

IMPACT MIRACLE END MILLS

VF3XB

Ball nose, Taper neck, 3 flute, For hardened materials

CARBIDE

SOLID END MILLS

Work material			Carbon steel, Cast iron, Alloy steel (—30HRC)			Alloy steel, Tool steel, Pre-hardened steel			Hardened steel (45—55HRC)			Hardened steel (55—62HRC)			
			Cf53, GG25			X40CrMoV51			X40CrMoV51			X210Cr12			
R (mm)	Taper angle one side	Neck length (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Depth of cut ap (mm)	
R1	0.4°	16	15000	3200	0.07	14000	2600	0.06	11000	2000	0.05	8800	1600	0.03	
		20	14000	2400	0.06	13000	2000	0.05	10000	1500	0.04	8000	1200	0.03	
		25	14000	2100	0.04	13000	1700	0.04	10000	1300	0.03	8000	1000	0.02	
		30	13000	1800	0.03	12000	1400	0.03	9000	1100	0.025	7200	880	0.02	
		35	13000	1600	0.03	12000	1300	0.025	9000	1000	0.02	7200	800	0.015	
		40	12000	1400	0.015	11000	1200	0.01	8500	900	0.01	6800	720	0.007	
	0.9°	20	14000	2600	0.06	13000	2100	0.05	10000	1600	0.04	8000	1300	0.03	
		25	14000	2200	0.05	13000	1800	0.04	10000	1400	0.03	8000	1100	0.025	
		30	13000	1900	0.04	12000	1600	0.04	9000	1200	0.03	7200	960	0.02	
		35	13000	1800	0.04	12000	1400	0.03	9000	1100	0.025	7200	880	0.02	
		40	12000	1600	0.03	11000	1300	0.025	8500	1000	0.02	6800	800	0.015	
		50	11000	1400	0.015	10000	1200	0.01	8000	900	0.01	6400	720	0.007	
	1.5°	60	9800	1100	0.007	9100	910	0.006	7000	700	0.005	5600	560	0.003	
		70	8400	960	0.004	7800	780	0.004	6000	600	0.003	4800	480	0.002	
		25	14000	2400	0.05	13000	2000	0.04	10000	1500	0.03	8000	1200	0.025	
		30	12600	2100	0.04	12000	1700	0.04	9000	1300	0.03	7200	1000	0.02	
1.5°	35	13000	1900	0.04	12000	1600	0.03	9000	1200	0.025	7200	960	0.02		
	40	12000	1800	0.03	11000	1400	0.025	8500	1100	0.02	6800	880	0.015		
	R1.25	0.9°	20	13000	2900	0.06	12000	2300	0.05	9000	1800	0.04	7200	1400	0.03
			30	12000	2600	0.05	11000	2100	0.04	8500	1600	0.03	6800	1300	0.025
40			11000	2200	0.04	9800	1800	0.04	7500	1400	0.03	6000	1100	0.02	
1.5°		20	13000	3000	0.06	12000	2500	0.05	9000	1900	0.04	7200	1500	0.03	
		30	12000	2700	0.05	11050	2200	0.04	8500	1700	0.03	6800	1400	0.025	
		40	11000	2400	0.04	9800	2000	0.04	7500	1500	0.03	6000	1200	0.02	
R1.5	0.4°	20	12000	3700	0.13	11000	3000	0.1	8500	2300	0.09	6800	1800	0.06	
		30	11000	2900	0.07	10000	2300	0.06	8000	1800	0.05	6400	1400	0.03	
		40	11000	2400	0.06	10000	2000	0.05	8000	1500	0.04	6400	1200	0.03	
		50	11000	2000	0.04	9800	1600	0.04	7500	1200	0.03	6000	960	0.02	
	0.9°	20	12000	3800	0.13	11000	3100	0.1	8500	2400	0.09	6800	1900	0.06	
		30	11000	3000	0.07	10000	2500	0.06	8000	1900	0.05	6400	1500	0.03	
		40	11000	2600	0.06	10000	2100	0.05	8000	1600	0.04	6400	1300	0.03	
		50	11000	2100	0.04	9800	1700	0.04	7500	1300	0.03	6000	1000	0.02	
		60	9800	2000	0.03	9100	1600	0.025	7000	1200	0.02	5600	960	0.015	
		70	9800	1800	0.015	9100	1400	0.01	7000	1100	0.01	5600	880	0.007	
	1.5°	50	11000	2200	0.04	9800	1800	0.04	7500	1400	0.03	6000	1100	0.02	
		60	9800	2100	0.03	9100	1700	0.025	7000	1300	0.02	5600	1000	0.015	
70		9800	2000	0.015	9100	1600	0.01	7000	1200	0.01	5600	960	0.007		
R2	0.9°	30	10000	3200	0.3	9400	2600	0.25	7200	2000	0.2	5800	1600	0.15	
		40	9500	2400	0.15	8800	2000	0.12	6800	1500	0.1	5400	1200	0.07	
		50	9500	2100	0.1	8800	1700	0.1	6800	1300	0.08	5400	1000	0.06	
		60	9000	1900	0.07	8300	1600	0.06	6400	1200	0.05	5100	960	0.03	
R2.5	0.9°	35	8000	3500	0.3	7400	2900	0.25	5700	2200	0.2	4600	1800	0.15	
		40	8000	3200	0.2	7400	2600	0.18	5700	2000	0.15	4600	1600	0.1	
		60	7600	2400	0.15	7000	2000	0.12	5400	1500	0.1	4300	1200	0.07	
Depth of cut		≤0.1R (R≤1) ≤0.2R (R>1) </													

1) If the depth of cut is shallow, the revolution and feed rate can be increased.

2) If the rigidity of the machine or the work materials installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.