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MHVNI-8, p.64

2026 CATALOGUE

Helical

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At Helical Solutions, we refuse to let machinists settle for ordinary. Our end mills unleash more speed, more precision, longer tool life, and greater productivity. They thrive at aggressive machining parameters, slash cycle times, elevate part finishes, and generate real savings for every shop floor.

Precision. Power. Performance.

We design and manufacture the industry's premier end mills that provide tool performance and longevity, optimal project outcomes, and enhanced workshop efficiency. With a robust European stock ready to ship, and tools optimised for a wide range of materials and applications, Helical empowers machinists to take on their toughest challenges and achieve their best results yet.

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Our team of experienced engineers live and breathe cutting tools and are enthusiastic about maximising your shop floor productivity. We're ready to help you with tool selection, application advice, technical support, either over the phone, via email or in person at your own production site.

HARVEY PERFORMANCE COMPANY

Helical Solutions is a proud brand of Harvey Performance Company, a global collection of industry-leading cutting tool brands dedicated to improving our customers' productivity by pairing an unwavering service commitment with high quality products that deliver exceptional results.

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Helical Solutions Arrives in Europe!

Helical Solutions, celebrated across North America as a leader in high performance carbide cutting tools, proudly brings our innovation and expertise to Europe. We now design, manufacture, and fully stock metric tooling locally, delivering renowned quality closer than ever. This expansion gives European machinists direct access to the industry's premier cutting tools, built specifically to match the demands of their shop floors.

Our expansion ensures **shorter lead times, local availability, and reliable support** tailored to the needs of European machinists. Combined with the unmatched technical expertise of our engineers, who are ready to advise on tool selection, applications, and performance, Helical Solutions delivers not just cutting tools but a complete commitment to helping your shop floor succeed.



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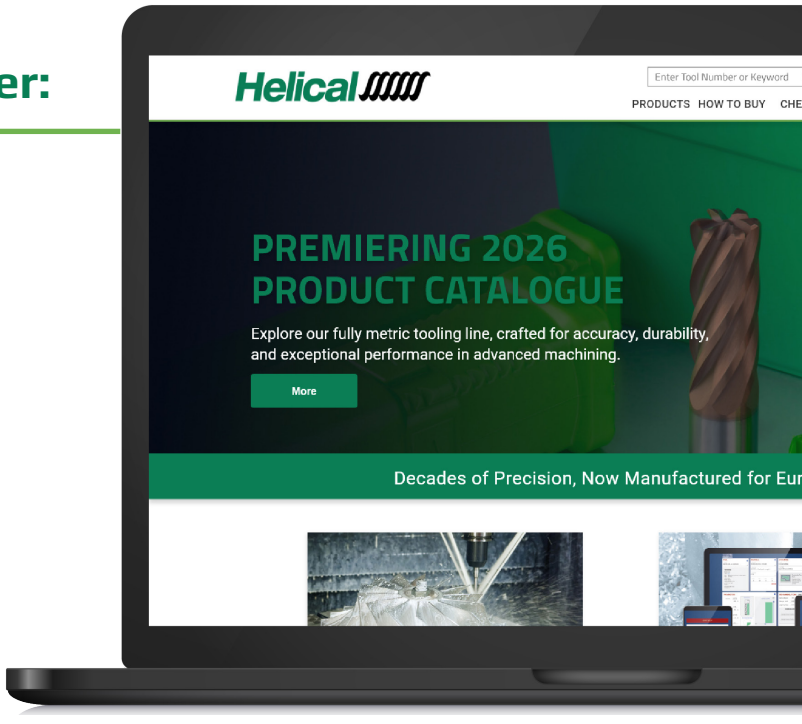
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END MILLS FOR ALUMINIUM

Aluminium Alloys & Non-Ferrous Materials

ROUGHERS

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OUR COATINGS

*D*plus

D*plus* delivers unmatched tool life in aerospace aluminium, graphite, abrasive composites, and other non-ferrous applications. Featuring a tetrahedral amorphous carbon (taC) bond structure, this coating offers an extremely low coefficient friction and exceptionally high hardness, allowing it to resist abrasion while maintaining a sharp cutting edge.

D*plus* is part of our DLC family of coatings.



Coating Colour: Charcoal

Materials	Max. Usage Temp.	Microhardness (HV 0.05)	Coefficient of Friction
Aluminium Alloys, Composites, Graphite, and Other Non-Ferrous Alloys	450° C	5000+ (50 GPa)	<0.10

*T*plus

T*plus* is an ideal choice for increased wear resistance and longer tool life in rigid, vibration-free machine setups. T*plus* excels in a wide variety of ferrous and difficult-to-machine materials including steels, hardened steels to 65HRC, stainless steels, inconel and titanium alloys.



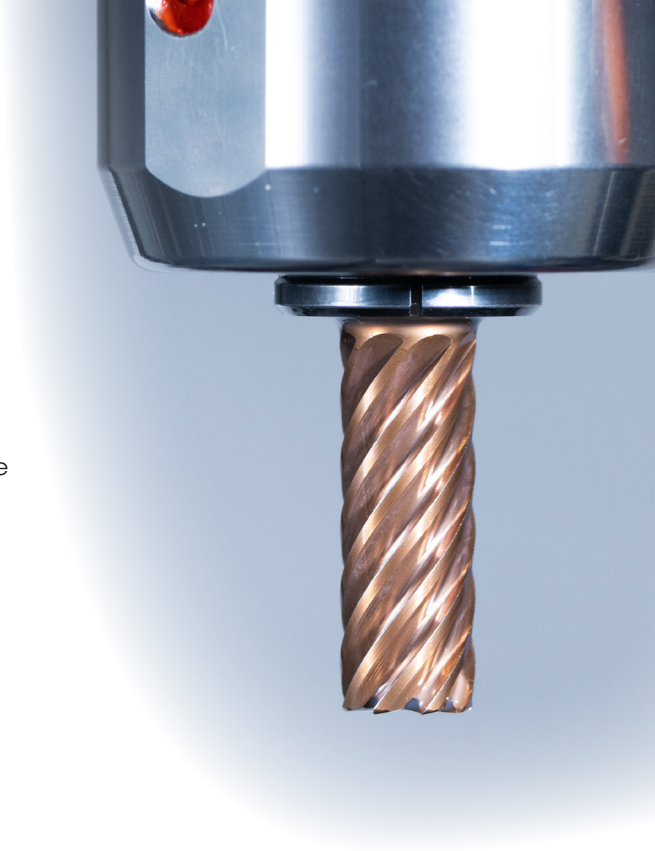
Coating Colour: Copper

Materials	Max. Usage Temp.	Microhardness (HV 0.05)	Coefficient of Friction
Steels, Hardened steels, Stainless steels, High Temperature Alloys, Titanium and Titanium Alloys, Cast Iron	1200° C	4487 (44 GPa)	0.35

TOLERANCE CHART

h6		e8	
Ø mm	microns	Ø mm	microns
<= 3	+0 µm / −6 µm	<= 3	−14 µm / −28 µm
> 3 - 6	+0 µm / −8 µm	> 3 - 6	−20 µm / −38 µm
> 6 - 10	+0 µm / −9 µm	> 6 - 10	−25 µm / −47 µm
> 10 - 18	+0 µm / −11 µm	> 10 - 18	−32 µm / −59 µm
> 18 - 24	+0 µm / −13 µm	> 18 - 24	−40 µm / −73 µm

Introduction to **High Efficiency Milling**



What is HEM?

High Efficiency Milling (HEM) refers to a group of advanced toolpath techniques such as Trochoidal, Adaptive, and Dynamic Milling. These methods use a low Radial Depth of Cut (RDOC/ae) and a high Axial Depth of Cut (ADOC/ap) to improve heat control, distribute wear evenly, and enhance overall tool performance.

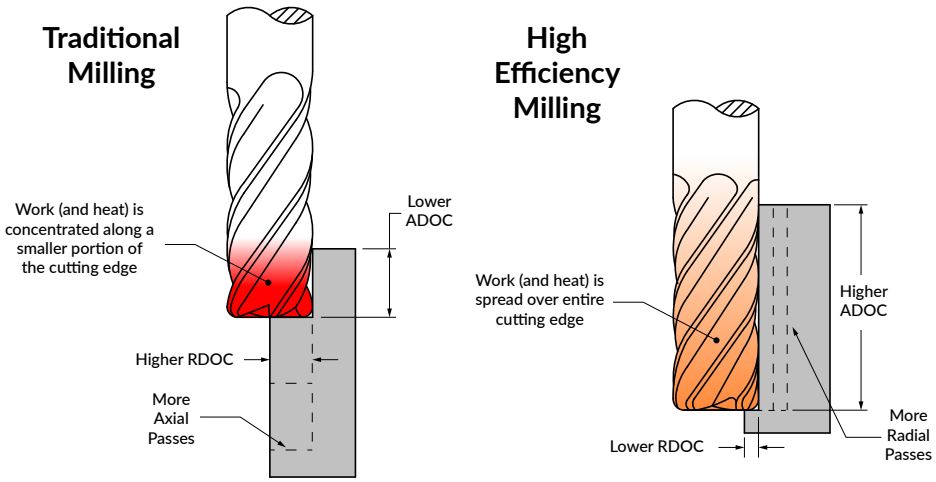
This approach helps to:

- Distribute wear evenly across the cutting edge
- Reduce heat buildup
- Lower the risk of tool failure

The reduced RDOC/ae minimises the arc of contact, decreasing heat generation. Increasing ADOC/ap allows for greater material removal per pass, resulting in higher productivity and a more stable, repeatable machining process.

How Does It Differ from Traditional Milling?

In contrast, Traditional Milling typically uses a high RDOC/ae and low ADOC/ap, concentrating heat in a small portion of the cutting edge. This accelerates tool wear and requires multiple axial passes. HEM toolpaths, on the other hand, favour more radial passes, improving tool life, consistency, and efficiency.



Tooling for Success

To get the most from HEM, select tools designed for aggressive roughing applications:

- High flute count to boost material removal rate
- Larger core diameters for better rigidity
- Optimised coatings for the workpiece material
- Variable pitch / variable helix designs to suppress harmonics

Key Advantages

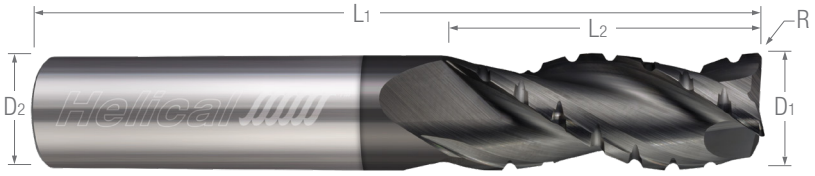
- Longer tool life and fewer tool changes
- Higher metal removal rates and faster cycle times
- Improved part quality with smoother finishes

3 FLUTE - CORNER RADIUS

35° Helix - Variable Pitch - Chipbreaker Rougher

MH35ALV-C-3

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Engineered with optimised variable pitch and chipbreaker geometry for reduced harmonics and elevated material removal rates
- Unique tool design requires less torque and horsepower
- Excellent performance in High Efficiency Milling (HEM)
- Unique "3 teeth-to-centre" end geometry for ramping applications
- h6 shank tolerance for high precision tool holders
- D*plus* coating for superior tool life and edge retention in abrasive non-ferrous materials
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius $R^{+0.01mm}_{-0.01mm}$	Length of Cut $L_2{}^{+0.7mm}_{+0.0mm}$	Overall Length $L_1{}^{+1.5mm}_{-1.5mm}$	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	3	**HS-401515**	**HS-401533**	MH35ALV-C-020-30300-R0.20
	6 mm	**0.2 mm**	10 mm	57 mm	3	**HS-401516**	**HS-401534**	MH35ALV-C-030-30300-R0.20
4 mm	6 mm	**0.2 mm**	9 mm	57 mm	3	**HS-401517**	**HS-401535**	MH35ALV-C-020-30400-R0.20
	6 mm	**0.2 mm**	13 mm	60 mm	3	**HS-401518**	**HS-401536**	MH35ALV-C-030-30400-R0.20
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	3	**HS-401519**	**HS-401537**	MH35ALV-C-020-30500-R0.20
	6 mm	**0.2 mm**	16 mm	65 mm	3	**HS-401520**	**HS-401538**	MH35ALV-C-030-30500-R0.20
6 mm	6 mm	**0.5 mm**	14 mm	60 mm	3	**HS-401521**	**HS-401539**	MH35ALV-C-020-30600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	3	**HS-401522**	**HS-401540**	MH35ALV-C-030-30600-R0.50
8 mm	8 mm	**0.5 mm**	18 mm	65 mm	3	**HS-401523**	**HS-401541**	MH35ALV-C-020-30800-R0.50
	8 mm	**0.5 mm**	26 mm	72 mm	3	**HS-401524**	**HS-401542**	MH35ALV-C-030-30800-R0.50
10 mm	10 mm	**0.5 mm**	22 mm	75 mm	3	**HS-401525**	**HS-401543**	MH35ALV-C-020-31000-R0.50
	10 mm	**0.5 mm**	32 mm	84 mm	3	**HS-401526**	**HS-401544**	MH35ALV-C-030-31000-R0.50
12 mm	12 mm	**0.5 mm**	26 mm	83 mm	3	**HS-401527**	**HS-401545**	MH35ALV-C-020-31200-R0.50
	12 mm	**0.5 mm**	38 mm	95 mm	3	**HS-401528**	**HS-401546**	MH35ALV-C-030-31200-R0.50
16 mm	16 mm	**0.5 mm**	34 mm	102 mm	3	**HS-401529**	**HS-401547**	MH35ALV-C-020-31600-R0.50
	16 mm	**0.5 mm**	50 mm	114 mm	3	**HS-401530**	**HS-401548**	MH35ALV-C-030-31600-R0.50
20 mm	20 mm	**0.5 mm**	42 mm	110 mm	3	**HS-401531**	**HS-401549**	MH35ALV-C-020-32000-R0.50
	20 mm	**0.5 mm**	62 mm	130 mm	3	**HS-401532**	**HS-401550**	MH35ALV-C-030-32000-R0.50

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MH35ALV-C-RN-3

3 FLUTE - CORNER RADIUS

35° Helix - Variable Pitch - Chipbreaker Rougher - Reduced Neck

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Engineered with optimised variable pitch and chipbreaker geometry for reduced harmonics and elevated material removal rates
- Unique tool design requires less torque and horsepower
- Excellent performance in High Efficiency Milling (HEM)
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Unique "3 teeth-to-centre" end geometry for ramping applications
- h6 shank tolerance for high precision tool holders
- D*plus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	3	**HS-401551**	**HS-401597**	MH35ALV-C-RN-030-30300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	3	**HS-401552**	**HS-401598**	MH35ALV-C-RN-040-30300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	3	**HS-401553**	**HS-401599**	MH35ALV-C-RN-030-30300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	3	**HS-401554**	**HS-401600**	MH35ALV-C-RN-040-30300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	3	**HS-401555**	**HS-401601**	MH35ALV-C-RN-030-30400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	3	**HS-401556**	**HS-401602**	MH35ALV-C-RN-040-30400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	3	**HS-401557**	**HS-401603**	MH35ALV-C-RN-030-30400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	3	**HS-401558**	**HS-401604**	MH35ALV-C-RN-040-30400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	3	**HS-401559**	**HS-401605**	MH35ALV-C-RN-030-30500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	3	**HS-401560**	**HS-401606**	MH35ALV-C-RN-040-30500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	3	**HS-401561**	**HS-401607**	MH35ALV-C-RN-030-30500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	3	**HS-401562**	**HS-401608**	MH35ALV-C-RN-040-30500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	3	**HS-401563**	**HS-401609**	MH35ALV-C-RN-030-30600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	3	**HS-401564**	**HS-401610**	MH35ALV-C-RN-040-30600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	3	**HS-401565**	**HS-401611**	MH35ALV-C-RN-030-30600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	3	**HS-401566**	**HS-401612**	MH35ALV-C-RN-040-30600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	3	**HS-401567**	**HS-401613**	MH35ALV-C-RN-030-30600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	3	**HS-401568**	**HS-401614**	MH35ALV-C-RN-040-30600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	3	**HS-401569**	**HS-401615**	MH35ALV-C-RN-030-30800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	3	**HS-401570**	**HS-401616**	MH35ALV-C-RN-040-30800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	3	**HS-401571**	**HS-401617**	MH35ALV-C-RN-030-30800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	3	**HS-401572**	**HS-401618**	MH35ALV-C-RN-040-30800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	3	**HS-401573**	**HS-401619**	MH35ALV-C-RN-030-30800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	3	**HS-401574**	**HS-401620**	MH35ALV-C-RN-040-30800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	3	**HS-401575**	**HS-401621**	MH35ALV-C-RN-030-31000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	3	**HS-401576**	**HS-401622**	MH35ALV-C-RN-040-31000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	3	**HS-401577**	**HS-401623**	MH35ALV-C-RN-030-31000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	3	**HS-401578**	**HS-401624**	MH35ALV-C-RN-040-31000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	3	**HS-401579**	**HS-401625**	MH35ALV-C-RN-030-31000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	3	**HS-401580**	**HS-401626**	MH35ALV-C-RN-040-31000-R1.00

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Speeds & Feeds on Page 10

3 FLUTE - CORNER RADIUS

35° Helix - Variable Pitch - Chipbreaker Rougher - Reduced Neck (cont.)

continued from previous page

MH35ALV-C-RN-3

Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	3	**HS-401581**	**HS-401627**	MH35ALV-C-RN-030-31200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	3	**HS-401582**	**HS-401628**	MH35ALV-C-RN-040-31200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	3	**HS-401583**	**HS-401629**	MH35ALV-C-RN-030-31200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	3	**HS-401584**	**HS-401630**	MH35ALV-C-RN-040-31200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	3	**HS-401585**	**HS-401631**	MH35ALV-C-RN-030-31200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	3	**HS-401586**	**HS-401632**	MH35ALV-C-RN-040-31200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	3	**HS-401587**	**HS-401633**	MH35ALV-C-RN-030-31600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	3	**HS-401588**	**HS-401634**	MH35ALV-C-RN-040-31600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	3	**HS-401589**	**HS-401635**	MH35ALV-C-RN-030-31600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	3	**HS-401590**	**HS-401636**	MH35ALV-C-RN-040-31600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	3	**HS-401591**	**HS-401637**	MH35ALV-C-RN-030-31600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	3	**HS-401592**	**HS-401638**	MH35ALV-C-RN-040-31600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	3	**HS-401593**	**HS-401639**	MH35ALV-C-RN-030-32000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	3	**HS-401594**	**HS-401640**	MH35ALV-C-RN-040-32000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	3	**HS-401595**	**HS-401641**	MH35ALV-C-RN-030-32000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	3	**HS-401596**	**HS-401642**	MH35ALV-C-RN-040-32000-R1.00

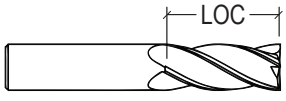
For an in depth material guide please see page 71

MH35ALV-C-3 / MH35ALV-C-RN-3

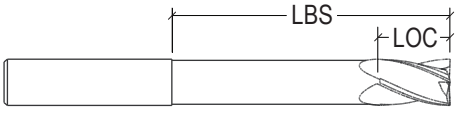
Material Guide	Material Number	V_c m/min.	f_z (mm/tooth)																	
			Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		Ø 16		Ø 20	
			Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh
WROUGHT ALUMINIUM ALLOY	3.1255 – 3.3523 – 3.3211 – 3.4144 – 3.4345 – 3.4365	640	0.018	0.033	0.023	0.044	0.029	0.055	0.035	0.065	0.046	0.087	0.056	0.104	0.068	0.127	0.086	0.160	0.104	0.195
CAST ALUMINIUM ALLOY	3.2151 – 3.2161 – 3.2381 – 3.3292	440	0.028	0.052	0.036	0.068	0.045	0.085	0.055	0.102	0.072	0.134	0.086	0.162	0.106	0.198	0.133	0.249	0.162	0.303
COPPER ALLOY	2.0065 – 2.1247 – 2.0265 – 2.0375 – 2.0230	235	0.019	0.035	0.024	0.045	0.030	0.057	0.036	0.068	0.048	0.090	0.058	0.108	0.071	0.133	0.089	0.167	0.108	0.203

MILLING PROCESS	STYLE	ADOC (ap)	RDOC (ae)
Slot (Full Slotting)	Non-reached (MH35ALV-C-3)	75%-125% Diameter	100% Diameter
	Reached (MH35ALV-C-RN-3)	Up to Max LOC	100% Diameter
Rgh (Traditional Roughing)	Non-reached (MH35ALV-C-3)	125%-200% Diameter	30%-40% Diameter
	Reached (MH35ALV-C-RN-3)	Up to Max LOC	30%-40% Diameter

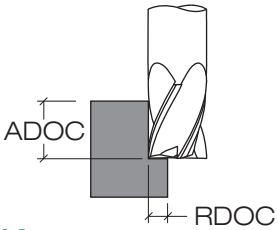
NOTES:
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters , please refer to Machining Advisor Pro.



Regular Style



Reduced Neck Style



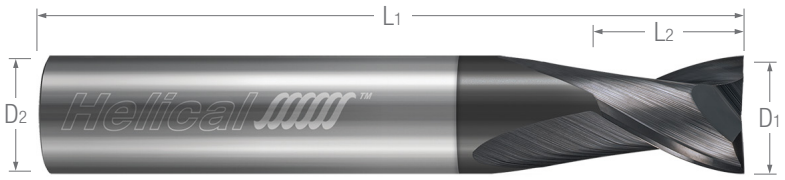
Key: LOC=Length of Cut ADOC (ap)=Axial Depth of Cut RDOC (ae)=Radial Depth of Cut

MH30AL-2

2 FLUTE - SQUARE

30° Helix

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Excellent performance in roughing and finishing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Available with D*plus* coating for higher hardness and high lubricity
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	2	HS-400959	HS-400968	MH30AL-020-20300
4 mm	6 mm	9 mm	57 mm	2	HS-400960	HS-400969	MH30AL-020-20400
5 mm	6 mm	11 mm	57 mm	2	HS-400961	HS-400970	MH30AL-020-20500
6 mm	6 mm	14 mm	60 mm	2	HS-400962	HS-400971	MH30AL-020-20600
8 mm	8 mm	18 mm	65 mm	2	HS-400963	HS-400972	MH30AL-020-20800
10 mm	10 mm	22 mm	75 mm	2	HS-400964	HS-400973	MH30AL-020-21000
12 mm	12 mm	26 mm	83 mm	2	HS-400965	HS-400974	MH30AL-020-21200
16 mm	16 mm	34 mm	102 mm	2	HS-400966	HS-400975	MH30AL-020-21600
20 mm	20 mm	42 mm	110 mm	2	HS-400967	HS-400976	MH30AL-020-22000

MH30AL-2

2 FLUTE - BALL

30° Helix

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Excellent performance in roughing and finishing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Available with D*plus* coating for higher hardness and high lubricity
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	2	HS-401023	HS-401032	MH30AL-020-20300-BN
4 mm	6 mm	9 mm	57 mm	2	HS-401024	HS-401033	MH30AL-020-20400-BN
5 mm	6 mm	11 mm	57 mm	2	HS-401025	HS-401034	MH30AL-020-20500-BN
6 mm	6 mm	14 mm	60 mm	2	HS-401026	HS-401035	MH30AL-020-20600-BN
8 mm	8 mm	18 mm	65 mm	2	HS-401027	HS-401036	MH30AL-020-20800-BN
10 mm	10 mm	22 mm	75 mm	2	HS-401028	HS-401037	MH30AL-020-21000-BN
12 mm	12 mm	26 mm	83 mm	2	HS-401029	HS-401038	MH30AL-020-21200-BN
16 mm	16 mm	34 mm	102 mm	2	HS-401030	HS-401039	MH30AL-020-21600-BN
20 mm	20 mm	42 mm	110 mm	2	HS-401031	HS-401040	MH30AL-020-22000-BN

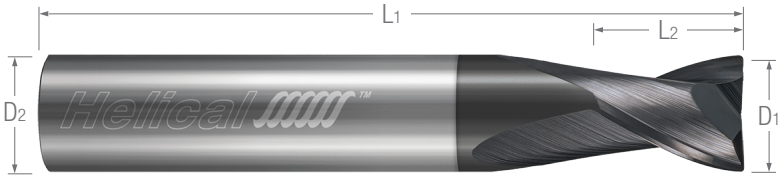
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2 FLUTE - CORNER RADIUS

30° Helix

MH30AL-2

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Excellent performance in roughing and finishing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Available with D*plus* coating for higher hardness and high lubricity
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	2	**HS-400977**	**HS-401000**	MH30AL-020-20300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	2	**HS-400978**	**HS-401001**	MH30AL-020-20300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	57 mm	2	**HS-400979**	**HS-401002**	MH30AL-020-20400-R0.20
	6 mm	**0.5 mm**	9 mm	57 mm	2	**HS-400980**	**HS-401003**	MH30AL-020-20400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	2	**HS-400981**	**HS-401004**	MH30AL-020-20500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	2	**HS-400982**	**HS-401005**	MH30AL-020-20500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	2	**HS-400983**	**HS-401006**	MH30AL-020-20600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	2	**HS-400984**	**HS-401007**	MH30AL-020-20600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	2	**HS-400985**	**HS-401008**	MH30AL-020-20600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	2	**HS-400986**	**HS-401009**	MH30AL-020-20800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	2	**HS-400987**	**HS-401010**	MH30AL-020-20800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	2	**HS-400988**	**HS-401011**	MH30AL-020-20800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	2	**HS-400989**	**HS-401012**	MH30AL-020-21000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	2	**HS-400990**	**HS-401013**	MH30AL-020-21000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	2	**HS-400991**	**HS-401014**	MH30AL-020-21000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	83 mm	2	**HS-400992**	**HS-401015**	MH30AL-020-21200-R0.20
	12 mm	**0.5 mm**	26 mm	83 mm	2	**HS-400993**	**HS-401016**	MH30AL-020-21200-R0.50
	12 mm	**1.0 mm**	26 mm	83 mm	2	**HS-400994**	**HS-401017**	MH30AL-020-21200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	2	**HS-400995**	**HS-401018**	MH30AL-020-21600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	2	**HS-400996**	**HS-401019**	MH30AL-020-21600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	2	**HS-400997**	**HS-401020**	MH30AL-020-21600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	110 mm	2	**HS-400998**	**HS-401021**	MH30AL-020-22000-R0.50
	20 mm	**1.0 mm**	42 mm	110 mm	2	**HS-400999**	**HS-401022**	MH30AL-020-22000-R1.00

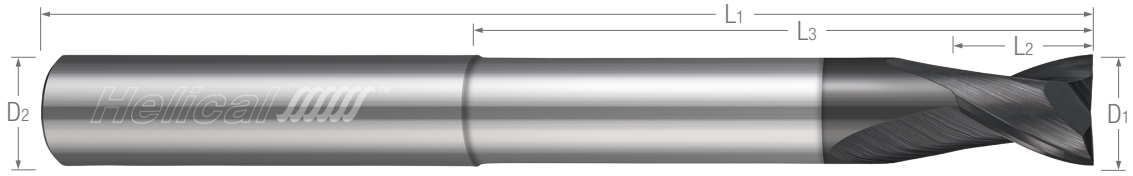
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MH30AL-RN-2

2 FLUTE - SQUARE

30° Helix - Reduced Neck

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Excellent performance in roughing and finishing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Available with D*plus* coating for higher hardness and high lubricity
- Reduced neck for long reach and deep pocketing applications
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	LOC L_2 +0.7mm +0.0mm	OAL L_1 +1.5mm −1.5mm	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	10 mm	2.85 mm	2	HS-401041	HS-401059	MH30AL-RN-030-20300
	6 mm	7 mm	57 mm	13 mm	2.85 mm	2	HS-401042	HS-401060	MH30AL-RN-040-20300
4 mm	6 mm	9 mm	55 mm	13 mm	3.80 mm	2	HS-401043	HS-401061	MH30AL-RN-030-20400
	6 mm	9 mm	60 mm	17 mm	3.80 mm	2	HS-401044	HS-401062	MH30AL-RN-040-20400
5 mm	6 mm	11 mm	57 mm	16 mm	4.75 mm	2	HS-401045	HS-401063	MH30AL-RN-030-20500
	6 mm	11 mm	65 mm	21 mm	4.75 mm	2	HS-401046	HS-401064	MH30AL-RN-040-20500
6 mm	6 mm	14 mm	60 mm	20 mm	5.70 mm	2	HS-401047	HS-401065	MH30AL-RN-030-20600
	6 mm	14 mm	65 mm	26 mm	5.70 mm	2	HS-401048	HS-401066	MH30AL-RN-040-20600
8 mm	8 mm	18 mm	65 mm	26 mm	7.60 mm	2	HS-401049	HS-401067	MH30AL-RN-030-20800
	8 mm	18 mm	78 mm	34 mm	7.60 mm	2	HS-401050	HS-401068	MH30AL-RN-040-20800
10 mm	10 mm	22 mm	75 mm	32 mm	9.50 mm	2	HS-401051	HS-401069	MH30AL-RN-030-21000
	10 mm	22 mm	90 mm	42 mm	9.50 mm	2	HS-401052	HS-401070	MH30AL-RN-040-21000
12 mm	12 mm	26 mm	90 mm	38 mm	11.40 mm	2	HS-401053	HS-401071	MH30AL-RN-030-21200
	12 mm	26 mm	102 mm	50 mm	11.40 mm	2	HS-401054	HS-401072	MH30AL-RN-040-21200
16 mm	16 mm	34 mm	102 mm	50 mm	15.20 mm	2	HS-401055	HS-401073	MH30AL-RN-030-21600
	16 mm	34 mm	125 mm	66 mm	15.20 mm	2	HS-401056	HS-401074	MH30AL-RN-040-21600
20 mm	20 mm	42 mm	125 mm	62 mm	19.00 mm	2	HS-401057	HS-401075	MH30AL-RN-030-22000
	20 mm	42 mm	140 mm	82 mm	19.00 mm	2	HS-401058	HS-401076	MH30AL-RN-040-22000

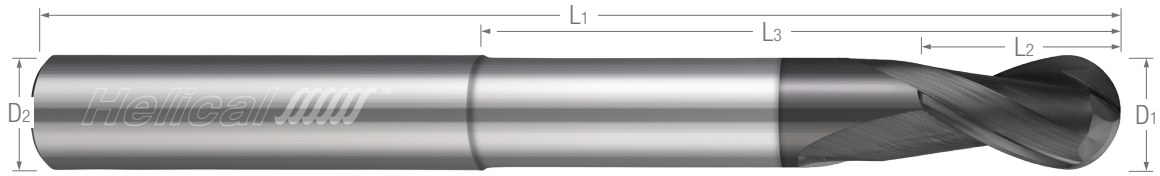
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2 FLUTE - BALL

30° Helix - Reduced Neck

MH30AL-RN-2

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Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	LOC L_2 +0.7mm +0.0mm	OAL L_1 +1.5mm −1.5mm	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	3 mm	55 mm	10 mm	2.85 mm	2	HS-401169	HS-401187	MH30AL-RN-030-20300-BN
	6 mm	3 mm	57 mm	13 mm	2.85 mm	2	HS-401170	HS-401188	MH30AL-RN-040-20300-BN
4 mm	6 mm	4 mm	55 mm	13 mm	3.80 mm	2	HS-401171	HS-401189	MH30AL-RN-030-20400-BN
	6 mm	4 mm	60 mm	17 mm	3.80 mm	2	HS-401172	HS-401190	MH30AL-RN-040-20400-BN
5 mm	6 mm	5 mm	57 mm	16 mm	4.75 mm	2	HS-401173	HS-401191	MH30AL-RN-030-20500-BN
	6 mm	5 mm	65 mm	21 mm	4.75 mm	2	HS-401174	HS-401192	MH30AL-RN-040-20500-BN
6 mm	6 mm	6 mm	60 mm	20 mm	5.70 mm	2	HS-401175	HS-401193	MH30AL-RN-030-20600-BN
	6 mm	6 mm	65 mm	26 mm	5.70 mm	2	HS-401176	HS-401194	MH30AL-RN-040-20600-BN
8 mm	8 mm	8 mm	65 mm	26 mm	7.60 mm	2	HS-401177	HS-401195	MH30AL-RN-030-20800-BN
	8 mm	8 mm	78 mm	34 mm	7.60 mm	2	HS-401178	HS-401196	MH30AL-RN-040-20800-BN
10 mm	10 mm	10 mm	75 mm	32 mm	9.50 mm	2	HS-401179	HS-401197	MH30AL-RN-030-21000-BN
	10 mm	10 mm	90 mm	42 mm	9.50 mm	2	HS-401180	HS-401198	MH30AL-RN-040-21000-BN
12 mm	12 mm	12 mm	90 mm	38 mm	11.40 mm	2	HS-401181	HS-401199	MH30AL-RN-030-21200-BN
	12 mm	12 mm	102 mm	50 mm	11.40 mm	2	HS-401182	HS-401200	MH30AL-RN-040-21200-BN
16 mm	16 mm	16 mm	102 mm	50 mm	15.20 mm	2	HS-401183	HS-401201	MH30AL-RN-030-21600-BN
	16 mm	16 mm	125 mm	66 mm	15.20 mm	2	HS-401184	HS-401202	MH30AL-RN-040-21600-BN
20 mm	20 mm	20 mm	125 mm	62 mm	19.00 mm	2	HS-401185	HS-401203	MH30AL-RN-030-22000-BN
	20 mm	20 mm	140 mm	82 mm	19.00 mm	2	HS-401186	HS-401204	MH30AL-RN-040-22000-BN

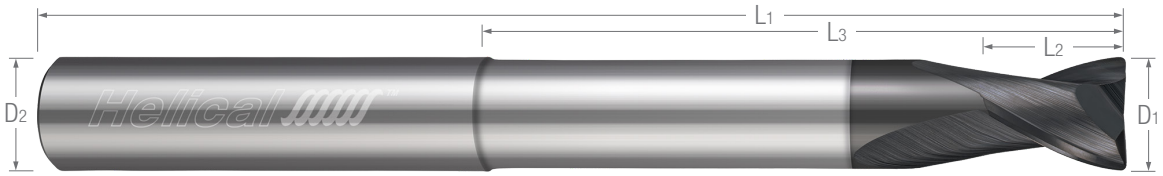
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MH30AL-RN-2

2 FLUTE - CORNER RADIUS

30° Helix - Reduced Neck

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Excellent performance in roughing and finishing applications
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- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	2	**HS-401077**	**HS-401123**	MH30AL-RN-030-20300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	2	**HS-401078**	**HS-401124**	MH30AL-RN-040-20300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	2	**HS-401079**	**HS-401125**	MH30AL-RN-030-20300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	2	**HS-401080**	**HS-401126**	MH30AL-RN-040-20300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	2	**HS-401081**	**HS-401127**	MH30AL-RN-030-20400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	2	**HS-401082**	**HS-401128**	MH30AL-RN-040-20400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	2	**HS-401083**	**HS-401129**	MH30AL-RN-030-20400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	2	**HS-401084**	**HS-401130**	MH30AL-RN-040-20400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	2	**HS-401085**	**HS-401131**	MH30AL-RN-030-20500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	2	**HS-401086**	**HS-401132**	MH30AL-RN-040-20500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	2	**HS-401087**	**HS-401133**	MH30AL-RN-030-20500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	2	**HS-401088**	**HS-401134**	MH30AL-RN-040-20500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	2	**HS-401089**	**HS-401135**	MH30AL-RN-030-20600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	2	**HS-401090**	**HS-401136**	MH30AL-RN-040-20600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	2	**HS-401091**	**HS-401137**	MH30AL-RN-030-20600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	2	**HS-401092**	**HS-401138**	MH30AL-RN-040-20600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	2	**HS-401093**	**HS-401139**	MH30AL-RN-030-20600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	2	**HS-401094**	**HS-401140**	MH30AL-RN-040-20600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	2	**HS-401095**	**HS-401141**	MH30AL-RN-030-20800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	2	**HS-401096**	**HS-401142**	MH30AL-RN-040-20800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	2	**HS-401097**	**HS-401143**	MH30AL-RN-030-20800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	2	**HS-401098**	**HS-401144**	MH30AL-RN-040-20800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	2	**HS-401099**	**HS-401145**	MH30AL-RN-030-20800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	2	**HS-401100**	**HS-401146**	MH30AL-RN-040-20800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	2	**HS-401101**	**HS-401147**	MH30AL-RN-030-21000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	2	**HS-401102**	**HS-401148**	MH30AL-RN-040-21000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	2	**HS-401103**	**HS-401149**	MH30AL-RN-030-21000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	2	**HS-401104**	**HS-401150**	MH30AL-RN-040-21000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	2	**HS-401105**	**HS-401151**	MH30AL-RN-030-21000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	2	**HS-401106**	**HS-401152**	MH30AL-RN-040-21000-R1.00

continued on next page

Speeds & Feeds on Page 16

2 FLUTE - CORNER RADIUS

30° Helix - Reduced Neck (cont.)

MH30AL-RN-2

continued from previous page

Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	2	**HS-401107**	**HS-401153**	MH30AL-RN-030-21200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	2	**HS-401108**	**HS-401154**	MH30AL-RN-040-21200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	2	**HS-401109**	**HS-401155**	MH30AL-RN-030-21200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	2	**HS-401110**	**HS-401156**	MH30AL-RN-040-21200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	2	**HS-401111**	**HS-401157**	MH30AL-RN-030-21200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	2	**HS-401112**	**HS-401158**	MH30AL-RN-040-21200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	2	**HS-401113**	**HS-401159**	MH30AL-RN-030-21600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	2	**HS-401114**	**HS-401160**	MH30AL-RN-040-21600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	2	**HS-401115**	**HS-401161**	MH30AL-RN-030-21600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	2	**HS-401116**	**HS-401162**	MH30AL-RN-040-21600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	2	**HS-401117**	**HS-401163**	MH30AL-RN-030-21600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	2	**HS-401118**	**HS-401164**	MH30AL-RN-040-21600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	2	**HS-401119**	**HS-401165**	MH30AL-RN-030-22000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	2	**HS-401120**	**HS-401166**	MH30AL-RN-040-22000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	2	**HS-401121**	**HS-401167**	MH30AL-RN-030-22000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	2	**HS-401122**	**HS-401168**	MH30AL-RN-040-22000-R1.00

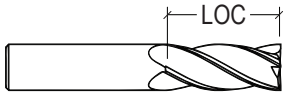
For an in depth material guide please see page 71

MH30AL-2 / MH30AL-RN-2

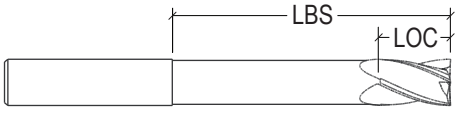
Material Guide	Material Number	V_c m/min.	f_z (mm/tooth)																										
			Ø 3			Ø 4			Ø 5			Ø 6			Ø 8			Ø 10			Ø 12			Ø 16			Ø 20		
			Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin
WROUGHT ALUMINIUM ALLOY	3.1255 – 3.3523 – 3.3211 – 3.4144 – 3.4345 – 3.4365	640	0.018	0.033	0.041	0.023	0.042	0.044	0.028	0.053	0.047	0.034	0.064	0.053	0.045	0.084	0.057	0.056	0.105	0.061	0.067	0.124	0.071	0.087	0.161	0.077	0.105	0.196	0.085
CAST ALUMINIUM ALLOY	3.2151 – 3.2161 – 3.2381 – 3.3292	440	0.027	0.051	0.052	0.036	0.066	0.055	0.044	0.083	0.058	0.053	0.100	0.066	0.070	0.131	0.071	0.087	0.163	0.076	0.103	0.194	0.088	0.135	0.250	0.096	0.164	0.306	0.105
COPPER ALLOY	2.0065 – 2.1247 – 2.0265 – 2.0375 – 2.0230	235	0.018	0.034	0.042	0.024	0.044	0.045	0.030	0.055	0.047	0.036	0.067	0.054	0.047	0.088	0.058	0.058	0.109	0.062	0.069	0.130	0.073	0.090	0.167	0.080	0.110	0.205	0.087

MILLING PROCESS	STYLE	ADOC (ap)	RDOC (ae)
Slot (Full Slotting)	Non-reached (MH30AL-2)	75%-125% Diameter	100% Diameter
	Reached (MH30AL-RN-2)	Up to Max LOC	100% Diameter
Rgh (Traditional Roughing)	Non-reached (MH30AL-2)	125%-200% Diameter	30%-40% Diameter
	Reached (MH30AL-RN-2)	Up to Max LOC	30%-40% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

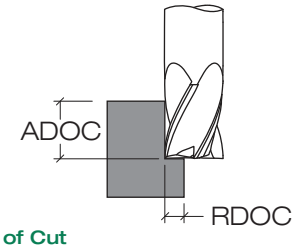
NOTES:
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters , please refer to Machining Advisor Pro.



Regular Style



Reduced Neck Style

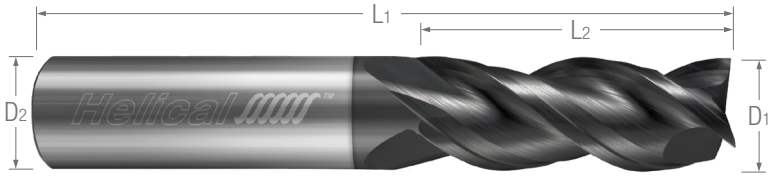


Key: LOC=Length of Cut **ADOC (ap)=Axial Depth of Cut** **RDOC (ae)=Radial Depth of Cut**

MH40ALV-3

3 FLUTE - SQUARE
40° Helix - Variable Pitch

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Designed with a specialised combination of features for excellent performance in roughing and finishing applications
- Unique “3 teeth-to-centre” end geometry for ramping applications
- Wiper flat design leaves superior surface finish
- Excellent performance in High Efficiency Milling (HEM)
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Uncoated tool offers an excellent option for aluminium finishing applications
- D*plus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (h6)	Shank Diameter D_2 (h6)	Length of Cut L_2 +0.7mm +0.0mm	Overall Length L_1 +1.5mm −1.5mm	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	3	HS-401205	HS-401223	MH40ALV-020-30300
	6 mm	10 mm	57 mm	3	HS-401206	HS-401224	MH40ALV-030-30300
4 mm	6 mm	9 mm	57 mm	3	HS-401207	HS-401225	MH40ALV-020-30400
	6 mm	13 mm	60 mm	3	HS-401208	HS-401226	MH40ALV-030-30400
5 mm	6 mm	11 mm	57 mm	3	HS-401209	HS-401227	MH40ALV-020-30500
	6 mm	16 mm	60 mm	3	HS-401210	HS-401228	MH40ALV-030-30500
6 mm	6 mm	14 mm	57 mm	3	HS-401211	HS-401229	MH40ALV-020-30600
	6 mm	20 mm	65 mm	3	HS-401212	HS-401230	MH40ALV-030-30600
8 mm	8 mm	18 mm	65 mm	3	HS-401213	HS-401231	MH40ALV-020-30800
	8 mm	26 mm	72 mm	3	HS-401214	HS-401232	MH40ALV-030-30800
10 mm	10 mm	22 mm	75 mm	3	HS-401215	HS-401233	MH40ALV-020-31000
	10 mm	32 mm	84 mm	3	HS-401216	HS-401234	MH40ALV-030-31000
12 mm	12 mm	26 mm	83 mm	3	HS-401217	HS-401235	MH40ALV-020-31200
	12 mm	38 mm	95 mm	3	HS-401218	HS-401236	MH40ALV-030-31200
16 mm	16 mm	34 mm	102 mm	3	HS-401219	HS-401237	MH40ALV-020-31600
	16 mm	50 mm	114 mm	3	HS-401220	HS-401238	MH40ALV-030-31600
20 mm	20 mm	42 mm	110 mm	3	HS-401221	HS-401239	MH40ALV-020-32000
	20 mm	62 mm	130 mm	3	HS-401222	HS-401240	MH40ALV-030-32000

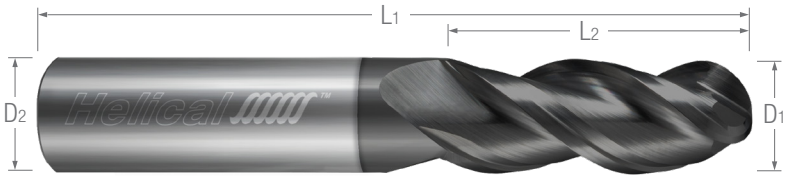
Speeds & Feeds on Page 24

3 FLUTE - BALL

40° Helix - Variable Pitch

MH40ALV-3

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Designed with a specialised combination of features for excellent performance in roughing and finishing applications
- Unique "3 teeth-to-centre" end geometry for ramping applications
- Excellent performance in High Efficiency Milling (HEM)
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Uncoated tool offers an excellent option for aluminium finishing applications
- D*plus* coating for superior tool life and edge retention in abrasive non-ferrous materials
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (h6)	Shank Diameter D_2 (h6)	Length of Cut L_2 +0.7mm +0.0mm	Overall Length L_1 +1.5mm −1.5mm	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	3	HS-401333	HS-401342	MH40ALV-020-30300-BN
4 mm	6 mm	9 mm	57 mm	3	HS-401334	HS-401343	MH40ALV-020-30400-BN
5 mm	6 mm	11 mm	57 mm	3	HS-401335	HS-401344	MH40ALV-020-30500-BN
6 mm	6 mm	14 mm	57 mm	3	HS-401336	HS-401345	MH40ALV-020-30600-BN
8 mm	8 mm	18 mm	65 mm	3	HS-401337	HS-401346	MH40ALV-020-30800-BN
10 mm	10 mm	22 mm	75 mm	3	HS-401338	HS-401347	MH40ALV-020-31000-BN
12 mm	12 mm	26 mm	83 mm	3	HS-401339	HS-401348	MH40ALV-020-31200-BN
16 mm	16 mm	34 mm	102 mm	3	HS-401340	HS-401349	MH40ALV-020-31600-BN
20 mm	20 mm	42 mm	110 mm	3	HS-401341	HS-401350	MH40ALV-020-32000-BN

Selecting the Right Flute Count

2 Flute Tools: Ideal for roughing and slotting, offering optimal chip removal.

3 Flute Tools: Suitable for finishing operations, providing a balance between chip removal and surface finish.

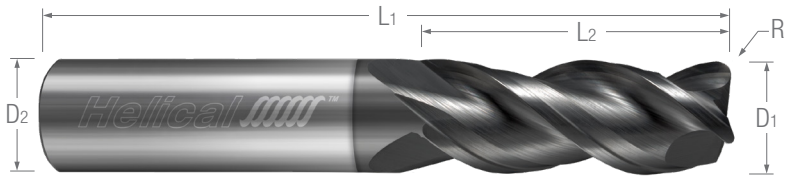
Speeds & Feeds on Page 24

MH40ALV-3

3 FLUTE - CORNER RADIUS

40° Helix - Variable Pitch

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Designed with a specialised combination of features for excellent performance in roughing and finishing applications
- Unique “3 teeth-to-centre” end geometry for ramping applications
- Wiper flat design leaves superior surface finish
- Excellent performance in High Efficiency Milling (HEM)
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Uncoated tool offers an excellent option for aluminium finishing applications
- D*plus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	Uncoated	D*plus* Coated	Tool Description
3mm	6 mm	**0.1 mm**	7 mm	55 mm	3	HS-401241	HS-401287	MH40ALV-020-30300-R0.10
	6 mm	**0.1 mm**	10 mm	57 mm	3	HS-401242	HS-401288	MH40ALV-030-30300-R0.10
	6 mm	**0.5 mm**	7 mm	55 mm	3	HS-401243	HS-401289	MH40ALV-020-30300-R0.50
	6 mm	**0.5 mm**	10 mm	57 mm	3	HS-401244	HS-401290	MH40ALV-030-30300-R0.50
4mm	6 mm	**0.1 mm**	9 mm	57 mm	3	HS-401245	HS-401291	MH40ALV-020-30400-R0.10
	6 mm	**0.1 mm**	13 mm	60 mm	3	HS-401246	HS-401292	MH40ALV-030-30400-R0.10
	6 mm	**0.5 mm**	9 mm	57 mm	3	HS-401247	HS-401293	MH40ALV-020-30400-R0.50
	6 mm	**0.5 mm**	13 mm	60 mm	3	HS-401248	HS-401294	MH40ALV-030-30400-R0.50
5mm	6 mm	**0.1 mm**	11 mm	57 mm	3	HS-401249	HS-401295	MH40ALV-020-30500-R0.10
	6 mm	**0.1 mm**	16 mm	60 mm	3	HS-401250	HS-401296	MH40ALV-030-30500-R0.10
	6 mm	**0.5 mm**	11 mm	57 mm	3	HS-401251	HS-401297	MH40ALV-020-30500-R0.50
	6 mm	**0.5 mm**	16 mm	60 mm	3	HS-401252	HS-401298	MH40ALV-030-30500-R0.50
6mm	6 mm	**0.2 mm**	14 mm	57 mm	3	HS-401253	HS-401299	MH40ALV-020-30600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	3	HS-401254	HS-401300	MH40ALV-030-30600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	3	HS-401255	HS-401301	MH40ALV-020-30600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	3	HS-401256	HS-401302	MH40ALV-030-30600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	3	HS-401257	HS-401303	MH40ALV-020-30600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	3	HS-401258	HS-401304	MH40ALV-030-30600-R1.00
8mm	8 mm	**0.2 mm**	18 mm	65 mm	3	HS-401259	HS-401305	MH40ALV-020-30800-R0.20
	8 mm	**0.2 mm**	26 mm	72 mm	3	HS-401260	HS-401306	MH40ALV-030-30800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	3	HS-401261	HS-401307	MH40ALV-020-30800-R0.50
	8 mm	**0.5 mm**	26 mm	72 mm	3	HS-401262	HS-401308	MH40ALV-030-30800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	3	HS-401263	HS-401309	MH40ALV-020-30800-R1.00
	8 mm	**1.0 mm**	26 mm	72 mm	3	HS-401264	HS-401310	MH40ALV-030-30800-R1.00
10mm	10 mm	**0.2 mm**	22 mm	75 mm	3	HS-401265	HS-401311	MH40ALV-020-31000-R0.20
	10 mm	**0.2 mm**	32 mm	84 mm	3	HS-401266	HS-401312	MH40ALV-030-31000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	3	HS-401267	HS-401313	MH40ALV-020-31000-R0.50
	10 mm	**0.5 mm**	32 mm	84 mm	3	HS-401268	HS-401314	MH40ALV-030-31000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	3	HS-401269	HS-401315	MH40ALV-020-31000-R1.00
	10 mm	**1.0 mm**	32 mm	84 mm	3	HS-401270	HS-401316	MH40ALV-030-31000-R1.00

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Speeds & Feeds on Page 24

3 FLUTE - CORNER RADIUS

40° Helix - Variable Pitch (cont.)

MH40ALV-3

continued from previous page

Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	Uncoated	D*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	83 mm	3	**HS-401271**	**HS-401317**	MH40ALV-020-31200-R0.20
	12 mm	**0.2 mm**	38 mm	95 mm	3	**HS-401272**	**HS-401318**	MH40ALV-030-31200-R0.20
	12 mm	**0.5 mm**	26 mm	83 mm	3	**HS-401273**	**HS-401319**	MH40ALV-020-31200-R0.50
	12 mm	**0.5 mm**	38 mm	95 mm	3	**HS-401274**	**HS-401320**	MH40ALV-030-31200-R0.50
	12 mm	**1.0 mm**	26 mm	93 mm	3	**HS-401275**	**HS-401321**	MH40ALV-020-31200-R1.00
	12 mm	**1.0 mm**	38 mm	95 mm	3	**HS-401276**	**HS-401322**	MH40ALV-030-31200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	3	**HS-401277**	**HS-401323**	MH40ALV-020-31600-R0.20
	16 mm	**0.2 mm**	50 mm	114 mm	3	**HS-401278**	**HS-401324**	MH40ALV-030-31600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	3	**HS-401279**	**HS-401325**	MH40ALV-020-31600-R0.50
	16 mm	**0.5 mm**	50 mm	114 mm	3	**HS-401280**	**HS-401326**	MH40ALV-030-31600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	3	**HS-401281**	**HS-401327**	MH40ALV-020-31600-R1.00
	16 mm	**1.0 mm**	50 mm	114 mm	3	**HS-401282**	**HS-401328**	MH40ALV-030-31600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	110 mm	3	**HS-401283**	**HS-401329**	MH40ALV-020-32000-R0.50
	20 mm	**0.5 mm**	62 mm	130 mm	3	**HS-401284**	**HS-401330**	MH40ALV-030-32000-R0.50
	20 mm	**1.0 mm**	42 mm	110 mm	3	**HS-401285**	**HS-401331**	MH40ALV-020-32000-R1.00
	20 mm	**1.0 mm**	62 mm	130 mm	3	**HS-401286**	**HS-401332**	MH40ALV-030-32000-R1.00

Prioritise Chip Evacuation

Aluminium is notorious for producing long, stringy chips that can recut if not evacuated. To mitigate this, use air blasts, high-pressure coolant, or chip breakers to keep chips clear.

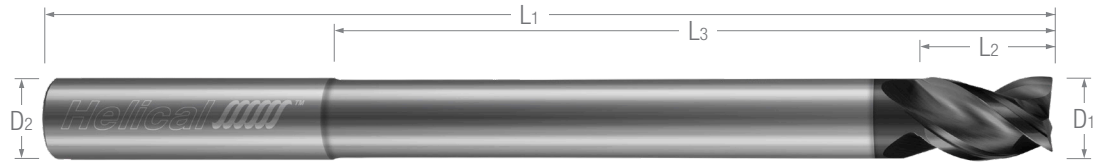
Speeds & Feeds on Page 24

MH40ALV-RN-3

3 FLUTE - SQUARE

40° Helix - Variable Pitch - Reduced Neck

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Designed with a specialised combination of features for excellent performance in roughing and finishing applications
- Unique “3 teeth-to-centre” end geometry for ramping applications
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Wiper flat design leaves superior surface finish
- Excellent performance in High Efficiency Milling (HEM)
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Uncoated tool offers an excellent option for aluminium finishing applications
- D*plus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	10 mm	2.85 mm	3	HS-401351	HS-401369	MH40ALV-RN-030-30300
	6 mm	7 mm	57 mm	13 mm	2.85 mm	3	HS-401352	HS-401370	MH40ALV-RN-040-30300
4 mm	6 mm	9 mm	55 mm	13 mm	3.80 mm	3	HS-401353	HS-401371	MH40ALV-RN-030-30400
	6 mm	9 mm	60 mm	17 mm	3.80 mm	3	HS-401354	HS-401372	MH40ALV-RN-040-30400
5 mm	6 mm	11 mm	57 mm	16 mm	4.75 mm	3	HS-401355	HS-401373	MH40ALV-RN-030-30500
	6 mm	11 mm	65 mm	21 mm	4.75 mm	3	HS-401356	HS-401374	MH40ALV-RN-040-30500
6 mm	6 mm	14 mm	60 mm	20 mm	5.70 mm	3	HS-401357	HS-401375	MH40ALV-RN-030-30600
	6 mm	14 mm	65 mm	26 mm	5.70 mm	3	HS-401358	HS-401376	MH40ALV-RN-040-30600
8 mm	8 mm	18 mm	65 mm	26 mm	7.60 mm	3	HS-401359	HS-401377	MH40ALV-RN-030-30800
	8 mm	18 mm	78 mm	34 mm	7.60 mm	3	HS-401360	HS-401378	MH40ALV-RN-040-30800
10 mm	10 mm	22 mm	75 mm	32 mm	9.50 mm	3	HS-401361	HS-401379	MH40ALV-RN-030-31000
	10 mm	22 mm	90 mm	42 mm	9.50 mm	3	HS-401362	HS-401380	MH40ALV-RN-040-31000
12 mm	12 mm	26 mm	90 mm	38 mm	11.40 mm	3	HS-401363	HS-401381	MH40ALV-RN-030-31200
	12 mm	26 mm	102 mm	50 mm	11.40 mm	3	HS-401364	HS-401382	MH40ALV-RN-040-31200
16 mm	16 mm	34 mm	102 mm	50 mm	15.20 mm	3	HS-401365	HS-401383	MH40ALV-RN-030-31600
	16 mm	34 mm	125 mm	66 mm	15.20 mm	3	HS-401366	HS-401384	MH40ALV-RN-040-31600
20 mm	20 mm	42 mm	125 mm	62 mm	19.00 mm	3	HS-401367	HS-401385	MH40ALV-RN-030-32000
	20 mm	42 mm	140 mm	82 mm	19.00 mm	3	HS-401368	HS-401386	MH40ALV-RN-040-32000

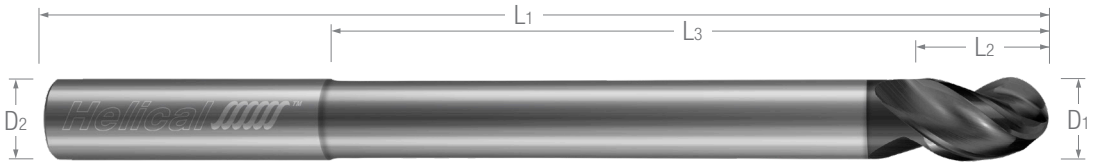
Speeds & Feeds on Page 24

3 FLUTE - BALL

40° Helix - Variable Pitch - Reduced Neck

MH40ALV-RN-3

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Designed with a specialised combination of features for excellent performance in roughing and finishing applications
- Unique "3 teeth-to-centre" end geometry for ramping applications
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Excellent performance in High Efficiency Milling (HEM)
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Uncoated tool offers an excellent option for aluminium finishing applications
- D*plus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	LOC L_2 +0.7mm +0.0mm	OAL L_1 +1.5mm −1.5mm	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	3 mm	55 mm	10 mm	2.85 mm	3	HS-401479	HS-401497	MH40ALV-RN-030-30300-BN
	6 mm	3 mm	57 mm	13 mm	2.85 mm	3	HS-401480	HS-401498	MH40ALV-RN-040-30300-BN
4 mm	6 mm	4 mm	55 mm	13 mm	3.80 mm	3	HS-401481	HS-401499	MH40ALV-RN-030-30400-BN
	6 mm	4 mm	60 mm	17 mm	3.80 mm	3	HS-401482	HS-401500	MH40ALV-RN-040-30400-BN
5 mm	6 mm	5 mm	57 mm	16 mm	4.75 mm	3	HS-401483	HS-401501	MH40ALV-RN-030-30500-BN
	6 mm	5 mm	65 mm	21 mm	4.75 mm	3	HS-401484	HS-401502	MH40ALV-RN-040-30500-BN
6 mm	6 mm	6 mm	60 mm	20 mm	5.70 mm	3	HS-401485	HS-401503	MH40ALV-RN-030-30600-BN
	6 mm	6 mm	65 mm	26 mm	5.70 mm	3	HS-401486	HS-401504	MH40ALV-RN-040-30600-BN
8 mm	8 mm	8 mm	65 mm	26 mm	7.60 mm	3	HS-401487	HS-401505	MH40ALV-RN-030-30800-BN
	8 mm	8 mm	78 mm	34 mm	7.60 mm	3	HS-401488	HS-401506	MH40ALV-RN-040-30800-BN
10 mm	10 mm	10 mm	75 mm	32 mm	9.50 mm	3	HS-401489	HS-401507	MH40ALV-RN-030-31000-BN
	10 mm	10 mm	90 mm	42 mm	9.50 mm	3	HS-401490	HS-401508	MH40ALV-RN-040-31000-BN
12 mm	12 mm	12 mm	90 mm	38 mm	11.40 mm	3	HS-401491	HS-401509	MH40ALV-RN-030-31200-BN
	12 mm	12 mm	102 mm	50 mm	11.40 mm	3	HS-401492	HS-401510	MH40ALV-RN-040-31200-BN
16 mm	16 mm	16 mm	102 mm	50 mm	15.20 mm	3	HS-401493	HS-401511	MH40ALV-RN-030-31600-BN
	16 mm	16 mm	125 mm	66 mm	15.20 mm	3	HS-401494	HS-401512	MH40ALV-RN-040-31600-BN
20 mm	20 mm	20 mm	125 mm	62 mm	19.00 mm	3	HS-401495	HS-401513	MH40ALV-RN-030-32000-BN
	20 mm	20 mm	140 mm	82 mm	19.00 mm	3	HS-401496	HS-401514	MH40ALV-RN-040-32000-BN

Speeds & Feeds on Page 24

MH40ALV-RN-3

3 FLUTE - CORNER RADIUS

40° Helix - Reduced Neck

- Designed for outstanding performance and accelerated metal removal rates in aluminium and non-ferrous materials
- Designed with a specialised combination of features for excellent performance in roughing and finishing applications
- Unique “3 teeth-to-centre” end geometry for ramping applications
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Wiper flat design leaves superior surface finish
- Excellent performance in High Efficiency Milling (HEM)
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Uncoated tool offers an excellent option for aluminium finishing applications
- D*plus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	3	**HS-401387**	**HS-401433**	MH40ALV-RN-030-30300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	3	**HS-401388**	**HS-401434**	MH40ALV-RN-040-30300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	3	**HS-401389**	**HS-401435**	MH40ALV-RN-030-30300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	3	**HS-401390**	**HS-401436**	MH40ALV-RN-040-30300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	3	**HS-401391**	**HS-401437**	MH40ALV-RN-030-30400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	3	**HS-401392**	**HS-401438**	MH40ALV-RN-040-30400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	3	**HS-401393**	**HS-401439**	MH40ALV-RN-030-30400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	3	**HS-401394**	**HS-401440**	MH40ALV-RN-040-30400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	3	**HS-401395**	**HS-401441**	MH40ALV-RN-030-30500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	3	**HS-401396**	**HS-401442**	MH40ALV-RN-040-30500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	3	**HS-401397**	**HS-401443**	MH40ALV-RN-030-30500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	3	**HS-401398**	**HS-401444**	MH40ALV-RN-040-30500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	3	**HS-401399**	**HS-401445**	MH40ALV-RN-030-30600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	3	**HS-401400**	**HS-401446**	MH40ALV-RN-040-30600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	3	**HS-401401**	**HS-401447**	MH40ALV-RN-030-30600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	3	**HS-401402**	**HS-401448**	MH40ALV-RN-040-30600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	3	**HS-401403**	**HS-401449**	MH40ALV-RN-030-30600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	3	**HS-401404**	**HS-401450**	MH40ALV-RN-040-30600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	3	**HS-401405**	**HS-401451**	MH40ALV-RN-030-30800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	3	**HS-401406**	**HS-401452**	MH40ALV-RN-040-30800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	3	**HS-401407**	**HS-401453**	MH40ALV-RN-030-30800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	3	**HS-401408**	**HS-401454**	MH40ALV-RN-040-30800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	3	**HS-401409**	**HS-401455**	MH40ALV-RN-030-30800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	3	**HS-401410**	**HS-401456**	MH40ALV-RN-040-30800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	3	**HS-401411**	**HS-401457**	MH40ALV-RN-030-31000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	3	**HS-401412**	**HS-401458**	MH40ALV-RN-040-31000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	3	**HS-401413**	**HS-401459**	MH40ALV-RN-030-31000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	3	**HS-401414**	**HS-401460**	MH40ALV-RN-040-31000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	3	**HS-401415**	**HS-401461**	MH40ALV-RN-030-31000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	3	**HS-401416**	**HS-401462**	MH40ALV-RN-040-31000-R1.00

continued on next page

3 Flute

Speeds & Feeds on Page 24

3 FLUTE - CORNER RADIUS

40° Helix - Reduced Neck (cont.)

MH40ALV-RN-3

continued from previous page

Cutter Dia. D_1 (h6)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	LOC L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Dia.	Flutes	Uncoated	D*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	3	**HS-401417**	**HS-401463**	MH40ALV-RN-030-31200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	3	**HS-401418**	**HS-401464**	MH40ALV-RN-040-31200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	3	**HS-401419**	**HS-401465**	MH40ALV-RN-030-31200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	3	**HS-401420**	**HS-401466**	MH40ALV-RN-040-31200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	3	**HS-401421**	**HS-401467**	MH40ALV-RN-030-31200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	3	**HS-401422**	**HS-401468**	MH40ALV-RN-040-31200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	3	**HS-401423**	**HS-401469**	MH40ALV-RN-030-31600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	3	**HS-401424**	**HS-401470**	MH40ALV-RN-040-31600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	3	**HS-401425**	**HS-401471**	MH40ALV-RN-030-31600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	3	**HS-401426**	**HS-401472**	MH40ALV-RN-040-31600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	3	**HS-401427**	**HS-401473**	MH40ALV-RN-030-31600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	3	**HS-401428**	**HS-401474**	MH40ALV-RN-040-31600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	3	**HS-401429**	**HS-401475**	MH40ALV-RN-030-32000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	3	**HS-401430**	**HS-401476**	MH40ALV-RN-040-32000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	3	**HS-401431**	**HS-401477**	MH40ALV-RN-030-32000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	3	**HS-401432**	**HS-401478**	MH40ALV-RN-040-32000-R1.00

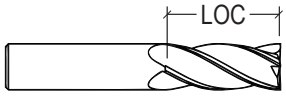
For an in depth material guide please see page 71

MH40ALV-3 / MH40ALV-RN-3

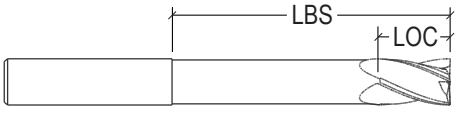
Material Guide	Material Number	V_c m/min.	f_z (mm/tooth)																									
			Ø 3			Ø 4			Ø 5			Ø 6			Ø 8			Ø 10			Ø 12			Ø 16			Ø 20		
			Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin
WROUGHT ALUMINIUM ALLOY	3.1255 – 3.3523 – 3.3211 – 3.4144 – 3.4345 – 3.4365	640	0.017	0.035	0.043	0.022	0.046	0.045	0.028	0.058	0.048	0.034	0.069	0.055	0.045	0.092	0.059	0.056	0.113	0.063	0.066	0.134	0.074	0.086	0.175	0.080	0.104	0.213	0.088
CAST ALUMINIUM ALLOY	3.2151 – 3.2161 – 3.2381 – 3.3292	440	0.027	0.055	0.053	0.035	0.072	0.057	0.044	0.090	0.060	0.053	0.108	0.068	0.070	0.142	0.073	0.086	0.177	0.078	0.102	0.209	0.092	0.133	0.273	0.100	0.162	0.331	0.109
COPPER ALLOY	2.0065 – 2.1247 – 2.0265 – 2.0375 – 2.0230	235	0.018	0.036	0.043	0.024	0.048	0.046	0.029	0.060	0.049	0.035	0.072	0.056	0.047	0.096	0.060	0.058	0.118	0.064	0.069	0.140	0.075	0.089	0.182	0.081	0.108	0.221	0.089

MILLING PROCESS	STYLE	ADOC (ap)	RDOC (ae)
Slot (Full Slotting)	Non-reached (MH40ALV-3)	75%-125% Diameter	100% Diameter
	Reached (MH40ALV-RN-3)	Up to Max LOC	100% Diameter
Rgh (Traditional Roughing)	Non-reached (MH40ALV-3)	125%-200% Diameter	30%-40% Diameter
	Reached (MH40ALV-RN-3)	Up to Max LOC	30%-40% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

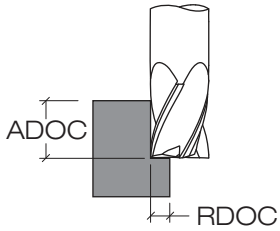
NOTES:
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.



Regular Style



Reduced Neck Style



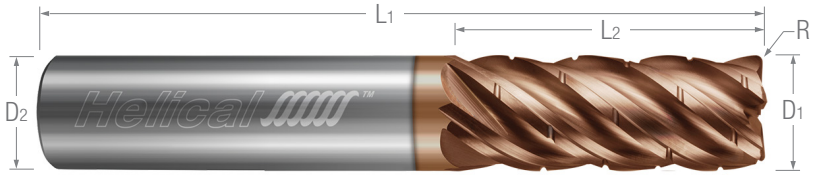
Key: LOC=Length of Cut ADOC (ap)=Axial Depth of Cut RDOC (ae)=Radial Depth of Cut

MHEV-C-5

5 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in High Efficiency Milling (HEM)
- 5 flute variable pitch and offset chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	5	**HS-400452**	MHEV-C-020-50300-R0.20
	6 mm	**0.2 mm**	10 mm	57 mm	5	**HS-400453**	MHEV-C-030-50300-R0.20
	6 mm	**0.2 mm**	13 mm	60 mm	5	**HS-400454**	MHEV-C-040-50300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	5	**HS-400455**	MHEV-C-020-50300-R0.50
	6 mm	**0.5 mm**	10 mm	57 mm	5	**HS-400456**	MHEV-C-030-50300-R0.50
	6 mm	**0.5 mm**	13 mm	60 mm	5	**HS-400457**	MHEV-C-040-50300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	5	**HS-400458**	MHEV-C-020-50400-R0.20
	6 mm	**0.2 mm**	13 mm	57 mm	5	**HS-400459**	MHEV-C-030-50400-R0.20
	6 mm	**0.2 mm**	17 mm	65 mm	5	**HS-400460**	MHEV-C-040-50400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	5	**HS-400461**	MHEV-C-020-50400-R0.50
	6 mm	**0.5 mm**	13 mm	57 mm	5	**HS-400462**	MHEV-C-030-50400-R0.50
	6 mm	**0.5 mm**	17 mm	65 mm	5	**HS-400463**	MHEV-C-040-50400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	55 mm	5	**HS-400464**	MHEV-C-020-50500-R0.20
	6 mm	**0.2 mm**	16 mm	60 mm	5	**HS-400465**	MHEV-C-030-50500-R0.20
	6 mm	**0.2 mm**	21 mm	65 mm	5	**HS-400466**	MHEV-C-040-50500-R0.20
	6 mm	**0.5 mm**	11 mm	55 mm	5	**HS-400467**	MHEV-C-020-50500-R0.50
	6 mm	**0.5 mm**	16 mm	60 mm	5	**HS-400468**	MHEV-C-030-50500-R0.50
	6 mm	**0.5 mm**	21 mm	65 mm	5	**HS-400469**	MHEV-C-040-50500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	5	**HS-400470**	MHEV-C-020-50600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	5	**HS-400471**	MHEV-C-030-50600-R0.20
	6 mm	**0.2 mm**	26 mm	70 mm	5	**HS-400472**	MHEV-C-040-50600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	5	**HS-400473**	MHEV-C-020-50600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	5	**HS-400474**	MHEV-C-030-50600-R0.50
	6 mm	**0.5 mm**	26 mm	70 mm	5	**HS-400475**	MHEV-C-040-50600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	5	**HS-400476**	MHEV-C-020-50600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	5	**HS-400477**	MHEV-C-030-50600-R1.00
	6 mm	**1.0 mm**	26 mm	70 mm	5	**HS-400478**	MHEV-C-040-50600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	5	**HS-400479**	MHEV-C-020-50800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	5	**HS-400480**	MHEV-C-030-50800-R0.20
	8 mm	**0.2 mm**	34 mm	78 mm	5	**HS-400481**	MHEV-C-040-50800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	5	**HS-400482**	MHEV-C-020-50800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	5	**HS-400483**	MHEV-C-030-50800-R0.50
	8 mm	**0.5 mm**	34 mm	78 mm	5	**HS-400484**	MHEV-C-040-50800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	5	**HS-400485**	MHEV-C-020-50800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	5	**HS-400486**	MHEV-C-030-50800-R1.00
	8 mm	**1.0 mm**	34 mm	78 mm	5	**HS-400487**	MHEV-C-040-50800-R1.00

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Speeds & Feeds on Page 27

5 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch (cont.)

MHEV-C-5

continued from previous page

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	5	**HS-400488**	MHEV-C-020-51000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	5	**HS-400489**	MHEV-C-030-51000-R0.20
	10 mm	**0.2 mm**	42 mm	90 mm	5	**HS-400490**	MHEV-C-040-51000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	5	**HS-400491**	MHEV-C-020-51000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	5	**HS-400492**	MHEV-C-030-51000-R0.50
	10 mm	**0.5 mm**	42 mm	90 mm	5	**HS-400493**	MHEV-C-040-51000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	5	**HS-400494**	MHEV-C-020-51000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	5	**HS-400495**	MHEV-C-030-51000-R1.00
	10 mm	**1.0 mm**	42 mm	90 mm	5	**HS-400496**	MHEV-C-040-51000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	5	**HS-400497**	MHEV-C-020-51200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	5	**HS-400498**	MHEV-C-030-51200-R0.20
	12 mm	**0.2 mm**	50 mm	102 mm	5	**HS-400499**	MHEV-C-040-51200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	5	**HS-400500**	MHEV-C-020-51200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	5	**HS-400501**	MHEV-C-030-51200-R0.50
	12 mm	**0.5 mm**	50 mm	102 mm	5	**HS-400502**	MHEV-C-040-51200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	5	**HS-400503**	MHEV-C-020-51200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	5	**HS-400504**	MHEV-C-030-51200-R1.00
	12 mm	**1.0 mm**	50 mm	102 mm	5	**HS-400505**	MHEV-C-040-51200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	5	**HS-400506**	MHEV-C-020-51600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	5	**HS-400507**	MHEV-C-030-51600-R0.20
	16 mm	**0.2 mm**	66 mm	125 mm	5	**HS-400508**	MHEV-C-040-51600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	5	**HS-400509**	MHEV-C-020-51600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	5	**HS-400510**	MHEV-C-030-51600-R0.50
	16 mm	**0.5 mm**	66 mm	125 mm	5	**HS-400511**	MHEV-C-040-51600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	5	**HS-400512**	MHEV-C-020-51600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	5	**HS-400513**	MHEV-C-030-51600-R1.00
	16 mm	**1.0 mm**	66 mm	125 mm	5	**HS-400514**	MHEV-C-040-51600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	5	**HS-400515**	MHEV-C-020-52000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	5	**HS-400516**	MHEV-C-030-52000-R0.50
	20 mm	**0.5 mm**	82 mm	140 mm	5	**HS-400517**	MHEV-C-040-52000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	5	**HS-400518**	MHEV-C-020-52000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	5	**HS-400519**	MHEV-C-030-52000-R1.00
	20 mm	**1.0 mm**	82 mm	140 mm	5	**HS-400520**	MHEV-C-040-52000-R1.00

MHEV-C-5

SPEEDS & FEEDS

5 Flute - Chipbreaker Rougher - Variable Pitch

For an in depth material guide please see page 71

MHEV-C-5

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																	
				Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		Ø 16		Ø 20	
				Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.022	0.035	0.029	0.046	0.037	0.057	0.044	0.068	0.058	0.092	0.072	0.114	0.085	0.135	0.111	0.176	0.136	0.214
		75 - 98 HRB (450-770 N/mm²)	135	0.017	0.025	0.022	0.034	0.027	0.042	0.032	0.050	0.043	0.068	0.053	0.084	0.063	0.099	0.082	0.129	0.099	0.156
		21 - 36 HRC (785-1155 N/mm²)	125	0.011	0.016	0.014	0.022	0.018	0.027	0.021	0.032	0.028	0.044	0.034	0.054	0.040	0.064	0.053	0.083	0.064	0.101
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.014	0.022	0.019	0.029	0.023	0.036	0.028	0.043	0.037	0.058	0.046	0.072	0.054	0.086	0.070	0.112	0.086	0.136
		21 - 36 HRC (785-1155 N/mm²)	105	0.011	0.016	0.014	0.022	0.017	0.027	0.021	0.032	0.027	0.043	0.034	0.053	0.040	0.063	0.052	0.083	0.064	0.101
		36 - 50 HRC	80	0.009	0.014	0.012	0.019	0.015	0.023	0.018	0.028	0.024	0.038	0.030	0.047	0.035	0.055	0.045	0.072	0.055	0.088
		> 50 HRC	50	0.007	0.011	0.010	0.015	0.012	0.019	0.014	0.022	0.019	0.030	0.023	0.037	0.028	0.044	0.036	0.057	0.044	0.069
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.014	0.022	0.019	0.029	0.023	0.036	0.028	0.043	0.037	0.058	0.046	0.072	0.054	0.086	0.070	0.112	0.086	0.136
		21 - 36 HRC (785-1155 N/mm²)	80	0.011	0.017	0.015	0.024	0.019	0.029	0.022	0.034	0.029	0.046	0.036	0.057	0.043	0.068	0.056	0.089	0.068	0.107
		36 - 50 HRC	45	0.009	0.013	0.012	0.018	0.014	0.022	0.017	0.027	0.023	0.036	0.028	0.045	0.034	0.053	0.044	0.069	0.053	0.084
		> 50 HRC	30	0.007	0.011	0.009	0.015	0.012	0.018	0.014	0.022	0.019	0.029	0.023	0.037	0.028	0.044	0.036	0.056	0.043	0.069
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.019	0.029	0.025	0.039	0.031	0.047	0.037	0.057	0.049	0.077	0.060	0.094	0.071	0.112	0.092	0.146	0.113	0.178
		75 - 98 HRB (450-770 N/mm²)	80	0.013	0.020	0.017	0.027	0.021	0.032	0.025	0.039	0.033	0.053	0.041	0.065	0.049	0.077	0.063	0.100	0.077	0.122
		21 - 36 HRC (785-1155 N/mm²)	55	0.011	0.018	0.015	0.024	0.019	0.029	0.022	0.035	0.030	0.047	0.037	0.058	0.043	0.069	0.057	0.090	0.069	0.109
		36 - 50 HRC	45	0.010	0.016	0.013	0.021	0.017	0.026	0.020	0.031	0.027	0.042	0.033	0.052	0.039	0.062	0.051	0.080	0.062	0.098
		> 50 HRC	20	0.006	0.010	0.008	0.013	0.010	0.016	0.012	0.019	0.017	0.026	0.021	0.032	0.024	0.038	0.031	0.049	0.038	0.060
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.014	0.021	0.018	0.029	0.023	0.035	0.027	0.042	0.036	0.057	0.044	0.070	0.053	0.083	0.069	0.109	0.084	0.132
		21 - 36 HRC (785-1155 N/mm²)	70	0.012	0.019	0.016	0.026	0.021	0.032	0.025	0.038	0.033	0.052	0.040	0.064	0.047	0.075	0.062	0.098	0.075	0.119
		36 - 50 HRC	55	0.010	0.015	0.013	0.021	0.017	0.026	0.020	0.030	0.026	0.041	0.032	0.051	0.038	0.060	0.050	0.078	0.060	0.096
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.014	0.022	0.019	0.030	0.023	0.036	0.028	0.043	0.037	0.059	0.046	0.072	0.054	0.086	0.071	0.112	0.086	0.136
		21 - 36 HRC (785-1155 N/mm²)	85	0.012	0.019	0.016	0.026	0.021	0.032	0.024	0.038	0.032	0.051	0.040	0.063	0.047	0.075	0.061	0.097	0.075	0.118
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.010	0.016	0.014	0.022	0.017	0.027	0.021	0.032	0.027	0.043	0.034	0.053	0.040	0.063	0.052	0.082	0.063	0.100
		36 - 50 HRC	45	0.009	0.014	0.012	0.019	0.015	0.023	0.018	0.027	0.024	0.037	0.029	0.046	0.035	0.055	0.045	0.071	0.055	0.087
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.023	0.035	0.030	0.048	0.038	0.058	0.045	0.070	0.060	0.095	0.074	0.117	0.088	0.139	0.114	0.181	0.139	0.220
		21 - 36 HRC (785-1155 N/mm²)	115	0.012	0.019	0.017	0.026	0.021	0.032	0.025	0.038	0.033	0.052	0.040	0.064	0.047	0.075	0.062	0.098	0.075	0.119
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.014	0.023	0.019	0.030	0.024	0.037	0.029	0.044	0.038	0.060	0.047	0.074	0.056	0.088	0.073	0.115	0.088	0.139
		21 - 36 HRC (785-1155 N/mm²)	103	0.012	0.019	0.017	0.026	0.021	0.032	0.025	0.038	0.033	0.052	0.040	0.064	0.048	0.076	0.062	0.099	0.076	0.120
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.015	0.023	0.020	0.031	0.025	0.038	0.030	0.046	0.039	0.062	0.049	0.077	0.058	0.091	0.075	0.119	0.091	0.145
		21 - 36 HRC (785-1155 N/mm²)	80	0.010	0.016	0.013	0.021	0.017	0.026	0.020	0.030	0.026	0.041	0.033	0.051	0.039	0.061	0.050	0.079	0.061	0.096
		36 - 50 HRC	40	0.007	0.010	0.008	0.013	0.011	0.017	0.012	0.020	0.017	0.026	0.021	0.033	0.024	0.038	0.031	0.050	0.038	0.061
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.020	0.030	0.026	0.040	0.032	0.050	0.038	0.059	0.051	0.080	0.063	0.099	0.074	0.118	0.097	0.153	0.118	0.186
		75 - 98 HRB (450-770 N/mm²)	75	0.017	0.025	0.022	0.034	0.027	0.041	0.032	0.050	0.042	0.067	0.053	0.083	0.062	0.099	0.081	0.129	0.099	0.156
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.010	0.015	0.013	0.021	0.016	0.025	0.020	0.030	0.026	0.041	0.032	0.051	0.038	0.060	0.049	0.078	0.060	0.094
		21 - 36 HRC (785-1155 N/mm²)	23	0.009	0.014	0.012	0.020	0.016	0.024	0.019	0.029	0.025	0.039	0.030	0.049	0.036	0.057	0.047	0.075	0.057	0.091
		36 - 50 HRC	22	0.008	0.013	0.011	0.017	0.013	0.021	0.016	0.025	0.021	0.034	0.026	0.041	0.031	0.049	0.040	0.064	0.049	0.077
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.027	0.041	0.035	0.056	0.044	0.069	0.053	0.082	0.070	0.111	0.087	0.137	0.103	0.163	0.134	0.212	0.163	0.257
		75 - 98 HRB (450-770 N/mm²)	85	0.022	0.035	0.029	0.046	0.037	0.057	0.044	0.069	0.059	0.093	0.073	0.115	0.086	0.136	0.112	0.177	0.136	0.215
		21 - 36 HRC (785-1155 N/mm²)	75	0.017	0.026	0.022	0.035	0.028	0.043	0.033	0.052	0.044	0.070	0.055	0.086	0.065	0.102	0.084	0.133	0.102	0.162
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.013	0.021	0.018	0.028	0.022	0.034	0.026	0.041	0.035	0.055	0.043	0.068	0.051	0.081	0.066	0.105	0.081	0.128
		36 - 50 HRC	50	0.012	0.019	0.016	0.025	0.020	0.031	0.024	0.037	0.031	0.050	0.039	0.062	0.046	0.073	0.060	0.095	0.073	0.116
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.011	0.017	0.015	0.023	0.019	0.029	0.022	0.034	0.029	0.046	0.037	0.058	0.043	0.068	0.056	0.088	0.068	0.108
		21 - 36 HRC (785-1155 N/mm²)	55	0.011	0.017	0.014	0.023	0.018	0.028	0.022	0.034	0.028	0.045	0.035	0.056	0.041	0.066	0.054	0.086	0.066	0.104
		36 - 50 HRC	20	0.007	0.011	0.010	0.016	0.012	0.019	0.014	0.023	0.019	0.030	0.024	0.038	0.028	0.045	0.037	0.058	0.045	0.070

MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
Slot (Full Slotting)	< 35 HRC	30%-75% Diameter	100% Diameter
	≥ 35 HRC	25%-50% Diameter	100% Diameter
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	10%-30% Diameter
	≥ 35 HRC	Up to Max LOC	10%-30% Diameter

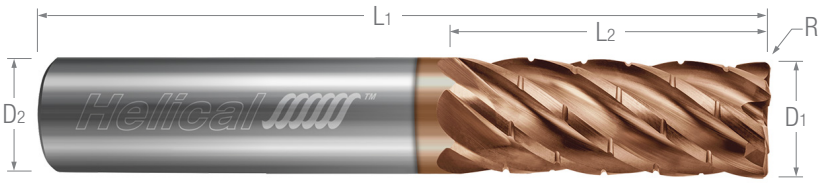
NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

6 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch

MHEV-C-6

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in High Efficiency Milling (HEM)
- 6 flute variable pitch and offset chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	6	**HS-400521**	MHEV-C-020-60600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	6	**HS-400522**	MHEV-C-030-60600-R0.20
	6 mm	**0.2 mm**	26 mm	70 mm	6	**HS-400523**	MHEV-C-040-60600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	6	**HS-400524**	MHEV-C-020-60600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	6	**HS-400525**	MHEV-C-030-60600-R0.50
	6 mm	**0.5 mm**	26 mm	70 mm	6	**HS-400526**	MHEV-C-040-60600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	6	**HS-400527**	MHEV-C-020-60600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	6	**HS-400528**	MHEV-C-030-60600-R1.00
	6 mm	**1.0 mm**	26 mm	70 mm	6	**HS-400529**	MHEV-C-040-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	6	**HS-400530**	MHEV-C-020-60800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	6	**HS-400531**	MHEV-C-030-60800-R0.20
	8 mm	**0.2 mm**	34 mm	78 mm	6	**HS-400532**	MHEV-C-040-60800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	6	**HS-400533**	MHEV-C-020-60800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	6	**HS-400534**	MHEV-C-030-60800-R0.50
	8 mm	**0.5 mm**	34 mm	78 mm	6	**HS-400535**	MHEV-C-040-60800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	6	**HS-400536**	MHEV-C-020-60800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	6	**HS-400537**	MHEV-C-030-60800-R1.00
	8 mm	**1.0 mm**	34 mm	78 mm	6	**HS-400538**	MHEV-C-040-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	6	**HS-400539**	MHEV-C-020-61000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	6	**HS-400540**	MHEV-C-030-61000-R0.20
	10 mm	**0.2 mm**	42 mm	90 mm	6	**HS-400541**	MHEV-C-040-61000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	6	**HS-400542**	MHEV-C-020-61000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	6	**HS-400543**	MHEV-C-030-61000-R0.50
	10 mm	**0.5 mm**	42 mm	90 mm	6	**HS-400544**	MHEV-C-040-61000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	6	**HS-400545**	MHEV-C-020-61000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	6	**HS-400546**	MHEV-C-030-61000-R1.00
	10 mm	**1.0 mm**	42 mm	90 mm	6	**HS-400547**	MHEV-C-040-61000-R1.00

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6 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch (cont.)

continued from previous page

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	6	**HS-400548**	MHEV-C-020-61200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	6	**HS-400549**	MHEV-C-030-61200-R0.20
	12 mm	**0.2 mm**	50 mm	102 mm	6	**HS-400550**	MHEV-C-040-61200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	6	**HS-400551**	MHEV-C-020-61200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	6	**HS-400552**	MHEV-C-030-61200-R0.50
	12 mm	**0.5 mm**	50 mm	102 mm	6	**HS-400553**	MHEV-C-040-61200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	6	**HS-400554**	MHEV-C-020-61200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	6	**HS-400555**	MHEV-C-030-61200-R1.00
	12 mm	**1.0 mm**	50 mm	102 mm	6	**HS-400556**	MHEV-C-040-61200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	6	**HS-400557**	MHEV-C-020-61600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	6	**HS-400558**	MHEV-C-030-61600-R0.20
	16 mm	**0.2 mm**	66 mm	125 mm	6	**HS-400559**	MHEV-C-040-61600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	6	**HS-400560**	MHEV-C-020-61600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	6	**HS-400561**	MHEV-C-030-61600-R0.50
	16 mm	**0.5 mm**	66 mm	125 mm	6	**HS-400562**	MHEV-C-040-61600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	6	**HS-400563**	MHEV-C-020-61600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	6	**HS-400564**	MHEV-C-030-61600-R1.00
	16 mm	**1.0 mm**	66 mm	125 mm	6	**HS-400565**	MHEV-C-040-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	6	**HS-400566**	MHEV-C-020-62000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	6	**HS-400567**	MHEV-C-030-62000-R0.50
	20 mm	**0.5 mm**	82 mm	140 mm	6	**HS-400568**	MHEV-C-040-62000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	6	**HS-400569**	MHEV-C-020-62000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	6	**HS-400570**	MHEV-C-030-62000-R1.00
	20 mm	**1.0 mm**	82 mm	140 mm	6	**HS-400571**	MHEV-C-040-62000-R1.00



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SPEEDS & FEEDS

6 Flute - Chipbreaker Rougher - Variable Pitch

MHEV-C-6

For an in depth material guide please see page 71

MHEV-C-6

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)								
				Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 16	Ø 20
				Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.033	0.045	0.055	0.065	0.089	0.110	0.130	0.170	0.206
		75 - 98 HRB (450-770 N/mm²)	135	0.024	0.033	0.040	0.048	0.065	0.080	0.095	0.124	0.151
		21 - 36 HRC (785-1155 N/mm²)	125	0.016	0.021	0.026	0.031	0.042	0.052	0.061	0.080	0.098
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.021	0.028	0.035	0.041	0.056	0.070	0.083	0.108	0.130
		21 - 36 HRC (785-1155 N/mm²)	105	0.016	0.021	0.026	0.031	0.042	0.052	0.061	0.080	0.097
		36 - 50 HRC	80	0.013	0.018	0.022	0.027	0.037	0.045	0.053	0.070	0.085
		> 50 HRC	50	0.011	0.014	0.018	0.021	0.029	0.036	0.042	0.055	0.067
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.021	0.028	0.035	0.041	0.056	0.070	0.083	0.107	0.130
		21 - 36 HRC (785-1155 N/mm²)	80	0.017	0.023	0.028	0.033	0.045	0.055	0.065	0.086	0.104
		36 - 50 HRC	45	0.013	0.018	0.022	0.026	0.035	0.043	0.051	0.067	0.081
		> 50 HRC	30	0.011	0.015	0.018	0.021	0.028	0.036	0.042	0.054	0.066
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.027	0.037	0.045	0.054	0.074	0.091	0.108	0.141	0.171
		75 - 98 HRB (450-770 N/mm²)	80	0.019	0.025	0.031	0.038	0.051	0.062	0.074	0.097	0.117
		21 - 36 HRC (785-1155 N/mm²)	55	0.017	0.023	0.028	0.034	0.046	0.056	0.066	0.086	0.105
		36 - 50 HRC	45	0.015	0.021	0.025	0.030	0.040	0.050	0.059	0.077	0.094
		> 50 HRC	20	0.009	0.012	0.015	0.018	0.025	0.031	0.037	0.047	0.058
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.020	0.027	0.034	0.040	0.055	0.068	0.080	0.105	0.127
		21 - 36 HRC (785-1155 N/mm²)	70	0.018	0.025	0.030	0.037	0.049	0.061	0.072	0.094	0.115
		36 - 50 HRC	55	0.014	0.020	0.024	0.029	0.040	0.049	0.058	0.076	0.092
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.021	0.028	0.035	0.041	0.056	0.070	0.083	0.108	0.131
		21 - 36 HRC (785-1155 N/mm²)	85	0.018	0.025	0.030	0.037	0.049	0.061	0.072	0.094	0.114
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.015	0.021	0.025	0.030	0.041	0.051	0.061	0.079	0.096
		36 - 50 HRC	45	0.013	0.018	0.022	0.026	0.036	0.045	0.052	0.069	0.083
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.034	0.046	0.056	0.068	0.091	0.113	0.133	0.174	0.211
		21 - 36 HRC (785-1155 N/mm²)	115	0.018	0.025	0.030	0.036	0.049	0.061	0.072	0.094	0.115
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.022	0.029	0.036	0.043	0.058	0.072	0.085	0.110	0.135
		21 - 36 HRC (785-1155 N/mm²)	103	0.019	0.025	0.030	0.037	0.050	0.062	0.073	0.095	0.115
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.022	0.030	0.037	0.044	0.060	0.074	0.088	0.115	0.139
		21 - 36 HRC (785-1155 N/mm²)	80	0.015	0.020	0.024	0.029	0.040	0.049	0.058	0.076	0.092
		36 - 50 HRC	40	0.010	0.013	0.016	0.019	0.025	0.031	0.037	0.049	0.058
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.029	0.039	0.047	0.057	0.078	0.096	0.113	0.148	0.179
		75 - 98 HRB (450-770 N/mm²)	75	0.024	0.033	0.040	0.048	0.065	0.080	0.094	0.124	0.150
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.014	0.020	0.024	0.029	0.039	0.049	0.058	0.075	0.091
		21 - 36 HRC (785-1155 N/mm²)	23	0.014	0.019	0.023	0.028	0.038	0.047	0.055	0.072	0.088
		36 - 50 HRC	22	0.012	0.017	0.020	0.024	0.032	0.040	0.047	0.062	0.075
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.040	0.054	0.066	0.079	0.107	0.132	0.156	0.204	0.248
		75 - 98 HRB (450-770 N/mm²)	85	0.033	0.045	0.055	0.066	0.089	0.111	0.131	0.171	0.208
		21 - 36 HRC (785-1155 N/mm²)	75	0.025	0.034	0.041	0.049	0.067	0.083	0.098	0.128	0.156
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.020	0.027	0.033	0.039	0.053	0.066	0.077	0.101	0.123
		36 - 50 HRC	50	0.018	0.024	0.030	0.036	0.048	0.060	0.071	0.092	0.112
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.017	0.023	0.027	0.033	0.045	0.055	0.065	0.085	0.104
		21 - 36 HRC (785-1155 N/mm²)	55	0.016	0.022	0.027	0.032	0.043	0.053	0.063	0.083	0.100
		36 - 50 HRC	20	0.011	0.015	0.018	0.022	0.029	0.037	0.043	0.056	0.068

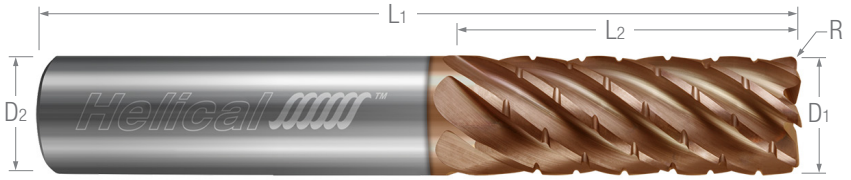
MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	15%-25% Diameter
	≥ 35 HRC	Up to Max LOC	10%-20% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

MHEV-C-7

7 FLUTE - CORNER RADIUS
Chipbreaker Rougher - Variable Pitch

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in light profiling, High Efficiency Milling (HEM)
- 7 flute variable pitch and offset chipbreaker geometry for optimal chip evacuation, reduced harmonics, and reduced tool pressure
- End cutting geometry (non-centre cutting)
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	7	**HS-400572**	MHEV-C-020-70600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	7	**HS-400573**	MHEV-C-030-70600-R0.20
	6 mm	**0.2 mm**	26 mm	70 mm	7	**HS-400574**	MHEV-C-040-70600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	7	**HS-400575**	MHEV-C-020-70600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	7	**HS-400576**	MHEV-C-030-70600-R0.50
	6 mm	**0.5 mm**	26 mm	70 mm	7	**HS-400577**	MHEV-C-040-70600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	7	**HS-400578**	MHEV-C-020-70600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	7	**HS-400579**	MHEV-C-030-70600-R1.00
	6 mm	**1.0 mm**	26 mm	70 mm	7	**HS-400580**	MHEV-C-040-70600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	7	**HS-400581**	MHEV-C-020-70800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	7	**HS-400582**	MHEV-C-030-70800-R0.20
	8 mm	**0.2 mm**	34 mm	78 mm	7	**HS-400583**	MHEV-C-040-70800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	7	**HS-400584**	MHEV-C-020-70800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	7	**HS-400585**	MHEV-C-030-70800-R0.50
	8 mm	**0.5 mm**	34 mm	78 mm	7	**HS-400586**	MHEV-C-040-70800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	7	**HS-400587**	MHEV-C-020-70800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	7	**HS-400588**	MHEV-C-030-70800-R1.00
	8 mm	**1.0 mm**	34 mm	78 mm	7	**HS-400589**	MHEV-C-040-70800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	7	**HS-400590**	MHEV-C-020-71000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	7	**HS-400591**	MHEV-C-030-71000-R0.20
	10 mm	**0.2 mm**	42 mm	90 mm	7	**HS-400592**	MHEV-C-040-71000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	7	**HS-400593**	MHEV-C-020-71000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	7	**HS-400594**	MHEV-C-030-71000-R0.50
	10 mm	**0.5 mm**	42 mm	90 mm	7	**HS-400595**	MHEV-C-040-71000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	7	**HS-400596**	MHEV-C-020-71000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	7	**HS-400597**	MHEV-C-030-71000-R1.00
	10 mm	**1.0 mm**	42 mm	90 mm	7	**HS-400598**	MHEV-C-040-71000-R1.00

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Speeds & Feeds on Page 33

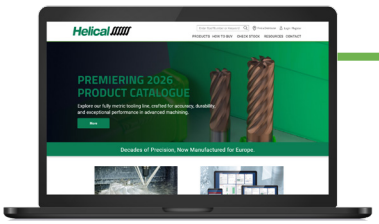
7 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch (cont.)

MHEV-C-7

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Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	7	**HS-400599**	MHEV-C-020-71200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	7	**HS-400600**	MHEV-C-030-71200-R0.20
	12 mm	**0.2 mm**	50 mm	102 mm	7	**HS-400601**	MHEV-C-040-71200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	7	**HS-400602**	MHEV-C-020-71200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	7	**HS-400603**	MHEV-C-030-71200-R0.50
	12 mm	**0.5 mm**	50 mm	102 mm	7	**HS-400604**	MHEV-C-040-71200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	7	**HS-400605**	MHEV-C-020-71200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	7	**HS-400606**	MHEV-C-030-71200-R1.00
	12 mm	**1.0 mm**	50 mm	102 mm	7	**HS-400607**	MHEV-C-040-71200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	7	**HS-400608**	MHEV-C-020-71600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	7	**HS-400609**	MHEV-C-030-71600-R0.20
	16 mm	**0.2 mm**	66 mm	125 mm	7	**HS-400610**	MHEV-C-040-71600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	7	**HS-400611**	MHEV-C-020-71600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	7	**HS-400612**	MHEV-C-030-71600-R0.50
	16 mm	**0.5 mm**	66 mm	125 mm	7	**HS-400613**	MHEV-C-040-71600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	7	**HS-400614**	MHEV-C-020-71600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	7	**HS-400615**	MHEV-C-030-71600-R1.00
	16 mm	**1.0 mm**	66 mm	125 mm	7	**HS-400616**	MHEV-C-040-71600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	7	**HS-400617**	MHEV-C-020-72000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	7	**HS-400618**	MHEV-C-030-72000-R0.50
	20 mm	**0.5 mm**	82 mm	140 mm	7	**HS-400619**	MHEV-C-040-72000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	7	**HS-400620**	MHEV-C-020-72000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	7	**HS-400621**	MHEV-C-030-72000-R1.00
	20 mm	**1.0 mm**	82 mm	140 mm	7	**HS-400622**	MHEV-C-040-72000-R1.00



Optimise Your Toolpath Before You Cut

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Helical Solutions offers Simulation Files in both .STEP and .DXF formats to streamline your programming process and ensure toolpath accuracy. Each file is precisely modelled to match the exact dimensions of your tool, allowing you to simulate machining parameters, create accurate toolpaths, and machine with confidence.

MHEV-C-7

SPEEDS & FEEDS

7 Flute - Chipbreaker Rougher - Variable Pitch

For an in depth material guide please see page 71

MHEV-C-7

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)								
				Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 16	Ø 20
				Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh	Rgh
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.038	0.050	0.060	0.075	0.097	0.121	0.141	0.185	0.226
		75 - 98 HRB (450-770 N/mm²)	135	0.028	0.036	0.043	0.054	0.071	0.088	0.103	0.135	0.166
		21 - 36 HRC (785-1155 N/mm²)	125	0.018	0.023	0.028	0.035	0.045	0.057	0.067	0.087	0.107
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.024	0.031	0.038	0.047	0.061	0.076	0.089	0.117	0.143
		21 - 36 HRC (785-1155 N/mm²)	105	0.018	0.023	0.028	0.035	0.046	0.057	0.066	0.087	0.106
		36 - 50 HRC	80	0.015	0.020	0.025	0.030	0.040	0.050	0.058	0.076	0.093
		> 50 HRC	50	0.012	0.016	0.020	0.024	0.031	0.039	0.045	0.060	0.073
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.024	0.031	0.038	0.047	0.061	0.076	0.089	0.117	0.143
		21 - 36 HRC (785-1155 N/mm²)	80	0.019	0.025	0.030	0.037	0.049	0.061	0.071	0.093	0.114
		36 - 50 HRC	45	0.015	0.020	0.024	0.029	0.038	0.047	0.055	0.072	0.089
		> 50 HRC	30	0.012	0.016	0.019	0.024	0.031	0.039	0.045	0.059	0.073
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.031	0.041	0.049	0.062	0.081	0.100	0.117	0.153	0.188
		75 - 98 HRB (450-770 N/mm²)	80	0.022	0.028	0.034	0.042	0.055	0.069	0.080	0.105	0.129
		21 - 36 HRC (785-1155 N/mm²)	55	0.019	0.025	0.030	0.038	0.049	0.061	0.072	0.094	0.116
		36 - 50 HRC	45	0.018	0.023	0.027	0.034	0.044	0.055	0.064	0.084	0.103
		> 50 HRC	20	0.011	0.014	0.017	0.021	0.027	0.034	0.039	0.052	0.064
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.023	0.030	0.037	0.046	0.060	0.074	0.087	0.114	0.140
		21 - 36 HRC (785-1155 N/mm²)	70	0.021	0.027	0.033	0.041	0.054	0.067	0.078	0.103	0.126
		36 - 50 HRC	55	0.017	0.022	0.027	0.033	0.043	0.054	0.063	0.082	0.101
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.024	0.032	0.038	0.048	0.061	0.077	0.089	0.117	0.144
		21 - 36 HRC (785-1155 N/mm²)	85	0.021	0.027	0.033	0.041	0.053	0.067	0.078	0.102	0.125
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.018	0.023	0.028	0.035	0.045	0.056	0.066	0.086	0.105
		36 - 50 HRC	45	0.015	0.020	0.024	0.030	0.039	0.049	0.057	0.075	0.091
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.039	0.051	0.061	0.077	0.099	0.124	0.144	0.189	0.232
		21 - 36 HRC (785-1155 N/mm²)	115	0.021	0.028	0.033	0.041	0.054	0.067	0.079	0.103	0.126
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.024	0.033	0.039	0.049	0.063	0.079	0.091	0.120	0.147
		21 - 36 HRC (785-1155 N/mm²)	103	0.021	0.028	0.033	0.042	0.054	0.068	0.079	0.104	0.127
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.026	0.034	0.040	0.050	0.065	0.082	0.095	0.125	0.153
		21 - 36 HRC (785-1155 N/mm²)	80	0.017	0.022	0.027	0.033	0.043	0.054	0.064	0.083	0.102
		36 - 50 HRC	40	0.011	0.014	0.017	0.021	0.028	0.035	0.040	0.052	0.065
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.033	0.043	0.052	0.065	0.084	0.105	0.122	0.161	0.197
		75 - 98 HRB (450-770 N/mm²)	75	0.027	0.036	0.043	0.055	0.070	0.088	0.102	0.134	0.165
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.017	0.022	0.026	0.033	0.043	0.054	0.062	0.082	0.100
		21 - 36 HRC (785-1155 N/mm²)	23	0.016	0.021	0.025	0.032	0.041	0.051	0.060	0.078	0.096
		36 - 50 HRC	22	0.014	0.018	0.022	0.027	0.035	0.044	0.051	0.067	0.082
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.045	0.059	0.072	0.090	0.116	0.145	0.169	0.222	0.272
		75 - 98 HRB (450-770 N/mm²)	85	0.038	0.050	0.060	0.075	0.098	0.121	0.141	0.186	0.228
		21 - 36 HRC (785-1155 N/mm²)	75	0.029	0.037	0.045	0.056	0.073	0.091	0.106	0.139	0.171
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.022	0.029	0.035	0.044	0.057	0.072	0.084	0.110	0.135
		36 - 50 HRC	50	0.021	0.027	0.032	0.040	0.053	0.066	0.076	0.100	0.123
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.019	0.025	0.030	0.037	0.049	0.061	0.071	0.093	0.114
		21 - 36 HRC (785-1155 N/mm²)	55	0.018	0.024	0.029	0.036	0.047	0.059	0.068	0.090	0.110
		36 - 50 HRC	20	0.013	0.017	0.020	0.025	0.032	0.040	0.046	0.061	0.075

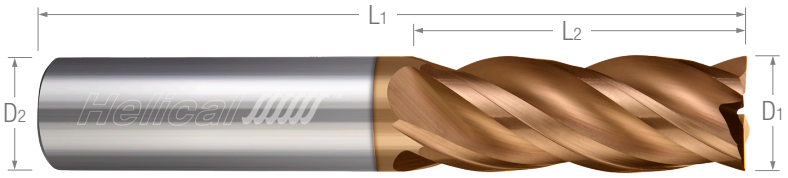
MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	10%-20% Diameter
	≥ 35 HRC	Up to Max LOC	10%-20% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

4 FLUTE - SQUARE
Variable Pitch

MHEV-4

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered with eccentric relief for maximum edge strength in both roughing and finishing applications
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



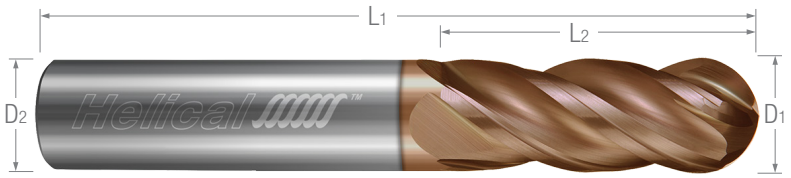
Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	4	HS-400822	MHEV-020-40300
	6 mm	10 mm	57 mm	4	HS-400823	MHEV-030-40300
4 mm	6 mm	9 mm	55 mm	4	HS-400824	MHEV-020-40400
	6 mm	13 mm	60 mm	4	HS-400825	MHEV-030-40400
5 mm	6 mm	11 mm	57 mm	4	HS-400826	MHEV-020-40500
	6 mm	16 mm	65 mm	4	HS-400827	MHEV-030-40500
6 mm	6 mm	14 mm	57 mm	4	HS-400828	MHEV-020-40600
	6 mm	20 mm	65 mm	4	HS-400829	MHEV-030-40600
8 mm	8 mm	18 mm	60 mm	4	HS-400830	MHEV-020-40800
	8 mm	26 mm	68 mm	4	HS-400831	MHEV-030-40800
10 mm	10 mm	22 mm	70 mm	4	HS-400832	MHEV-020-41000
	10 mm	32 mm	80 mm	4	HS-400833	MHEV-030-41000
12 mm	12 mm	26 mm	78 mm	4	HS-400834	MHEV-020-41200
	12 mm	38 mm	90 mm	4	HS-400835	MHEV-030-41200
16 mm	16 mm	34 mm	90 mm	4	HS-400836	MHEV-020-41600
	16 mm	50 mm	108 mm	4	HS-400837	MHEV-030-41600
20 mm	20 mm	42 mm	102 mm	4	HS-400838	MHEV-020-42000
	20 mm	62 mm	125 mm	4	HS-400839	MHEV-030-42000

Speeds & Feeds on Page 41

MHEV-4

4 FLUTE - BALL
Variable Pitch

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered with eccentric relief for maximum edge strength in both roughing and finishing applications
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 +0.7mm +0.0mm	Overall Length L_1 +1.5mm −1.5mm	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	4	**HS-400840**	MHEV-020-40300-BN
4 mm	6 mm	9 mm	55 mm	4	**HS-400841**	MHEV-020-40400-BN
5 mm	6 mm	11 mm	57 mm	4	**HS-400842**	MHEV-020-40500-BN
6 mm	6 mm	14 mm	57 mm	4	**HS-400843**	MHEV-020-40600-BN
8 mm	8 mm	18 mm	60 mm	4	**HS-400844**	MHEV-020-40800-BN
10 mm	10 mm	22 mm	70 mm	4	**HS-400845**	MHEV-020-41000-BN
12 mm	12 mm	26 mm	78 mm	4	**HS-400846**	MHEV-020-41200-BN
16 mm	16 mm	34 mm	90 mm	4	**HS-400847**	MHEV-020-41600-BN
20 mm	20 mm	42 mm	102 mm	4	**HS-400848**	MHEV-020-42000-BN

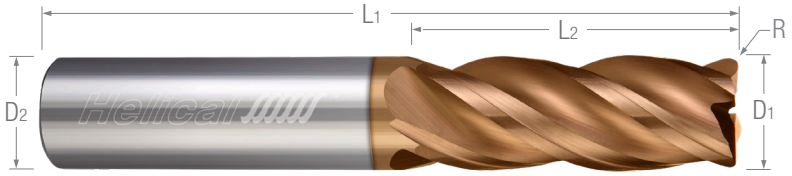
Speeds & Feeds on Page 41

4 FLUTE - CORNER RADIUS

Variable Pitch

MHEV-4

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered with eccentric relief for maximum edge strength in both roughing and finishing applications
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	4	**HS-400849**	MHEV-020-40300-R0.20
	6 mm	**0.2 mm**	10 mm	57 mm	4	**HS-400850**	MHEV-030-40300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	4	**HS-400851**	MHEV-020-40300-R0.50
	6 mm	**0.5 mm**	10 mm	57 mm	4	**HS-400852**	MHEV-030-40300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	4	**HS-400853**	MHEV-020-40400-R0.20
	6 mm	**0.2 mm**	13 mm	60 mm	4	**HS-400854**	MHEV-030-40400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	4	**HS-400855**	MHEV-020-40400-R0.50
	6 mm	**0.5 mm**	13 mm	60 mm	4	**HS-400856**	MHEV-030-40400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	4	**HS-400857**	MHEV-020-40500-R0.20
	6 mm	**0.2 mm**	16 mm	65 mm	4	**HS-400858**	MHEV-030-40500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	4	**HS-400859**	MHEV-020-40500-R0.50
	6 mm	**0.5 mm**	16 mm	65 mm	4	**HS-400860**	MHEV-030-40500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	4	**HS-400861**	MHEV-020-40600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	4	**HS-400862**	MHEV-030-40600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	4	**HS-400863**	MHEV-020-40600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	4	**HS-400864**	MHEV-030-40600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	4	**HS-400865**	MHEV-020-40600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	4	**HS-400866**	MHEV-030-40600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	4	**HS-400867**	MHEV-020-40800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	4	**HS-400868**	MHEV-030-40800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	4	**HS-400869**	MHEV-020-40800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	4	**HS-400870**	MHEV-030-40800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	4	**HS-400871**	MHEV-020-40800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	4	**HS-400872**	MHEV-030-40800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	4	**HS-400873**	MHEV-020-41000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	4	**HS-400874**	MHEV-030-41000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	4	**HS-400875**	MHEV-020-41000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	4	**HS-400876**	MHEV-030-41000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	4	**HS-400877**	MHEV-020-41000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	4	**HS-400878**	MHEV-030-41000-R1.00

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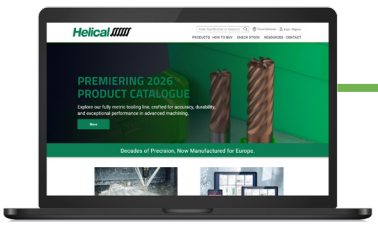
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MHEV-4

4 FLUTE - CORNER RADIUS
Variable Pitch (cont.)

continued from previous page

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	*Tplus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	4	**HS-400879**	MHEV-020-41200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	4	**HS-400880**	MHEV-030-41200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	4	**HS-400881**	MHEV-020-41200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	4	**HS-400882**	MHEV-030-41200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	4	**HS-400883**	MHEV-020-41200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	4	**HS-400884**	MHEV-030-41200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	4	**HS-400885**	MHEV-020-41600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	4	**HS-400886**	MHEV-030-41600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	4	**HS-400887**	MHEV-020-41600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	4	**HS-400888**	MHEV-030-41600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	4	**HS-400889**	MHEV-020-41600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	4	**HS-400890**	MHEV-030-41600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	4	**HS-400891**	MHEV-020-42000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	4	**HS-400892**	MHEV-030-42000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	4	**HS-400893**	MHEV-020-42000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	4	**HS-400894**	MHEV-030-42000-R1.00



Expansive Stock Check

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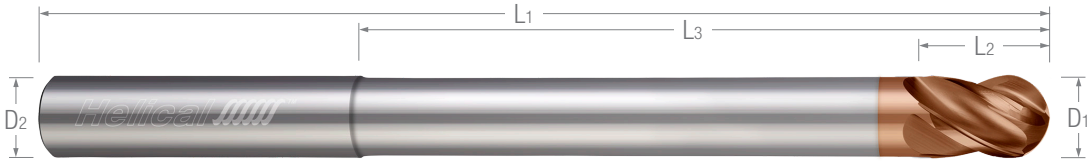
Check real-time availability of as many as 50 tools at once to simplify the order planning process and spend more time where it counts: at the spindle.

4 FLUTE - BALL

Variable Pitch - Reduced Neck

MHEV-RN-4

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered with eccentric relief for maximum edge strength in both roughing and finishing applications
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 +0.7mm +0.0mm	Overall Length L_1 +1.5mm −1.5mm	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	3 mm	55 mm	10 mm	2.85 mm	4	HS-400895	MHEV-RN-030-40300-BN
	6 mm	3 mm	57 mm	13 mm	2.85 mm	4	HS-400896	MHEV-RN-040-40300-BN
4 mm	6 mm	4 mm	55 mm	13 mm	3.80 mm	4	HS-400897	MHEV-RN-030-40400-BN
	6 mm	4 mm	60 mm	17 mm	3.80 mm	4	HS-400898	MHEV-RN-040-40400-BN
5 mm	6 mm	5 mm	57 mm	16 mm	4.75 mm	4	HS-400899	MHEV-RN-030-40500-BN
	6 mm	5 mm	65 mm	21 mm	4.75 mm	4	HS-400900	MHEV-RN-040-40500-BN
6 mm	6 mm	6 mm	60 mm	20 mm	5.70 mm	4	HS-400901	MHEV-RN-030-40600-BN
	6 mm	6 mm	65 mm	26 mm	5.70 mm	4	HS-400902	MHEV-RN-040-40600-BN
8 mm	8 mm	8 mm	65 mm	26 mm	7.60 mm	4	HS-400903	MHEV-RN-030-40800-BN
	8 mm	8 mm	78 mm	34 mm	7.60 mm	4	HS-400904	MHEV-RN-040-40800-BN
10 mm	10 mm	10 mm	75 mm	32 mm	9.50 mm	4	HS-400905	MHEV-RN-030-41000-BN
	10 mm	10 mm	90 mm	42 mm	9.50 mm	4	HS-400906	MHEV-RN-040-41000-BN
12 mm	12 mm	12 mm	90 mm	38 mm	11.40 mm	4	HS-400907	MHEV-RN-030-41200-BN
	12 mm	12 mm	102 mm	50 mm	11.40 mm	4	HS-400908	MHEV-RN-040-41200-BN
16 mm	16 mm	16 mm	102 mm	50 mm	15.20 mm	4	HS-400909	MHEV-RN-030-41600-BN
	16 mm	16 mm	125 mm	66 mm	15.20 mm	4	HS-400910	MHEV-RN-040-41600-BN
20 mm	20 mm	20 mm	125 mm	62 mm	19.00 mm	4	HS-400911	MHEV-RN-030-42000-BN
	20 mm	20 mm	140 mm	82 mm	19.00 mm	4	HS-400912	MHEV-RN-040-42000-BN

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MHEV-RN-4

4 FLUTE - CORNER RADIUS
Variable Pitch - Reduced Neck

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered with eccentric relief for maximum edge strength in both roughing and finishing applications
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	4	**HS-400913**	MHEV-RN-030-40300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	4	**HS-400914**	MHEV-RN-040-40300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	4	**HS-400915**	MHEV-RN-030-40300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	4	**HS-400916**	MHEV-RN-040-40300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	4	**HS-400917**	MHEV-RN-030-40400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	4	**HS-400918**	MHEV-RN-040-40400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	4	**HS-400919**	MHEV-RN-030-40400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	4	**HS-400920**	MHEV-RN-040-40400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	4	**HS-400921**	MHEV-RN-030-40500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	4	**HS-400922**	MHEV-RN-040-40500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	4	**HS-400923**	MHEV-RN-030-40500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	4	**HS-400924**	MHEV-RN-040-40500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	4	**HS-400925**	MHEV-RN-030-40600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	4	**HS-400926**	MHEV-RN-040-40600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	4	**HS-400927**	MHEV-RN-030-40600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	4	**HS-400928**	MHEV-RN-040-40600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	4	**HS-400929**	MHEV-RN-030-40600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	4	**HS-400930**	MHEV-RN-040-40600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	4	**HS-400931**	MHEV-RN-030-40800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	4	**HS-400932**	MHEV-RN-040-40800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	4	**HS-400933**	MHEV-RN-030-40800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	4	**HS-400934**	MHEV-RN-040-40800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	4	**HS-400935**	MHEV-RN-030-40800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	4	**HS-400936**	MHEV-RN-040-40800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	4	**HS-400937**	MHEV-RN-030-41000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	4	**HS-400938**	MHEV-RN-040-41000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	4	**HS-400939**	MHEV-RN-030-41000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	4	**HS-400940**	MHEV-RN-040-41000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	4	**HS-400941**	MHEV-RN-030-41000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	4	**HS-400942**	MHEV-RN-040-41000-R1.00

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4 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck (cont.)

MHEV-RN-4

continued from previous page

Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	4	**HS-400943**	MHEV-RN-030-41200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	4	**HS-400944**	MHEV-RN-040-41200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	4	**HS-400945**	MHEV-RN-030-41200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	4	**HS-400946**	MHEV-RN-040-41200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	4	**HS-400947**	MHEV-RN-030-41200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	4	**HS-400948**	MHEV-RN-040-41200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	4	**HS-400949**	MHEV-RN-030-41600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	4	**HS-400950**	MHEV-RN-040-41600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	4	**HS-400951**	MHEV-RN-030-41600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	4	**HS-400952**	MHEV-RN-040-41600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	4	**HS-400953**	MHEV-RN-030-41600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	4	**HS-400954**	MHEV-RN-040-41600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	4	**HS-400955**	MHEV-RN-030-42000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	4	**HS-400956**	MHEV-RN-040-42000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	4	**HS-400957**	MHEV-RN-030-42000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	4	**HS-400958**	MHEV-RN-040-42000-R1.00

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MHEV-4

SPEEDS & FEEDS

4 Flute - Variable Pitch

For an in depth material guide please see page 71

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Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																																						
				Ø 3			Ø 4			Ø 5			Ø 6			Ø 8			Ø 10			Ø 12			Ø 16			Ø 20														
				Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin														
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.017	0.029	0.042	0.022	0.039	0.044	0.027	0.048	0.047	0.033	0.058	0.053	0.044	0.077	0.057	0.054	0.095	0.061	0.064	0.113	0.071	0.083	0.146	0.077	0.101	0.178	0.085												
		75 - 98 HRB (450-770 N/mm²)	135	0.012	0.021	0.036	0.016	0.028	0.038	0.020	0.035	0.040	0.024	0.042	0.045	0.032	0.056	0.049	0.040	0.069	0.053	0.047	0.083	0.062	0.061	0.107	0.066	0.074	0.130	0.072												
		21 - 36 HRC (785-1155 N/mm²)	125	0.008	0.014	0.028	0.010	0.018	0.030	0.013	0.023	0.032	0.015	0.027	0.037	0.021	0.036	0.039	0.026	0.045	0.042	0.030	0.054	0.049	0.040	0.069	0.053	0.048	0.084	0.058												
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.011	0.019	0.033	0.014	0.024	0.035	0.018	0.031	0.037	0.021	0.037	0.042	0.028	0.049	0.045	0.034	0.060	0.049	0.041	0.071	0.057	0.053	0.092	0.062	0.064	0.112	0.068												
		21 - 36 HRC (785-1155 N/mm²)	105	0.008	0.014	0.028	0.010	0.018	0.030	0.013	0.023	0.032	0.015	0.027	0.036	0.021	0.036	0.039	0.025	0.044	0.042	0.030	0.053	0.049	0.039	0.069	0.053	0.048	0.084	0.058												
		36 - 50 HRC	80	0.007	0.012	0.027	0.009	0.016	0.028	0.011	0.020	0.030	0.013	0.024	0.034	0.018	0.031	0.037	0.022	0.039	0.039	0.026	0.046	0.046	0.034	0.060	0.050	0.042	0.073	0.055												
		> 50 HRC	50	0.006	0.010	0.024	0.007	0.012	0.025	0.009	0.016	0.027	0.011	0.019	0.029	0.014	0.025	0.032	0.018	0.031	0.035	0.021	0.037	0.041	0.027	0.047	0.044	0.033	0.058	0.049												
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.011	0.019	0.033	0.014	0.024	0.035	0.018	0.031	0.037	0.021	0.037	0.042	0.028	0.049	0.045	0.034	0.060	0.049	0.041	0.071	0.057	0.053	0.092	0.062	0.064	0.112	0.068												
		21 - 36 HRC (785-1155 N/mm²)	80	0.008	0.015	0.030	0.011	0.020	0.031	0.014	0.024	0.034	0.017	0.029	0.038	0.022	0.039	0.040	0.027	0.048	0.044	0.032	0.057	0.051	0.042	0.073	0.055	0.051	0.089	0.060												
		36 - 50 HRC	45	0.007	0.011	0.026	0.009	0.015	0.028	0.011	0.019	0.029	0.013	0.023	0.034	0.017	0.030	0.036	0.021	0.037	0.038	0.025	0.044	0.045	0.033	0.058	0.048	0.040	0.070	0.053												
		> 50 HRC	30	0.005	0.009	0.023	0.007	0.012	0.025	0.009	0.015	0.026	0.011	0.019	0.030	0.014	0.025	0.032	0.017	0.030	0.035	0.021	0.037	0.041	0.027	0.047	0.044	0.033	0.057	0.049												
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.014	0.024	0.038	0.018	0.032	0.040	0.023	0.040	0.042	0.027	0.048	0.049	0.036	0.064	0.052	0.045	0.078	0.056	0.053	0.093	0.065	0.069	0.121	0.071	0.084	0.147	0.077												
		75 - 98 HRB (450-770 N/mm²)	80	0.010	0.017	0.032	0.013	0.022	0.033	0.016	0.027	0.035	0.019	0.033	0.040	0.025	0.044	0.043	0.031	0.054	0.046	0.037	0.064	0.054	0.048	0.083	0.059	0.058	0.101	0.064												
		21 - 36 HRC (785-1155 N/mm²)	55	0.009	0.015	0.030	0.011	0.020	0.031	0.014	0.025	0.034	0.017	0.029	0.038	0.022	0.039	0.041	0.027	0.048	0.044	0.033	0.058	0.051	0.042	0.074	0.056	0.052	0.091	0.061												
		36 - 50 HRC	45	0.008	0.013	0.028	0.010	0.018	0.030	0.012	0.022	0.031	0.015	0.027	0.036	0.020	0.035	0.038	0.025	0.043	0.041	0.029	0.052	0.048	0.038	0.067	0.053	0.046	0.081	0.058												
		> 50 HRC	20	0.005	0.008	0.022	0.006	0.011	0.023	0.008	0.013	0.024	0.009	0.016	0.028	0.012	0.022	0.030	0.015	0.026	0.033	0.018	0.032	0.038	0.023	0.041	0.041	0.028	0.050	0.045												
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.010	0.018	0.033	0.014	0.024	0.035	0.017	0.030	0.037	0.021	0.036	0.042	0.027	0.047	0.045	0.033	0.058	0.048	0.039	0.070	0.057	0.051	0.090	0.061	0.062	0.110	0.067												
		21 - 36 HRC (785-1155 N/mm²)	70	0.009	0.016	0.031	0.012	0.021	0.033	0.015	0.027	0.035	0.018	0.032	0.040	0.024	0.042	0.042	0.030	0.053	0.046	0.036	0.063	0.053	0.046	0.082	0.058	0.056	0.099	0.063												
		36 - 50 HRC	55	0.007	0.013	0.027	0.010	0.017	0.029	0.012	0.022	0.031	0.015	0.026	0.036	0.019	0.034	0.038	0.024	0.042	0.041	0.029	0.051	0.048	0.037	0.065	0.052	0.045	0.080	0.057												
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.011	0.019	0.033	0.014	0.025	0.035	0.018	0.031	0.037	0.021	0.037	0.042	0.028	0.049	0.045	0.034	0.060	0.049	0.041	0.072	0.057	0.053	0.093	0.062	0.064	0.113	0.068												
		21 - 36 HRC (785-1155 N/mm²)	85	0.009	0.016	0.031	0.012	0.021	0.033	0.015	0.027	0.035	0.018	0.032	0.040	0.024	0.042	0.042	0.030	0.052	0.045	0.036	0.062	0.053	0.046	0.081	0.057	0.056	0.098	0.063												
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.008	0.013	0.028	0.010	0.018	0.030	0.013	0.023	0.032	0.015	0.027	0.036	0.020	0.036	0.039	0.025	0.044	0.041	0.030	0.053	0.048	0.039	0.068	0.053	0.047	0.083	0.058												
		36 - 50 HRC	45	0.007	0.012	0.027	0.009	0.016	0.028	0.011	0.020	0.030	0.013	0.023	0.034	0.018	0.031	0.036	0.022	0.038	0.039	0.026	0.046	0.045	0.034	0.059	0.049	0.041	0.072	0.054												
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.017	0.030	0.042	0.023	0.040	0.045	0.028	0.050	0.047	0.034	0.059	0.054	0.045	0.079	0.058	0.055	0.097	0.062	0.066	0.116	0.072	0.086	0.150	0.079	0.104	0.182	0.086												
		21 - 36 HRC (785-1155 N/mm²)	115	0.009	0.017	0.031	0.012	0.022	0.033	0.015	0.027	0.035	0.019	0.032	0.040	0.024	0.043	0.042	0.030	0.053	0.046	0.036	0.063	0.053	0.046	0.081	0.057	0.057	0.099	0.064												
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.011	0.019	0.033	0.014	0.025	0.036	0.018	0.031	0.038	0.022	0.038	0.043	0.028	0.050	0.046	0.035	0.062	0.049	0.042	0.073	0.058	0.054	0.095	0.063	0.066	0.116	0.068												
		21 - 36 HRC (785-1155 N/mm²)	103	0.009	0.017	0.031	0.012	0.022	0.033	0.015	0.027	0.035	0.019	0.033	0.040	0.025	0.043	0.043	0.030	0.053	0.045	0.036	0.063	0.054	0.047	0.082	0.059	0.057	0.100	0.064												
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.011	0.020	0.034	0.015	0.026	0.037	0.019	0.033	0.039	0.022	0.039	0.044	0.030	0.052	0.047	0.037	0.064	0.051	0.043	0.076	0.059	0.056	0.099	0.064	0.069	0.120	0.070												
		21 - 36 HRC (785-1155 N/mm²)	80	0.007	0.013	0.028	0.010	0.018	0.029	0.012	0.022	0.031	0.015	0.026	0.035	0.020	0.035	0.038	0.024	0.042	0.041	0.029	0.051	0.048	0.037	0.066	0.052	0.045	0.080	0.057												
		36 - 50 HRC	40	0.005	0.008	0.022	0.006	0.011	0.023	0.008	0.014	0.025	0.009	0.017	0.028	0.012	0.022	0.030	0.015	0.027	0.033	0.018	0.032	0.038	0.024	0.041	0.041	0.029	0.050	0.045												
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.014	0.025	0.039	0.019	0.034	0.041	0.024	0.042	0.044	0.029	0.051	0.050	0.038	0.067	0.053	0.047	0.082	0.057	0.056	0.098	0.067	0.073	0.127	0.073	0.088	0.155	0.080												
		75 - 98 HRB (450-770 N/mm²)	75	0.012	0.021	0.035	0.016	0.028	0.038	0.020	0.035	0.040	0.024	0.042	0.045	0.032	0.056	0.049	0.039	0.069	0.052	0.047	0.082	0.061	0.061	0.106	0.067	0.074	0.130	0.072												
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.007	0.013	0.028	0.010	0.017	0.029	0.012	0.021	0.031	0.015	0.025	0.035	0.019	0.034	0.038	0.024	0.042	0.041	0.028	0.050	0.047	0.037	0.065	0.052	0.045	0.079	0.056												
		21 - 36 HRC (785-1155 N/mm²)	23	0.007	0.013	0.027	0.009	0.017	0.029	0.012	0.020	0.030	0.014	0.024	0.034	0.019	0.033	0.037	0.023	0.040	0.040	0.027	0.048	0.046	0.036	0.062	0.051	0.043	0.075	0.055												
		36 - 50 HRC	22	0.006	0.011	0.025	0.008	0.014	0.027	0.010	0.018	0.028	0.012	0.021	0.032	0.016	0.028	0.034	0.020	0.035	0.037	0.023	0.041	0.043	0.030	0.053	0.047	0.037	0.064	0.052												
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.020	0.035	0.045	0.027	0.046	0.049	0.033	0.058	0.052	0.040	0.070	0.059	0.053	0.092	0.062	0.065	0.114	0.067	0.077	0.136	0.078	0.100	0.176	0.085	0.122	0.213	0.093												
		75 - 98 HRB (450-770 N/mm²)	85	0.017	0.029	0.042	0.022	0.039	0.045	0.028	0.049	0.047	0.033	0.058	0.053	0.044	0.077	0.057	0.054	0.095	0.061	0.065	0.114	0.072	0.084	0.147	0.078	0.102	0.179	0.085												
		21 - 36 HRC (785-1155 N/mm²)	75	0.013	0.022	0.036	0.017	0.029	0.038	0.021	0.036	0.040	0.025	0.043	0.046	0.033	0.058	0.050	0.041	0.072	0.054	0.048	0.085	0.063	0.063	0.110	0.068	0.076	0.134	0.074												
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.010	0.017	0.032	0.013	0.023	0.035	0.017	0.029	0.036	0.020	0.035	0.041	0.026	0.046	0.044	0.032	0.056	0.047	0.038	0.067	0.055	0.050	0.087	0.060	0.060	0.106	0.066												
		36 - 50 HRC	50	0.009	0.016	0.030	0.012	0.021	0.033	0.015	0.026	0.035	0.018	0.031	0.039	0.024	0.042	0.042	0.029	0.051	0.045	0.035	0.061	0.053	0.045	0.079	0.057	0.055	0.096	0.062												
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.008	0.014	0.029	0.011	0.019	0.031	0.014	0.024	0.033	0.017	0.029	0.038	0.022	0.039	0.040	0.027	0.048	0.043	0.032	0.057	0.051	0.042	0.074	0.055	0.051	0.089	0.060												
		21 - 36 HRC (785-1155 N/mm²)	55	0.008	0.014	0.029	0.011	0.019	0.031	0.013	0.023	0.033	0.016	0.028	0.037	0.021	0.037	0.039	0.026	0.046	0.043	0.031	0.055	0.050	0.041	0.071	0.054	0.050	0.087	0.059												
		36 - 50 HRC	20	0.006	0.010	0.023	0.007	0.013	0.025	0.009	0.016	0.027	0.011	0.019	0.031	0.014	0.025	0.033	0.018	0.031	0.035	0.021	0.037	0.041	0.027	0.049	0.045	0.034	0.059	0.049												

MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
Slot (Full Slotting)	< 35 HRC	75%-125% Diameter	100% Diameter
	≥ 35 HRC	60%-100% Diameter	100% Diameter
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	30%-40% Diameter
	≥ 35 HRC	Up to Max LOC	25%-35% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

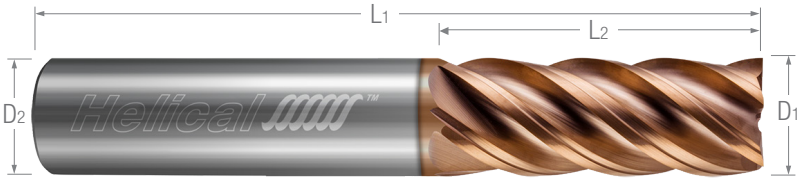
NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C

Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

5 FLUTE - SQUARE
Variable Pitch

MHEV-5

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Engineered for excellent performance in light profiling, High Efficiency Milling (HEM), and finishing applications
- 5 flute variable pitch design for reduced harmonics and increased feed rates
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	5	**HS-400122**	MHEV-020-50300
	6 mm	10 mm	57 mm	5	**HS-400123**	MHEV-030-50300
4 mm	6 mm	9 mm	55 mm	5	**HS-400124**	MHEV-020-50400
	6 mm	13 mm	57 mm	5	**HS-400125**	MHEV-030-50400
5 mm	6 mm	11 mm	57 mm	5	**HS-400126**	MHEV-020-50500
	6 mm	16 mm	60 mm	5	**HS-400127**	MHEV-030-50500
6 mm	6 mm	14 mm	55 mm	5	**HS-400128**	MHEV-020-50600
	6 mm	20 mm	60 mm	5	**HS-400129**	MHEV-030-50600
8 mm	8 mm	18 mm	60 mm	5	**HS-400130**	MHEV-020-50800
	8 mm	26 mm	68 mm	5	**HS-400131**	MHEV-030-50800
10 mm	10 mm	22 mm	70 mm	5	**HS-400132**	MHEV-020-51000
	10 mm	32 mm	80 mm	5	**HS-400133**	MHEV-030-51000
12 mm	12 mm	26 mm	78 mm	5	**HS-400134**	MHEV-020-51200
	12 mm	38 mm	90 mm	5	**HS-400135**	MHEV-030-51200
16 mm	16 mm	34 mm	90 mm	5	**HS-400136**	MHEV-020-51600
	16 mm	50 mm	108 mm	5	**HS-400137**	MHEV-030-51600
20 mm	20 mm	42 mm	102 mm	5	**HS-400138**	MHEV-020-52000
	20 mm	62 mm	125 mm	5	**HS-400139**	MHEV-030-52000

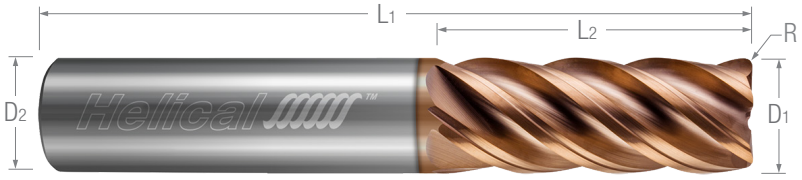
Speeds & Feeds on Page 47

MHEV-5

5 FLUTE - CORNER RADIUS

Variable Pitch

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Engineered for excellent performance in light profiling, High Efficiency Milling (HEM), and finishing applications
- 5 flute variable pitch design for reduced harmonics and increased feed rates
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	5	**HS-400140**	MHEV-020-50300-R0.20
	6 mm	**0.2 mm**	10 mm	57 mm	5	**HS-400141**	MHEV-030-50300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	5	**HS-400142**	MHEV-020-50300-R0.50
	6 mm	**0.5 mm**	10 mm	57 mm	5	**HS-400143**	MHEV-030-50300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	5	**HS-400144**	MHEV-020-50400-R0.20
	6 mm	**0.2 mm**	13 mm	57 mm	5	**HS-400145**	MHEV-030-50400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	5	**HS-400146**	MHEV-020-50400-R0.50
	6 mm	**0.5 mm**	13 mm	57 mm	5	**HS-400147**	MHEV-030-50400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	5	**HS-400148**	MHEV-020-50500-R0.20
	6 mm	**0.2 mm**	16 mm	60 mm	5	**HS-400149**	MHEV-030-50500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	5	**HS-400150**	MHEV-020-50500-R0.50
	6 mm	**0.5 mm**	16 mm	60 mm	5	**HS-400151**	MHEV-030-50500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	55 mm	5	**HS-400152**	MHEV-020-50600-R0.20
	6 mm	**0.2 mm**	20 mm	60 mm	5	**HS-400153**	MHEV-030-50600-R0.20
	6 mm	**0.5 mm**	14 mm	55 mm	5	**HS-400154**	MHEV-020-50600-R0.50
	6 mm	**0.5 mm**	20 mm	60 mm	5	**HS-400155**	MHEV-030-50600-R0.50
	6 mm	**1.0 mm**	14 mm	55 mm	5	**HS-400156**	MHEV-020-50600-R1.00
	6 mm	**1.0 mm**	20 mm	60 mm	5	**HS-400157**	MHEV-030-50600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	5	**HS-400158**	MHEV-020-50800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	5	**HS-400159**	MHEV-030-50800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	5	**HS-400160**	MHEV-020-50800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	5	**HS-400161**	MHEV-030-50800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	5	**HS-400162**	MHEV-020-50800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	5	**HS-400163**	MHEV-030-50800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	5	**HS-400164**	MHEV-020-51000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	5	**HS-400165**	MHEV-030-51000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	5	**HS-400166**	MHEV-020-51000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	5	**HS-400167**	MHEV-030-51000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	5	**HS-400168**	MHEV-020-51000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	5	**HS-400169**	MHEV-030-51000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	5	**HS-400170**	MHEV-020-51200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	5	**HS-400171**	MHEV-030-51200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	5	**HS-400172**	MHEV-020-51200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	5	**HS-400173**	MHEV-030-51200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	5	**HS-400174**	MHEV-020-51200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	5	**HS-400175**	MHEV-030-51200-R1.00

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5 FLUTE - CORNER RADIUS

Variable Pitch (cont.)

MHEV-5

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Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	5	**HS-400176**	MHEV-020-51600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	5	**HS-400177**	MHEV-030-51600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	5	**HS-400178**	MHEV-020-51600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	5	**HS-400179**	MHEV-030-51600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	5	**HS-400180**	MHEV-020-51600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	5	**HS-400181**	MHEV-030-51600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	5	**HS-400182**	MHEV-020-52000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	5	**HS-400183**	MHEV-030-52000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	5	**HS-400184**	MHEV-020-52000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	5	**HS-400185**	MHEV-030-52000-R1.00



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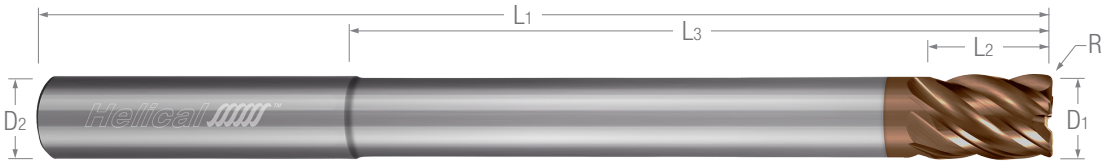
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MHEV-RN-5

5 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- 5 flute variable pitch design for reduced harmonics and increased feed rates
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	5	**HS-400186**	MHEV-RN-030-50300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	5	**HS-400187**	MHEV-RN-040-50300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	5	**HS-400188**	MHEV-RN-030-50300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	5	**HS-400189**	MHEV-RN-040-50300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	5	**HS-400190**	MHEV-RN-030-50400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	5	**HS-400191**	MHEV-RN-040-50400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	5	**HS-400192**	MHEV-RN-030-50400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	5	**HS-400193**	MHEV-RN-040-50400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	5	**HS-400194**	MHEV-RN-030-50500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	5	**HS-400195**	MHEV-RN-040-50500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	5	**HS-400196**	MHEV-RN-030-50500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	5	**HS-400197**	MHEV-RN-040-50500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	5	**HS-400198**	MHEV-RN-030-50600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	5	**HS-400199**	MHEV-RN-040-50600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	5	**HS-400200**	MHEV-RN-030-50600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	5	**HS-400201**	MHEV-RN-040-50600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	5	**HS-400202**	MHEV-RN-030-50600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	5	**HS-400203**	MHEV-RN-040-50600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	5	**HS-400204**	MHEV-RN-030-50800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	5	**HS-400205**	MHEV-RN-040-50800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	5	**HS-400206**	MHEV-RN-030-50800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	5	**HS-400207**	MHEV-RN-040-50800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	5	**HS-400208**	MHEV-RN-030-50800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	5	**HS-400209**	MHEV-RN-040-50800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	5	**HS-400210**	MHEV-RN-030-51000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	5	**HS-400211**	MHEV-RN-040-51000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	5	**HS-400212**	MHEV-RN-030-51000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	5	**HS-400213**	MHEV-RN-040-51000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	5	**HS-400214**	MHEV-RN-030-51000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	5	**HS-400215**	MHEV-RN-040-51000-R1.00

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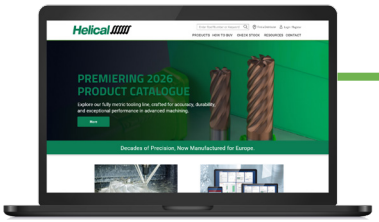
5 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck (cont.)

MHEV-RN-5

continued from previous page

Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	*Tplus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	5	**HS-400216**	MHEV-RN-030-51200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	5	**HS-400217**	MHEV-RN-040-51200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	5	**HS-400218**	MHEV-RN-030-51200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	5	**HS-400219**	MHEV-RN-040-51200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	5	**HS-400220**	MHEV-RN-030-51200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	5	**HS-400221**	MHEV-RN-040-51200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	5	**HS-400222**	MHEV-RN-030-51600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	5	**HS-400223**	MHEV-RN-040-51600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	5	**HS-400224**	MHEV-RN-030-51600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	5	**HS-400225**	MHEV-RN-040-51600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	5	**HS-400226**	MHEV-RN-030-51600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	5	**HS-400227**	MHEV-RN-040-51600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	5	**HS-400228**	MHEV-RN-030-52000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	5	**HS-400229**	MHEV-RN-040-52000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	5	**HS-400230**	MHEV-RN-030-52000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	5	**HS-400231**	MHEV-RN-040-52000-R1.00



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MHEV-5

SPEEDS & FEEDS

5 Flute - Variable Pitch

For an in depth material guide please see page 71

MHEV-5 / MHEV-RN-5

Material Guide	Material Number	Hardness	Vc m/min.	f_z (mm/tooth)																										
				Ø 3			Ø 4			Ø 5			Ø 6			Ø 8			Ø 10			Ø 12			Ø 16			Ø 20		
				Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin	Slot	Rgh	Fin
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.022	0.035	0.045	0.029	0.046	0.047	0.037	0.057	0.050	0.044	0.068	0.057	0.058	0.092	0.061	0.072	0.114	0.066	0.085	0.134	0.076	0.111	0.175	0.083	0.135	0.213	0.091
		75 - 98 HRB (450-770 N/mm²)	135	0.016	0.025	0.038	0.022	0.034	0.040	0.027	0.042	0.043	0.032	0.050	0.049	0.043	0.067	0.052	0.053	0.083	0.056	0.062	0.098	0.065	0.081	0.128	0.071	0.098	0.156	0.077
		21 - 36 HRC (785-1155 N/mm²)	125	0.010	0.016	0.030	0.014	0.022	0.033	0.017	0.027	0.035	0.021	0.032	0.040	0.027	0.043	0.042	0.034	0.054	0.045	0.040	0.064	0.052	0.052	0.083	0.057	0.064	0.101	0.062
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.014	0.022	0.036	0.018	0.029	0.038	0.023	0.036	0.040	0.028	0.043	0.045	0.037	0.058	0.049	0.045	0.072	0.052	0.054	0.085	0.061	0.070	0.111	0.067	0.085	0.135	0.072
		21 - 36 HRC (785-1155 N/mm²)	105	0.010	0.016	0.030	0.014	0.022	0.033	0.017	0.027	0.035	0.021	0.032	0.039	0.027	0.043	0.042	0.034	0.053	0.045	0.040	0.063	0.052	0.052	0.082	0.057	0.064	0.100	0.062
		36 - 50 HRC	80	0.009	0.014	0.028	0.012	0.019	0.030	0.015	0.023	0.032	0.018	0.028	0.037	0.024	0.038	0.039	0.029	0.046	0.042	0.035	0.055	0.049	0.045	0.072	0.053	0.055	0.087	0.058
		> 50 HRC	50	0.007	0.011	0.025	0.010	0.015	0.027	0.012	0.019	0.028	0.014	0.022	0.032	0.019	0.029	0.035	0.023	0.037	0.037	0.027	0.044	0.043	0.036	0.057	0.047	0.044	0.069	0.052
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.014	0.022	0.036	0.018	0.029	0.038	0.023	0.036	0.040	0.028	0.043	0.045	0.037	0.058	0.049	0.045	0.072	0.052	0.054	0.085	0.061	0.070	0.111	0.067	0.085	0.135	0.072
		21 - 36 HRC (785-1155 N/mm²)	80	0.011	0.017	0.032	0.015	0.023	0.033	0.019	0.029	0.036	0.022	0.034	0.040	0.029	0.046	0.043	0.036	0.057	0.046	0.043	0.068	0.054	0.056	0.088	0.059	0.068	0.107	0.065
		36 - 50 HRC	45	0.009	0.013	0.028	0.012	0.018	0.029	0.014	0.022	0.031	0.017	0.027	0.035	0.023	0.036	0.038	0.028	0.044	0.041	0.034	0.053	0.048	0.044	0.069	0.052	0.053	0.084	0.057
		> 50 HRC	30	0.007	0.011	0.025	0.009	0.015	0.027	0.012	0.018	0.028	0.014	0.022	0.032	0.019	0.029	0.035	0.023	0.037	0.037	0.027	0.043	0.043	0.036	0.056	0.047	0.043	0.068	0.052
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.019	0.029	0.040	0.024	0.038	0.043	0.030	0.047	0.045	0.037	0.057	0.052	0.049	0.076	0.056	0.060	0.094	0.060	0.071	0.111	0.070	0.092	0.145	0.076	0.112	0.177	0.083
		75 - 98 HRB (450-770 N/mm²)	80	0.013	0.020	0.034	0.017	0.026	0.036	0.021	0.032	0.038	0.025	0.039	0.043	0.033	0.052	0.046	0.041	0.065	0.049	0.049	0.077	0.058	0.063	0.100	0.063	0.077	0.121	0.069
		21 - 36 HRC (785-1155 N/mm²)	55	0.011	0.018	0.032	0.015	0.024	0.034	0.019	0.029	0.036	0.022	0.035	0.040	0.030	0.047	0.043	0.037	0.058	0.046	0.043	0.069	0.054	0.057	0.089	0.059	0.069	0.109	0.065
		36 - 50 HRC	45	0.010	0.016	0.030	0.013	0.021	0.032	0.017	0.026	0.034	0.020	0.031	0.038	0.027	0.042	0.041	0.033	0.052	0.044	0.039	0.061	0.052	0.051	0.080	0.056	0.061	0.097	0.061
		> 50 HRC	20	0.006	0.010	0.023	0.008	0.013	0.025	0.010	0.016	0.027	0.012	0.019	0.029	0.016	0.026	0.032	0.020	0.032	0.035	0.024	0.038	0.040	0.031	0.049	0.044	0.038	0.060	0.047
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.014	0.021	0.035	0.018	0.029	0.037	0.022	0.035	0.039	0.027	0.042	0.045	0.036	0.057	0.048	0.044	0.070	0.051	0.053	0.083	0.060	0.068	0.108	0.065	0.083	0.131	0.071
		21 - 36 HRC (785-1155 N/mm²)	70	0.012	0.019	0.034	0.016	0.025	0.035	0.020	0.031	0.037	0.025	0.038	0.043	0.032	0.051	0.046	0.040	0.063	0.049	0.047	0.075	0.057	0.062	0.097	0.062	0.075	0.118	0.068
		36 - 50 HRC	55	0.010	0.015	0.029	0.013	0.021	0.031	0.017	0.025	0.034	0.020	0.030	0.038	0.026	0.041	0.041	0.032	0.051	0.044	0.038	0.060	0.051	0.050	0.078	0.056	0.060	0.095	0.061
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.014	0.022	0.035	0.019	0.029	0.038	0.023	0.036	0.040	0.028	0.043	0.045	0.037	0.058	0.049	0.046	0.072	0.052	0.054	0.086	0.061	0.070	0.111	0.067	0.086	0.135	0.072
		21 - 36 HRC (785-1155 N/mm²)	85	0.012	0.019	0.033	0.016	0.025	0.035	0.020	0.031	0.037	0.024	0.038	0.042	0.032	0.051	0.045	0.040	0.062	0.049	0.047	0.074	0.057	0.061	0.097	0.062	0.074	0.118	0.068
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.010	0.016	0.030	0.013	0.022	0.033	0.017	0.027	0.035	0.020	0.032	0.039	0.027	0.043	0.042	0.033	0.053	0.044	0.040	0.063	0.052	0.052	0.082	0.057	0.063	0.099	0.062
		36 - 50 HRC	45	0.009	0.014	0.028	0.012	0.019	0.030	0.015	0.023	0.032	0.018	0.027	0.036	0.023	0.037	0.038	0.029	0.046	0.041	0.035	0.055	0.048	0.045	0.071	0.053	0.054	0.086	0.058
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.023	0.035	0.045	0.030	0.047	0.048	0.038	0.058	0.050	0.045	0.070	0.057	0.059	0.094	0.062	0.074	0.116	0.066	0.087	0.138	0.078	0.114	0.180	0.084	0.138	0.218	0.092
		21 - 36 HRC (785-1155 N/mm²)	115	0.012	0.019	0.033	0.016	0.026	0.035	0.020	0.032	0.037	0.024	0.038	0.042	0.032	0.051	0.045	0.040	0.063	0.049	0.047	0.075	0.057	0.062	0.098	0.062	0.075	0.118	0.068
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.014	0.022	0.036	0.019	0.030	0.038	0.024	0.037	0.040	0.029	0.044	0.045	0.038	0.060	0.049	0.047	0.074	0.053	0.055	0.088	0.062	0.072	0.114	0.067	0.088	0.139	0.073
		21 - 36 HRC (785-1155 N/mm²)	103	0.012	0.019	0.033	0.017	0.026	0.035	0.021	0.032	0.037	0.025	0.038	0.043	0.033	0.052	0.046	0.040	0.064	0.049	0.048	0.075	0.058	0.062	0.098	0.062	0.075	0.119	0.068
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.015	0.023	0.037	0.020	0.031	0.039	0.025	0.038	0.041	0.030	0.046	0.046	0.039	0.062	0.050	0.049	0.077	0.054	0.057	0.091	0.063	0.075	0.119	0.068	0.091	0.144	0.074
		21 - 36 HRC (785-1155 N/mm²)	80	0.010	0.016	0.030	0.013	0.021	0.032	0.017	0.026	0.034	0.020	0.030	0.038	0.026	0.041	0.040	0.032	0.051	0.044	0.038	0.060	0.051	0.050	0.079	0.056	0.060	0.096	0.061
		36 - 50 HRC	40	0.007	0.010	0.024	0.008	0.013	0.025	0.011	0.016	0.027	0.012	0.019	0.030	0.017	0.026	0.033	0.021	0.032	0.035	0.024	0.038	0.041	0.031	0.050	0.044	0.038	0.060	0.049
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.019	0.030	0.042	0.025	0.040	0.044	0.032	0.050	0.047	0.038	0.059	0.053	0.051	0.080	0.057	0.062	0.099	0.061	0.074	0.117	0.071	0.096	0.152	0.077	0.117	0.185	0.085
		75 - 98 HRB (450-770 N/mm²)	75	0.016	0.025	0.038	0.022	0.034	0.040	0.027	0.041	0.042	0.032	0.050	0.049	0.042	0.067	0.052	0.053	0.083	0.056	0.062	0.098	0.065	0.081	0.128	0.071	0.098	0.155	0.078
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.010	0.015	0.030	0.013	0.021	0.031	0.016	0.025	0.034	0.020	0.030	0.038	0.026	0.041	0.040	0.032	0.050	0.044	0.038	0.059	0.051	0.049	0.078	0.055	0.059	0.094	0.061
		21 - 36 HRC (785-1155 N/mm²)	23	0.009	0.014	0.029	0.012	0.020	0.031	0.016	0.024	0.033	0.019	0.028	0.037	0.025	0.039	0.039	0.030	0.048	0.042	0.036	0.057	0.050	0.047	0.074	0.054	0.057	0.090	0.059
		36 - 50 HRC	22	0.008	0.013	0.027	0.011	0.017	0.028	0.013	0.021	0.030	0.016	0.025	0.034	0.021	0.033	0.037	0.026	0.041	0.039	0.031	0.049	0.046	0.040	0.064	0.050	0.049	0.077	0.055
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.027	0.041	0.049	0.035	0.055	0.052	0.044	0.068	0.055	0.053	0.082	0.062	0.070	0.110	0.067	0.086	0.136	0.072	0.102	0.162	0.084	0.133	0.211	0.092	0.162	0.256	0.100
		75 - 98 HRB (450-770 N/mm²)	85	0.022	0.035	0.045	0.029	0.046	0.047	0.037	0.057	0.050	0.044	0.068	0.057	0.058	0.092	0.061	0.073	0.114	0.066	0.086	0.135	0.077	0.112	0.177	0.084	0.136	0.214	0.091
		21 - 36 HRC (785-1155 N/mm²)	75	0.017	0.026	0.038	0.022	0.035	0.041	0.028	0.043	0.043	0.033	0.052	0.050	0.044	0.069	0.053	0.054	0.086	0.057	0.065	0.102	0.066	0.084	0.132	0.072	0.102	0.161	0.079
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.013	0.021	0.034	0.017	0.027	0.037	0.022	0.034	0.039	0.026	0.041	0.044	0.035	0.055	0.047	0.043	0.068	0.051	0.051	0.080	0.059	0.066	0.104	0.064	0.080	0.127	0.070
		36 - 50 HRC	50	0.012	0.019	0.033	0.016	0.025	0.035	0.020	0.031	0.037	0.024	0.037	0.042	0.031	0.050	0.045	0.039	0.061	0.048	0.046	0.073	0.057	0.060	0.095	0.061	0.073	0.115	0.067
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.011	0.017	0.031	0.015	0.023	0.034	0.019	0.029	0.035	0.022	0.034	0.041	0.029	0.046	0.044	0.036	0.057	0.047	0.043	0.068	0.055	0.056	0.088	0.059	0.068	0.107	0.065
		21 - 36 HRC (785-1155 N/mm²)	55	0.011	0.017	0.031	0.014	0.023	0.033	0.018	0.028	0.035	0.022	0.033	0.040	0.028	0.045	0.042	0.035	0.055	0.046	0.041	0.065	0.053	0.054	0.085	0.057	0.065	0.103	0.063
		36 - 50 HRC	20	0.007	0.011	0.025	0.010	0.015	0.027	0.012	0.019	0.029	0.014	0.022	0.032	0.019	0.030	0.035	0.024	0.037	0.038	0.028	0.045	0.044	0.037	0.058	0.048	0.044	0.070	0.052

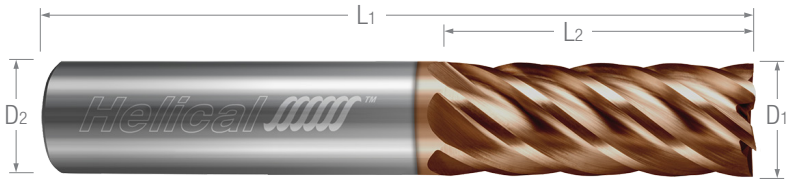
MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
Slot (Full Slotting)	< 35 HRC	30%-75% Diameter	100% Diameter
	≥ 35 HRC	25%-50% Diameter	100% Diameter
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	15%-30% Diameter
	≥ 35 HRC	Up to Max LOC	10%-20% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

6 FLUTE - SQUARE
Variable Pitch

MHEV-6

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in light profiling, High Efficiency Milling (HEM), and finishing applications
- 6 flute variable pitch design for reduced harmonics and increased feed rates
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



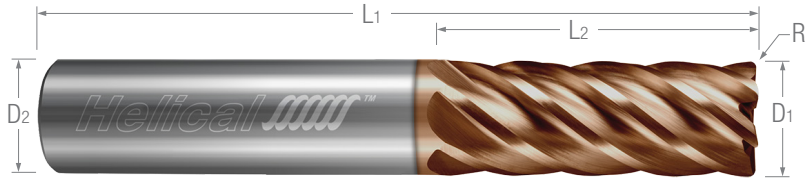
Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	7 mm	55 mm	6	HS-400232	MHEV-020-60300
	6 mm	10 mm	57 mm	6	HS-400233	MHEV-030-60300
4 mm	6 mm	9 mm	55 mm	6	HS-400234	MHEV-020-60400
	6 mm	13 mm	57 mm	6	HS-400235	MHEV-030-60400
5 mm	6 mm	11 mm	55 mm	6	HS-400236	MHEV-020-60500
	6 mm	16 mm	60 mm	6	HS-400237	MHEV-030-60500
6 mm	6 mm	14 mm	57 mm	6	HS-400238	MHEV-020-60600
	6 mm	20 mm	65 mm	6	HS-400239	MHEV-030-60600
8 mm	8 mm	18 mm	60 mm	6	HS-400240	MHEV-020-60800
	8 mm	26 mm	68 mm	6	HS-400241	MHEV-030-60800
10 mm	10 mm	22 mm	70 mm	6	HS-400242	MHEV-020-61000
	10 mm	32 mm	80 mm	6	HS-400243	MHEV-030-61000
12 mm	12 mm	26 mm	78 mm	6	HS-400244	MHEV-020-61200
	12 mm	38 mm	90 mm	6	HS-400245	MHEV-030-61200
16 mm	16 mm	34 mm	90 mm	6	HS-400246	MHEV-020-61600
	16 mm	50 mm	108 mm	6	HS-400247	MHEV-030-61600
20 mm	20 mm	42 mm	102 mm	6	HS-400248	MHEV-020-62000
	20 mm	62 mm	125 mm	6	HS-400249	MHEV-030-62000

Speeds & Feeds on Page 53

MHEV-6

6 FLUTE - CORNER RADIUS
Variable Pitch

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in light profiling, High Efficiency Milling (HEM), and finishing applications
- 6 flute variable pitch design for reduced harmonics and increased feed rates
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	6	**HS-400250**	MHEV-020-60300-R0.20
	6 mm	**0.2 mm**	10 mm	57 mm	6	**HS-400251**	MHEV-030-60300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	6	**HS-400252**	MHEV-020-60300-R0.50
	6 mm	**0.5 mm**	10 mm	57 mm	6	**HS-400253**	MHEV-030-60300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	6	**HS-400254**	MHEV-020-60400-R0.20
	6 mm	**0.2 mm**	13 mm	57 mm	6	**HS-400255**	MHEV-030-60400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	6	**HS-400256**	MHEV-020-60400-R0.50
	6 mm	**0.5 mm**	13 mm	57 mm	6	**HS-400257**	MHEV-030-60400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	55 mm	6	**HS-400258**	MHEV-020-60500-R0.20
	6 mm	**0.2 mm**	16 mm	60 mm	6	**HS-400259**	MHEV-030-60500-R0.20
	6 mm	**0.5 mm**	11 mm	55 mm	6	**HS-400260**	MHEV-020-60500-R0.50
	6 mm	**0.5 mm**	16 mm	60 mm	6	**HS-400261**	MHEV-030-60500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	6	**HS-400262**	MHEV-020-60600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	6	**HS-400263**	MHEV-030-60600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	6	**HS-400264**	MHEV-020-60600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	6	**HS-400265**	MHEV-030-60600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	6	**HS-400266**	MHEV-020-60600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	6	**HS-400267**	MHEV-030-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	6	**HS-400268**	MHEV-020-60800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	6	**HS-400269**	MHEV-030-60800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	6	**HS-400270**	MHEV-020-60800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	6	**HS-400271**	MHEV-030-60800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	6	**HS-400272**	MHEV-020-60800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	6	**HS-400273**	MHEV-030-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	6	**HS-400274**	MHEV-020-61000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	6	**HS-400275**	MHEV-030-61000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	6	**HS-400276**	MHEV-020-61000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	6	**HS-400277**	MHEV-030-61000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	6	**HS-400278**	MHEV-020-61000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	6	**HS-400279**	MHEV-030-61000-R1.00

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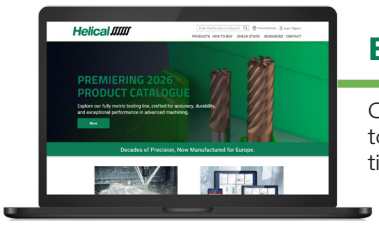
6 FLUTE - CORNER RADIUS

Variable Pitch (cont.)

MHEV-6

continued from previous page

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	*Tplus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	6	**HS-400280**	MHEV-020-61200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	6	**HS-400281**	MHEV-030-61200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	6	**HS-400282**	MHEV-020-61200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	6	**HS-400283**	MHEV-030-61200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	6	**HS-400284**	MHEV-020-61200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	6	**HS-400285**	MHEV-030-61200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	6	**HS-400286**	MHEV-020-61600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	6	**HS-400287**	MHEV-030-61600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	6	**HS-400288**	MHEV-020-61600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	6	**HS-400289**	MHEV-030-61600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	6	**HS-400290**	MHEV-020-61600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	6	**HS-400291**	MHEV-030-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	6	**HS-400292**	MHEV-020-62000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	6	**HS-400293**	MHEV-030-62000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	6	**HS-400294**	MHEV-020-62000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	6	**HS-400295**	MHEV-030-62000-R1.00



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MHEV-RN-6

HEM

6 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in light profiling, High Efficiency Milling (HEM), and finishing applications
- 6 flute variable pitch design for reduced harmonics and increased feed rates
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	6	**HS-400296**	MHEV-RN-030-60300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	6	**HS-400297**	MHEV-RN-040-60300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	6	**HS-400298**	MHEV-RN-030-60300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	6	**HS-400299**	MHEV-RN-040-60300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	6	**HS-400300**	MHEV-RN-030-60400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	6	**HS-400301**	MHEV-RN-040-60400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	6	**HS-400302**	MHEV-RN-030-60400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	6	**HS-400303**	MHEV-RN-040-60400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	6	**HS-400304**	MHEV-RN-030-60500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	6	**HS-400305**	MHEV-RN-040-60500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	6	**HS-400306**	MHEV-RN-030-60500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	6	**HS-400307**	MHEV-RN-040-60500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	6	**HS-400308**	MHEV-RN-030-60600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	6	**HS-400309**	MHEV-RN-040-60600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	6	**HS-400310**	MHEV-RN-030-60600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	6	**HS-400311**	MHEV-RN-040-60600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	6	**HS-400312**	MHEV-RN-030-60600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	6	**HS-400313**	MHEV-RN-040-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	6	**HS-400314**	MHEV-RN-030-60800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	6	**HS-400315**	MHEV-RN-040-60800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	6	**HS-400316**	MHEV-RN-030-60800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	6	**HS-400317**	MHEV-RN-040-60800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	6	**HS-400318**	MHEV-RN-030-60800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	6	**HS-400319**	MHEV-RN-040-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	6	**HS-400320**	MHEV-RN-030-61000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	6	**HS-400321**	MHEV-RN-040-61000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	6	**HS-400322**	MHEV-RN-030-61000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	6	**HS-400323**	MHEV-RN-040-61000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	6	**HS-400324**	MHEV-RN-030-61000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	6	**HS-400325**	MHEV-RN-040-61000-R1.00

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6 Flute

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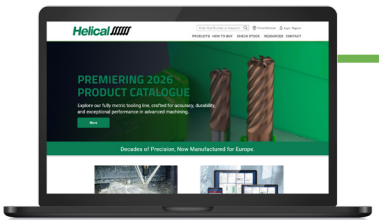
6 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck (cont.)

MHEV-RN-6

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Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	6	**HS-400326**	MHEV-RN-030-61200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	6	**HS-400327**	MHEV-RN-040-61200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	6	**HS-400328**	MHEV-RN-030-61200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	6	**HS-400329**	MHEV-RN-040-61200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	6	**HS-400330**	MHEV-RN-030-61200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	6	**HS-400331**	MHEV-RN-040-61200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	6	**HS-400332**	MHEV-RN-030-61600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	6	**HS-400333**	MHEV-RN-040-61600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	6	**HS-400334**	MHEV-RN-030-61600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	6	**HS-400335**	MHEV-RN-040-61600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	6	**HS-400336**	MHEV-RN-030-61600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	6	**HS-400337**	MHEV-RN-040-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	6	**HS-400338**	MHEV-RN-030-62000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	6	**HS-400339**	MHEV-RN-040-62000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	6	**HS-400340**	MHEV-RN-030-62000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	6	**HS-400341**	MHEV-RN-040-62000-R1.00



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MHEV-6

SPEEDS & FEEDS

6 Flute - Variable Pitch

For an in depth material guide please see page 71

MHEV-6 / MHEV-RN-6

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																	
				Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		Ø 16		Ø 20	
				Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.033	0.043	0.045	0.045	0.055	0.048	0.066	0.055	0.089	0.059	0.110	0.063	0.130	0.074	0.170	0.080	0.206	0.087
		75 - 98 HRB (450-770 N/mm²)	135	0.024	0.037	0.033	0.038	0.040	0.041	0.048	0.046	0.065	0.050	0.080	0.054	0.095	0.063	0.124	0.068	0.151	0.074
		21 - 36 HRC (785-1155 N/mm²)	125	0.016	0.029	0.022	0.031	0.026	0.033	0.031	0.037	0.042	0.040	0.052	0.043	0.061	0.051	0.080	0.055	0.098	0.060
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.021	0.034	0.029	0.036	0.035	0.038	0.042	0.043	0.056	0.046	0.070	0.050	0.083	0.058	0.108	0.064	0.130	0.069
		21 - 36 HRC (785-1155 N/mm²)	105	0.016	0.029	0.021	0.031	0.026	0.033	0.031	0.037	0.042	0.039	0.052	0.043	0.061	0.050	0.080	0.054	0.097	0.059
		36 - 50 HRC	80	0.013	0.027	0.019	0.029	0.022	0.030	0.027	0.035	0.037	0.038	0.045	0.040	0.053	0.046	0.070	0.051	0.085	0.055
		> 50 HRC	50	0.011	0.024	0.015	0.025	0.018	0.027	0.021	0.031	0.029	0.033	0.036	0.036	0.042	0.041	0.055	0.045	0.067	0.049
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.021	0.034	0.029	0.036	0.035	0.038	0.042	0.043	0.056	0.046	0.070	0.050	0.083	0.058	0.107	0.064	0.130	0.069
		21 - 36 HRC (785-1155 N/mm²)	80	0.017	0.030	0.023	0.032	0.028	0.034	0.034	0.039	0.045	0.041	0.055	0.044	0.065	0.052	0.086	0.056	0.104	0.061
		36 - 50 HRC	45	0.013	0.027	0.018	0.028	0.022	0.030	0.026	0.034	0.035	0.037	0.043	0.039	0.051	0.046	0.067	0.050	0.081	0.055
		> 50 HRC	30	0.011	0.024	0.015	0.026	0.018	0.027	0.021	0.030	0.028	0.033	0.036	0.036	0.042	0.041	0.054	0.045	0.066	0.049
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.027	0.039	0.037	0.041	0.045	0.044	0.055	0.050	0.074	0.053	0.091	0.057	0.108	0.067	0.141	0.072	0.171	0.079
		75 - 98 HRB (450-770 N/mm²)	80	0.019	0.032	0.026	0.034	0.031	0.036	0.038	0.041	0.051	0.044	0.062	0.047	0.074	0.055	0.097	0.060	0.117	0.065
		21 - 36 HRC (785-1155 N/mm²)	55	0.017	0.030	0.023	0.033	0.028	0.035	0.034	0.039	0.046	0.042	0.056	0.045	0.066	0.052	0.086	0.057	0.105	0.062
		36 - 50 HRC	45	0.015	0.029	0.021	0.030	0.025	0.032	0.030	0.037	0.040	0.039	0.050	0.042	0.059	0.049	0.077	0.053	0.094	0.058
		> 50 HRC	20	0.009	0.022	0.013	0.023	0.015	0.025	0.018	0.028	0.025	0.030	0.031	0.033	0.037	0.039	0.047	0.042	0.058	0.046
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.020	0.034	0.028	0.035	0.034	0.037	0.041	0.043	0.055	0.046	0.068	0.049	0.080	0.057	0.105	0.063	0.127	0.068
		21 - 36 HRC (785-1155 N/mm²)	70	0.018	0.032	0.025	0.034	0.030	0.036	0.037	0.040	0.049	0.043	0.061	0.047	0.072	0.054	0.094	0.060	0.115	0.065
		36 - 50 HRC	55	0.014	0.028	0.020	0.030	0.024	0.032	0.029	0.037	0.040	0.039	0.049	0.042	0.058	0.048	0.076	0.053	0.092	0.058
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.021	0.034	0.029	0.036	0.035	0.038	0.042	0.043	0.056	0.046	0.070	0.050	0.083	0.058	0.108	0.064	0.131	0.069
		21 - 36 HRC (785-1155 N/mm²)	85	0.018	0.032	0.025	0.034	0.030	0.036	0.037	0.040	0.049	0.043	0.061	0.046	0.072	0.054	0.094	0.059	0.114	0.065
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.015	0.029	0.021	0.031	0.025	0.033	0.031	0.037	0.041	0.039	0.051	0.043	0.061	0.050	0.079	0.054	0.096	0.059
		36 - 50 HRC	45	0.013	0.027	0.018	0.029	0.022	0.030	0.026	0.034	0.036	0.037	0.045	0.040	0.052	0.046	0.069	0.051	0.083	0.055
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.034	0.043	0.046	0.045	0.056	0.048	0.068	0.055	0.091	0.059	0.113	0.063	0.133	0.074	0.174	0.080	0.211	0.088
		21 - 36 HRC (785-1155 N/mm²)	115	0.018	0.032	0.025	0.034	0.030	0.036	0.037	0.040	0.049	0.043	0.061	0.046	0.072	0.054	0.094	0.059	0.115	0.065
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.022	0.035	0.029	0.037	0.036	0.039	0.043	0.044	0.058	0.047	0.072	0.051	0.085	0.059	0.110	0.064	0.135	0.070
		21 - 36 HRC (785-1155 N/mm²)	103	0.019	0.032	0.026	0.034	0.030	0.036	0.037	0.040	0.050	0.043	0.062	0.047	0.073	0.054	0.095	0.059	0.115	0.065
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.022	0.035	0.030	0.037	0.037	0.040	0.045	0.045	0.060	0.048	0.074	0.052	0.088	0.060	0.115	0.065	0.139	0.071
		21 - 36 HRC (785-1155 N/mm²)	80	0.015	0.028	0.021	0.030	0.024	0.032	0.029	0.036	0.040	0.039	0.049	0.041	0.058	0.049	0.076	0.053	0.092	0.058
		36 - 50 HRC	40	0.010	0.023	0.013	0.024	0.016	0.025	0.019	0.029	0.025	0.031	0.031	0.033	0.037	0.039	0.049	0.042	0.058	0.046
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.029	0.040	0.039	0.042	0.047	0.045	0.057	0.051	0.078	0.054	0.096	0.058	0.113	0.068	0.148	0.075	0.179	0.081
		75 - 98 HRB (450-770 N/mm²)	75	0.024	0.036	0.033	0.039	0.040	0.041	0.048	0.046	0.065	0.049	0.080	0.053	0.094	0.062	0.124	0.068	0.150	0.074
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.014	0.028	0.020	0.030	0.024	0.032	0.029	0.036	0.039	0.038	0.049	0.041	0.058	0.048	0.075	0.053	0.091	0.058
		21 - 36 HRC (785-1155 N/mm²)	23	0.014	0.027	0.019	0.029	0.023	0.031	0.028	0.035	0.038	0.038	0.047	0.040	0.055	0.047	0.072	0.052	0.088	0.056
		36 - 50 HRC	22	0.012	0.025	0.017	0.027	0.020	0.029	0.024	0.033	0.032	0.035	0.040	0.038	0.047	0.044	0.062	0.048	0.075	0.052
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.040	0.047	0.054	0.049	0.066	0.053	0.079	0.060	0.107	0.064	0.132	0.069	0.156	0.081	0.204	0.088	0.248	0.096
		75 - 98 HRB (450-770 N/mm²)	85	0.033	0.042	0.046	0.045	0.055	0.048	0.066	0.055	0.089	0.059	0.111	0.063	0.131	0.074	0.171	0.080	0.208	0.088
		21 - 36 HRC (785-1155 N/mm²)	75	0.025	0.037	0.034	0.039	0.041	0.042	0.050	0.047	0.067	0.051	0.083	0.055	0.098	0.064	0.128	0.069	0.156	0.076
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.020	0.033	0.027	0.035	0.033	0.037	0.039	0.042	0.053	0.045	0.066	0.048	0.077	0.057	0.101	0.061	0.123	0.067
		36 - 50 HRC	50	0.018	0.031	0.025	0.033	0.030	0.035	0.036	0.040	0.048	0.043	0.060	0.046	0.071	0.054	0.092	0.059	0.112	0.064
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.017	0.030	0.023	0.032	0.027	0.034	0.033	0.039	0.045	0.041	0.055	0.045	0.065	0.052	0.085	0.057	0.104	0.062
		21 - 36 HRC (785-1155 N/mm²)	55	0.016	0.030	0.022	0.031	0.027	0.034	0.032	0.038	0.043	0.041	0.053	0.044	0.063	0.051	0.083	0.056	0.100	0.061
		36 - 50 HRC	20	0.011	0.024	0.015	0.026	0.018	0.027	0.022	0.031	0.029	0.034	0.037	0.036	0.043	0.042	0.056	0.045	0.068	0.050

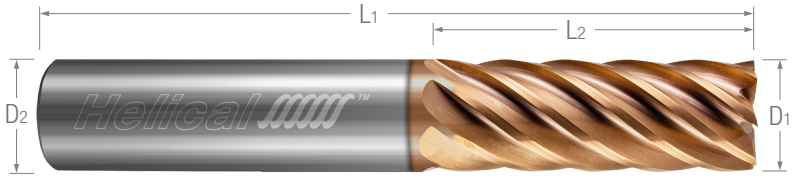
MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	15%-25% Diameter
	≥ 35 HRC	Up to Max LOC	10%-20% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

7 FLUTE - SQUARE
Variable Pitch

MHEV-7

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in High Efficiency Milling (HEM)
- 7 flute variable pitch design for reduced harmonics and increased feed rates
- End cutting geometry (non-centre cutting)
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



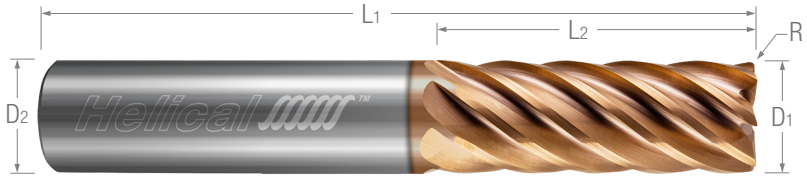
Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Decription
3 mm	6 mm	7 mm	55 mm	7	HS-400342	MHEV-020-70300
	6 mm	10 mm	57 mm	7	HS-400343	MHEV-030-70300
4 mm	6 mm	9 mm	55 mm	7	HS-400344	MHEV-020-70400
	6 mm	13 mm	57 mm	7	HS-400345	MHEV-030-70400
5 mm	6 mm	11 mm	57 mm	7	HS-400346	MHEV-020-70500
	6 mm	16 mm	60 mm	7	HS-400347	MHEV-030-70500
6 mm	6 mm	14 mm	57 mm	7	HS-400348	MHEV-020-70600
	6 mm	20 mm	65 mm	7	HS-400349	MHEV-030-70600
8 mm	8 mm	18 mm	60 mm	7	HS-400350	MHEV-020-70800
	8 mm	26 mm	68 mm	7	HS-400351	MHEV-030-70800
10 mm	10 mm	22 mm	70 mm	7	HS-400352	MHEV-020-71000
	10 mm	32 mm	80 mm	7	HS-400353	MHEV-030-71000
12 mm	12 mm	26 mm	78 mm	7	HS-400354	MHEV-020-71200
	12 mm	38 mm	90 mm	7	HS-400355	MHEV-030-71200
16 mm	16 mm	34 mm	90 mm	7	HS-400356	MHEV-020-71600
	16 mm	50 mm	108 mm	7	HS-400357	MHEV-030-71600
20 mm	20 mm	42 mm	102 mm	7	HS-400358	MHEV-020-72000
	20 mm	62 mm	125 mm	7	HS-400359	MHEV-030-72000

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MHEV-7

7 FLUTE - CORNER RADIUS
Variable Pitch

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Engineered for excellent performance in High Efficiency Milling (HEM)
- 7 flute variable pitch design for reduced harmonics and increased feed rates
- End cutting geometry (non-centre cutting)
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	7	**HS-400360**	MHEV-020-70300-R0.20
	6 mm	**0.2 mm**	10 mm	57 mm	7	**HS-400361**	MHEV-030-70300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	7	**HS-400362**	MHEV-020-70300-R0.50
	6 mm	**0.5 mm**	10 mm	57 mm	7	**HS-400363**	MHEV-030-70300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	7	**HS-400364**	MHEV-020-70400-R0.20
	6 mm	**0.2 mm**	13 mm	57 mm	7	**HS-400365**	MHEV-030-70400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	7	**HS-400366**	MHEV-020-70400-R0.50
	6 mm	**0.5 mm**	13 mm	57 mm	7	**HS-400367**	MHEV-030-70400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	7	**HS-400368**	MHEV-020-70500-R0.20
	6 mm	**0.2 mm**	16 mm	60 mm	7	**HS-400369**	MHEV-030-70500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	7	**HS-400370**	MHEV-020-70500-R0.50
	6 mm	**0.5 mm**	16 mm	60 mm	7	**HS-400371**	MHEV-030-70500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	7	**HS-400372**	MHEV-020-70600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	7	**HS-400373**	MHEV-030-70600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	7	**HS-400374**	MHEV-020-70600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	7	**HS-400375**	MHEV-030-70600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	7	**HS-400376**	MHEV-020-70600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	7	**HS-400377**	MHEV-030-70600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	7	**HS-400378**	MHEV-020-70800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	7	**HS-400379**	MHEV-030-70800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	7	**HS-400380**	MHEV-020-70800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	7	**HS-400381**	MHEV-030-70800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	7	**HS-400382**	MHEV-020-70800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	7	**HS-400383**	MHEV-030-70800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	7	**HS-400384**	MHEV-020-71000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	7	**HS-400385**	MHEV-030-71000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	7	**HS-400386**	MHEV-020-71000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	7	**HS-400387**	MHEV-030-71000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	7	**HS-400388**	MHEV-020-71000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	7	**HS-400389**	MHEV-030-71000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	7	**HS-400390**	MHEV-020-71200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	7	**HS-400391**	MHEV-030-71200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	7	**HS-400392**	MHEV-020-71200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	7	**HS-400393**	MHEV-030-71200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	7	**HS-400394**	MHEV-020-71200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	7	**HS-400395**	MHEV-030-71200-R1.00

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7 FLUTE - CORNER RADIUS

Variable Pitch

MHEV-7

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Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	7	**HS-400396**	MHEV-020-71600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	7	**HS-400397**	MHEV-030-71600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	7	**HS-400398**	MHEV-020-71600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	7	**HS-400399**	MHEV-030-71600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	7	**HS-400400**	MHEV-020-71600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	7	**HS-400401**	MHEV-030-71600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	7	**HS-400402**	MHEV-020-72000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	7	**HS-400403**	MHEV-030-72000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	7	**HS-400404**	MHEV-020-72000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	7	**HS-400405**	MHEV-030-72000-R1.00



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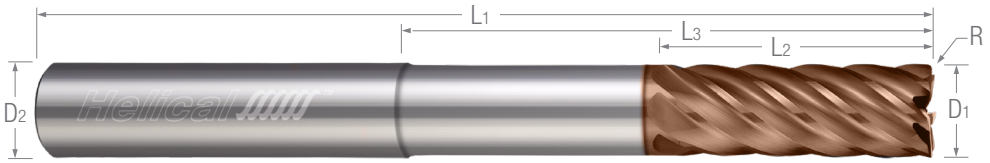
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MHEV-RN-7

7 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck

- Offers proven performance and extended tool life in stainless steels, high temp alloys, hardened steels, and other ferrous alloys
- Well-suited for increased wear resistance in a wide range of ferrous materials, including low and medium alloy steels, tool steels, and cast iron
- Excellent performance in High Efficiency Milling (HEM)
- 7 flute chatter free design for increased feed rates
- Reduced neck provides maximum strength in long reach and deep pocketing applications
- End cutting geometry (non-centre cutting)
- T*plus* coating offers high hardness for superior tool life
- Manufactured to DIN 6535 Form HA



Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
3 mm	6 mm	**0.2 mm**	7 mm	55 mm	10 mm	2.85 mm	7	**HS-400406**	MHEV-RN-030-70300-R0.20
	6 mm	**0.2 mm**	7 mm	57 mm	13 mm	2.85 mm	7	**HS-400407**	MHEV-RN-040-70300-R0.20
	6 mm	**0.5 mm**	7 mm	55 mm	10 mm	2.85 mm	7	**HS-400408**	MHEV-RN-030-70300-R0.50
	6 mm	**0.5 mm**	7 mm	57 mm	13 mm	2.85 mm	7	**HS-400409**	MHEV-RN-040-70300-R0.50
4 mm	6 mm	**0.2 mm**	9 mm	55 mm	13 mm	3.80 mm	7	**HS-400410**	MHEV-RN-030-70400-R0.20
	6 mm	**0.2 mm**	9 mm	60 mm	17 mm	3.80 mm	7	**HS-400411**	MHEV-RN-040-70400-R0.20
	6 mm	**0.5 mm**	9 mm	55 mm	13 mm	3.80 mm	7	**HS-400412**	MHEV-RN-030-70400-R0.50
	6 mm	**0.5 mm**	9 mm	60 mm	17 mm	3.80 mm	7	**HS-400413**	MHEV-RN-040-70400-R0.50
5 mm	6 mm	**0.2 mm**	11 mm	57 mm	16 mm	4.75 mm	7	**HS-400414**	MHEV-RN-030-70500-R0.20
	6 mm	**0.2 mm**	11 mm	65 mm	21 mm	4.75 mm	7	**HS-400415**	MHEV-RN-040-70500-R0.20
	6 mm	**0.5 mm**	11 mm	57 mm	16 mm	4.75 mm	7	**HS-400416**	MHEV-RN-030-70500-R0.50
	6 mm	**0.5 mm**	11 mm	65 mm	21 mm	4.75 mm	7	**HS-400417**	MHEV-RN-040-70500-R0.50
6 mm	6 mm	**0.2 mm**	14 mm	60 mm	20 mm	5.70 mm	7	**HS-400418**	MHEV-RN-030-70600-R0.20
	6 mm	**0.2 mm**	14 mm	65 mm	26 mm	5.70 mm	7	**HS-400419**	MHEV-RN-040-70600-R0.20
	6 mm	**0.5 mm**	14 mm	60 mm	20 mm	5.70 mm	7	**HS-400420**	MHEV-RN-030-70600-R0.50
	6 mm	**0.5 mm**	14 mm	65 mm	26 mm	5.70 mm	7	**HS-400421**	MHEV-RN-040-70600-R0.50
	6 mm	**1.0 mm**	14 mm	60 mm	20 mm	5.70 mm	7	**HS-400422**	MHEV-RN-030-70600-R1.00
	6 mm	**1.0 mm**	14 mm	65 mm	26 mm	5.70 mm	7	**HS-400423**	MHEV-RN-040-70600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	65 mm	26 mm	7.60 mm	7	**HS-400424**	MHEV-RN-030-70800-R0.20
	8 mm	**0.2 mm**	18 mm	78 mm	34 mm	7.60 mm	7	**HS-400425**	MHEV-RN-040-70800-R0.20
	8 mm	**0.5 mm**	18 mm	65 mm	26 mm	7.60 mm	7	**HS-400426**	MHEV-RN-030-70800-R0.50
	8 mm	**0.5 mm**	18 mm	78 mm	34 mm	7.60 mm	7	**HS-400427**	MHEV-RN-040-70800-R0.50
	8 mm	**1.0 mm**	18 mm	65 mm	26 mm	7.60 mm	7	**HS-400428**	MHEV-RN-030-70800-R1.00
	8 mm	**1.0 mm**	18 mm	78 mm	34 mm	7.60 mm	7	**HS-400429**	MHEV-RN-040-70800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	75 mm	32 mm	9.50 mm	7	**HS-400430**	MHEV-RN-030-71000-R0.20
	10 mm	**0.2 mm**	22 mm	90 mm	42 mm	9.50 mm	7	**HS-400431**	MHEV-RN-040-71000-R0.20
	10 mm	**0.5 mm**	22 mm	75 mm	32 mm	9.50 mm	7	**HS-400432**	MHEV-RN-030-71000-R0.50
	10 mm	**0.5 mm**	22 mm	90 mm	42 mm	9.50 mm	7	**HS-400433**	MHEV-RN-040-71000-R0.50
	10 mm	**1.0 mm**	22 mm	75 mm	32 mm	9.50 mm	7	**HS-400434**	MHEV-RN-030-71000-R1.00
	10 mm	**1.0 mm**	22 mm	90 mm	42 mm	9.50 mm	7	**HS-400435**	MHEV-RN-040-71000-R1.00

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7 Flute

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7 FLUTE - CORNER RADIUS

Variable Pitch - Reduced Neck (cont.)

MHEV-RN-7

continued from previous page

Cutter Dia. D_1 (e8)	Shank Dia. D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	OAL L_1 $^{+1.5mm}_{-1.5mm}$	Reach (LBS) L_3	Neck Diameter	Flutes	T*plus* Coated	Tool Description
12 mm	12 mm	**0.2 mm**	26 mm	90 mm	38 mm	11.40 mm	7	**HS-400436**	MHEV-RN-030-71200-R0.20
	12 mm	**0.2 mm**	26 mm	102 mm	50 mm	11.40 mm	7	**HS-400437**	MHEV-RN-040-71200-R0.20
	12 mm	**0.5 mm**	26 mm	90 mm	38 mm	11.40 mm	7	**HS-400438**	MHEV-RN-030-71200-R0.50
	12 mm	**0.5 mm**	26 mm	102 mm	50 mm	11.40 mm	7	**HS-400439**	MHEV-RN-040-71200-R0.50
	12 mm	**1.0 mm**	26 mm	90 mm	38 mm	11.40 mm	7	**HS-400440**	MHEV-RN-030-71200-R1.00
	12 mm	**1.0 mm**	26 mm	102 mm	50 mm	11.40 mm	7	**HS-400441**	MHEV-RN-040-71200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	102 mm	50 mm	15.20 mm	7	**HS-400442**	MHEV-RN-030-71600-R0.20
	16 mm	**0.2 mm**	34 mm	125 mm	66 mm	15.20 mm	7	**HS-400443**	MHEV-RN-040-71600-R0.20
	16 mm	**0.5 mm**	34 mm	102 mm	50 mm	15.20 mm	7	**HS-400444**	MHEV-RN-030-71600-R0.50
	16 mm	**0.5 mm**	34 mm	125 mm	66 mm	15.20 mm	7	**HS-400445**	MHEV-RN-040-71600-R0.50
	16 mm	**1.0 mm**	34 mm	102 mm	50 mm	15.20 mm	7	**HS-400446**	MHEV-RN-030-71600-R1.00
	16 mm	**1.0 mm**	34 mm	125 mm	66 mm	15.20 mm	7	**HS-400447**	MHEV-RN-040-71600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	125 mm	62 mm	19.00 mm	7	**HS-400448**	MHEV-RN-030-72000-R0.50
	20 mm	**0.5 mm**	42 mm	140 mm	82 mm	19.00 mm	7	**HS-400449**	MHEV-RN-040-72000-R0.50
	20 mm	**1.0 mm**	42 mm	125 mm	62 mm	19.00 mm	7	**HS-400450**	MHEV-RN-030-72000-R1.00
	20 mm	**1.0 mm**	42 mm	140 mm	82 mm	19.00 mm	7	**HS-400451**	MHEV-RN-040-72000-R1.00

MHEV-7

SPEEDS & FEEDS

7 Flute - Variable Pitch

For an in depth material guide please see page 71

MHEV-7 / MHEV-RN-7

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																	
				Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		Ø 16		Ø 20	
				Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin
CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	< 75 HRB (<450 N/mm²)	140	0.037	0.043	0.051	0.046	0.061	0.049	0.077	0.056	0.101	0.060	0.124	0.064	0.145	0.075	0.191	0.081	0.233	0.089
		75 - 98 HRB (450-770 N/mm²)	135	0.027	0.037	0.037	0.039	0.044	0.042	0.056	0.047	0.074	0.051	0.091	0.055	0.106	0.064	0.139	0.069	0.171	0.076
		21 - 36 HRC (785-1155 N/mm²)	125	0.017	0.030	0.024	0.031	0.029	0.034	0.037	0.038	0.048	0.041	0.059	0.044	0.069	0.051	0.090	0.056	0.110	0.061
LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	75 - 98 HRB (450-770 N/mm²)	120	0.023	0.035	0.032	0.037	0.038	0.039	0.049	0.044	0.064	0.048	0.078	0.051	0.092	0.059	0.121	0.065	0.148	0.071
		21 - 36 HRC (785-1155 N/mm²)	105	0.018	0.030	0.024	0.031	0.029	0.034	0.036	0.038	0.048	0.041	0.059	0.044	0.068	0.051	0.089	0.056	0.109	0.061
		36 - 50 HRC	80	0.015	0.028	0.021	0.029	0.025	0.031	0.031	0.035	0.042	0.038	0.051	0.041	0.060	0.048	0.078	0.052	0.096	0.057
		> 50 HRC	50	0.012	0.025	0.017	0.026	0.020	0.028	0.025	0.032	0.033	0.034	0.041	0.037	0.047	0.042	0.061	0.046	0.076	0.050
TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	75 - 98 HRB (450-770 N/mm²)	105	0.023	0.035	0.032	0.037	0.038	0.039	0.049	0.044	0.064	0.048	0.078	0.051	0.092	0.059	0.121	0.065	0.148	0.071
		21 - 36 HRC (785-1155 N/mm²)	80	0.019	0.031	0.025	0.033	0.031	0.035	0.039	0.040	0.051	0.042	0.063	0.045	0.073	0.053	0.096	0.057	0.118	0.063
		36 - 50 HRC	45	0.014	0.027	0.020	0.029	0.024	0.031	0.030	0.035	0.040	0.037	0.049	0.040	0.057	0.046	0.075	0.051	0.092	0.055
		> 50 HRC	30	0.012	0.025	0.016	0.026	0.020	0.027	0.025	0.032	0.033	0.034	0.040	0.036	0.046	0.042	0.061	0.045	0.075	0.050
SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	< 75 HRB (<450 N/mm²)	90	0.030	0.039	0.042	0.042	0.050	0.044	0.064	0.051	0.084	0.055	0.103	0.059	0.120	0.069	0.158	0.075	0.194	0.081
		75 - 98 HRB (450-770 N/mm²)	80	0.021	0.033	0.029	0.035	0.035	0.037	0.043	0.042	0.058	0.045	0.071	0.048	0.083	0.057	0.108	0.061	0.133	0.067
		21 - 36 HRC (785-1155 N/mm²)	55	0.019	0.031	0.026	0.033	0.031	0.035	0.039	0.040	0.052	0.043	0.064	0.045	0.074	0.053	0.097	0.057	0.119	0.063
		36 - 50 HRC	45	0.017	0.030	0.024	0.031	0.028	0.033	0.035	0.038	0.046	0.040	0.057	0.043	0.067	0.051	0.087	0.055	0.107	0.060
		> 50 HRC	20	0.011	0.023	0.014	0.025	0.017	0.026	0.022	0.029	0.029	0.032	0.035	0.034	0.040	0.040	0.054	0.043	0.066	0.047
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.023	0.034	0.031	0.036	0.038	0.039	0.047	0.044	0.062	0.047	0.077	0.050	0.089	0.059	0.117	0.064	0.144	0.070
		21 - 36 HRC (785-1155 N/mm²)	70	0.021	0.033	0.028	0.034	0.034	0.037	0.043	0.042	0.056	0.045	0.069	0.048	0.081	0.056	0.106	0.061	0.130	0.066
		36 - 50 HRC	55	0.017	0.029	0.023	0.031	0.027	0.033	0.034	0.037	0.045	0.039	0.055	0.043	0.065	0.050	0.085	0.054	0.104	0.059
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.023	0.035	0.033	0.037	0.039	0.039	0.049	0.044	0.064	0.048	0.079	0.051	0.092	0.059	0.121	0.065	0.149	0.071
		21 - 36 HRC (785-1155 N/mm²)	85	0.021	0.032	0.028	0.034	0.034	0.037	0.042	0.041	0.056	0.044	0.069	0.047	0.080	0.056	0.105	0.060	0.129	0.066
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.017	0.030	0.024	0.031	0.028	0.034	0.036	0.038	0.047	0.041	0.058	0.044	0.068	0.051	0.089	0.056	0.109	0.061
		36 - 50 HRC	45	0.015	0.027	0.021	0.029	0.024	0.031	0.031	0.035	0.041	0.038	0.051	0.041	0.059	0.047	0.077	0.051	0.095	0.056
GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	75 - 98 HRB (450-770 N/mm²)	125	0.038	0.044	0.052	0.047	0.062	0.050	0.079	0.056	0.104	0.060	0.128	0.065	0.149	0.076	0.195	0.083	0.240	0.090
		21 - 36 HRC (785-1155 N/mm²)	115	0.020	0.032	0.029	0.035	0.034	0.037	0.043	0.041	0.056	0.044	0.069	0.047	0.081	0.056	0.106	0.060	0.130	0.066
MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	75 - 98 HRB (450-770 N/mm²)	105	0.024	0.035	0.033	0.037	0.039	0.040	0.050	0.045	0.066	0.048	0.081	0.052	0.094	0.060	0.124	0.065	0.152	0.071
		21 - 36 HRC (785-1155 N/mm²)	103	0.021	0.032	0.029	0.034	0.034	0.037	0.043	0.041	0.057	0.045	0.070	0.047	0.081	0.056	0.107	0.060	0.131	0.066
NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	75 - 98 HRB (450-770 N/mm²)	95	0.025	0.036	0.035	0.037	0.041	0.040	0.052	0.045	0.069	0.049	0.084	0.053	0.098	0.062	0.129	0.067	0.158	0.073
		21 - 36 HRC (785-1155 N/mm²)	80	0.017	0.029	0.023	0.031	0.027	0.033	0.034	0.037	0.045	0.039	0.056	0.043	0.065	0.050	0.086	0.054	0.105	0.059
		36 - 50 HRC	40	0.011	0.023	0.014	0.024	0.018	0.026	0.022	0.030	0.029	0.032	0.035	0.034	0.041	0.040	0.054	0.043	0.067	0.047
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.032	0.041	0.044	0.043	0.053	0.046	0.067	0.052	0.088	0.055	0.108	0.059	0.126	0.070	0.166	0.076	0.203	0.083
		75 - 98 HRB (450-770 N/mm²)	75	0.027	0.037	0.037	0.039	0.044	0.042	0.056	0.047	0.074	0.050	0.091	0.054	0.106	0.064	0.139	0.069	0.170	0.075
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.017	0.029	0.023	0.031	0.027	0.032	0.034	0.037	0.045	0.039	0.055	0.042	0.064	0.050	0.084	0.054	0.103	0.059
		21 - 36 HRC (785-1155 N/mm²)	23	0.015	0.028	0.022	0.030	0.026	0.032	0.033	0.036	0.043	0.038	0.053	0.041	0.061	0.048	0.081	0.053	0.099	0.058
		36 - 50 HRC	22	0.013	0.026	0.019	0.027	0.022	0.029	0.028	0.034	0.037	0.036	0.045	0.039	0.053	0.045	0.069	0.048	0.085	0.053
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.044	0.048	0.061	0.051	0.073	0.054	0.093	0.061	0.121	0.066	0.149	0.070	0.174	0.082	0.229	0.089	0.281	0.098
		75 - 98 HRB (450-770 N/mm²)	85	0.037	0.044	0.052	0.046	0.061	0.049	0.078	0.056	0.102	0.060	0.125	0.064	0.146	0.075	0.192	0.082	0.235	0.089
		21 - 36 HRC (785-1155 N/mm²)	75	0.028	0.038	0.039	0.040	0.046	0.042	0.058	0.049	0.076	0.052	0.094	0.056	0.109	0.065	0.144	0.071	0.176	0.077
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.022	0.033	0.030	0.036	0.036	0.038	0.046	0.043	0.060	0.046	0.074	0.050	0.086	0.058	0.114	0.063	0.139	0.069
		36 - 50 HRC	50	0.020	0.032	0.028	0.034	0.033	0.036	0.042	0.041	0.055	0.044	0.067	0.047	0.079	0.055	0.103	0.060	0.127	0.066
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.019	0.030	0.026	0.033	0.030	0.035	0.039	0.039	0.052	0.042	0.063	0.046	0.073	0.053	0.096	0.058	0.118	0.063
		21 - 36 HRC (785-1155 N/mm²)	55	0.018	0.030	0.025	0.033	0.029	0.035	0.037	0.039	0.049	0.041	0.060	0.045	0.070	0.052	0.093	0.056	0.114	0.061
		36 - 50 HRC	20	0.012	0.025	0.017	0.027	0.020	0.028	0.025	0.032	0.033	0.034	0.041	0.037	0.048	0.042	0.063	0.046	0.077	0.050

MILLING PROCESS	HARDNESS	ADOC (ap)	RDOC (ae)
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

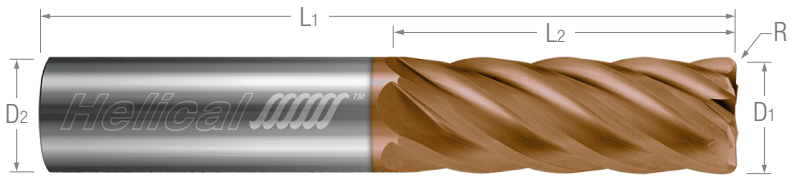
NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

6 FLUTE - AUSTENITIC STAINLESS

Corner Radius - Variable Pitch

MHVAS-6

- Specially engineered and proven through extensive testing for optimal performance in High Efficiency Milling (HEM) of 1.4404 (316L) and other austenitic stainless steel alloys
- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Not for use in traditional slotting and roughing toolpaths
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	6	**HS-400788**	MHVAS-020-60600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	6	**HS-400789**	MHVAS-030-60600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	6	**HS-400790**	MHVAS-020-60600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	6	**HS-400791**	MHVAS-030-60600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	6	**HS-400792**	MHVAS-020-60600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	6	**HS-400793**	MHVAS-030-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	6	**HS-400794**	MHVAS-020-60800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	6	**HS-400795**	MHVAS-030-60800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	6	**HS-400796**	MHVAS-020-60800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	6	**HS-400797**	MHVAS-030-60800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	6	**HS-400798**	MHVAS-020-60800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	6	**HS-400799**	MHVAS-030-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	6	**HS-400800**	MHVAS-020-61000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	6	**HS-400801**	MHVAS-030-61000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	6	**HS-400802**	MHVAS-020-61000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	6	**HS-400803**	MHVAS-030-61000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	6	**HS-400804**	MHVAS-020-61000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	6	**HS-400805**	MHVAS-030-61000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	6	**HS-400806**	MHVAS-020-61200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	6	**HS-400807**	MHVAS-030-61200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	6	**HS-400808**	MHVAS-020-61200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	6	**HS-400809**	MHVAS-030-61200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	6	**HS-400810**	MHVAS-020-61200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	6	**HS-400811**	MHVAS-030-61200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	6	**HS-400812**	MHVAS-020-61600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	6	**HS-400813**	MHVAS-030-61600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	6	**HS-400814**	MHVAS-020-61600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	6	**HS-400815**	MHVAS-030-61600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	6	**HS-400816**	MHVAS-020-61600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	6	**HS-400817**	MHVAS-030-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	6	**HS-400818**	MHVAS-020-62000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	6	**HS-400819**	MHVAS-030-62000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	6	**HS-400820**	MHVAS-020-62000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	6	**HS-400821**	MHVAS-030-62000-R1.00

Speeds & Feeds on Page 61

MHVAS-6

SPEEDS & FEEDS

6 Flute - Austenitic Stainless
Corner Radius - Variable Pitch

For an in depth material guide please see page 71

MHVAS-6																							
Material Guide		Hardness	V_c m/min.	f_z (mm/tooth)																			
				Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		Ø 16		Ø 20	
				HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin
AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	75 - 98 HRB (450-770 N/mm²)	80	0.054	0.033	0.073	0.035	0.090	0.037	0.107	0.042	0.147	0.045	0.181	0.049	0.213	0.057	0.281	0.061	0.339	0.068
		21 - 36 HRC (785-1155 N/mm²)	70	0.049	0.032	0.066	0.033	0.081	0.035	0.096	0.040	0.133	0.043	0.163	0.046	0.192	0.054	0.252	0.059	0.306	0.065
		36 - 50 HRC	55	0.039	0.028	0.054	0.030	0.065	0.032	0.077	0.036	0.106	0.038	0.131	0.041	0.154	0.048	0.203	0.053	0.246	0.058
MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	75 - 98 HRB (450-770 N/mm²)	90	0.055	0.033	0.077	0.036	0.092	0.038	0.111	0.043	0.151	0.046	0.186	0.049	0.220	0.058	0.288	0.063	0.349	0.068
		21 - 36 HRC (785-1155 N/mm²)	85	0.049	0.032	0.066	0.033	0.080	0.035	0.095	0.040	0.132	0.043	0.162	0.046	0.191	0.054	0.250	0.059	0.303	0.064
PH STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	21 - 36 HRC (785-1155 N/mm²)	60	0.041	0.029	0.055	0.030	0.068	0.032	0.081	0.037	0.111	0.039	0.138	0.042	0.160	0.049	0.212	0.053	0.256	0.058
		36 - 50 HRC	45	0.036	0.027	0.049	0.028	0.059	0.030	0.070	0.034	0.095	0.037	0.119	0.039	0.140	0.046	0.184	0.050	0.223	0.055

MILLING PROCESS	ADOC (ap)	RDOC (ae)
HEM (High Efficiency Milling)	Up to Max LOC	Up to 10% Diameter
Fin (Finishing)	Up to Max LOC	4%-6% Diameter

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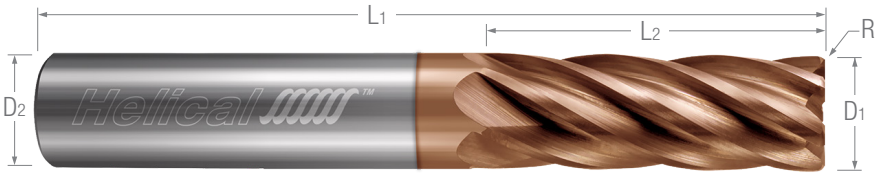
Count on up-to-date product libraries across a roster of leading CAM partners.

6 FLUTE - CORNER RADIUS

Variable Pitch

MHVNI-6

- Specially engineered for optimal performance in Inconel 718 and other nickel-based superalloys in High Efficiency Milling (HEM) and traditional roughing toolpaths
- 6 flute variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- End cutting geometry (non-centre cutting)
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius $R^{+0.01mm}_{-0.01mm}$	Length of Cut $L_2{}^{+0.7mm}_{+0.0mm}$	Overall Length $L_1{}^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	57 mm	6	**HS-400720**	MHVNI-020-60600-R0.20
	6 mm	**0.2 mm**	20 mm	65 mm	6	**HS-400721**	MHVNI-030-60600-R0.20
	6 mm	**0.5 mm**	14 mm	57 mm	6	**HS-400722**	MHVNI-020-60600-R0.50
	6 mm	**0.5 mm**	20 mm	65 mm	6	**HS-400723**	MHVNI-030-60600-R0.50
	6 mm	**1.0 mm**	14 mm	57 mm	6	**HS-400724**	MHVNI-020-60600-R1.00
	6 mm	**1.0 mm**	20 mm	65 mm	6	**HS-400725**	MHVNI-030-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	6	**HS-400726**	MHVNI-020-60800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	6	**HS-400727**	MHVNI-030-60800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	6	**HS-400728**	MHVNI-020-60800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	6	**HS-400729**	MHVNI-030-60800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	6	**HS-400730**	MHVNI-020-60800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	6	**HS-400731**	MHVNI-030-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	6	**HS-400732**	MHVNI-020-61000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	6	**HS-400733**	MHVNI-030-61000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	6	**HS-400734**	MHVNI-020-61000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	6	**HS-400735**	MHVNI-030-61000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	6	**HS-400736**	MHVNI-020-61000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	6	**HS-400737**	MHVNI-030-61000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	6	**HS-400738**	MHVNI-020-61200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	6	**HS-400739**	MHVNI-030-61200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	6	**HS-400740**	MHVNI-020-61200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	6	**HS-400741**	MHVNI-030-61200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	6	**HS-400742**	MHVNI-020-61200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	6	**HS-400743**	MHVNI-030-61200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	6	**HS-400744**	MHVNI-020-61600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	6	**HS-400745**	MHVNI-030-61600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	6	**HS-400746**	MHVNI-020-61600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	6	**HS-400747**	MHVNI-030-61600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	6	**HS-400748**	MHVNI-020-61600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	6	**HS-400749**	MHVNI-030-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	6	**HS-400750**	MHVNI-020-62000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	6	**HS-400751**	MHVNI-030-62000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	6	**HS-400752**	MHVNI-020-62000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	6	**HS-400753**	MHVNI-030-62000-R1.00

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MHVNI-6

SPEEDS & FEEDS

6 Flute - Variable Pitch

For an in depth material guide please see page 71

MHVNI-6

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																										
				Ø 3			Ø 4			Ø 5			Ø 6			Ø 8			Ø 10			Ø 12			Ø 16			Ø 20		
				HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin	HEM	Rgh	Fin
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.069	0.028	0.039	0.097	0.040	0.043	0.113	0.047	0.044	0.137	0.057	0.051	0.193	0.080	0.056	0.230	0.095	0.058	0.271	0.113	0.068	0.370	0.153	0.076	0.397	0.165	0.074
		75 - 98 HRB (450-770 N/mm²)	75	0.058	0.024	0.036	0.082	0.034	0.040	0.095	0.039	0.040	0.114	0.047	0.046	0.162	0.067	0.051	0.193	0.080	0.053	0.227	0.094	0.062	0.309	0.129	0.070	0.333	0.138	0.068
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.035	0.015	0.028	0.050	0.021	0.031	0.058	0.024	0.031	0.070	0.029	0.035	0.099	0.041	0.039	0.117	0.049	0.041	0.138	0.057	0.047	0.188	0.078	0.055	0.202	0.084	0.053
		21 - 36 HRC (785-1155 N/mm²)	23	0.034	0.014	0.027	0.047	0.020	0.030	0.056	0.023	0.031	0.067	0.028	0.035	0.094	0.039	0.039	0.112	0.046	0.040	0.132	0.055	0.047	0.181	0.075	0.053	0.194	0.080	0.052
		36 - 50 HRC	22	0.029	0.012	0.025	0.040	0.017	0.028	0.047	0.020	0.028	0.058	0.024	0.033	0.082	0.034	0.037	0.096	0.040	0.038	0.113	0.047	0.043	0.155	0.064	0.049	0.165	0.069	0.047
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.059	0.039	0.046	0.078	0.056	0.051	0.098	0.065	0.052	0.118	0.078	0.059	0.157	0.111	0.066	0.197	0.132	0.068	0.236	0.155	0.080	0.314	0.212	0.090	0.392	0.227	0.087
		75 - 98 HRB (450-770 N/mm²)	85	0.050	0.033	0.042	0.066	0.047	0.047	0.082	0.054	0.047	0.098	0.065	0.054	0.131	0.093	0.060	0.164	0.110	0.062	0.197	0.130	0.073	0.263	0.178	0.082	0.328	0.191	0.080
		21 - 36 HRC (785-1155 N/mm²)	75	0.037	0.025	0.037	0.049	0.035	0.041	0.061	0.041	0.041	0.074	0.049	0.047	0.099	0.070	0.052	0.124	0.083	0.054	0.148	0.098	0.063	0.198	0.133	0.072	0.247	0.143	0.069
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.029	0.019	0.033	0.039	0.028	0.036	0.049	0.033	0.037	0.058	0.039	0.041	0.078	0.055	0.047	0.097	0.065	0.048	0.117	0.077	0.056	0.156	0.105	0.064	0.194	0.113	0.061
		36 - 50 HRC	50	0.027	0.018	0.031	0.035	0.025	0.034	0.044	0.029	0.035	0.053	0.035	0.040	0.071	0.050	0.044	0.088	0.059	0.045	0.106	0.070	0.053	0.142	0.096	0.061	0.176	0.102	0.059
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.040	0.017	0.030	0.057	0.023	0.033	0.066	0.027	0.034	0.079	0.033	0.038	0.112	0.046	0.042	0.133	0.055	0.044	0.156	0.065	0.052	0.213	0.088	0.058	0.229	0.095	0.056
		21 - 36 HRC (785-1155 N/mm²)	55	0.039	0.016	0.030	0.054	0.023	0.033	0.064	0.026	0.033	0.076	0.032	0.038	0.109	0.045	0.042	0.130	0.053	0.043	0.151	0.063	0.051	0.207	0.086	0.057	0.222	0.092	0.055
		36 - 50 HRC	20	0.027	0.011	0.024	0.037	0.015	0.027	0.043	0.018	0.027	0.052	0.021	0.031	0.073	0.030	0.035	0.087	0.036	0.035	0.103	0.043	0.041	0.140	0.058	0.047	0.151	0.062	0.045

MILLING PROCESS	ADOC (ap)	RDOC (ae)
HEM (High Efficiency Milling)	Up to Max LOC	Up to 10% Diameter
Rgh (Roughing)	Up to Max LOC	10%-20% Diameter
Fin (Finishing)	Up to Max LOC	4%-6% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C

Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

Nickel Alloy Machining: Key Tips & Best Practices

1. Avoid Work Hardening

Nickel alloys harden quickly when heat builds up. Keep the tool engaged and maintain consistent feed to prevent rubbing.

2. Prevent Built-Up Edge

Nickel chips can weld to the cutting edge. Use coated tools that reduce friction and clear chips effectively.

3. Use High-Pressure Coolant

Coolant at 70 BAR or higher helps remove heat and flush chips from the cut zone. Water-based fluids improve heat transfer.

4. Choose Climb Milling

Climb milling keeps heat in the chip and lowers tool wear by reducing rubbing on the cutting edge.

5. Select the Right Tooling

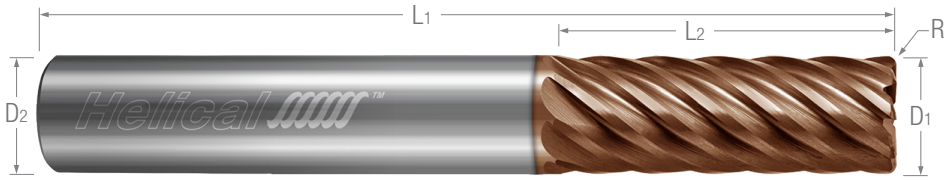
Use rigid, multi-flute tools for strength and stability. Six flutes are ideal for roughing, while eight are optimised for finishing. Wear-resistant coatings like T*plus* are essential for optimal performance.

8 FLUTE - CORNER RADIUS

Variable Pitch - For High Efficiency Milling

MHVNI-8

- Specially engineered for optimal performance in High Efficiency Milling (HEM) of Inconel 718 and other nickel-based superalloys
- 8 flute variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Not for use in traditional slotting and roughing toolpaths
- End cutting geometry (non-centre cutting)
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	55 mm	8	**HS-400754**	MHVNI-020-80600-R0.20
	6 mm	**0.2 mm**	20 mm	60 mm	8	**HS-400755**	MHVNI-030-80600-R0.20
	6 mm	**0.5 mm**	14 mm	55 mm	8	**HS-400756**	MHVNI-020-80600-R0.50
	6 mm	**0.5 mm**	20 mm	60 mm	8	**HS-400757**	MHVNI-030-80600-R0.50
	6 mm	**1.0 mm**	14 mm	55 mm	8	**HS-400758**	MHVNI-020-80600-R1.00
	6 mm	**1.0 mm**	20 mm	60 mm	8	**HS-400759**	MHVNI-030-80600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	8	**HS-400760**	MHVNI-020-80800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	8	**HS-400761**	MHVNI-030-80800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	8	**HS-400762**	MHVNI-020-80800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	8	**HS-400763**	MHVNI-030-80800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	8	**HS-400764**	MHVNI-020-80800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	8	**HS-400765**	MHVNI-030-80800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	8	**HS-400766**	MHVNI-020-81000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	8	**HS-400767**	MHVNI-030-81000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	8	**HS-400768**	MHVNI-020-81000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	8	**HS-400769**	MHVNI-030-81000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	8	**HS-400770**	MHVNI-020-81000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	8	**HS-400771**	MHVNI-030-81000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	8	**HS-400772**	MHVNI-020-81200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	8	**HS-400773**	MHVNI-030-81200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	8	**HS-400774**	MHVNI-020-81200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	8	**HS-400775**	MHVNI-030-81200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	8	**HS-400776**	MHVNI-020-81200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	8	**HS-400777**	MHVNI-030-81200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	8	**HS-400778**	MHVNI-020-81600-R0.20
	16 mm	**0.2 mm**	50 mm	102 mm	8	**HS-400779**	MHVNI-030-81600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	8	**HS-400780**	MHVNI-020-81600-R0.50
	16 mm	**0.5 mm**	50 mm	102 mm	8	**HS-400781**	MHVNI-030-81600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	8	**HS-400782**	MHVNI-020-81600-R1.00
	16 mm	**1.0 mm**	50 mm	102 mm	8	**HS-400783**	MHVNI-030-81600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	8	**HS-400784**	MHVNI-020-82000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	8	**HS-400785**	MHVNI-030-82000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	8	**HS-400786**	MHVNI-020-82000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	8	**HS-400787**	MHVNI-030-82000-R1.00

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SPEEDS & FEEDS

8 Flute - Variable Pitch - For High Efficiency Milling

For an in depth material guide please see page 71

MHVNI-8

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																	
				Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		Ø 16		Ø 20	
				HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.058	0.041	0.076	0.043	0.092	0.046	0.113	0.052	0.151	0.056	0.185	0.060	0.222	0.070	0.285	0.076	0.347	0.083
		75 - 98 HRB (450-770 N/mm²)	75	0.048	0.037	0.064	0.039	0.077	0.042	0.094	0.047	0.126	0.050	0.155	0.054	0.186	0.064	0.238	0.069	0.291	0.075
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.030	0.029	0.039	0.031	0.047	0.033	0.057	0.037	0.076	0.039	0.094	0.042	0.114	0.050	0.145	0.054	0.177	0.059
		21 - 36 HRC (785-1155 N/mm²)	23	0.028	0.028	0.037	0.030	0.045	0.032	0.055	0.036	0.074	0.039	0.090	0.041	0.108	0.048	0.139	0.053	0.170	0.058
		36 - 50 HRC	22	0.025	0.026	0.032	0.027	0.038	0.029	0.047	0.034	0.063	0.036	0.077	0.039	0.093	0.045	0.118	0.049	0.145	0.053
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.052	0.048	0.069	0.051	0.087	0.054	0.104	0.061	0.139	0.066	0.174	0.070	0.209	0.082	0.280	0.089	0.349	0.098
		75 - 98 HRB (450-770 N/mm²)	85	0.044	0.044	0.058	0.046	0.072	0.049	0.087	0.056	0.117	0.060	0.146	0.065	0.175	0.075	0.234	0.082	0.292	0.089
		21 - 36 HRC (785-1155 N/mm²)	75	0.032	0.038	0.044	0.040	0.054	0.042	0.065	0.049	0.088	0.052	0.110	0.056	0.131	0.065	0.175	0.071	0.219	0.077
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.026	0.033	0.035	0.036	0.043	0.038	0.052	0.043	0.069	0.046	0.086	0.050	0.104	0.058	0.138	0.063	0.173	0.069
		36 - 50 HRC	50	0.024	0.032	0.032	0.034	0.039	0.036	0.047	0.041	0.063	0.044	0.079	0.047	0.094	0.055	0.126	0.060	0.157	0.066
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.033	0.030	0.044	0.033	0.052	0.035	0.065	0.040	0.087	0.042	0.107	0.046	0.129	0.053	0.164	0.058	0.201	0.063
		21 - 36 HRC (785-1155 N/mm²)	55	0.032	0.030	0.043	0.033	0.051	0.035	0.063	0.039	0.084	0.041	0.104	0.045	0.125	0.052	0.159	0.057	0.194	0.062
		36 - 50 HRC	20	0.023	0.025	0.029	0.027	0.034	0.028	0.042	0.032	0.057	0.035	0.070	0.037	0.084	0.042	0.108	0.046	0.132	0.050

MILLING PROCESS	ADOC (ap)	RDOC (ae)
HEM (High Efficiency Milling)	Up to Max LOC	Up to 10% Diameter
Fin (Finishing)	Up to Max LOC	4%-6% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.



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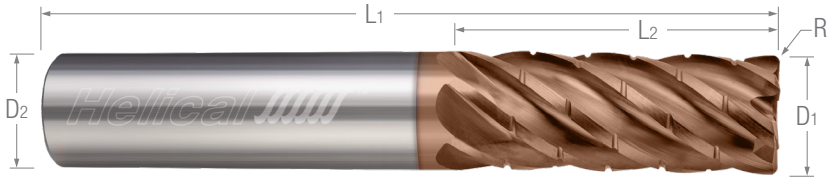
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6 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch - For High Efficiency Milling

MHVTI-C-6

- Specially engineered for optimal performance in High Efficiency Milling (HEM) of Titanium TiAl6V4 and other titanium alloys
- 6 flute variable pitch and offset chipbreaker geometry for optimal chip evacuation, minimised harmonics, and reduced tool pressure
- Not for use in traditional slotting and roughing toolpaths
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers added lubricity and high temperature resistance for faster speeds and feeds and improved tool life
- Manufactured to DIN 6535 Form HA



Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	55 mm	6	**HS-400669**	MHVTI-C-020-60600-R0.20
	6 mm	**0.2 mm**	20 mm	60 mm	6	**HS-400670**	MHVTI-C-030-60600-R0.20
	6 mm	**0.2 mm**	26 mm	70 mm	6	**HS-400671**	MHVTI-C-040-60600-R0.20
	6 mm	**0.5 mm**	14 mm	55 mm	6	**HS-400672**	MHVTI-C-020-60600-R0.50
	6 mm	**0.5 mm**	20 mm	60 mm	6	**HS-400673**	MHVTI-C-030-60600-R0.50
	6 mm	**0.5 mm**	26 mm	70 mm	6	**HS-400674**	MHVTI-C-040-60600-R0.50
	6 mm	**1.0 mm**	14 mm	55 mm	6	**HS-400675**	MHVTI-C-020-60600-R1.00
	6 mm	**1.0 mm**	20 mm	60 mm	6	**HS-400676**	MHVTI-C-030-60600-R1.00
	6 mm	**1.0 mm**	26 mm	70 mm	6	**HS-400677**	MHVTI-C-040-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	6	**HS-400678**	MHVTI-C-020-60800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	6	**HS-400679**	MHVTI-C-030-60800-R0.20
	8 mm	**0.2 mm**	34 mm	78 mm	6	**HS-400680**	MHVTI-C-040-60800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	6	**HS-400681**	MHVTI-C-020-60800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	6	**HS-400682**	MHVTI-C-030-60800-R0.50
	8 mm	**0.5 mm**	34 mm	78 mm	6	**HS-400683**	MHVTI-C-040-60800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	6	**HS-400684**	MHVTI-C-020-60800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	6	**HS-400685**	MHVTI-C-030-60800-R1.00
	8 mm	**1.0 mm**	34 mm	78 mm	6	**HS-400686**	MHVTI-C-040-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	6	**HS-400687**	MHVTI-C-020-61000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	6	**HS-400688**	MHVTI-C-030-61000-R0.20
	10 mm	**0.2 mm**	42 mm	90 mm	6	**HS-400689**	MHVTI-C-040-61000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	6	**HS-400690**	MHVTI-C-020-61000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	6	**HS-400691**	MHVTI-C-030-61000-R0.50
	10 mm	**0.5 mm**	42 mm	90 mm	6	**HS-400692**	MHVTI-C-040-61000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	6	**HS-400693**	MHVTI-C-020-61000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	6	**HS-400694**	MHVTI-C-030-61000-R1.00
	10 mm	**1.0 mm**	42 mm	90 mm	6	**HS-400695**	MHVTI-C-040-61000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	6	**HS-400696**	MHVTI-C-020-61200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	6	**HS-400697**	MHVTI-C-030-61200-R0.20
	12 mm	**0.2 mm**	50 mm	102 mm	6	**HS-400698**	MHVTI-C-040-61200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	6	**HS-400699**	MHVTI-C-020-61200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	6	**HS-400700**	MHVTI-C-030-61200-R0.50
	12 mm	**0.5 mm**	50 mm	102 mm	6	**HS-400701**	MHVTI-C-040-61200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	6	**HS-400702**	MHVTI-C-020-61200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	6	**HS-400703**	MHVTI-C-030-61200-R1.00
	12 mm	**1.0 mm**	50 mm	102 mm	6	**HS-400704**	MHVTI-C-040-61200-R1.00

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6 FLUTE - CORNER RADIUS

Chipbreaker Rougher - Variable Pitch - For High Efficiency Milling

continued from previous page

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	6	**HS-400705**	MHVTI-C-020-61600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	6	**HS-400706**	MHVTI-C-030-61600-R0.20
	16 mm	**0.2 mm**	66 mm	125 mm	6	**HS-400707**	MHVTI-C-040-61600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	6	**HS-400708**	MHVTI-C-020-61600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	6	**HS-400709**	MHVTI-C-030-61600-R0.50
	16 mm	**0.5 mm**	66 mm	125 mm	6	**HS-400710**	MHVTI-C-040-61600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	6	**HS-400711**	MHVTI-C-020-61600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	6	**HS-400712**	MHVTI-C-030-61600-R1.00
	16 mm	**1.0 mm**	66 mm	125 mm	6	**HS-400713**	MHVTI-C-040-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	6	**HS-400714**	MHVTI-C-020-62000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	6	**HS-400715**	MHVTI-C-030-62000-R0.50
	20 mm	**0.5 mm**	82 mm	140 mm	6	**HS-400716**	MHVTI-C-040-62000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	6	**HS-400717**	MHVTI-C-020-62000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	6	**HS-400718**	MHVTI-C-030-62000-R1.00
	20 mm	**1.0 mm**	82 mm	140 mm	6	**HS-400719**	MHVTI-C-040-62000-R1.00

MHVTIC-C-6

SPEEDS & FEEDS

6 Flute - Corner Radius - Chipbreaker Rougher - Variable Pitch - For High Efficiency Milling

For an in depth material guide please see page 71

MHVTI-C-6

Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth) Ø 3 HEM	Ø 4 HEM	Ø 5 HEM	Ø 6 HEM	Ø 8 HEM	Ø 10 HEM	Ø 12 HEM	16 Ø HEM	Ø 20 HEM
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.048	0.063	0.079	0.095	0.126	0.158	0.188	0.253	0.316
		75 - 98 HRB (450-770 N/mm²)	75	0.040	0.053	0.066	0.079	0.105	0.132	0.158	0.212	0.265
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.024	0.032	0.040	0.048	0.064	0.080	0.096	0.129	0.161
		21 - 36 HRC (785-1155 N/mm²)	23	0.023	0.031	0.039	0.046	0.062	0.077	0.092	0.124	0.154
		36 - 50 HRC	22	0.020	0.026	0.033	0.040	0.053	0.066	0.079	0.106	0.132
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.066	0.087	0.110	0.130	0.174	0.218	0.260	0.349	0.437
		75 - 98 HRB (450-770 N/mm²)	85	0.055	0.073	0.092	0.109	0.145	0.183	0.218	0.293	0.366
		21 - 36 HRC (785-1155 N/mm²)	75	0.041	0.054	0.069	0.082	0.109	0.137	0.164	0.220	0.274
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.032	0.043	0.054	0.065	0.086	0.108	0.130	0.173	0.216
		36 - 50 HRC	50	0.030	0.039	0.049	0.059	0.078	0.098	0.117	0.157	0.197
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.028	0.037	0.046	0.055	0.073	0.091	0.109	0.146	0.183
		21 - 36 HRC (785-1155 N/mm²)	55	0.027	0.035	0.045	0.054	0.070	0.088	0.105	0.141	0.177
		36 - 50 HRC	20	0.018	0.024	0.031	0.036	0.047	0.060	0.071	0.096	0.120

MILLING PROCESS	ADOC (ap)	RDOC (ae)
HEM (High Efficiency Milling)	Up to Max LOC	Up to 10% Diameter

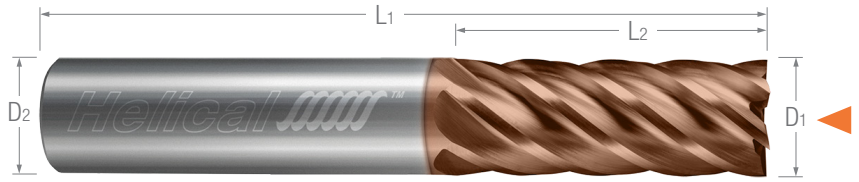
NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

6 FLUTE - SQUARE

Variable Pitch - For High Efficiency Milling

MHVTI-6

- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Not for use in traditional slotting and roughing toolpaths
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers added lubricity and high temperature resistance for faster speeds and feeds and improved tool life
- Manufactured to DIN 6535 Form HA



Extensive testing has proven MHVTI-6's excellence in extending tool life for HEM operations in Titanium

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	14 mm	55 mm	6	HS-400623	MHVTI-020-60600
	6 mm	20 mm	60 mm	6	HS-400624	MHVTI-030-60600
8 mm	8 mm	18 mm	60 mm	6	HS-400625	MHVTI-020-60800
	8 mm	26 mm	68 mm	6	HS-400626	MHVTI-030-60800
10 mm	10 mm	22 mm	70 mm	6	HS-400627	MHVTI-020-61000
	10 mm	32 mm	80 mm	6	HS-400628	MHVTI-030-61000
12 mm	12 mm	26 mm	78 mm	6	HS-400629	MHVTI-020-61200
	12 mm	38 mm	90 mm	6	HS-400630	MHVTI-030-61200
16 mm	16 mm	34 mm	90 mm	6	HS-400631	MHVTI-020-61600
	16 mm	50 mm	108 mm	6	HS-400632	MHVTI-030-61600
20 mm	20 mm	42 mm	102 mm	6	HS-400633	MHVTI-020-62000
	20 mm	62 mm	125 mm	6	HS-400634	MHVTI-030-62000

Implement High-Efficiency Milling (HEM)

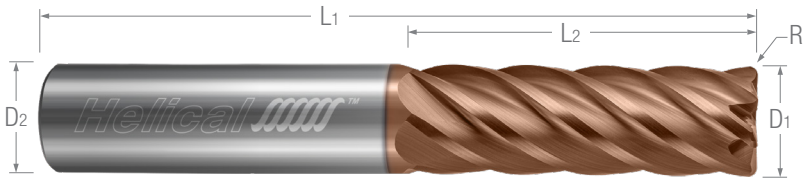
HEM strategies allow for deeper axial cuts with lighter radial engagement. This approach improves chip removal, reduces heat generation, and extends tool life.

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MHVTI-6

6 FLUTE - CORNER RADIUS
Variable Pitch - For High Efficiency Milling

- Variable pitch geometry results in higher quality parts by decreasing chatter and harmonics
- Not for use in traditional slotting and roughing toolpaths
- Centre cutting
- h6 shank tolerance for high precision tool holders
- T*plus* coating offers added lubricity and high temperature resistance for faster speeds and feeds and improved tool life
- Manufactured to DIN 6535 Form HA



Extensive testing has proven MHVTI-6's excellence in extending tool life for HEM operations in Titanium

Cutter Diameter D_1 (e8)	Shank Diameter D_2 (h6)	Corner Radius R $^{+0.01mm}_{-0.01mm}$	Length of Cut L_2 $^{+0.7mm}_{+0.0mm}$	Overall Length L_1 $^{+1.5mm}_{-1.5mm}$	Flutes	T*plus* Coated	Tool Description
6 mm	6 mm	**0.2 mm**	14 mm	55 mm	6	**HS-400635**	MHVTI-020-60600-R0.20
	6 mm	**0.2 mm**	20 mm	60 mm	6	**HS-400636**	MHVTI-030-60600-R0.20
	6 mm	**0.5 mm**	14 mm	55 mm	6	**HS-400637**	MHVTI-020-60600-R0.50
	6 mm	**0.5 mm**	20 mm	60 mm	6	**HS-400638**	MHVTI-030-60600-R0.50
	6 mm	**1.0 mm**	14 mm	55 mm	6	**HS-400639**	MHVTI-020-60600-R1.00
	6 mm	**1.0 mm**	20 mm	60 mm	6	**HS-400640**	MHVTI-030-60600-R1.00
8 mm	8 mm	**0.2 mm**	18 mm	60 mm	6	**HS-400641**	MHVTI-020-60800-R0.20
	8 mm	**0.2 mm**	26 mm	68 mm	6	**HS-400642**	MHVTI-030-60800-R0.20
	8 mm	**0.5 mm**	18 mm	60 mm	6	**HS-400643**	MHVTI-020-60800-R0.50
	8 mm	**0.5 mm**	26 mm	68 mm	6	**HS-400644**	MHVTI-030-60800-R0.50
	8 mm	**1.0 mm**	18 mm	60 mm	6	**HS-400645**	MHVTI-020-60800-R1.00
	8 mm	**1.0 mm**	26 mm	68 mm	6	**HS-400646**	MHVTI-030-60800-R1.00
10 mm	10 mm	**0.2 mm**	22 mm	70 mm	6	**HS-400647**	MHVTI-020-61000-R0.20
	10 mm	**0.2 mm**	32 mm	80 mm	6	**HS-400648**	MHVTI-030-61000-R0.20
	10 mm	**0.5 mm**	22 mm	70 mm	6	**HS-400649**	MHVTI-020-61000-R0.50
	10 mm	**0.5 mm**	32 mm	80 mm	6	**HS-400650**	MHVTI-030-61000-R0.50
	10 mm	**1.0 mm**	22 mm	70 mm	6	**HS-400651**	MHVTI-020-61000-R1.00
	10 mm	**1.0 mm**	32 mm	80 mm	6	**HS-400652**	MHVTI-030-61000-R1.00
12 mm	12 mm	**0.2 mm**	26 mm	78 mm	6	**HS-400653**	MHVTI-020-61200-R0.20
	12 mm	**0.2 mm**	38 mm	90 mm	6	**HS-400654**	MHVTI-030-61200-R0.20
	12 mm	**0.5 mm**	26 mm	78 mm	6	**HS-400655**	MHVTI-020-61200-R0.50
	12 mm	**0.5 mm**	38 mm	90 mm	6	**HS-400656**	MHVTI-030-61200-R0.50
	12 mm	**1.0 mm**	26 mm	78 mm	6	**HS-400657**	MHVTI-020-61200-R1.00
	12 mm	**1.0 mm**	38 mm	90 mm	6	**HS-400658**	MHVTI-030-61200-R1.00
16 mm	16 mm	**0.2 mm**	34 mm	90 mm	6	**HS-400659**	MHVTI-020-61600-R0.20
	16 mm	**0.2 mm**	50 mm	108 mm	6	**HS-400660**	MHVTI-030-61600-R0.20
	16 mm	**0.5 mm**	34 mm	90 mm	6	**HS-400661**	MHVTI-020-61600-R0.50
	16 mm	**0.5 mm**	50 mm	108 mm	6	**HS-400662**	MHVTI-030-61600-R0.50
	16 mm	**1.0 mm**	34 mm	90 mm	6	**HS-400663**	MHVTI-020-61600-R1.00
	16 mm	**1.0 mm**	50 mm	108 mm	6	**HS-400664**	MHVTI-030-61600-R1.00
20 mm	20 mm	**0.5 mm**	42 mm	102 mm	6	**HS-400665**	MHVTI-020-62000-R0.50
	20 mm	**0.5 mm**	62 mm	125 mm	6	**HS-400666**	MHVTI-030-62000-R0.50
	20 mm	**1.0 mm**	42 mm	102 mm	6	**HS-400667**	MHVTI-020-62000-R1.00
	20 mm	**1.0 mm**	62 mm	125 mm	6	**HS-400668**	MHVTI-030-62000-R1.00

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SPEEDS & FEEDS

6 Flute - For High Efficiency Milling

MHVTI-6

For an in depth material guide please see page 71

MHVTI-6																					
Material Guide	Material Number	Hardness	V_c m/min.	f_z (mm/tooth)																	
				Ø 3		Ø 4		Ø 5		Ø 6		Ø 8		Ø 10		Ø 12		16 Ø		Ø 20	
				HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin	HEM	Fin
PURE NICKEL	2.4066 – 2.4068	< 75 HRB (<450 N/mm²)	85	0.048	0.040	0.063	0.042	0.079	0.044	0.095	0.051	0.126	0.054	0.158	0.058	0.188	0.068	0.253	0.073	0.316	0.081
		75 - 98 HRB (450-770 N/mm²)	75	0.040	0.036	0.053	0.039	0.066	0.041	0.079	0.046	0.105	0.049	0.132	0.053	0.158	0.062	0.212	0.068	0.265	0.074
NICKEL ALLOY	2.4602 (Hastelloy C-22) – 2.4856 (Inconel 625) – 2.4654 (Waspaloy) – 2.4973 (René 41) – 2.4668 (Inconel 718) – 2.4660 (Incoloy 20)	75 - 98 HRB (450-770 N/mm²)	26	0.024	0.028	0.032	0.030	0.040	0.032	0.048	0.035	0.064	0.038	0.080	0.041	0.096	0.048	0.129	0.053	0.161	0.058
		21 - 36 HRC (785-1155 N/mm²)	23	0.023	0.027	0.031	0.029	0.039	0.031	0.046	0.035	0.062	0.038	0.077	0.040	0.092	0.047	0.124	0.051	0.154	0.056
		36 - 50 HRC	22	0.020	0.025	0.026	0.027	0.033	0.029	0.040	0.033	0.053	0.035	0.066	0.038	0.079	0.044	0.106	0.048	0.132	0.052
PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235 – 3.7235 – 3.7105	< 75 HRB (<450 N/mm²)	90	0.066	0.046	0.087	0.049	0.110	0.053	0.130	0.060	0.174	0.063	0.218	0.068	0.260	0.081	0.349	0.088	0.437	0.096
		75 - 98 HRB (450-770 N/mm²)	85	0.055	0.042	0.073	0.045	0.092	0.047	0.109	0.054	0.145	0.058	0.183	0.062	0.218	0.073	0.293	0.080	0.366	0.087
		21 - 36 HRC (785-1155 N/mm²)	75	0.041	0.037	0.054	0.039	0.069	0.041	0.082	0.047	0.109	0.050	0.137	0.054	0.164	0.063	0.220	0.069	0.274	0.075
TITANIUM ALLOY	3.7194 – 3.7164	21 - 36 HRC (785-1155 N/mm²)	55	0.032	0.033	0.043	0.035	0.054	0.037	0.065	0.042	0.086	0.045	0.108	0.048	0.130	0.057	0.173	0.061	0.216	0.066
		36 - 50 HRC	50	0.030	0.031	0.039	0.033	0.049	0.035	0.059	0.040	0.078	0.042	0.098	0.046	0.117	0.053	0.157	0.059	0.197	0.063
COBALT ALLOY	2.4999 – 2.4964 – 2.4979	75 - 98 HRB (450-770 N/mm²)	65	0.028	0.030	0.037	0.032	0.046	0.034	0.055	0.039	0.073	0.041	0.091	0.044	0.109	0.052	0.146	0.056	0.183	0.061
		21 - 36 HRC (785-1155 N/mm²)	55	0.027	0.030	0.035	0.031	0.045	0.034	0.054	0.038	0.070	0.041	0.088	0.043	0.105	0.051	0.141	0.055	0.177	0.060
		36 - 50 HRC	20	0.018	0.024	0.024	0.026	0.031	0.027	0.036	0.031	0.047	0.033	0.060	0.035	0.071	0.041	0.096	0.045	0.120	0.050

MILLING PROCESS	ADOC (ap)	RDOC (ae)
HEM (High Efficiency Milling)	Up to Max LOC	Up to 10% Diameter
Fin (Finishing)	Up to Max LOC	4%-6% Diameter

NOTES:
Hardness Scales: HRB = Rockwell B
HRC = Rockwell C
Feed per tooth, fz, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, fz should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

Prioritise Rigid Setup & Workholding

Titanium's flexibility necessitates a secure grip and a rigid machine setup. Avoid interrupted cuts and ensure the tool remains in motion during contact to prevent work hardening and premature tool wear.

MATERIAL GUIDE

This chart provides a reference across international standards for each material group. It lists the ISO designation, the DIN material number, and the corresponding European (EN), French (AFNOR), British (BS), and United States (US) standards. By aligning equivalent standards side by side, the chart simplifies comparison and helps ensure accurate material selection, regardless of which standard system is being used.

Material Group		Material Number	EN	AFNOR	BS	US
N	WROUGHT ALUMINIUM ALLOY	3.1255 – 3.3523 – 3.3211 – 3.4144 – 3.4345 – 3.4365	EN AW-2014 (AlCuSiMn) – EN AW-5052 (AlMg2.5) – EN AW-6061 (AlMg1SiCu) – AlZnMgCu0.5 – EN AW-7075 (AlZnMgCu1.5) – EN AW-7475 (AlZn5.5MgCu1)	AZ4GU/9051 – AZ5GU.9050C.7075	L86	2014, 5062, 6061, 7050, 7075, 7475
	CAST ALUMINIUM ALLOY	3.2151 – 3.2161 – 3.2381 – 3.3292	G-AlSi6Cu4 – G-AlSi8Cu3 – G-AlSi5Cu – G-AlSi8Cu3Fe – GD-AlMg9 – G-AlSi10Mg	A-S5UZ – A-S903 – A-S9G – A-S10G	LM4 – LM21 – LM24 – LM9	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0
	COPPER ALLOY	2.0065 – 2.1247 – 2.0265 – 2.0375 – 2.0230	E-Cu58 – CuBe2 – CuZn30 – CuZn36Pb3 – CuZn10 CuSn5	UBe2 – CuZn30 – CuZn10	CZ106 – CZ101 – PB102	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5
P	CARBON STEEL	1.0037 – 1.0570 – 1.0401 – 1.0503 – 1.0715 – 1.1158 – 1.1206	S235JR – C15 – ST52-3 – C45 – 9SMn28 – Ck25 – Ck50	E24-2 – E36-3 – AF37.C12.XC18 – AF35.C45 – S250 – 2C50	FE360B – 4360-50B – 080M15 – 080M46 – 230M07 – XC25 – 070M26 – 080M50	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36
	LOW ALLOY STEEL	1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225	100Cr6 – 43CrMo4 – 34CrNiMo6 – 16MnCr5 – 25CrMo4 – 42CrMo4	Y100C6 – 35NCD6 – 16MC4 – 25CD4 – 42CD4	2S.135 – 817M40 – 527M17 – 1717CDS110 – 708M40	13XX, 41XX, 43XX, 51XX, 86XX, 93XX
	TOOL STEEL	1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355	X100CrMoV5 – X40CrMoV-1 – 55NiCrMoV6 – 40CrMnMo7 – 50CrMoV13-15	Z100CDV5 – Z40CDV5 – 55NCDV7 – 40CMD8	BH13	A2, H13, L6, P20, S7
	SPECIALTY STEEL	1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maragin250)	Ni36 – NiCo2918 – X2NiCoMo18-8-5	Invar36 (Fe-Ni 36) – Maraging300 (K93120) – Maragin250 (Z2CN15-10M) – Kovar (Fe-Ni29Co17)	Maraging300 (K93120)	300M, Invar 36, Kovar, Maraging200, Maraging250, Maraging 300, Maraging 350
M	AUSTENITIC STAINLESS STEEL	1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306	X2CrNiMnMoNNb21-16-5-3 – X12CrNi17-7 – X10CrNiS18-9 – X5CrNi18-9 – X2rNi19-11	Z12CN17.07 – Z10CNF18.09 – 76CN18.09 – Z2CN18.10	301 S 21 – 303 S 21 – 304 S 12 – 304 S 15	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347
	MARTENSITIC & FERRITIC STAINLESS STEEL	1.4000 – 1.4006 – 1.4005 – 1.4021 – 1.4125 – 1.4016 – 1.4762	X6Cr13 – X10Cr13 – X12CrS13 – X20Cr13 – X105CrMo17 – X10CrAlSi25 – X6Cr17	X6Cr13 – Z12C13 – Z12CF13 – Z100CD14 – Z8C17 – Z12CAS25 – Z20C13	403 S 17 – 410 S 21 – 416 D 21 – 430S15 – X10CrAlSi25 – 420 S 37	403, 410, 416, 420, 440, 430, 446
	PRECIPITATION HARDENING (PH) STAINLESS STEEL	1.4545 – 1.4548 – 1.4594 – 1.4614	C5CrNiCu15-5 – X5CrNiCuNb17-4-4 – X5CrNiMoCuNb14-5 – X2CrNiTi 12-11-2	S17400	15-5 – S17480	15-5, 17-4, Carpenter 450, Carpenter 465
K	GRAY CAST IRON	0.6010 – 0.6015 – 0.6020 – 0.6025 – 0.6030 – 0.6040	GG-10 – GG-15 – GG-20 – GG-25 – GG-30 – GG-40	FT10D – FT15D – FT20D – FT25D – FT30D – FT40D	Grade 150 – Grade 220 – Grade 260 – Grade 300 – Grade 400	SAE J431, ASTM A48
	MALLEABLE CAST IRON	0.8135 – 0.8155 – 0.8165 – 0.8170	GTS-35-10 – GTS55-04 – GTS65-02 – GTS-70-02	MN35-10 – MP50-5 – MP60-3 – IP70-2	B340/12 – P510/4 – P570/3 – P690/2	ASTM A47, ASTM A220, ASTM A602
	NODULAR (DUCTILE) CAST IRON	0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070	EN-GJS-3500-22 – EN-GJS-400-15 – EN-GJS-500-7 – EN-GJS-700	FGS400-12 – FGS500-7 – FGS600 – FGS600-3 – FG700-2	SNG420/12 – SNG500/7 – SNG-600/3 – SNG700/2	ASTM A536, ASTM 897
S	PURE NICKEL	2.4066 – 2.4068	Ni 99,6 – LC-Ni99,6		Na11 – Na12	Nickel 200, Nickel 201
	NICKEL ALLOY	2.4602 – 2.4856 – 2.4654	NiCr21Mo14W – NiCr22Mo9Nb – NiCr19Co14Mo4Ti		Na21	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20
	PURE TITANIUM	3.7025 – 3.7035 – 3.7055 – 3.7065 – 3.7235	Ti99,8	T-40 – T-50 – T-60	2TA.6 – 2TA.7 – 2TA.8 – 2TA.9	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12
	TITANIUM ALLOY	3.7194 – 3.7164	Ti3Al2.5V (Grade 9) – Ti6Al4V (Grade 5) – Ti10V2Fe3Al			Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al
	COBALT ALLOY	2.4999 – 2.4964 – 2.4979	CoCr20W15Ni – CoCr28Mo6		HR240	ASTM F562, ASTM F90, ASTM F75, ASTM F799

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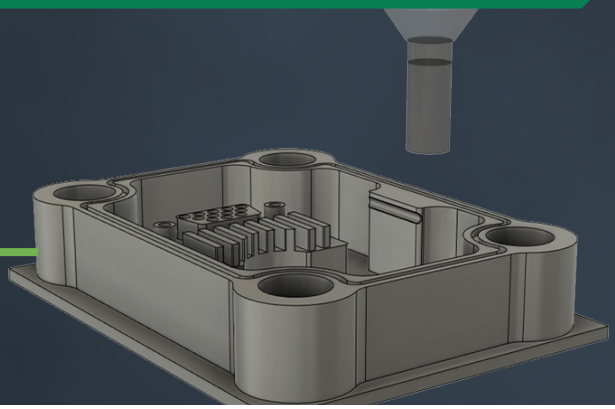
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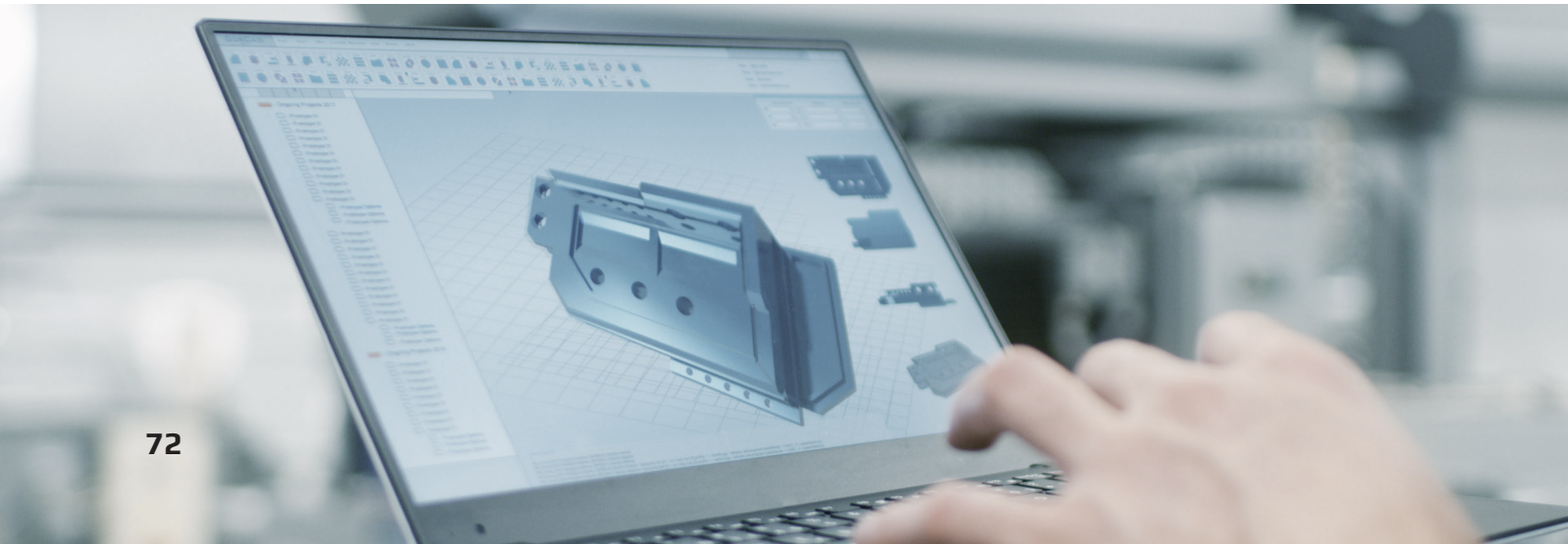
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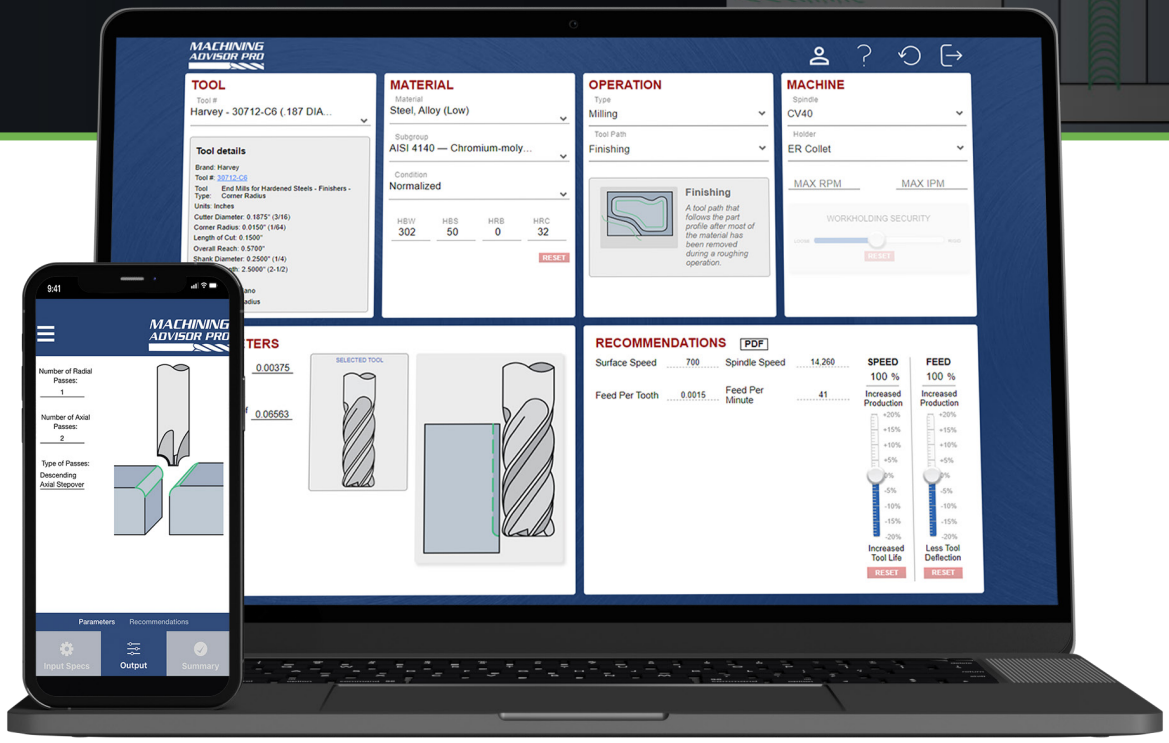
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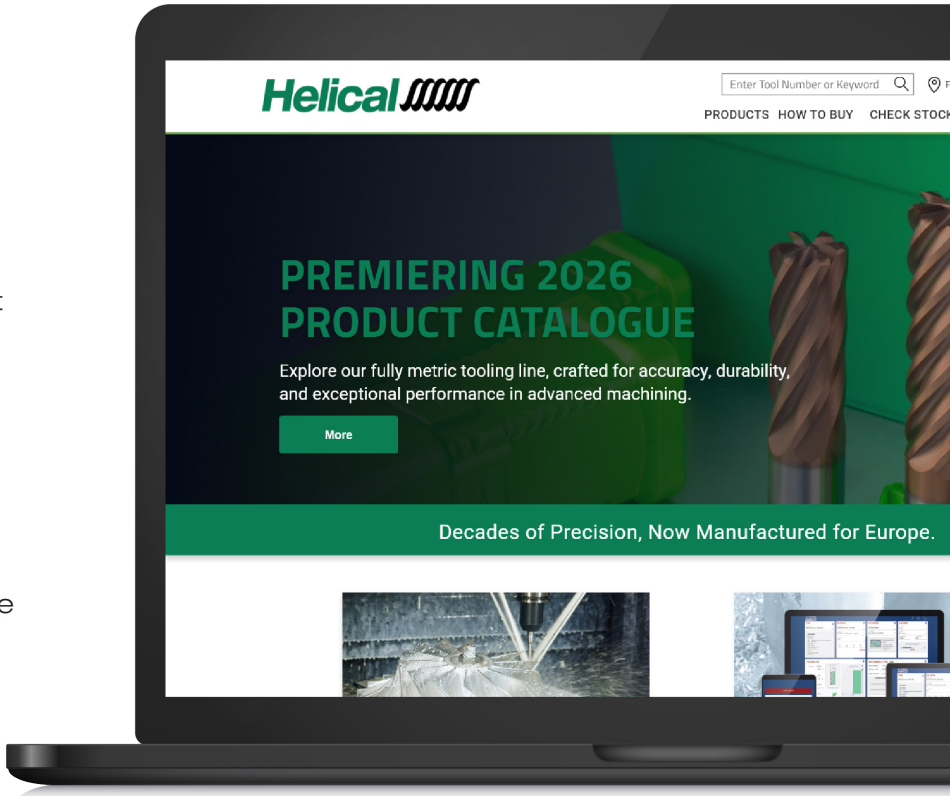
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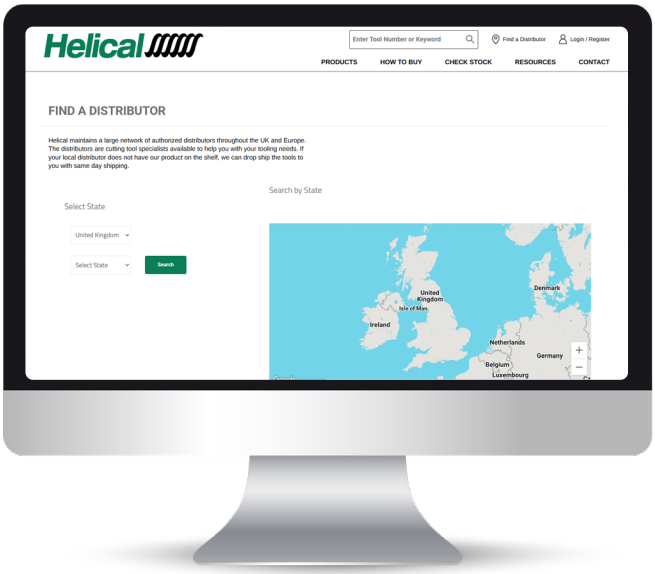
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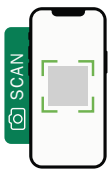
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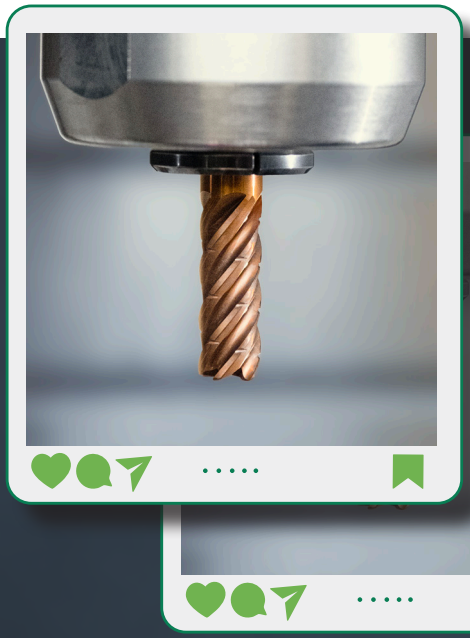
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