

HEV-C-7

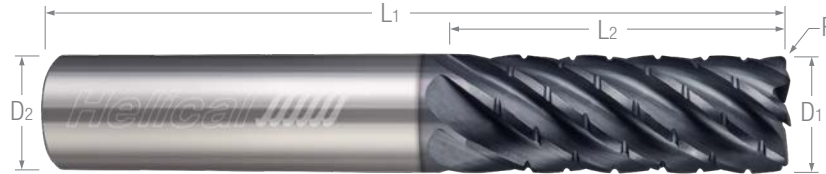


New Items!

7 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch

- Offset chip breaker geometry creates smaller chips for optimal evacuation and a semi-finished surface
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- 7 flute design offers a large core for added strength
- Excellent performance in High Efficiency Milling (HEM)
- End cutting geometry (non-center cutting) allows for ramping
- h6 shank tolerance for high precision tool holders
- *Aplus* coating for added lubricity, higher speeds and feeds, and increased wear resistance



Cutter Diameter*	Shank Diameter	Corner Radius	Length of Cut	Overall Length	Flutes	<i>Aplus</i> Coated	Tool Description
$D_1^{+.000" / -.002"}$	$D_2 (h6)$	$R^{+.002" / -.002"}$	$L_2^{+.032" / -.000"}$	$L_1^{+.062" / -.062"}$			
1/4	1/4	.020	3/8	2	7	59420	HEV-C-S-70250-R.020
	1/4	.020	1/2	2	7	59421	HEV-C-SR-70250-R.020
	1/4	.020	3/4	2-1/2	7	59422	HEV-C-R-70250-R.020
3/8	3/8	.020	1/2	2	7	59423	HEV-C-S-70375-R.020
	3/8	.020	3/4	2-1/2	7	59424	HEV-C-SR-70375-R.020
	3/8	.020	1	2-1/2	7	59425	HEV-C-R-70375-R.020
1/2	1/2	.030	5/8	2-1/2	7	59426	HEV-C-S-70500-R.030
	1/2	.030	1	3	7	59427	HEV-C-SR-70500-R.030
	1/2	.030	1-1/4	3	7	59428	HEV-C-R-70500-R.030
	1/2	.030	1-5/8	4	7	59429	HEV-C-M-70500-R.030
	1/2	.030	2	4	7	81975	HEV-C-L-70500-R.030
	1/2	.060	5/8	2-1/2	7	81978	HEV-C-S-70500-R.060
	1/2	.060	1	3	7	81979	HEV-C-SR-70500-R.060
	1/2	.060	1-1/4	3	7	81980	HEV-C-R-70500-R.060
	1/2	.060	1-5/8	4	7	81981	HEV-C-M-70500-R.060
1/2	.060	2	4	7	81982	HEV-C-L-70500-R.060	
5/8	5/8	.030	1-1/4	3-1/2	7	59430	HEV-C-SR-70625-R.030
	5/8	.030	1-5/8	4	7	59431	HEV-C-R-70625-R.030
	5/8	.030	2-1/8	4	7	81976	HEV-C-M-70625-R.030
	5/8	.060	1-1/4	3-1/2	7	81983	HEV-C-SR-70625-R.060
	5/8	.060	1-5/8	4	7	81984	HEV-C-R-70625-R.060
5/8	.060	2-1/8	4	7	81985	HEV-C-M-70625-R.060	
3/4	3/4	.030	1-5/8	4	7	59432	HEV-C-R-70750-R.030
	3/4	.030	2-1/4	5	7	59433	HEV-C-M-70750-R.030
	3/4	.030	2-3/4	5	7	81977	HEV-C-L-70750-R.030
	3/4	.060	1-5/8	4	7	81986	HEV-C-R-70750-R.060
	3/4	.060	2-1/4	5	7	81987	HEV-C-M-70750-R.060
3/4	.060	2-3/4	5	7	81988	HEV-C-L-70750-R.060	

*.0005 max TIR



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1-800-486-4243

SPEEDS & FEEDS



HEV-C-7

7 Flute - Chipbreaker Rougher - Variable Pitch

Roughers

Click on tool numbers to access pricing, stock, and technical info.

HEV-C-7										
Material Guide		Hardness	SFM	1/8	3/16	1/4	3/8	1/2	3/4	1
				Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh
CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB	450	.0032	.0047	.0063	.0095	.0126	.0179	.0242
		75 - 98 HRB	450	.0019	.0029	.0037	.0058	.0074	.0116	.0158
		21 - 36 HRC	400	.0013	.0021	.0026	.0042	.0053	.0084	.0105
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	450	.0019	.0026	.0037	.0053	.0074	.0105	.0137
		21 - 36 HRC	400	.0013	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	200	.0008	.0013	.0016	.0023	.0032	.0047	.0063
		> 50 HRC	100	.0006	.0009	.0013	.0019	.0023	.0037	.0047
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	325	.0016	.0023	.0032	.0047	.0063	.0095	.0126
		21 - 36 HRC	250	.0013	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	175	.0008	.0013	.0016	.0023	.0032	.0047	.0063
		> 50 HRC	55	.0006	.0009	.0013	.0019	.0023	.0037	.0047
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	350	.0021	.0032	.0042	.0063	.0084	.0126	.0168
		75 - 98 HRB	400	.0016	.0023	.0032	.0047	.0063	.0095	.0126
		21 - 36 HRC	225	.0011	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	150	.0011	.0016	.0021	.0032	.0042	.0063	.0084
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB	250	.0013	.0021	.0026	.0042	.0053	.0084	.0105
		21 - 36 HRC	225	.0011	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	175	.0008	.0013	.0019	.0026	.0037	.0053	.0074
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB	325	.0011	.0016	.0021	.0032	.0042	.0063	.0084
		21 - 36 HRC	300	.0016	.0021	.0029	.0042	.0058	.0084	.0116
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	225	.0013	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	130	.0008	.0013	.0016	.0026	.0032	.0053	.0063
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	450	.0032	.0053	.0063	.0105	.0137	.0200	.0263
		21 - 36 HRC	400	.0021	.0032	.0042	.0063	.0084	.0126	.0168
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	350	.0019	.0029	.0037	.0058	.0074	.0116	.0147
		21 - 36 HRC	325	.0013	.0019	.0023	.0037	.0047	.0074	.0095
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	325	.0019	.0029	.0037	.0058	.0074	.0116	.0147
		21 - 36 HRC	275	.0013	.0019	.0026	.0037	.0053	.0074	.0105
		36 - 50 HRC	175	.0006	.0009	.0013	.0019	.0023	.0037	.0047
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	450	.0023	.0037	.0047	.0074	.0095	.0147	.0189
		75 - 98 HRB	450	.0021	.0032	.0042	.0063	.0084	.0126	.0168
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	175	.0013	.0021	.0026	.0042	.0053	.0084	.0105
		21 - 36 HRC	160	.0011	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	90	.0009	.0013	.0019	.0026	.0037	.0053	.0074
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	400	.0032	.0053	.0063	.0105	.0137	.0200	.0273
		75 - 98 HRB	400	.0016	.0023	.0032	.0047	.0063	.0095	.0126
		21 - 36 HRC	350	.0019	.0026	.0037	.0053	.0074	.0105	.0137
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	225	.0013	.0021	.0026	.0042	.0053	.0084	.0105
		36 - 50 HRC	150	.0011	.0016	.0021	.0032	.0042	.0063	.0084
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	225	.0008	.0013	.0016	.0023	.0032	.0047	.0063
		21 - 36 HRC	160	.0011	.0019	.0023	.0037	.0047	.0074	.0095
		36 - 50 HRC	90	.0008	.0013	.0016	.0023	.0032	.0047	.0063

Milling Process	Hardness	ADOC	RDOC
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	10%-20% Diameter
	≥ 35 HRC	Up to Max LOC	10%-20% Diameter

NOTES:

Speed (SFM) and feed (IPT) numbers shown in the table above are considered to be average values. Use a tolerance of ± 25% as needed.

Hardness Scales: HRB = Rockwell B
HRC = Rockwell C

7 FLUTE - SQUARE

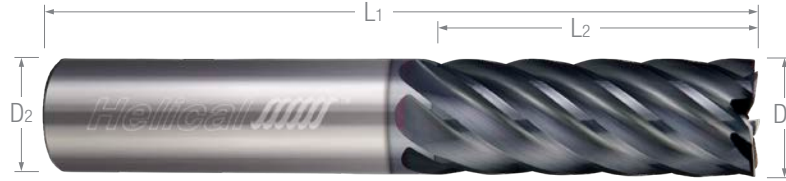
New Items!



HEV-7

Variable Pitch

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- Excellent performance in High Efficiency Milling (HEM)
- 7 flute design offers a large core for added strength
- h6 shank tolerance for high precision tool holders
- *Aplus* coating for added lubricity, higher speeds and feeds, and increased wear resistance
- *Tplus* coating for optimal tool life in rigid machining setups



Cutter Diameter*	Shank Diameter	Length of Cut	Overall Length	Flutes	<i>Aplus</i> Coated	<i>Tplus</i> Coated	Tool Description
$D1^{+0.000}_{-0.002}$	$D2 (h6)$	$L2^{+0.032}_{-0.000}$	$L1^{+0.062}_{-0.062}$				
1/4	1/4	3/8	2	7	26107	59939	HEV-S-70250
	1/4	1/2	2	7	26122	59940	HEV-SR-70250
	1/4	3/4	2-1/2	7	26137	59941	HEV-R-70250
	1/4	1	3	7	26152		HEV-M-70250
3/8	3/8	1/2	2	7	26212	59942	HEV-S-70375
	3/8	3/4	2-1/2	7	26227	59943	HEV-SR-70375
	3/8	1	2-1/2	7	26242	59944	HEV-R-70375
	3/8	1-1/2	3-1/2	7	26247	81939	HEV-L-70375 new
1/2	1/2	5/8	2-1/2	7	26257	59945	HEV-S-70500
	1/2	1	3	7	26272	59946	HEV-SR-70500
	1/2	1-1/4	3	7	26287	59947	HEV-R-70500
	1/2	1-5/8	4	7	26302	59948	HEV-M-70500
	1/2	2	4	7	26307	81940	HEV-L-70500 new
5/8	5/8	3/4	3	7	26317	81941	HEV-S-70625 new
	5/8	1-1/4	3-1/2	7	26322	81942	HEV-SR-70625 new
	5/8	1-5/8	4	7	26332	81943	HEV-R-70625 new
	5/8	2-1/8	4	7	26347		HEV-M-70625
3/4	3/4	1	3	7	26362		HEV-S-70750
	3/4	1-1/4	3-1/2	7	26367		HEV-SR-70750
	3/4	1-5/8	4	7	26377	81944	HEV-R-70750 new
	3/4	2-1/4	5	7	26392	81945	HEV-M-70750 new
1	1	1-1/4	4	7	26407		HEV-S-71000
	1	2	5	7	26422	81946	HEV-R-71000 new
	1	3-1/4	6	7	26442		HEV-L-71000

* .0005 max TIR

Click on tool numbers to access pricing, stock, and technical info.

7 Flute

Speeds & Feeds on Page 126

Roughing

Finishing

MHEV-7

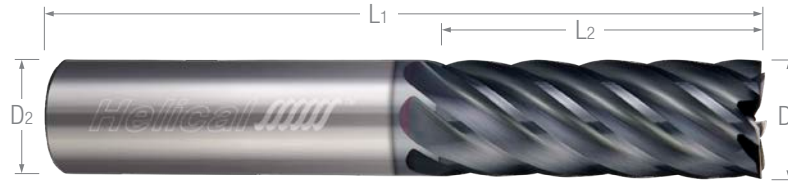
METRIC



7 FLUTE - SQUARE - METRIC

Variable Pitch

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Cutter Diameter*	Shank Diameter	Length of Cut	Overall Length	Flutes	<i>Aplus</i> Coated	Tool Description
$D_1 \begin{smallmatrix} +.00 \text{ mm} \\ -.05 \text{ mm} \end{smallmatrix}$	$D_2 \text{ (h6)}$	$L_2 \begin{smallmatrix} +.80 \text{ mm} \\ -.00 \text{ mm} \end{smallmatrix}$	$L_1 \begin{smallmatrix} +1.60 \text{ mm} \\ -1.60 \text{ mm} \end{smallmatrix}$			
6 mm	6.00 mm	9.00 mm	63 mm	7	59632	MHEV-015-70600
	6.00 mm	12.00 mm	63 mm	7	59650	MHEV-020-70600
	6.00 mm	18.00 mm	63 mm	7	59684	MHEV-030-70600
8 mm	8.00 mm	12.00 mm	63 mm	7	59635	MHEV-015-70800
	8.00 mm	16.00 mm	63 mm	7	59653	MHEV-020-70800
	8.00 mm	24.00 mm	75 mm	7	59687	MHEV-030-70800
10 mm	10.00 mm	15.00 mm	63 mm	7	59638	MHEV-015-71000
	10.00 mm	20.00 mm	63 mm	7	59656	MHEV-020-71000
	10.00 mm	25.00 mm	75 mm	7	59670	MHEV-025-71000
12 mm	12.00 mm	18.00 mm	75 mm	7	59641	MHEV-015-71200
	12.00 mm	24.00 mm	75 mm	7	59659	MHEV-020-71200
	12.00 mm	30.00 mm	75 mm	7	59673	MHEV-025-71200
16 mm	16.00 mm	24.00 mm	89 mm	7	59644	MHEV-015-71600
	16.00 mm	32.00 mm	89 mm	7	59662	MHEV-020-71600
	16.00 mm	40.00 mm	89 mm	7	59676	MHEV-025-71600
20 mm	20.00 mm	30.00 mm	89 mm	7	59647	MHEV-015-72000
	20.00 mm	40.00 mm	100 mm	7	59665	MHEV-020-72000
	20.00 mm	50.00 mm	125 mm	7	59679	MHEV-025-72000
25 mm	25.00 mm	50.00 mm	125 mm	7	59668	MHEV-020-72500
	25.00 mm	64.00 mm	125 mm	7	59682	MHEV-025-72500

* .013 mm max TIR

Click on tool numbers to access pricing, stock, and technical info.

7 Flute

Speeds & Feeds on Page 126



Roughing

Finishing

7 FLUTE - CORNER RADIUS

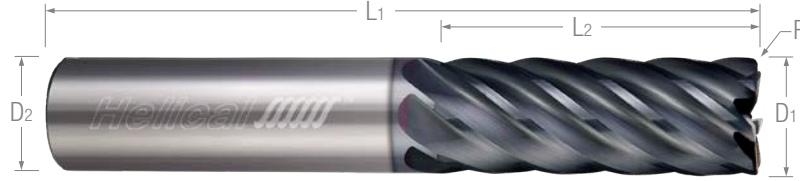
New Items!



HEV-7

Variable Pitch

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Cutter Diameter*	Shank Diameter	Corner Radius	Length of Cut	Overall Length	Flutes	Aplus Coated	Tplus Coated	Tool Description
D1 ^{+0.000"} -0.002"	D2 (h6)	R ^{+0.002"} -0.002"	L2 ^{+0.032"} -0.000"	L1 ^{+0.062"} -0.062"				
1/4	1/4	.020	3/8	2	7	27107	59949	HEV-S-70250-R.020
	1/4	.020	1/2	2	7	27122	59950	HEV-SR-70250-R.020
	1/4	.020	3/4	2-1/2	7	27137	59951	HEV-R-70250-R.020
	1/4	.020	1	3	7	27152		HEV-M-70250-R.020
	1/4	.060	3/8	2	7	81807		HEV-S-70250-R.060
	1/4	.060	1/2	2	7	81808		HEV-SR-70250-R.060
	1/4	.060	3/4	2-1/2	7	81809		HEV-R-70250-R.060
	1/4	.060	1	3	7	81810		HEV-M-70250-R.060
3/8	3/8	.020	1/2	2	7	27212	59952	HEV-S-70375-R.020
	3/8	.020	3/4	2-1/2	7	27227	59953	HEV-SR-70375-R.020
	3/8	.020	1	2-1/2	7	27242	59954	HEV-R-70375-R.020
	3/8	.020	1-1/2	3-1/2	7	27247	81947	HEV-L-70375-R.020
	3/8	.060	1/2	2	7	81811		HEV-S-70375-R.060
	3/8	.060	3/4	2-1/2	7	81812		HEV-SR-70375-R.060
	3/8	.060	1	2-1/2	7	81813		HEV-R-70375-R.060
	1/2	1/2	.020	5/8	2-1/2	7	81814	
1/2		.020	1	3	7	81815		HEV-SR-70500-R.020
1/2		.020	1-1/4	3	7	81816		HEV-R-70500-R.020
1/2		.020	1-5/8	4	7	81817		HEV-M-70500-R.020
1/2		.020	2	4	7	81818		HEV-L-70500-R.020
1/2		.030	5/8	2-1/2	7	27257	59955	HEV-S-70500-R.030
1/2		.030	1	3	7	27272	59956	HEV-SR-70500-R.030
1/2		.030	1-1/4	3	7	27287	59957	HEV-R-70500-R.030
1/2		.030	1-5/8	4	7	27302	59958	HEV-M-70500-R.030
1/2		.030	2	4	7	27307	81948	HEV-L-70500-R.030
1/2		.060	5/8	2-1/2	7	81819		HEV-S-70500-R.060
1/2		.060	1	3	7	81820		HEV-SR-70500-R.060
1/2		.060	1-1/4	3	7	81821		HEV-R-70500-R.060
1/2		.060	1-5/8	4	7	81822		HEV-M-70500-R.060
1/2		.060	2	4	7	81823		HEV-L-70500-R.060

* .0005 max TIR

continued on next page

Click on tool numbers to access pricing, stock, and technical info.

7 Flute

Speeds & Feeds on Page 126

HEV-7



New Items!

7 FLUTE - CORNER RADIUS

Variable Pitch (cont.)

continued from previous page

Cutter Diameter*	Shank Diameter	Corner Radius	Length of Cut	Overall Length	Flutes	Aplus Coated	Tplus Coated	Tool Description
$D_1^{+.000"}$ $-.002"$	D_2 (h6)	$R^{+.002"}$ $-.002"$	$L_2^{+.032"}$ $-.000"$	$L_1^{+.062"}$ $-.062"$				
new new new new new new	5/8	.030	3/4	3	7	27317	81949	HEV-S-70625-R.030
	5/8	.030	1-1/4	3-1/2	7	27322	81950	HEV-SR-70625-R.030
	5/8	.030	1-5/8	4	7	27332	81951	HEV-R-70625-R.030
	5/8	.030	2-1/8	4	7	27347		HEV-M-70625-R.030
	5/8	.060	1-1/4	3-1/2	7	81824		HEV-SR-70625-R.060
	5/8	.060	1-5/8	4	7	81825		HEV-R-70625-R.060
new new new new new new new	3/4	.030	1	3	7	27362	81952	HEV-S-70750-R.030
	3/4	.030	1-1/4	3-1/2	7	27367	81953	HEV-SR-70750-R.030
	3/4	.030	1-5/8	4	7	27377	81954	HEV-R-70750-R.030
	3/4	.030	2-1/4	5	7	27392	81955	HEV-M-70750-R.030
	3/4	.060	1	3	7	81826		HEV-S-70750-R.060
	3/4	.060	1-5/8	4	7	81827		HEV-R-70750-R.060
	3/4	.060	2-1/4	5	7	81828		HEV-M-70750-R.060
1	1	.030	1-1/4	4	7	27407		HEV-S-71000-R.030
	1	.030	2	5	7	27422		HEV-R-71000-R.030
	1	.030	3-1/4	6	7	27442		HEV-L-71000-R.030

*.0005 max TIR



Why Flute Count Matters

7 Flutes? Is that really necessary? Yes! Our "In the Loupe" blog post **Why Flute Count Matters** walks readers through the importance of the tool's core diameter size, and why flute count plays a pivotal role in speeds and feeds calculations.

[Read more on helical.blog/intheloupe](https://www.helical.com/blog/intheloupe)

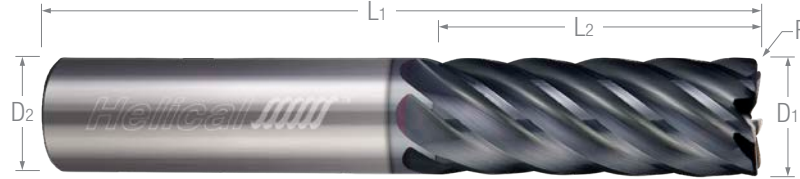
7 FLUTE - CORNER RADIUS - METRIC



MHEV-7
METRIC

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- *Aplus* coating for added lubricity, higher speeds and feeds, and increased wear resistance



Cutter Diameter*	Shank Diameter	Corner Radius	Length of Cut	Overall Length	Flutes	<i>Aplus</i> Coated	Tool Description
$D_1^{+0.00 \text{ mm} / -0.05 \text{ mm}}$	$D_2 \text{ (h6)}$	$R^{+0.05 \text{ mm} / -0.05 \text{ mm}}$	$L_2^{+0.80 \text{ mm} / -0.00 \text{ mm}}$	$L_1^{+1.60 \text{ mm} / -1.60 \text{ mm}}$			
6 mm	6.00 mm	.50 mm	9.00 mm	63 mm	7	59633	MHEV-015-70600-R0.50
	6.00 mm	.50 mm	12.00 mm	63 mm	7	59651	MHEV-020-70600-R0.50
	6.00 mm	.50 mm	18.00 mm	63 mm	7	59685	MHEV-030-70600-R0.50
	6.00 mm	1.00 mm	9.00 mm	63 mm	7	59634	MHEV-015-70600-R1.00
	6.00 mm	1.00 mm	12.00 mm	63 mm	7	59652	MHEV-020-70600-R1.00
	6.00 mm	1.00 mm	18.00 mm	63 mm	7	59686	MHEV-030-70600-R1.00
8 mm	8.00 mm	.50 mm	12.00 mm	63 mm	7	59636	MHEV-015-70800-R0.50
	8.00 mm	.50 mm	16.00 mm	63 mm	7	59654	MHEV-020-70800-R0.50
	8.00 mm	.50 mm	24.00 mm	75 mm	7	59688	MHEV-030-70800-R0.50
	8.00 mm	1.00 mm	12.00 mm	63 mm	7	59637	MHEV-015-70800-R1.00
	8.00 mm	1.00 mm	16.00 mm	63 mm	7	59655	MHEV-020-70800-R1.00
	8.00 mm	1.00 mm	24.00 mm	75 mm	7	59689	MHEV-030-70800-R1.00
10 mm	10.00 mm	.50 mm	15.00 mm	63 mm	7	59639	MHEV-015-71000-R0.50
	10.00 mm	.50 mm	20.00 mm	63 mm	7	59657	MHEV-020-71000-R0.50
	10.00 mm	.50 mm	25.00 mm	75 mm	7	59671	MHEV-025-71000-R0.50
	10.00 mm	1.00 mm	15.00 mm	63 mm	7	59640	MHEV-015-71000-R1.00
	10.00 mm	1.00 mm	20.00 mm	63 mm	7	59658	MHEV-020-71000-R1.00
	10.00 mm	1.00 mm	25.00 mm	75 mm	7	59672	MHEV-025-71000-R1.00
12 mm	12.00 mm	.50 mm	18.00 mm	75 mm	7	59642	MHEV-015-71200-R0.50
	12.00 mm	.50 mm	24.00 mm	75 mm	7	59660	MHEV-020-71200-R0.50
	12.00 mm	.50 mm	30.00 mm	75 mm	7	59674	MHEV-025-71200-R0.50
	12.00 mm	1.00 mm	18.00 mm	75 mm	7	59643	MHEV-015-71200-R1.00
	12.00 mm	1.00 mm	24.00 mm	75 mm	7	59661	MHEV-020-71200-R1.00
	12.00 mm	1.00 mm	30.00 mm	75 mm	7	59675	MHEV-025-71200-R1.00

* .013 mm max TIR

continued on next page

Click on tool numbers to access pricing, stock, and technical info.

7 Flute

Speeds & Feeds on Page 126

Roughing Finishing

MHEV-7

METRIC



7 FLUTE - CORNER RADIUS - METRIC

Variable Pitch (cont.)

continued from previous page

Cutter Diameter*	Shank Diameter	Corner Radius	Length of Cut	Overall Length	Flutes	Aplus Coated	Tool Description
$D_1 \begin{smallmatrix} +.00 \text{ mm} \\ -.05 \text{ mm} \end{smallmatrix}$	$D_2 \text{ (h6)}$	$R \begin{smallmatrix} +.05 \text{ mm} \\ -.05 \text{ mm} \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.80 \text{ mm} \\ -.00 \text{ mm} \end{smallmatrix}$	$L_1 \begin{smallmatrix} +1.60 \text{ mm} \\ -1.60 \text{ mm} \end{smallmatrix}$			
16 mm	16.00 mm	.50 mm	24.00 mm	89 mm	7	59645	MHEV-015-71600-R0.50
	16.00 mm	.50 mm	32.00 mm	89 mm	7	59663	MHEV-020-71600-R0.50
	16.00 mm	.50 mm	40.00 mm	89 mm	7	59677	MHEV-025-71600-R0.50
	16.00 mm	1.00 mm	24.00 mm	89 mm	7	59646	MHEV-015-71600-R1.00
	16.00 mm	1.00 mm	32.00 mm	89 mm	7	59664	MHEV-020-71600-R1.00
	16.00 mm	1.00 mm	40.00 mm	89 mm	7	59678	MHEV-025-71600-R1.00
20 mm	20.00 mm	.50 mm	30.00 mm	89 mm	7	59648	MHEV-015-72000-R0.50
	20.00 mm	.50 mm	40.00 mm	100 mm	7	59666	MHEV-020-72000-R0.50
	20.00 mm	.50 mm	50.00 mm	125 mm	7	59680	MHEV-025-72000-R0.50
	20.00 mm	1.00 mm	30.00 mm	89 mm	7	59649	MHEV-015-72000-R1.00
	20.00 mm	1.00 mm	40.00 mm	100 mm	7	59667	MHEV-020-72000-R1.00
	20.00 mm	1.00 mm	50.00 mm	125 mm	7	59681	MHEV-025-72000-R1.00
25 mm	25.00 mm	1.00 mm	50.00 mm	125 mm	7	59669	MHEV-020-72500-R1.00
	25.00 mm	1.00 mm	64.00 mm	125 mm	7	59683	MHEV-025-72500-R1.00

* .013 mm max TIR

Click on tool numbers to access pricing, stock, and technical info.

7 Flute

Access customized running parameters for your specific setup and material at
www.machiningadvisorpro.com



SPEEDS & FEEDS



HEV-7

7 Flute - Variable Pitch

Click on tool numbers to access pricing, stock, and technical info.

HEV-7																	
Material Guide		Hardness	SFM	1/8		3/16		1/4		3/8		1/2		3/4		1	
				Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin		
CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB	450	.0030	.0012	.0045	.0018	.0060	.0022	.0090	.0035	.0120	.0045	.0170	.0070	.0230	.0090
		75 - 98 HRB	450	.0018	.0008	.0028	.0012	.0035	.0015	.0055	.0025	.0070	.0030	.0110	.0050	.0150	.0060
		21 - 36 HRC	400	.0012	.0006	.0020	.0009	.0025	.0012	.0040	.0018	.0050	.0022	.0080	.0035	.0100	.0045
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	450	.0018	.0007	.0025	.0011	.0035	.0015	.0050	.0022	.0070	.0028	.0100	.0045	.0130	.0055
		21 - 36 HRC	400	.0012	.0005	.0018	.0008	.0022	.0011	.0035	.0018	.0045	.0022	.0070	.0035	.0090	.0045
		36 - 50 HRC	200	.0008	.0004	.0012	.0006	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0022	.0060	.0030
		> 50 HRC	100	.0006	.0003	.0009	.0004	.0012	.0006	.0018	.0009	.0022	.0012	.0035	.0018	.0045	.0022
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	325	.0015	.0006	.0022	.0010	.0030	.0012	.0045	.0020	.0060	.0025	.0090	.0040	.0120	.0050
		21 - 36 HRC	250	.0012	.0005	.0018	.0008	.0022	.0011	.0035	.0015	.0045	.0022	.0070	.0030	.0090	.0045
		36 - 50 HRC	175	.0008	.0004	.0012	.0006	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0022	.0060	.0030
		> 50 HRC	55	.0006	.0003	.0009	.0004	.0012	.0006	.0018	.0008	.0022	.0012	.0035	.0018	.0045	.0022
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	350	.0020	.0007	.0030	.0010	.0040	.0015	.0060	.0022	.0080	.0030	.0120	.0045	.0160	.0060
		75 - 98 HRB	400	.0015	.0006	.0022	.0009	.0030	.0012	.0045	.0020	.0060	.0025	.0090	.0040	.0120	.0050
		21 - 36 HRC	225	.0010	.0005	.0018	.0008	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		36 - 50 HRC	150	.0010	.0005	.0015	.0007	.0020	.0009	.0030	.0012	.0040	.0018	.0060	.0028	.0080	.0035
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB	250	.0012	.0005	.0020	.0008	.0025	.0010	.0040	.0015	.0050	.0020	.0080	.0030	.0100	.0040
		21 - 36 HRC	225	.0010	.0005	.0018	.0008	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		36 - 50 HRC	175	.0008	.0004	.0012	.0006	.0018	.0008	.0025	.0012	.0035	.0015	.0050	.0025	.0070	.0030
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB	325	.0010	.0005	.0015	.0007	.0020	.0010	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		21 - 36 HRC	300	.0015	.0006	.0020	.0010	.0028	.0012	.0040	.0020	.0055	.0025	.0080	.0040	.0110	.0050
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	225	.0012	.0005	.0018	.0008	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		36 - 50 HRC	130	.0008	.0004	.0012	.0006	.0015	.0008	.0025	.0012	.0030	.0015	.0050	.0022	.0060	.0030
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	450	.0030	.0012	.0050	.0020	.0060	.0025	.0100	.0040	.0130	.0050	.0190	.0080	.0250	.0100
		21 - 36 HRC	400	.0020	.0009	.0030	.0015	.0040	.0018	.0060	.0028	.0080	.0035	.0120	.0055	.0160	.0070
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	350	.0018	.0008	.0028	.0012	.0035	.0015	.0055	.0022	.0070	.0030	.0110	.0045	.0140	.0060
		21 - 36 HRC	325	.0012	.0006	.0018	.0008	.0022	.0010	.0035	.0018	.0045	.0022	.0070	.0035	.0090	.0045
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	325	.0018	.0008	.0028	.0012	.0035	.0015	.0055	.0022	.0070	.0030	.0110	.0045	.0140	.0060
		21 - 36 HRC	275	.0012	.0006	.0018	.0009	.0025	.0012	.0035	.0018	.0050	.0022	.0070	.0035	.0100	.0045
		36 - 50 HRC	175	.0006	.0003	.0009	.0004	.0012	.0006	.0018	.0009	.0022	.0012	.0035	.0018	.0045	.0022
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	450	.0022	.0009	.0035	.0012	.0045	.0018	.0070	.0028	.0090	.0035	.0140	.0055	.0180	.0070
		75 - 98 HRB	450	.0020	.0008	.0030	.0012	.0040	.0018	.0060	.0025	.0080	.0035	.0120	.0050	.0160	.0070
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	175	.0012	.0005	.0020	.0008	.0025	.0010	.0040	.0015	.0050	.0020	.0080	.0030	.0100	.0040
		21 - 36 HRC	160	.0010	.0005	.0018	.0007	.0022	.0009	.0035	.0015	.0045	.0020	.0070	.0028	.0090	.0040
		36 - 50 HRC	90	.0009	.0004	.0012	.0006	.0018	.0008	.0025	.0012	.0035	.0018	.0050	.0025	.0070	.0035
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	400	.0030	.0011	.0050	.0015	.0060	.0022	.0100	.0030	.0130	.0045	.0190	.0060	.0260	.0090
		75 - 98 HRB	400	.0015	.0006	.0022	.0009	.0030	.0012	.0045	.0018	.0060	.0025	.0090	.0035	.0120	.0050
		21 - 36 HRC	350	.0018	.0006	.0025	.0009	.0035	.0012	.0050	.0020	.0070	.0025	.0100	.0040	.0130	.0050
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	225	.0012	.0005	.0020	.0008	.0025	.0010	.0040	.0015	.0050	.0020	.0080	.0030	.0100	.0040
		36 - 50 HRC	150	.0010	.0004	.0015	.0007	.0020	.0009	.0030	.0012	.0040	.0018	.0060	.0025	.0080	.0035
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	225	.0008	.0003	.0012	.0005	.0015	.0007	.0022	.0010	.0030	.0012	.0045	.0020	.0060	.0025
		21 - 36 HRC	160	.0010	.0005	.0018	.0007	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		36 - 50 HRC	90	.0008	.0004	.0012	.0006	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0022	.0060	.0030

7 Flute

Milling Process	Hardness	ADOC	RDOC
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	10%-15% Diameter
	≥ 35 HRC	Up to Max LOC	10%-15% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

NOTES:
 Speed (SFM) and feed (IPT) numbers shown in the table above are considered to be average values. Use a tolerance of ± 25% as needed.
 Hardness Scales: HRB = Rockwell B
 HRC = Rockwell C

HSF-7



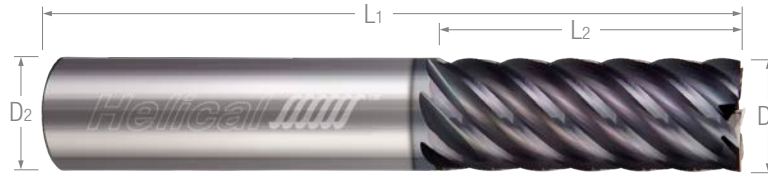
New Items!

7 FLUTE - SQUARE

Finisher

- 7 flute design offers excellent performance in light profiling, High Efficiency Milling (HEM), and finishing applications
- Center cutting

- h6 shank tolerance for high precision tool holders
- *Aplus* coating for added lubricity, higher speeds and feeds, and increased wear resistance



Cutter Diameter*	Shank Diameter	Length of Cut	Overall Length	Flutes	<i>Aplus</i> Coated	Tool Description
$D_1^{+0.001}_{-0.002}$	D_2 (h6)	$L_2^{+0.032}_{-0.000}$	$L_1^{+0.062}_{-0.062}$			
1/4	1/4	3/8	2	7	24017	HSF-S-70250
	1/4	1/2	2-1/2	7	24022	HSF-SR-70250
	1/4	3/4	2-1/2	7	24032	HSF-R-70250
	1/4	1-1/4	3	7	24047	HSF-L-70250
	1/4	1-3/4	4	7	24062	HSF-X-70250
5/16	5/16	7/16	2	7	24092	HSF-S-70312
	5/16	13/16	2-1/2	7	24107	HSF-R-70312
	5/16	1-3/8	3-1/2	7	24122	HSF-L-70312
	5/16	2	4	7	24137	HSF-X-70312
3/8	3/8	1/2	2	7	24167	HSF-S-70375
	3/8	7/8	2-1/2	7	24182	HSF-SR-70375
	3/8	1	3	7	24187	HSF-R-70375
	3/8	1-1/2	3-1/2	7	24197	HSF-L-70375
	3/8	2-1/2	5	7	24212	HSF-X-70375
7/16	7/16	9/16	2-3/4	7	24242	HSF-S-70437
	7/16	1	2-3/4	7	24257	HSF-R-70437
	7/16	1-1/2	3-1/2	7	24272	HSF-M-70437
1/2	1/2	3/4	2-1/2	7	24317	HSF-S-70500
	1/2	1	2-1/2	7	81829	HSF-SR-70500
	1/2	1-1/4	3	7	24332	HSF-R-70500
	1/2	1-5/8	3-1/2	7	81830	HSF-M-70500
	1/2	2	4	7	24347	HSF-L-70500
	1/2	2-1/2	5	7	81831	HSF-LX-70500
	1/2	3-1/4	6	7	24362	HSF-X-70500
5/8	5/8	3/4	3	7	24392	HSF-S-70625
	5/8	1-5/8	4	7	24407	HSF-R-70625
	5/8	2	4	7	24422	HSF-M-70625
3/4	3/4	1	3	7	24467	HSF-S-70750
	3/4	1-5/8	4	7	24482	HSF-R-70750
	3/4	2-1/4	5	7	24497	HSF-M-70750
	3/4	3-1/4	6	7	24512	HSF-L-70750
1	1	1-1/4	4	7	24542	HSF-S-71000
	1	2	4-1/2	7	24557	HSF-R-71000
	1	3-1/4	6	7	24572	HSF-ML-71000
	1	4-1/8	7	7	24587	HSF-X-71000
1-1/4	1-1/4	2	4-1/2	7	24617	HSF-R-71250
	1-1/4	2-5/8	5-1/2	7	24632	HSF-M-71250
	1-1/4	3-1/4	6	7	24647	HSF-L-71250
	1-1/4	5	7-1/2	7	24662	HSF-X-71250

*.0005 max TIR

Speeds & Feeds on Page 128



SPEEDS & FEEDS



HSF-7

7 Flute - Finisher

HSF-7																	
Material Guide		Hardness	SFM	Inches Per Tooth (IPT)													
				1/8		3/16		1/4		3/8		1/2		3/4		1	
				Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin
CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB	450	.0025	.0010	.0040	.0018	.0050	.0022	.0080	.0035	.0100	.0045	.0150	.0070	.0200	.0090
		75 - 98 HRB	450	.0015	.0008	.0025	.0012	.0030	.0015	.0050	.0025	.0060	.0030	.0100	.0050	.0130	.0060
		21 - 36 HRC	450	.0012	.0006	.0018	.0009	.0022	.0012	.0035	.0018	.0045	.0022	.0070	.0035	.0090	.0045
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	450	.0015	.0007	.0022	.0010	.0030	.0015	.0045	.0020	.0060	.0028	.0090	.0040	.0120	.0055
		21 - 36 HRC	400	.0010	.0005	.0015	.0008	.0020	.0011	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		36 - 50 HRC	200	.0007	.0004	.0010	.0006	.0012	.0007	.0020	.0010	.0028	.0015	.0040	.0022	.0055	.0030
		> 50 HRC	100	.0005	.0003	.0008	.0004	.0010	.0006	.0015	.0009	.0020	.0012	.0030	.0018	.0040	.0022
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	325	.0012	.0006	.0020	.0009	.0028	.0012	.0040	.0018	.0055	.0025	.0080	.0035	.0110	.0050
		21 - 36 HRC	250	.0010	.0005	.0015	.0008	.0020	.0011	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		36 - 50 HRC	175	.0007	.0004	.0010	.0006	.0012	.0008	.0020	.0012	.0028	.0015	.0040	.0022	.0055	.0030
		> 50 HRC	60	.0005	.0003	.0008	.0004	.0010	.0006	.0015	.0008	.0020	.0010	.0030	.0018	.0040	.0022
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	350	.0018	.0007	.0025	.0011	.0035	.0015	.0050	.0022	.0070	.0030	.0100	.0045	.0140	.0060
		75 - 98 HRB	400	.0012	.0006	.0020	.0009	.0028	.0012	.0040	.0018	.0055	.0025	.0080	.0035	.0110	.0050
		21 - 36 HRC	225	.0010	.0005	.0015	.0007	.0020	.0010	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		36 - 50 HRC	150	.0008	.0004	.0012	.0007	.0018	.0009	.0025	.0012	.0035	.0018	.0050	.0028	.0070	.0035
		> 50 HRC	50	.0005	.0003	.0008	.0004	.0011	.0006	.0015	.0008	.0020	.0010	.0030	.0018	.0040	.0022
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB	250	.0010	.0005	.0018	.0008	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		21 - 36 HRC	225	.0010	.0005	.0015	.0008	.0020	.0010	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		36 - 50 HRC	175	.0007	.0004	.0010	.0006	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0022	.0060	.0030
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB	325	.0009	.0005	.0012	.0007	.0018	.0010	.0028	.0015	.0035	.0020	.0055	.0030	.0070	.0040
		21 - 36 HRC	300	.0012	.0006	.0018	.0009	.0025	.0012	.0035	.0020	.0050	.0025	.0070	.0040	.0100	.0050
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	225	.0010	.0005	.0015	.0008	.0020	.0010	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		36 - 50 HRC	130	.0007	.0004	.0011	.0006	.0015	.0008	.0022	.0012	.0028	.0015	.0045	.0022	.0055	.0030
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	450	.0028	.0012	.0040	.0020	.0055	.0025	.0080	.0040	.0110	.0050	.0170	.0080	.0220	.0100
		21 - 36 HRC	400	.0018	.0009	.0025	.0012	.0035	.0018	.0050	.0028	.0070	.0035	.0100	.0055	.0140	.0070
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	350	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0022	.0060	.0030	.0090	.0045	.0120	.0060
		21 - 36 HRC	325	.0010	.0005	.0015	.0008	.0020	.0011	.0030	.0015	.0040	.0022	.0060	.0030	.0080	.0045
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	325	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0022	.0060	.0030	.0090	.0045	.0130	.0060
		21 - 36 HRC	275	.0010	.0006	.0015	.0008	.0020	.0010	.0030	.0018	.0040	.0022	.0060	.0035	.0080	.0045
		36 - 50 HRC	175	.0005	.0003	.0008	.0004	.0010	.0006	.0015	.0008	.0020	.0010	.0030	.0018	.0040	.0022
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	500	.0020	.0009	.0030	.0012	.0040	.0018	.0060	.0025	.0080	.0035	.0120	.0050	.0160	.0070
		75 - 98 HRB	450	.0018	.0008	.0025	.0012	.0035	.0015	.0050	.0025	.0070	.0030	.0100	.0050	.0140	.0060
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	175	.0010	.0005	.0018	.0008	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		21 - 36 HRC	160	.0010	.0005	.0015	.0007	.0020	.0009	.0030	.0015	.0040	.0018	.0060	.0028	.0080	.0035
		36 - 50 HRC	90	.0008	.0004	.0012	.0006	.0015	.0008	.0022	.0012	.0030	.0015	.0045	.0025	.0060	.0030
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	400	.0028	.0010	.0040	.0015	.0055	.0020	.0080	.0030	.0110	.0040	.0170	.0060	.0230	.0080
		75 - 98 HRB	400	.0012	.0006	.0020	.0009	.0028	.0012	.0040	.0018	.0055	.0022	.0080	.0035	.0110	.0045
		21 - 36 HRC	350	.0015	.0006	.0022	.0009	.0030	.0012	.0045	.0018	.0060	.0025	.0090	.0035	.0120	.0050
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	225	.0012	.0005	.0018	.0008	.0022	.0010	.0035	.0015	.0045	.0020	.0070	.0030	.0090	.0040
		36 - 50 HRC	150	.0009	.0004	.0012	.0006	.0018	.0009	.0028	.0012	.0035	.0018	.0055	.0025	.0070	.0035
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	225	.0007	.0003	.0010	.0005	.0015	.0006	.0020	.0010	.0028	.0012	.0040	.0020	.0055	.0025
		21 - 36 HRC	160	.0010	.0005	.0015	.0007	.0020	.0010	.0030	.0015	.0040	.0020	.0060	.0030	.0080	.0040
		36 - 50 HRC	90	.0007	.0004	.0010	.0006	.0012	.0007	.0020	.0010	.0028	.0015	.0040	.0022	.0055	.0030

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7 Flute

Milling Process	Hardness	ADOC	RDOC
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	10%-15% Diameter
	≥ 35 HRC	Up to Max LOC	10%-15% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

NOTES:
 Speed (SFM) and feed (IPT) numbers shown in the table above are considered to be average values. Use a tolerance of ± 25% as needed.
 Hardness Scales: HRB = Rockwell B
 HRC = Rockwell C

