

# Helical

Let Helical Impress You

**Over 1500 SKUs  
Fully Stocked**

**Unbeatable  
Performance**

**Manufactured  
in Europe**

MHVNI-8, p.64

**2026 CATALOGUE**

# Helical

## Let Helical Impress You

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.

## Outstanding Technical Expertise

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.

### Europe, Asia & Rest of World



### North America



## 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.

## Join Our Email List

Scan the QR code to sign up for our email list! Our email delivers valuable information about Helical Solutions products and technical resources directly to your inbox. Be the first to know of newly-released tools to gain an immediate leg-up on the competition!

- + Helical Solutions Product Releases
- + Valuable Technical Resources
- + Machining Tips & Best Practices
- + Giveaways & Promotions



## Shopping Has Never Been Easier:

### Get started on [helicaltool.com](https://helicaltool.com)



#### Find a Distributor Page

Use the Find a Distributor page to quickly locate your local Helical distributor to place your order.



#### Send Cart to Your Distributor

Add products to your Helicaltool.com shopping cart and then submit the cart to a participating distributor to place your order.



8

End Mills for Aluminium Alloys & Non-Ferrous Materials



25

End Mills for Steels, Stainless & High Temp



60

End Mills for Stainless Steels



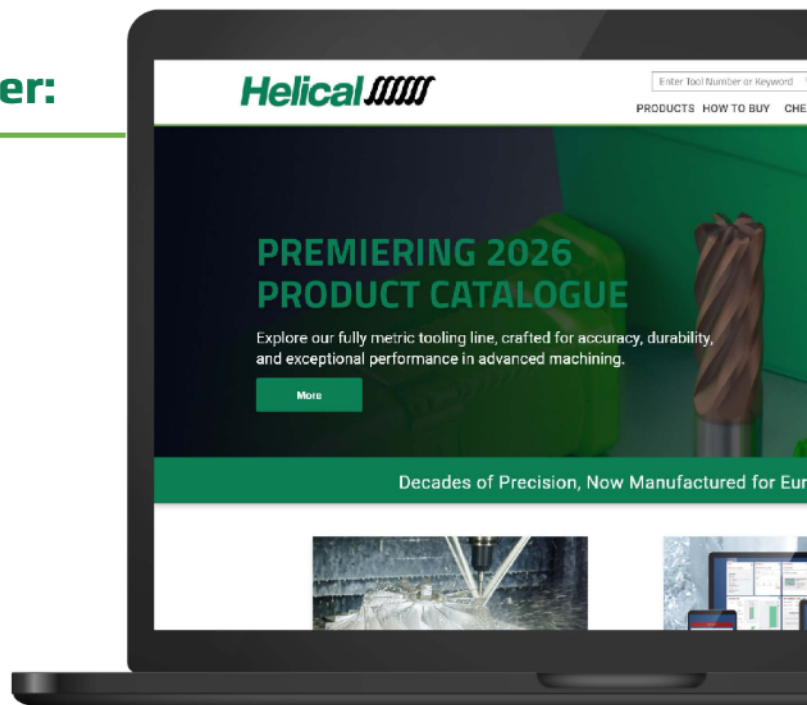
62

End Mills for Nickel Alloys



66

End Mills for Titanium & Titanium Alloys



## END MILLS FOR ALUMINIUM

### Aluminium Alloys & Non-Ferrous Materials

| <b>ROUGHERS</b> |         |               |   | <b>PG</b> |
|-----------------|---------|---------------|---|-----------|
| MH35ALV-C-3     | 3 Flute | Corner Radius | 35° Helix - Chipbreaker Rougher - Variable Pitch                | 8         |
| MH35ALV-C-RN-3  | 3 Flute | Corner Radius | 35° Helix - Chipbreaker Rougher - Variable Pitch - Reduced Neck | 9         |
| <b>2 FLUTE</b>  |         |               |   | <b>PG</b> |
| MH30AL-2        | 2 Flute | Square        | 30° Helix   | 11        |
| MH30AL-2        | 2 Flute | Ball          | 30° Helix   | 11        |
| MH30AL-2        | 2 Flute | Corner Radius | 30° Helix   | 12        |
| MH30AL-RN-2     | 2 Flute | Square        | 30° Helix - Reduced Neck  | 13        |
| MH30AL-RN-2     | 2 Flute | Ball          | 30° Helix - Reduced Neck  | 14        |
| MH30AL-RN-2     | 2 Flute | Corner Radius | 30° Helix - Reduced Neck  | 15        |
| <b>3 FLUTE</b>  |         |               |   | <b>PG</b> |
| MH40ALV-3       | 3 Flute | Square        | 40° Helix - Variable Pitch                                      | 17        |
| MH40ALV-3       | 3 Flute | Ball          | 40° Helix - Variable Pitch                                      | 18        |
| MH40ALV-3       | 3 Flute | Corner Radius | 40° Helix - Variable Pitch                                      | 19        |
| MH40ALV-RN-3    | 3 Flute | Square        | 40° Helix - Variable Pitch - Reduced Neck                       | 21        |
| MH40ALV-RN-3    | 3 Flute | Ball          | 40° Helix - Variable Pitch - Reduced Neck                       | 22        |
| MH40ALV-RN-3    | 3 Flute | Corner Radius | 40° Helix - Variable Pitch - Reduced Neck                       | 23        |

## END MILLS FOR STEELS, STAINLESS & HIGH TEMP

| <b>ROUGHERS</b> |         |               |                                      | <b>PG</b> |
|-----------------|---------|---------------|--------------------------------------|-----------|
| MHEV-C-5        | 5 Flute | Corner Radius | Chipbreaker Rougher - Variable Pitch | 25        |
| MHEV-C-6        | 6 Flute | Corner Radius | Chipbreaker Rougher - Variable Pitch | 28        |
| MHEV-C-7        | 7 Flute | Corner Radius | Chipbreaker Rougher - Variable Pitch | 31        |
| <b>4 FLUTE</b>  |         |               |                                      | <b>PG</b> |
| MHEV-4          | 4 Flute | Square        | Variable Pitch                       | 34        |
| MHEV-4          | 4 Flute | Ball          | Variable Pitch                       | 35        |
| MHEV-4          | 4 Flute | Corner Radius | Variable Pitch                       | 36        |
| MHEV-RN-4       | 4 Flute | Ball          | Variable Pitch - Reduced Neck        | 38        |
| MHEV-RN-4       | 4 Flute | Corner Radius | Variable Pitch - Reduced Neck        | 39        |
| <b>5 FLUTE</b>  |         |               |                                      | <b>PG</b> |
| MHEV-5          | 5 Flute | Square        | Variable Pitch                       | 42        |
| MHEV-5          | 5 Flute | Corner Radius | Variable Pitch                       | 43        |
| MHEV-RN-5       | 5 Flute | Corner Radius | Variable Pitch - Reduced Neck        | 45        |
| <b>6 FLUTE</b>  |         |               |                                      | <b>PG</b> |
| MHEV-6          | 6 Flute | Square        | Variable Pitch                       | 48        |
| MHEV-6          | 6 Flute | Corner Radius | Variable Pitch                       | 49        |
| MHEV-RN-6       | 6 Flute | Corner Radius | Variable Pitch - Reduced Neck        | 51        |

## END MILLS FOR STEELS, STAINLESS & HIGH TEMP (CONT.)

### 7 FLUTE

|           |         |               |                               | PG |
|-----------|---------|---------------|-------------------------------|----|
| MHEV-7    | 7 Flute | Square        | Variable Pitch                | 54 |
| MHEV-7    | 7 Flute | Corner Radius | Variable Pitch                | 55 |
| MHEV-RN-7 | 7 Flute | Corner Radius | Variable Pitch - Reduced Neck | 57 |

## END MILLS FOR STAINLESS STEELS

### AUSTENITIC STAINLESS END MILLS

|         |         |               |                      | PG |
|---------|---------|---------------|----------------------|----|
| MHVAS-6 | 6 Flute | Corner Radius | Variable Pitch - HEM | 60 |

## END MILLS FOR NICKEL ALLOYS

### 6 FLUTE

|         |         |               |                | PG |
|---------|---------|---------------|----------------|----|
| MHVNI-6 | 6 Flute | Corner Radius | Variable Pitch | 62 |

### 8 FLUTE

|         |         |               |                      | PG |
|---------|---------|---------------|----------------------|----|
| MHVNI-8 | 8 Flute | Corner Radius | Variable Pitch - HEM | 64 |

## END MILLS FOR TITANIUM

Titanium & Titanium Alloys

### ROUGHERS

|           |         |               |  | PG |
|-----------|---------|---------------|--|----|
| MHVTI-C-6 | 6 Flute | Corner Radius | Chipbreaker Rougher - Variable Pitch - HEM | 66 |

### 6 FLUTE

|         |         |               |                      | PG |
|---------|---------|---------------|----------------------|----|
| MHVTI-6 | 6 Flute | Square        | Variable Pitch - HEM | 68 |
| MHVTI-6 | 6 Flute | Corner Radius | Variable Pitch - HEM | 69 |

## TECHNICAL RESOURCES

|                                 | PG |
|---------------------------------|----|
| Speeds & Feeds - Material Guide | 71 |

## OUR COATINGS

### Dplus

Dplus 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.

Dplus 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                   |

### Tplus

Tplus is an ideal choice for increased wear resistance and longer tool life in rigid, vibration-free machine setups. Tplus 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.

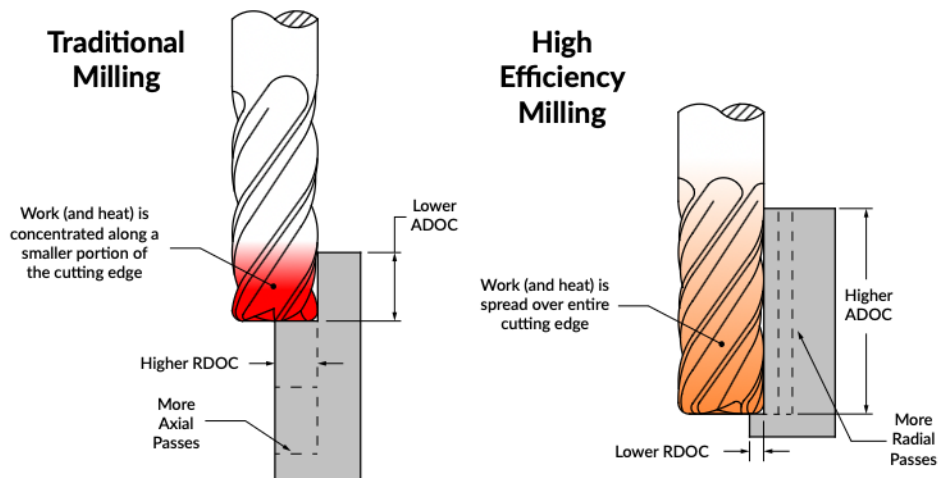
### This approach helps to:

- + 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

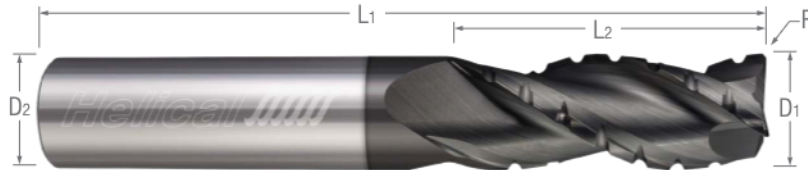
- + Longer tool life and fewer tool changes
- + Higher metal removal rates and faster cycle times
- + Improved part quality with smoother finishes

## 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
- *Dplus* coating for superior tool life and edge retention in abrasive non-ferrous materials
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D1 (h6) | Shank Dia.<br>D2 (h6) | Corner Radius<br>R<br><sup>+0.01mm</sup><br><sub>-0.01mm</sub> | Length of Cut<br>L2<br><sup>+0.7mm</sup><br><sub>+0.0mm</sub> | Overall Length<br>L1<br><sup>+1.5mm</sup><br><sub>-1.5mm</sub> | Flutes | Uncoated  | Dplus 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 |

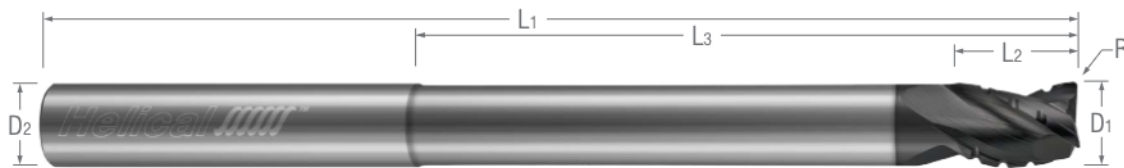
## MH35ALV-C-RN-3



## 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
- *Dplus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | LOC<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | OAL<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes | Uncoated  | <i>Dplus</i> 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 |

continued on next page

### 3 FLUTE - CORNER RADIUS



### MH35ALV-C-RN-3

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

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br>+0.01mm<br>-0.01mm | LOC<br>L <sub>2</sub> +0.7mm<br>+0.0mm | OAL<br>L <sub>1</sub> +1.5mm<br>-1.5mm | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes | Uncoated  | Dplus Coated | Tool Description             |
|------------------------------------|-----------------------------------|--|--|--|-------------------------------|-----------|--------|-----------|--------------|------------------------------|
|                                    |                                   |  |  |  |                               |           |        | HS-401581 | HS-401627    |                              |
| 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (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 |

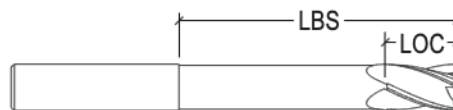
| MILLING PROCESS            | STYLE                     | ADOC (ap)          | RDOC (ae)        |
|----------------------------|---------------------------|--------------------|------------------|
| Slot (Full Slotting)       | Non-reached (MH35ALV-C-3) | 75%-125% Diameter  | 100% Diameter    |
|                            | 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:

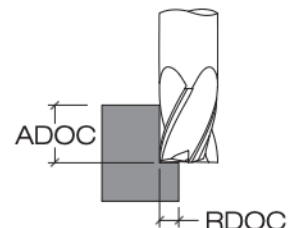
Feed per tooth, f<sub>z</sub> values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer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



Regular Style



Reduced Neck Style



Key: LOC=Length of Cut

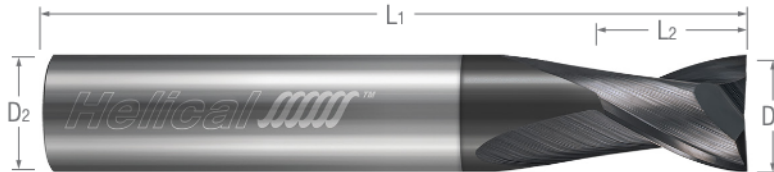
ADOC (ap)=Axial Depth of Cut

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 *Dplus* coating for higher hardness and high lubricity
- Manufactured to DIN 6535 Form HA

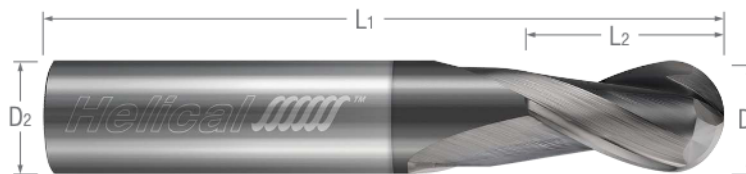


| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub><br><sup>+0.7mm</sup><br><sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub><br><sup>+1.5mm</sup><br><sub>-1.5mm</sub> | Flutes | Uncoated  | <i>Dplus</i> Coated | Tool Description |
|------------------------------------|-----------------------------------|---|--|--------|-----------|---------------------|------------------|
| 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 *Dplus* coating for higher hardness and high lubricity
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub><br><sup>+0.7mm</sup><br><sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub><br><sup>+1.5mm</sup><br><sub>-1.5mm</sub> | Flutes | Uncoated  | <i>Dplus</i> 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 |

## 2 FLUTE - CORNER RADIUS

### MH30AL-2

### 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 *Dplus* coating for higher hardness and high lubricity
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut  |  | Flutes | Uncoated  | Dplus Coated | Tool Description       |
|------------------------------------|-----------------------------------|--|--|--|--------|-----------|--------------|------------------------|
|                                    |                                   |  | L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> |        |           |              |                        |
| 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 |

**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 *Dplus* coating for higher hardness and high lubricity
- Reduced neck for long reach and deep pocketing applications
- Manufactured to DIN 6535 Form HA



2 Flute

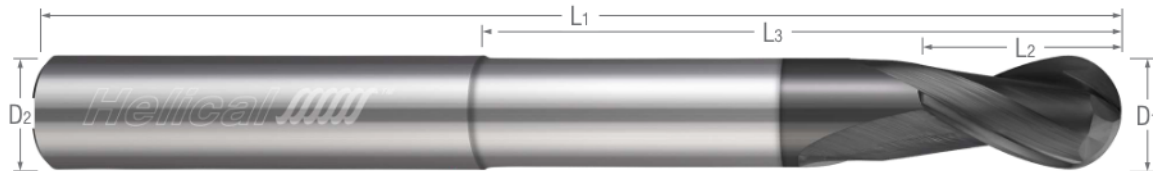
| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | LOC<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes | Uncoated  | <i>Dplus</i> Coated | Tool Description    |
|------------------------------------|-----------------------------------|---|---|-------------------------------|-----------|--------|-----------|---------------------|---------------------|
|                                    |                                   |   |   |                               |           |        |           |                     |                     |
| 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 |

## 2 FLUTE - BALL

### 30° Helix - Reduced Neck

**MH30AL-RN-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 *Dplus* coating for higher hardness and high lubricity
- Reduced neck for long reach and deep pocketing applications
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | LOC  |  | OAL  |  | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes    | Uncoated               | Dplus Coated | Tool Description |
|------------------------------------|-----------------------------------|--|--|--|--|-------------------------------|-----------|-----------|------------------------|--------------|------------------|
|                                    |                                   | L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> |                               |           |           |                        |              |                  |
| 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 |              |                  |

**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
- Centre cutting
- h6 shank tolerance for high precision tool holders
- Available with *Dplus* coating for higher hardness and high lubricity
- Reduced neck for long reach and deep pocketing applications
- Manufactured to DIN 6535 Form HA



2 Flute

| Cutter Dia.<br>D1 (h6) | Shank Dia.<br>D2 (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | LOC                                    |  | OAL   |         | Reach (LBS)<br>L3 | Neck Dia. | Flutes    | Uncoated                  | Dplus Coated | Tool Description |
|------------------------|-----------------------|--|--|--|-------|---------|-------------------|-----------|-----------|---------------------------|--------------|------------------|
|                        |                       |  | L2<br><small>+0.7mm<br/>+0.0mm</small> | L1<br><small>+1.5mm<br/>-1.5mm</small> |       |         |                   |           |           |                           |              |                  |
| 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

## 2 FLUTE - CORNER RADIUS

### 30° Helix - Reduced Neck (cont.)

## MH30AL-RN-2

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br>+0.01mm<br>-0.01mm | LOC<br>L <sub>2</sub> +0.7mm<br>+0.0mm | OAL<br>L <sub>1</sub> +1.5mm<br>-1.5mm | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes | Uncoated  | Dplus 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

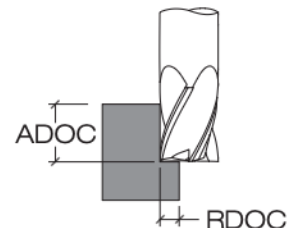
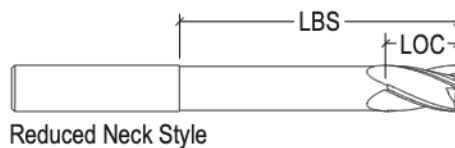
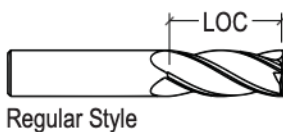
## MH30AL-2 / MH30AL-RN-2

| Material Guide          | Material Number                                     | V <sub>c</sub><br>m/min.          | f <sub>z</sub> (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, f<sub>z</sub>, 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, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.



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
- *Dplus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (h6) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | Uncoated  | <i>Dplus</i> 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 |

## 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
- *Dplus* coating for superior tool life and edge retention in abrasive non-ferrous materials
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (h6) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | Uncoated  | <i>Dplus</i> 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
- *Dplus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><sup>+0.01mm</sup><br><sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub><br><sup>+0.7mm</sup><br><sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub><br><sup>+1.5mm</sup><br><sub>-1.5mm</sub> | Flutes | Uncoated  | Dplus 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 |

continued on next page

## 3 FLUTE - CORNER RADIUS

40° Helix - Variable Pitch (cont.)



### MH40ALV-3

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | Uncoated  | Dplus 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

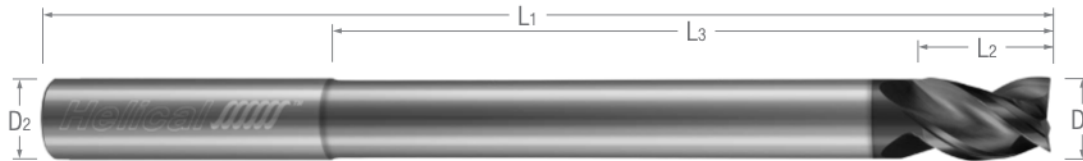
Aluminium is notorious for producing long, stringy chips that can recut if not evacuated. To mitigate this, use air blasts, high-pressure coolant, or chip breakers to keep chips clear.



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
- *Dplus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



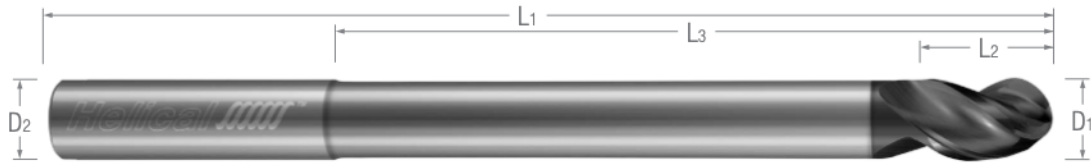
| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | LOC<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes | Uncoated  | <i>Dplus</i> Coated | Tool Description     |
|------------------------------------|-----------------------------------|---|---|-------------------------------|-----------|--------|-----------|---------------------|----------------------|
| 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 |

## 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
- *Dplus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | LOC<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes | Uncoated  | <i>Dplus</i> 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 |



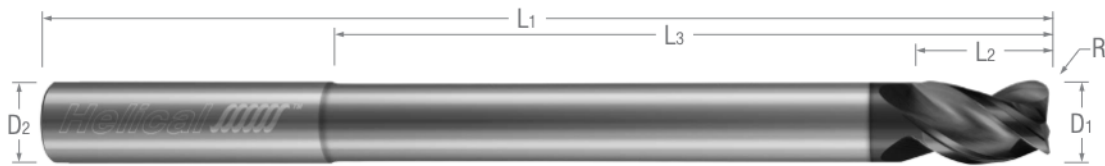
Speeds &amp; Feeds on Page 24

**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
- *Dplus* coating offers higher hardness and added lubricity for maximum performance
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | LOC<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | OAL<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Reach (LBS)<br>L <sub>3</sub> | Neck Dia. | Flutes    | Uncoated  | <i>Dplus</i> 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 - CORNER RADIUS

## 40° Helix - Reduced Neck (cont.)



### MH40ALV-RN-3

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (h6) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R +0.01mm<br>-0.01mm | LOC                             |                                 |                | OAL            |                |                | Reach (LBS)<br>L <sub>3</sub> | Neck Dia.                  | Flutes | Uncoated | Dplus Coated | Tool Description |
|------------------------------------|-----------------------------------|---------------------------------------|---------------------------------|---------------------------------|----------------|----------------|----------------|----------------|-------------------------------|----------------------------|--------|----------|--------------|------------------|
|                                    |                                   |                                       | L <sub>2</sub> +0.7mm<br>+0.0mm | L <sub>1</sub> +1.5mm<br>-1.5mm | L <sub>3</sub> | L <sub>2</sub> | L <sub>1</sub> | L <sub>3</sub> |                               |                            |        |          |              |                  |
| 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 |        |          |              |                  |

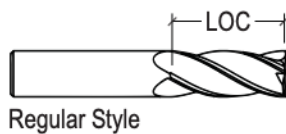
For an in depth material guide please see page 71

|                         |   | MH40ALV-3 / MH40ALV-RN-3 |                           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------|---|--------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Material Guide          | Material Number                                     | V <sub>c</sub> m/min.    | f <sub>z</sub> (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 |

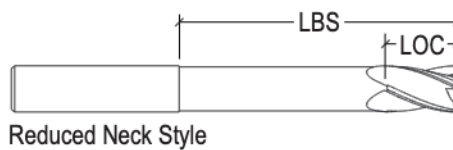
| MILLING PROCESS            | STYLE                   | ADOC (ap)          | RDOC (ae)        |
|----------------------------|-------------------------|--------------------|------------------|
| Slot (Full Slotting)       | Non-reached (MH40ALV-3) | 75%-125% Diameter  | 100% Diameter    |
|                            | 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:

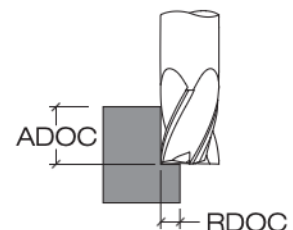
Feed per tooth, f<sub>z</sub>, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer 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

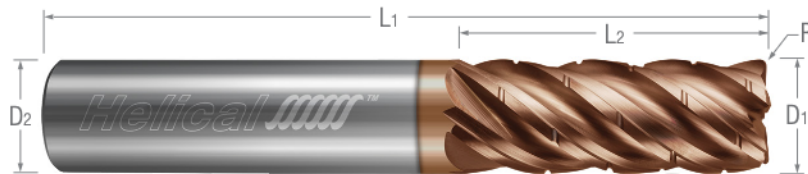
## MHEV-C-5



## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes    | <i>Tplus</i> 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 |                        |

## 5 FLUTE - CORNER RADIUS

### Chipbreaker Rougher - Variable Pitch (cont.)


**MHEV-C-5**

continued from previous page

| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | Tplus 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 |
| 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 |
| 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 |
| 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 &amp; 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 |
| TOOL STEEL                             | 1.2363 – 1.2344 – 1.2713 – 1.2311 – 1.2355   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 |
| SPECIALTY STEEL                        | 1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maraging250)  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 |
| AUSTENITIC STAINLESS STEEL             | 1.3964 (Nitronic50) – 1.4341 – 1.4305 – 1.4301 – 1.4306  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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, f<sub>z</sub>, 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, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

## 6 FLUTE - CORNER RADIUS

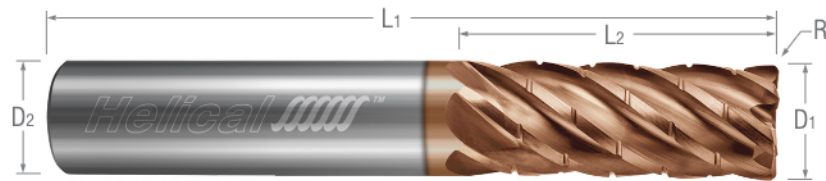
### Chipbreaker Rougher - Variable Pitch



**MHEV-C-6**

Roughers

- 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | Length of Cut<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | Overall Length<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Flutes    | <i>Tplus</i> 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 |

continued on next page



## MHEV-C-6



## 6 FLUTE - CORNER RADIUS

### Chipbreaker Rougher - Variable Pitch (cont.)

continued from previous page

| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes    | Tplus 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 |



**Follow Helical Tools on Instagram**  
Get machining insights, expert tips, and  
inspiration straight from the spindle.

@helicaltools.eu

Tag us and share what you are working on @helicaltools.eu

**MHEV-C-6**

**SPEEDS & FEEDS**

**6 Flute - Chipbreaker Rougher - Variable Pitch**

For an in depth material guide please see page 71

Roughers

| MHEV-C-6                               |   |  |                          |                           |       |       |       |       |       |       |       |       |
|--|---|--|--------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Material Guide                         | Material Number   | Hardness                                   | V <sub>c</sub><br>m/min. | f <sub>z</sub> (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 –<br>1.0401 – 1.0503 –<br>1.0715 – 1.1158 – 1.1206  | < 75 HRB (<450 N/mm <sup>2</sup> )         | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.6582 – 1.7131 –<br>1.7218 – 1.7225   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )   | 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/mm <sup>2</sup> ) | 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 –<br>1.2713 – 1.2311 – 1.2355   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )   | 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/mm <sup>2</sup> ) | 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) –<br>1.3981 (Kovar) –<br>1.6354 (Maraging300) –<br>1.6359 (Maraging250)  | < 75 HRB (<450 N/mm <sup>2</sup> )         | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.4341 – 1.4305 –<br>1.4301 – 1.4306   | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4005 – 1.4021 –<br>1.4125 – 1.4016 – 1.4762  | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4594 – 1.4614  | 21 - 36 HRC ( 785-1155 N/mm <sup>2</sup> ) | 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 –<br>0.6020 – 0.6025 –<br>0.6030 – 0.6040   | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.8165 – 0.8170  | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.7050 – 0.7060 – 0.7070   | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )         | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 |
|  |   | < 75 HRB (<450 N/mm <sup>2</sup> )         | 90                       | 0.040                     | 0.054 | 0.066 | 0.079 | 0.107 | 0.132 | 0.156 | 0.204 | 0.248 |
| PURE TITANIUM                          | 3.7025 – 3.7035 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | 75 - 98 HRB ( 450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 75                       | 0.025                     | 0.034 | 0.041 | 0.049 | 0.067 | 0.083 | 0.098 | 0.128 | 0.156 |
|  |   | 36 - 50 HRC                                | 55                       | 0.020                     | 0.027 | 0.033 | 0.039 | 0.053 | 0.066 | 0.077 | 0.101 | 0.123 |
| TITANIUM ALLOY                         | 3.7194 – 3.7164   | 21 - 36 HRC ( 785-1155 N/mm <sup>2</sup> ) | 55                       | 0.018                     | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 | 0.071 | 0.092 | 0.112 |
|  |   | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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, f<sub>z</sub>, 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, f<sub>z</sub> 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<sub>plus</sub> coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | T <sub>plus</sub> 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 |
| 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 |
| 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 |

continued on next page

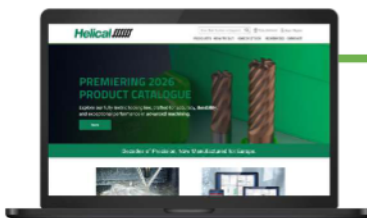
## 7 FLUTE - CORNER RADIUS

### Chipbreaker Rougher - Variable Pitch (cont.)


**MHEV-C-7**

continued from previous page

| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | Length of Cut<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | Overall Length<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Flutes | Tplus 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

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.

[www.helicaltool.com](http://www.helicaltool.com)

## MHEV-C-7



## SPEEDS &amp; 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (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 –<br>1.0401 – 1.0503 – 1.0715 –<br>1.1158 – 1.1206  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.6582 – 1.7131 –<br>1.7218 – 1.7225   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.2713 – 1.2311 – 1.2355   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.3981 (Kovar) –<br>1.6354 (Maraging300) –<br>1.6359 (Maraging250)  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.4341 – 1.4305 –<br>1.4301 – 1.4306   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4005 – 1.4021 – 1.4125 –<br>1.4016 – 1.4762  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4594 – 1.4614  | 21 - 36 HRC (785-1155 N/mm <sup>2</sup> ) | 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 –<br>0.6025 – 0.6030 – 0.6040  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.8165 – 0.8170  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.7050 – 0.7060 – 0.7070   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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

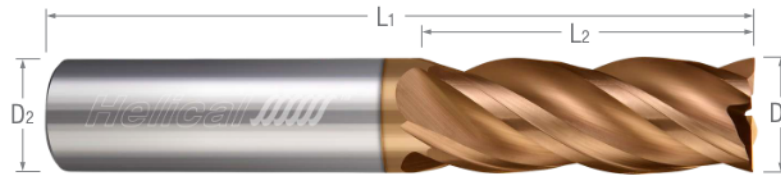
Feed per tooth, f<sub>z</sub>, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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   |

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



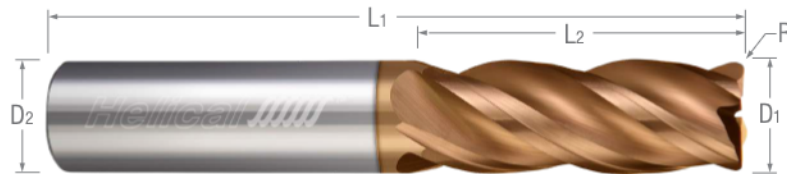
| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | Tplus Coated | Tool Description  |
|--|---------------------------------------|---|--|--------|--------------|-------------------|
| 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 |

## 4 FLUTE - CORNER RADIUS

## MHEV-4

### 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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 |

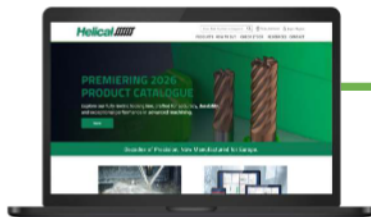
continued on next page

## MHEV-4

4 FLUTE - CORNER RADIUS  
Variable Pitch (cont.)

continued from previous page

| Cutter Diameter<br>D <sub>1</sub> (ø8) | Shank Diameter<br>D <sub>2</sub> (H6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | 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

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.

[www.helicaltool.com](http://www.helicaltool.com)

## 4 FLUTE - BALL

## MHEV-RN-4

### 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | <i>Tplus</i> 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 |

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>-0.0mm</sup> | OAL<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | <i>Tplus</i> 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 |

continued on next page

## 4 FLUTE - CORNER RADIUS

## MHEV-RN-4

### Variable Pitch - Reduced Neck (cont.)

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | Tplus 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 |

## Helical Solutions is proud to partner with industry-leading CAM software packages to make using our tools as simple as possible.

### Valuable Time Savings

Import tool libraries directly into CAM software, so you can spend more time at the machine.

### Confident Machining

Program confidently with accurate tool dimensions and CAM-specific tool data.

### Growing Libraries & Partnerships

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

MHEV-4

SPEEDS & FEEDS  
4 Flute - Variable Pitch

For an in depth material guide please see page 71

MHEV-4 / MHEV-RN-4

| Material Guide                         | Material Number   | Hardness                     | Vc<br>m/ min | fz (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 (Maraging250) | < 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 |       |
|  | 36 - 50 HRC   | 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 |       |
| 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 |       |
|  | 36 - 50 HRC   | 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 |       |
| 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 |       |
|  | 36 - 50 HRC   | 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 |       |
| NODULAR (DUCTILE) CAST IRON            | 0.7033 – 0.7044 – 0.7050 – 0.7060 – 0.7070                                      | 75 - 98 HRB (450-770 N/mm²)  | 80           | 0.007         | 0.013 | 0.028 | 0.010 | 0.018 | 0.030 | 0.013 | 0.023 | 0.032 | 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 |
|  | 21 - 36 HRC (785-1155 N/mm²)  | 80                           | 0.007        | 0.013         | 0.028 | 0.010 | 0.018 | 0.030 | 0.013 | 0.023 | 0.032 | 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 |       |
|  | 36 - 50 HRC   | 26                           | 0.007        | 0.013         | 0.028 | 0.010 | 0.017 | 0.029 | 0.    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

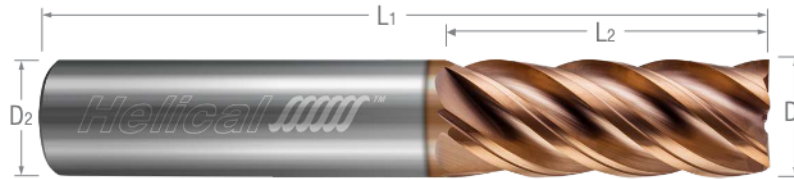
## 5 FLUTE - SQUARE

### 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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   |

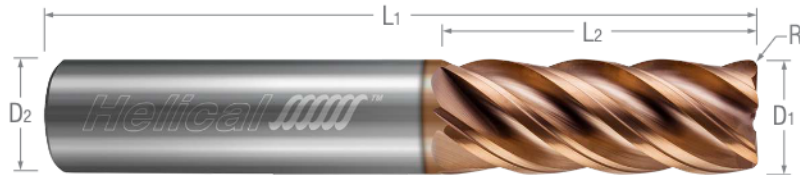
## MHEV-5



## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | <i>Tplus</i> 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 |
| 12 mm                              | 10 mm                             | 1.0 mm  | 32 mm  | 80 mm   | 5      | HS-400169           | MHEV-030-51000-R1.00 |
|                                    | 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                              | 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 |

continued on next page



## 5 FLUTE - CORNER RADIUS

### MHEV-5

### Variable Pitch (cont.)

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | Length of Cut<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | Overall Length<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Flutes | Tplus 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 |



Follow Helical Tools on Instagram  
Get machining insights, expert tips, and  
inspiration straight from the spindle.

 @helicaltools.eu

Tag us and share what you are working on @helicaltools.eu

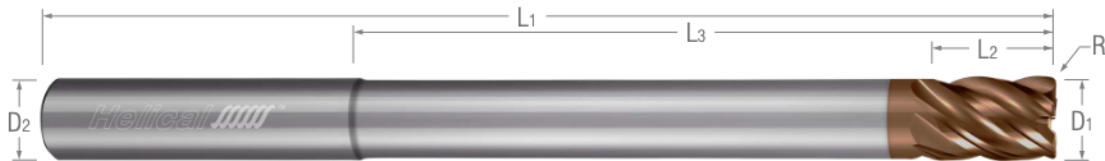
## MHEV-RN-5



## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | Length of Cut<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | OAL<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | <i>Tplus</i> 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 |

continued on next page

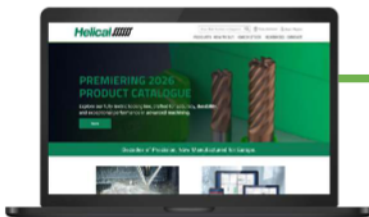

**MHEV-RN-5**

## 5 FLUTE - CORNER RADIUS

### Variable Pitch - Reduced Neck (cont.)

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br>+0.01mm<br>-0.01mm | Length of Cut<br>L <sub>2</sub> +0.7mm<br>+0.0mm | OAL<br>L <sub>1</sub> +1.5mm<br>-1.5mm | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | <i>Tplus Coated</i> | Tool Description        |
|------------------------------------|-----------------------------------|--|--|--|-------------------------------|---------------|--------|---------------------|-------------------------|
| 12 mm                              | 12 mm                             | <b>0.2 mm</b>                            | 26 mm  | 90 mm                                  | 38 mm                         | 11.40 mm      | 5      | <b>HS-400216</b>    | MHEV-RN-030-51200-R0.20 |
|                                    | 12 mm                             | <b>0.2 mm</b>                            | 26 mm  | 102 mm                                 | 50 mm                         | 11.40 mm      | 5      | <b>HS-400217</b>    | MHEV-RN-040-51200-R0.20 |
|                                    | 12 mm                             | <b>0.5 mm</b>                            | 26 mm  | 90 mm                                  | 38 mm                         | 11.40 mm      | 5      | <b>HS-400218</b>    | MHEV-RN-030-51200-R0.50 |
|                                    | 12 mm                             | <b>0.5 mm</b>                            | 26 mm  | 102 mm                                 | 50 mm                         | 11.40 mm      | 5      | <b>HS-400219</b>    | MHEV-RN-040-51200-R0.50 |
|                                    | 12 mm                             | <b>1.0 mm</b>                            | 26 mm  | 90 mm                                  | 38 mm                         | 11.40 mm      | 5      | <b>HS-400220</b>    | MHEV-RN-030-51200-R1.00 |
|                                    | 12 mm                             | <b>1.0 mm</b>                            | 26 mm  | 102 mm                                 | 50 mm                         | 11.40 mm      | 5      | <b>HS-400221</b>    | MHEV-RN-040-51200-R1.00 |
| 16 mm                              | 16 mm                             | <b>0.2 mm</b>                            | 34 mm  | 102 mm                                 | 50 mm                         | 15.20 mm      | 5      | <b>HS-400222</b>    | MHEV-RN-030-51600-R0.20 |
|                                    | 16 mm                             | <b>0.2 mm</b>                            | 34 mm  | 125 mm                                 | 66 mm                         | 15.20 mm      | 5      | <b>HS-400223</b>    | MHEV-RN-040-51600-R0.20 |
|                                    | 16 mm                             | <b>0.5 mm</b>                            | 34 mm  | 102 mm                                 | 50 mm                         | 15.20 mm      | 5      | <b>HS-400224</b>    | MHEV-RN-030-51600-R0.50 |
|                                    | 16 mm                             | <b>0.5 mm</b>                            | 34 mm  | 125 mm                                 | 66 mm                         | 15.20 mm      | 5      | <b>HS-400225</b>    | MHEV-RN-040-51600-R0.50 |
|                                    | 16 mm                             | <b>1.0 mm</b>                            | 34 mm  | 102 mm                                 | 50 mm                         | 15.20 mm      | 5      | <b>HS-400226</b>    | MHEV-RN-030-51600-R1.00 |
|                                    | 16 mm                             | <b>1.0 mm</b>                            | 34 mm  | 125 mm                                 | 66 mm                         | 15.20 mm      | 5      | <b>HS-400227</b>    | MHEV-RN-040-51600-R1.00 |
| 20 mm                              | 20 mm                             | <b>0.5 mm</b>                            | 42 mm  | 125 mm                                 | 62 mm                         | 19.00 mm      | 5      | <b>HS-400228</b>    | MHEV-RN-030-52000-R0.50 |
|                                    | 20 mm                             | <b>0.5 mm</b>                            | 42 mm  | 140 mm                                 | 82 mm                         | 19.00 mm      | 5      | <b>HS-400229</b>    | MHEV-RN-040-52000-R0.50 |
|                                    | 20 mm                             | <b>1.0 mm</b>                            | 42 mm  | 125 mm                                 | 62 mm                         | 19.00 mm      | 5      | <b>HS-400230</b>    | MHEV-RN-030-52000-R1.00 |
|                                    | 20 mm                             | <b>1.0 mm</b>                            | 42 mm  | 140 mm                                 | 82 mm                         | 19.00 mm      | 5      | <b>HS-400231</b>    | MHEV-RN-040-52000-R1.00 |



### "Smart-Search" Feature

Simply and quickly search for a Helical Solutions tool, then receive results for its product page, as well as for every technical resource relevant to that tool, presented in one click to save you valuable time and money.

[www.helicaltool.com](http://www.helicaltool.com)

## MHEV-5

SPEEDS & FEEDS  
5 Flute - Variable Pitch

For an in depth material guide please see page 71

## MHEV-5 / MHEV-RN-5

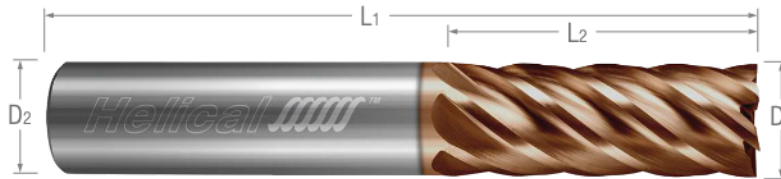
| Material Guide                         | Material Number  | Hardness                                  | V <sub>c</sub><br>m/min. | f <sub>z</sub> (mm/tooth) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|--|---|--------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|  |  |   |                          | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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                        | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )   |   | 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 |
|  | 1.3505 – 1.3563 – 1.6582 – 1.7131 – 1.7218 – 1.7225  | 21 - 36 HRC (785-1155 N/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 | 0.044 | 0.043 | 0.036 | 0.057 | 0.047 | 0.043 | 0.068 | 0.052 |
| SPECIALTY STEEL                        | 1.3913 (Invar36) – 1.3981 (Kovar) – 1.6354 (Maraging300) – 1.6359 (Maraging250)  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 | 0.085 |
|  |  | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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                       |                           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | <i>Tplus</i> 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   |

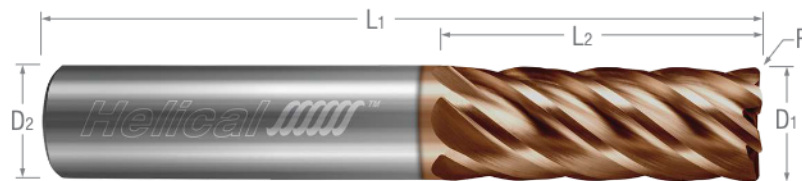
## MHEV-6



## 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<sub>plus</sub> coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | T <sub>plus</sub> 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 |

continued on next page

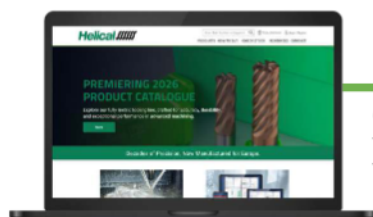
## 6 FLUTE - CORNER RADIUS

### Variable Pitch (cont.)


**MHEV-6**

continued from previous page

| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br>+0.01mm<br>-0.01mm | Length of Cut<br>L <sub>2</sub><br>+0.7mm<br>+0.0mm | Overall Length<br>L <sub>1</sub><br>+1.5mm<br>-1.5mm | Flutes | T <sub>plus</sub> 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 |



### Expansive Stock Check

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.

[www.helicaltool.com](http://www.helicaltool.com)

## MHEV-RN-6



## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | OAL<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | <i>Tplus</i> 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 |

continued on next page

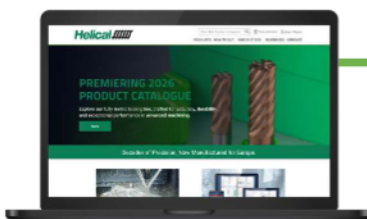
## 6 FLUTE - CORNER RADIUS

### Variable Pitch - Reduced Neck (cont.)


**MHEV-RN-6**

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | Tplus 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 |



### Optimise Your Toolpath Before You Cut

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.

[www.helicaltool.com](http://www.helicaltool.com)

## 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (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 –<br>1.0401 – 1.0503 –<br>1.0715 – 1.1158 – 1.1206  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.6582 – 1.7131 –<br>1.7218 – 1.7225   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.2713 – 1.2311 – 1.2355   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.3981 (Kovar) –<br>1.6354 (Maraging300) –<br>1.6359 (Maraging250)  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.4341 – 1.4305 –<br>1.4301 – 1.4306   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4005 – 1.4021 –<br>1.4125 – 1.4016 – 1.4762  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4594 – 1.4614  | 21 - 36 HRC (785-1155 N/mm <sup>2</sup> ) | 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 –<br>0.6020 – 0.6025 –<br>0.6030 – 0.6040   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.8165 – 0.8170  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.7050 – 0.7060 – 0.7070   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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

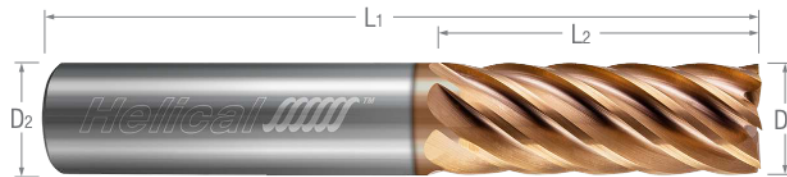
Feed per tooth, f<sub>z</sub>, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> Coated | Tool Description |
|--|---------------------------------------|---|--|--------|---------------------|------------------|
| 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   |

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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 |

continued on next page

## 7 FLUTE - CORNER RADIUS

### Variable Pitch


**MHEV-7**

continued from previous page

| Cutter Diameter<br>$D_1$ (e8) | Shank Diameter<br>$D_2$ (h6) | Corner Radius<br>$R$<br>$+0.01\text{mm}$<br>$-0.01\text{mm}$ | Length of Cut<br>$L_2$<br>$+0.7\text{mm}$<br>$+0.0\text{mm}$ | Overall Length<br>$L_1$<br>$+1.5\text{mm}$<br>$-1.5\text{mm}$ | Flutes | <i>Tplus</i> 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 |



Follow Helical Tools on Instagram  
Get machining insights, expert tips, and  
inspiration straight from the spindle.

@helicaltools.eu

Tag us and share what you are working on @helicaltools.eu

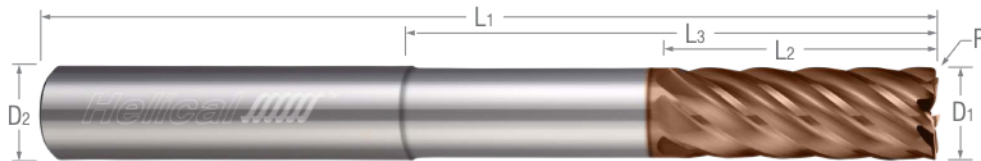
## MHEV-RN-7



## 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)
- *Tplus* coating offers high hardness for superior tool life
- Manufactured to DIN 6535 Form HA



| Cutter Dia.<br>D1 (e8) | Shank Dia.<br>D2 (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L2 <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L1 <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L3 | Neck Diameter | Flutes | <i>Tplus</i> 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 |

continued on next page

## 7 FLUTE - CORNER RADIUS

### Variable Pitch - Reduced Neck (cont.)


**MHEV-RN-7**

continued from previous page

| Cutter Dia.<br>D <sub>1</sub> (e8) | Shank Dia.<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | OAL<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Reach (LBS)<br>L <sub>3</sub> | Neck Diameter | Flutes | Tiplus Coated | Tool Description        |
|------------------------------------|-----------------------------------|--|---|---|-------------------------------|---------------|--------|---------------|-------------------------|
|                                    |                                   |  |   |   |                               |               |        |               |                         |
| 12 mm                              | 12 mm                             | <b>0.2 mm</b>  | 26 mm   | 90 mm   | 38 mm                         | 11.40 mm      | 7      | HS-400436     | MHEV-RN-030-71200-R0.20 |
|                                    | 12 mm                             | <b>0.2 mm</b>  | 26 mm   | 102 mm  | 50 mm                         | 11.40 mm      | 7      | HS-400437     | MHEV-RN-040-71200-R0.20 |
|                                    | 12 mm                             | <b>0.5 mm</b>  | 26 mm   | 90 mm   | 38 mm                         | 11.40 mm      | 7      | HS-400438     | MHEV-RN-030-71200-R0.50 |
|                                    | 12 mm                             | <b>0.5 mm</b>  | 26 mm   | 102 mm  | 50 mm                         | 11.40 mm      | 7      | HS-400439     | MHEV-RN-040-71200-R0.50 |
|                                    | 12 mm                             | <b>1.0 mm</b>  | 26 mm   | 90 mm   | 38 mm                         | 11.40 mm      | 7      | HS-400440     | MHEV-RN-030-71200-R1.00 |
|                                    | 12 mm                             | <b>1.0 mm</b>  | 26 mm   | 102 mm  | 50 mm                         | 11.40 mm      | 7      | HS-400441     | MHEV-RN-040-71200-R1.00 |
| 16 mm                              | 16 mm                             | <b>0.2 mm</b>  | 34 mm   | 102 mm  | 50 mm                         | 15.20 mm      | 7      | HS-400442     | MHEV-RN-030-71600-R0.20 |
|                                    | 16 mm                             | <b>0.2 mm</b>  | 34 mm   | 125 mm  | 66 mm                         | 15.20 mm      | 7      | HS-400443     | MHEV-RN-040-71600-R0.20 |
|                                    | 16 mm                             | <b>0.5 mm</b>  | 34 mm   | 102 mm  | 50 mm                         | 15.20 mm      | 7      | HS-400444     | MHEV-RN-030-71600-R0.50 |
|                                    | 16 mm                             | <b>0.5 mm</b>  | 34 mm   | 125 mm  | 66 mm                         | 15.20 mm      | 7      | HS-400445     | MHEV-RN-040-71600-R0.50 |
|                                    | 16 mm                             | <b>1.0 mm</b>  | 34 mm   | 102 mm  | 50 mm                         | 15.20 mm      | 7      | HS-400446     | MHEV-RN-030-71600-R1.00 |
|                                    | 16 mm                             | <b>1.0 mm</b>  | 34 mm   | 125 mm  | 66 mm                         | 15.20 mm      | 7      | HS-400447     | MHEV-RN-040-71600-R1.00 |
| 20 mm                              | 20 mm                             | <b>0.5 mm</b>  | 42 mm   | 125 mm  | 62 mm                         | 19.00 mm      | 7      | HS-400448     | MHEV-RN-030-72000-R0.50 |
|                                    | 20 mm                             | <b>0.5 mm</b>  | 42 mm   | 140 mm  | 82 mm                         | 19.00 mm      | 7      | HS-400449     | MHEV-RN-040-72000-R0.50 |
|                                    | 20 mm                             | <b>1.0 mm</b>  | 42 mm   | 125 mm  | 62 mm                         | 19.00 mm      | 7      | HS-400450     | MHEV-RN-030-72000-R1.00 |
|                                    | 20 mm                             | <b>1.0 mm</b>  | 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (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 –<br>1.0401 – 1.0503 –<br>1.0715 – 1.1158 – 1.1206  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.6582 – 1.7131 –<br>1.7218 – 1.7225   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.2713 – 1.2311 – 1.2355   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.3981 (Kovar) –<br>1.6354 (Maraging300) –<br>1.6359 (Maraging250)  | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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) –<br>1.4341 – 1.4305 –<br>1.4301 – 1.4306   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4005 – 1.4021 –<br>1.4125 – 1.4016 – 1.4762  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>1.4594 – 1.4614  | 21 - 36 HRC (785-1155 N/mm <sup>2</sup> ) | 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 –<br>0.6020 – 0.6025 –<br>0.6030 – 0.6040   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.8165 – 0.8170  | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>0.7050 – 0.7060 – 0.7070   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 |

## NOTES:

Hardness Scales: HRB = Rockwell B  
HRC = Rockwell C

Feed per tooth, f<sub>z</sub>, 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, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.

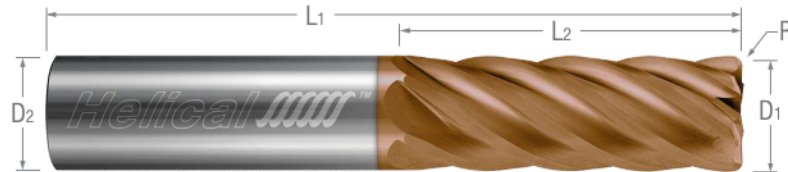
| MILLING PROCESS            | HARDNESS | ADOC (ap)     | RDOC (ae)        |
|----------------------------|----------|---------------|------------------|
| Rgh (Traditional Roughing) | < 35 HRC | Up to Max LOC | 10%-15% Diameter |
|                            | ≥ 35 HRC | Up to Max LOC | 10%-15% Diameter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

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | <i>Tplus</i> 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 &amp; 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (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<br>STAINLESS STEEL                | 1.3964 (Nitronic50) –<br>1.4341 – 1.4305 –<br>1.4301 – 1.4306         | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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<br>& FERRITIC<br>STAINLESS STEEL | 1.4000 – 1.4006 –<br>1.4005 – 1.4021 –<br>1.4125 – 1.4016 –<br>1.4762 | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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<br>STEEL                        | 1.4545 – 1.4548 –<br>1.4594 – 1.4614                                  | 21 - 36 HRC (785-1155 N/mm <sup>2</sup> ) | 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     |

## Helical Solutions is proud to partner with industry-leading CAM software packages to make using our tools as simple as possible.

### Valuable Time Savings

Import tool libraries directly into CAM software, so you can spend more time at the machine.

### Confident Machining

Program confidently with accurate tool dimensions and CAM-specific tool data.

### Growing Libraries & Partnerships

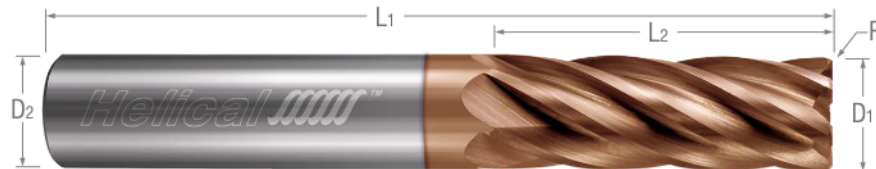
Count on up-to-date product libraries across a roster of leading CAM partners.

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | Length of Cut<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | Overall Length<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Flutes | <i>Tplus</i> 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 |

**Speeds & Feeds on Page 63**

## 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 <sub>c</sub><br>m/min | f <sub>z</sub> (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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Inconel 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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 –<br>2.4979   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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, f<sub>z</sub>, 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, f<sub>z</sub> 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

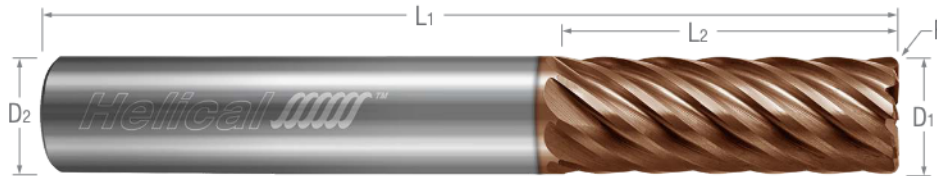
Use rigid, multi-flute tools for strength and stability. Six flutes are ideal for roughing, while eight are optimised for finishing. Wear-resistant coatings like *Tplus* are essential for optimal performance.

## 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
- *Tplus* coating offers high hardness for superior tool life and increased edge strength
- Manufactured to DIN 6535 Form HA



| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><sup>+0.01mm</sup><br><sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub><br><sup>+0.7mm</sup><br><sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub><br><sup>+1.5mm</sup><br><sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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 |

**Speeds & Feeds on Page 65**

## MHVNI-8



## SPEEDS &amp; 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 <sub>c</sub><br>m/<br>min. | f <sub>z</sub> (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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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 –<br>2.4979   | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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, f<sub>z</sub>, 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, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer to Machining Advisor Pro.



Follow Helical Tools on Instagram  
Get machining insights, expert tips, and  
inspiration straight from the spindle.

@helicaltools.eu

Tag us and share what you are working on @helicaltools.eu



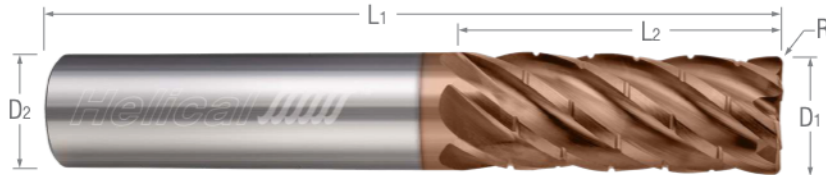
**MHVTI-C-6**

**6 FLUTE - CORNER RADIUS**

**Chipbreaker Rougher - Variable Pitch - For High Efficiency Milling**

Roughers

- 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
- *Tplus* 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<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R<br><small>+0.01mm<br/>-0.01mm</small> | Length of Cut<br>L <sub>2</sub><br><small>+0.7mm<br/>+0.0mm</small> | Overall Length<br>L <sub>1</sub><br><small>+1.5mm<br/>-1.5mm</small> | Flutes | <i>Tplus</i> 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 |
| 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 |
| 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 |
| 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 |

continued on next page

Speeds & Feeds on Page 67

## MHVTI-C-6



## 6 FLUTE - CORNER RADIUS

### Chipbreaker Rougher - Variable Pitch - For High Efficiency Milling

continued from previous page

| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm<br/>-0.01mm</sup> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm<br/>+0.0mm</sup> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm<br/>-1.5mm</sup> | Flutes | Tplus 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 &amp; 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 <sub>c</sub><br>m/min. | f <sub>z</sub> (mm/tooth) |       |       |       |       |       |       |       |       |
|                |   |   |                          | Ø 3                       | Ø 4   | Ø 5   | Ø 6   | Ø 8   | Ø 10  | Ø 12  | 16 Ø  | Ø 20  |
|                |   |   |                          | HEM                       | HEM   | HEM   | HEM   | HEM   | HEM   | HEM   | HEM   | HEM   |
| PURE NICKEL    | 2.4066 – 2.4068   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 85                       | 0.055                     | 0.073 | 0.092 | 0.109 | 0.145 | 0.183 | 0.218 | 0.293 | 0.366 |
| TITANIUM ALLOY | 3.7194 – 3.7164   | 21 - 36 HRC (785-1155 N/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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

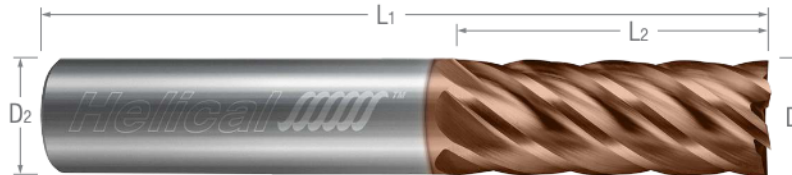
Feed per tooth, f<sub>z</sub>, values shown are for 3xD length of cut tools, and should be adjusted for longer or shorter lengths of cut. Values shown are for non-reached tools. For tools with reaches greater than 3xD, f<sub>z</sub> should be reduced. For more accurate machining parameters, please refer 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
- *Tplus* 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<br>D1 (e8) | Shank Diameter<br>D2 (h6) | Length of Cut<br>L2 <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L1 <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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.

Speeds & Feeds on Page 70

## MHVTI-6

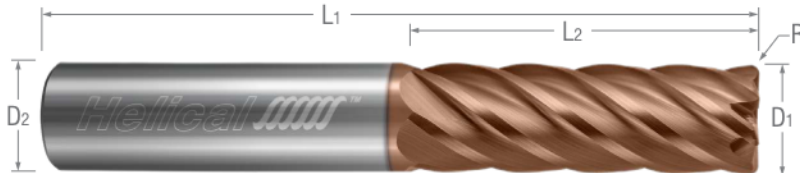


## 6 FLUTE - CORNER RADIUS

### 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
- *Tplus* 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

6 Flute

| Cutter Diameter<br>D <sub>1</sub> (e8) | Shank Diameter<br>D <sub>2</sub> (h6) | Corner Radius<br>R <sup>+0.01mm</sup> / <sub>-0.01mm</sub> | Length of Cut<br>L <sub>2</sub> <sup>+0.7mm</sup> / <sub>+0.0mm</sub> | Overall Length<br>L <sub>1</sub> <sup>+1.5mm</sup> / <sub>-1.5mm</sub> | Flutes | <i>Tplus</i> 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 |

Speeds & Feeds on Page 70



MHVTI-6

## SPEEDS &amp; FEEDS

## 6 Flute - For High Efficiency Milling

For an in depth material guide please see page 71

6 Flute

| MHVTI-6        |   |   |                          |                           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|---|---|--------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Material Guide | Material Number   | Hardness                                  | V <sub>c</sub><br>m/min. | f <sub>z</sub> (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/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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) –<br>2.4856 (Inconel 625) –<br>2.4654 (Waspaloy) –<br>2.4973 (René 41) –<br>2.4668 (Inconel 718) –<br>2.4660 (Incoloy 20) | 75 - 98 HRB (450-770 N/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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 –<br>3.7055 – 3.7065 –<br>3.7235 – 3.7235 –<br>3.7105   | < 75 HRB (<450 N/mm <sup>2</sup> )        | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> ) | 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/mm <sup>2</sup> )  | 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/mm <sup>2</sup> ) | 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, f<sub>z</sub>, 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, f<sub>z</sub> 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 (Maraging250) | Ni36 – NiCo2918 – X2NiCoMo18-8-5   | Invar36 (Fe-Ni 36) – Maraging300 (K93120) – Maraging250 (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                         | X2CrNiMnMoNb21-16-5-3 – X12CrNi17-7 – X10CrNiS18-9 – X5CrNi18-9 – X2Ni19-11  | 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   |

# CAM Tool Libraries

Harvey Performance Company and Helical Solutions work closely with industry-leading CAM software companies to optimise Helical Solutions product libraries for their platforms.

## Valuable Time Savings

Import tool libraries directly into CAM software and allow more time to be spent at the machine.

## Confident Machining

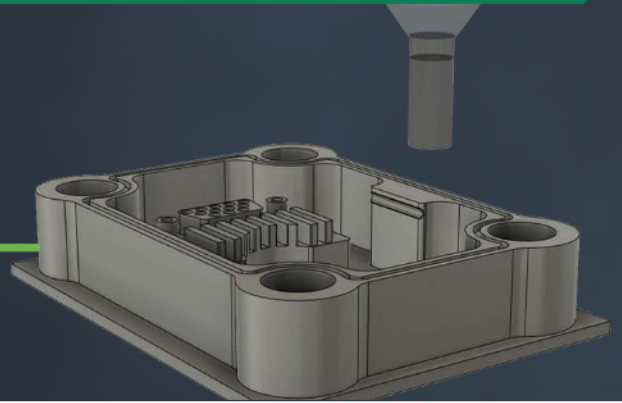
Program confidently with accurate tool dimensions and CAM-specific tool data.

## Growing Libraries & Partnerships

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

## Download Tool Libraries Now

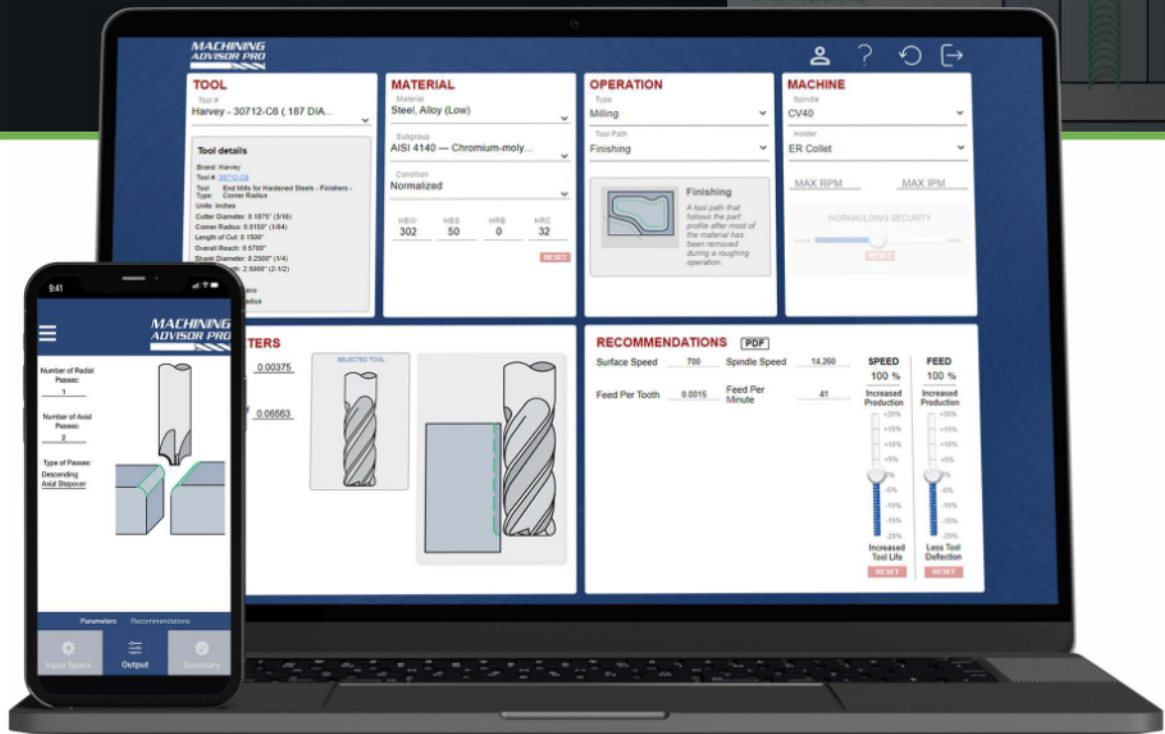
[harveypformance.com/tool-libraries](http://harveypformance.com/tool-libraries)



CAM Tool Libraries available in English only



# MACHINING ADVISOR PRO



A cutting-edge resource that generates custom machining parameters for optimised machining with Helical Solutions end mills.

## Optimised for Your Specific Application

Increase material removal rates and shop floor productivity with customised machining parameters, specifically tailored to Helical Solutions products.

## Customisable Speeds & Feeds

Generate specialised machining parameters by pairing your end mill with your exact tool path, material, and machine setup.

## Free to Use

Access the app quickly on your desktop, tablet, or mobile phone with no fee or subscription required.

Machining Advisor Pro available in English only

Available on all desktop, tablet, and mobile devices.

[www.machiningadvisorpro.com](http://www.machiningadvisorpro.com)



# A Website that Works Hard for You

Helical Solutions is also equipped with several technical resources, from Simulation Files and Speeds & Feeds charts to CAM Tool Libraries, we complement your high quality tool with equally beneficial resources.

## helicaltool.com



### “Smart Search”

Simply and quickly search for a Helical Solutions tool, then receive results for its product page, as well as for every technical resource relevant to that tool, presented in one click to save you valuable time and money.



### Machining Advisor Pro

Quickly and accurately access customised machining parameters for your specific setup.



### Speeds & Feeds

Utilise downloadable, printer-friendly Speeds & Feeds charts optimised for each Helical product.



### Simulation Files

Download files in .STEP or .DXF format to quickly generate tool paths using your preferred software.



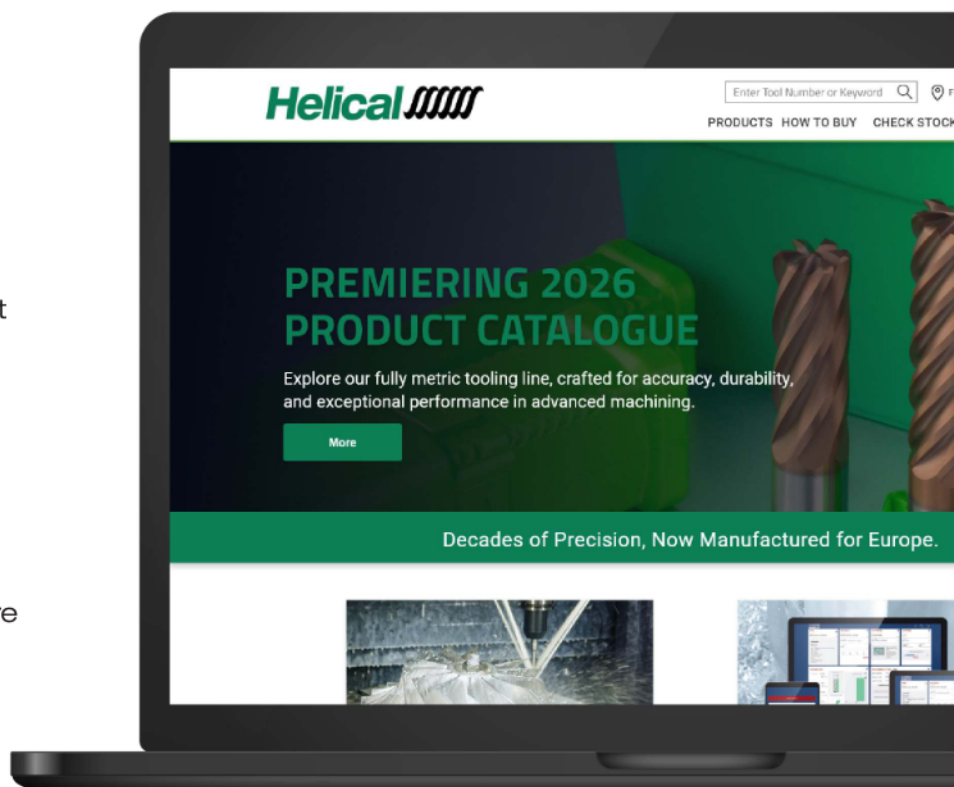
### CAM Partnerships

Explore industry-leading CAM software packages to simplify your machining setup and operation.



### Product Table Filtering

Find the perfect Helical Solutions tool for your job quickly and easily by using the filtering functionality on each product table, sorting through an expansive and always growing product offering.



# How to Buy Online



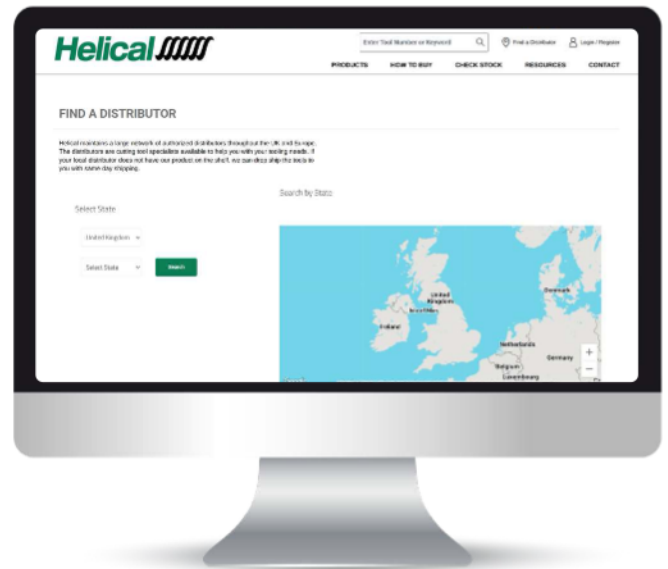
## Find a Distributor

Use the Find a Distributor page to quickly locate your local Helical distributor to place your order.



## Send Cart to Your Distributor

Add products to your Helicaltool.com shopping cart and then submit the cart to a participating distributor to place your order.



## Join Our Email List

Scan the QR code to sign up for our email list! Our weekly email delivers valuable information about Helical Solutions products and technical resources directly to your inbox. Be the first to know of newly-released tools to gain an immediate leg-up on the competition!



## Stay Connected With Us

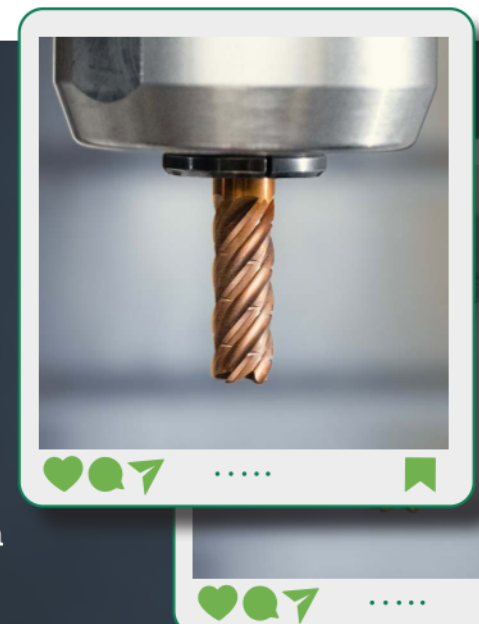
- + Helical Solutions Product Releases
- + Valuable Technical Resources
- + Machining Tips & Best Practices
- + Giveaways & Promotions

# Get Connected With Helical Tool

 Instagram @helicaltools.eu

 LinkedIn @helical-solutions-llp-eu

From amazing tool geometries to precise final parts made with Helical Solutions tools, you'll find it all on our social media channels! Also, be sure to send us your pictures and videos! We love to check out what you accomplish with our tools.



## DECADES OF TRUST, NOW IN EUROPE

Let Helical Impress You

Helical Solutions has been trusted for decades by North American industry leaders to deliver high-performance cutting tools. Our end mills, now designed, manufactured, and fully stocked in Europe, thrive at aggressive running parameters, improve part finishes, and generate real savings for every shop floor.



MH40ALV-RN-3, p.23



MHEV-4, p.34

Precision. Power. Performance.



8

End Mills for  
Aluminium Alloys  
& Non-Ferrous  
Materials



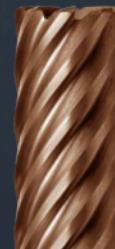
25

End Mills for  
Steels, Stainless  
& High Temp



60

End Mills for  
Stainless  
Steels



62

End Mills for  
Nickel Alloys



66

End Mills for  
Titanium &  
Titanium Alloys