

EPDRF-TH *Epoch Deep Radius F*

Solid Carbide 4-Flute Corner Radius End Mill



D1mm~D4mm

• **For Materials $\leq 69\text{HRC}$**

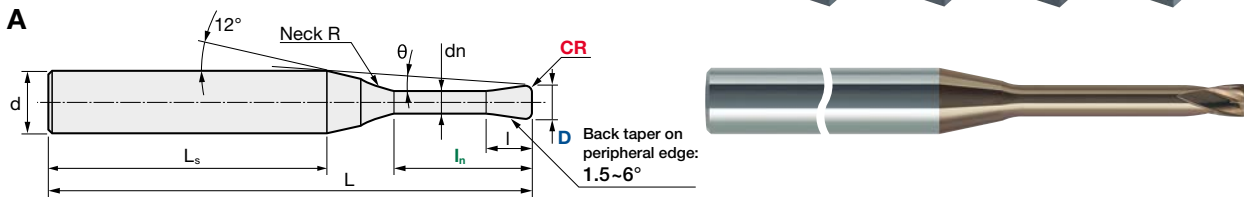
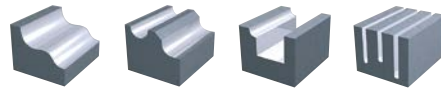
• **l_n 2~27xD**



www.moldino.eu

EPDRF-TH | Epoch Deep Radius F

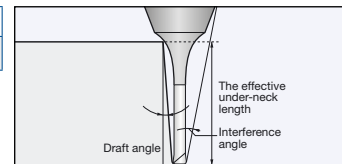
V max High Speed	Q max High Efficient	▽ Roughing	▽▽ Semi-Finishing	▽▽▽ Finishing	HRC 69	No. of Teeth 4
----------------------------	--------------------------------	----------------------	-----------------------------	-------------------------	------------------	--------------------------



※ Back Draft is not available for Diameter 4 mm

Carbide Micro Grain	TH45+ Nano-PVD Coating	Rake Angle Positive
-------------------------------	----------------------------------	-------------------------------

Helix Angle 20°	R Tol. [mm] +/- 0.005	d Tol. h5
---------------------------	---------------------------------	---------------------

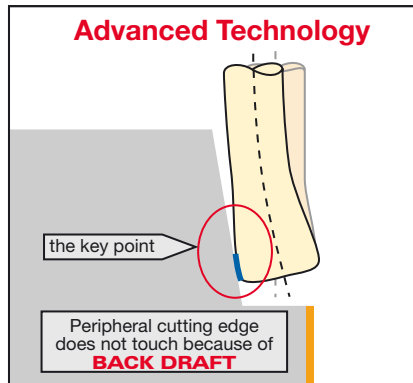
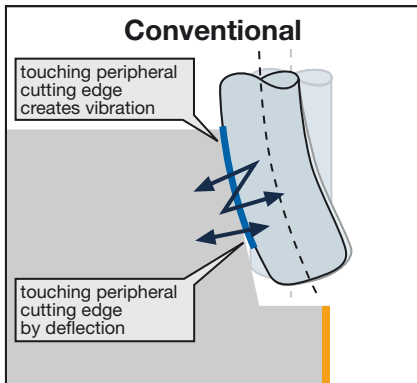


Size													Actual Effective Length in Incline Angles					
ID Code	Item Code	Z	D	CR	I _n	I	dn	L _s	L	d	Neck R	θ°	0.5°	1°	1.5°	2°	3°	
EP716	EPDRF-4010-4-005-TH	4	1	0.05	4	0.8	0.94	38.81	50	4		7.67	4.75	4.95	5.13	5.28	5.56	
EP717	EPDRF-4010-6-005-TH				6			36.81				6.51	6.84	7.09	7.30	7.49	8.13	
EP718	EPDRF-4010-8-005-TH				8			34.81				5.66	8.92	9.21	9.46	9.73	10.78	
EP719	EPDRF-4010-10-005-TH				10			32.81				5.00	10.99	11.32	11.59	12.12	13.44	
EP720	EPDRF-4010-12-005-TH				12			40.81				4.48	13.06	13.42	13.84	14.51	16.09	
EP721	EPDRF-4010-16-005-TH				16			36.81				3.71	17.18	17.60	18.40	19.30	21.40	
EP722	EPDRF-4010-20-005-TH			20	32.81			3.17	21.29			21.93	22.96	24.09	26.71			
EP723	EPDRF-4010-4-01-TH			0.1	4			38.81	50			7.70	4.74	4.95	5.12	5.28	5.55	
EP724	EPDRF-4010-6-01-TH				6			36.81				6.54	6.83	7.09	7.30	7.49	8.11	
EP725	EPDRF-4010-8-01-TH				8			34.81				5.68	8.91	9.21	9.45	9.72	10.77	
EP726	EPDRF-4010-10-01-TH				10			32.81				5.02	10.99	11.32	11.59	12.11	13.42	
EP727	EPDRF-4010-12-01-TH				12			40.81				4.50	13.06	13.42	13.83	14.50	16.08	
EP728	EPDRF-4010-16-01-TH				16			36.81				3.72	17.18	17.60	18.39	19.29	21.39	
EP729	EPDRF-4010-20-01-TH				20			32.81				3.17	21.29	21.93	22.95	24.08	26.70	
EP730	EPDRF-4015-4-01-TH		1.5				4	1.35				1.42	39.94	50	7.15	4.80	4.99	5.16
EP731	EPDRF-4015-8-01-TH			8			35.94		5.12				8.96		9.24	9.48	9.77	10.83
EP732	EPDRF-4015-12-01-TH			12			41.94		3.98				13.09		13.45	13.88	14.56	16.14
EP733	EPDRF-4015-15-01-TH			15			38.94		3.42				16.18		16.58	17.30	18.15	20.12
EP734	EPDRF-4015-20-01-TH			20			33.94		2.76				21.32		21.98	23.01	24.13	x
EP735	EPDRF-4020-4-005-TH		2	0.05		4	1.7	1.92	41.11			50	6.46	4.80	4.99	5.16	5.31	5.59
EP736	EPDRF-4020-8-005-TH					8			37.11				4.46	8.96	9.25	9.48	9.78	10.85
EP737	EPDRF-4020-12-005-TH					12			43.11				3.40	13.09	13.45	13.89	14.57	16.16
EP738	EPDRF-4020-16-005-TH					16			39.11				2.75	17.21	17.63	18.45	19.36	x
EP739	EPDRF-4020-20-005-TH					20			35.11				2.31	21.32	21.98	23.01	24.14	x
EP740	EPDRF-4020-4-01-TH	4				41.11			6.49	4.80	4.99		5.16	5.31	5.58			
EP741	EPDRF-4020-8-01-TH	8		37.11	4.47	8.96			9.24	9.48	9.77	10.83						
EP742	EPDRF-4020-12-01-TH	12		43.11	3.41	13.09			13.45	13.88	14.56	16.14						
EP743	EPDRF-4020-16-01-TH	16		39.11	2.76	17.21			17.62	18.44	19.35	x						
EP744	EPDRF-4020-20-01-TH	20		35.11	2.31	21.32			21.98	23.01	24.13	x						
EP745	EPDRF-4025-8-01-TH	2.5				8			2	2.4	38.24	50	3.68	9.00	9.27	9.51	9.83	10.89
EP746	EPDRF-4025-16-01-TH					16					40.24	2.19	17.24	17.67	18.50	19.40	x	
EP747	EPDRF-4025-20-01-TH		20			36.24	1.82	21.35			22.03	23.06	x	x				
EP748	EPDRF-4025-8-02-TH		8			38.24	3.72	8.99			9.27	9.50	9.81	10.86				
EP749	EPDRF-4025-16-02-TH		16			40.24	2.20	17.24			17.67	18.48	19.38	x				
EP750	EPDRF-4025-20-02-TH		20			36.24	1.83	21.34			22.02	23.05	x	x				
EP751	EPDRF-4030-8-02-TH	3		0.2	8	2.5	2.86	44.62	60	5.65	9.07	9.33	9.55	9.92	10.99			
EP752	EPDRF-4030-12-02-TH				12			40.62		4.48	13.19	13.52	14.03	14.71	16.30			
EP753	EPDRF-4030-16-02-TH				16			36.62		3.71	17.30	17.77	18.59	19.50	21.60			
EP754	EPDRF-4030-20-02-TH				20			42.62		3.16	21.40	22.13	23.15	24.28	26.91			
EP755	EPDRF-4030-25-02-TH				25			37.62		2.67	26.51	27.57	28.86	30.27	x			
EP756	EPDRF-4030-30-02-TH				30			42.62		2.31	31.62	33.02	34.56	36.25	x			
EP757	EPDRF-4040-12-02-TH	4			12	4	3.9	43.07	60	3.42	13.12	13.47	13.92	14.60	16.17			
EP758	EPDRF-4040-20-02-TH				20			35.07		2.32	21.34	22.02	23.05	24.17	x			
EP759	EPDRF-4040-30-02-TH				30			45.07		1.65	31.57	32.92	34.45	x	x			
EP760	EPDRF-4040-40-02-TH				40			35.07		1.29	41.94	43.81	x	x	x			

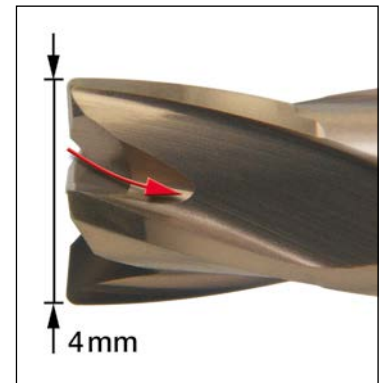
x = no contact

EPDRF-TH | Epoch Deep Radius F

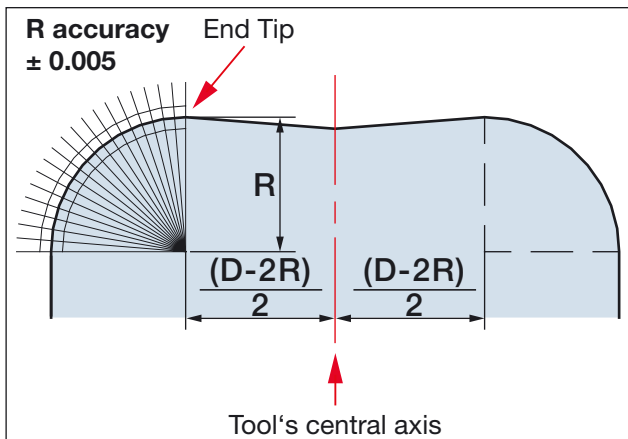
Advanced Technology – Back Draft



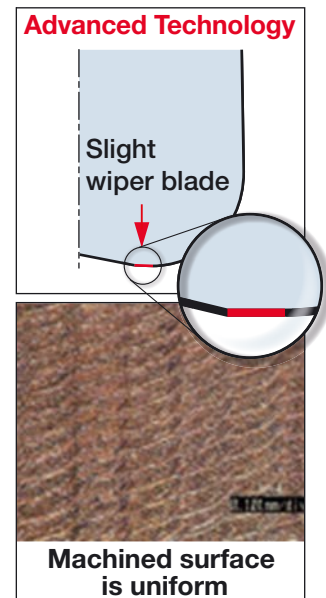
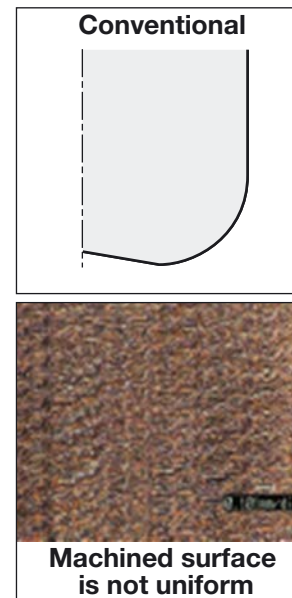
Smooth Chip Removal



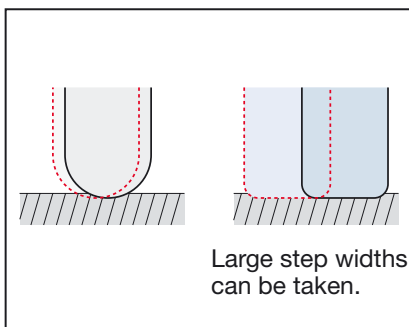
Unprecedented high corner R accuracy



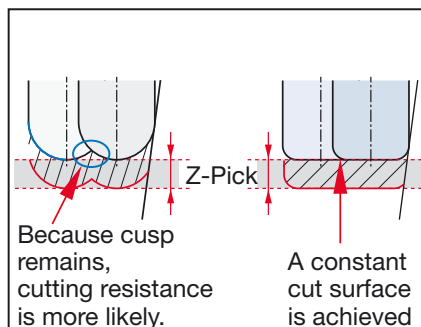
Bottom flute wiper effect



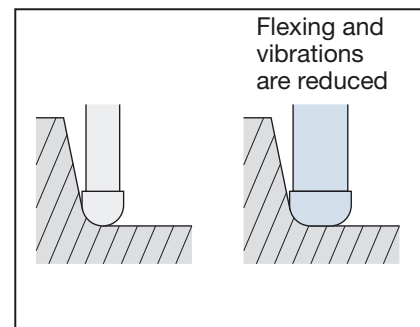
Features of radius end mill compared with ball end mill



1. Difference in step width



2. Difference in stability



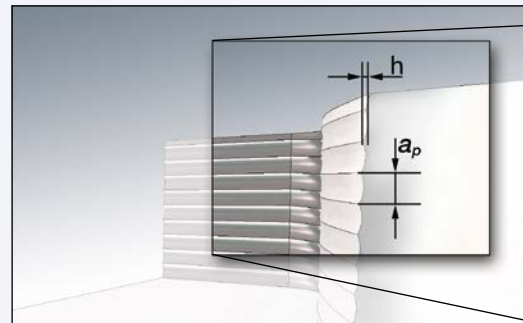
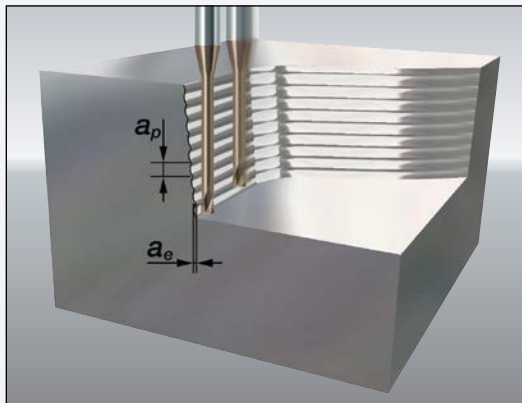
3. Difference in rigidity

EPDRF-TH | Recommended Cutting Conditions

	Workpiece Material			I							II							III						
				Copper							Carbon Steels · Alloy steels (180~250HB)							Stainless steels · Tool steels (25~35HRC)						
	D	CR	I _n	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min						
1	0.05 0.1 0.05 0.1 0.05 0.1 0.05 0.1 0.05 0.1 0.05	4	0.059	0.176	43200	0.024	4200	0.049	0.147	36000	0.024	3500	0.044	0.132	32400	0.024	3150	29160	0.024	3150				
			0.084	0.252		0.027	4670	0.070	0.210		0.027	3890	0.063	0.189		0.027	3500							
			0.034	0.101		0.022	3400	0.028	0.084		0.022	2840	0.025	0.076		0.022	2560							
		6	0.048	0.144	38880	0.024	3780	0.040	0.120	32400	0.024	3150	0.036	0.108	29160	0.024	2840	25920	0.024	2840				
			0.034	0.101		0.022	3400	0.028	0.084		0.022	2840	0.025	0.076		0.022	2560							
			0.048	0.144		0.024	3780	0.040	0.120		0.024	3150	0.036	0.108		0.024	2840							
		8	0.034	0.101	34560	0.022	3400	0.018	0.054	28800	0.022	2840	0.016	0.049	25920	0.022	2560	19440	0.022	2240				
			0.022	0.065		0.022	3400	0.018	0.054		0.022	2840	0.016	0.049		0.022	2240							
			0.030	0.090		0.024	3780	0.025	0.075		0.024	3150	0.023	0.068		0.024	2840							
		10	0.022	0.065	25920	0.019	2690	0.018	0.054	21600	0.019	2240	0.016	0.049	19440	0.019	2020	1760	0.019	1960				
			0.030	0.090		0.022	2990	0.025	0.075		0.022	2490	0.023	0.068		0.022	2240							
			0.013	0.040		0.017	1760	0.007	0.021		0.017	1470	0.006	0.019		0.017	1320							
12	0.018	0.054	33240	0.019	2610	0.015	0.045	27700	0.019	1960	0.010	0.030	25200	0.019	1760	22680	0.019	1630						
	0.008	0.025		0.017	1760	0.007	0.021		0.017	1470	0.006	0.019		0.017	1320									
	0.012	0.036		0.019	1960	0.010	0.030		0.019	1630	0.009	0.027		0.019	1470									
1.5	0.1	4	0.084	0.252	30240	0.026	3490	0.070	0.210	27700	0.026	2910	0.063	0.189	25200	0.026	2620	22680	0.026	2210				
		8	0.072	0.216		0.024	2940	0.060	0.180		0.024	2450	0.054	0.162		0.024	2210							
		15	0.046	0.137		0.022	2320	0.038	0.114		0.022	1940	0.034	0.103		0.022	1740							
		20	0.046	0.137		0.022	2320	0.038	0.114		0.022	1940	0.034	0.103		0.022	1740							
2	0.05 0.1 0.05 0.1 0.05 0.1 0.05 0.1 0.05 0.1	4	0.168	0.504	25200	0.046	4590	0.140	0.420	21000	0.046	3830	0.126	0.378	18900	0.046	3450	17000	0.046	3040				
			0.240	0.720		0.051	5100	0.200	0.600		0.051	4250	0.180	0.540		0.051	3830							
		8	0.120	0.360	22680	0.046	4590	0.100	0.300	18900	0.046	3830	0.090	0.270	14980	0.046	3100	12960	0.046	2630				
			0.168	0.504		0.051	5100	0.140	0.420		0.051	4250	0.126	0.378		0.051	3830							
		12	0.067	0.202	19980	0.041	3720	0.056	0.168	16700	0.041	3100	0.050	0.151	14980	0.041	2790	12960	0.041	2630				
			0.096	0.288		0.046	4130	0.080	0.240		0.046	3440	0.072	0.216		0.046	3100							
		16	0.067	0.202	22200	0.041	3720	0.056	0.168	17600	0.041	3100	0.050	0.151	14980	0.041	2790	12960	0.041	2630				
			0.096	0.288		0.046	4130	0.080	0.240		0.046	3440	0.072	0.216		0.046	3100							
		20	0.042	0.126	21100	0.041	3720	0.035	0.105	16700	0.041	3100	0.032	0.095	14980	0.041	2790	12960	0.041	2630				
			0.060	0.180		0.046	4130	0.050	0.150		0.046	3440	0.045	0.135		0.046	3100							
2.5	0.2 0.1 0.2 0.1	8	0.216	0.648	22200	0.046	4080	0.180	0.540	18500	0.046	3380	0.162	0.486	16650	0.046	3040	14400	0.046	2920				
			0.264	0.792		0.051	4530	0.220	0.660		0.051	3750	0.198	0.594		0.051	3380							
		16	0.096	0.288	21100	0.043	3650	0.080	0.240	17600	0.039	2740	0.072	0.216	15800	0.039	2460	12960	0.039	2360				
			0.120	0.360		0.048	4050	0.100	0.300		0.043	3040	0.090	0.270		0.043	2730							
3	0.2	12	0.078	0.234	19980	0.041	3310	0.065	0.195	16700	0.041	2740	0.059	0.176	14980	0.041	2460	12960	0.041	2360				
			0.096	0.288		0.046	3680	0.080	0.240		0.046	3040	0.072	0.216		0.046	2730							
		16	0.360	1.080	19200	0.051	3890	0.300	0.900	16000	0.051	3240	0.270	0.810	14400	0.051	2920	12960	0.051	2360				
			0.252	0.756		0.210	0.630	0.189	0.567		0.108	0.324	0.108	0.324		0.090	0.270		0.072	0.216				
		20	0.144	0.432	17280	0.046	3150	0.120	0.360	14400	0.046	2630	0.108	0.324	12960	0.046	2360	10800	0.046	1940				
			0.120	0.360		0.100	0.300	0.090	0.270		0.072	0.216	0.090	0.270		0.072	0.216							
4		12	0.420	1.260	14400	0.075	4320	0.350	1.050	12000	0.075	3600	0.315	0.945	10800	0.075	3240	9720	0.075	2630				
			0.216	0.648		0.350	0.180	0.540	0.2920		0.162	0.486	0.2920	0.162		0.486								
		20	0.156	0.468	9550	0.068	2580	0.130	0.390	7960	0.068	2150	0.117	0.351	7160	0.068	1940	6090	0.068	1650				
			0.120	0.360		0.2190	0.100	0.300	0.1830		0.090	0.270	0.1830	0.090		0.270								

NOTE: All a_p -values are maximum, please do not exceed!


Theoretical cusp height in end milling (μm)



EPDRF-TH | Recommended Cutting Conditions

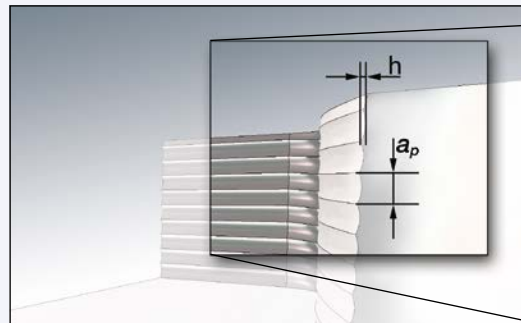
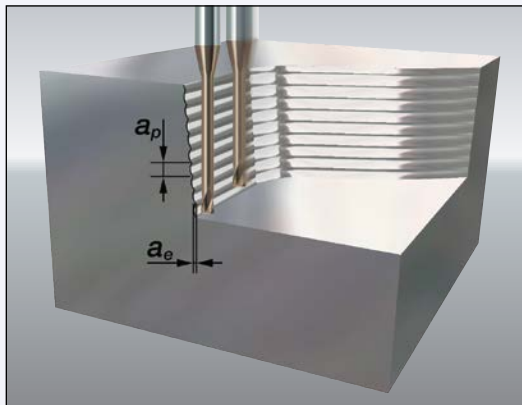
IV					V					VI					Workpiece Material					
Pre-hardened Steels (35~45HRC)					Hardened Steels (45~55HRC)					Hardened Steels (55~70HRC)										
a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	D	CR	I _n			
0.039	0.118	30600	0.022	2670	0.032	0.096	27000	0.019	2100	0.029	0.088	25200	0.017	1720	1	0.05	4			
0.056	0.168		0.024	2970	0.046	0.137		0.022	2330	0.042	0.126		0.019	1910					0.05	6
0.022	0.067		0.022	2410	0.018	0.055		0.019	1890	0.017	0.050		0.017	1550						
0.032	0.096		0.024	2680	0.026	0.078		0.022	2100	0.024	0.072		0.019	1720					0.05	10
0.022	0.067		0.022	2410	0.018	0.055		0.019	1890	0.017	0.050		0.017	1550						
0.032	0.096		0.024	2680	0.026	0.078		0.022	2100	0.024	0.072		0.019	1720					0.05	16
0.014	0.043		0.022	2410	0.012	0.035		0.019	1890	0.011	0.032		0.017	1550						
0.020	0.060		0.024	2680	0.016	0.049		0.022	2100	0.015	0.045		0.019	1720					0.05	
0.014	0.043		0.017	1670	0.012	0.035		0.028	2450	0.011	0.032		0.015	1180						
0.020	0.060		0.019	1850	0.016	0.049		0.019	1630	0.015	0.045		0.016	1310					0.05	
0.009	0.026	0.016	1550	0.007	0.021	0.024	2100	0.007	0.020	0.012	980	0.05								
0.012	0.036	0.018	1720	0.010	0.029	0.016	1400	0.009	0.027	0.014	1090			0.05						
0.006	0.017	0.016	1160	0.005	0.014	0.015	950	0.004	0.013	0.012	740	0.05								
0.008	0.024	0.018	1290	0.007	0.020	0.016	1050	0.006	0.018	0.014	820			0.05						
0.056	0.168	23540	0.026	2470	0.046	0.137	20780	0.024	2000	0.042	0.126	19390	0.020			1570	1.5		0.1	4
0.048	0.144		0.024	2080	0.039	0.117		0.022	1630	0.036	0.108		0.019	1330	0.05	8				
0.030	0.091		0.019	1440	0.025	0.074		0.019	1270	0.023	0.068		0.016	1020						
0.112	0.336	17850	0.046	3260	0.091	0.273	15750	0.037	2300	0.084	0.252	14700	0.032	1870	2	0.05	4			
0.160	0.480		0.051	3620	0.130	0.390		0.040	2550	0.120	0.360		0.035	2080					0.05	8
0.080	0.240		0.046	3260	0.065	0.195		0.037	2300	0.060	0.180		0.032	1870						
0.112	0.336		0.051	3620	0.091	0.273		0.040	2550	0.084	0.252		0.035	2080					0.05	16
0.045	0.134		0.041	2640	0.036	0.109		0.036	2070	0.034	0.101		0.032	1690						
0.064	0.192		0.046	2930	0.052	0.156		0.041	2300	0.048	0.144		0.036	1880					0.05	
0.045	0.134		0.041	2640	0.036	0.109		0.036	2070	0.034	0.101		0.032	1690						
0.064	0.192		0.046	2930	0.052	0.156		0.041	2300	0.048	0.144		0.036	1880					0.05	
0.028	0.084		0.041	2640	0.023	0.068		0.036	2070	0.021	0.063		0.032	1690						
0.040	0.120		0.046	2930	0.033	0.098		0.041	2300	0.030	0.090		0.036	1880					0.05	
0.144	0.432	15730	0.2870	0.117	0.351	0.037	2030	0.108	0.324	0.032	1660	12950	0.032	1660	2.5	0.2	8			
0.176	0.528		0.051	3190	0.143	0.429	0.041	2250	0.132	0.396	0.036		1840	0.05				16		
0.064	0.192		0.039	2320	0.052	0.156	0.035	1830	0.048	0.144	0.030		1490						0.05	20
0.080	0.240	0.043	2580	0.065	0.195	0.038	2030	0.060	0.180	0.034	1660	0.05								
0.052	0.156	0.041	2320	0.042	0.127	0.037	1830	0.039	0.117	0.032	1490			0.05						
0.064	0.192	0.046	2580	0.052	0.156	0.041	2030	0.048	0.144	0.036	1660	0.05								
0.240	0.720	13600			0.195	0.585	12000			0.180	0.540			11200			3	0.2	8	
0.168	0.504		0.051	2750	0.137	0.410		0.126	0.378	0.035	1590	0.05	16							
0.096	0.288				0.078	0.234		0.072	0.216	0.048	0.144				0.05	20				
0.080	0.240	12240	0.046	2230	0.065	0.195	10800	0.041	1750	0.060	0.180	10080	0.035	1430			4	0.2	25	
0.064	0.192				0.052	0.156		0.048	0.144	0.036	1430		0.05	30						
0.280	0.840		0.075	3060	0.228	0.683		0.210	0.630	0.052	1760				0.05	40				
0.144	0.432	9180		2480	0.117	0.351	8100		1750	0.108	0.324	7560		1430			0.05	20		
0.104	0.312	6770	0.068	1830	0.085	0.254	5970	0.054	1290	0.078	0.234	5570	0.047	1050	0.05	30				
0.080	0.240	5760		1560	0.065	0.195	5070		1100	0.060	0.180	4730		890			0.05	40		

EPDRF-TH | Recommended Cutting Conditions

Workpiece Material		I							II							III						
		Copper							Carbon Steels · Alloy steels (180~250HB)							Stainless steels · Tool steels (25~35HRC)						
		D	CR	I_n	a_p mm	a_e mm	n min ⁻¹	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	f_z mm/t	V_f mm/min			
 Finishing	1	0.05	4	0.014	0.014 ~ 0.043	38900	0.016	2440	0.012	0.012 ~ 0.036	31120	0.016	1952	0.011	0.011 ~ 0.032	28008	0.016	1757				
		0.1	6	0.022	0.022 ~ 0.065	31500		1780	0.018	0.018 ~ 0.054	25200		1424	0.016	0.016 ~ 0.049	22680		1282				
		0.05	8	0.012	0.012 ~ 0.036	28000	0.014	1580	0.010	0.010 ~ 0.030	22400	0.014	1264	0.009	0.009 ~ 0.027	20160	0.014	1138				
		0.1	10	0.019	0.019 ~ 0.058	24500		1390	0.016	0.016 ~ 0.048	19600		1112	0.014	0.014 ~ 0.043	17640		1001				
		0.05	12	0.010	0.010 ~ 0.029	21800	0.013	1100	0.008	0.008 ~ 0.024	17440	0.013	880	0.007	0.007 ~ 0.022	15696	0.013	792				
		0.1	16	0.016	0.016 ~ 0.047	16300	0.011	960	0.013	0.013 ~ 0.039	13040	0.011	768	0.012	0.012 ~ 0.035	11736	0.011	691				
		0.05	20	0.007	0.007 ~ 0.022	29900		2030	0.006	0.006 ~ 0.018	23920		1624	0.005	0.005 ~ 0.016	21528		1462				
		0.1	24	0.011	0.011 ~ 0.032	27200		1850	0.009	0.009 ~ 0.027	21760		1480	0.008	0.008 ~ 0.024	19584		1332				
		0.05	12	0.005	0.005 ~ 0.014	21800		960	0.004	0.004 ~ 0.012	17440		768	0.004	0.004 ~ 0.011	15696		691				
		0.1	16	0.008	0.008 ~ 0.025	16300		720	0.007	0.007 ~ 0.021	13040		576	0.006	0.006 ~ 0.019	11736		518				
		0.05	20	0.004	0.004 ~ 0.011	29900		2030	0.003	0.003 ~ 0.009	23920		1624	0.003	0.003 ~ 0.008	21528		1462				
		0.1	24	0.006	0.006 ~ 0.018	27200		1850	0.005	0.005 ~ 0.015	21760		1480	0.005	0.005 ~ 0.014	19584		1332				
	1.5	0.05	4	0.030	0.030 ~ 0.090	29900	0.017	2030	0.025	0.025 ~ 0.075	23920	0.017	1624	0.023	0.023 ~ 0.068	21528	0.017	1462				
		0.1	8	0.024	0.024 ~ 0.072	27200		1850	0.020	0.020 ~ 0.060	21760		1480	0.018	0.018 ~ 0.054	19584		1332				
		0.05	12	0.019	0.019 ~ 0.058	21800		1480	0.016	0.016 ~ 0.048	17440		1184	0.014	0.014 ~ 0.043	15696		1066				
		0.1	15	0.016	0.016 ~ 0.047	16900	0.015	1020	0.013	0.013 ~ 0.039	13520	0.015	816	0.012	0.012 ~ 0.035	12168	0.015	734				
		0.05	20	0.012	0.012 ~ 0.036	14300	0.027	1520	0.010	0.010 ~ 0.030	11900		1260	0.009	0.009 ~ 0.027	10700		1140				
		0.1	24	0.042	0.042 ~ 0.126	14300	0.027	1520	0.035	0.035 ~ 0.105	11900		1260	0.032	0.032 ~ 0.095	10700		1140				
		0.05	4	0.050	0.050 ~ 0.151	24900	0.030	2940	0.042	0.042 ~ 0.126	20800	0.029	2450	0.038	0.038 ~ 0.113	18700	0.030	2210				
		0.1	8	0.030	0.030 ~ 0.090	22700	0.029	2670	0.025	0.025 ~ 0.075	18900		2230	0.023	0.023 ~ 0.068	17000		2010				
		0.05	12	0.043	0.043 ~ 0.130	18400	0.026	1950	0.036	0.036 ~ 0.108	15300		1620	0.032	0.032 ~ 0.097	13800	0.026	1460				
		0.1	16	0.024	0.024 ~ 0.072	16300	0.027	1730	0.020	0.020 ~ 0.060	13600	0.026	1440	0.018	0.018 ~ 0.054	12200	0.027	1300				
		0.05	20	0.043	0.043 ~ 0.130	14300	0.027	1520	0.036	0.036 ~ 0.108	11900		1260	0.032	0.032 ~ 0.097	10700		1140				
		0.1	24	0.018	0.018 ~ 0.054	16300	0.027	1730	0.015	0.015 ~ 0.045	13600	0.026	1440	0.014	0.014 ~ 0.041	12200	0.027	1300				
	2.5	0.05	8	0.028	0.028 ~ 0.083	14300	0.029	1680	0.023	0.023 ~ 0.069	11900		1260	0.021	0.021 ~ 0.062	10700		1140				
		0.1	12	0.012	0.012 ~ 0.036	14300	0.027	1520	0.010	0.010 ~ 0.030	11900		1260	0.009	0.009 ~ 0.027	10700		1140				
		0.05	20	0.022	0.022 ~ 0.065	22700	0.033	2970	0.018	0.018 ~ 0.054	18900	0.033	2480	0.016	0.016 ~ 0.049	17000	0.033	2230				
		0.1	8	0.056	0.056 ~ 0.169	19400	0.030	2570	0.047	0.047 ~ 0.141	16200	0.030	2140	0.042	0.042 ~ 0.127	14600	0.030	1920				
		0.05	16	0.096	0.096 ~ 0.288	16300	0.030	1930	0.080	0.080 ~ 0.240	13600	0.030	1610	0.072	0.072 ~ 0.216	12200	0.030	1440				
		0.1	20	0.044	0.044 ~ 0.133	16900	0.032	2130	0.037	0.037 ~ 0.111	14100	0.031	1770	0.033	0.033 ~ 0.100	12700	0.031	1600				
		0.05	24	0.054	0.054 ~ 0.162	14300	0.029	1680	0.045	0.045 ~ 0.135	11900	0.029	1400	0.041	0.041 ~ 0.122	10700	0.029	1260				
		0.1	30	0.030	0.030 ~ 0.090	14100	0.031	1750	0.025	0.025 ~ 0.075	11900	0.030	1410	0.023	0.023 ~ 0.068	10600	0.030	1270				
		0.05	8	0.050	0.050 ~ 0.151	14100	0.031	1750	0.042	0.042 ~ 0.126	11800	0.030	1410	0.038	0.038 ~ 0.113	10600	0.030	1270				
		0.1	12	0.108	0.108 ~ 0.324	17300		2550	0.090	0.090 ~ 0.270	14400		2120	0.081	0.081 ~ 0.243	13000		1910				
		0.05	20	0.084	0.084 ~ 0.252	14000		2060	0.070	0.070 ~ 0.210	11700		1720	0.063	0.063 ~ 0.189	10500		1550				
		0.1	24	0.060	0.060 ~ 0.180	10900	0.047	2060	0.050	0.050 ~ 0.150	9100	0.047		0.045	0.045 ~ 0.135	8200	0.047					
		0.05	30	0.048	0.048 ~ 0.144	12400	0.068	3350	0.036	0.036 ~ 0.108	10400	0.067	2790	0.033	0.033 ~ 0.100	9300	0.068	2520				
		0.1	40	0.156	0.156 ~ 0.468	11200	0.067	3020	0.117	0.117 ~ 0.351	9300	0.068	2520	0.117	0.117 ~ 0.351	8400	0.068	2010				
		0.05	20	0.120	0.120 ~ 0.360	11200	0.067	3020	0.090	0.090 ~ 0.270	9300	0.068	2520	0.090	0.090 ~ 0.270	8400	0.068	2010				
		0.1	30	0.096	0.096 ~ 0.288	11200	0.067	3020	0.072	0.072 ~ 0.216	9300	0.068	2520	0.072	0.072 ~ 0.216	8400	0.068	2010				
		0.05	40	0.072	0.072 ~ 0.216	11200	0.067	3020	0.054	0.054 ~ 0.162	9300	0.068	2520	0.054	0.054 ~ 0.162	8400	0.068	2010				

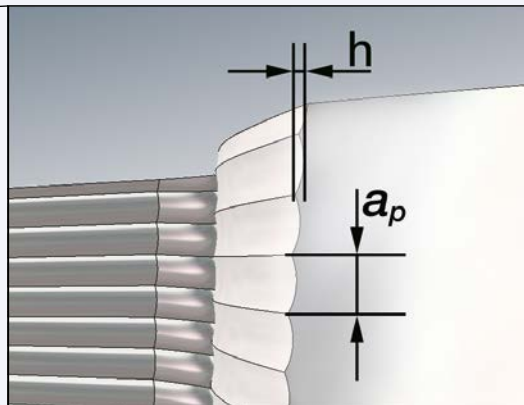
NOTE: All a_p -values are maximum, please do not exceed!

Theoretical cusp height in end milling (μm)



EPDRF-TH | Recommended Cutting Conditions

IV					V					VI					Workpiece Material		
Pre-hardened Steels (35~45HRC)					Hardened Steels (45~55HRC)					Hardened Steels (55~70HRC)					D	CR	I _n
a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	f _z mm/t	V _f mm/min			
0.010	0.010 ~ 0.029	26608	0.016	1669	0.008	0.008 ~ 0.023	23947		1230	0.007	0.007 ~ 0.022	22749		1000	1	0.05	4
0.014	0.014 ~ 0.043				0.012	0.012 ~ 0.035				0.011	0.011 ~ 0.032					0.1	
0.008	0.008 ~ 0.024	21546		1218	0.007	0.007 ~ 0.020	19391		990	0.006	0.006 ~ 0.018	18422		810		0.05	6
0.013	0.013 ~ 0.038				0.010	0.010 ~ 0.031				0.010	0.010 ~ 0.029					0.1	
0.006	0.006 ~ 0.019	19152	0.014	1081	0.005	0.005 ~ 0.016	17237		880	0.005	0.005 ~ 0.014	16375		720		0.05	8
0.010	0.010 ~ 0.031				0.008	0.008 ~ 0.025				0.008	0.008 ~ 0.023					0.1	
0.005	0.005 ~ 0.014	16758		951	0.004	0.004 ~ 0.012	15082		770	0.004	0.004 ~ 0.011	14328		630		0.05	10
0.008	0.008 ~ 0.024				0.007	0.007 ~ 0.020				0.006	0.006 ~ 0.018					0.1	
0.004	0.004 ~ 0.012		0.013	752	0.003	0.003 ~ 0.010		0.011	600	0.003	0.003 ~ 0.009		0.009	480		0.05	12
0.007	0.007 ~ 0.022				0.006	0.006 ~ 0.018				0.005	0.005 ~ 0.016					0.1	
0.003	0.003 ~ 0.010	14911		657	0.003	0.003 ~ 0.008	13420		510	0.002	0.002 ~ 0.007	12749		400	2	0.05	16
0.006	0.006 ~ 0.017		0.011		0.005	0.005 ~ 0.014		0.010		0.004	0.004 ~ 0.013		0.008			0.1	
0.002	0.002 ~ 0.007			492	0.002	0.002 ~ 0.006			385	0.002	0.002 ~ 0.005			300		0.05	20
0.004	0.004 ~ 0.012	11149			0.003	0.003 ~ 0.010	10034			0.003	0.003 ~ 0.009	9533					
0.020	0.020 ~ 0.060	20452		1389	0.016	0.016 ~ 0.049	18406	0.014	1020	0.015	0.015 ~ 0.045	17486	0.012	830		0.1	4
0.016	0.016 ~ 0.048	18605	0.017	1265	0.013	0.013 ~ 0.039	16744		1030	0.012	0.012 ~ 0.036	15907		840			8
0.013	0.013 ~ 0.038	14911		1012	0.010	0.010 ~ 0.031	13420	0.015	820	0.010	0.010 ~ 0.029	12749	0.013	670		0.1	12
0.010	0.010 ~ 0.031				0.008	0.008 ~ 0.025				0.008	0.008 ~ 0.023						15
0.008	0.008 ~ 0.024	11560	0.015	698	0.007	0.007 ~ 0.020	10404	0.013	560	0.006	0.006 ~ 0.018	9883	0.011	450		0.1	20
0.028	0.028 ~ 0.084				0.023	0.023 ~ 0.068				0.021	0.021 ~ 0.063				3	0.05	4
0.034	0.034 ~ 0.101	17700	0.029	2080	0.027	0.027 ~ 0.082	15600		1470	0.025	0.025 ~ 0.076	14600		1200		0.1	
0.020	0.020 ~ 0.060				0.016	0.016 ~ 0.049		0.024		0.015	0.015 ~ 0.045					0.05	8
0.029	0.029 ~ 0.086	16100		1890	0.023	0.023 ~ 0.070	14200		1340	0.022	0.022 ~ 0.065	13200		1090		0.1	
0.016	0.016 ~ 0.048				0.013	0.013 ~ 0.039				0.012	0.012 ~ 0.036		0.021	890		0.05	12
0.029	0.029 ~ 0.086	13000	0.027	1380	0.023	0.023 ~ 0.070	11500	0.023	1080	0.022	0.022 ~ 0.065	10700				0.1	
0.012	0.012 ~ 0.036				0.010	0.010 ~ 0.029				0.009	0.009 ~ 0.027					0.05	16
0.018	0.018 ~ 0.055	11600		1230	0.015	0.015 ~ 0.045	10200		960	0.014	0.014 ~ 0.041	9500		790		0.1	
0.008	0.008 ~ 0.024		0.026	1070	0.007	0.007 ~ 0.020	8900	0.024		0.006	0.006 ~ 0.018	8300		690		0.05	20
0.014	0.014 ~ 0.043				0.012	0.012 ~ 0.035			840	0.011	0.011 ~ 0.032					0.1	
0.038	0.038 ~ 0.113	16100	0.033	2100	0.031	0.031 ~ 0.092	14200		1490	0.028	0.028 ~ 0.085	13200	0.023	1210	2.5	0.2	8
0.064	0.064 ~ 0.192	13800		1820	0.052	0.052 ~ 0.156	12200		1280	0.048	0.048 ~ 0.144	11300	0.024	1100			
0.030	0.030 ~ 0.089	11600	0.029	1360	0.024	0.024 ~ 0.072	10200		1070	0.022	0.022 ~ 0.067	9500	0.023	870		0.1	16
0.036	0.036 ~ 0.108	12000	0.031	1510	0.029	0.029 ~ 0.088	10600		1110	0.027	0.027 ~ 0.081	9900	0.024	960		0.2	
0.020	0.020 ~ 0.060	10100	0.029	1190	0.016	0.016 ~ 0.049	8900		940	0.015	0.015 ~ 0.045	8300	0.023	770		0.1	
0.034	0.034 ~ 0.101	10000	0.030	1200	0.027	0.027 ~ 0.082	8800		930	0.025	0.025 ~ 0.076	8200	0.024	790			20
0.072	0.072 ~ 0.216				0.059	0.059 ~ 0.176				0.054	0.054 ~ 0.162				3		8
0.056	0.056 ~ 0.168	12200		1800	0.046	0.046 ~ 0.137	10800	0.029	1270	0.042	0.042 ~ 0.126	10100	0.026	1040			12
			0.037		0.033	0.033 ~ 0.098				0.030	0.030 ~ 0.090						16
0.040	0.040 ~ 0.120																20
0.036	0.036 ~ 0.108	9900		1460	0.029	0.029 ~ 0.088	8700	0.033	1150	0.027	0.027 ~ 0.081	8200	0.029	940		0.2	25
0.032	0.032 ~ 0.096	7700	0.047		0.026	0.026 ~ 0.078	6800	0.042		0.024	0.024 ~ 0.072	6400	0.037	940			30
0.104	0.104 ~ 0.312				0.085	0.085 ~ 0.254				0.078	0.078 ~ 0.234						12
0.080	0.080 ~ 0.240	8800	0.064	2240	0.065	0.065 ~ 0.195	7800	0.056	1750	0.060	0.060 ~ 0.180	7200		1300	4		20
0.064	0.064 ~ 0.192				0.052	0.052 ~ 0.156				0.048	0.048 ~ 0.144						30
0.048	0.048 ~ 0.144	7900	0.058	1830	0.039	0.039 ~ 0.117	7000	0.053	1470	0.036	0.036 ~ 0.108	6500		1170			40



		a _p (mm)							
CR		0.01	0.015	0.02	0.025	0.03	0.04	0.05	0.10
		0.250	0.563	1.000	1.563	2.250	4.000	6.250	25.000
0.05		0.125	0.281	0.500	0.781	1.125	2.000	3.125	12.500
0.1		0.063	0.141	0.250	0.391	0.563	1.000	1.563	6.250
0.2		0.025	0.056	0.100	0.156	0.225	0.400	0.625	2.500
0.5									

μm

$$h = R - \sqrt{\frac{(2 \cdot R)^2 - a_{p,e}^2}{4}}$$

$$h = \frac{a_e^2}{8 \cdot R}$$

Always up to date: Please check our P50 QuickFinder



Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. Please caution of fire while using oil base coolant, fire prevention is necessary.
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

“MOLDINO” is a registered trademark of MOLDINO Tool Engineering, Ltd. in Japan.

Specifications for the products listed in this catalog are subject to change without notice due to replacement or modification.

MOLDINO Tool Engineering Europe GmbH

Itterpark 12 · 40724 Hilden · Germany · Phone +49 (0) 21 03-24 82-0 · Fax +49 (0) 21 03-24 82-30
E-Mail info@moldino.eu · Internet www.moldino.eu
© 2020 by MOLDINO Tool Engineering Europe GmbH · 3rd Edition · Printed in Germany