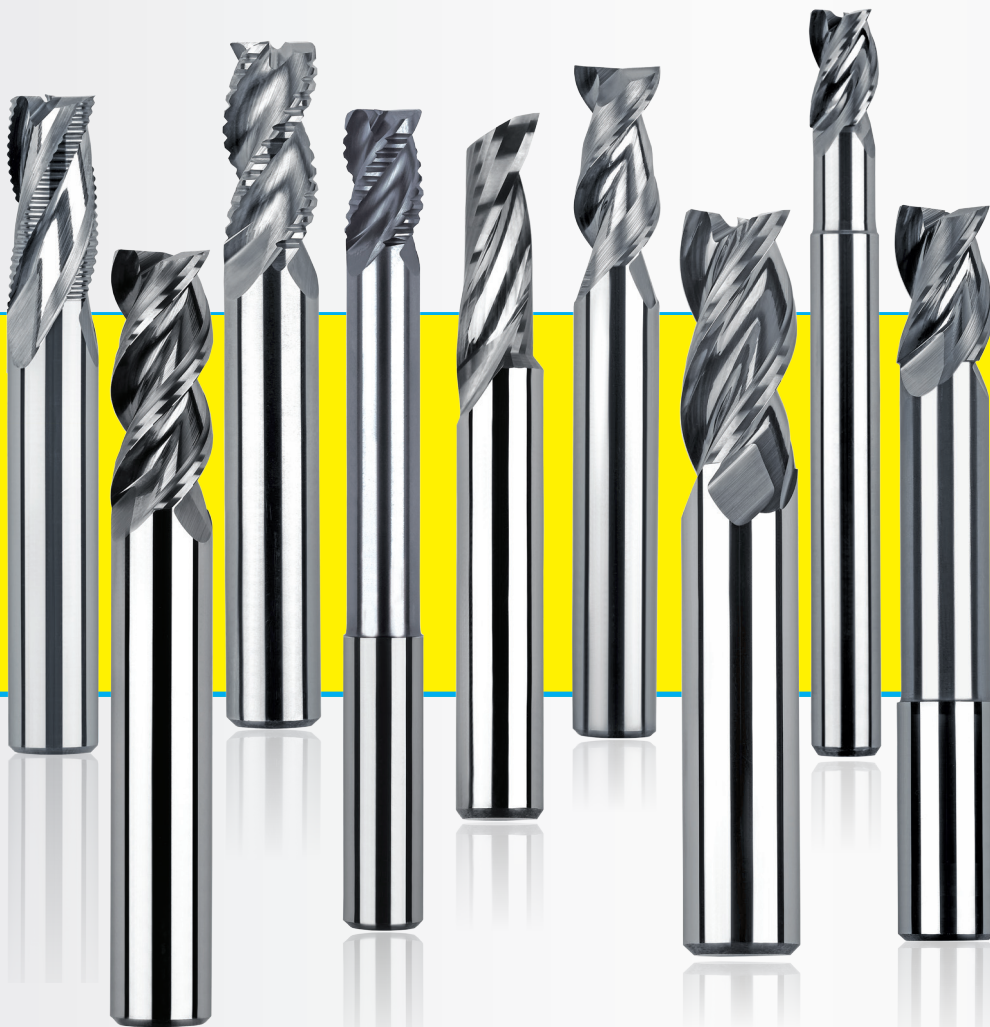




High Performance Cutting Tools

RAZORCUT™

SOLID CARBIDE END MILLING SOLUTIONS
FOR MACHINING NON FERROUS MATERIALS
FOR AEROSPACE & AUTOMOBILE INDUSTRY



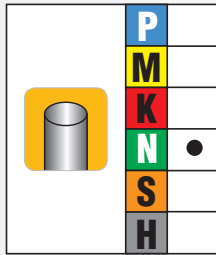
ROUGHER SERIES
CBC/ CBCH/ NCBCB

FINISHER SERIES
2FWF/3FWF/3FWFXL/3FWFCR/3F

ROUTER SERIES
1F



Forbes & Company Limited



FEATURES, FUNCTIONS AND BENEFITS

- Designed for Aluminium Alloys (Works excellent on Al6061 & Al7075)
- Designed to maximize metal removal rates and deliver superior wall and floor finishes on the part.
- Designed to be used in roughing, semi-finishing, finishing and super finishing applications
- Designed with a strong core geometry and flute form to tackle corners at elevated cutting conditions without chattering.
- 3FWF incorporates unequal flute spacing which helps to eliminate chatter while running at elevated parameters
- 3FWF tools come with a Wiper Flat Geometry with a wide gash which helps in ensuring excellent floor finish during the finish cycle.
- 3FWF tools are excellent in profiling operations up to 0.5D radial x 1.5D axial depth of cut
- The 3 Flute Razorcut™ generates less vibration and less deflection, enabling higher metal removal rates
- The 3 Flute Razorcut™ 3FWFXL/3FWFCR are available with neck for deep pocketing operations
- The 3 Flute Razorcut™ 3FWF Excellent performance in thin wall applications as the geometry exerts very less radial force
- The 3 Flute Razorcut™ CBCH incorporates a 40 degree helix which will ensure a better surface finish with its chamfered chip breaker and be used directly for semi finishing Aluminium
- The 3 Flute Razorcut™ 3FWF and the Razorcut™ CBCH and Razorcut™ CBC can be used in trochoidal milling with an Ae/D ratio of 30% with at least 35% improvement in cycle time over conventional strategy with improved parameters
- The Razorcut™ 1F tool is a first choice for Routing Aluminium, Organic Materials, Thermo-plastics, Thermosets, Delerine, Nylon. These tools can be offered with HardCarbon™ coating for atleast 30% higher productivity.
- Razorcut™ is an excellent program for slotting operations up to a 1 x D axial depth of cut
- Razorcut™ is available in 1,2 and 3 Flute Styles
- Effective throughout the full range of machine speeds, from 3000 to 50000 RPM
- The entire Razorcut™ family of tools can be offered with a TiCN coating for machining Cast Aluminium
- The entire program is available with various corner radii and alternate lengths as a special

TARGET MARKET SEGMENTS

- Especially useful in airframe machining and other aerospace applications (Al2024, 6061 & Al7075).
- Can be used in general engineering, machine tool, and automotive casting (AlSi9, ADC6, ADC12)
- Designed for customers machining a large volume of aluminium products.
- Effective in high-speed machining, conventional milling, and MQL applications.



High Performance Cutting Tools



RAZORCUT CBC FOR ROUGHING OF ALUMINIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Corner Chamfer	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	CH	Z			30%			20%	
FBK0508672	6.00	13.00	57.00	6.00	0.50	3	30	Al 6000/7000	1.80	0.033	Wrought Aluminium	1.20	0.027
FBK0508673	8.00	16.00	63.00	8.00	1.00	3	30	Al 6000/7000	2.40	0.043	Wrought Aluminium	1.60	0.035
FBK0508674	10.00	22.00	72.00	10.00	1.00	3	30	Al 6000/7000	3.00	0.054	Wrought Aluminium	2.00	0.044
FBK0508675	12.00	26.00	83.00	12.00	1.00	3	30	Al 6000/7000	3.60	0.065	Wrought Aluminium	2.40	0.053
FBK0508676	16.00	32.00	92.00	16.00	1.00	3	30	Al 6000/7000	4.80	0.087	Wrought Aluminium	3.20	0.071
FBK0508677	20.00	38.00	104.00	20.00	1.00	3	30	Al 6000/7000	6.00	0.108	Wrought Aluminium	4.00	0.089
FBK0508678	25.00	45.00	121.00	25.00	1.00	3	30	Al 6000/7000	7.50	0.136	Wrought Aluminium	5.00	0.111



RAZORCUT CBCH FOR ROUGHING OF ALUMINIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Corner Radius	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	Cr	Z			30%			20%	
FBK0508701	6.00	13.00	57.00	6.00	0.25	3	40	Al 6000/7000	1.80	0.035	Wrought Aluminium	1.20	0.029
FBK0508702	8.00	16.00	63.00	8.00	0.25	3	40	Al 6000/7000	2.40	0.047	Wrought Aluminium	1.60	0.039
FBK0508703	10.00	22.00	72.00	10.00	0.50	3	40	Al 6000/7000	3.00	0.059	Wrought Aluminium	2.00	0.048
FBK0508704	12.00	26.00	83.00	12.00	0.50	3	40	Al 6000/7000	3.60	0.071	Wrought Aluminium	2.40	0.058
FBK0508705	16.00	32.00	92.00	16.00	1.00	3	40	Al 6000/7000	4.80	0.095	Wrought Aluminium	3.20	0.077
FBK0508706	20.00	38.00	104.00	20.00	1.00	3	40	Al 6000/7000	6.00	0.118	Wrought Aluminium	4.00	0.097
FBK0508707	25.00	45.00	121.00	25.00	1.50	3	40	Al 6000/7000	7.50	0.128	Wrought Aluminium	5.00	0.105



RAZORCUT NCBCH FOR ROUGHING OF ALUMINIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Neck Diameter	Neck Length	Corner Radius	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	ØD3	NL	Cr	Z			30%			20%	
FBK0509069	6.00	8.00	57.00	6.00	5.00	18.00	0.25	3	40	Al 6000/7000	1.80	0.035	Wrought Aluminium	1.20	0.029
FBK0509070	8.00	10.00	63.00	8.00	7.00	24.00	0.25	3	40	Al 6000/7000	2.40	0.047	Wrought Aluminium	1.60	0.039
FBK0509071	10.00	12.00	76.00	10.00	9.00	30.00	0.50	3	40	Al 6000/7000	3.00	0.059	Wrought Aluminium	2.00	0.048
FBK0509072	12.00	15.00	83.00	12.00	11.00	36.00	0.50	3	40	Al 6000/7000	3.60	0.071	Wrought Aluminium	2.40	0.058
FBK0509073	16.00	20.00	92.00	16.00	15.00	48.00	1.00	3	40	Al 6000/7000	4.80	0.095	Wrought Aluminium	3.20	0.077
FBK0509074	20.00	24.00	104.00	20.00	19.00	104.00	1.00	3	40	Al 6000/7000	6.00	0.118	Wrought Aluminium	4.00	0.097



High Performance Cutting Tools



RAZOR CUT 1F FOR MACHINING ALUMNIUM AND PLASTICS



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Number of teeth	Helix
	ØD1	L1	L	ØD2	Z	
FBK0509238	3.00	12.00	50.00	3.00	1	30
FBK0509239	4.00	15.00	60.00	4.00	1	30
FBK0509240	5.00	17.00	60.00	5.00	1	30
FBK0509241	6.00	20.00	65.00	6.00	1	30
FBK0509242	8.00	25.00	65.00	8.00	1	30
FBK0509243	10.00	25.00	75.00	10.00	1	30



RAZORCUT 2FWF FOR FINISHING OF ALUMNIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Number of teeth	Helix
	ØD1	L1	L	ØD2	Z	
FBK0508795	1.50	6.00	38.00	3.00	2	45
FBK0508796	2.00	8.00	38.00	3.00	2	45
FBK0508797	2.50	9.00	38.00	3.00	2	45
FBK0508798	3.00	12.00	38.00	3.00	2	45
FBK0508799	4.00	12.00	50.00	4.00	2	45
FBK0508800	5.00	14.00	50.00	5.00	2	45
FBK0508801	5.00	14.00	50.00	6.00	2	45
FBK0508802	6.00	16.00	50.00	6.00	2	45
FBK0508803	8.00	20.00	63.00	8.00	2	45
FBK0508804	10.00	22.00	76.00	10.00	2	45
FBK0508805	12.00	25.00	76.00	12.00	2	45
FBK0508806	16.00	32.00	89.00	16.00	2	45
FBK0508807	20.00	38.00	104.00	20.00	2	45



RAZORCUT 3FWF FOR FINISHING OF ALUMNIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	Z			30%			20%	
FBK0508708	3.00	12.00	38.00	3.00	3	38	Al 6000/7000	0.90	0.013	Wrought Aluminium	0.60	0.011
FBK0508709	4.00	12.00	51.00	4.00	3	38	Al 6000/7000	1.20	0.018	Wrought Aluminium	0.80	0.015
FBK0508710	5.00	14.00	51.00	5.00	3	38	Al 6000/7000	1.50	0.023	Wrought Aluminium	1.00	0.019
FBK0508711	6.00	16.00	50.00	6.00	3	38	Al 6000/7000	1.80	0.027	Wrought Aluminium	1.20	0.022
FBK0508712	8.00	20.00	63.00	8.00	3	38	Al 6000/7000	2.40	0.035	Wrought Aluminium	1.60	0.029
FBK0508713	10.00	22.00	76.00	10.00	3	38	Al 6000/7000	3.00	0.044	Wrought Aluminium	2.00	0.036
FBK0508714	12.00	25.00	76.00	12.00	3	38	Al 6000/7000	3.60	0.053	Wrought Aluminium	2.40	0.043
FBK0508715	16.00	32.00	89.00	16.00	3	38	Al 6000/7000	4.80	0.071	Wrought Aluminium	3.20	0.058
FBK0508716	20.00	38.00	104.00	20.00	3	38	Al 6000/7000	6.00	0.089	Wrought Aluminium	4.00	0.072



High Performance Cutting Tools

RAZORCUT 3FWFCR FOR SEMIFINISHING AND FINISHING ALUMINIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Neck Diameter	Neck Length	Corner Radius	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	ØD3	NL	Cr	Z			30%			20%	
FBK0508685	6.00	9.00	63.00	6.00	5.40	18.00	0.20	3	38	Al 6000/7000	1.80	0.030	Wrought Aluminium	1.20	0.024
FBK0508686	6.00	9.00	63.00	6.00	5.40	18.00	0.50	3	38	Al 6000/7000	1.80	0.030	Wrought Aluminium	1.20	0.024
FBK0508687	6.00	9.00	63.00	6.00	5.40	18.00	1.00	3	38	Al 6000/7000	1.80	0.030	Wrought Aluminium	1.20	0.024
FBK0508688	8.00	12.00	76.00	8.00	7.20	24.00	0.20	3	38	Al 6000/7000	2.40	0.039	Wrought Aluminium	1.60	0.032
FBK0508689	8.00	12.00	76.00	8.00	7.20	24.00	0.50	3	38	Al 6000/7000	2.40	0.039	Wrought Aluminium	1.60	0.032
FBK0508690	8.00	12.00	76.00	8.00	7.20	24.00	1.00	3	38	Al 6000/7000	2.40	0.039	Wrought Aluminium	1.60	0.032
FBK0508691	10.00	15.00	89.00	10.00	9.00	30.00	0.20	3	38	Al 6000/7000	3.00	0.049	Wrought Aluminium	2.00	0.040
FBK0508692	10.00	15.00	89.00	10.00	9.00	30.00	0.50	3	38	Al 6000/7000	3.00	0.049	Wrought Aluminium	2.00	0.040
FBK0508693	10.00	15.00	89.00	10.00	9.00	30.00	1.00	3	38	Al 6000/7000	3.00	0.049	Wrought Aluminium	2.00	0.040
FBK0508694	12.00	18.00	100.00	12.00	10.80	36.00	0.20	3	38	Al 6000/7000	3.60	0.059	Wrought Aluminium	2.40	0.048
FBK0508695	12.00	18.00	100.00	12.00	10.80	36.00	0.50	3	38	Al 6000/7000	3.60	0.059	Wrought Aluminium	2.40	0.048
FBK0508696	12.00	18.00	100.00	12.00	10.80	36.00	1.00	3	38	Al 6000/7000	3.60	0.059	Wrought Aluminium	2.40	0.048
FBK0508697	16.00	24.00	110.00	16.00	14.40	48.00	0.20	3	38	Al 6000/7000	4.80	0.079	Wrought Aluminium	3.20	0.064
FBK0508698	16.00	24.00	110.00	16.00	14.40	48.00	0.50	3	38	Al 6000/7000	4.80	0.079	Wrought Aluminium	3.20	0.064
FBK0508699	16.00	24.00	110.00	16.00	14.40	48.00	1.00	3	38	Al 6000/7000	4.80	0.079	Wrought Aluminium	3.20	0.064
FBK0508700	16.00	24.00	110.00	16.00	14.40	48.00	2.00	3	38	Al 6000/7000	4.80	0.079	Wrought Aluminium	3.20	0.064

RAZORCUT 3FWFXL LONG REACH TOOL FOR SEMIFINISHING AND FINISHING ALUMINIUM



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Neck Diameter	Neck Length	Corner Radius	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	ØD3	NL	Cr	Z			20%			15%	
FBK0508679	6.00	10.00	100.00	6.00	5.50	42.00	0.20	3	38	Al 6000/7000	1.20	0.024	Wrought Aluminium	0.90	0.021
FBK0508680	8.00	13.00	100.00	8.00	7.30	48.00	0.20	3	38	Al 6000/7000	1.60	0.032	Wrought Aluminium	1.20	0.028
FBK0508681	10.00	16.00	125.00	10.00	9.10	60.00	0.20	3	38	Al 6000/7000	2.00	0.040	Wrought Aluminium	1.50	0.035
FBK0508682	12.00	20.00	125.00	12.00	11.00	73.00	0.20	3	38	Al 6000/7000	2.40	0.048	Wrought Aluminium	1.80	0.042
FBK0508683	16.00	26.00	150.00	16.00	14.56	100.00	0.20	3	38	Al 6000/7000	3.20	0.064	Wrought Aluminium	2.40	0.056
FBK0508684	20.00	32.00	150.00	20.00	18.20	100.00	0.20	3	38	Al 6000/7000	4.00	0.080	Wrought Aluminium	3.00	0.070

RAZORCUT 3F FOR GENERAL MACHINING OF NON FERROUS MATERIALS



FG Code	Cutting Dia	Flute Length	OAL	Shank Dia	Number of teeth	Helix	Primary W/P	Ae (max)	hm	Secondary W/P	Ae (max)	hm
	ØD1	L1	L	ØD2	Z			30%			20%	
FBK0509996	3.00	12.00	38.00	3.00	3	38	Al 6000/7000	0.90	0.013	Wrought Aluminium	0.60	0.011
FBK0509997	4.00	12.00	50.00	4.00	3	38	Al 6000/7000	1.20	0.018	Wrought Aluminium	0.80	0.017
FBK0509998	5.00	14.00	50.00	5.00	3	38	Al 6000/7000	1.50	0.023	Wrought Aluminium	1.00	0.024
FBK0509999	6.00	16.00	50.00	6.00	3	38	Al 6000/7000	1.80	0.027	Wrought Aluminium	1.20	0.022
FBK0510000	8.00	20.00	63.00	8.00	3	38	Al 6000/7000	2.40	0.035	Wrought Aluminium	1.60	0.029
FBK0510001	10.00	22.00	76.00	10.00	3	38	Al 6000/7000	3.00	0.044	Wrought Aluminium	2.00	0.036
FBK0510002	12.00	25.00	76.00	12.00	3	38	Al 6000/7000	3.60	0.053	Wrought Aluminium	2.40	0.043
FBK0510003	16.00	32.00	89.00	16.00	3	38	Al 6000/7000	4.80	0.071	Wrought Aluminium	3.20	0.058
FBK0510004	20.00	38.00	104.00	20.00	3	38	Al 6000/7000	6.00	0.089	Wrought Aluminium	4.00	0.072



High Performance Cutting Tools

CUTTING SPEED AND FEED CHART

RAZORCUT CBC*

Material		Cutting speed for side milling (rough and semi finish). If high power spindle is available, you can increase Vc upto 2 times							Cutting speed for slot milling		Recommended feed per tooth (fz = mm/th) for side milling & For slotting, reduce fz by 20%.																	
		5	2.3	1.6	1.4	1.2	1.1	1	←		Multiply fz by this multiplication factor based on ae. For excellent floor finish, use the standard fz per chart below. Only add chip thinning multiplication factor when roughing or semi-finishing.																	
											Cutting Speed Vc (m/min)			Diameter in mm														
		ap Max	ap Max	ap 2D	ap 1.5D	ap 1.25D	ap 1D	ap 1D	ap	ap	Range			6.0		8.0		10.0		12.0		16.0		20.0		25.0		
ae 1%	ae 5%	ae 10%	ae 15%	ae 20%	ae 30%	ae 50%	0.75XD	1xD	min	max	mm	min	max	min	max	min	max	min	max	min	max	min	max	min	max			
Non Ferrous	N	1	1050	825	750	700	675	650	625	1000	1250	500	2000	fz	0.053	0.066	0.070	0.088	0.088	0.110	0.106	0.132	0.141	0.176	0.176	0.220	0.220	0.275
	2	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.047	0.059	0.063	0.079	0.079	0.099	0.095	0.119	0.126	0.158	0.158	0.198	0.198	0.248	

If you are using Trochoidal Strategy with the Razorcut CBC. Program the helix as 30 degrees, use the starting hm value as given in the catalogue section, Use an engagement angle starting value of 53.13 degrees to get good results.

RAZORCUT CBCH/NCBCH*

Material		Cutting speed for side milling (rough and semi finish). If high power spindle is available, you can increase Vc upto 2 times							Cutting speed for slot milling		Recommended feed per tooth (fz = mm/th) for side milling & For slotting, reduce fz by 20%.																	
		5	2.3	1.6	1.4	1.2	1.1	1	←		Multiply fz by this multiplication factor based on ae. For excellent floor finish, use the standard fz per chart below. Only add chip thinning multiplication factor when roughing or semi-finishing.																	
											Cutting Speed Vc (m/min)			Diameter in mm														
		ap Max	ap Max	ap 2D	ap 1.5D	ap 1.25D	ap 1D	ap 1D	ap	ap	Range			6.0		8.0		10.0		12.0		16.0		20.0		25.0		
ae 1%	ae 5%	ae 10%	ae 15%	ae 20%	ae 30%	ae 50%	0.75XD	1xD	min	max	mm	min	max	min	max	min	max	min	max	min	max	min	max	min	max			
Non Ferrous	N	1	1050	825	750	700	675	650	625	1000	1250	500	2000	fz	0.058	0.072	0.077	0.096	0.096	0.120	0.115	0.144	0.154	0.192	0.192	0.240	0.208	0.260
		2	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.052	0.065	0.069	0.086	0.086	0.108	0.104	0.130	0.138	0.173	0.173	0.216	0.192	0.240
		3	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.040	0.050	0.054	0.067	0.067	0.084	0.081	0.101	0.107	0.134	0.134	0.168	0.144	0.180
		4	840	660	600	560	540	520	500	460	575	400	750	fz	0.046	0.058	0.062	0.077	0.077	0.096	0.092	0.115	0.123	0.154	0.154	0.192	0.164	0.205
		5	525	413	375	350	338	325	313	500	625	250	1000	fz	0.052	0.065	0.069	0.086	0.086	0.108	0.104	0.130	0.138	0.173	0.173	0.216	0.187	0.234

If you are using Trochoidal Strategy with the Razorcut CBCH/NCBCH. Program the helix as 40 degrees, use the starting hm value as given in the catalogue section, Use an engagement angle starting value of 53.13 degrees to get good results.

RAZORCUT 3FWFCR/ 3FWFXL*

Material		Cutting speed for side milling (rough and semi finish). If high power spindle is available, you can increase Vc upto 2 times							Cutting speed for slot milling		Recommended feed per tooth (fz = mm/th) for side milling & For slotting, reduce fz by 20%.																
		5	2.3	1.6	1.4	1.2	1.1	1	←		Multiply fz by this multiplication factor based on ae. For excellent floor finish, use the standard fz per chart below. Only add chip thinning multiplication factor when roughing or semi-finishing.																
											Cutting Speed Vc (m/min)			Diameter in mm													
		ap Max	ap Max	ap 2D	ap 1.5D	ap 1.25D	ap 1D	ap 1D	ap	ap	Range			6.0		8.0		10.0		12.0		16.0		20.0			
ae 1%	ae 5%	ae 10%	ae 15%	ae 20%	ae 30%	ae 50%	0.75XD	1xD	min	max	mm	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
Non Ferrous	N	1	1050	825	750	700	675	650	625	1000	1250	500	2000	fz	0.048	0.060	0.064	0.080	0.080	0.100	0.096	0.120	0.128	0.160	0.160	0.200	
		2	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.043	0.054	0.058	0.072	0.072	0.090	0.086	0.108	0.115	0.144	0.144	0.180	

If you are using Trochoidal Strategy with the Razorcut 3FWFCR. Program the helix as 38 degrees, use the starting hm value as given in the catalogue section, Use an engagement angle starting value of 66.42 degrees to get good results.

#RPM = Vc X 318.057/Tool Dia.

#Feed (mm/min) = RPM X number of teeth X Feed (mm/tooth)

ap max = maximum length of cutting as per catalogue (L1)

If the Max machine spindle speed is lower than the recommended conditions. Use the below formula to get revised parameters

(Maximum Spindle Speed of Spindle)/(Spindle Speed of Recommended Milling Condition) = Conversion Rate (α)

Feed of Recommended Milling Condition (Vf mm / min) X α = Corrected Vf (mm / min)

Disclaimer

*Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



High Performance Cutting Tools

CUTTING SPEED AND FEED CHART

RAZORCUT 3FWF/ RAZORCUT 3F*

Material		Cutting speed for side milling (rough and semi finish). If high power spindle is available, you can increase Vc upto 2 times							Cutting speed for slot milling		Recommended feed per tooth (fz = mm/th) for side milling & For slotting, reduce fz by 20%.																	
		5	2.3	1.6	1.4	1.2	1.1	1	←		Multiply fz by this multiplication factor based on ae. For excellent floor finish, use the standard fz per chart below. Only add chip thinning multiplication factor when roughing or semi-finishing.																	
											Cutting Speed Vc (m/min)		Diameter in mm															
		ap Max	ap Max	ap 2D	ap 1.5D	ap 1.25D	ap 1D	ap 1D	ap	ap	Range			3.0		6.0		8.0		10.0		12.0		16.0		20.0		
ae 1%	ae 5%	ae 10%	ae 15%	ae 20%	ae 30%	ae 50%	0.75XD	1xD	min	max	mm	min	max	min	max	min	max	min	max	min	max	min	max	min	max			
Non Ferrous	N	1	1050	825	750	700	675	650	625	1000	1250	500	2000	fz	0.022	0.027	0.043	0.054	0.058	0.072	0.072	0.090	0.086	0.108	0.115	0.144	0.144	0.180
		2	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.019	0.024	0.039	0.049	0.052	0.065	0.065	0.081	0.078	0.097	0.104	0.130	0.130	0.162

If you are using Trochoidal Strategy with the Razorcut 3FWF/3F. Program the helix as 38 degrees, use the starting hm value as given in the catalogue section, Use an engagement angle starting value of 53.13 degrees to get good results.

RAZORCUT 2FWF*

Material		Cutting speed for side milling (rough and semi finish). If high power spindle is available, you can increase Vc upto 2 times							Cutting speed for slot milling		Recommended feed per tooth (fz = mm/th) for side milling & For slotting, reduce fz by 20%.																					
		5	2.3	1.6	1.4	1.2	1.1	1	←		Multiply fz by this multiplication factor based on ae. For excellent floor finish, use the standard fz per chart below. Only add chip thinning multiplication factor when roughing or semi-finishing.																					
											Cutting Speed Vc (m/min)		Diameter in mm																			
		ap Max	ap Max	ap 2D	ap 1.5D	ap 1.25D	ap 1D	ap 1D	ap	ap	Range			1.5		2.0		4.0		6.0		8.0		10.0		12.0		16.0		20.0		
ae 1%	ae 5%	ae 10%	ae 15%	ae 20%	ae 30%	ae 50%	1XD	0.5XD	min	max	mm	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max					
Non Ferrous	N	1	1050	825	750	700	675	650	625	1000	1250	500	2000	fz	0.011	0.014	0.014	0.018	0.029	0.036	0.043	0.054	0.058	0.072	0.072	0.090	0.086	0.108	0.115	0.144	0.144	0.180
		2	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.010	0.012	0.013	0.016	0.026	0.032	0.039	0.049	0.052	0.065	0.065	0.081	0.078	0.097	0.104	0.130	0.130	0.162

RAZORCUT 1F*

Material		Cutting speed for side milling (rough and semi finish). If high power spindle is available, you can increase Vc upto 2 times							Cutting speed for slot milling		Recommended feed per tooth (fz = mm/th) for side milling & For slotting, reduce fz by 20%.															
											Cutting Speed Vc (m/min)		Diameter in mm													
		ap Max	ap Max	ap 2D	ap 1.2D	ap 1.1D	ap 1D	ap 1D	ap	ap	Range			3.0		4.0		5.0		6.0		8.0		10.0		
		ae 1%	ae 5%	ae 10%	ae 15%	ae 20%	ae 30%	ae 50%	1XD	0.5XD	min	max	mm	min	max	min	max	min	max	min	max	min	max	min	max	
Non Ferrous	N	1	1050	825	750	700	675	650	625	1000	1250	500	2000	fz	0.017	0.021	0.022	0.028	0.028	0.035	0.034	0.042	0.045	0.056	0.056	0.070
		2	1050	825	750	700	675	650	625	800	1000	500	1500	fz	0.014	0.017	0.018	0.022	0.028	0.027	0.034	0.036	0.045	0.045	0.056	

For better finish reduce the feed rate.

#RPM = Vc X 318.057/Tool Dia.

#Feed (mm/min) = RPM X number of teeth X Feed (mm/tooth)

ap max = maximum length of cutting as per catalogue (L1)

If the Max machine spindle speed is lower than the recommended conditions.

Use the below formula to get revised parameters

(Maximum Spindle Speed of Spindle)/(Spindle Speed of Recommended

Milling Condition) = Conversion Rate (α)

Feed of Recommended Milling Condition (Vf mm / min) X α = Corrected Vf (mm / min)

Disclaimer

*Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

EXAMPLE

Material : N1 Category

Part with Ap 15mm Ae 1.8mm Rough Ae 0.5mm Finish

ROUGHING

12mm Tool Selected for Roughing is Razorcut™ CBCH- FBK0508793

Ap 15, Ae 1.8, Ae/D Ratio- 15%

From the Side Milling Chart we can select the cutting speed as Vc 700

From the Feed per tooth Chart we can arrive at the feed range of 0.115mm/rev-0.144mm/rev (0.13mm/rev

Average can be considered)

As this is a Roughing side milling application, We can introduce the Chip thinning multiplication factor from the table of 1.4

Multiply 1.4 X 0.13. The revised feed per tooth(fz) is 0.182mm/tooth

The feed per revolution (f rev) is now is 0.546mm/rev

Based on the Vc the RPM to be programmed is 18560 and the Table Feed (F) (mm/min) is 10134mm/min

FINISHING

10mm Tool Selected for Finishing is Razorcut™ 3FWF- FBK0508713

Ap 15, Ae 0.5, Ae/D Ratio- 5%

From the Side Milling Chart we can select the cutting speed as Vc 825

From the Feed per tooth Chart we can arrive at the feed range of 0.072mm/rev-0.090mm/rev (0.072mm/rev lower limit to be considered as we have to achieve a finish value)

As this is a Finish side milling application, We do not need to introduce the Chip thinning multiplication factor

The feed per revolution (f rev) is now is 0.216mm/rev

Based on the Vc the RPM to be programmed is 26250 and the Table Feed (F) (mm/min) is 5670mm/min

If the desired Ra value is not achieved, Lower the feed rates until the desired value is achieved



High Performance Cutting Tools

CASE STUDIES

CHALLENGE

Roughing and finishing with FBK0508712 - EM 8.00MMX20X63 SH8 3FLT 38HX WF

SOLUTION

FBK0508712 - EM 8.00MMX20X63 SH8 3FLT 38HX WF

CUTTING DATA

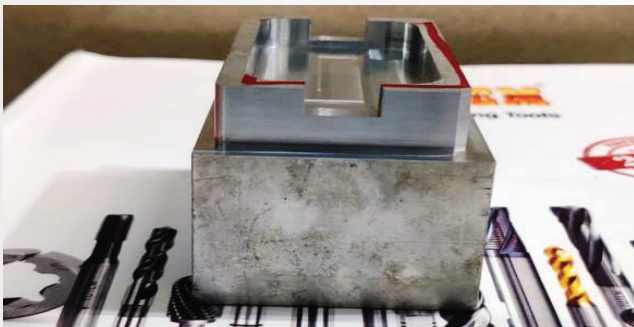
Machine : BFW
Power- 9KW, Max RPM-10000,
Coolant-External Emulsion
RPM-6000 mm/min
Feed= 400 mm/min
ap-3mm
ae-1mm

RESULT

Existing tool life 20 blocks
Totem Razorcut™ 3FWF tool life 50 blocks

BENEFITS

CPC Reduced by 50%



Material – Al Block 2025

CHALLENGE

Floor flatness of 40 microns across the length and width of the Vacuum Pressure plate and cycle time reduction

SOLUTION

FBK0508705- EM 16.00MMX32X92 SH16 CR1 3FL 40HXCB

CUTTING DATA

Machine : Mazak-FJV-60/80-11
Holder :- FBT0500672- HSKA63SFC16095M
(balanced 2.5G @ 25000 RPM)

Plunging Parameters:

18000 RPM- Feed 700. (Plunge depth -4.9mm)

Cavity machining parameters:

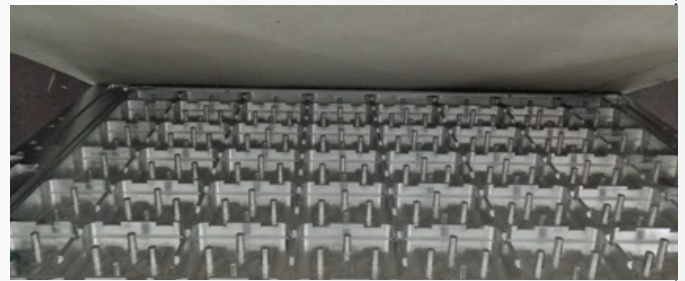
16000 RPM Feed 4000. (Cavity depth -19.5mm)

RESULT

Earlier cycle time: 1 Hour 2 minutes
Totem Razorcut™ CBCH Cycle Time :- 42 minutes

BENEFITS

20 minutes saving in cycle time



Material – AL6061



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