M.A. FORD
High Performance Cutting Tools

25 1998 - 2023
YEARS ANNIVERSARY

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New Products

- See inside for details

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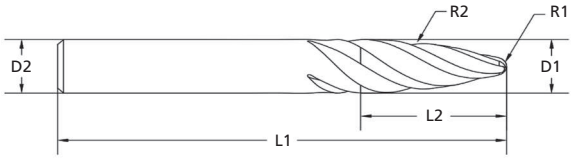
Contents

NEW

TuffCut® 3D Series XFO

Multi Flute | <50HRC | HA | ALtima® Q | R ±0.010mm

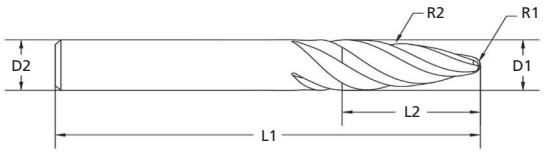


Tool No.	EDP	D1	D2 (h6)	L1	L2	R1	R2	No. of Flutes
XFO-4M06R95AQ	19904	6.0	6.0	64.0	20.8	1.0	95.0	4
XFO-4M08R90AQ	19905	8.0	8.0	64.0	24.5	1.0	90.0	4
XFO-4M10R85AQ	19906	10.0	10.0	72.0	24.7	2.0	85.0	4
XFO-6M10R85AQ	19907	10.0	10.0	72.0	24.7	2.0	85.0	6
XFO-4M12R80AQ	19908	12.0	12.0	84.0	27.3	2.0	80.0	4
XFO-6M12R80AQ	19909	12.0	12.0	84.0	27.3	2.0	80.0	6

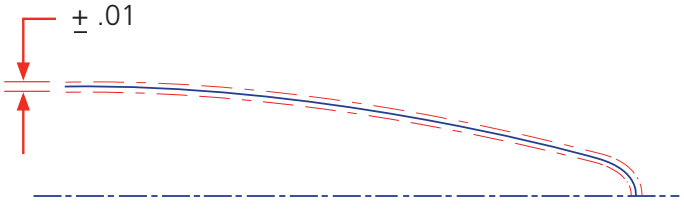
NEW

TuffCut® 3D Series XFO-AL

Multi Flute | HA | Ford lube | R ±0.010mm



Tool No.	EDP	D1	D2 (h6)	L1	L2	R1	R2	No. of Flutes
XFO-AL3M06R95F	19900	6.0	6.0	64.0	20.8	1.0	95.0	3
XFO-AL3M08R90F	19901	8.0	8.0	64.0	24.5	1.0	90.0	3
XFO-AL4M10R85F	19902	10.0	10.0	72.0	24.7	2.0	85.0	4
XFO-AL4M12R80F	19903	12.0	12.0	84.0	27.3	2.0	80.0	4



Radius form tolerance

The XFO and XFO-AL series are held to a precision radius form tolerance of ±.010mm to ensure high accuracy finishing, and prevention of mis-match on component surfaces.

Recommended Cutting Data

Series XFO								
Recommended Speeds by Material Group						Finishing	Semi-Finishing	
Workpiece Material Group		Material Type	Stock Allowance			.01-.03 x D	.05-.07 x D	
			Coolant			Vc - M/Min		
			Emulsion	Air	MQL			
Steels	P	Low Carbon	●	●	●	450	350	
		Medium Carbon	●	●	●	345	275	
		Alloy Steels	●	●	●	315	255	
		Die / Tool Steels (≤ 45 HRC)	●	●	●	275	220	
Stainless Steels	M	Free Machining	●	X		205	165	
		Austenitic	●	X		160	130	
		Difficult Stainless	●	X		125	100	
		PH Stainless (≤ 45 HRC)	●	X		160	130	
		Cobalt Chrome Alloys	●	X		125	100	
		Duplex (22%)	●	X		75	60	
		Super Duplex (25%)	●	X		60	50	
Special Alloys	S	High Temp Alloys	●	X	X	45	30	
		Titanium Alloys	●	X	X	110	90	

● Preferred Possible X Not Possible

Series XFO										
Recommended Feeds by Material Group			Tool Diameter							
Workpiece Material Group		Material Type	6		8		10		12	
			Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish
			Fz - mm/tooth							
Steels	P	Low Carbon	.048	.030	.064	.040	.080	.050	.096	.060
		Medium Carbon	.048	.030	.064	.040	.080	.050	.096	.060
		Alloy Steels	.048	.030	.064	.040	.080	.050	.096	.060
		Die / Tool Steels (≤ 45 HRC)	.036	.024	.048	.032	.060	.040	.072	.048
Stainless Steels	M	Free Machining	.048	.030	.064	.040	.080	.050	.096	.060
		Austenitic	.048	.030	.064	.040	.080	.050	.096	.060
		Difficult Stainless	.048	.030	.064	.040	.080	.050	.096	.060
		PH Stainless (≤ 45 HRC)	.036	.024	.048	.032	.060	.040	.072	.048
		Cobalt Chrome Alloys	.036	.024	.048	.032	.060	.040	.072	.048
		Duplex (22%)	.036	.024	.048	.032	.060	.040	.072	.048
		Super Duplex (25%)	.036	.024	.048	.032	.060	.040	.072	.048
Special Alloys	S	High Temp Alloys	.036	.024	.048	.032	.060	.040	.072	.048
		Titanium Alloys	.042	.030	.056	.040	.070	.050	.084	.060

Notes:

- Cutting data provided should be considered advisory only. Adjustments may be necessary depending on the application.
- To prevent chip evcaution issues, utilize 4-flute tools for semi-finishing operations & avoid cutting with the tip of the tool wherever possible.
- Reduced feeds required when cutting with the tip of the tool.

Recommended Cutting Data

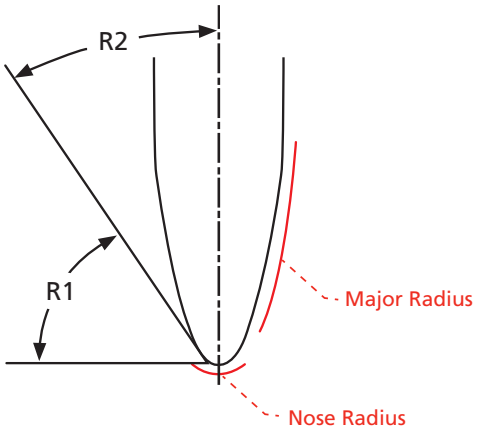
Series XFO-AL							
Recommended Speeds by Material Group						Finishing	Semi-Finishing
Workpiece Material Group		Material Type	Stock Allowance			.01-.03 x D	.05-.07 x D
			Coolant			Vc - M/Min	
			Emulsion	Air	MQL		
Aluminium	N	Wrought (≤ 10% Si)	●	X		610	580
		Cast (> 10% Si)	●	X		520	490

● Preferred Possible X Not Possible

Series XFO-AL									
Recommended Feeds by Material Group			Tool Diameter						
Workpiece Material Group		Material Type	6		8		10		12	
			Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish
			Fz - mm/tooth							
Aluminium	N	Wrought (≤ 10% Si)	.060	.039	.080	.052	.100	.065	.120	.078
		Cast (> 10% Si)	.060	.039	.080	.052	.100	.065	.120	.078

Notes:

- Cutting data provided should be considered advisory only. Adjustments may be necessary depending on the application.
- To prevent chip evcaution issues, avoid cutting with the tip of the tool wherever possible.
- Reduced feeds required when cutting with the tip of the tool.



Tool Ø	Nose Radius		Major Radius	
D1	R1	Effective Angle (Max.)	R2	Effective Angle (Max.)
6	1	78.2°	95	11.8°
8	1	75.1°	90	14.9°
10	2	74.6°	85	15.4°
12	2	71.6°	80	18.4°

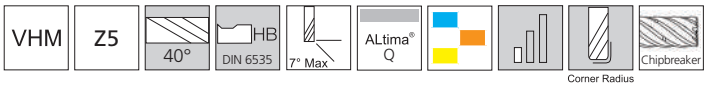
*Numbers above represent maximum angle values.

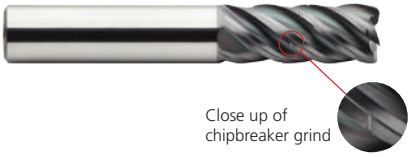
Stepover Distance by Cusp Height

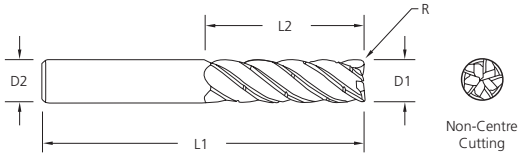
Tool Ø (mm)		Cusp Height (mm)	0.003	0.005	0.008	0.010	0.013
D1	R2						
6	95	Stepover (mm)	1.50	1.95	2.46	2.76	3.14
8	90		1.47	1.90	2.40	2.69	3.06
10	85		1.43	1.84	2.33	2.61	2.97
12	80		1.38	1.79	2.26	2.53	2.88

NEW

TuffCut® XV Series XV5CB 2xD



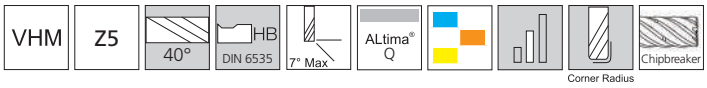


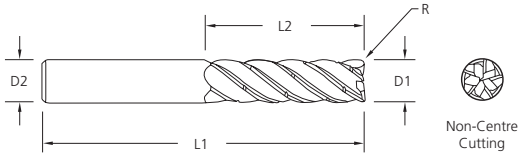


Tool Number	D1	D2	L1	L2	R
XV5CBM1002-R0.5AQW	10.0	10.0	74.0	27.0	0.5
XV5CBM1202-R0.5AQW	12.0	12.0	85.0	32.0	0.5
XV5CBM1602-R0.5AQW	16.0	16.0	98.0	42.0	0.5
XV5CBM2002-R0.5AQW	20.0	20.0	110.0	52.0	0.5

NEW

TuffCut® XV Series XV5CB 3xD

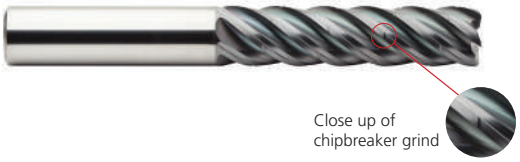


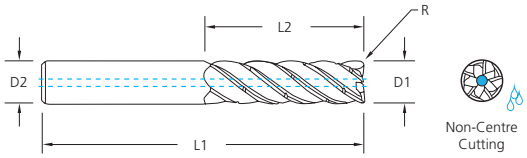


Tool Number	D1	D2	L1	L2	R
XV5CBM1003-R0.5AQW	10.0	10.0	80.0	33.0	0.5
XV5CBM1203-R0.5AQW	12.0	12.0	93.0	40.0	0.5
XV5CBM1603-R0.5AQW	16.0	16.0	110.0	54.0	0.5
XV5CBM2003-R0.5AQW	20.0	20.0	124.0	66.0	0.5

NEW

TuffCut® XV Series XV5CB 3xD-C

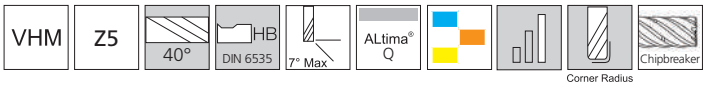


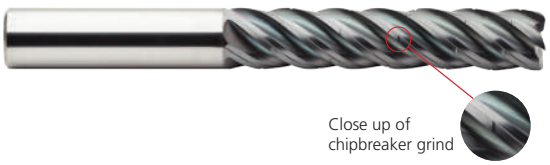


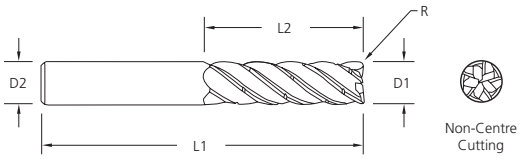
Tool Number	D1	D2	L1	L2	R
XV5CBM1003-R0.5AQW-C	10.0	10.0	80.0	33.0	0.5
XV5CBM1203-R0.5AQW-C	12.0	12.0	93.0	40.0	0.5
XV5CBM1603-R0.5AQW-C	16.0	16.0	110.0	54.0	0.5
XV5CBM2003-R0.5AQW-C	20.0	20.0	124.0	66.0	0.5

NEW

TuffCut® XV Series XV5CB 4xD







Tool Number	D1	D2	L1	L2	R
XV5CBM1004-R0.5AQW	10.0	10.0	90.0	43.0	0.5
XV5CBM1204-R0.5AQW	12.0	12.0	104.0	51.0	0.5
XV5CBM1604-R0.5AQW	16.0	16.0	123.0	67.0	0.5
XV5CBM2004-R0.5AQW	20.0	20.0	141.0	83.0	0.5

Recommended Cutting Data

Series XV5CB - 2xD											
Workpiece Material Group	ISO	Coolant			RWOC (ae)			Tool Diameter (mm)			
								10	12	16	20
		Emulsion	Air	MQL	10%	15%	20%	← Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only use this calculation when roughing or semi-finishing.			
					1.67	1.4	1.2				
					Vc - M/Min			fz - mm/tooth			
Low Carbon Steels	P	•	•	•	350	300	250	0.060	0.072	0.096	0.120
Medium Carbon Steels	P	•	•	•	260	240	220	0.060	0.072	0.096	0.120
Alloy Steels	P	•	•	•	240	220	200	0.060	0.072	0.096	0.120
Die / Tool Steels	P	•	•	•	220	200	180	0.060	0.072	0.096	0.120
Stainless Steels - Free Machining	M	•	•	o	205	180	150	0.060	0.072	0.096	0.120
Stainless Steels - Austenitic	M	•	x	o	160	140	100	0.048	0.058	0.077	0.096
Stainless Steels - Difficult to Machine	M	•	x	o	110	90	70	0.040	0.048	0.064	0.080
Stainless Steels - Precipitation Hardened	M	•	•	o	160	140	100	0.048	0.058	0.077	0.096
Titanium Alloys - Special Alloys	S	•	x	x	120	100	80	0.040	0.048	0.064	0.080

Series XV5CB - 3xD											
Workpiece Material Group	ISO	Coolant			RWOC (ae)			Tool Diameter (mm)			
								10	12	16	20
		Emulsion	Air	MQL	5%	10%	15%	← Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only use this calculation when roughing or semi-finishing.			
					2.3	1.67	1.4				
					Vc - M/Min			fz - mm/tooth			
Low Carbon Steels	P	•	•	•	350	300	250	0.060	0.072	0.096	0.120
Medium Carbon Steels	P	•	•	•	260	240	220	0.060	0.072	0.096	0.120
Alloy Steels	P	•	•	•	240	220	200	0.060	0.072	0.096	0.120
Die / Tool Steels	P	•	•	•	220	200	180	0.060	0.072	0.096	0.120
Stainless Steels - Free Machining	M	•	•	o	205	180	150	0.060	0.072	0.096	0.120
Stainless Steels - Austenitic	M	•	x	o	160	140	100	0.048	0.058	0.077	0.096
Stainless Steels - Difficult to Machine	M	•	x	o	110	90	70	0.040	0.048	0.064	0.080
Stainless Steels - Precipitation Hardened	M	•	•	o	160	140	100	0.048	0.058	0.077	0.096
Titanium AlloysSpecial Alloys	S	•	x	x	120	100	80	0.040	0.048	0.064	0.080

Series XV5CB - 4xD											
Workpiece Material Group	ISO	Coolant			RWOC (ae)			Tool Diameter (mm)			
								10	12	16	20
		Emulsion	Air	MQL	5%	7%	10%	← Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only use this calculation when roughing or semi-finishing.			
					2.3	2.0	1.67				
					Vc - M/Min			fz - mm/tooth			
Low Carbon Steels	P	•	•	•	300	275	250	0.040	0.048	0.064	0.080
Medium Carbon Steels	P	•	•	•	240	230	220	0.040	0.048	0.064	0.080
Alloy Steels	P	•	•	•	220	210	200	0.040	0.048	0.064	0.080
Die / Tool Steels	P	•	•	•	200	190	180	0.040	0.048	0.064	0.080
Stainless Steels - Free Machining	M	•	•	o	180	165	150	0.040	0.048	0.064	0.080
Stainless Steels - Austenitic	M	•	x	o	160	150	140	0.028	0.034	0.045	0.056
Stainless Steels - Difficult to Machine	M	•	x	o	90	80	70	0.024	0.029	0.038	0.048
Stainless Steels - Precipitation Hardened	M	•	•	o	160	150	140	0.028	0.034	0.045	0.056
Titanium Alloys - Special Alloys	S	•	x	x	100	90	80	0.024	0.029	0.038	0.048

• Preferred o Possible x Not Possible

Notes

Cutting data provided should be considered advisory only. Adjustments may be necessary depending on the application, workpiece rigidity, machine tool, etc.
The XV5CB should only be used in accurate tool holders with high gripping power. ER collet type holders are not recommended.
For optimal performance in ISO S materials, ae = ≤ 0.1 x D

XV5CB Series Recommended Cutting Data - Profile Milling with 4xD ADOC (ap)

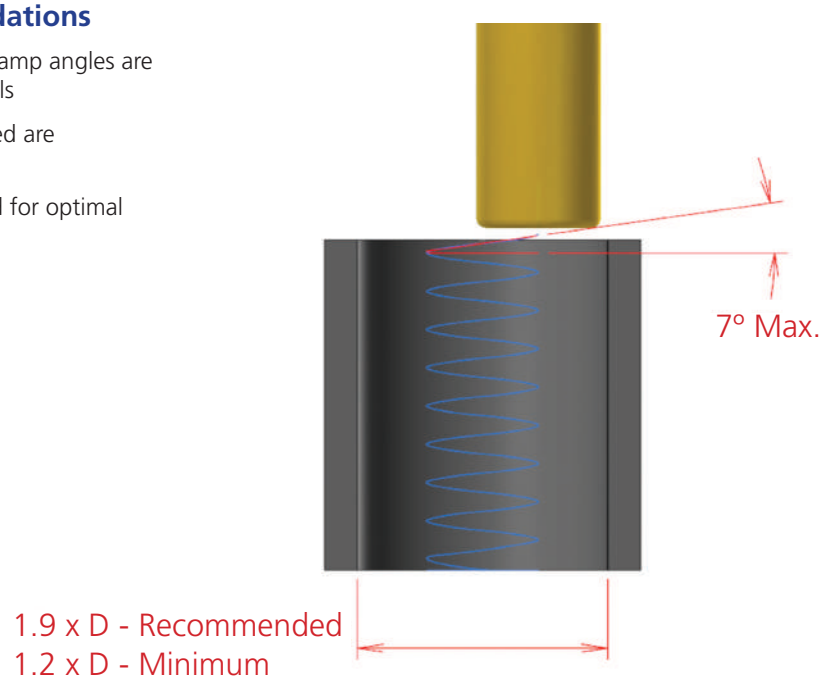
Helical interpolation recommendations

Under optimal conditions, up to 7° helical ramp angles are achievable with the XV5CB in most materials

A reduction of 30-50% in both speed & feed are recommended for helical interpolation

A hole diameter of 1.9 x D is recommended for optimal helical interpolation performance

Minumum hole diameter = 1.2 x D



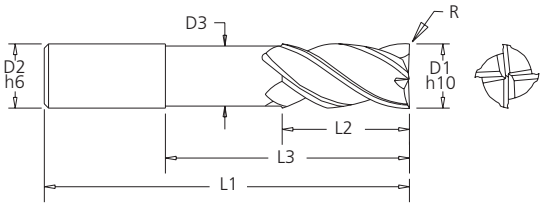
RWOC (ae)	Chip Thicknesss Compensation Factor
5%	2.30
7%	1.96
8%	1.84
10%	1.67

During profile milling with a radial width of less than 50% of the cutter diameter, the actual chip thickness at the cutting edge is less than the programmed chipload. The accompanying table shows the increase in chipload by given radial width percentage to adjust for chip thinning. Multiply your recommended chip thickness by the appropriate feed factor to establish the correct feed rate.

NEW

TuffCut® XT Series 277NR-4

VHM | Z4 | 39°/41° | 7° Max | <48HRC | HA DIN 6535 | ALtima® BLAZE | N=4xD | Corner Radius

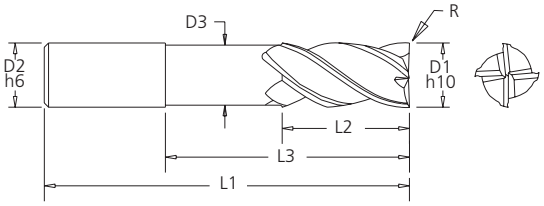


Tool Number	D1	D2	D3	L1	L2	L3	R
277 06N4-0.5RB	6.0	6.0	5.8	64.0	13.0	26.0	0.5
277 08N4-0.5RB	8.0	8.0	7.6	75.0	19.0	34.0	0.5
277 10N4-0.5RB	10.0	10.0	9.6	82.0	22.0	42.0	0.5
277 12N4-0.5RB	12.0	12.0	11.4	100.0	26.0	50.0	0.5
277 12N4-3.0RB	12.0	12.0	11.4	100.0	26.0	50.0	3.0
277 16N4-0.5RB	16.0	16.0	15.2	120.0	32.0	66.0	0.5
277 16N4-3.0RB	16.0	16.0	15.2	120.0	32.0	66.0	3.0

NEW

TuffCut® XT Series 277NR-5

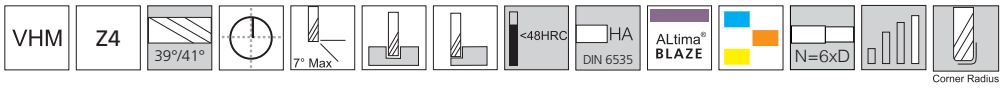
VHM | Z4 | 39°/41° | 7° Max | <48HRC | HA DIN 6535 | ALtima® BLAZE | N=5xD | Corner Radius

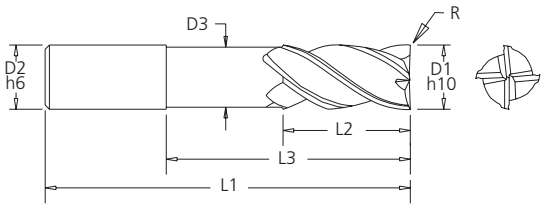


Tool Number	D1	D2	D3	L1	L2	L3	R
277 06N5-0.5RB	6.0	6.0	5.8	70.0	13.0	32.0	0.5
277 08N5-0.5RB	8.0	8.0	7.6	80.0	19.0	42.0	0.5
277 10N5-0.5RB	10.0	10.0	9.6	92.0	22.0	52.0	0.5
277 12N5-0.5RB	12.0	12.0	11.4	110.0	26.0	62.0	0.5
277 12N5-3.0RB	12.0	12.0	11.4	110.0	26.0	62.0	3.0
277 16N5-0.5RB	16.0	16.0	15.2	130.0	32.0	82.0	0.5
277 16N5-3.0RB	16.0	16.0	15.2	130.0	32.0	82.0	3.0

NEW

TuffCut® XT Series 277NR-6





Tool Number	D1	D2	D3	L1	L2	L3	R
277 06N6-0.5RB	6.0	6.0	5.8	75.0	13.0	38.0	0.5
277 08N6-0.5RB	8.0	8.0	7.6	90.0	19.0	50.0	0.5
277 10N6-0.5RB	10.0	10.0	9.6	105.0	22.0	62.0	0.5
277 12N6-0.5RB	12.0	12.0	11.4	120.0	26.0	74.0	0.5
277 12N6-3.0RB	12.0	12.0	11.4	120.0	26.0	74.0	3.0
277 16N6-0.5RB	16.0	16.0	15.2	150.0	32.0	98.0	0.5
277 16N6-3.0RB	16.0	16.0	15.2	150.0	32.0	98.0	3.0

Recommended Cutting Data

Series 277NR - 4xD													
Workpiece Material Group	ISO	Coolant			Application	Depth of Cut Per Application		Vc- m/min	Tool Diameter (mm)				
		Emulsion	Air	MQL		Axial (Ap)	Radial (Ae)		6	8	10	12	16
									fz - mm/tooth by Cutter Diameter				
Low Carbon Steels	P	•	•	•	Profiling	1xD	0.4xD	300	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	200	0.03	0.04	0.05	0.06	0.08
Medium Carbon Steels		•	•	•	Profiling	1xD	0.4xD	230	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	155	0.03	0.04	0.05	0.06	0.08
Alloy Steels		•	•	•	Profiling	1xD	0.4xD	205	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	135	0.03	0.04	0.05	0.06	0.08
Die / Tool Steels		•	•	•	Profiling	1xD	0.4xD	170	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	115	0.03	0.04	0.05	0.06	0.08
Stainless Steel	M	•	x	o	Profiling	1xD	0.4xD	120	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	80	0.03	0.04	0.05	0.06	0.08
Duplex		•	x	o	Profiling	1xD	0.4xD	80	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	55	0.03	0.04	0.05	0.06	0.08
Super Duplex		•	x	o	Profiling	1xD	0.4xD	50	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	35	0.03	0.04	0.05	0.06	0.08
Titanium Alloys	S	•	x	x	Profiling	1xD	0.4xD	60	0.06	0.08	0.1	0.12	0.16
					Slotting	0.5xD	-	40	0.03	0.04	0.05	0.06	0.08

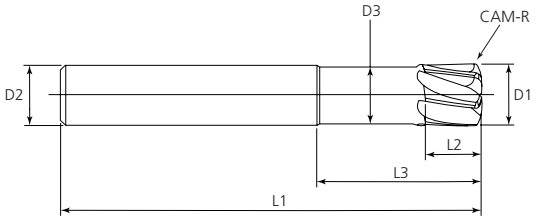
Series 277NR - 5xD													
Workpiece Material Group	ISO	Coolant			Application	Depth of Cut Per Application		Vc- m/min	Tool Diameter (mm)				
		Emulsion	Air	MQL		Axial (Ap)	Radial (Ae)		6	8	10	12	16
									fz - mm/tooth by Cutter Diameter				
Low Carbon Steels	P	•	•	•	Profiling	1xD	0.25xD	270	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	180	0.03	0.04	0.05	0.06	0.08
Medium Carbon Steels		•	•	•	Profiling	1xD	0.25xD	205	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	135	0.03	0.04	0.05	0.06	0.08
Alloy Steels		•	•	•	Profiling	1xD	0.25xD	185	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	125	0.03	0.04	0.05	0.06	0.08
Die / Tool Steels		•	•	•	Profiling	1xD	0.25xD	153	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	105	0.03	0.04	0.05	0.06	0.08
Stainless Steel	M	•	x	o	Profiling	1xD	0.25xD	80	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	55	0.03	0.04	0.05	0.06	0.08
Duplex		•	x	o	Profiling	1xD	0.25xD	70	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	45	0.03	0.04	0.05	0.06	0.08
Super Duplex		•	x	o	Profiling	1xD	0.25xD	45	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	30	0.03	0.04	0.05	0.06	0.08
Titanium Alloys	S	•	x	x	Profiling	1xD	0.25xD	75	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	50	0.03	0.04	0.05	0.06	0.08

Series 277NR - 6xD													
Workpiece Material Group	ISO	Coolant			Application	Depth of Cut Per Application		Vc- m/min	Tool Diameter (mm)				
		Emulsion	Air	MQL		Axial (Ap)	Radial (Ae)		6	8	10	12	16
									fz - mm/tooth by Cutter Diameter				
Low Carbon Steels	P	•	•	•	Profiling	1xD	0.25xD	240	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	160	0.03	0.04	0.05	0.06	0.08
Medium Carbon Steels		•	•	•	Profiling	1xD	0.25xD	184	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	125	0.03	0.04	0.05	0.06	0.08
Alloy Steels		•	•	•	Profiling	1xD	0.25xD	164	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	110	0.03	0.04	0.05	0.06	0.08
Die / Tool Steels		•	•	•	Profiling	1xD	0.25xD	136	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	90	0.03	0.04	0.05	0.06	0.08
Stainless Steel	M	•	x	o	Profiling	1xD	0.25xD	75	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	50	0.03	0.04	0.05	0.06	0.08
Duplex		•	x	o	Profiling	1xD	0.25xD	65	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	45	0.03	0.04	0.05	0.06	0.08
Super Duplex		•	x	o	Profiling	1xD	0.25xD	35	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	25	0.03	0.04	0.05	0.06	0.08
Titanium Alloys	S	•	x	x	Profiling	1xD	0.25xD	64	0.06	0.08	0.1	0.12	0.16
					Slotting	0.3xD	-	45	0.03	0.04	0.05	0.06	0.08

• Preferred o Possible x Not Possible

NEW

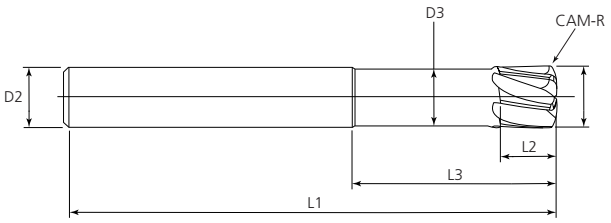
TuffCut® Series FHFN-N3



Tool Number	D1	D2	D3	L1	L2	L3	Flutes	CAM-R
FHFN 03N3-AX	3.0	6.0	2.9	60.0	3.0	9.0	4	0.25
FHFN 04N3-AX	4.0	6.0	3.9	60.0	4.0	12.0	4	0.3
FHFN 05N3-AX	5.0	6.0	4.7	60.0	5.0	15.0	4	0.35
FHFN 06N3-AX	6.0	6.0	5.5	60.0	5.0	18.0	6	0.45
FHFN 08N3-AX	8.0	8.0	7.5	75.0	7.0	24.0	6	0.6
FHFN 10N3-AX	10.0	10.0	9.5	90.0	8.0	30.0	6	0.75
FHFN 12N3-AX	12.0	12.0	11.5	100.0	10.0	36.0	6	0.9

NEW

TuffCut® Series FHFN-N4



Tool Number	D1	D2	D3	L1	L2	L3	Flutes	CAM-R
FHFN 06N4-AX	6.0	6.0	5.5	100.0	5.0	24.0	6	0.45
FHFN 08N4-AX	8.0	8.0	7.5	100.0	7.0	32.0	6	0.6
FHFN 10N4-AX	10.0	10.0	9.5	120.0	8.0	40.0	6	0.75
FHFN 12N4-AX	12.0	12.0	11.5	150.0	10.0	48.0	6	0.9

Recommended Cutting Data

Series FHFN - 3xD																	
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter & CAM-R											
		Emulsion	Air	MQL		3mm x R0.25			4mm x R0.3			5mm x R0.35			6mm x R0.45		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Pre-Hardened Steels 35-45HRC	P		●	●	100	0.1	1.7	0.09	0.15	2.2	0.12	0.18	2.8	0.15	0.300	3.3	0.180
Hardened Steels 50 - 55HRC	H	X	●		80	0.1	1.7	0.115	0.15	2.2	0.155	0.18	2.8	0.19	0.240	3.3	0.230
Hardened Steels 55 - 60HRC		X	●		60	0.07	1.7	0.075	0.095	2.2	0.1	0.115	2.8	0.12	0.140	3.3	0.145
Hardened Steels 60 - 65HRC		X	●		50	0.055	1.7	0.055	0.075	2.2	0.07	0.09	2.8	0.09	0.110	3.3	0.105
Hardened Steels 65 - 70HRC		X	●		40	0.04	1.5	0.04	0.055	2	0.05	0.065	2.5	0.065	0.080	3.0	0.075

Series FHFN - 3xD														
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter & CAM-R								
		Emulsion	Air	MQL		8mm x R0.6			10mm x R0.75			12mm x R0.9		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Pre-Hardened Steels 35-45HRC	P		●	●	100	0.4	4.4	0.240	0.5	5.5	0.300	0.6	6.6	0.360
Hardened Steels 50 - 55HRC	H	X	●		80	0.32	4.4	0.305	0.4	5.5	0.380	0.48	6.6	0.460
Hardened Steels 55 - 60HRC		X	●		60	0.185	4.4	0.195	0.23	5.5	0.240	0.28	6.6	0.290
Hardened Steels 60 - 65HRC		X	●		50	0.145	4.4	0.140	0.18	5.5	0.175	0.22	6.6	0.210
Hardened Steels 65 - 70HRC		X	●		40	0.105	4.0	0.100	0.13	5.0	0.125	0.16	6.0	0.150

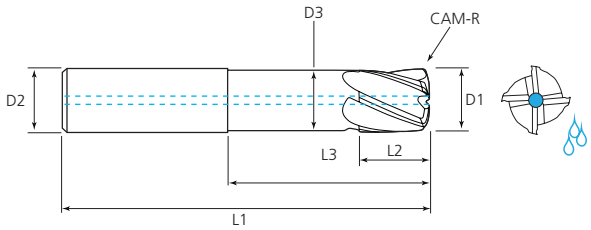
Series FHFN - 4xD																	
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter & CAM-R											
		Emulsion	Air	MQL		6mm x R0.45			8mm x R0.6			10mm x R0.75			12mm x R0.9		
						Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Pre-Hardened Steels 35-45HRC	P		●	●	90	0.260	3.3	0.180	0.34	4.4	0.240	0.43	5.5	0.300	0.51	6.6	0.360
Hardened Steels 50 - 55HRC	H	X	●		75	0.200	3.3	0.230	0.27	4.4	0.305	0.34	5.5	0.380	0.41	6.6	0.460
Hardened Steels 55 - 60HRC		X	●		55	0.120	3.3	0.145	0.16	4.4	0.195	0.2	5.5	0.240	0.24	6.6	0.290
Hardened Steels 60 - 65HRC		X	●		45	0.090	3.3	0.105	0.12	4.4	0.140	0.15	5.5	0.175	0.19	6.6	0.210
Hardened Steels 65 - 70HRC		X	●		35	0.070	3.0	0.075	0.09	4.0	0.100	0.11	5.0	0.125	0.14	6.0	0.150

● Preferred Possible X Not Possible

Notes:
Ramp angle 0.5° or less
For roughing, area clearance, slotting and pocketing operations

NEW

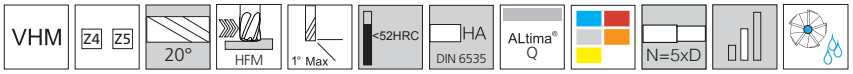
TuffCut® Series FHFP N3

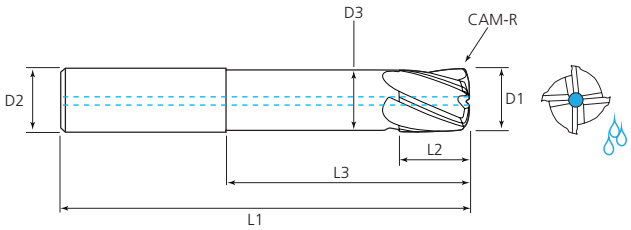


Tool Number	D1	D2	D3	L1	L2	L3	Flutes	CAM-R
FHFP 06N3-CCAQ	6.0	6.0	5.8	57.0	6.0	20.0	4	0.6
FHFP 08N3-CCAQ	8.0	8.0	7.8	63.0	8.0	26.0	4	0.8
FHFP 10N3-CCAQ	10.0	10.0	9.8	72.0	10.0	32.0	4	1.0
FHFP 12N3-CCAQ	12.0	12.0	11.8	83.0	12.0	38.0	5	1.2
FHFP 16N3-CCAQ	16.0	16.0	15.8	100.0	16.0	50.0	5	1.6

NEW

TuffCut® Series FHFP N5

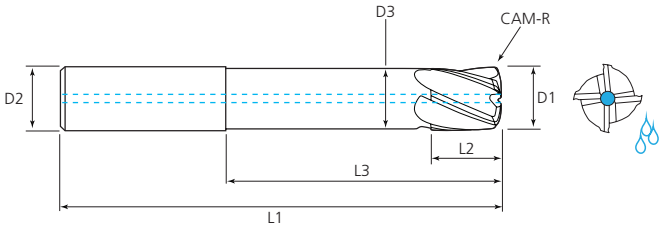




Tool Number	D1	D2	D3	L1	L2	L3	Flutes	CAM-R
FHFP 06N5-CCAQ	6.0	6.0	5.8	75.0	6.0	32.0	4	0.6
FHFP 08N5-CCAQ	8.0	8.0	7.8	83.0	8.0	42.0	4	0.8
FHFP 10N5-CCAQ	10.0	10.0	9.8	100.0	10.0	52.0	4	1.0
FHFP 12N5-CCAQ	12.0	12.0	11.8	110.0	12.0	62.0	5	1.2
FHFP 16N5-CCAQ	16.0	16.0	15.8	133.0	16.0	82.0	5	1.6

NEW

TuffCut® Series FHFP N8



Tool Number	D1	D2	D3	L1	L2	L3	Flutes	CAM-R
FHFP 06N8-CCAQ	6.0	6.0	5.8	90.0	6.0	50.0	4	0.6
FHFP 08N8-CCAQ	8.0	8.0	7.8	110.0	8.0	66.0	4	0.8
FHFP 10N8-CCAQ	10.0	10.0	9.8	130.0	10.0	82.0	4	1.0
FHFP 12N8-CCAQ	12.0	12.0	11.8	150.0	12.0	98.0	5	1.2

Recommended Cutting Data

Series FHFP - 3xD																				
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter and CAM-R														
						6mm x R0.6			8mm x R0.8			10mm x R1.0			12mm x R1.2			16mm x R1.6		
		Emulsion	Air	MQL		Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon	P	●	●	●	150	0.3	3.6	0.39	0.4	4.8	0.52	0.5	6	0.65	0.6	7.2	0.78	0.8	9.6	1.04
Medium Carbon		●	●	●	120	0.3	3.6	0.36	0.4	4.8	0.48	0.5	6	0.6	0.6	7.2	0.72	0.8	9.6	0.96
Alloy Steels		●	●	●	110	0.3	3.6	0.33	0.4	4.8	0.44	0.5	6	0.55	0.6	7.2	0.66	0.8	9.6	0.88
Die/Tools		●	●	●	100	0.3	3.6	0.3	0.4	4.8	0.4	0.5	6	0.5	0.6	7.2	0.6	0.8	9.6	0.8
Stainless Steel	M	●	X		85	0.24	3.3	0.24	0.32	4.4	0.48	0.4	5.5	0.4	0.48	6.6	0.48	0.64	8.8	0.64
Duplex		●	X		60	0.24	3.3	0.24	0.32	4.4	0.48	0.4	5.5	0.4	0.48	6.6	0.48	0.64	8.8	0.64
Super Duplex		●	X		55	0.24	3.3	0.24	0.32	4.4	0.48	0.4	5.5	0.4	0.48	6.6	0.48	0.64	8.8	0.64
Titanium	S	●	X	X	60	0.18	2.7	0.24	0.24	3.6	0.32	0.3	4.5	0.4	0.36	5.4	0.48	0.48	7.2	0.64
High Temp Alloys		●	X	X	30	0.15	2.7	0.16	0.2	3.6	0.22	0.25	4.5	0.27	0.3	5.4	0.32	0.4	7.2	0.43
Hardened Steels 45 - 50HRC	H	●	X	X	80	0.24	3.6	0.27	0.32	4.8	0.36	0.4	6	0.45	0.48	7.2	0.54	0.64	9.6	0.72
Hardened Steels 50 - 55HRC		●	X	X	70	0.21	3.6	0.21	0.28	4.8	0.28	0.35	6	0.35	0.42	7.2	0.42	0.56	9.6	0.56

Series FHFP - 5xD																				
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter and CAM-R														
						6mm x R0.6			8mm x R0.8			10mm x R1.0			12mm x R1.2			16mm x R1.6		
		Emulsion	Air	MQL		Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon	P	●	●	●	120	0.24	3.6	0.39	0.32	4.8	0.52	0.4	6	0.65	0.48	7.2	0.78	0.64	9.6	1.04
Medium Carbon		●	●	●	95	0.24	3.6	0.36	0.32	4.8	0.48	0.4	6	0.6	0.48	7.2	0.72	0.64	9.6	0.96
Alloy Steels		●	●	●	90	0.24	3.6	0.33	0.32	4.8	0.44	0.4	6	0.55	0.48	7.2	0.66	0.64	9.6	0.88
Die/Tools		●	●	●	80	0.24	3.6	0.3	0.32	4.8	0.4	0.4	6	0.5	0.48	7.2	0.6	0.64	9.6	0.8
Stainless Steel	M	●	X		70	0.19	3.3	0.24	0.26	4.4	0.48	0.32	5.5	0.4	0.38	6.6	0.48	0.51	8.8	0.64
Duplex		●	X		50	0.19	3.3	0.24	0.26	4.4	0.48	0.32	5.5	0.4	0.38	6.6	0.48	0.51	8.8	0.64
Super Duplex		●	X		45	0.19	3.3	0.24	0.26	4.4	0.48	0.32	5.5	0.4	0.38	6.6	0.48	0.51	8.8	0.64
Titanium	S	●	X	X	50	0.14	2.7	0.24	0.19	3.6	0.32	0.24	4.5	0.4	0.29	5.4	0.48	0.38	7.2	0.64
High Temp Alloys		●	X	X	25	0.12	2.7	0.16	0.16	3.6	0.22	0.2	4.5	0.27	0.24	5.4	0.32	0.32	7.2	0.43
Hardened Steels 45 - 50HRC	H	●	X	X	65	0.19	3.6	0.27	0.26	4.8	0.36	0.32	6	0.45	0.38	7.2	0.54	0.51	9.6	0.72
Hardened Steels 50 - 55HRC		●	X	X	55	0.17	3.6	0.21	0.22	4.8	0.28	0.28	6	0.35	0.34	7.2	0.42	0.45	9.6	0.56

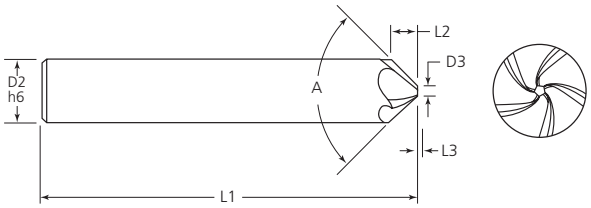
Series FHFP - 8xD																				
Workpiece Material Group	ISO	Coolant			Vc- m/min	Tool Diameter and CAM-R														
						6mm x R0.6			8mm x R0.8			10mm x R1.0			12mm x R1.2			16mm x R1.6		
		Emulsion	Air	MQL		Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz	Ap	Ae	Fz
Low Carbon	P	●	●	●	105	0.2	3.6	0.39	0.26	4.8	0.52	0.33	6	0.65	0.39	7.2	0.78	0.52	9.6	1.04
Medium Carbon		●	●	●	85	0.2	3.6	0.36	0.26	4.8	0.48	0.33	6	0.6	0.39	7.2	0.72	0.52	9.6	0.96
Alloy Steels		●	●	●	75	0.2	3.6	0.33	0.26	4.8	0.44	0.33	6	0.55	0.39	7.2	0.66	0.52	9.6	0.88
Die/Tools		●	●	●	70	0.2	3.6	0.3	0.26	4.8	0.4	0.33	6	0.5	0.39	7.2	0.6	0.52	9.6	0.8
Stainless Steel	M	●	X		60	0.16	3.3	0.24	0.21	4.4	0.48	0.26	5.5	0.4	0.31	6.6	0.48	0.42	8.8	0.64
Duplex		●	X		40	0.16	3.3	0.24	0.21	4.4	0.48	0.26	5.5	0.4	0.31	6.6	0.48	0.42	8.8	0.64
Super Duplex		●	X		40	0.16	3.3	0.24	0.21	4.4	0.48	0.26	5.5	0.4	0.31	6.6	0.48	0.42	8.8	0.64
Titanium	S	●	X	X	40	0.12	2.7	0.24	0.16	3.6	0.32	0.2	4.5	0.4	0.23	5.4	0.48	0.31	7.2	0.64
High Temp Alloys		●	X	X	20	0.1	2.7	0.16	0.13	3.6	0.22	0.16	4.5	0.27	0.2	5.4	0.32	0.26	7.2	0.43
Hardened Steels 45 - 50HRC	H	●	X	X	55	0.16	3.6	0.27	0.21	4.8	0.36	0.26	6	0.45	0.31	7.2	0.54	0.42	9.6	0.72
Hardened Steels 50 - 55HRC		●	X	X	50	0.14	3.6	0.21	0.18	4.8	0.28	0.23	6	0.35	0.27	7.2	0.42	0.36	9.6	0.56

● Preferred Possible X Not Possible

NEW

TuffCut® Series 5HC 90°

VHM | Z5 | <48HRC | HA DIN 6535 | ALtima® BLAZE

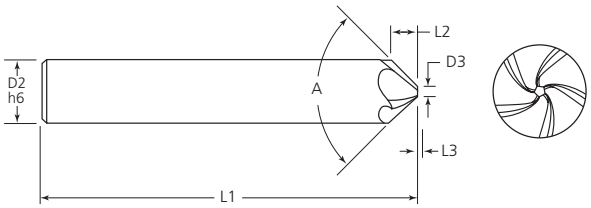


Tool Number	EDP	D2	D3	Angle	L1	L2	L3
5HCM06003B	35026	6.0	1.5	90°	57.0	2.25	0.75
5HCM08003B	35027	8.0	1.75	90°	63.0	3.125	0.875
5HCM10003B	35028	10.0	1.75	90°	72.0	4.125	0.875
5HCM12003B	35029	12.0	2.0	90°	83.0	5.0	1.0
5HCM16003B	35030	16.0	2.25	90°	92.0	6.875	1.125

NEW

TuffCut® Series 5HC 60°

VHM | Z5 | <48HRC | HA DIN 6535 | ALtima® BLAZE



Tool Number	EDP	D2	D3	Angle	L1	L2	L3
5HCM06001B	19993	6.0	1.5	60°	57.0	3.9	1.3
5HCM08001B	19994	8.0	1.75	60°	63.0	5.4	1.5
5HCM10001B	19995	10.0	1.75	60°	72.0	7.1	1.5
5HCM12001B	19996	12.0	2.0	60°	83.0	8.7	1.7
5HCM16001B	19997	16.0	2.25	60°	92.0	13.9	2.0

Recommended Cutting Data

Series 5HCM											
Workpiece Material Group		Material Type	Coolant			Vc-m/min	Tool Diameter				
			Emulsion	Air	MQL		6mm	8mm	10mm	12mm	16mm
							fz-mm/tooth				
Steels	P	Low Carbon Steels	●	●	●	350	0.072	0.096	0.120	0.144	0.192
		Medium Carbon Steels	●	●	●	270	0.048	0.064	0.080	0.096	0.128
		Alloy Tool Steels	●	●	●	250	0.048	0.064	0.080	0.096	0.128
		Die/Tool Steels	●	●	●	220	0.042	0.056	0.070	0.084	0.112
Stainless Steels	M	Free Machining Stainless	●	X		180	0.042	0.056	0.070	0.084	0.112
		Austenitic Stainless	●	X		130	0.036	0.048	0.060	0.072	0.096
		Difficult Stainless	●	X		75	0.030	0.040	0.050	0.060	0.080
		PH Stainless	●	X		130	0.036	0.048	0.060	0.072	0.096
		Cobalt Chrome Alloys	●	X		75	0.030	0.040	0.050	0.060	0.080
		Duplex (22%)	●	X		75	0.030	0.040	0.050	0.060	0.080
		Super Duplex (25%)	●	X		55	0.030	0.040	0.050	0.060	0.080
Special Alloys	S	High Temp Alloys	●	X	X	45	0.030	0.040	0.050	0.060	0.080
		Titanium Alloys	●	X	X	100	0.036	0.048	0.060	0.072	0.096
Cast Irons	K	Grey Cast Iron	●			300	0.084	0.112	0.140	0.168	0.224
		Ductile Cast Iron	●			190	0.060	0.080	0.100	0.120	0.160
Hardened Steels	H	Hardened Steels 45 - 50HRC		●		80	0.030	0.040	0.050	0.060	0.080
		Hardened Steels 50 - 55HRC		●		60	0.036	0.048	0.060	0.072	0.096
Non Ferrous	N	Aluminium Alloys	●	X		600	0.072	0.096	0.120	0.144	0.192
		Brass / Bronze / Copper	●	X		350	0.054	0.072	0.090	0.108	0.144

● Preferred Possible X Not Possible

Please note:

Technical data provided should be considered as advisory only and alterations may be necessary depending on the specific application.
Decreased feeds and/or a finish pass may be required to reach the desired surface finish requirements.
Decreased speeds and feeds may be required for heavy duty cutting.

Cutting speed (Vc) should be calculated from the effective cutting diameter using the following formula:
(Major diameter D2 + minor diameter D3) / 2.
Alternatively, estimate the actual diameter that is in contact with the workpiece.

NEW

HC20S & HC32S
Hydraulic Milling Chuck
SK (DIN 69871 AD+B)

EDP	Tool No.	SK	Type
FA13327	SK40-HC20S-64.5	40	HC20S
FA13330	SK50-HC32S-81	50	HC32S

NEW

HC20 Hydraulic Milling Chuck
SK (DIN 69871)

EDP	Tool No.	SK	Type
FA13376	SK40-HC20-24.60SGP	40	HC20

NEW

HC20S & HC32S
Hydraulic Milling Chuck
BT (MAS 403)

EDP	Tool No.	BT	Type
FA13203	BT40-HC20S-72.5	40	HC20S
FA13206	BT50-HC32S-090	50	HC32S

NEW

HC20 Hydraulic Milling Chuck
BT (Mas 403)

EDP	Tool No.	ISO	Type
FA13262	BT40-HC20-32.50SGP	40	HC20

NEW

HC20S & HC32S
Hydraulic Milling Chuck
HSK (DIN 69893 A)

EDP	Tool No.	HSK	Type
FA13380	HSK-A63-HC20S-080	63	HC20S
FA13383	HSK-A100-HC32S-110	100	HC32S

NEW

HC20 Hydraulic Milling Chuck
KBT (MAS 403) Face and
Taper Contact

EDP	Tool No.	ISO	Type
FA13325	KBT40-HC20-32.50SGP	40	HC20

NEW

HC25 Hydraulic Milling Chuck BT (MAS 403)

EDP	Tool No.	SK	Type
FA13238	BT40-HC25-090ADB	40	HC25

NEW

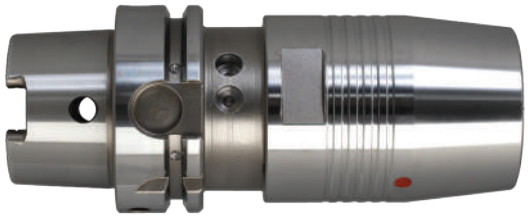
HRNPO25 Cylindrical Reduction Sleeves

Non Pullout

EDP	Tool No.	M
FA13604	HRNPO25-12.0	M16X2
FA13604	HRNPO25-16.0	M16X2

NEW

HC25 Hydraulic Milling Chuck HSK-A (DIN 69893-1)



EDP	Tool No.	HSK-A	Type
FA13439	HSK-A63-HC25-120	63	HC25

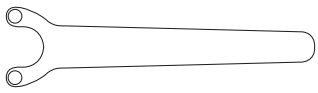
NEW

HC25 Hydraulic Milling Chuck SK (DIN 69871)

EDP	Tool No.	SK	Type
FA13352	SK40-HC25-095ADB	40	HC25

Spare Parts

ER25A Pin Spanner



EDP	Tool Number
FA12701	E25A-SPA

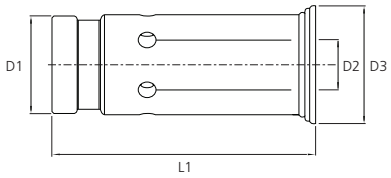
Non Pull-Out Sleeve Pin

EDP	Tool Number
FA13606	NPO-PIN

Non Pull-Out Sleeve Pin Ejector

EDP	Tool Number
FA13607	NPO-PINEJE

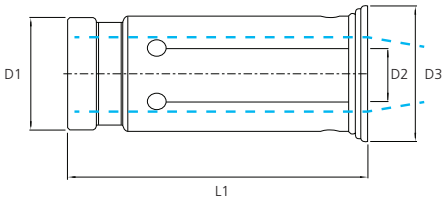
NEW HRS Cylindrical Reduction Sleeves



EDP	Tool No.	D1	D2	D3	L1
FA13536	HRS20-3.0	20.0	3.0	29.0	52.5
FA13537	HRS20-4.0	20.0	4.0	29.0	52.5
FA13538	HRS20-5.0	20.0	5.0	29.0	52.5
FA13539	HRS20-6.0	20.0	6.0	29.0	52.5
FA13540	HRS20-7.0	20.0	7.0	29.0	52.5
FA13541	HRS20-8.0	20.0	8.0	29.0	52.5
FA13542	HRS20-9.0	20.0	9.0	29.0	52.5
FA13543	HRS20-10.0	20.0	10.0	29.0	52.5
FA13544	HRS20-11.0	20.0	11.0	29.0	52.5
FA13545	HRS20-12.0	20.0	12.0	29.0	52.5
FA13546	HRS20-13.0	20.0	13.0	29.0	52.5
FA13547	HRS20-14.0	20.0	14.0	29.0	52.5
FA13548	HRS20-15.0	20.0	15.0	29.0	52.5
FA13549	HRS20-16.0	20.0	16.0	29.0	52.5
FA13560	HRS25-6.0	25.0	6.0	29.0	56.5
FA13561	HRS25-8.0	25.0	8.0	29.0	56.5
FA13562	HRS25-10.0	25.0	10.0	29.0	56.5
FA13563	HRS25-12.0	25.0	12.0	29.0	56.5
FA13564	HRS25-14.0	25.0	14.0	29.0	56.5
FA13565	HRS25-16.0	25.0	16.0	29.0	56.5
FA13566	HRS25-18.0	25.0	18.0	29.0	56.5
FA13567	HRS25-20.0	25.0	20.0	29.0	56.5
FA13550	HRS32-6.0	32.0	6.0	39.0	63.5
FA13551	HRS32-8.0	32.0	8.0	39.0	63.5
FA13552	HRS32-10.0	32.0	10.0	39.0	63.5
FA13553	HRS32-12.0	32.0	12.0	39.0	63.5
FA13554	HRS32-14.0	32.0	14.0	39.0	63.5
FA13555	HRS32-16.0	32.0	16.0	39.0	63.5
FA13556	HRS32-18.0	32.0	18.0	39.0	63.5
FA13557	HRS32-20.0	32.0	20.0	39.0	63.5
FA13558	HRS32-25.0	32.0	25.0	39.0	63.5

NEW HRTC Cylindrical Reduction Sleeves

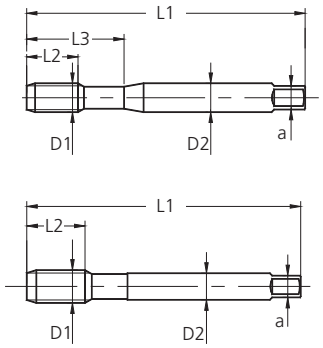
Through Face Coolant



EDP	Tool No.	D1	D2	D3	L1
FA13568	HRTC20-3.0	12.0	3.0	24.0	52.5
FA13569	HRTC20-4.0	12.0	4.0	24.0	52.5
FA13570	HRTC20-5.0	12.0	5.0	24.0	52.5
FA13571	HRTC20-6.0	12.0	6.0	24.0	52.5
FA13572	HRTC20-7.0	12.0	7.0	24.0	52.5
FA13573	HRTC20-8.0	12.0	8.0	24.0	52.5
FA13574	HRTC20-9.0	20.0	9.0	24.0	52.5
FA13575	HRTC20-10.0	20.0	10.0	24.0	52.5
FA13576	HRTC20-11.0	20.0	11.0	24.0	52.5
FA13577	HRTC20-12.0	20.0	12.0	24.0	52.5
FA13578	HRTC20-13.0	20.0	13.0	24.0	52.5
FA13579	HRTC20-14.0	20.0	14.0	24.0	52.5
FA13580	HRTC20-15.0	20.0	15.0	24.0	52.5
FA13581	HRTC20-16.0	20.0	16.0	24.0	52.5
FA13582	HRTC25-6.0	25.0	6.0	29.0	56.5
FA13583	HRTC25-8.0	25.0	8.0	29.0	56.5
FA13584	HRTC25-10.0	25.0	10.0	29.0	56.5
FA13585	HRTC25-12.0	25.0	12.0	29.0	56.5
FA13586	HRTC25-14.0	25.0	14.0	29.0	56.5
FA13587	HRTC25-16.0	25.0	16.0	29.0	56.5
FA13588	HRTC25-18.0	25.0	18.0	29.0	56.5
FA13589	HRTC25-20.0	25.0	20.0	29.0	56.5
FA13590	HRTC32-6.0	32.0	6.0	36.0	63.5
FA13591	HRTC32-7.0	32.0	7.0	36.0	63.5
FA13592	HRTC32-8.0	32.0	8.0	36.0	63.5
FA13593	HRTC32-9.0	32.0	9.0	36.0	63.5
FA13594	HRTC32-10.0	32.0	10.0	36.0	63.5
FA13595	HRTC32-11.0	32.0	11.0	36.0	63.5
FA13596	HRTC32-12.0	32.0	12.0	36.0	63.5
FA13597	HRTC32-13.0	32.0	13.0	36.0	63.5
FA13598	HRTC32-14.0	32.0	14.0	36.0	63.5
FA13599	HRTC32-15.0	32.0	15.0	36.0	63.5
FA13600	HRTC32-16.0	32.0	16.0	36.0	63.5
FA13601	HRTC32-18.0	32.0	18.0	36.0	63.5
FA13602	HRTC32-20.0	32.0	20.0	36.0	63.5
FA13603	HRTC32-25.0	32.0	25.0	36.0	63.5

NEW

High Performance Taps



EVO-SP/SF HSSE | ISO 2 6H | OX

UNI-SP/SF HSSEV | ISO 2 6H | TiN

	EVOSP	EVOSF	UNISP	UNISF
	P 6-10 10-15 M K N 12-20 S	P 10-12 10-12 M K N 12-20 S	P 10-12 10-12 M 6-10 K N 10-30 S	P 8-10 8-10 M 4-7 K N 10-30 S
Hole type	< 3d	< 3d	< 2.5d	< 2.5d
Coating	OX	OX	TIN	TIN
Chamfer	B / 3.5-6	C / 2-3P	B / 3.5-6	C / 2-3P
Tolerance	6HX	6HX	6HX	6HX

M Ø D1	P	L1	L2	L3	Ø D2	a		EVOSP	EVOSF	UNISP	UNISF
DIN 371											
M2	0.4	45.0	8.0	12.0	2.8	2.1	1.6	M2 x 0.4	M2 x 0.4	-	-
M2.5	0.45	50.0	9.0	14.0	2.8	2.1	2.05	M2.5 x 0.45	M2.5 x 0.45	-	-
M3	0.5	56.0	9.0	18.0	3.5	2.7	2.5	M3 x 0.5	M3 x 0.5	M3 x 0.5	M3 x 0.5
M4	0.7	63.0	12.0	21.0	4.5	3.4	3.3	M4 x 0.7	M4 x 0.7	M4 x 0.7	M4 x 0.7
M5	0.8	70.0	13.0	25.0	6.0	4.9	4.2	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8
M6	1.0	80.0	15.0	30.0	6.0	4.9	5.0	M6 x 1.0	M6 x 1.0	M6 x 1.0	M6 x 1.0
M8	1.25	90.0	18.0	35.0	8.0	6.2	6.8	M8 x 1.25	M8 x 1.25	M8 x 1.25	M8 x 1.25
M10	1.5	100.0	20.0	39.0	10.0	8.0	8.5	M10 x 1.5	M10 x 1.5	M10 x 1.5	M10 x 1.5
DIN 376											
M12	1.75	110.0	23.0	-	9.0	7.0	10.2	M12 x 1.75	M12 x 1.75	M12 x 1.75	M12 x 1.75
M14	2	110.0	25.0	-	11.0	9.0	12.0	M14 x 2.0	M14 x 2.0	M14 x 2.0	M14 x 2.0
M16	2	110.0	25.0	-	12.0	9.0	14.0	M16 x 2.0	M16 x 2.0	M16 x 2.0	M16 x 2.0
M20	2.5	140.0	30.0	-	16.0	12.0	17.5	-	M20 x 2.5	M20 x 2.5	M20 x 2.5
M24	3.0	160.0	30.0	-	18.0	14.5	21.0	-	M24 x 3.0	-	-
M30	3.5	180.0	35.0	-	22.0	18.0	26.5	-	M30 x 3.5	-	-

MF Ø D1	P	L1	L2	Ø D2	a		EVOSP	EVOSF	UNISP	UNISF
DIN 374										
M8 x 1	1.0	90.0	10.0	6.0	4.9	7.0	M8 x 1.0	M8 x 1.0	-	-
M10 x 1	1.0	90.0	10.0	7.0	5.5	9.0	M10 x 1.0	M10 x 1.0	-	-
M10 x 1.25	1.25	100.0	15.0	7.0	5.5	8.8	M10 x 1.25	M10 x 1.25	-	-
M12 x 1.5	1.5	100.0	15.0	9.0	7.0	10.5	M12 x 1.5	M12 x 1.5	-	-
M14 x 1.5	1.5	100.0	15.0	11.0	9.0	12.5	M14 x 1.5	M14 x 1.5	-	-
M16 x 1.5	1.5	100.0	15.0	12.0	9.0	14.5	M16 x 1.5	M16 x 1.5	-	-

Example of order

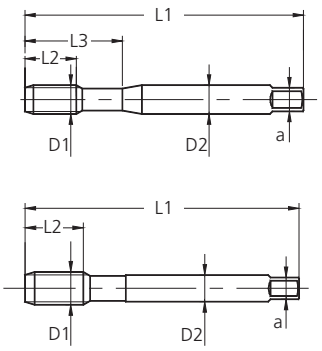
EVOSP - M2 x 0.4

Vc (m/min)

P	< 150 HB	6-10	10-12	10-12	8-10
	150-240 HB	10-15	10-12	10-12	8-10
M	-	-	-	-	4-7
K	-	-	-	-	-
N	-	12-20	12-20	10-30	10-30
S	-	-	-	-	-

NEW

High Performance Taps



HPSP/HPSF

HSSE PM | 60° P | HL

	HPSP	HPSPC	HPSF	HPSFC
	P 6-8, 4-6; M 6-14; K 10-30; N 10-30; S	P 10-12, 4-6; M 6-14; K 10-50; N 10-50; S	P 6-8; M 6-14; K 10-30; N 10-30; S	P 10-12; M 6-14; K 10-50; N 10-30; S
Hole type	< 3d	< 3d	< 2.5d	< 2.5d
Coating	HL	HL	HL	HL
Chamfer	B / 3.5-6P	B / 3.5-6P	C / 2-3P	C / 2-3P
Tolerance	6HX	6HX	6HX	6HX

M Ø D1	P	L1	L2	L3	Ø D2	a	d	HPSP	HPSPC	HPSF	HPSFC
DIN 371											
M3	0.5	56.0	9.0	18.0	3.5	2.7	2.5	M3 X 0.5	-	M3 X 0.5	-
M4	0.7	63.0	12.0	21.0	4.5	3.4	3.3	M4 X 0.7	-	M4 X 0.7	-
M5	0.8	70.0	13.0	25.0	6.0	4.9	4.2	M5 X 0.8	-	M5 X 0.8	-
M6	1.0	80.0	15.0	30.0	6.0	4.9	5.0	M6 X 1.0	M6 X 1.0	M6 X 1.0	M6 X 1.0
M8	1.25	90.0	18.0	35.0	8.0	6.2	6.8	M8 X 1.25	M8 X 1.25	M8 X 1.25	M8 X 1.25
M10	1.5	100.0	20.0	39.0	10.0	8.0	8.5	M10 X 1.5	M10 X 1.5	M10 X 1.5	M10 X 1.5
DIN 376											
M12	1.75	110.0	23.0	-	9.0	7.0	10.2	M12 x 1.75	-	M12 x 1.75	M12 x 1.75
M14	2.0	110.0	25.0	-	11.0	9.0	12.0	M14 x 2.0	-	M14 x 2.0	-
M16	2.0	110.0	25.0	-	12.0	9.0	14.0	M16 x 2.0	-	M16 x 2.0	-
M20	2.5	140.0	30.0	-	16.0	12.0	17.5	M20 X 2.5	-	M20 x 2.5	-

Example of order

HPSP - M3 X 0.5

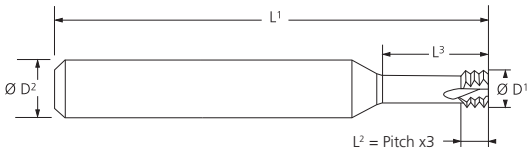
Vc (m/min)

P	Rm < 1200	6-8	10-12	6-8	10-12
	Rm < 1400	4-6	4-6	-	-
M	-	6-14	6-14	6-14	6-14
K	-	10-30	10-50	10-30	10-50
N	-	10-30	10-50	10-30	10-30
S	-	-	-	-	-

NEW

Metric 2D Carbide Thread Mills Series 3TC

VHM | Z3 Z4 | HA | ALtima® Xtreme | 60° P | M | MF | 2xD | RH Cutting

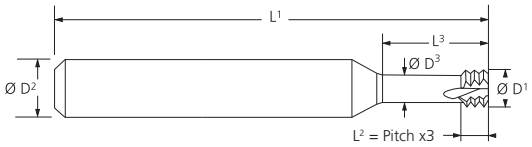


Tool Number	Thread		Tool Dimensions					
	M Coarse	M Fine	Pitch (mm)	D¹	D²	L¹	L³	Flutes
3TCM 0154D2-040AX	M2x0.4	-	0.4	1.54	4.0	50.0	4.5	3
3TCM 0196D2-045AX	M2.5x0.45	-	0.45	1.96	4.0	50.0	5.5	3
3TCM 0240D2-050AX	M3x0.5	M3.5x0.5	0.5	2.4	4.0	50.0	7.0	3
3TCM 0315D2-070AX	M4x0.7	-	0.7	3.15	4.0	50.0	8.8	3
3TCM 0400D2-080AX	M5x0.8	-	0.8	4.0	6.0	50.0	12.0	3
3TCM 0475D2-100AX	M6x1.0	M8x1.0	1.0	4.75	6.0	50.0	12.0	3
3TCM 0600D2-125AX	M8x1.25	-	1.25	6.0	6.0	60.0	17.5	3
3TCM 0800D2-150AX	M10x1.5	M12x1.5	1.5	8.0	8.0	60.0	22.0	4
3TCM 1000D2-175AX	M12x1.75	-	1.75	10.0	10.0	75.0	28.0	4
3TCM 1200D2-200AX	M16x2.0	-	2.0	12.0	12.0	75.0	35.0	4

NEW

Metric 3D Carbide Thread Mills Series 3TC

VHM | Z3 Z4 Z6 | HA | ALtima® Xtreme | 60° P | M | 3xD | RH Cutting

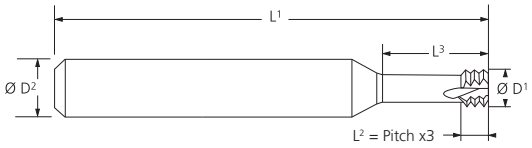


Tool Number	Thread	Tool Dimensions							
	M Coarse	Pitch (mm)	D¹	D²	D³	L¹	L³	Flutes	Drill Dia.
3TC-M1606D3-0.35X	M1.6	0.35	1.2	4.0	0.68	50.0	5.0	3	1.25
3TC-M206D3-0.4X	M2	0.4	1.54	6.0	0.88	60.0	6.5	3	1.6
3TC-M2506D3-0.45X	M2.5	0.45	1.96	6.0	1.15	60.0	8.0	3	2.05
3TC-M306D3-0.5X	M3	0.5	2.42	6.0	1.63	60.0	9.5	3	2.5
3TC-M406D3-0.7X	M4	0.7	3.15	6.0	1.99	60.0	12.5	3	3.3
3TC-M506D3-0.8X	M5	0.8	4.0	6.0	2.54	60.0	15.5	3	4.2
3TC-M606D3-1.0X	M6	1.0	4.75	6.0	3.03	60.0	18.5	3	5
3TC-M806D3-1.25X	M8	1.25	5.95	6.0	3.81	65.0	25.0	3	6.75
3TC-M1008D3-1.5X	M10	1.5	7.9	8.0	5.82	75.0	31.0	4	8.5
3TC-M1210D3-1.75X	M12	1.75	9.9	10.0	7.42	80.0	37.0	4	10.25
3TC-M1612D3-2.0X	M16	2.0	11.9	12.0	8.95	100.0	50.0	4	14
3TC-M2016D3-2.5X	M20	2.5	15.9	16.0	12.39	110.0	62.0	6	17.5

NEW

UN 2D Carbide Thread Mills Series 3TC

VHM | Z3 Z4 | HA | ALtima® Xtreme | 60° P | UNC | UNF | 2xD | RH Cutting



Tool Number	Thread		Tool Dimensions					
	UNC	UNF	Pitch (TPI)	D¹	D²	L¹	L³	Flutes
3TCU 0140D2-64AX	1-64	2-64	64	1.4	4.0	50.0	4.0	3
3TCU 0145D2-72AX	-	1-72	72	1.45	4.0	50.0	3.8	3
3TCU 0165D2-56AX	2-56	3-56	56	1.65	4.0	50.0	5.0	3
3TCU 0190D2-48AX	3-48	4-48	48	1.9	4.0	50.0	5.0	3
3TCU 0210D2-40AX	4-40	6-40	40	2.1	4.0	50.0	6.0	3
3TCU 0245D2-40AX	5-40	6-40	40	2.45	4.0	50.0	8.0	3
3TCU 0255D2-32AX	6-32	10-32	32	2.55	4.0	50.0	7.4	3
3TCU 0320D2-32AX	8-32	10-32	32	3.2	4.0	50.0	11.0	3
3TCU 0330D2-36AX	-	8-36	36	3.3	4.0	50.0	11.0	3
3TCU 0358D2-24AX	10-24	5/16-24	24	3.58	4.0	50.0	11.0	3
3TCU 0488D2-20AX	1/4-20	7/16-20	20	4.88	6.0	50.0	13.5	3
3TCU 0525D2-28AX	-	1/4-28	28	5.25	6.0	50.0	15.0	3
3TCU 0668D2-24AX	-	5/16-24	24	6.68	8.0	65.0	21.0	4
3TCU 0670D2-16AX	3/8-16	-	16	7.6	8.0	60.0	20.0	4
3TCU 0900D2-14AX	7/16-14	-	14	9.0	10.0	75.0	28.0	4
3TCU 0955D2-20AX	-	7/16-20	20	9.55	10.0	75.0	28.0	4

NEW

TuffCut® XM Series XM2B

Z2 | ALtima® Xtreme

- Range - Ø0.1mm to Ø6.0mm
- Neck Lengths - 0.2mm to 50.0mm

NEW

TuffCut® XM Series XM2S

Z2 | ALtima® Xtreme

- Range - Ø0.1mm to Ø6.0mm
- Neck Lengths - 0.3mm to 50.0mm

NEW

TuffCut® XM Series XM2R

Z2 | ALtima® Xtreme | Corner Radius

- Range - Ø0.2mm to Ø6.0mm
- Neck Lengths - 0.5mm to 55.0mm

NEW

TuffCut® XM Series XM4R

Z4 | ALtima® Xtreme | Corner Radius

- Range - Ø1.0mm to Ø6.0mm
- Neck Lengths - 4.0mm to 72.0mm

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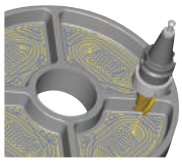

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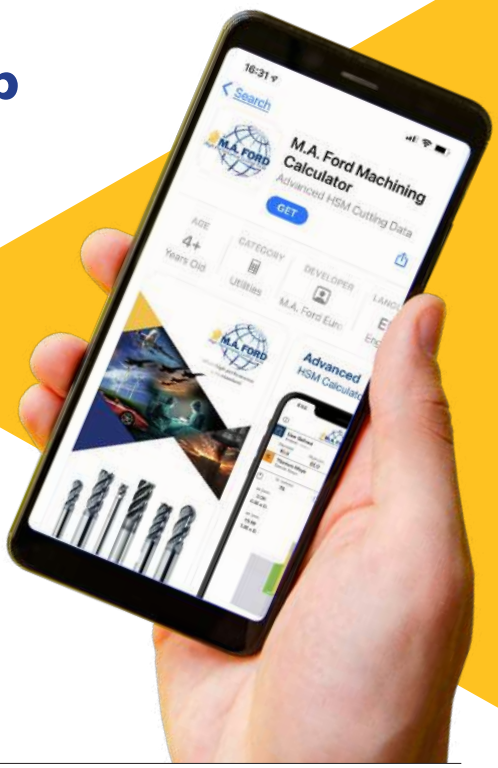

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