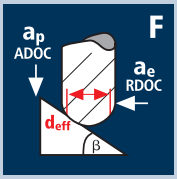
The application symbols are on the left next to the cutting data.
The letter, top right, provides information concerning strategy in relation to the stated cutting data.

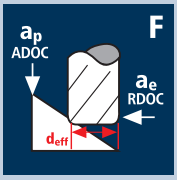




R stands for «Roughing» - a process which requires sufficient power and stability with regard to the machine and clamping.

Z-level roughing: The cutting data given in the catalog is for layer-by-layer removal. In this case the axial machine axis is set to constant depth and does not change. Pull and push cutting are therefore not recommended!





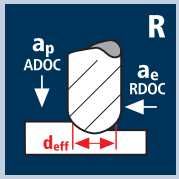
PF stands for «Pre-Finishing»
F stands for «Finishing»
SF stands for «Super-Finishing»

The cutting data given in the catalog applies for removal from level surfaces and parallel with the shape of the workpiece. Pull and push cutting are permissible. Push cutting is however less than ideal and will result in a reduction in tool life.

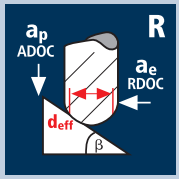
Applications for 3D machining

HSC machining

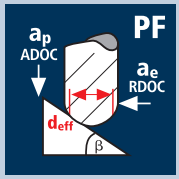
Ball nose



Z-level roughing
(Roughing R)

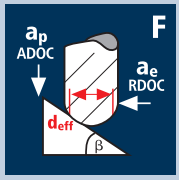


Roughing parallel
to contour
(Roughing R)



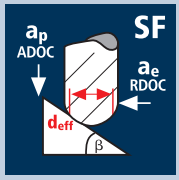
Pre-finishing
(Pre-Finishing PF)

Steep slopes



Finishing
(Finishing F)

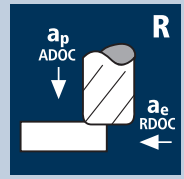
Steep slopes



Super-Finishing
(Super-Finishing SF)

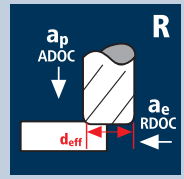
Steep slopes

Corner radius



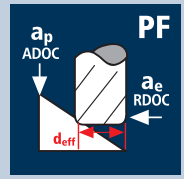
Z-level roughing
(Roughing R)

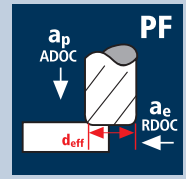
For use above the
corner radius area



Z-level roughing
(Roughing R)

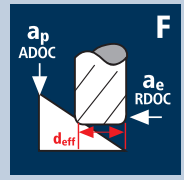
For use in the
corner radius area

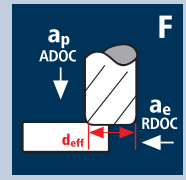




Pre-finishing
(Pre-Finishing PF)

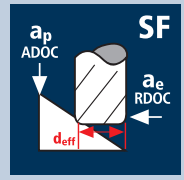
Steep slopes /
Flat surfaces

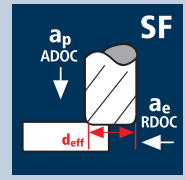




Finishing
(Finishing F)

Steep slopes /
Flat surfaces

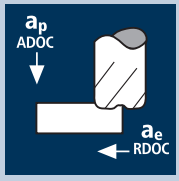




Super-Finishing
(Super-Finishing SF)

Steep slopes /
Flat surfaces

HFC machining



Rough milling (area clearance) with high-feed mills
(High-Feed-Cutting)

Machining strategies for ArCutX milling tools (circular arc milling cutters)

Finishing Planes and free-form surfaces can be pre-finished and finished highly efficiently using the ArCutX tool concept.

HSC Radius areas can be machined using a 5-axis HSC strategy.

HDC Rest material in corners can be removed using a 5-axis HDC strategy.

Applications for ArCutX milling tools (circular arc milling cutters)

Spherical / Spherical & Toric





Pre-finishing
(Pre-Finishing PF)

Steep slopes /
Flat surfaces





Finishing
(Finishing F)

Steep slopes /
Flat surfaces





Super-Finishing
(Super-Finishing SF)

Steep slopes /
Flat surfaces



Pre-finishing HSC
(Pre-Finishing PF)

Radius areas



Finishing HSC
(Finishing F)

Radius areas



Super-Finishing HSC
(Super-Finishing SF)

Radius areas

Toric / Toric integral



HDC (Rest material)
Roughing
(Roughing HDC)

Corners



Pre-finishing
(Pre-Finishing PF)

Steep slopes



Finishing
(Finishing F)

Steep slopes



Super-Finishing
(Super-Finishing SF)

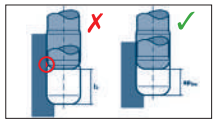
Steep slopes



Roughing HSC
(Roughing R)

Corners

AX tools:



Clean transitions can be achieved with the AX tools during finishing by means of several infeed depths. However, in this application the correct infeed depth is important. On the basis of the tool geometry with front radius, the limited axial infeed (ap_{lim}) is specified in the following table:

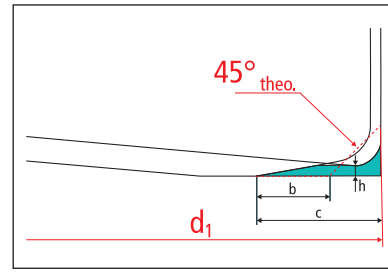
Axial infeed depth ap_{lim} for plane transition in wall for AX

d_1	l_2	Radius r	ap_{lim}	Radius r	ap_{lim}	Radius r	ap_{lim}	Radius r	ap_{lim}	Radius r	ap_{lim}	Radius r	ap_{lim}
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
3	4	0.5	2.5										
4	5	0.5	3.5										
5	6	0.5	4.5										
6	7	0.5	5.5	1.0	5.0					2.5	3.5		
8	9			1.0	7.0					2.5	5.5		
10	11			1.0	9.0	1.5	8.5			2.5	7.5	4.0	6.0
12	13			1.0	11.0	1.5	10.5			2.5	9.5	4.0	8.0
16	18			1.0	16.0	1.5	15.5	2.0	15.0	2.5	14.5	4.0	13.0
20	22			1.0	20.0	1.5	19.5	2.0	19.0	2.5	18.5	4.0	17.0
25	27			1.0	25.0	1.5	24.5			2.5	23.5	4.0	22.0

Tools with face finishing cutting edge:

Radial cutting depth ae_{max} for plane surfaces with tools with a face finishing cutting edge

d_1	h	b	c	ae_{max}
[mm]	[mm]	[mm]	[mm]	[mm]
3	0.02	0.1	0.20	2.6
4	0.02	0.1	0.20	3.6
5	0.02	0.1	0.20	4.6
6	0.03	0.2	0.20	5.3
8	0.03	0.2	0.35	7.3
10	0.04	0.3	0.35	9
12	0.04	0.3	0.50	11
16	0.04	0.3	0.50	15

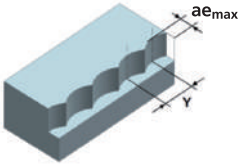


Indexable insert milling tools:

Radial infeed depth a_e for flat surfaces with HFC indexable insert milling tools

d_1	Insert size	a_e
[mm]	[mm]	[mm]
25	10	13.6
35	13	18.8
40	10	28.6
50	10	38.6
63	10	51.6
50	13	33.8
63	13	46.8
80	13	63.8

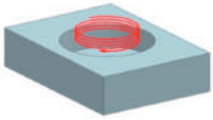
Plunge milling with HFC indexable insert milling tools



Insert size	ae_{max}	f_z	Y_{max}
[mm]	[mm]	[mm]	[mm]
10	8	0.15	< 0.7 x d_1
13	10.5	0.20	< 0.7 x d_1

Bore milling/helical plunging with milling tools for HFC and round indexable inserts

Minimum and maximum bore diameters



	Indexable inserts HFC 10mm		Indexable inserts HFC 13mm	
d_1	D_{max}	D_{min}	D_{max}	D_{min}
[mm]	[mm]	[mm]	[mm]	[mm]
25	48	35	–	–
35	–	–	68	50
40	78	65	–	–
50	98	85	98	80
63	124	111	124	106
80	–	–	158	140

	Round indexable inserts 10mm		Round indexable inserts 12mm	
d_1	D_{max}	D_{min}	D_{max}	D_{min}
[mm]	[mm]	[mm]	[mm]	[mm]
20	40	24	–	–
25	50	32	–	–
32	64	46	–	–
35	70	52	70	48
40	80	62	80	58
42	84	66	84	62
50	100	82	100	78
52	104	86	104	82
63	–	–	126	104
66	–	–	132	110
80	–	–	160	138
100	–	–	200	178

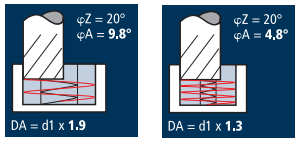
Infeed angle for monoblock milling tools

Chapter: Steel, stainless steel, titanium and nickel												
Material group	Rm 850-1500 HRC 24-48			HRC 48-60			Inox Stainless			Ti Titanium		
Version	N	M	L	N	M	L	N	M	L	N	M	L
Feed rate v_f [%]	100%			100%			80%			80%		
z = 2	2.50°	1.80°	1.00°	1.50°	1.00°	0.60°	2.50°	1.80°	1.00°	2.50°	1.80°	1.00°
z = 3	2.00°	1.20°	0.80°	1.00°	0.65°	0.40°	2.00°	1.20°	0.80°	2.00°	1.20°	0.80°
z = 4	1.00°	0.65°	0.40°	0.50°	0.35°	0.20°	1.00°	0.65°	0.40°	1.00°	0.65°	0.40°
z > 4	0.40°	0.30°	0.20°	0.20°	0.15°	0.10°	0.40°	0.30°	0.20°	0.40°	0.30°	0.20°

Chapter: 3D machining												
Material group	Rm 850-1500 HRC 24-48			HRC 48-60			Inox Stainless			Ti Titanium		
Version	N	M	L	N	M	L	N	M	L	N	M	L
Feed rate v_f [%]	100%			100%			80%			80%		
z = 2	0.50°	0.35°	0.25°	0.25°	0.20°	0.10°	0.50°	0.35°	0.25°	0.50°	0.35°	0.25°
z = 4	0.30°	0.25°	0.15°	0.20°	0.15°	0.10°	0.30°	0.25°	0.15°	0.30°	0.25°	0.15°
z > 4	0.20°	0.15°	0.10°	0.15°	0.10°	0.10°	0.20°	0.15°	0.10°	0.20°	0.15°	0.10°
HFC	0.50°	0.35°	0.25°	0.40°	0.30°	0.20°	0.50°	0.35°	0.25°	0.50°	0.35°	0.25°

Chapter: Aluminium and copper												
Material group	Al Aluminium Alloy						Cu Copper					
Version	N	M	2xd	3xd	4xd	5xd	N	M	2xd	3xd	4xd	5xd
Feed rate v_f [%]	100%						100%					
z = 2	5.00°	4.00°	6.00°	5.00°	4.00°	2.50°	4.00°	3.00°	5.00°	4.00°	3.00°	2.00°
z = 3	4.50°	3.50°	5.00°	4.50°	3.50°	2.00°	3.50°	2.50°	4.00°	3.50°	2.50°	1.50°

The penetration angle (Helix) for milling tools with high-performance penetration edge



Program the penetration angle φZ or φA correctly!

Conversion table φZ to φA with corresponding bore diameter											
Penetration angle φZ [°]	20°	18°	17.5°	16°	15°	13°	12°	10°	9°	8°	7°
Bore diameter DA	**Penetration angle φA [°]**										
DA = d_1 x 1.3 [mm]	4.8°	4.3°	4.2°	3.8°	3.5°	3.0°	2.8°	2.3°	2.1°	1.9°	1.6°
DA = d_1 x 1.5 [mm]	6.9°	6.2°	6.0°	5.5°	5.1°	4.4°	4.1°	3.4°	3.0°	2.7°	2.3°
DA = d_1 x 1.7 [mm]	8.5°	7.6°	7.4°	6.7°	6.3°	5.4°	5.0°	4.2°	3.7°	3.3°	2.9°
DA = d_1 x 1.9 [mm]	**9.8°**	**8.7°**	**8.5°**	**7.7°**	**7.2°**	**6.2°**	**5.7°**	**4.8°**	**4.3°**	**3.8°**	**3.3°**

FRAISA recommendation

Infeed angle for indexable insert milling tools

Material group		Rm 850-1500 HRC 24-48			HRC 48-60			Inox Stainless		Ti Titanium	Al Aluminium Alloy		
Version		K	M	L/XL	K	M	L/XL	K	M	L/XL	K	M	L/XL
Feed rate v_f [%]		100 %			100 %			80 %			100 %		
	d_1												
Corner-/Slot end mills 8mm	16	1.00°	0.80°	0.60°	0.70°	0.55°	0.40°	1.00°	0.80°	0.60°	1.30°	1.10°	0.80°
Corner-/Slot end mills 8mm	20	0.75°	0.60°	0.45°	0.55°	0.40°	0.30°	0.75°	0.60°	0.45°	1.00°	0.80°	0.60°
Corner-/Slot end mills 8mm	25	0.75°	0.60°	0.45°	0.55°	0.40°	0.30°	0.75°	0.60°	0.45°	1.00°	0.80°	0.60°
Corner-/Slot end mills 8mm	32	0.50°	0.40°	0.30°	0.35°	0.30°	0.20°	0.50°	0.40°	0.30°	0.65°	0.50°	0.40°
Corner-/Slot end mills 13mm	25	2.00°	1.60°	1.20°	1.40°	1.10°	0.85°	2.00°	1.60°	1.20°	2.50°	2.00°	1.50°
Corner-/Slot end mills 13mm	32	1.60°	1.30°	0.95°	1.10°	0.90°	0.65°	1.60°	1.30°	0.95°	2.00°	1.60°	1.20°
Corner end mills 8mm	40 ; 50	0.20°			0.20°			0.20°			0.25°		
Corner end mills 8mm	63 ; 80	0.10°			0.10°			0.10°			0.15°		
Corner end mills 13mm	40 ; 50	0.40°			0.40°			0.40°			0.45°		
Corner end mills 13mm	63 ; 80	0.20°			0.20°			0.20°			0.25°		
Face milling cutter	40 ; 50	0.15°			X			0.15°			0.20°		
Face milling cutter	63 ; 80	0.10°			X			0.10°			0.15°		
Face milling cutter	100 ; 125	X			X			X			X		
High feed end mills	25 ; 35	0.60°	0.40°	0.20°	0.50°	0.30°	0.15°	0.60°	0.40°	0.20°	X		
High feed end mills	40 ; 50	0.40°			0.30°			0.40°			X		
High feed end mills	63 ; 80	0.20°			0.15°			0.20°			X		
Round insert end mills	20 ; 25	0.60°	0.40°	0.20°	0.50°	0.30°	0.15°	0.60°	0.40°	0.20°	0.80°	0.50°	0.25°
Round insert end mills	32 ; 35	0.60°	0.40°	0.20°	0.50°	0.30°	0.15°	0.60°	0.40°	0.20°	0.80°	0.50°	0.25°
Round insert end mills	40 ; 42	0.50°			0.40°			0.50°			0.60°		
Round insert end mills	50 ; 52	0.40°			0.30°			0.40°			0.50°		
Round insert end mills	63 ; 66	0.25°			0.20°			0.25°			0.35°		
Round insert end mills	80 ; 100	0.10°			0.10°			0.10°			0.20°		

Information for cutting data

FRAISA ToolExpert® – the new online cutting data tool for optimum tool use

In the era of Industry 4.0, you need to be productive and work with precision at all times. To help you achieve this, we at FRAISA develop not only high-quality and flexible tools, but also innovative software solutions, such as our new FRAISA ToolExpert®.

The user-friendly online tool provides you with perfectly coordinated, tool and material- specific cutting data for your production – and the perfect basis for high-precision usage of your FRAISA tools: fast and simple.

FRAISA experts have tested the optimum operating points in great detail in our inhouse application centers. They have taken all factors involved into account and have bundled together the data for you in the new FRAISA ToolExpert®.



FRAISA ToolExpert® ArCutX – Tested online application data for efficient milling with ArCutX

ArCutX milling cutters were developed for finishing processes aimed at producing excellent surface quality. A variety of applications are possible for each of the five ArCutX tool types.

The specially developed ToolExpert ArCutX is now a reliable aid for finding the perfect tool from the ArCutX family to suit the desired material and application. The clearly structured menu lets you select/read off material, application, ArCutX tool type and the option «coated» or «uncoated».

Similarly, using ToolExpert ArCutX you can also find the corresponding cutting data for the selected tool. The phenomenal range of options offered by the ArCutX can therefore be exploited to the full, thanks to the specially developed cutting data calculator.



FRAISA ToolExpert® AX-FPS – An innovative solution for defining cutting data

The new ToolExpert AX-FPS gives FRAISA customers an innovative solution for defining cutting data that is specially tailored to their machine environment. High-performance roughing of aluminium alloys is not limited by the tool, but by the machine spindle and the machine environment.

ToolExpert AX-FPS lets you clearly and simply describe your machine environment, making it easy to discover the most effective and reliable cutting data for your application. This new option, the only one of its kind on the market, offers our customers real added value and ensures a reduction in machining times and production costs.

The functions incorporated into ToolExpert AX-FPS have been developed by recording over a thousand measuring points and guarantee highly productive and reliable system utilisation. At the same time, capacity utilisation of the milling cutter, the machine spindle and machine environment come as close as possible to maximum utilisation.



Services

FRAISA's service portfolio at a glance



FRAISA ToolCare®:
management, procurement and information system for tools



FRAISA ConcepTool:
custom-made special tools



FRAISA ReTool®:
industrial tool recondi-tioning with performance guarantee



FRAISA ToolSchool:
initial and further training

CAD data

We offer you the possibility to download 2D drawings (DXF), 3D models (STEP) and XML data (according DIN4000-102) for our products. Simply enter the article number of the tool and select the desired file.

Download measurement report*

As a customer, you can enter the measurement report number of your FRAISA tool and download the measurement report as a PDF file.

* Measurement reports available for the following article:
- High precision mills +/- 0,003 SpheroX (X7500)

https://www.fraisa.com/en/online-tools

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You can also use our ordering service via our E-Shop and benefit from our changing offers.

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for precision
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Calculation formulas for cutting data

Formulas

d_1	Diameter of the cutting edge [mm]
z	Number of cutting edges
a_p	Axial infeed depth [mm]
a_e	Radial infeed depth [mm]
v_c	Cutting speed [m/min]
f_z	Feed per tooth and revolution [mm]
n	Spindle speed [min^{-1}]
v_f	Feed rate [mm/min]
f	Feed per rotation [mm]
Q	Material removal rate [cm^3/min]
d_{eff}	Effective engagement diameter [mm]
β	Setting angle «Beta» [° - DEG]

Spindle speed

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \left[\frac{1}{min}\right]$$

Cutting speed

$$v_c = \frac{d_1 \cdot n \cdot \pi}{1000} \left[\frac{m}{min}\right]$$

Feed rate

$$v_f = f_z \cdot z \cdot n \left[\frac{mm}{min}\right]$$

Feed per tooth

$$f_z = \frac{v_f}{z \cdot n} \left[mm\right]$$

Feed per rotation

$$f = f_z \cdot z \left[mm\right]$$

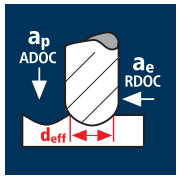
Material removal rate

$$Q = \frac{ap \cdot ae \cdot v_f}{1000} \left[\frac{cm^3}{min}\right]$$

i

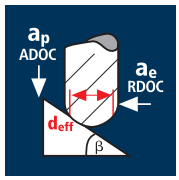
Calculation formulas for cutting data

Effective diameter for ball nose end mills at a set angle β = 0°



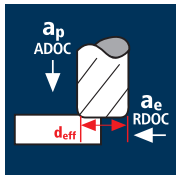
$$d_{eff} = 2 \cdot \sqrt{d_1 \cdot ap - ap^2} \quad [mm]$$

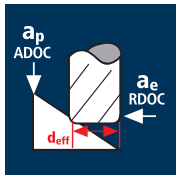
Effective diameter for ball nose end mills at a set angle 0 < β < 90°
Calculator setting in [° - DEG] ; entry of β in [°- DEG]



$$d_{eff} = d_1 \cdot \sin\left[\beta + \cos^{-1}\left(\frac{d_1 - 2 \cdot ap}{d_1}\right)\right] \quad [mm]$$

Effective diameter for corner radius end mills at a set angle 0 ≤ β < 90°
Calculator setting in [° - DEG] ; entry of β in [°- DEG]





$$d_{eff} = d_1 - 2 \cdot r + 2 \cdot r \cdot \sin\left[\beta + \cos^{-1}\left(1 - \frac{ap}{r}\right)\right] \quad [mm]$$

Calculation formulas for cutting data

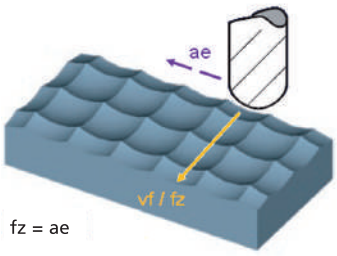
Theoretical surface roughness and surface qualities

Surface roughness in the direction of feed v_f

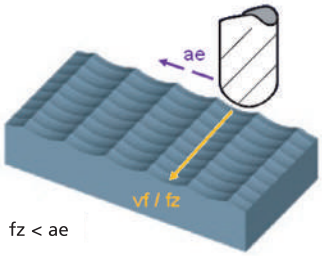
$$R_{th,vf} = \left(\frac{d_1}{2} - \sqrt{\frac{d_1^2 - f_z^2}{4}} \right) \cdot 1000 \ [\mu m]$$

Surface roughness in the infeed direction ae

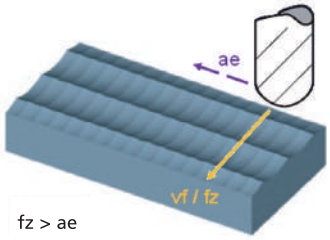
$$R_{th,ae} = \left(\frac{d_1}{2} - \sqrt{\frac{d_1^2 - ae^2}{4}} \right) \cdot 1000 \ [\mu m]$$



fz = ae



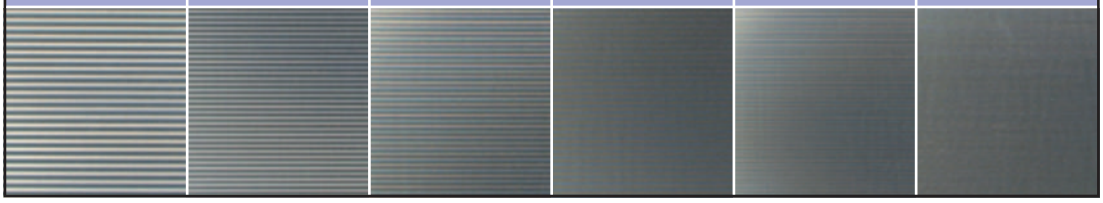
fz < ae



fz > ae

Surface qualities

Maximum roughness values Ra in µm; 1 µm = 0.001 mm					
3.2	1.6	0.8	0.4	0.2	0.1
Roughness classes					
N8	N7	N6	N5	N4	N3



Hardness conversion table (R_m → HV10 → HB → HRC)

R_m [N/mm²]	HV 10	HB	HRC		R_m [N/mm²]	HV 10	HB	HRC
240	75	71			920	287	273	28
255	80	76			940	293	278	29
270	85	81			970	302	287	30
285	90	86			995	310	295	31
305	95	90			1020	317	301	32
320	100	95			1050	327	311	33
335	105	100			1080	336	319	34
350	110	105			1110	345	328	35
370	115	109			1140	355	337	36
385	120	114			1170	364	346	37
400	125	119			1200	373	354	38
415	130	124			1230	382	363	39
430	135	128			1260	392	372	40
450	140	133			1300	403	383	41
465	145	138			1330	413	393	42
480	150	143			1360	423	402	43
495	155	147			1400	434	413	44
510	160	152			1440	446	424	45
530	165	157			1480	458	435	46
545	170	162			1530	473	449	47
560	175	166			1570	484	460	48
575	180	171			1620	497	472	49
595	185	176			1680	514	488	50
610	190	181			1730	527	501	51
625	195	185			1790	544	517	52
640	200	190			1845	560	532	53
660	205	195			1910	578	549	54
675	210	199			1980	596	567	55
690	215	204			2050	615	584	56
705	220	209			2140	639	607	57
720	225	214				655	622	58
740	230	219				675		59
755	235	223				698		60
770	240	228				720		61
785	245	233				745		62
800	250	238	22			773		63
820	255	242	23			800		64
835	260	247	24			829		65
860	268	255	25			864		66
870	272	258	26			900		67
900	280	266	27			940		68

Coating suitability for milling tools

Coating suitability related to dry or wet machining conditions



A: Excellent suitability of the coating A during wet machining.
B: The suitability of the coating B during wet machining is sufficient to good.

C: Excellent suitability of the coating C during dry machining.
D: The suitability of the coating D during dry machining is sufficient to good.

Distribution network

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Article list

Example : Article H8604

Article-N°.: 8604
Coating: H
Page: 37

Article-N°.		Coating														
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
Chemical composition			TiAlCrN	AlCrN	AlTiN	AlTiSiN	TiAlSiN	AlTiN/ TiSiXN	TiAlN/ AlCrN	TiAlN/ AlCrN	TiAlN	TiB2	TiAlN	C	C	C
Hardness [HV]			3000	3200	3600	3300	3200	3800	3300	3300	3000	4000	3400	10000	10000	10000
Max. temp. [°C]			1000	1100	880	1100	1100	1100	1100	1100	800	700	900	600	600	600
0111	89		●													
0201	145		●													
0401	317		●													
0411	321		●													
0541	221		●													
0612	223		●													
0622	239		●													
0651	229		●													
0666	237		●													
0701	171		●													
0781	93		●													
0891	755		●													
0906	751		●													
0911	749		●													
0916	747		●													
0921	745		●													
1392	645	●														
3491	763		●													
5036	167		●													
5213	159		●													
5225	99		●													
5229	165		●													
5236	311		●													
5237	315		●													
5249	157		●		●											
5250	409		●													
5252	415		●													
5255	71		●													
5286	371		●													
5297	641											●				
5313	159		●													
5325	99		●													
5329	165		●													
5335	313		●													
5336	311		●													
5337	315		●													
5349	157		●		●											
5355	71		●													

Article-N°.		Coating															
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
5397	641											●				
5640	735													●		
5645	737													●		
5712	291										●					
5714	295										●					
5714	725													●		
5716	299										●					
5716	727													●		
5717	729													●		
5752	559										●					
5754	561										●					
5754	721													●		
5756	563										●					
5756	723													●		
5782	505										●					
5784	507										●					
5784	689													●		
5786	509										●					
5786	691													●		
5787	693													●		
5791	695													●		
5793	697													●		
6032	701														●	
6034	703														●	
6036	707														●	
6038	711														●	
6040	715														●	
6042	717														●	
6044	719														●	
6062	675														●	
6064	677														●	
6066	679														●	
6068	681														●	
6070	683														●	
6072	685														●	
6074	687														●	
6460	435								●							
6461	437								●							
6462	441								●							
6463	445								●							
6464	449								●							
6481	439								●							
6482	443								●							
6483	447								●							
6500	259									●						
6501	261									●						
6502	263									●						
6503	265									●						
6504	267									●						
6505	269									●						
6506	271									●						
6508	273									●						
6531	513									●						
6532	515									●						
6533	519									●						
6534	521									●						
6535	525									●						
6536	527									●						
6538	531									●						
6560	451									●						
6561	453									●						
6562	457									●						
6563	461									●						
6564	465									●						

Article-N°.		Coating															
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
6565	467									●						
6566	471									●						
6567	473									●						
6568	475									●						
6579	469									●						
6581	455									●						
6582	459									●						
6583	463									●						
6632	547									●						
6634	549									●						
6735	535									●						
6736	537									●						
6738	539									●						
6740	541									●						
6742	543									●						
6744	545									●						
6765	477									●						
6766	479									●						
6768	481									●						
6770	483									●						
6772	485									●						
6774	487									●						
6800	275									●						
6802	277									●						
6804	279									●						
6807	281									●						
6809	283									●						
6810	285									●						
6811	287									●						
6812	289									●						
6816	551									●						
6818	553									●						
6820	555									●						
6823	557									●						
6832	489									●						
6836	491									●						
6840	493									●						
6844	495									●						
6846	497									●						
6847	499									●						
6848	501									●						
6849	503									●						
7100	395									●						
7104	405									●						
7200	391									●						
7204	401									●						
7210	389						●									
7212	399						●									
7284	733														●	
7340	411		●													
7344	417		●													
7400	345									●						
7402	357									●						
7404	363									●						
7460	347									●						
7470	341					●										
7472	353					●										
7474	359					●										
7478	369					●										
7484	731														●	
7490	343					●										
7492	355						●									
7494	361						●									
7500	339									●						

Article-N°.		Coating																
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
7540	349		●													
7544	365		●													
7550	351	●														
7554	367	●														
7610	421						●									
7612	427						●									
7614	431						●									
7620	425									●						
7630	423									●						
7632	429									●						
7634	433									●						
7920	743		●													
7932	757												●			
7940	759		●													
7942	761		●													
8100	57		●													
8101	51		●													
8102	53		●													
8105	55		●													
8107	189		●													
8111	109		●													
8112	111		●													
8115	113		●													
8117	211		●													
8121	147		●													
8122	155		●													
8200	57		●													
8201	51		●													
8202	53		●													
8205	55		●													
8207	189		●													
8211	109		●													
8212	111		●													
8215	113		●													
8217	211		●													
8221	147		●													
8222	155		●													
8300	65		●													
8301	243		●													
8302	215		●													
8303	73		●													
8304	59		●													
8305	67		●													
8306	69			●												
8307	193		●													
8308	161		●													
8309	163		●													
8310	121		●													
8311	247		●													
8313	125		●													
8315	123		●													
8320	149		●													
8321	253		●													
8322	255		●													
8323	151		●													
8330	63			●												
8340	119			●												
8400	65		●													
8401	243		●													
8402	215		●													
8403	73		●													
8404	59		●													
8405	67		●													
8406	69			●												

Article-N°.		Coating															
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
8407	193		●													
8408	161		●													
8409	163		●													
8410	121		●													
8413	125		●													
8415	123		●													
8420	149		●													
8423	151		●													
8430	63			●												
8440	119			●												
8500	39		●													
8502	257						●									
8504	37						●									
8506	47						●									
8507	175						●									
8508	49							●								
8514	101						●									
8516	105						●									
8517	207						●									
8518	107							●								
8521	251		●				●									
8530	373		●													
8531	375	●														
8535	377		●													
8536	379	●														
8540	381		●													
8541	383	●														
8550	385		●													
8551	387	●														
8560	581	●														
8561	587	●														
8563	643	●														
8565	579	●														
8567	611	●														
8570	597	●														
8571	601	●														
8573	655	●														
8575	593	●														
8576	615	●														
8577	619	●														
8578	595	●														
8580	607	●														
8585	609	●														
8587	623	●														
8600	39		●													
8604	37						●									
8606	47						●									
8607	175						●									
8608	49							●								
8614	101						●									
8616	105						●									
8617	207						●									
8618	107							●								
8660	581	●														
8661	587	●														
8663	643	●														
8665	579	●														
8667	611	●														
8670	597	●														
8671	601	●														
8673	655	●														
8675	593	●														
8676	615	●														
8677	619	●														

Article-N°.		Coating															
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
8678	595	●														
8680	607	●														
8685	609	●														
8687	623	●														
8700	43		●													
8705	45		●													
8720	183		●													
8800	43		●													
8805	45		●													
8820	183		●													
15207	61		●													
15208	117		●													
15210	115		●													
15222	41		●													
15223	103		●													
15225	137		●													
15232	309	●	●													
15236	217		●													
15238	227		●													
15239	231		●													
15242	97		●													
15248	235		●													
15250	241		●				●									
15251	245		●				●									
15254	249		●				●									
15259	135		●													
15260	233		●													
15268	179		●													
15297	649											●				
15298	653											●				
15299	139		●													
15307	61		●													
15308	117		●													
15310	115		●													
15322	41		●													
15323	103		●													
15325	137		●													
15336	217		●													
15338	227		●													
15339	231		●													
15342	97		●													
15348	235		●													
15359	135		●													
15360	233		●													
15368	179		●													
15397	649											●				
15398	653											●				
15399	139		●													
15500	639	●														
15502	659	●														
15505	651	●														
15506	647	●														
15507	657	●														
15510	665	●														
15512	667	●														
15520	583	●										●				
15525	585	●										●				
15530	575	●										●				
15535	577	●										●				
15550	599	●										●				
15557	589	●										●				
15559	603	●										●				
15560	591	●										●				
15561	605	●										●				

Article-N°.		Coating															
INDEX		without	P POLYCHROM	K MULTICHROM	D DURO-S	V DURO-V	H DURO-SI	S DURO-XI	Y DURO-AI	X X-AL	M MICRO	C CELERO	W TiAlN	B DIAMOND	B DIAPLUS	B DIA-C
15573	631	●										●				
15575	637	●										●				
15583	627	●										●				
15585	635	●										●				
15589	661	●										●				
15590	663	●										●				
15600	639	●														
15605	651	●														
15606	647	●														
15607	657	●														
15620	583	●										●				
15625	585	●										●				
15630	575	●										●				
15635	577	●										●				
15650	599	●										●				
15657	589	●										●				
15659	603	●										●				
15660	591	●										●				
15661	605	●										●				
15752	293										●					
15754	297										●					
15795	699													●		
45217	81		●													
45219	201		●													
45223	143		●													
45225	79		●													
45226	131		●													
45233	85		●													
45234	133		●													
45255	83		●													
45268	169		●													
45270	77		●													
45280	129		●													
45282	141		●													
45317	81		●													
45319	201		●													
45323	143		●													
45325	79		●													
45326	131		●													
45333	85		●													
45334	133		●													
45355	83		●													
45368	169		●													
45370	77		●													
45371	219		●													
45380	129		●													
45382	141		●													
45710	301										●					
45713	305										●					
45785	511										●					
46200	75		●													
46207	199		●													
46210	127		●													
46220	153		●													
46300	75		●													
46307	199		●													
46310	127		●													
46320	153		●													





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