

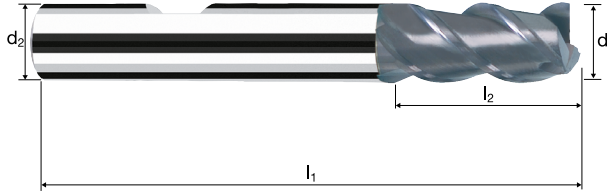
# Cylindrical end mills

Smooth-edged, normal version



HM  
MG10

$\lambda$  45°  
 $\gamma$  15°



Roughing

Finishing



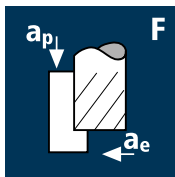
ToolSchool

Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Copper
-------------	----------------	-----------------	--	--	--	--	-------------------	--	-----------------

Ø Code	d <sub>1</sub> e8	d <sub>2</sub> h6	l <sub>1</sub>	l <sub>2</sub>	l <sub>4</sub>	45°	α	z	POLYCHROM	
									5330	P5330
138*	2.00	2.00	42	6.00	-	0.10	0.0°	3	●	●
140	2.00	6.00	54	6.00	15.32	0.10	8.0°	3	●	●
158*	2.50	2.50	42	7.00	-	0.10	0.0°	3	●	●
160	2.50	6.00	54	6.00	14.89	0.10	7.5°	3	●	●
178*	3.00	3.00	45	7.00	-	0.10	0.0°	3	●	●
180	3.00	6.00	57	7.00	14.96	0.10	6.0°	3	●	●
198*	3.50	3.50	50	7.00	-	0.10	0.0°	3	●	●
200	3.50	6.00	57	7.00	14.02	0.10	5.5°	3	●	●
218*	4.00	4.00	50	8.00	-	0.10	0.0°	3	●	●
220	4.00	6.00	57	8.00	14.59	0.10	4.5°	3	●	●
238*	4.50	4.50	50	8.00	-	0.15	0.0°	3	●	●
240	4.50	6.00	57	8.00	13.66	0.15	3.5°	3	●	●
258*	5.00	5.00	50	10.00	-	0.15	0.0°	3	●	●
260	5.00	6.00	57	10.00	14.72	0.15	2.5°	3	●	●
278*	5.50	5.50	57	10.00	-	0.15	0.0°	3	●	●
280	5.50	6.00	57	10.00	13.79	0.15	1.5°	3	●	●
300	6.00	6.00	57	10.00	-	0.15	0.0°	3	●	●
322	6.50	8.00	63	13.00	18.66	0.15	2.5°	3	●	●
331	7.00	8.00	63	13.00	17.72	0.15	2.0°	3	●	●
362	7.50	8.00	63	16.00	19.79	0.15	1.0°	3	●	●
391	8.00	8.00	63	16.00	-	0.15	0.0°	3	●	●

\* without clamping flat only

## Application



## Material

Steel  
< 850 N/mm<sup>2</sup>

**P**

**P**

Steel  
850 - 1100 N/mm<sup>2</sup>

**P**

**P**

Stainless steel  
[Cr-Ni/1.4301]

**P**

Cast iron  
(lamellar / spheroidal)

**P**

**P**



Steel  
< 850 N/mm<sup>2</sup>

**P**

**P**

Steel  
850 - 1100 N/mm<sup>2</sup>

**P**

**P**

Stainless steel  
[Cr-Ni/1.4301]

**P**

Cast iron  
(lamellar / spheroidal)

**P**

**P**

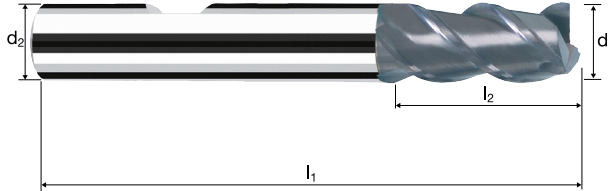
d1 [mm]	z	v <sub>c</sub> [m/min]	f <sub>s</sub> [mm]	a <sub>p</sub> [mm]	a <sub>e</sub> [mm]	n [min <sup>-1</sup> ]	v <sub>r</sub> [mm/min]	Q [cm <sup>3</sup> /min]
2.00	3	115	0.005	3.000	0.200	18305	275	0.2
2.50	3	115	0.010	3.750	0.250	14640	440	0.4
3.00	3	115	0.010	4.500	0.300	12200	365	0.5
3.50	3	115	0.010	5.250	0.350	10460	315	0.6
4.00	3	115	0.015	6.000	0.400	9150	410	1.0
5.00	3	115	0.015	7.500	0.500	7320	330	1.2
6.00	3	115	0.020	9.000	0.600	6100	365	2.0
7.00	3	115	0.025	10.500	0.700	5230	390	2.9
8.00	3	115	0.025	12.000	0.800	4575	345	3.3
2.00	3	75	0.005	3.000	0.200	11935	180	0.1
2.50	3	75	0.010	3.750	0.250	9550	285	0.3
3.00	3	75	0.010	4.500	0.300	7960	240	0.3
3.50	3	75	0.010	5.250	0.350	6820	205	0.4
4.00	3	75	0.015	6.000	0.400	5970	270	0.6
5.00	3	75	0.015	7.500	0.500	4775	215	0.8
6.00	3	75	0.020	9.000	0.600	3980	240	1.3
7.00	3	75	0.025	10.500	0.700	3410	255	1.9
8.00	3	75	0.025	12.000	0.800	2985	225	2.1
2.00	3	60	0.005	3.000	0.200	9550	145	0.1
2.50	3	60	0.010	3.750	0.250	7640	230	0.2
3.00	3	60	0.010	4.500	0.300	6365	190	0.3
3.50	3	60	0.010	5.250	0.350	5455	165	0.3
4.00	3	60	0.015	6.000	0.400	4775	215	0.5
5.00	3	60	0.015	7.500	0.500	3820	170	0.6
6.00	3	60	0.020	9.000	0.600	3185	190	1.0
7.00	3	60	0.025	10.500	0.700	2730	205	1.5
8.00	3	60	0.025	12.000	0.800	2385	180	1.7
2.00	3	150	0.005	3.000	0.200	23875	360	0.2
2.50	3	150	0.010	3.750	0.250	19100	575	0.5
3.00	3	150	0.010	4.500	0.300	15915	475	0.6
3.50	3	150	0.010	5.250	0.350	13640	410	0.8
4.00	3	150	0.015	6.000	0.400	11935	535	1.3
5.00	3	150	0.015	7.500	0.500	9550	430	1.6
6.00	3	150	0.020	9.000	0.600	7960	475	2.6
7.00	3	150	0.025	10.500	0.700	6820	510	3.8
8.00	3	150	0.025	12.000	0.800	5970	450	4.3
2.00	3	85	0.005	1.000	2.000	13530	205	0.4
2.50	3	85	0.005	1.250	2.500	10825	160	0.5
3.00	3	85	0.010	1.500	3.000	9020	270	1.2
3.50	3	85	0.010	1.750	3.500	7730	230	1.4
4.00	3	85	0.010	2.000	4.000	6765	205	1.6
5.00	3	85	0.015	2.500	5.000	5410	245	3.0
6.00	3	85	0.015	3.000	6.000	4510	205	3.7
7.00	3	85	0.020	3.500	7.000	3865	230	5.7
8.00	3	85	0.020	4.000	8.000	3380	205	6.5
2.00	3	60	0.005	1.000	2.000	9550	145	0.3
2.50	3	60	0.005	1.250	2.500	7640	115	0.4
3.00	3	60	0.010	1.500	3.000	6365	190	0.9
3.50	3	60	0.010	1.750	3.500	5455	165	1.0
4.00	3	60	0.010	2.000	4.000	4775	145	1.1
5.00	3	60	0.015	2.500	5.000	3820	170	2.1
6.00	3	60	0.015	3.000	6.000	3185	145	2.6
7.00	3	60	0.020	3.500	7.000	2730	165	4.0
8.00	3	60	0.020	4.000	8.000	2385	145	4.6
2.00	3	40	0.005	1.000	2.000	6365	95	0.2
2.50	3	40	0.005	1.250	2.500	5095	75	0.2
3.00	3	40	0.010	1.500	3.000	4245	125	0.6
3.50	3	40	0.010	1.750	3.500	3640	110	0.7
4.00	3	40	0.010	2.000	4.000	3185	95	0.8
5.00	3	40	0.015	2.500	5.000	2545	115	1.4
6.00	3	40	0.015	3.000	6.000	2120	95	1.7
7.00	3	40	0.020	3.500	7.000	1820	110	2.7
8.00	3	40	0.020	4.000	8.000	1590	95	3.1
2.00	3	105	0.005	1.000	2.000	16710	250	0.5
2.50	3	105	0.010	1.250	2.500	13370	400	1.3
3.00	3	105	0.010	1.500	3.000	11140	335	1.5
3.50	3	105	0.010	1.750	3.500	9550	285	1.8
4.00	3	105	0.010	2.000	4.000	8355	250	2.0
5.00	3	105	0.015	2.500	5.000	6685	300	3.8
6.00	3	105	0.020	3.000	6.000	5570	335	6.0
7.00	3	105	0.020	3.500	7.000	4775	285	7.0
8.00	3	105	0.025	4.000	8.000	4180	315	10.0

# Cylindrical end mills

Smooth-edged, normal version

HM  
MG10

$\lambda$  45°  
 $\gamma$  15°



Roughing

Finishing

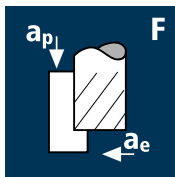


ToolSchool

Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Copper
-------------	----------------	-----------------	--	--	--	--	-------------------	--	-----------------

Ø Code	d <sub>1</sub> e8	d <sub>2</sub> h6	l <sub>1</sub>	l <sub>2</sub>	l <sub>4</sub>	45°	α	z	POLYCHROM	
									5330	P5330
410	8.50	10.00	72	16.00	21.66	0.20	2.5°	3	●	●
420	9.00	10.00	72	16.00	20.72	0.20	1.5°	3	●	●
430	9.50	10.00	72	19.00	22.79	0.20	1.0°	3	●	●
450	10.00	10.00	72	19.00	-	0.20	0.0°	3	●	●
470	11.00	12.00	83	22.00	27.22	0.20	1.5°	3	●	●
501	12.00	12.00	83	22.00	-	0.20	0.0°	3	●	●
540	13.00	14.00	83	22.00	27.22	0.20	1.5°	3	●	●
570	14.00	14.00	83	22.00	-	0.20	0.0°	3	●	●
581	15.00	16.00	92	26.00	31.22	0.20	1.0°	3	●	●
610	16.00	16.00	92	26.00	-	0.20	0.0°	3	●	●
640	18.00	18.00	92	26.00	-	0.20	0.0°	3	●	●
682	20.00	20.00	104	32.00	-	0.20	0.0°	3	●	●
710	22.00	20.00	104	38.00	-	0.25	0.0°	3	●	●
772	25.00	25.00	121	45.00	-	0.25	0.0°	3	●	●

## Application



## Material

Steel  
< 850 N/mm<sup>2</sup>

**P**

**P**

Steel  
850 - 1100 N/mm<sup>2</sup>

**P**

**P**

Stainless steel  
[Cr-Ni/1.4301]

**P**

Cast iron  
(lamellar / spheroidal)

**P**

**P**



Steel  
< 850 N/mm<sup>2</sup>

**P**

**P**

Steel  
850 - 1100 N/mm<sup>2</sup>

**P**

**P**

Stainless steel  
[Cr-Ni/1.4301]

**P**

Cast iron  
(lamellar / spheroidal)

**P**

**P**

d1 [mm]	z	v <sub>c</sub> [m/min]	f <sub>s</sub> [mm]	a <sub>p</sub> [mm]	a <sub>e</sub> [mm]	n [min <sup>-1</sup> ]	v <sub>r</sub> [mm/min]	Q [cm <sup>3</sup> /min]
9.00	3	115	0.030	13.500	0.900	4065	365	4.4
10.00	3	115	0.035	15.000	1.000	3660	385	5.8
12.00	3	115	0.040	18.000	1.200	3050	365	7.9
14.00	3	115	0.045	21.000	1.400	2615	355	10.4
16.00	3	115	0.055	24.000	1.600	2290	375	14.5
18.00	3	115	0.060	27.000	1.800	2035	365	17.8
20.00	3	115	0.065	30.000	2.000	1830	355	21.4
22.00	3	115	0.075	33.000	2.200	1665	375	27.2
25.00	3	115	0.085	37.500	2.500	1465	375	35.0
9.00	3	75	0.030	13.500	0.900	2655	240	2.9
10.00	3	75	0.035	15.000	1.000	2385	250	3.8
12.00	3	75	0.040	18.000	1.200	1990	240	5.2
14.00	3	75	0.045	21.000	1.400	1705	230	6.8
16.00	3	75	0.055	24.000	1.600	1490	245	9.5
18.00	3	75	0.060	27.000	1.800	1325	240	11.6
20.00	3	75	0.065	30.000	2.000	1195	235	14.0
22.00	3	75	0.075	33.000	2.200	1085	245	17.7
25.00	3	75	0.085	37.500	2.500	955	245	22.8
9.00	3	60	0.030	13.500	0.900	2120	190	2.3
10.00	3	60	0.035	15.000	1.000	1910	200	3.0
12.00	3	60	0.040	18.000	1.200	1590	190	4.1
14.00	3	60	0.045	21.000	1.400	1365	185	5.4
16.00	3	60	0.055	24.000	1.600	1195	195	7.6
18.00	3	60	0.060	27.000	1.800	1060	190	9.3
20.00	3	60	0.065	30.000	2.000	955	185	11.2
22.00	3	60	0.075	33.000	2.200	870	195	14.2
25.00	3	60	0.085	37.500	2.500	765	195	18.3
9.00	3	150	0.030	13.500	0.900	5305	475	5.8
10.00	3	150	0.035	15.000	1.000	4775	500	7.5
12.00	3	150	0.040	18.000	1.200	3980	475	10.3
14.00	3	150	0.045	21.000	1.400	3410	460	13.5
16.00	3	150	0.055	24.000	1.600	2985	490	18.9
18.00	3	150	0.060	27.000	1.800	2655	475	23.2
20.00	3	150	0.065	30.000	2.000	2385	465	27.9
22.00	3	150	0.075	33.000	2.200	2170	490	35.5
25.00	3	150	0.085	37.500	2.500	1910	485	45.7
9.00	3	85	0.025	4.500	9.000	3005	225	9.1
10.00	3	85	0.030	5.000	10.000	2705	245	12.2
12.00	3	85	0.035	6.000	12.000	2255	235	17.0
14.00	3	85	0.040	7.000	14.000	1935	230	22.7
16.00	3	85	0.045	8.000	16.000	1690	230	29.2
18.00	3	85	0.050	9.000	18.000	1505	225	36.5
20.00	3	85	0.055	10.000	20.000	1355	225	44.6
22.00	3	85	0.060	11.000	22.000	1230	220	53.6
25.00	3	85	0.070	12.500	25.000	1080	225	71.0
9.00	3	60	0.025	4.500	9.000	2120	160	6.4
10.00	3	60	0.025	5.000	10.000	1910	145	7.2
12.00	3	60	0.030	6.000	12.000	1590	145	10.3
14.00	3	60	0.035	7.000	14.000	1365	145	14.0
16.00	3	60	0.040	8.000	16.000	1195	145	18.3
18.00	3	60	0.045	9.000	18.000	1060	145	23.2
20.00	3	60	0.050	10.000	20.000	955	145	28.6
22.00	3	60	0.055	11.000	22.000	870	145	34.7
25.00	3	60	0.065	12.500	25.000	765	150	46.6
9.00	3	40	0.025	4.500	9.000	1415	105	4.3
10.00	3	40	0.025	5.000	10.000	1275	95	4.8
12.00	3	40	0.030	6.000	12.000	1060	95	6.9
14.00	3	40	0.035	7.000	14.000	910	95	9.4
16.00	3	40	0.040	8.000	16.000	795	95	12.2
18.00	3	40	0.045	9.000	18.000	705	95	15.5
20.00	3	40	0.050	10.000	20.000	635	95	19.1
22.00	3	40	0.055	11.000	22.000	580	95	23.1
25.00	3	40	0.065	12.500	25.000	510	100	31.0
9.00	3	105	0.030	4.500	9.000	3715	335	13.5
10.00	3	105	0.030	5.000	10.000	3340	300	15.0
12.00	3	105	0.035	6.000	12.000	2785	290	21.1
14.00	3	105	0.045	7.000	14.000	2385	320	31.6
16.00	3	105	0.050	8.000	16.000	2090	315	40.1
18.00	3	105	0.055	9.000	18.000	1855	305	49.6
20.00	3	105	0.060	10.000	20.000	1670	300	60.2
22.00	3	105	0.065	11.000	22.000	1520	295	71.7
25.00	3	105	0.075	12.500	25.000	1335	300	94.0