

High Feed Indexable Milling Program Tools

With new five- and six-axis CNC grinding technology, Millstar has been able to create some of the most sophisticated and complex geometries in use today. With this increase in grinding technology, high-feed tooling has been reborn. The definition of high-feed geometry is producing a positive cutting edge out of a series of continuous radii with no tangent point to induce wear. The geometry must allow the chip to flow up and out of the cut quickly and smoothly. This cutting motion allows the use of heavy chip loads to achieve very high feed rates.



<i>High Feed Indexable Milling Program Tool Contents</i>			
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HFA	Shell Milling Cutters	34	
HFSS	End Milling Cutters	34	
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Milling Cutters Identification System

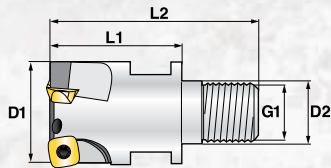
Modular

Measurement System	Denotes High Feed Cutter	SC = Screw-on Cutter A = Shell Cutter	Denotes Diameter Size		Denotes Number of Flutes
Imperial	HF	SC	1000	/	3
Metric	HF	SC	25	/	3

Shank

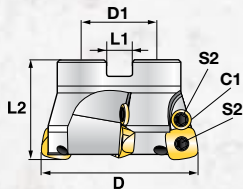
Measurement System	Denotes High Feed Cutter	Denotes Shank Cutter	Denotes Diameter Size		Denotes Tool Cutter Length		Denotes Tool Diameter Shank
Imperial	HF	SS	1000	-	5.5	-	1000
Metric	HF	SS	25	-	140	-	25

High Feed Indexable Milling Program Tools



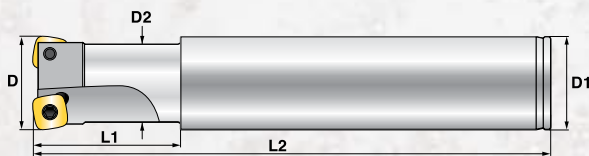
HFSC - Modular Screw-On Heads

Tool Ordering Number	Dimensions					Thread G1	Screw	Clamp	Key	Use with Inserts	CAM R
	ØD	L1	L2	D2	Z						
HFSC-1000/3	1.000	1.250	2.000	.429	3	M10	HFIS-1	-	T8	HFIC-09T3	0.089
HFSC-1250/4	1.250	1.570	2.500	.649	4	M12	HFIS-1	-	T8	HFIC-09T3	0.089
HFSC-1500/4	1.500	1.570	2.500	.649	4	M16	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138



HFA - Shell Milling Cutters

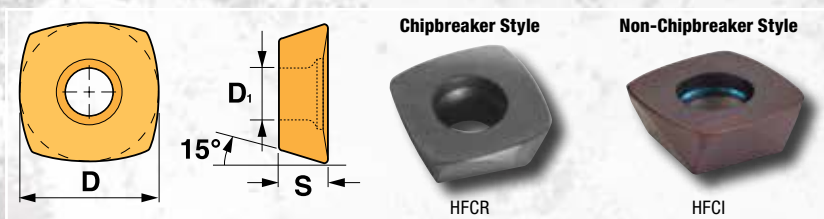
Tool Ordering Number	Dimensions					Screw S1	Screw S2	Clamp C1	Key	Use with Inserts	CAM R
	ØD	ØD1	L1	L2	Z						
HFA-1500/4	1.500	0.500	0.252	1.575	4	HFIS-2	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138
HFA-2000/5	2.000	0.750	0.312	1.575	5	HFIS-2	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138
HFA-2500/6	2.500	1.000	0.375	1.575	6	HFIS-2	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138
HFA-3000/7	3.000	1.000	0.375	1.968	7	HFIS-2	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138
HFA-4000/8	4.000	1.250	0.500	1.968	8	HFIS-2	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138



HFSS - End Milling Cutters

Tool Ordering Number	Dimensions					Screw	Clamp C1	Key	Use with Inserts	CAM R
	ØD	ØD1	L1	L2	Z					
HFSS-1000-5.5-1000	1.000	1.000	1.580	5.500	3	HFIS-1	-	T8	HFIC-09T3	0.089
HFSS-1000-7.0-1000	1.000	1.000	1.580	7.000	3	HFIS-1	-	T8	HFIC-09T3	0.089
HFSS-1250-6.0-1250	1.250	1.250	1.580	6.000	3	HFIS-1	-	T8	HFIC-09T3	0.089
HFSS-1250-8.0-1250	1.250	1.250	1.580	8.000	3	HFIS-1	-	T8	HFIC-09T3	0.089
HFSS-1500-6.0-1500	1.500	1.500	1.580	6.000	4	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138
HFSS-1500-9.0-1500	1.500	1.500	1.580	9.000	4	HFIS-2	HFIC-1	T15	HFIC-1204 HFICR-1204	0.138

High Feed Indexable Milling Program Tools



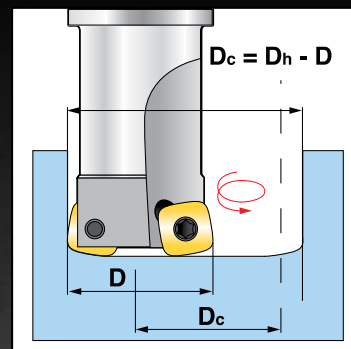
Insert Data

Tool Ordering Number	Dimensions			Grade		CAM
	D	S	D1	XRN	HSN	R
HFCI-09T3	.375	.156	.133	•	•	0.089
HFCI-1204	.500	.187	.173	•	•	0.138
HFCR-09T3	.375	.156	.133	•	•	0.089
HFCR-1204	.500	.187	.173	•	•	0.138

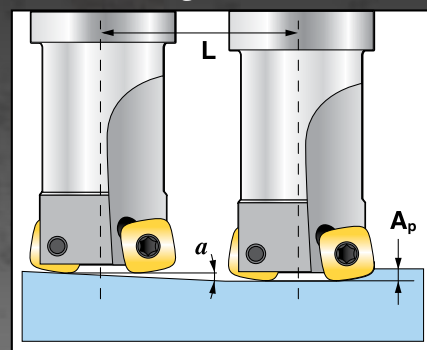
Machining Application Data

Tool Ordering Number	Dimensions				Helical Interpolation	
	ØD	ØDh	Ap	F	ØDh min	ØDh max
HFSC-1000/3	1.000	9mm	0.040	0.500	1.400	1.900
HFSC-1250/4	1.250	9mm	0.040	0.750	1.800	2.250
HFSC-1500/4	1.500	12mm	0.040	0.800	2.000	2.500
HFSS-1000-5.5-1000	1.000	9mm	0.040	0.500	1.500	1.900
HFSS-1000-7.0-1000	1.000	9mm	0.040	0.500	1.500	1.900
HFSS-1250-6.0-1250	1.250	9mm	0.040	0.800	1.000	2.500
HFSS-1250-8.0-1250	1.250	9mm	0.040	0.800	1.000	2.500
HFSS-1500-6.0-1500	1.500	12mm	0.040	1.125	1.250	3.000
HFSS-1500-9.0-1500	1.500	12mm	0.066	0.800	1.250	3.000
HFA-1500/4	1.500	12mm	0.066	1.000	2.500	3.250
HFA-2000/5	2.000	12mm	0.066	1.250	3.125	3.750
HFA-2500/6	2.500	12mm	0.066	1.900	4.000	4.750
HFA-3000/7	3.000	12mm	0.066	2.500	5.500	6.000
HFA-4000/8	4.000	12mm	0.066	3.250	7.000	7.750

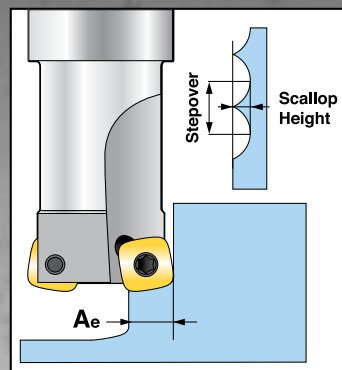
Helical Interpolation



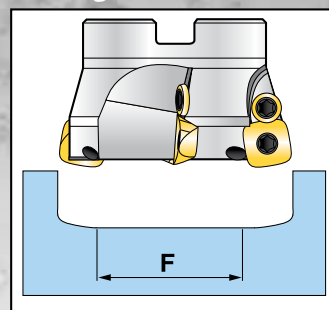
Slant Milling



Plunge Milling



Facing - Max Flat



- For Slant Milling or Helical Interpolation decrease the recommended feed by 30%.
- In case of Helical Interpolation do not exceed the max Ap/revolution.
- For Plunging use 50% of recommended feed only.
- For insert HFCI 09T3 the max Ae is: 0.200
- For insert HFCI 1204 the max Ae is: 0.250

The values of “n” and “Vf” in the tables on the following pages are computed. In the application, use the closest (up side) speed from the range of the machine tool.

The cutting parameters have to be adjusted accordingly to the rigidity of the machine-tool and working piece.

In case of hard steel alloy of 50-55 HRC decrease by 30% the Ap, Vc and feed.

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	sfm	Max RPM	inch/tooth	inch	inch
HFSC-1000/3	HFCl-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2420	623	11618	0.040	0.025	<.75
				3D-5D	1783	459	5350	0.040	0.025	<.75
				5D-7D	1656	426	4968	0.040	0.025	<.75
				>7D	1146	295	3439	0.040	0.025	<.75
			Alloy Steel 32-42HRC	<3D	2038	524	9783	0.040	0.025	<.75
				3D-5D	1656	426	4968	0.040	0.025	<.75
				5D-7D	1529	393	4586	0.040	0.025	<.75
				>7D	1146	295	3439	0.040	0.025	<.75
			Tool Steel 42-52HRC	<3D	1783	459	7490	0.040	0.025	<.75
				3D-5D	1274	328	3057	0.040	0.025	<.75
				5D-7D	1274	328	3057	0.040	0.025	<.75
				>7D	1146	295	2064	0.040	0.025	<.75
			Cast Iron	<3D	2293	590	11006	0.040	0.025	<.75
				3D-5D	1783	459	6420	0.040	0.025	<.75
				5D-7D	1656	426	5962	0.040	0.025	<.75
				>7D	1146	295	4127	0.040	0.025	<.75
HFSC-1250/4	HFCl-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2017	623	12102	0.040	0.025	<.75
				3D-5D	1486	459	5350	0.040	0.025	<.75
				5D-7D	1380	426	4968	0.040	0.025	<.75
				>7D	955	295	3439	0.040	0.025	<.75
			Alloy Steel 32-42HRC	<3D	1699	525	10191	0.040	0.025	<.75
				3D-5D	1380	427	4968	0.040	0.025	<.75
				5D-7D	1274	394	4586	0.040	0.025	<.75
				>7D	955	295	3439	0.040	0.025	<.75
			Tool Steel 42-52HRC	<3D	1486	459	7134	0.040	0.025	<.75
				3D-5D	1062	328	3397	0.040	0.025	<.75
				5D-7D	1062	328	2548	0.040	0.025	<.75
				>7D	955	295	2293	0.040	0.025	<.75
			Cast Iron	<3D	1911	591	12229	0.040	0.025	<.75
				3D-5D	1486	459	7134	0.040	0.025	<.75
				5D-7D	1380	427	6624	0.040	0.025	<.75
				>7D	955	295	4586	0.040	0.025	<.75
HFSC-1500/4	HFCl-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1441	623	8644	0.040	0.025	<.75
				3D-5D	1062	459	3822	0.040	0.025	<.75
				5D-7D	986	427	3549	0.040	0.025	<.75
				>7D	682	295	2457	0.040	0.025	<.75
			Alloy Steel 32-42HRC	<3D	1213	525	7279	0.040	0.025	<.75
				3D-5D	986	427	3549	0.040	0.025	<.75
				5D-7D	910	394	3276	0.040	0.025	<.75
				>7D	682	295	2457	0.040	0.025	<.75
			Tool Steel 42-52HRC	<3D	1062	459	5945	0.040	0.025	<.75
				3D-5D	758	328	2426	0.040	0.025	<.75
				5D-7D	758	328	2426	0.040	0.025	<.75
				>7D	682	295	1638	0.040	0.025	<.75
			Cast Iron	<3D	1365	591	9827	0.040	0.025	<.75
				3D-5D	1062	459	5945	0.040	0.025	<.75
				5D-7D	986	427	5520	0.040	0.025	<.75
				>7D	682	295	3822	0.040	0.025	<.75

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	sfm	Max RPM	inch/tooth	inch	inch
HFSS-1000-5.5-1000 HFSS-1000-7.0-1000	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2420	623	11618	0.040	0.025	<.75
				3D-5D	1783	459	5350	0.040	0.025	<.75
				5D-7D	1656	427	4968	0.040	0.025	<.75
				>7D	1146	295	3439	0.040	0.025	<.75
			Tool Steel 32-42HRC	<3D	2038	525	9783	0.040	0.025	<.75
				3D-5D	1656	427	4968	0.040	0.025	<.75
				5D-7D	1529	394	4586	0.040	0.025	<.75
				>7D	1146	295	3439	0.040	0.025	<.75
			Tool Steel 42-52HRC	<3D	1783	459	7490	0.040	0.025	<.75
				3D-5D	1274	328	3057	0.040	0.025	<.75
				5D-7D	1274	328	3057	0.040	0.025	<.75
				>7D	1146	295	2064	0.040	0.025	<.75
			Cast Iron	<3D	2293	591	11006	0.040	0.025	<.75
				3D-5D	1783	459	6420	0.040	0.025	<.75
				5D-7D	1656	427	5962	0.040	0.025	<.75
				>7D	1146	295	4127	0.040	0.025	<.75
HFSS-1250-6.0-1250 HFSS-1250-8.0-1250	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2017	623	12102	0.040	0.025	<.75
				3D-5D	1486	459	5350	0.040	0.025	<.75
				5D-7D	1380	427	4968	0.040	0.025	<.75
				>7D	896	295	3225	0.040	0.025	<.75
			Tool Steel 32-42HRC	<3D	1699	525	10191	0.040	0.025	<.75
				3D-5D	1380	427	4968	0.040	0.025	<.75
				5D-7D	1274	394	4586	0.040	0.025	<.75
				>7D	896	295	3225	0.040	0.025	<.75
			Tool Steel 42-52HRC	<3D	1486	459	7134	0.040	0.025	<.75
				3D-5D	1062	328	3397	0.040	0.025	<.75
				5D-7D	1062	328	2548	0.040	0.025	<.75
				>7D	896	295	2150	0.040	0.025	<.75
			Cast Iron	<3D	1911	591	12229	0.040	0.025	<.75
				3D-5D	1486	459	7134	0.040	0.025	<.75
				5D-7D	1380	427	6624	0.040	0.025	<.75
				>7D	896	295	4299	0.040	0.025	<.75
HFSS-1500-6.0-1500 HFSS-1500-9.0-1500	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1441	623	8644	0.040	0.040	<1
				3D-5D	1062	459	3822	0.040	0.040	<1
				5D-7D	986	427	3549	0.040	0.040	<1
				>7D	717	295	2580	0.040	0.040	<1
			Tool Steel 32-42HRC	<3D	1213	525	7279	0.040	0.040	<1
				3D-5D	986	427	3549	0.040	0.040	<1
				5D-7D	910	394	3276	0.040	0.040	<1
				>7D	717	295	2580	0.040	0.040	<1
			Tool Steel 42-52HRC	<3D	1062	459	5945	0.040	0.040	<1
				3D-5D	758	328	2426	0.040	0.040	<1
				5D-7D	758	328	2426	0.040	0.040	<1
				>7D	717	295	1720	0.040	0.040	<1
			Cast Iron	<3D	1365	591	9827	0.040	0.040	<1
				3D-5D	1062	459	5945	0.040	0.040	<1
				5D-7D	986	427	5520	0.040	0.040	<1
				>7D	717	295	4013	0.040	0.040	<1

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	sfm	Max RPM	inch/tooth	inch	inch
HFA-1500/4	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1441	623	8644	0.040	0.040	<1
				3D-5D	1062	459	3822	0.040	0.040	<1
				5D-7D	986	427	3549	0.040	0.040	<1
				>7D	682	295	2457	0.040	0.040	<1
			Tool Steel 32-42HRC	<3D	1213	525	7279	0.040	0.040	<1
				3D-5D	986	427	3549	0.040	0.040	<1
				5D-7D	910	394	3276	0.040	0.040	<1
				>7D	682	295	2457	0.040	0.040	<1
			Tool Steel 42-52HRC	<3D	1062	459	5945	0.040	0.040	<1
				3D-5D	758	328	2426	0.040	0.040	<1
				5D-7D	758	328	2426	0.040	0.040	<1
				>7D	682	295	1638	0.040	0.040	<1
			Cast Iron	<3D	1365	591	9827	0.040	0.040	<1
				3D-5D	1062	459	5945	0.040	0.040	<1
				5D-7D	986	427	5520	0.040	0.040	<1
				>7D	682	295	3822	0.040	0.040	<1
HFA-2000/5	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1210	623	8471	0.040	0.040	<1.375
				3D-5D	892	459	4459	0.040	0.040	<1.375
				5D-7D	828	427	4140	0.040	0.040	<1.375
				>7D	573	295	2293	0.040	0.040	<1.375
			Tool Steel 32-42HRC	<3D	1019	525	6115	0.040	0.040	<1.375
				3D-5D	828	427	4140	0.040	0.040	<1.375
				5D-7D	764	394	3822	0.040	0.040	<1.375
				>7D	573	295	2293	0.040	0.040	<1.375
			Tool Steel 42-52HRC	<3D	892	459	5350	0.040	0.040	<1.375
				3D-5D	637	328	2548	0.040	0.040	<1.375
				5D-7D	637	328	2548	0.040	0.040	<1.375
				>7D	573	295	2293	0.040	0.040	<1.375
			Cast Iron	<3D	1146	591	9172	0.040	0.040	<1.375
				3D-5D	892	459	5350	0.040	0.040	<1.375
				5D-7D	828	427	4968	0.040	0.040	<1.375
				>7D	573	295	3439	0.040	0.040	<1.375
HFA-2500/6	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	917	623	7701	0.040	0.040	<1.8
				3D-5D	676	459	4053	0.040	0.040	<1.8
				5D-7D	627	427	3764	0.040	0.040	<1.8
				>7D	434	295	2085	0.040	0.040	<1.8
			Tool Steel 32-42HRC	<3D	772	525	5559	0.040	0.040	<1.8
				3D-5D	627	427	3764	0.040	0.040	<1.8
				5D-7D	579	394	3474	0.040	0.040	<1.8
				>7D	434	295	2085	0.040	0.040	<1.8
			Tool Steel 42-52HRC	<3D	676	459	4864	0.040	0.040	<1.8
				3D-5D	483	328	2316	0.040	0.040	<1.8
				5D-7D	483	328	2316	0.040	0.040	<1.8
				>7D	434	295	2085	0.040	0.040	<1.8
			Cast Iron	<3D	869	591	8338	0.040	0.040	<1.8
				3D-5D	676	459	4864	0.040	0.040	<1.8
				5D-7D	627	427	4517	0.040	0.040	<1.8
				>7D	434	295	3127	0.040	0.040	<1.8

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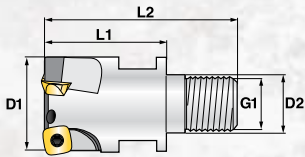
High Feed Indexable Milling Program Tool Contents

HFSC	Modular Screw-on Heads	90	
HFA	Shell Milling Cutters	90	
HFSS	End Milling Cutters	91	
Insert Data		92	
Cutting Conditions Data		93-97	

Milling Cutters Identification System

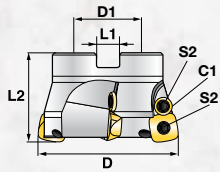
Modular						
Measurement System	Denotes High Feed Cutter	SC = Screw-on Cutter A = Shell Cutter	Denotes Diameter Size		Denotes Number of Flutes	
Imperial	HF	SC	1000	/	3	
Metric	HF	SC	25	/	3	
Shank						
Measurement System	Denotes High Feed Cutter	Denotes Shank Cutter	Denotes Diameter Size		Denotes Tool Cutter Length	Denotes Tool Diameter Shank
Imperial	HF	SS	1000	-	5.5	1000
Metric	HF	SS	25	-	140	25

High Feed Indexable Milling Program Tools



HFSC - Modular Screw-On Heads

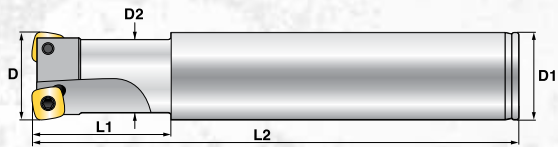
Tool Ordering Number	Dimensions					Thread G1	Screw	Clamp	Key	Use with Inserts	CAM R
	ØD	L1	L2	D2	Z						
HFSC-20/2	20	31	49	10,5	2	M10	HFIS 1	-	T8	HFCl-09T3	2,27
HFSC-25/3	25	32	54	12,5	3	M12	HFIS 1	-	T8	HFCl-09T3	2,27
HFSC-30/4	30	40	63	17,0	4	M16	HFIS 1	-	T8	HFCl-09T3	2,27
HFSC-32/4	32	40	63	17,0	4	M16	HFIS 1	-	T8	HFCl-09T3	2,27
HFSC-32/3	32	40	63	17,0	3	M16	HFIS 2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFSC-42/4	42	40	63	17,0	4	M16	HFIS 2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52



HFA - Shell Milling Cutters

Tool Ordering Number	Dimensions					Screw S1	Screw S2	Clamp C1	Key	Use with Inserts	CAM R
	ØD	ØD1	L1	L2	Z						
HFA-42/4	42	16	8,4	40	4	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFA-50/5	50	22	10,4	40	5	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFA-52/5	52	22	10,4	50	5	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFA-63/6	63	27	12,4	50	6	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFA-66/6	66	27	12,4	50	6	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFA-80/7	80	27	12,4	50	7	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52
HFA-100/8	100	32	14,4	50	8	HFIS-2	HFIS-2	HFIC-1	T15	HFCl-1204 HFCl-1204	3,52

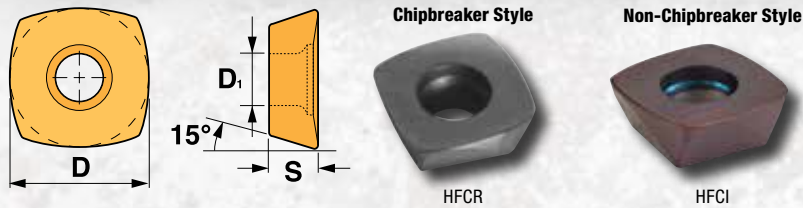
High Feed Indexable Milling Program Tools



HFSS - End Milling Cutters

Tool Ordering Number	Dimensions					Screw	Clamp C1	Key	Use with Inserts	CAM R
	ØD	ØD1	L1	L2	Z					
HFSS-20-110-20	20	20	30	110	2	HFIS-1	-	T8	HFCI-09T3	2,27
HFSS-25-100-25	25	25	30	100	3	HFIS-1	-	T8	HFCI-09T3	2,27
HFSS-25-140-25	25	25	40	140	3	HFIS-1	-	T8	HFCI-09T3	2,27
HFSS-25-240-25	25	25	40	240	3	HFIS-1	-	T8	HFCI-09T3	2,27
HFSS-32-140-32	32	32	40	140	4	HFIS-1	-	T8	HFCI-09T3	2,27
HFSS-32-240-32	32	32	40	240	4	HFIS-1	-	T8	HFCI-09T3	2,27
HFSS-40-140-32	40	32	-	140	4	HFIS-2	HFIC-1	T15	HFCI-1204 HFCR-1204	3,52
HFSS-40-240-32	40	32	-	240	4	HFIS-2	HFIC-1	T15	HFCI-1204 HFCR-1204	3,52

High Feed Indexable Milling Program Tools



Insert Data

Tool Ordering Number	Dimensions			Grade		CAM
	D	S	D1	XRN	HSN	R
HFCl-09T3	9,525	3,97	4,4	•	•	2,27
HFCl-1204	12,700	4,76	3,4	•	•	3,52
HFCR-09T3	9,525	3,97	4,4	•	•	2,27
HFCR-1204	12,700	4,76	3,4	•	•	3,52

Machining Application Data

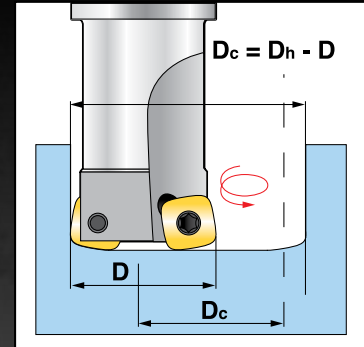
Tool Ordering Number	Dimensions				Helical Interpolation	
	ØD	ØDh	Ap	F	ØDh min	ØDh max
HFSC-20/2	20	9	1	8,8	26,3	38,1
HFSC-25/3	25	9	1	13,8	36,3	48,1
HFSC-30/4	30	9	1	18,8	46,3	58,1
HFSC-32/4	32	9	1	20,8	50,3	62,1
HFSC-32/3	32	12	1,7	15,4	44,6	61,8
HFSC-42/4	42	12	1,7	25,4	64,6	81,8
HFSS-20-110-20	20	9	1	8,8	26,3	38,1
HFSS-25-100-25	25	9	1	13,8	36,3	48,1
HFSS-25-140-25	25	9	1	13,8	36,3	48,1
HFSS-25-240-25	25	9	1	13,8	36,3	48,1
HFSS-32-140-32	32	9	1	20,8	50,3	62,1
HFSS-32-240-32	32	9	1	20,8	50,3	62,1
HFSS-40-140-32	40	9	1	28,8	66,3	78,1
HFSS-40-240-32	40	12	1,7	23,4	60,6	77,8
HFSS-20-110-20	20	12	1,7	8,8	26,3	38,1
HFA-42/4	42	12	1,7	25,4	64,6	81,8
HFA-50/5	50	12	1,7	33,4	80,5	97,8
HFA-52/5	52	12	1,7	35,4	84,5	101,8
HFA-63/6	63	12	1,7	46,4	106,5	123,8
HFA-66/6	66	12	1,7	49,4	112,5	129,8
HFA-80/7	80	12	1,7	63,4	140,5	157,8

- For Slant Milling or Helical Interpolation decrease the recommended feed by 30%.
- In case of Helical Interpolation do not exceed the max Ap/revolution.
- For Plunging use 50% of recommended feed only.
- For insert HFCl 09T3 the max Ae is: 0.200 • For insert HFCl 1204 the max Ae is: 0.250

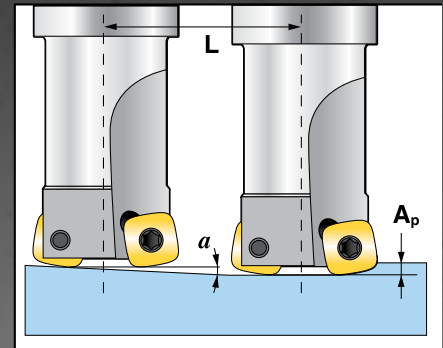
The values of "n" and "Vf" in the tables on the following pages are computed. In the application, use the closest (up side) speed from the range of the machine tool. The cutting parameters have to be adjusted accordingly to the rigidity of the machine-tool and working piece.

In case of hard steel alloy of 50-55 HRC decrease by 30% the Ap, Vc and feed.

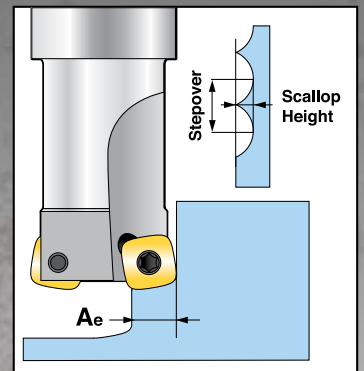
Helical Interpolation



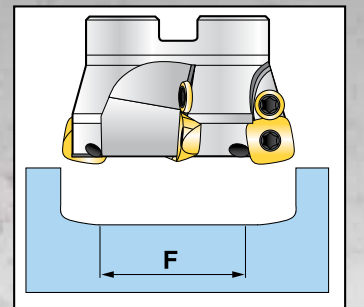
Slant Milling



Plunge Milling



Facing - Max Flat



High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	mm/min	mm/min	mm/tooth	mm	mm
HFSC-20/2	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	3025	190	8471	1,4	0,6	<15
				3D-5D	2229	140	3567	0,8	0,6	<15
				5D-7D	2070	130	3312	0,8	0,5	<15
				>7D	1433	90	2293	0,8	0,4	<15
			Tool Steel 32-42HRC	<3D	2548	160	7134	1,4	0,4	<15
				3D-5D	2070	130	3312	0,8	0,5	<15
				5D-7D	1911	120	3057	0,8	0,4	<15
				>7D	1433	90	2293	0,8	0,3	<15
			Tool Steel 42-52HRC	<3D	2229	140	5350	1,2	0,4	<15
				3D-5D	1592	100	2548	0,8	0,4	<15
				5D-7D	1592	100	2548	0,8	0,3	<15
				>7D	1433	90	1720	0,6	0,2	<15
			Cast Iron	<3D	2866	180	9172	1,6	0,8	<15
				3D-5D	2229	140	5350	1,2	0,8	<15
				5D-7D	2070	130	4968	1,2	0,6	<15
				>7D	1433	90	3439	1,2	0,5	<15
HFSC 25/3	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2420	190	11618	1,6	0,6	<20
				3D-5D	1783	140	5350	1	0,6	<20
				5D-7D	1656	130	4968	1	0,5	<20
				>7D	1146	90	3439	1	0,4	<20
			Alloy Steel 32-42HRC	<3D	2038	160	9783	1,6	0,4	<20
				3D-5D	1656	130	4968	1	0,5	<20
				5D-7D	1529	120	4586	1	0,4	<20
				>7D	1146	90	3439	1	0,3	<20
			Tool Steel 42-52HRC	<3D	1783	140	7490	1,4	0,4	<20
				3D-5D	1274	100	3057	0,8	0,4	<20
				5D-7D	1274	100	3057	0,8	0,3	<20
				>7D	1146	90	2064	0,6	0,2	<20
			Cast Iron	<3D	2293	180	11006	1,6	0,8	<20
				3D-5D	1783	140	6420	1,2	0,8	<20
				5D-7D	1656	130	5962	1,2	0,6	<20
				>7D	1146	90	4127	1,2	0,5	<20
HFSC-30/4	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2017	190	12102	1,5	0,6	<21
				3D-5D	1486	140	5350	0,9	0,6	<21
				5D-7D	1380	130	4968	0,9	0,5	<21
				>7D	955	90	3439	0,9	0,4	<21
			Alloy Steel 32-42HRC	<3D	1699	160	10191	1,5	0,4	<21
				3D-5D	1380	130	4968	0,9	0,5	<21
				5D-7D	1274	120	4586	0,9	0,4	<21
				>7D	955	90	3439	0,9	0,3	<21
			Tool Steel 42-52HRC	<3D	1486	140	7134	1,2	0,4	<21
				3D-5D	1062	100	3397	0,8	0,4	<21
				5D-7D	1062	100	2548	0,6	0,3	<21
				>7D	955	90	2293	0,6	0,2	<21
			Cast Iron	<3D	1911	180	12229	1,6	0,8	<21
				3D-5D	1486	140	7134	1,2	0,8	<21
				5D-7D	1380	130	6624	1,2	0,6	<21
				>7D	955	90	4586	1,2	0,4	<21

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	mm/min	mm/min	mm/tooth	mm	mm
HFSC-32/4	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	1891	190	11346	1,5	0,6	<22
				3D-5D	1393	140	5016	0,9	0,6	<22
				5D-7D	1294	130	4658	0,9	0,5	<22
				>7D	896	90	3225	0,9	0,4	<22
			Alloy Steel 32-42HRC	<3D	1592	160	9554	1,5	0,4	<22
				3D-5D	1294	130	4658	0,9	0,5	<22
				5D-7D	1194	120	4299	0,9	0,4	<22
				>7D	896	90	3225	0,9	0,3	<22
			Tool Steel 42-52HRC	<3D	1393	140	6688	1,2	0,4	<22
				3D-5D	995	100	3185	0,8	0,4	<22
				5D-7D	995	100	2389	0,6	0,3	<22
				>7D	896	90	2150	0,6	0,2	<22
			Cast Iron	<3D	1791	180	11465	1,6	0,8	<22
				3D-5D	1393	140	6688	1,2	0,8	<22
				5D-7D	1294	130	6210	1,2	0,6	<22
				>7D	896	90	4299	1,2	0,4	<22
HFSC-32/3	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1891	190	8509	1,5	1	<22
				3D-5D	1393	140	3762	0,9	1,2	<22
				5D-7D	1294	130	3493	0,9	1	<22
				>7D	896	90	2418	0,9	0,8	<22
			Alloy Steel 32-42HRC	<3D	1592	160	7166	1,5	0,8	<22
				3D-5D	1294	130	3493	0,9	1	<22
				5D-7D	1194	120	3225	0,9	0,8	<22
				>7D	896	90	2418	0,9	0,6	<22
			Tool Steel 42-52HRC	<3D	1393	140	5852	1,4	0,8	<22
				3D-5D	995	100	2389	0,8	0,6	<22
				5D-7D	995	100	2389	0,8	0,5	<22
				>7D	896	90	1612	0,6	0,4	<22
			Cast Iron	<3D	1791	180	9674	1,8	1,2	<22
				3D-5D	1393	140	5852	1,4	1	<22
				5D-7D	1294	130	5434	1,4	0,8	<22
				>7D	896	90	3762	1,4	0,6	<22
HFSC-42/4	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1441	190	8644	1,5	1	<28
				3D-5D	1062	140	3822	0,9	1,2	<28
				5D-7D	986	130	3549	0,9	1	<28
				>7D	682	90	2457	0,9	0,8	<28
			Alloy Steel 32-42HRC	<3D	1213	160	7279	1,5	0,8	<28
				3D-5D	986	130	3549	0,9	1	<28
				5D-7D	910	120	3276	0,9	0,8	<28
				>7D	682	90	2457	0,9	0,6	<28
			Tool Steel 42-52HRC	<3D	1062	140	5945	1,4	0,8	<28
				3D-5D	758	100	2426	0,8	0,6	<28
				5D-7D	758	100	2426	0,8	0,5	<28
				>7D	682	90	1638	0,6	0,4	<28
			Cast Iron	<3D	1365	180	9827	1,8	1,2	<28
				3D-5D	1062	140	5945	1,4	1	<28
				5D-7D	986	130	5520	1,4	0,8	<28
				>7D	682	90	3822	1,4	0,6	<28

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	mm/min	mm/min	mm/tooth	mm	mm
HFSS-20-110-20	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	3025	190	8471	1,4	0,6	<15
				3D-5D	2229	140	3567	0,8	0,6	<15
				5D-7D	2070	130	3312	0,8	0,5	<15
				>7D	1433	90	2293	0,8	0,4	<15
			Tool Steel 32-42HRC	<3D	2548	160	7134	1,4	0,4	<15
				3D-5D	2070	130	3312	0,8	0,5	<15
				5D-7D	1911	120	3057	0,8	0,4	<15
				>7D	1433	90	2293	0,8	0,3	<15
			Tool Steel 42-52HRC	<3D	2229	140	5350	1,2	0,4	<15
				3D-5D	1592	100	2548	0,8	0,4	<15
				5D-7D	1592	100	2548	0,8	0,3	<15
				>7D	1433	90	1720	0,6	0,2	<15
			Cast Iron	<3D	2866	180	9172	1,6	0,8	<15
				3D-5D	2229	140	5350	1,2	0,8	<15
				5D-7D	2070	130	4968	1,2	0,6	<15
				>7D	1433	90	3439	1,2	0,5	<15
HFSS-25-110-25 HFSS-25-140-25 HFSS-25-240-25	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2420	190	11618	1,6	0,6	<20
				3D-5D	1783	140	5350	1	0,6	<20
				5D-7D	1656	130	4968	1	0,5	<20
				>7D	1146	90	3439	1	0,4	<20
			Tool Steel 32-42HRC	<3D	2038	160	9783	1,6	0,4	<20
				3D-5D	1656	130	4968	1	0,5	<20
				5D-7D	1529	120	4586	1	0,4	<20
				>7D	1146	90	3439	1	0,3	<20
			Tool Steel 42-52HRC	<3D	1783	140	7490	1,4	0,4	<20
				3D-5D	1274	100	3057	0,8	0,4	<20
				5D-7D	1274	100	3057	0,8	0,3	<20
				>7D	1146	90	2064	0,6	0,2	<20
			Cast Iron	<3D	2293	180	11006	1,6	0,8	<20
				3D-5D	1783	140	6420	1,2	0,8	<20
				5D-7D	1656	130	5962	1,2	0,6	<20
				>7D	1146	90	4127	1,2	0,5	<20
HFSS 32-140-32 HFSS-32-240-32	HFCI-09T3	HSN-XRN	Alloy Steel <32HRC	<3D	2017	190	12102	1,5	0,6	<21
				3D-5D	1486	140	5350	0,9	0,6	<21
				5D-7D	1380	130	4968	0,9	0,5	<21
				>7D	896	90	3225	0,9	0,4	<21
			Tool Steel 32-42HRC	<3D	1699	160	10191	1,5	0,4	<21
				3D-5D	1380	130	4968	0,9	0,5	<21
				5D-7D	1274	120	4586	0,9	0,4	<21
				>7D	896	90	3225	0,9	0,3	<21
			Tool Steel 42-52HRC	<3D	1486	140	7134	1,2	0,4	<21
				3D-5D	1062	100	3397	0,8	0,4	<21
				5D-7D	1062	100	2548	0,6	0,3	<21
				>7D	896	90	2150	0,6	0,2	<21
			Cast Iron	<3D	1911	180	12229	1,6	0,8	<21
				3D-5D	1486	140	7134	1,2	0,8	<21
				5D-7D	1380	130	6624	1,2	0,6	<21
				>7D	896	90	4299	1,2	0,4	<21

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	mm/min	mm/min	mm/tooth	mm	mm
HFSS-40-140-32 HFSS-40-240-32	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1441	190	8644	1,5	1	<28
				3D-5D	1062	140	3822	0,9	1,2	<28
				5D-7D	986	130	3549	0,9	1	<28
				>7D	717	90	2580	0,9	0,8	<28
			Tool Steel 32-42HRC	<3D	1213	160	7279	1,5	0,8	<28
				3D-5D	986	130	3549	0,9	1	<28
				5D-7D	910	120	3276	0,9	0,8	<28
				>7D	717	90	2580	0,9	0,6	<28
			Tool Steel 42-52HRC	<3D	1062	140	5945	1,4	0,8	<28
				3D-5D	758	100	2426	0,8	0,6	<28
				5D-7D	758	100	2426	0,8	0,5	<28
				>7D	717	90	1720	0,6	0,4	<28
			Cast Iron	<3D	1365	180	9827	1,8	1,2	<28
				3D-5D	1062	140	5945	1,4	1	<28
				5D-7D	986	130	5520	1,4	0,8	<28
				>7D	717	90	4013	1,4	0,6	<28
HFA-42/4	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1441	190	8644	1,5	1	<28
				3D-5D	1062	140	3822	0,9	1,2	<28
				5D-7D	986	130	3549	0,9	1	<28
				>7D	682	90	2457	0,9	0,8	<28
			Tool Steel 32-42HRC	<3D	1213	160	7279	1,5	0,8	<28
				3D-5D	986	130	3549	0,9	1	<28
				5D-7D	910	120	3276	0,9	0,8	<28
				>7D	682	90	2457	0,9	0,6	<28
			Tool Steel 42-52HRC	<3D	1062	140	5945	1,4	0,8	<28
				3D-5D	758	100	2426	0,8	0,6	<28
				5D-7D	758	100	2426	0,8	0,5	<28
				>7D	682	90	1638	0,6	0,4	<28
			Cast Iron	<3D	1365	180	9827	1,8	1,2	<28
				3D-5D	1062	140	5945	1,4	1	<28
				5D-7D	986	130	5520	1,4	0,8	<28
				>7D	682	90	3822	1,4	0,6	<28
HFA-50/5	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1210	190	8471	1,4	0,7	<35
				3D-5D	892	140	4459	1	1	<35
				5D-7D	828	130	4140	1	0,8	<35
				>7D	573	90	2293	0,8	0,6	<35
			Tool Steel 32-42HRC	<3D	1019	160	6115	1,2	0,6	<35
				3D-5D	828	130	4140	1	0,6	<35
				5D-7D	764	120	3822	1	0,6	<35
				>7D	573	90	2293	0,8	0,4	<35
			Tool Steel 42-52HRC	<3D	892	140	5350	1,2	0,6	<35
				3D-5D	637	100	2548	0,8	0,5	<35
				5D-7D	637	100	2548	0,8	0,4	<35
				>7D	573	90	2293	0,8	0,3	<35
			Cast Iron	<3D	1146	180	9172	1,6	1	<35
				3D-5D	892	140	5350	1,2	0,8	<35
				5D-7D	828	130	4968	1,2	0,6	<35
				>7D	573	90	3439	1,2	0,4	<35

High Feed Indexable Milling Program Tools

Cutting Conditions Data

Cutter	Insert	Grade	Work Piece Material	Overhang	n	Vc	Vf	fz	Ap	Ae
					RPM	mm/min	mm/min	mm/tooth	mm	mm
HFA-52/5	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	1164	190	8146	1,4	0,7	<36
				3D-5D	857	140	4287	1	1	<36
				5D-7D	796	130	3981	1	0,8	<36
				>7D	551	90	2205	0,8	0,6	<36
			Tool Steel 32-42HRC	<3D	980	160	5879	1,2	0,6	<36
				3D-5D	796	130	3981	1	0,6	<36
				5D-7D	735	120	3675	1	0,6	<36
				>7D	551	90	2205	0,8	0,4	<36
			Tool Steel 42-52HRC	<3D	857	140	5145	1,2	0,6	<36
				3D-5D	612	100	2450	0,8	0,5	<36
				5D-7D	612	100	2450	0,8	0,4	<36
				>7D	551	90	2205	0,8	0,3	<36
			Cast Iron	<3D	1102	180	8819	1,6	1	<36
				3D-5D	857	140	5145	1,2	0,8	<36
				5D-7D	796	130	4777	1,2	0,6	<36
				>7D	551	90	3307	1,2	0,4	<36
HFA-63/6	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	960	190	8068	1,4	0,7	<45
				3D-5D	708	140	4246	1	1	<45
				5D-7D	657	130	3943	1	0,8	<45
				>7D	455	90	2184	0,8	0,6	<45
			Tool Steel 32-42HRC	<3D	809	160	5823	1,2	0,6	<45
				3D-5D	657	130	3943	1	0,6	<45
				5D-7D	607	120	3640	1	0,6	<45
				>7D	455	90	2184	0,8	0,4	<45
			Tool Steel 42-52HRC	<3D	708	140	5096	1,2	0,6	<45
				3D-5D	506	100	2426	0,8	0,5	<45
				5D-7D	506	100	2426	0,8	0,4	<45
				>7D	455	90	2184	0,8	0,3	<45
			Cast Iron	<3D	910	180	8735	1,6	1	<45
				3D-5D	708	140	5096	1,2	0,8	<45
				5D-7D	657	130	4732	1,2	0,6	<45
				>7D	455	90	3276	1,2	0,4	<45
HFA-66/6	HFCI-1204	HSN-XRN	Alloy Steel <32HRC	<3D	917	190	7701	1,4	0,7	<47
				3D-5D	676	140	4053	1	1	<47
				5D-7D	627	130	3764	1	0,8	<47
				>7D	434	90	2085	0,8	0,6	<47
			Tool Steel 32-42HRC	<3D	772	160	5559	1,2	0,6	<47
				3D-5D	627	130	3764	1	0,6	<47
				5D-7D	579	120	3474	1	0,6	<47
				>7D	434	90	2085	0,8	0,4	<47
			Tool Steel 42-52HRC	<3D	676	140	4864	1,2	0,6	<47
				3D-5D	483	100	2316	0,8	0,5	<47
				5D-7D	483	100	2316	0,8	0,4	<47
				>7D	434	90	2085	0,8	0,3	<47
			Cast Iron	<3D	869	180	8338	1,6	1	<47
				3D-5D	676	140	4864	1,2	0,8	<47
				5D-7D	627	130	4517	1,2	0,6	<47
				>7D	434	90	3127	1,2	0,4	<47