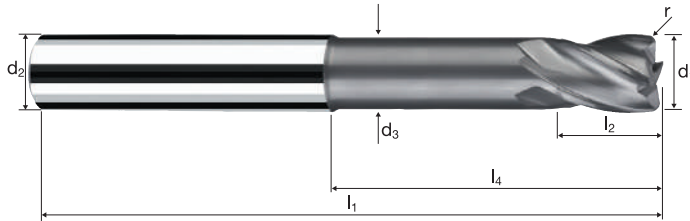
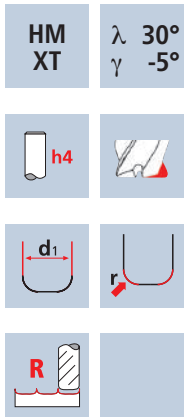


Corner radius end mills ToroX

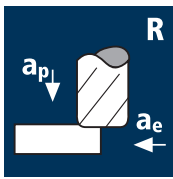
Tolerance r 0/+0.015, 6xd



Rm	Rm	Rm	HRC	HRC	HRC	Ti	GG(G)
850-1100	1100-1300	1300-1500	48-56	56-60	> 60	Titanium	Tool Steel HSS

Ø Code	Example: Order-N°.											X-AL
	d ₁ 0/-0.01	d ₂ h4	d ₃	l ₁	l ₂	l ₃	l ₄	r 0/+0.015	α	z	X7104	
	Coating: X			Article-N°: 7104			ø-Code: 138					
138	2.00	6.00	1.90	66	3.00	12.00	20.31	0.200	5.9°	4	●	
178	3.00	6.00	2.80	66	4.00	18.00	24.63	0.200	3.7°	4	●	
218	4.00	6.00	3.70	69	5.00	24.00	28.95	0.200	2.1°	4	●	
258	5.00	6.00	4.60	75	6.00	30.00	33.27	0.200	0.9°	4	●	
297	6.00	6.00	5.50	80	7.00	42.34	43.00	0.200	0.0°	4	●	
385	8.00	8.00	7.40	90	9.00	52.29	53.00	0.200	0.0°	4	●	
445	10.00	10.00	9.20	105	11.00	63.20	64.00	0.200	0.0°	4	●	
496	12.00	12.00	11.00	120	13.00	73.13	74.00	0.200	0.0°	4	●	
140	2.00	6.00	1.90	66	3.00	12.00	20.31	0.500	6.0°	4	●	
180	3.00	6.00	2.80	66	4.00	18.00	24.63	0.500	3.7°	4	●	
220	4.00	6.00	3.70	69	5.00	24.00	28.95	0.500	2.1°	4	●	
260	5.00	6.00	4.60	75	6.00	30.00	33.27	0.500	0.9°	4	●	
300	6.00	6.00	5.50	80	7.00	42.34	43.00	0.500	0.0°	4	●	
388	8.00	8.00	7.40	90	9.00	52.29	53.00	0.500	0.0°	4	●	
448	10.00	10.00	9.20	105	11.00	63.20	64.00	0.500	0.0°	4	●	
498	12.00	12.00	11.00	120	13.00	73.13	74.00	0.500	0.0°	4	●	

Application



Material

Hardened tool steel
42 - 48 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _t [mm/min]	r [mm]
2.00	4	180	0.025	0.600	0.800	28650	2865	0.50
3.00	4	180	0.035	0.600	1.200	19100	2675	0.50
4.00	4	180	0.045	0.600	1.600	14325	2580	0.50
5.00	4	180	0.045	0.600	2.000	11460	2065	0.50
6.00	4	180	0.050	0.600	2.400	9550	1910	0.50
8.00	4	180	0.060	0.600	3.200	7160	1720	0.50
10.00	4	180	0.080	0.600	4.000	5730	1835	0.50
12.00	4	180	0.095	0.600	4.800	4775	1815	0.50

Hardened tool steel
48 - 52 HRC



2.00	4	140	0.025	0.600	0.800	22280	2230	0.50
3.00	4	140	0.030	0.600	1.200	14855	1785	0.50
4.00	4	140	0.040	0.600	1.600	11140	1785	0.50
5.00	4	140	0.040	0.600	2.000	8915	1425	0.50
6.00	4	140	0.045	0.600	2.400	7425	1335	0.50
8.00	4	140	0.055	0.600	3.200	5570	1225	0.50
10.00	4	140	0.070	0.600	4.000	4455	1250	0.50
12.00	4	140	0.085	0.600	4.800	3715	1265	0.50

Hardened tool steel
52 - 56 HRC



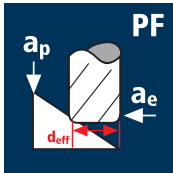
2.00	4	100	0.020	0.600	0.800	15915	1275	0.50
3.00	4	100	0.030	0.600	1.200	10610	1275	0.50
4.00	4	100	0.035	0.600	1.600	7960	1115	0.50
5.00	4	100	0.035	0.600	2.000	6365	890	0.50
6.00	4	100	0.040	0.600	2.400	5305	850	0.50
8.00	4	100	0.050	0.600	3.200	3980	795	0.50
10.00	4	100	0.065	0.600	4.000	3185	830	0.50
12.00	4	100	0.080	0.600	4.800	2655	850	0.50

Hardened tool steel
56 - 60 HRC



2.00	4	70	0.015	0.600	0.800	11140	670	0.50
3.00	4	70	0.020	0.600	1.200	7425	595	0.50
4.00	4	70	0.025	0.600	1.600	5570	555	0.50
5.00	4	70	0.025	0.600	2.000	4455	445	0.50
6.00	4	70	0.030	0.600	2.400	3715	445	0.50
8.00	4	70	0.035	0.600	3.200	2785	390	0.50
10.00	4	70	0.045	0.600	4.000	2230	400	0.50
12.00	4	70	0.055	0.600	4.800	1855	410	0.50

Application



Material

Hardened tool steel
42 - 48 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _t [mm/min]	β [°]
2.00	4	263	0.045	0.100	0.100	1.99	42070	7570	45°
3.00	4	360	0.065	0.120	0.120	3.00	38195	9930	45°
4.00	4	360	0.085	0.120	0.120	4.00	28650	9740	45°
5.00	4	360	0.100	0.160	0.160	5.00	22920	9165	45°
6.00	4	360	0.135	0.180	0.180	6.00	19100	10315	45°
8.00	4	360	0.150	0.200	0.200	7.99	14340	8605	45°
10.00	4	360	0.200	0.240	0.240	9.97	11495	9195	45°
12.00	4	360	0.170	0.260	0.260	11.96	9580	6515	45°

Hardened tool steel
48 - 52 HRC



2.00	4	250	0.045	0.100	0.100	1.99	39990	7200	45°
3.00	4	250	0.060	0.120	0.120	3.00	26525	6365	45°
4.00	4	250	0.080	0.120	0.120	4.00	19895	6365	45°
5.00	4	250	0.095	0.160	0.160	5.00	15915	6050	45°
6.00	4	250	0.130	0.180	0.180	6.00	13265	6895	45°
8.00	4	250	0.145	0.200	0.200	7.99	9960	5775	45°
10.00	4	250	0.190	0.240	0.240	9.97	7980	6065	45°
12.00	4	250	0.160	0.260	0.260	11.96	6655	4260	45°

Hardened tool steel
52 - 56 HRC



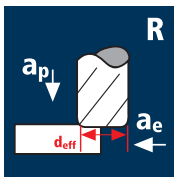
2.00	4	180	0.040	0.100	0.100	1.99	28790	4605	45°
3.00	4	180	0.055	0.120	0.120	3.00	19100	4200	45°
4.00	4	180	0.075	0.120	0.120	4.00	14325	4295	45°
5.00	4	180	0.085	0.160	0.160	5.00	11460	3895	45°
6.00	4	180	0.115	0.180	0.180	6.00	9550	4395	45°
8.00	4	180	0.130	0.200	0.200	7.99	7170	3730	45°
10.00	4	180	0.170	0.240	0.240	9.97	5745	3910	45°
12.00	4	180	0.145	0.260	0.260	11.96	4790	2780	45°

Hardened tool steel
56 - 60 HRC



2.00	4	100	0.025	0.100	0.100	1.99	15995	1600	45°
3.00	4	100	0.035	0.120	0.120	3.00	10610	1485	45°
4.00	4	100	0.045	0.120	0.120	4.00	7960	1430	45°
5.00	4	100	0.050	0.160	0.160	5.00	6365	1275	45°
6.00	4	100	0.070	0.180	0.180	6.00	5305	1485	45°
8.00	4	100	0.075	0.200	0.200	7.99	3985	1195	45°
10.00	4	100	0.100	0.240	0.240	9.97	3195	1275	45°
12.00	4	100	0.085	0.260	0.260	11.96	2660	905	45°

Application



Material

Hardened tool steel
42 - 48 HRC



Hardened tool steel
48 - 52 HRC



Hardened tool steel
52 - 56 HRC



Hardened tool steel
56 - 60 HRC



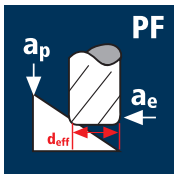
d1 [mm]	z	v _c [m/min]	f _s [mm]	a _s [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
4.00	4	200	0.045	0.600	2.400	3.83	16620	2990	1.00
5.00	4	200	0.050	0.600	3.000	4.83	13180	2635	1.00
6.00	4	200	0.055	0.600	3.600	5.83	10920	2400	1.00
8.00	4	200	0.070	0.600	4.800	7.83	8130	2275	1.00
10.00	4	200	0.090	0.600	6.000	9.83	6475	2330	1.00
12.00	4	200	0.105	0.600	7.200	11.83	5380	2260	1.00

4.00	4	160	0.040	0.600	2.400	3.83	13300	2130	1.00
5.00	4	160	0.045	0.600	3.000	4.83	10545	1900	1.00
6.00	4	160	0.050	0.600	3.600	5.83	8735	1745	1.00
8.00	4	160	0.065	0.600	4.800	7.83	6505	1690	1.00
10.00	4	160	0.080	0.600	6.000	9.83	5180	1660	1.00
12.00	4	160	0.095	0.600	7.200	11.83	4305	1635	1.00

4.00	4	150	0.035	0.600	2.400	3.83	12465	1745	1.00
5.00	4	150	0.040	0.600	3.000	4.83	9885	1580	1.00
6.00	4	150	0.045	0.600	3.600	5.83	8190	1475	1.00
8.00	4	150	0.055	0.600	4.800	7.83	6100	1340	1.00
10.00	4	150	0.075	0.600	6.000	9.83	4855	1455	1.00
12.00	4	150	0.085	0.600	7.200	11.83	4035	1370	1.00

4.00	4	70	0.025	0.600	1.600	3.83	5820	580	1.00
5.00	4	70	0.030	0.600	2.000	4.83	4615	555	1.00
6.00	4	70	0.030	0.600	2.400	5.83	3820	460	1.00
8.00	4	70	0.040	0.600	3.200	7.83	2845	455	1.00
10.00	4	70	0.050	0.600	4.000	9.83	2265	455	1.00
12.00	4	70	0.060	0.600	4.800	11.83	1885	450	1.00

Application



Material

Hardened tool steel
42 - 48 HRC



Hardened tool steel
48 - 52 HRC



Hardened tool steel
52 - 56 HRC



Hardened tool steel
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _s [mm]	a _s [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4.00	4	300	0.065	0.180	0.180	3.97	24055	6255	45°
5.00	4	300	0.075	0.240	0.240	4.99	19135	5740	45°
6.00	4	300	0.090	0.270	0.270	6.00	15915	5730	45°
8.00	4	300	0.125	0.300	0.300	8.00	11935	5970	45°
10.00	4	300	0.145	0.360	0.360	9.99	9560	5545	45°
12.00	4	300	0.170	0.390	0.390	11.98	7970	5420	45°

4.00	4	220	0.060	0.180	0.180	3.97	17640	4235	45°
5.00	4	220	0.070	0.240	0.240	4.99	14035	3930	45°
6.00	4	220	0.085	0.270	0.270	6.00	11670	3970	45°
8.00	4	220	0.120	0.300	0.300	8.00	8755	4200	45°
10.00	4	220	0.140	0.360	0.360	9.99	7010	3925	45°
12.00	4	220	0.160	0.390	0.390	11.98	5845	3740	45°

4.00	4	160	0.055	0.180	0.180	3.97	12830	2820	45°
5.00	4	160	0.065	0.240	0.240	4.99	10205	2655	45°
6.00	4	160	0.075	0.270	0.270	6.00	8490	2545	45°
8.00	4	160	0.110	0.300	0.300	8.00	6365	2800	45°
10.00	4	160	0.125	0.360	0.360	9.99	5100	2550	45°
12.00	4	160	0.145	0.390	0.390	11.98	4250	2465	45°

4.00	4	80	0.035	0.180	0.180	3.97	6415	900	45°
5.00	4	80	0.040	0.240	0.240	4.99	5105	815	45°
6.00	4	80	0.045	0.270	0.270	6.00	4245	765	45°
8.00	4	80	0.065	0.300	0.300	8.00	3185	830	45°
10.00	4	80	0.075	0.360	0.360	9.99	2550	765	45°
12.00	4	80	0.085	0.390	0.390	11.98	2125	725	45°