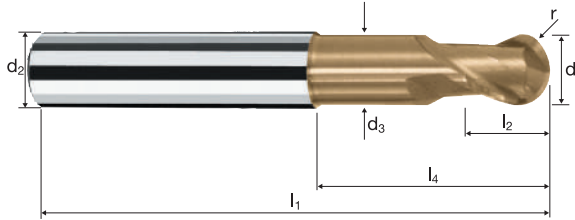
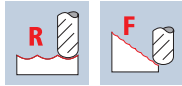
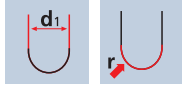
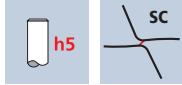


Ball nose end mills Sphero-X

Tolerance r ± 0.005 , 3xd



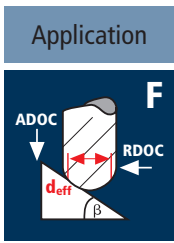
**HM
XA** λ **30°**
 γ -**10°**



HRC 34-42 **HRC** 42-48 **HRC** 48-56 **HRC** 56-60 **HRC** > 60 **HSS**

Order-N°	d_1	d_2 h_5	d_3	l_1	l_2	l_3	l_4	r ± 0.005	α		fl	DURO-V
V7470100	1	6	0.95	57	1.5	3.00	13.08	0.5	11.8°		2	●
V7470140	2	6	1.90	57	3.0	6.00	14.31	1.0	9.0°		2	●
V7470180	3	6	2.80	57	4.0	9.00	15.63	1.5	6.4°		2	●
V7470220	4	6	3.70	57	5.0	12.00	16.95	2.0	4.0°		2	●
V7470260	5	6	4.60	57	6.0	15.00	18.27	2.5	2.0°		2	●
V7470300	6	6	5.50	57	7.0	19.34	20.00	3.0	0.0°		2	●
V7470391	8	8	7.40	63	9.0	25.29	26.00	4.0	0.0°		2	●
V7470450	10	10	9.20	72	11.0	30.20	31.00	5.0	0.0°		2	●
V7470501	12	12	11.00	83	13.0	36.13	37.00	6.0	0.0°		2	●
V7470610	16	16	15.00	92	17.0	42.13	43.00	8.0	0.0°		2	●

VII



Material

Hardened tool steel
52 - 56 HRC

d1 [mm]	fl	Speed [m/min]	FPT [mm]	ADOC [mm]	RDOC [mm]	d _{eff} [mm]	RPM [min ⁻¹]	Feed [mm/min]	β [°]
1	2	200	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	200	0.030	0.07	0.07	1.84	34600	2075	45°
3	2	200	0.035	0.10	0.10	2.74	23235	1625	45°
4	2	200	0.065	0.12	0.12	3.62	17585	2285	45°
5	2	200	0.070	0.15	0.15	4.53	14055	1970	45°
6	2	200	0.075	0.15	0.15	5.36	11880	1780	45°
8	2	200	0.085	0.17	0.17	7.05	9030	1535	45°
10	2	200	0.090	0.20	0.20	8.77	7260	1305	45°
12	2	200	0.095	0.25	0.25	10.56	6030	1145	45°

Hardened tool steel
56 - 60 HRC

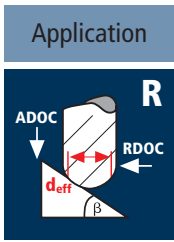
1	2	150	0.025	0.05	0.05	0.94	50795	2540	45°
2	2	150	0.030	0.07	0.07	1.84	25950	1555	45°
3	2	150	0.035	0.10	0.10	2.74	17425	1220	45°
4	2	150	0.060	0.12	0.12	3.62	13190	1585	45°
5	2	150	0.065	0.15	0.15	4.53	10540	1370	45°
6	2	150	0.070	0.15	0.15	5.36	8910	1245	45°
8	2	150	0.080	0.17	0.17	7.05	6775	1085	45°
10	2	150	0.085	0.20	0.20	8.77	5445	925	45°
12	2	150	0.090	0.25	0.25	10.56	4520	815	45°

Hardened tool steel
60 - 64 HRC

1	2	90	0.020	0.04	0.04	0.93	30805	1230	45°
2	2	90	0.025	0.06	0.06	1.80	15915	795	45°
3	2	90	0.030	0.08	0.08	2.68	10690	640	45°
4	2	90	0.050	0.09	0.09	3.54	8095	810	45°
5	2	90	0.055	0.12	0.12	4.43	6465	710	45°
6	2	90	0.060	0.12	0.12	5.24	5465	655	45°
8	2	90	0.070	0.13	0.13	6.90	4150	580	45°
10	2	90	0.070	0.15	0.15	8.58	3340	470	45°
12	2	90	0.075	0.19	0.19	10.34	2770	415	45°

Hardened tool steel
64 - 70 HRC

1	2	60	0.015	0.03	0.03	0.89	21460	645	45°
2	2	60	0.020	0.04	0.04	1.74	10975	440	45°
3	2	60	0.020	0.05	0.05	2.59	7375	295	45°
4	2	60	0.035	0.06	0.06	3.43	5570	390	45°
5	2	60	0.040	0.08	0.08	4.29	4450	355	45°
6	2	60	0.040	0.08	0.08	5.08	3760	300	45°
8	2	60	0.050	0.09	0.09	6.70	2850	285	45°
10	2	60	0.050	0.10	0.10	8.34	2290	230	45°
12	2	60	0.055	0.13	0.13	10.03	1905	210	45°



Material

Hardened tool steel
52 - 56 HRC

d1 [mm]	fl	Speed [m/min]	FPT [mm]	ADOC [mm]	RDOC [mm]	d _{eff} [mm]	RPM [min ⁻¹]	Feed [mm/min]	β [°]
1	2	130	0.045	0.12	0.12	0.94	44025	3960	30°
2	2	130	0.070	0.24	0.24	1.89	21895	3065	30°
3	2	130	0.075	0.36	0.36	2.83	14620	2195	30°
4	2	130	0.090	0.48	0.48	3.77	10975	1975	30°
5	2	130	0.100	0.60	0.60	4.71	8785	1755	30°
6	2	130	0.110	0.72	0.72	5.66	7310	1610	30°
8	2	130	0.125	0.96	0.96	7.54	5490	1375	30°
10	2	130	0.145	1.10	1.10	9.32	4440	1290	30°
12	2	130	0.155	1.20	1.20	11.04	3750	1165	30°

Hardened tool steel
56 - 60 HRC

1	2	80	0.025	0.10	0.10	0.92	27680	1385	30°
2	2	80	0.040	0.19	0.19	1.83	13915	1115	30°
3	2	80	0.045	0.29	0.29	2.75	9260	835	30°
4	2	80	0.055	0.38	0.38	3.65	6975	765	30°
5	2	80	0.060	0.48	0.48	4.57	5570	670	30°
6	2	80	0.065	0.58	0.58	5.49	4640	605	30°
8	2	80	0.075	0.77	0.77	7.32	3480	520	30°
10	2	80	0.085	0.88	0.88	9.03	2820	480	30°
12	2	80	0.095	0.96	0.96	10.68	2385	455	30°

Hardened tool steel
60 - 64 HRC

1	2	60	0.020	0.08	0.08	0.89	21460	860	30°
2	2	60	0.030	0.14	0.14	1.74	10975	660	30°
3	2	60	0.035	0.22	0.22	2.63	7260	510	30°
4	2	60	0.040	0.29	0.29	3.51	5440	435	30°
5	2	60	0.045	0.36	0.36	4.38	4360	390	30°
6	2	60	0.050	0.43	0.43	5.25	3640	365	30°
8	2	60	0.055	0.58	0.58	7.01	2725	300	30°
10	2	60	0.065	0.66	0.66	8.64	2210	285	30°
12	2	60	0.070	0.72	0.72	10.22	1870	260	30°

Hardened tool steel
64 - 70 HRC

1	2	40	0.020	0.08	0.08	0.89	14305	570	30°
2	2	40	0.030	0.14	0.14	1.74	7320	440	30°
3	2	40	0.035	0.22	0.22	2.63	4840	340	30°
4	2	40	0.040	0.29	0.29	3.51	3630	290	30°
5	2	40	0.045	0.36	0.36	4.38	2905	260	30°
6	2	40	0.050	0.43	0.43	5.25	2425	245	30°
8	2	40	0.055	0.58	0.58	7.01	1815	200	30°
10	2	40	0.065	0.66	0.66	8.64	1475	190	30°
12	2	40	0.070	0.72	0.72	10.22	1245	175	30°