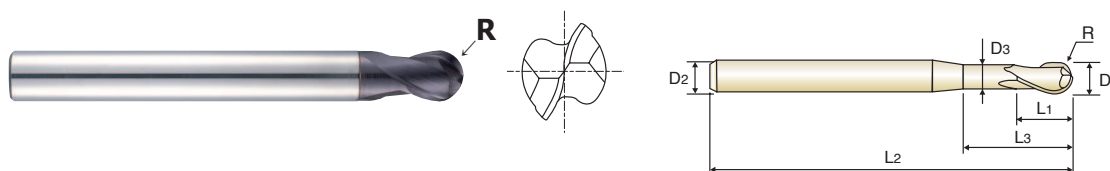


**CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE for OVER HRc55**  
**VOLLHARTMETALL, 2 SCHNEIDEN EXTRA KURZ STIRNRADIUS für ÜBER HRc55**

- ▶ Suitable for HRc55~HRc70 high hardened materials.
- ▶ Strong cutting edges and higher tool rigidity.
- ▶ Radius tolerance  $\pm 0.01$ mm.

- ▶ Geeignet zum Fräsen von HRc55 ~ HRc70
- ▶ Robuste Schneidkanten und hohe Werkzeughärte.
- ▶ Radius Toleranz  $\pm 0.01$ mm.



Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
PLAIN	FLAT	R ( $\pm 0.01$ )	D1	D2	L1	L3	L2	D3
G4953010	—	R0.5	1.0	4	1	2.2	50	0.95
G4953012	—	R0.6	1.2	4	1.2	2.6	50	1.1
G4953015	—	R0.75	1.5	4	1.5	3	50	1.4
G4953020	G4954020	R1.0	2.0	6	2	4	50	1.9
G4953030	G4954030	R1.5	3.0	6	3	6	60	2.9
G4953040	G4954040	R2.0	4.0	6	4	8	70	3.9
G4953050	G4954050	R2.5	5.0	6	5	10	80	4.9
G4953060	G4954060	R3.0	6.0	6	6	12	90	5.9
G4953070	G4954070	R3.5	7.0	8	7	14	90	6.9
G4953080	G4954080	R4.0	8.0	8	8	16	100	7.9
G4953090	G4954090	R4.5	9.0	10	9	18	100	8.9
G4953100	G4954100	R5.0	10.0	10	10	20	100	9.9
G4953120	G4954120	R6.0	12.0	12	12	24	110	11.9
G4953140	G4954140	R7.0	14.0	14	14	28	110	13.8
G4953160	G4954160	R8.0	16.0	16	16	32	140	15.8
G4953180	G4954180	R9.0	18.0	18	18	36	140	17.8
G4953200	G4954200	R10.0	20.0	20	20	40	160	19.8
G4953250	G4954250	R12.5	25.0	25	25	50	180	24.8

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
			○	◎	◎									



**RECOMMENDED CUTTING CONDITIONS  
EMPFOHLENE SCHNEIDKONDITIONEN**

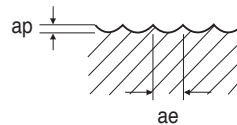
**CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE for OVER HRC55  
VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS EXTRA KURZ für ÜBER HRC55**

**G4953, G4954 SERIES**

**■ NORMAL SPEED**

MATERIAL	HARDENED STEELS				HARDENED STEELS				HARDENED STEELS				HARDENED STEELS			
	HRC45 ~ HRC50				HRC50 ~ HRC55				HRC55 ~ HRC60				HRC60 ~ HRC70			
HARDNESS																
STRENGTH	1500 ~ 1750N/mm <sup>2</sup>				1750 ~ 2000N/mm <sup>2</sup>				2000 ~ 2080N/mm <sup>2</sup>				2080N/mm <sup>2</sup> ~			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
R0.5 × 1.0	20000	460	65	0.012	20000	400	65	0.010	20000	350	65	0.009	20000	240	65	0.006
R0.75 × 1.5	16300	640	75	0.020	16100	580	75	0.018	16000	570	75	0.018	14200	360	65	0.013
R1.0 × 2.0	14500	800	90	0.028	14200	740	90	0.026	13850	760	85	0.027	11300	465	70	0.021
R1.25 × 2.5	13400	950	105	0.035	13000	890	100	0.034	12600	920	100	0.037	9600	560	75	0.029
R1.5 × 3.0	12700	1100	120	0.043	12300	1050	115	0.043	11800	1000	110	0.042	8400	660	80	0.039
R2.0 × 4.0	10600	1100	135	0.052	10300	1050	130	0.051	9800	1000	125	0.051	6650	650	85	0.049
R2.5 × 5.0	9400	1100	150	0.059	9050	1050	140	0.058	8600	950	135	0.055	5600	680	90	0.061
R3.0 × 6.0	8600	1150	160	0.067	8250	1100	155	0.067	7850	950	150	0.061	4850	700	90	0.072
R4.0 × 8.0	7000	1050	175	0.075	6700	1000	170	0.075	6350	950	160	0.075	3800	650	95	0.086
R5.0 × 10.0	6050	1000	190	0.083	5800	960	180	0.083	5450	900	170	0.083	3200	620	100	0.097
R6.0 × 12.0	5450	1000	205	0.092	5200	960	195	0.092	4900	900	185	0.092	2750	610	105	0.111
R8.0 × 16.0	4350	870	220	0.100	4150	830	210	0.100	3900	820	195	0.105	2150	265	110	0.062
R10.0 × 20.0	3500	690	220	0.099	3300	650	205	0.098	3150	630	200	0.100	1700	220	105	0.065

ap: D1~D4 = 0.05 × D  
D5~D8 = 0.25mm  
D10~D20 = 0.30mm  
ae: D1~D20 = 0.1 × D

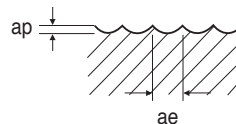


RPM = rev./min. Vc = m/min.  
FEED = mm/min. fz = mm/t

**■ HIGH SPEED**

MATERIAL	HARDENED STEELS				HARDENED STEELS				HARDENED STEELS			
	HRC45 ~ HRC50				HRC50 ~ HRC55				HRC55 ~ HRC70			
HARDNESS												
STRENGTH	1500 ~ 1750N/mm <sup>2</sup>				1750 ~ 2000N/mm <sup>2</sup>				2000N/mm <sup>2</sup> ~			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
R0.5 × 1.0	20000	770	65	0.019	20000	700	65	0.018	20000	410	65	0.010
R0.75 × 1.5	16300	1050	75	0.032	16100	980	75	0.030	16000	580	75	0.018
R1.0 × 2.0	14500	1300	90	0.045	14200	1230	90	0.043	13850	700	85	0.025
R1.25 × 2.5	13400	1500	105	0.056	13000	1430	100	0.055	12600	780	100	0.031
R1.5 × 3.0	12700	1750	120	0.069	12300	1670	115	0.068	11800	860	110	0.036
R2.0 × 4.0	10600	1700	135	0.080	10300	1620	130	0.079	9800	860	125	0.044
R2.5 × 5.0	9400	1650	150	0.088	9050	1570	140	0.087	8600	860	135	0.050
R3.0 × 6.0	8600	1750	160	0.102	8250	1670	155	0.101	7850	865	150	0.055
R4.0 × 8.0	7000	1550	175	0.111	6700	1460	170	0.109	6350	890	160	0.070
R5.0 × 10.0	6050	1450	190	0.120	5800	1360	180	0.117	5450	870	170	0.080
R6.0 × 12.0	5450	1420	205	0.130	5200	1330	195	0.128	4900	785	185	0.080
R8.0 × 16.0	4350	1230	220	0.141	4150	1130	210	0.136	3900	485	195	0.062
R10.0 × 20.0	3500	1000	220	0.143	3300	900	205	0.136	3150	410	200	0.065

ap: D1~D4 = 0.05 × D  
D5~D8 = 0.25mm  
D10~D20 = 0.30mm  
ae: D1~D20 = 0.05 × D



RPM = rev./min. Vc = m/min.  
FEED = mm/min. fz = mm/t