



Solid Carbide End Mills

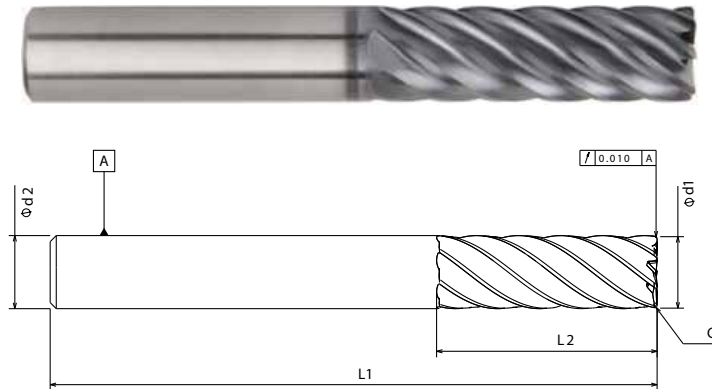
F180TR/NF180TR Series

7 Flute

Centre cutting high performance end mill for roughing & finishing



END MILLS

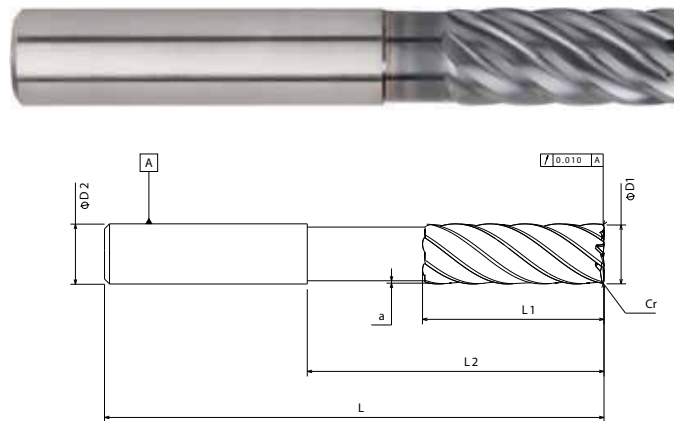


- P0-P6
- S1-S4
- M1-M3
- H1

F180TR

Unit : mm

$\varnothing D1$ (mm)	L2 (mm)	L1 (mm)	$\varnothing D2$ (mm)	$\varnothing Cr$ (mm)	EDP No
10.00	30.00	76.00	10.00	0.50	FBK0508808
12.00	36.00	100.00	12.00	0.50	FBK0508809
16.00	48.00	110.00	16.00	0.50	FBK0508810



- P0-P6
- S1-S4
- M1-M3
- H1

NF180TR

$\varnothing D1$ (mm)	L2 (mm)	L (mm)	$\varnothing D2$ (mm)	L1 (mm)	Corner Radius $\varnothing Cr$	EDP No
10.00	30.00	76.00	10.00	22.00	0.50	FBK0508811
12.00	36.00	100.00	12.00	26.00	0.50	FBK0508812
16.00	48.00	110.00	16.00	32.00	0.50	FBK0508813



Solid Carbide End Mills

Cutting parameters

F180TR/NF180TR for semifinishing

Material			Side Milling		Cutting Speed Vc (m/min)		Recommended feed per tooth (fz = mm/tooth) for side milling			
							Diameter in mm			
			ap	ae	min	max	mm	10.0	12.0	16.0
Steel	P	0	3XD	0.2XD	300	500	fz	0.060	0.065	0.080
		1	3XD	0.2XD	300	500	fz	0.060	0.065	0.080
		2	3XD	0.2XD	200	240	fz	0.060	0.065	0.080
		3	3XD	0.2XD	120	150	fz	0.054	0.062	0.077
		4	3XD	0.2XD	90	150	fz	0.054	0.062	0.077
Stainless Steel	M	5	3XD	0.2XD	60	100	fz	0.048	0.056	0.070
		1	3XD	0.2XD	90	115	fz	0.061	0.070	0.087
		2	3XD	0.2XD	60	80	fz	0.048	0.056	0.070
Special Alloys	S	3	3XD	0.2XD	60	70	fz	0.040	0.047	0.057
		1	3XD	0.2XD	50	90	fz	0.061	0.070	0.087
		2	3XD	0.2XD	25	40	fz	0.032	0.037	0.046
		3	3XD	0.2XD	60	80	fz	0.048	0.056	0.070
Hardened Steel	H	4	3XD	0.2XD	50	60	fz	0.045	0.052	0.064
		1	3XD	0.2XD	80	140	fz	0.054	0.062	0.077
		2	3XD	0.2XD	70	120	fz	0.040	0.047	0.057

For NF180TR with neck Ap- can be used upto Ap Max
Use Minimum value of cutting speed for harder material within range

F180TR/NF180TR for finishing

Material			Side Milling		Cutting Speed Vc (m/min)		Recommended feed per tooth (fz = mm/tooth) for side milling			
							Diameter in mm			
			ap	ae	min	max	mm	10.0	12.0	16.0
Steel	P	0	3XD	0.06XD	300	500	fz	0.060	0.065	0.080
		1	3XD	0.06XD	300	500	fz	0.060	0.065	0.080
		2	3XD	0.06XD	200	240	fz	0.060	0.065	0.080
		3	3XD	0.06XD	180	300	fz	0.065	0.075	0.092
		4	3XD	0.06XD	180	300	fz	0.065	0.075	0.092
Stainless Steel	M	5	3XD	0.06XD	120	200	fz	0.058	0.067	0.084
		1	3XD	0.06XD	180	230	fz	0.073	0.084	0.105
		2	3XD	0.06XD	120	160	fz	0.058	0.067	0.084
Special Alloys	S	3	3XD	0.06XD	120	140	fz	0.048	0.056	0.068
		1	3XD	0.06XD	100	180	fz	0.073	0.084	0.105
		2	3XD	0.06XD	50	80	fz	0.038	0.045	0.056
		3	3XD	0.06XD	120	160	fz	0.058	0.067	0.084
Hardened Steel	H	4	3XD	0.06XD	100	120	fz	0.053	0.062	0.077
		1	3XD	0.06XD	160	280	fz	0.065	0.075	0.092
		2	3XD	0.06XD	140	240	fz	0.048	0.056	0.068

For NF180TR Ap- can be used upto Ap Max
Use Minimum value of cutting speed for harder material within range



Trochoidal Milling



Features

- Robust Core Design
- Multiflutes for High Productivity
- Available with alternate coating

Functions

- Operates at high cutting speeds
- Geometry programmed to suit adequate material removal at various engagement angles

Benefits

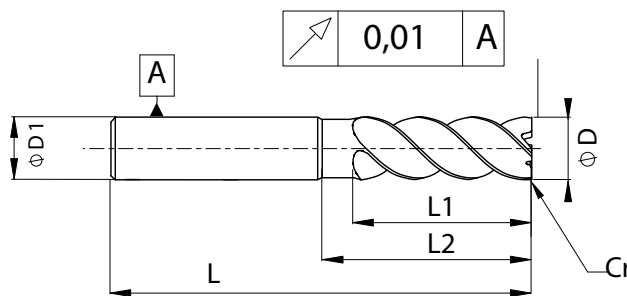
- Highest dynamic speed rates
- Highest material removal rate
- Least cutting forces
- Prolonged tool life due to reduced shock
- High savings in cycle time when compared to the conventional milling strategy

5 Flute

Centre cutting end mill for finishing steel and super alloys for Trochoidal milling



END MILLS



P5-P6

K1-K3

S2-S4

M1-M3

Unit : mm

ØD (mm)	L1 (mm)	L2 (mm)	L (mm)	Ø D1 (mm)	Ø Cr (mm)	EDP No
6	13	18	64	6	0.5	FBK0508649
6	13	18	64	6	1.0	FBK0508650
6	13	18	64	6	1.5	FBK0508651
6	14	18	64	6	-	FBK0508652
8	19	24	76	8	0.5	FBK0508653
8	19	24	76	8	1.0	FBK0508654
8	18	24	76	8	-	FBK0508655
10	22	30	76	10	0.5	FBK0508656
10	22	30	76	10	1.0	FBK0508657
10	22	30	76	10	2.0	FBK0508658
10	22	30	76	10	-	FBK0508659
12	26	36	84	12	0.5	FBK0508660
12	26	36	84	12	1.0	FBK0508661
12	26	36	84	12	2.0	FBK0508662
12	26	36	84	12	-	FBK0508663
16	32	48	100	16	0.5	FBK0508664
16	32	48	100	16	1.0	FBK0508665
16	32	48	100	16	2.0	FBK0508666
16	32	48	100	16	3.0	FBK0508667
16	32	48	100	16	-	FBK0508668

Features

- 5 Flutes
- Variable Helix
- Variable Pitch
- Effective for machining Steel/ Stainless (Wet) / Super Alloys (Wet)
- Also available with more flutes/ Neck and through coolant as a special option

Functions

- Effective for Trochoidal Milling and I-machining
- High MRR
- Optimal Flutes as per Diameter of Tool

Benefits

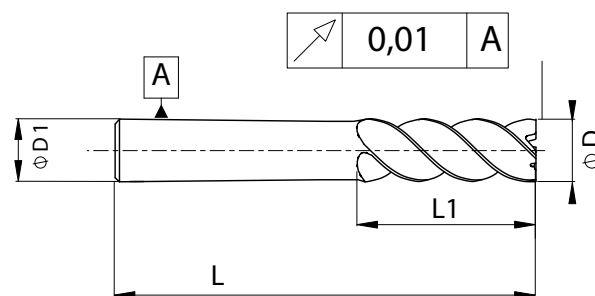
- Stable Cutting edge at elevated cutting conditions
- Superior Tool Life

6 Flute

Centre cutting high performance
6 flute end mill for Trochoidal milling



END MILLS



- P0-P6
- K1-K3
- S1-S4
- M1-M3
- H1

Unit : mm

ØD (mm)	L1 (mm)	L (mm)	ØD1 (mm)	EDP No
6	13	57	6	FBK0508789
8	19	63	8	FBK0508790
10	22	72	10	FBK0508791
12	26	83	12	FBK0508792
16	32	92	16	FBK0508793
20	38	104	20	FBK0508794

Features

- 6 Flutes
- 45° Helix
- Good geometry for finishing
- Effective for machining Steel/ Stainless (Wet) / SuperAlloys (Wet)
- Also available with more flutes/ Neck and through coolant as a special option

Functions

- Effective for Trochoidal Milling and I-machining
- High MRR
- Optimal Flutes as per Diameter of Tool

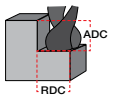
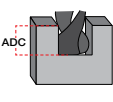
Benefits

- Stable Cutting edge at elevated cutting conditions
- Superior Tool Life

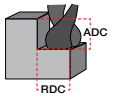
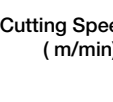


Solid Carbide End Mills

Cutting parameters for 5VR

	Material	Side Milling		Slot Milling	Cutting Speed Vc (m/min)		Recommended feed per tooth (fz = mm/tooth) for side milling & For slotting, reduce fz by 20%.								
															
							Diameter in mm								
		ap	ae	ap	min	max	mm	6.0	8.0	10.0	12.0	16.0	20.0	25.0	
Steel	P	5	1.5xD	0.5xD	1xD	60	100	Fz	0.029	0.040	0.048	0.056	0.070	0.081	0.091
		6	1.5xD	0.5xD	0.75xD	50	75	Fz	0.025	0.034	0.040	0.047	0.057	0.065	0.071
Special Alloys	S	2	1.5xD	0.3xD	0.3xD	25	40	Fz	0.019	0.026	0.032	0.037	0.046	0.054	0.061
		3	1.5xD	0.5xD	1xD	60	80	Fz	0.029	0.040	0.048	0.056	0.070	0.081	0.091
		4	1.5xD	0.5xD	1xD	50	60	Fz	0.026	0.037	0.045	0.052	0.064	0.074	0.084

Cutting parameters for 6VR

	Material	Side Milling		Cutting Speed Vc (m/min)		Recommended feed per tooth (fz = mm/tooth) for side milling										
																
						Diameter in mm										
		ap	ae	min	max	mm	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
Steel	P	0	Ap1 max	0.05	150	200	fz	0.028	0.044	0.060	0.072	0.083	0.092	0.101	0.108	0.114
		1	Ap1 max	0.05	150	200	fz	0.028	0.044	0.060	0.072	0.083	0.092	0.101	0.108	0.114
		2	Ap1 max	0.05	140	190	fz	0.028	0.044	0.060	0.072	0.083	0.092	0.101	0.108	0.114
		3	Ap1 max	0.05	120	160	fz	0.023	0.036	0.050	0.061	0.070	0.079	0.087	0.095	0.101
		4	Ap1 max	0.05	90	150	fz	0.021	0.033	0.045	0.054	0.062	0.070	0.077	0.083	0.088
		5	Ap1 max	0.05	60	100	fz	0.019	0.029	0.040	0.048	0.056	0.063	0.070	0.076	0.081
Stainless Steel	M	1	Ap1 max	0.05	90	115	fz	0.023	0.036	0.050	0.061	0.070	0.079	0.087	0.095	0.101
		2	Ap1 max	0.05	60	80	fz	0.019	0.029	0.040	0.048	0.056	0.063	0.070	0.076	0.081
		3	Ap1 max	0.05	60	70	fz	0.016	0.025	0.034	0.040	0.047	0.052	0.057	0.061	0.065
Cast Iron	K	1	Ap1 max	0.05	120	150	fz	0.028	0.044	0.060	0.072	0.083	0.092	0.101	0.108	0.114
		2	Ap1 max	0.05	110	140	fz	0.023	0.036	0.050	0.061	0.070	0.079	0.087	0.095	0.101
		3	Ap1 max	0.05	110	130	fz	0.019	0.029	0.040	0.048	0.056	0.063	0.070	0.076	0.081
Special Alloys	S	1	Ap1 max	0.04	50	90	fz	0.023	0.036	0.050	0.061	0.070	0.079	0.087	0.095	0.101
		2	Ap1 max	0.04	25	40	fz	0.013	0.019	0.026	0.032	0.037	0.042	0.046	0.050	0.054
		3	Ap1 max	0.05	60	80	fz	0.019	0.029	0.040	0.048	0.056	0.063	0.070	0.076	0.081
		4	Ap1 max	0.05	50	60	fz	0.016	0.026	0.037	0.045	0.052	0.058	0.064	0.069	0.074
Hardened Steel	H	1	Ap1 max	0.04	80	140	fz	0.021	0.033	0.045	0.054	0.062	0.070	0.077	0.083	0.088