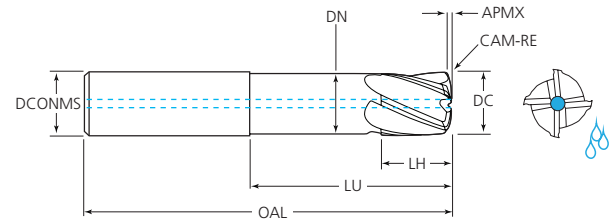


TuffCut® HF Series FHFP N3 Metric

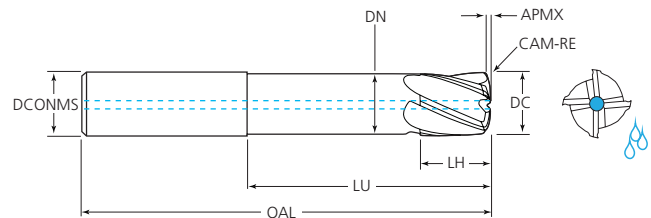
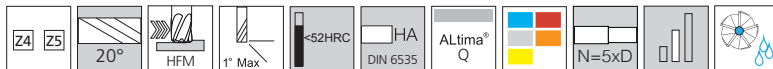


M.A. Ford **High-Feed, Positive**

High-feed roughing in 3D shapes, long reach applications, & difficult materials.

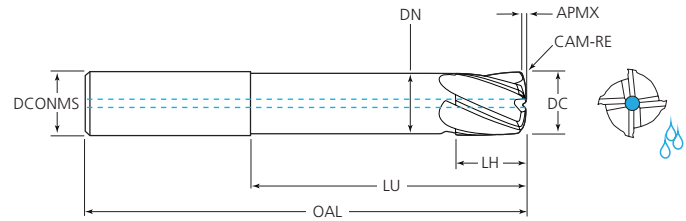
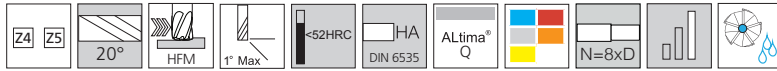
Tool Number	EDP	DC	DCONMS	DN	OAL	LH	APMX	LU	NOF	CAM-RE
FHFP06N3-CCAQ	19877	6.0	6.0	5.8	57.0	6.0	0.31	20.0	4	0.6
FHFP08N3-CCAQ	19878	8.0	8.0	7.8	63.0	8.0	0.44	26.0	4	0.8
FHFP10N3-CCAQ	19879	10.0	10.0	9.8	72.0	10.0	0.55	32.0	4	1.0
FHFP12N3-CCAQ	19880	12.0	12.0	11.8	83.0	12.0	0.63	38.0	5	1.2
FHFP16N3-CCAQ	19881	16.0	16.0	15.8	100.0	16.0	0.77	50.0	5	1.6

TuffCut® HF Series FHFP N5 Metric



Tool Number	EDP	DC	DCONMS	DN	OAL	LH	APMX	LU	NOF	CAM-RE
FHFP06N5-CCAQ	19882	6.0	6.0	5.8	75.0	6.0	0.31	32.0	4	0.6
FHFP08N5-CCAQ	19883	8.0	8.0	7.8	83.0	8.0	0.44	42.0	4	0.8
FHFP10N5-CCAQ	19884	10.0	10.0	9.8	100.0	10.0	0.55	52.0	4	1.0
FHFP12N5-CCAQ	19885	12.0	12.0	11.8	110.0	12.0	0.63	62.0	5	1.2
FHFP16N5-CCAQ	19886	16.0	16.0	15.8	133.0	16.0	0.77	82.0	5	1.6

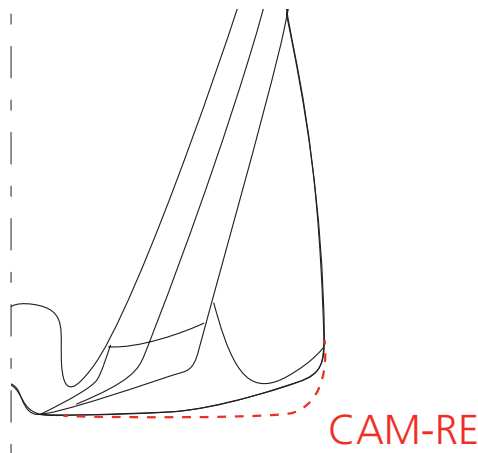
TuffCut® HF Series FHFP N8 Metric



Tool Number	EDP	DC	DCONMS	DN	OAL	LH	APMX	LU	NOF	CAM-RE
FHFP06N8-CCAQ	19887	6.0	6.0	5.8	90.0	6.0	0.31	50.0	4	0.6
FHFP08N8-CCAQ	19888	8.0	8.0	7.8	110.0	8.0	0.44	66.0	4	0.8
FHFP10N8-CCAQ	19889	10.0	10.0	9.8	130.0	10.0	0.55	82.0	4	1.0
FHFP12N8-CCAQ	19890	12.0	12.0	11.8	150.0	12.0	0.63	98.0	5	1.2

CAM-RE

- CAM-RE = theoretical radius
- Used to create tool definition in CAM to ensure high accuracy, near-net shape 3D roughing



Safety Note

Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded.



WARNING: This product can expose you to chemicals including cobalt, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Recommended Cutting Data - Inch

Series FHFP - 3xD - Inch																				
Workpiece Material Group	ISO	Coolant			Vc- SFM	Tool Diameter (inch)														
		Emulsion	Air	MQL		.2362			.3150			.3937			.4724			.6299		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon Steels	P	●	●	o	985	.0118	.1772	.0154	.0157	.2362	.0205	.0197	.2953	.0256	.0236	.3543	.0307	.0276	.4724	.0409
Medium Carbon Steels		●	●	o	820	.0118	.1772	.0142	.0157	.2362	.0189	.0197	.2953	.0236	.0236	.3543	.0283	.0276	.4724	.0378
Alloy Steels		●	●	o	655	.0118	.1772	.0130	.0157	.2362	.0173	.0197	.2953	.0217	.0236	.3543	.0260	.0276	.4724	.0346
Die/Tool Steels		●	●	o	490	.0118	.1772	.0118	.0157	.2362	.0157	.0197	.2953	.0197	.0236	.3543	.0236	.0276	.4724	.0315
Austenitic Stainless Steels	M	●	X	o	395	.0094	.1417	.0094	.0126	.1890	.0126	.0157	.2362	.0157	.0189	.2835	.0189	.0220	.3780	.0252
Duplex (22%)		●	X	o	295	.0083	.1417	.0094	.0110	.1890	.0126	.0138	.2362	.0157	.0165	.2835	.0189	.0193	.3780	.0252
Super Duplex (25%)		●	X	o	245	.0071	.0945	.0094	.0094	.1260	.0126	.0118	.1575	.0157	.0142	.1890	.0189	.0165	.2520	.0252
Titanium Alloys	S	●	X	X	330	.0071	.0945	.0094	.0094	.1260	.0126	.0118	.1575	.0157	.0142	.1890	.0189	.0165	.2520	.0252
High Temp Alloys		●	X	X	100	.0059	.0709	.0063	.0079	.0945	.0087	.0098	.1181	.0106	.0118	.1417	.0126	.0138	.1890	.0169
Hardened Steels 45 - 50HRC	H	●	●	o	295	.0106	.1772	.0106	.0142	.2362	.0142	.0177	.2953	.0177	.0213	.3543	.0213	.0248	.4724	.0283
Hardened Steels 50 - 55HRC		●	●	o	260	.0094	.1417	.0083	.0126	.1890	.0110	.0157	.2362	.0138	.0189	.2835	.0165	.0220	.3780	.0220

Series FHFP - 5xD - Inch																				
Workpiece Material Group	I S O	Coolant			Vc- SFM	Tool Diameter (inch)														
		Emulsion	Air	MQL		.2362			.3150			.3937			.4724			.6299		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon Steels	P	●	●	○	885	.0094	.1772	.0154	.0126	.2362	.0205	.0157	.2953	.0256	.0189	.3543	.0307	.0220	.4724	.0409
Medium Carbon Steels		●	●	○	740	.0094	.1772	.0142	.0126	.2362	.0189	.0157	.2953	.0236	.0189	.3543	.0283	.0220	.4724	.0378
Alloy Steels		●	●	○	590	.0094	.1772	.0130	.0126	.2362	.0173	.0157	.2953	.0217	.0189	.3543	.0260	.0220	.4724	.0346
Die/Tool Steels		●	●	○	445	.0094	.1772	.0118	.0126	.2362	.0157	.0157	.2953	.0197	.0189	.3543	.0236	.0220	.4724	.0315
Austenitic Stainless Steels	M	●	X	○	360	.0075	.1417	.0094	.0102	.1890	.0126	.0126	.2362	.0157	.0150	.2835	.0189	.0177	.3780	.0252
Duplex (22%)		●	X	○	260	.0067	.1417	.0094	.0087	.1890	.0126	.0110	.2362	.0157	.0134	.2835	.0189	.0154	.3780	.0252
Super Duplex (25%)		●	X	○	230	.0055	.0945	.0094	.0075	.1260	.0126	.0094	.1575	.0157	.0114	.1890	.0189	.0134	.2520	.0252
Titanium Alloys	S	●	X	X	295	.0055	.0945	.0094	.0075	.1260	.0126	.0094	.1575	.0157	.0114	.1890	.0189	.0134	.2520	.0252
High Temp Alloys		●	X	X	100	.0047	.0709	.0063	.0063	.0945	.0087	.0079	.1181	.0106	.0094	.1417	.0126	.0110	.1890	.0169
Hardened Steels 45 - 50HRC	H	●	●	○	260	.0087	.1772	.0106	.0114	.2362	.0142	.0142	.2953	.0177	.0169	.3543	.0213	.0197	.4724	.0283
Hardened Steels 50 - 55HRC		●	●	○	230	.0075	.1417	.0083	.0102	.1890	.0110	.0126	.2362	.0138	.0150	.2835	.0165	.0177	.3780	.0220

Series FHFP - 8xD - Inch																				
Workpiece Material Group	I S O	Coolant			Vc- SFM	Tool Diameter (inch)														
		Emulsion	Air	MQL		.2362			.3150			.3937			.4724			.6299		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon Steels	P	●	●	o	490	.0071	.1417	.0154	.0094	.1890	.0205	.0118	.2362	.0256	.0142	.2835	.0307	.0165	.3780	.0409
Medium Carbon Steels		●	●	o	395	.0071	.1417	.0142	.0094	.1890	.0189	.0118	.2362	.0236	.0142	.2835	.0283	.0165	.3780	.0378
Alloy Steels		●	●	o	330	.0071	.1417	.0130	.0094	.1890	.0173	.0118	.2362	.0217	.0142	.2835	.0260	.0165	.3780	.0346
Die/Tool Steels		●	●	o	330	.0071	.1417	.0118	.0094	.1890	.0157	.0118	.2362	.0197	.0142	.2835	.0236	.0165	.3780	.0315
Austenitic Stainless Steels	M	●	X	o	260	.0055	.1417	.0094	.0075	.1890	.0126	.0094	.2362	.0157	.0114	.2835	.0189	.0134	.3780	.0252
Duplex (22%)		●	X	o	195	.0051	.0945	.0094	.0067	.1260	.0126	.0083	.1575	.0157	.0098	.1890	.0189	.0114	.2520	.0252
Super Duplex (25%)		●	X	o	165	.0043	.0945	.0094	.0055	.1260	.0126	.0071	.1575	.0157	.0087	.1890	.0189	.0098	.2520	.0252
Titanium Alloys	S	●	X	X	230	.0043	.0945	.0094	.0055	.1260	.0126	.0071	.1575	.0157	.0087	.1890	.0189	.0098	.2520	.0252
High Temp Alloys		●	X	X	65	.0035	.0709	.0063	.0047	.0945	.0087	.0059	.1181	.0106	.0071	.1417	.0126	.0083	.1890	.0169
Hardened Steels 45 - 50HRC	H	●	●	o	195	.0063	.1417	.0106	.0087	.1890	.0142	.0106	.2362	.0177	.0126	.2835	.0213	.0150	.3780	.0283
Hardened Steels 50 - 55HRC		●	●	o	165	.0055	.0945	.0083	.0075	.1260	.0110	.0094	.1575	.0138	.0114	.1890	.0165	.0134	.2520	.0220

● Preferred o Possible X Not Possible

Recommended Cutting Data - Metric

Series FHFP - 3xD - Metric																				
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter (mm)														
		Emulsion	Air	MQL		6			8			10			12			16		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon Steels	P	●	●	○	300	0.30	4.5	0.39	0.40	6.0	0.52	0.50	7.5	0.65	0.60	9.0	0.78	0.70	12.0	1.04
Medium Carbon Steels		●	●	○	250	0.30	4.5	0.36	0.40	6.0	0.48	0.50	7.5	0.60	0.60	9.0	0.72	0.70	12.0	0.96
Alloy Steels		●	●	○	200	0.30	4.5	0.33	0.40	6.0	0.44	0.50	7.5	0.55	0.60	9.0	0.66	0.70	12.0	0.88
Die/Tool Steels		●	●	○	150	0.30	4.5	0.30	0.40	6.0	0.40	0.50	7.5	0.50	0.60	9.0	0.60	0.70	12.0	0.80
Austenitic Stainless Steels	M	●	X	○	120	0.24	3.6	0.24	0.32	4.8	0.32	0.40	6.0	0.40	0.48	7.2	0.48	0.56	9.6	0.64
Duplex (22%)		●	X	○	90	0.21	3.6	0.24	0.28	4.8	0.32	0.35	6.0	0.40	0.42	7.2	0.48	0.49	9.6	0.64
Super Duplex (25%)		●	X	○	75	0.18	2.4	0.24	0.24	3.2	0.32	0.30	4.0	0.40	0.36	4.8	0.48	0.42	6.4	0.64
Titanium Alloys	S	●	X	X	100	0.18	2.4	0.24	0.24	3.2	0.32	0.30	4.0	0.40	0.36	4.8	0.48	0.42	6.4	0.64
High Temp Alloys		●	X	X	30	0.15	1.8	0.16	0.20	2.4	0.22	0.25	3.0	0.27	0.30	3.6	0.32	0.35	4.8	0.43
Hardened Steels 45 - 50HRC	H	●	●	○	90	0.27	4.5	0.27	0.36	6.0	0.36	0.45	7.5	0.45	0.54	9.0	0.54	0.63	12.0	0.72
Hardened Steels 50 - 55HRC		●	●	○	80	0.24	3.6	0.21	0.32	4.8	0.28	0.40	6.0	0.35	0.48	7.2	0.42	0.56	9.6	0.56

Series FHFP - 5xD - Metric																				
Workpiece Material Group	I S O	Coolant			Vc- m/min	Tool Diameter (mm)														
		Emulsion	Air	MQL		6			8			10			12			16		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon Steels	P	●	●	○	270	0.24	4.5	0.39	0.32	6.0	0.52	0.40	7.5	0.65	0.48	9.0	0.78	0.56	12.0	1.04
Medium Carbon Steels		●	●	○	225	0.24	4.5	0.36	0.32	6.0	0.48	0.40	7.5	0.60	0.48	9.0	0.72	0.56	12.0	0.96
Alloy Steels		●	●	○	180	0.24	4.5	0.33	0.32	6.0	0.44	0.40	7.5	0.55	0.48	9.0	0.66	0.56	12.0	0.88
Die/Tool Steels		●	●	○	135	0.24	4.5	0.30	0.32	6.0	0.40	0.40	7.5	0.50	0.48	9.0	0.60	0.56	12.0	0.80
Austenitic Stainless Steels	M	●	X	○	110	0.19	3.6	0.24	0.26	4.8	0.32	0.32	6.0	0.40	0.38	7.2	0.48	0.45	9.6	0.64
Duplex (22%)		●	X	○	80	0.17	3.6	0.24	0.22	4.8	0.32	0.28	6.0	0.40	0.34	7.2	0.48	0.39	9.6	0.64
Super Duplex (25%)		●	X	○	70	0.14	2.4	0.24	0.19	3.2	0.32	0.24	4.0	0.40	0.29	4.8	0.48	0.34	6.4	0.64
Titanium Alloys	S	●	X	X	90	0.14	2.4	0.24	0.19	3.2	0.32	0.24	4.0	0.40	0.29	4.8	0.48	0.34	6.4	0.64
High Temp Alloys		●	X	X	30	0.12	1.8	0.16	0.16	2.4	0.22	0.20	3.0	0.27	0.24	3.6	0.32	0.28	4.8	0.43
Hardened Steels 45 - 50HRC	H	●	●	○	80	0.22	4.5	0.27	0.29	6.0	0.36	0.36	7.5	0.45	0.43	9.0	0.54	0.50	12.0	0.72
Hardened Steels 50 - 55HRC		●	●	○	70	0.19	3.6	0.21	0.26	4.8	0.28	0.32	6.0	0.35	0.38	7.2	0.42	0.45	9.6	0.56

Series FHFP - 8xD - Metric																				
Workpiece Material Group	I S O	Coolant			Vc- m/min	Tool Diameter (mm)														
		Emulsion	Air	MQL		6			8			10			12			16		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon Steels	P	●	●	○	150	0.18	3.6	0.39	0.24	4.8	0.52	0.30	6.0	0.65	0.36	7.2	0.78	0.42	9.6	1.04
Medium Carbon Steels		●	●	○	120	0.18	3.6	0.36	0.24	4.8	0.48	0.30	6.0	0.60	0.36	7.2	0.72	0.42	9.6	0.96
Alloy Steels		●	●	○	100	0.18	3.6	0.33	0.24	4.8	0.44	0.30	6.0	0.55	0.36	7.2	0.66	0.42	9.6	0.88
Die/Tool Steels		●	●	○	100	0.18	3.6	0.30	0.24	4.8	0.40	0.30	6.0	0.50	0.36	7.2	0.60	0.42	9.6	0.80
Austenitic Stainless Steels	M	●	X	○	80	0.14	3.6	0.24	0.19	4.8	0.32	0.24	6.0	0.40	0.29	7.2	0.48	0.34	9.6	0.64
Duplex (22%)		●	X	○	60	0.13	2.4	0.24	0.17	3.2	0.32	0.21	4.0	0.40	0.25	4.8	0.48	0.29	6.4	0.64
Super Duplex (25%)		●	X	○	50	0.11	2.4	0.24	0.14	3.2	0.32	0.18	4.0	0.40	0.22	4.8	0.48	0.25	6.4	0.64
Titanium Alloys	S	●	X	X	70	0.11	2.4	0.24	0.14	3.2	0.32	0.18	4.0	0.40	0.22	4.8	0.48	0.25	6.4	0.64
High Temp Alloys		●	X	X	20	0.09	1.8	0.16	0.12	2.4	0.22	0.15	3.0	0.27	0.18	3.6	0.32	0.21	4.8	0.43
Hardened Steels 45 - 50HRC	H	●	●	○	60	0.16	3.6	0.27	0.22	4.8	0.36	0.27	6.0	0.45	0.32	7.2	0.54	0.38	9.6	0.72
Hardened Steels 50 - 55HRC		●	●	○	50	0.14	2.4	0.21	0.19	3.2	0.28	0.24	4.0	0.35	0.29	4.8	0.42	0.34	6.4	0.56

● Preferred ○ Possible X Not Possible