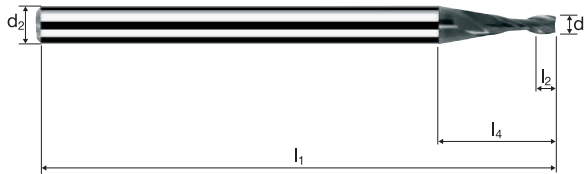
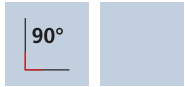


Cylindrical end mills

Shank \varnothing 3mm, 1.5xd



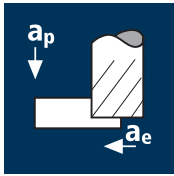
HM	λ 30°
MG10	γ 8°



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

Example: Order-N°.									MICRO
Coating Article-N° ø-Code									
M 45709 010									M45709
\varnothing Code	d_1 ± 0.01	d_2 h6	l_1	l_2	l_4	α	z		
010	0.10	3.00	40	0.15	6.01	14.5°	2	●	
015	0.15	3.00	40	0.23	5.99	14.5°	2	●	
020	0.20	3.00	40	0.30	5.97	14.5°	2	●	
025	0.25	3.00	40	0.38	5.96	14.0°	2	●	
030	0.30	3.00	40	0.45	5.93	14.0°	2	●	
040	0.40	3.00	40	0.60	5.90	13.5°	2	●	
050	0.50	3.00	40	0.75	5.86	13.0°	2	●	
060	0.60	3.00	40	0.90	5.82	12.5°	2	●	
070	0.70	3.00	40	1.05	5.79	12.5°	2	●	
080	0.80	3.00	40	1.20	5.75	12.0°	2	●	
090	0.90	3.00	40	1.35	5.71	11.5°	2	●	
100	1.00	3.00	40	1.50	5.68	11.0°	2	●	
104	1.10	3.00	40	1.65	5.69	10.5°	2	●	
108	1.20	3.00	40	1.80	5.65	10.0°	2	●	
112	1.30	3.00	40	1.95	5.62	9.5°	2	●	
116	1.40	3.00	40	2.10	5.58	9.0°	2	●	
120	1.50	3.00	40	2.25	5.54	8.5°	2	●	
123	1.60	3.00	40	2.40	5.51	8.0°	2	●	
126	1.70	3.00	40	2.55	5.47	7.5°	2	●	
130	1.80	3.00	40	2.70	5.43	7.0°	2	●	
135	1.90	3.00	40	2.85	5.40	6.5°	2	●	

Application



Material

Steel
< 850 N/mm²



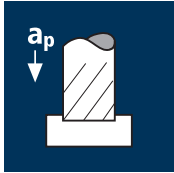
Short-chipping brass
[CuZn]



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



Titanium alloys
> 300 HB
[Ti6Al4V]



Steel
< 850 N/mm²



Short-chipping brass
[CuZn]



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

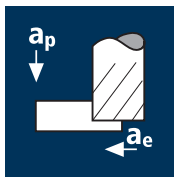


Titanium alloys
> 300 HB
[Ti6Al4V]



d1 [mm]	z	v _c [m/min]	f _s [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _r [mm/min]	Q [mm ³ /min]
0.20	2	26	0.002	0.200	0.040	41380	165	1.3
0.40	2	53	0.004	0.400	0.080	42175	335	10.8
0.50	2	66	0.006	0.500	0.100	42015	505	25.2
0.60	2	79	0.008	0.600	0.120	41910	670	48.3
0.80	2	106	0.010	0.800	0.160	42175	845	108.0
1.00	2	132	0.012	1.000	0.200	42015	1010	201.7
1.20	2	158	0.014	1.200	0.240	41910	1175	338.0
1.50	2	180	0.018	1.500	0.300	38195	1375	618.8
1.80	2	180	0.022	1.800	0.360	31830	1400	907.6
0.20	2	26	0.002	0.200	0.040	41380	165	1.3
0.40	2	53	0.004	0.400	0.080	42175	335	10.8
0.50	2	66	0.006	0.500	0.100	42015	505	25.2
0.60	2	79	0.008	0.600	0.120	41910	670	48.3
0.80	2	106	0.012	0.800	0.160	42175	1010	129.6
1.00	2	132	0.014	1.000	0.200	42015	1175	235.3
1.20	2	158	0.016	1.200	0.240	41910	1340	386.2
1.50	2	190	0.020	1.500	0.300	40320	1615	725.7
1.80	2	190	0.024	1.800	0.360	33600	1615	1045.1
0.20	2	26	0.002	0.200	0.040	41380	165	1.3
0.40	2	53	0.004	0.400	0.080	42175	335	10.8
0.50	2	66	0.004	0.500	0.100	42015	335	16.8
0.60	2	70	0.006	0.600	0.120	37135	445	32.1
0.80	2	70	0.008	0.800	0.160	27850	445	57.0
1.00	2	70	0.010	1.000	0.200	22280	445	89.1
1.20	2	70	0.012	1.200	0.240	18570	445	128.3
1.50	2	70	0.014	1.500	0.300	14855	415	187.2
1.80	2	70	0.018	1.800	0.360	12380	445	288.8
0.20	2	26	0.002	0.200	0.040	41380	165	1.3
0.40	2	50	0.002	0.400	0.080	39790	160	5.1
0.50	2	50	0.004	0.500	0.100	31830	255	12.7
0.60	2	50	0.006	0.600	0.120	26525	320	22.9
0.80	2	50	0.008	0.800	0.160	19895	320	40.7
1.00	2	50	0.008	1.000	0.200	15915	255	50.9
1.20	2	50	0.010	1.200	0.240	13265	265	76.4
1.50	2	50	0.012	1.500	0.300	10610	255	114.6
1.80	2	50	0.016	1.800	0.360	8840	285	183.3
0.20	2	26	0.002	0.040	0.200	41380	165	1.3
0.40	2	53	0.004	0.080	0.400	42175	335	10.8
0.50	2	66	0.006	0.100	0.500	42015	505	25.2
0.60	2	79	0.006	0.120	0.600	41910	505	36.2
0.80	2	106	0.008	0.160	0.800	42175	675	86.4
1.00	2	132	0.012	0.200	1.000	42015	1010	201.7
1.20	2	158	0.014	0.240	1.200	41910	1175	338.0
1.50	2	160	0.016	0.300	1.500	33955	1085	488.9
1.80	2	160	0.020	0.360	1.800	28295	1130	733.4
0.20	2	26	0.002	0.040	0.200	41380	165	1.3
0.40	2	53	0.004	0.080	0.400	42175	335	10.8
0.50	2	66	0.006	0.100	0.500	42015	505	25.2
0.60	2	79	0.006	0.120	0.600	41910	505	36.2
0.80	2	106	0.008	0.160	0.800	42175	675	86.4
1.00	2	132	0.012	0.200	1.000	42015	1010	201.7
1.20	2	158	0.014	0.240	1.200	41910	1175	338.0
1.50	2	170	0.016	0.300	1.500	36075	1155	519.5
1.80	2	170	0.022	0.360	1.800	30065	1325	857.1
0.20	2	26	0.002	0.040	0.200	41380	165	1.3
0.40	2	53	0.004	0.080	0.400	42175	335	10.8
0.50	2	60	0.006	0.100	0.500	38195	460	22.9
0.60	2	60	0.006	0.120	0.600	31830	380	27.5
0.80	2	60	0.008	0.160	0.800	23875	380	48.9
1.00	2	60	0.010	0.200	1.000	19100	380	76.4
1.20	2	60	0.012	0.240	1.200	15915	380	110.0
1.50	2	60	0.014	0.300	1.500	12730	355	160.4
1.80	2	60	0.018	0.360	1.800	10610	380	247.5
0.20	2	26	0.002	0.040	0.200	41380	165	1.3
0.40	2	40	0.004	0.080	0.400	31830	255	8.1
0.50	2	40	0.004	0.100	0.500	25465	205	10.2
0.60	2	40	0.004	0.120	0.600	21220	170	12.2
0.80	2	40	0.006	0.160	0.800	15915	190	24.4
1.00	2	40	0.010	0.200	1.000	12730	255	50.9
1.20	2	40	0.012	0.240	1.200	10610	255	73.3
1.50	2	40	0.012	0.300	1.500	8490	205	91.7
1.80	2	40	0.016	0.360	1.800	7075	225	146.7

Application



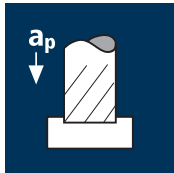
Material

Steel
< 850 N/mm²

Short-chipping brass
[CuZn]

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

Titanium alloys
> 300 HB
[Ti6Al4V]



Steel
< 850 N/mm²

Short-chipping brass
[CuZn]

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

Titanium alloys
> 300 HB
[Ti6Al4V]

d1 [mm]	z	v _c [m/min]	f _s [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _r [mm/min]	Q [cm ³ /min]
2.00	2	180	0.024	2.000	0.400	28650	1375	1.1
2.10	2	180	0.024	2.100	0.420	27285	1310	1.2
2.20	2	180	0.026	2.200	0.440	26045	1355	1.3
2.30	2	180	0.028	2.300	0.460	24910	1395	1.5
2.40	2	180	0.028	2.400	0.480	23875	1335	1.5
2.50	2	180	0.030	2.500	0.500	22920	1375	1.7
2.60	2	180	0.030	2.600	0.520	22035	1320	1.8
2.70	2	180	0.032	2.700	0.540	21220	1360	2.0
2.80	2	180	0.032	2.800	0.560	20465	1310	2.1
2.00	2	190	0.026	2.000	0.400	30240	1570	1.3
2.10	2	190	0.026	2.100	0.420	28800	1500	1.3
2.20	2	190	0.028	2.200	0.440	27490	1540	1.5
2.30	2	190	0.030	2.300	0.460	26295	1580	1.7
2.40	2	190	0.030	2.400	0.480	25200	1510	1.7
2.50	2	190	0.034	2.500	0.500	24190	1645	2.1
2.60	2	190	0.034	2.600	0.520	23260	1580	2.1
2.70	2	190	0.036	2.700	0.540	22400	1615	2.4
2.80	2	190	0.036	2.800	0.560	21600	1555	2.4
2.00	2	70	0.020	2.000	0.400	11140	445	0.4
2.10	2	70	0.020	2.100	0.420	10610	425	0.4
2.20	2	70	0.020	2.200	0.440	10130	405	0.4
2.30	2	70	0.022	2.300	0.460	9690	425	0.5
2.40	2	70	0.022	2.400	0.480	9285	410	0.5
2.50	2	70	0.024	2.500	0.500	8915	430	0.5
2.60	2	70	0.024	2.600	0.520	8570	410	0.6
2.70	2	70	0.026	2.700	0.540	8250	430	0.6
2.80	2	70	0.026	2.800	0.560	7960	415	0.6
2.00	2	50	0.016	2.000	0.400	7960	255	0.2
2.10	2	50	0.016	2.100	0.420	7580	245	0.2
2.20	2	50	0.018	2.200	0.440	7235	260	0.3
2.30	2	50	0.020	2.300	0.460	6920	275	0.3
2.40	2	50	0.020	2.400	0.480	6630	265	0.3
2.50	2	50	0.022	2.500	0.500	6365	280	0.4
2.60	2	50	0.022	2.600	0.520	6120	270	0.4
2.70	2	50	0.022	2.700	0.540	5895	260	0.4
2.80	2	50	0.022	2.800	0.560	5685	250	0.4
2.00	2	160	0.022	0.400	2.000	25465	1120	0.9
2.10	2	160	0.024	0.420	2.100	24250	1165	1.0
2.20	2	160	0.024	0.440	2.200	23150	1110	1.1
2.30	2	160	0.026	0.460	2.300	22145	1150	1.2
2.40	2	160	0.026	0.480	2.400	21220	1105	1.3
2.50	2	160	0.028	0.500	2.500	20370	1140	1.4
2.60	2	160	0.028	0.520	2.600	19590	1095	1.5
2.70	2	160	0.030	0.540	2.700	18865	1130	1.7
2.80	2	160	0.032	0.560	2.800	18190	1165	1.8
2.00	2	170	0.024	0.400	2.000	27055	1300	1.0
2.10	2	170	0.026	0.420	2.100	25770	1340	1.2
2.20	2	170	0.026	0.440	2.200	24595	1280	1.2
2.30	2	170	0.028	0.460	2.300	23525	1320	1.4
2.40	2	170	0.028	0.480	2.400	22545	1265	1.5
2.50	2	170	0.030	0.500	2.500	21645	1300	1.6
2.60	2	170	0.030	0.520	2.600	20815	1250	1.7
2.70	2	170	0.032	0.540	2.700	20040	1285	1.9
2.80	2	170	0.034	0.560	2.800	19325	1315	2.1
2.00	2	60	0.020	0.400	2.000	9550	380	0.3
2.10	2	60	0.022	0.420	2.100	9095	400	0.4
2.20	2	60	0.022	0.440	2.200	8680	380	0.4
2.30	2	60	0.022	0.460	2.300	8305	365	0.4
2.40	2	60	0.022	0.480	2.400	7960	350	0.4
2.50	2	60	0.024	0.500	2.500	7640	365	0.5
2.60	2	60	0.024	0.520	2.600	7345	355	0.5
2.70	2	60	0.026	0.540	2.700	7075	370	0.5
2.80	2	60	0.028	0.560	2.800	6820	380	0.6
2.00	2	40	0.018	0.400	2.000	6365	230	0.2
2.10	2	40	0.020	0.420	2.100	6065	245	0.2
2.20	2	40	0.020	0.440	2.200	5785	230	0.2
2.30	2	40	0.020	0.460	2.300	5535	220	0.2
2.40	2	40	0.020	0.480	2.400	5305	210	0.2
2.50	2	40	0.022	0.500	2.500	5095	225	0.3
2.60	2	40	0.022	0.520	2.600	4895	215	0.3
2.70	2	40	0.024	0.540	2.700	4715	225	0.3
2.80	2	40	0.026	0.560	2.800	4545	235	0.4