



# Solid carbide tools

Performance. Productivity. Precision.

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### Solid carbide tools

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# Innovative by Tradition

PFERD TOOLS is synonymous with high-quality, precise and innovative tools with the wow factor. We've been developing solutions for work on surfaces and for cutting and machining materials since 1799.

We have a global presence and are there for you whenever you need us in more than 100 countries, both on site and digitally. With our innovative strength and expertise, we pursue a clear mission: to provide solutions that make a real difference to you and your projects.



# Solid carbide tools

## Highlights from the PFERD TOOLS range



### Performance stainless solid carbide end mills

By combining a material-specific tool geometry and state-of-the-art coatings, the performance stainless solid carbide end mills are ideal for machining stainless steel and titanium alloys. The high-performance tools have been optimized for both conventional and dynamic milling, meaning they ensure a more reliable process and higher productivity when used on materials that are difficult to machine.

#### Advantages:

- Optimum temperature control when working on materials that are difficult to machine.
- Optimized helix angle for improved chip evacuation.
- Unequal pitch and unequal helix angle for low-vibration work with smooth running.



### Performance aluminium solid carbide end mills

The material-specific geometry of our solid carbide end mills from the Performance Aluminium Line has been optimized for use in the most demanding aluminium machining scenarios. The universal high-performance tools are suitable for a variety of applications, from roughing to finishing. Can also be used for dynamic milling (trochoidal milling) and in large overhangs and deep cavities, depending on the specific type.

#### Advantages:

- Large polished chip channels for optimum chip control.
- Increased process reliability at high cutting speeds.
- Unequal pitch for low-vibration machining with smooth running.



### Universal solid carbide drills

Solid carbide drills from the Universal Line can be used universally on the most important materials such as steel, stainless steel, cast iron and non-ferrous metals. To achieve the highest performance, the surface post-treatment is tailored to each specific drill.

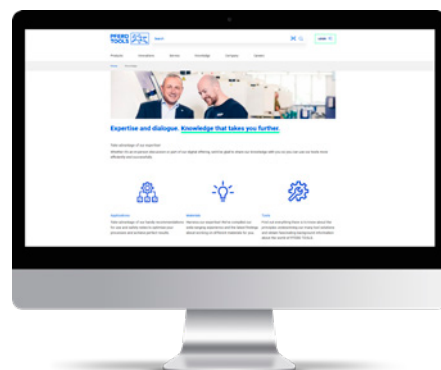
#### Advantages:

- Double margin flute for increased process stability and high-quality bores.
- Inner coolant supply for increased tool life and controlled chip removal.
- State-of-the-art coatings.



### More expert information online

Scan the QR code to find out a wide range of tool and application knowledge relating to PFERD TOOLS' high-quality tools and their huge variety of materials.



### PFERD TOOLS solid carbide tools

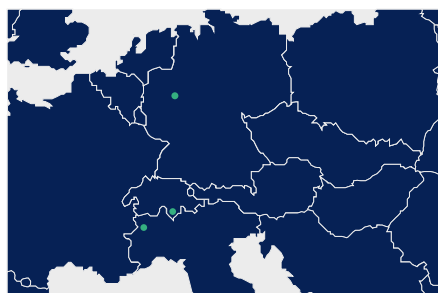
Our solid carbide tools combine the very best of our long-standing, comprehensive expertise in the development and manufacture of milling and drilling tools with our ongoing specialization in the field of surface treatment and coatings. As such, we provide the right solutions for tomorrow's manufacturing, today.



#### All the benefits to you at a glance:

- The highest production and quality standards due to precise micro and macro geometry together with tungsten carbide optimised for specific applications.
- High productivity due to optimum stock removal rate.

### Comprehensive expertise at all levels



#### Innovations made in Europe

In our innovative centres of expertise for surface treatment and coatings, located in Germany, Italy and Switzerland, we develop and manufacture solid carbide tools that make a real difference. Our equipment currently includes 93 state-of-the-art CNC tool grinding machines.



#### Premium quality without compromises

When it comes to the quality of our solid carbide tools, we don't leave anything to chance. We use state-of-the-art measuring equipment to ensure super-accurate tolerances down to the last micrometer, which enables us to meet and exceed the highest demands for process reliability, productivity and precision.



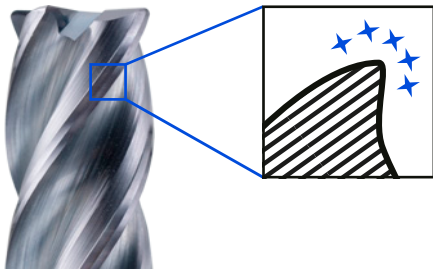
#### The right choice for every application

Whether it's common, universal machining applications or material-specific high-performance applications: our user-centric range has been tailored to your specific requirements. Depending on the specific tool and type, we can provide solid carbide tools with diameters ranging from 0.1 mm to 32 mm.

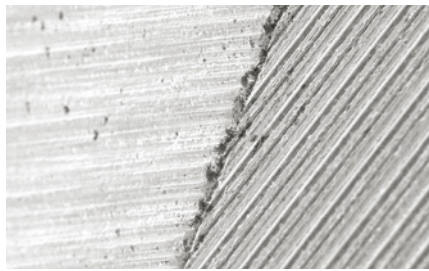
### Pooled expertise in surface treatment and coatings

From tool preparation to the coating stage and the post-treatment of the layer: each individual process step is designed to provide the best possible tool solution for your machining processes.

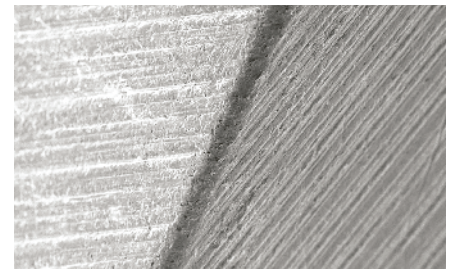
### Tool preparation



Defined rounded cutting edges for improved coating adhesion, a sturdier cutting edge and, in turn, a longer tool life and higher tool productivity.



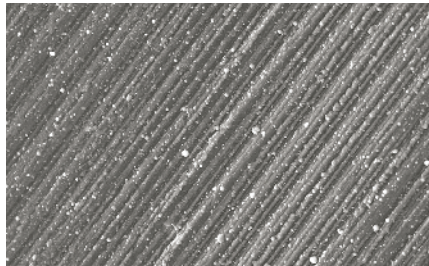
Non-rounded cutting edge.



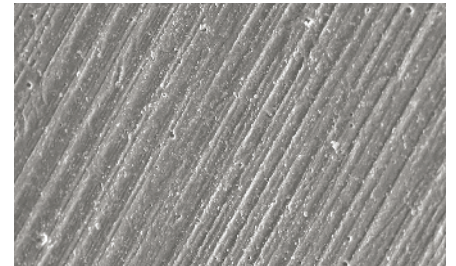
Defined rounded cutting edge.

### Smoothing

Smoothing rough areas on the surface using post-treatment processes (e.g. removing droplets after applying a coating) in order to reduce friction and extend the tool life.



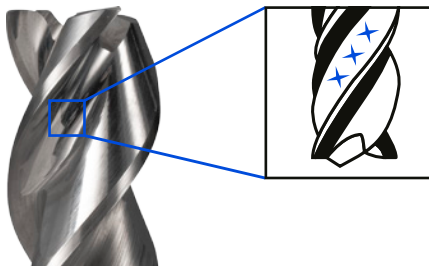
Tool surface with droplets.



Tool surface without droplets.

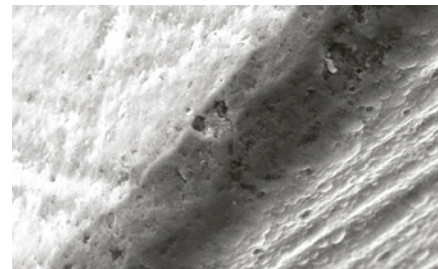
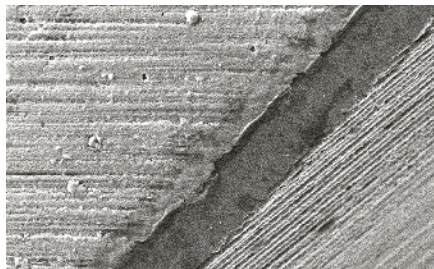
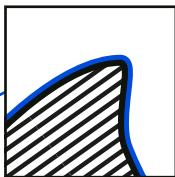
### Polish grinding

Chip channels have been optimized for specific materials, ensuring controlled chip evacuation and that the tool does not clog up when machining non-ferrous metals with a high volume of chips.



Polished chip channels for optimum chip control.

### Coatings



High-performance PVD coatings, optimized for use with different materials and applications, thanks to state-of-the-art in-house coating technology.

Coating on an untreated tool surface.

Coating on a pretreated tool surface.

### Technical customer support

If you have any questions about optimizing your stock removal applications, our sales representatives and technical advisers will be happy to help or visit you. PFERD TOOLS works alongside you to provide application engineering solutions for working with diverse materials. Please do not hesitate to contact us for further information. You can find our worldwide sales office addresses at: [www.pferd.com](http://www.pferd.com).



### Custom-made products

If you cannot find the solution for your particular application in our catalogue range, we are happy to produce solid carbide milling and drilling tools to meet your wishes and requirements. Our sales representatives and technical advisers will be happy to assist you in analyzing your task.



#### Find your ideal tool solution in just three steps:

##### ■ 1. Process analysis

Make an appointment with our experienced sales representatives and technical advisers. You can find our worldwide sales office addresses at [www.pferd.com](http://www.pferd.com).

##### ■ 2. Production

Our production teams subsequently create a technical drawing with which your made-to-order product will be produced.

##### ■ 3. Use

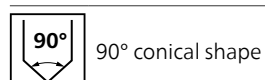
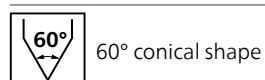
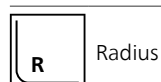
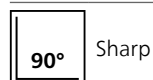
See the quality, performance and economic value of products from PFERD TOOLS for yourself!



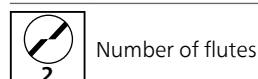
# Solid carbide end mills

## Explanation of pictograms used

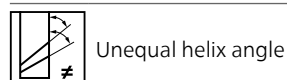
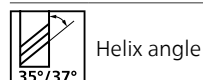
### Geometry – Type



### Geometry – Number of flutes



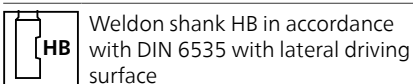
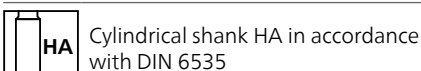
### Geometry – helix angle



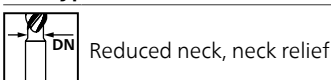
### Norm



### Shank type



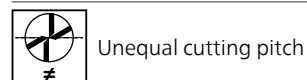
### Tool type



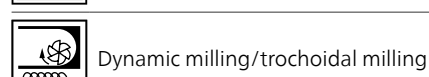
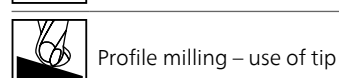
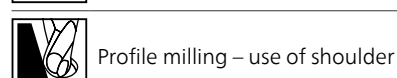
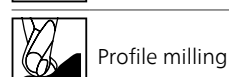
### Feed direction



### Unequal pitch



### Applications



## Formulae for cut data calculation

$$n = \frac{v_c \times 1,000}{DC \times \pi} \text{ min}^{-1}$$

### Rotational speed

$$v_c = \frac{DC \times \pi \times n}{1,000} \text{ m/min}$$

### Cutting speed

$$v_f = f_z \times ZEFP \times n \text{ mm/min}$$

### Feeding speed

### Explanation of the abbreviations

- $a_p$  = cutting depth
- $a_e$  = contact width
- DC = milling cutter diameter in [mm]

- $f_z$  = feed per tooth in [mm/tooth]
- $n$  = spindle rotational speed in [rev/min]
- $v_c$  = cutting speed in [m/min]

- $v_f$  = feeding speed in [mm/min]
- ZEFP = effective no. of teeth

# SCM - UC4 - M100C - M72HB AL40

## ① Tool group

SCM = Solid Carbide Mill

## ② Product line

U = Universal

H = High Performance

## ③ Shape

B = Full radius end mill (ball nose)

D = Deburring end mill (deburring/chamfering)

C = Cylindrical end mill with centre cut

CR = Cylindrical end mill for roughing

CD = Cylindrical end mill with chip divider

## ④ Number of cutting edges

## ⑤ Material group

ISO groups P, M, K, N, S, H, O.

Omitted unless specified.

## ⑥ Units

M = Metric

I = Imperial

## ⑦ Cutting diameter

Metric: mm x 10

Example: D 10.5 mm = 105

## ⑧ Corner design

A = Angled

Example: A90°

C = Chamfer

R = radius with size

Example: R40 for 4.0 mm

S = Sharp

## ⑨ Cut length class

XS: Extra short

S: Short

M: Medium

L: Long

XL: Extra long

XXL: Extra extra long (>4xD)

## ⑩ Total length

Metric: total length LF in mm.

Not specified for deburring end mills.

## ⑪ Shank type

HA = Cylindrical

HB = Weldon shank (in accordance with DIN 6535)

Additional shank diameter for design with DC < 6 mm and DCON = 6 mm

⑫ \*

⑬ \*

## ⑭ Grade

\*Optional

## Explanation of short names in accordance with ISO 13399

APMX = Maximum cutting depth

CHW = Chamfer width

DC = Cutting diameter

DCON = Shank diameter

DN = Neck diameter

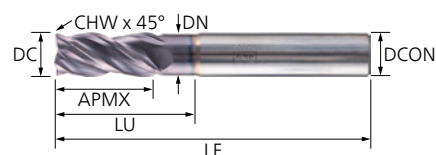
KAPR = Tool cutting edge angle

LF = Total length

LU = Working length

RE = Corner radius

ZEFP = No. of teeth



# Universal solid carbide end mills

## Material suitability overview

### Universal

| Material group |                                  |                                                             | Ballnose mill UB | Deburring end mill UD | Solid carbide mill with two flutes UC2 | Solid carbide mill with three flutes UC3 | Solid carbide mill with four flutes UC4 | Solid carbide mill with four flutes UCR4 | Solid carbide mill with five flutes UC5 | Solid carbide mill with five flutes UCD5 | Solid carbide mill with six/eight flutes |
|----------------|----------------------------------|-------------------------------------------------------------|------------------|-----------------------|----------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|
| <b>P</b>       | Steel                            | All types of steel and cast steel                           | ●                | ●                     | ●                                      | ●                                        | ●                                       | ●                                        | ●                                       | ●                                        | ●                                        |
| <b>M</b>       | Stainless steel                  | Ferritic and martensitic                                    | ●                | ●                     | ●                                      | ●                                        | ●                                       | ○                                        | ●                                       | ●                                        | ●                                        |
|                |                                  | Austenitic                                                  | ●                | ●                     | ●                                      | ●                                        | ●                                       | ○                                        | ●                                       | ●                                        | ●                                        |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) | ○                | ●                     | ○                                      | ○                                        | ○                                       | ○                                        | ○                                       | ○                                        | ○                                        |
| <b>K</b>       | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | ●                | ●                     | ●                                      | ●                                        | ●                                       | ●                                        | ●                                       | ●                                        | ●                                        |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | ●                | ●                     | ●                                      | ●                                        | ●                                       | ●                                        | ●                                       | ●                                        | ●                                        |
| <b>N</b>       | Non-ferrous metals               | Aluminium                                                   | ○                | ●                     | ○                                      | ○                                        | ○                                       | ○                                        | ○                                       | ○                                        | ○                                        |
|                |                                  | Copper, brass, bronze and red brass                         | ●                | ●                     | ○                                      | ○                                        | ○                                       | ○                                        | ○                                       | ○                                        | ○                                        |
| <b>S</b>       | Super and titanium alloys        | Heat-resistant super alloys based on Fe, Ni and Co          |                  | ○                     |                                        | ○                                        | ○                                       |                                          | ○                                       | ○                                        | ●                                        |
|                |                                  | Pure titanium                                               |                  | ○                     |                                        | ○                                        | ○                                       | ○                                        | ○                                       | ○                                        | ●                                        |
|                |                                  | Titanium alloys                                             |                  | ○                     |                                        | ○                                        | ○                                       | ○                                        | ○                                       | ○                                        | ●                                        |
| <b>H</b>       | Hard steels and chilled castings | Heat-treated and hardened steels up to 50 HRC               | ●                | ○                     | ○                                      | ○                                        | ○                                       | ○                                        | ○                                       | ○                                        | ○                                        |
|                |                                  | Hardened steels up to 58 HRC                                | ○                |                       |                                        |                                          |                                         |                                          |                                         |                                          |                                          |
|                |                                  | Hardened steels over 58 HRC                                 |                  |                       |                                        |                                          |                                         |                                          |                                         |                                          |                                          |
| <b>O</b>       | Other                            | Thermoplastics                                              | ○                | ○                     | ○                                      | ○                                        | ○                                       |                                          | ○                                       | ○                                        | ○                                        |
|                |                                  | Duroplastics                                                |                  |                       |                                        |                                          |                                         |                                          |                                         |                                          |                                          |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                  |                       |                                        |                                          |                                         |                                          |                                         |                                          |                                          |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

## Universal solid carbide end mills with two flutes UC2



### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Full slot milling <math>a_p = 1 \times DC</math>; <math>a_e = 1 \times DC</math></div> <div></div> |                                                               |       |      |       |      |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------|------|-------|------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                                          | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $DC$ [mm] |       |      |       |      |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                                            | 4                                                             | 5     | 6    | 8     | 10   | 12    | 16    | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 90                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 85                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 80                                                                                                                                                                                         | 0.02                                                          | 0.02  | 0.02 | 0.03  | 0.04 | 0.045 | 0.055 | 0.07  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 70                                                                                                                                                                                         | 0.02                                                          | 0.02  | 0.02 | 0.03  | 0.04 | 0.045 | 0.055 | 0.07  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 55                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 55                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 45                                                                                                                                                                                         | 0.018                                                         | 0.018 | 0.02 | 0.025 | 0.03 | 0.04  | 0.05  | 0.065 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 80                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 65                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | 135                                                                                                                                                                                        | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 110                                                                                                                                                                                        | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 90                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 60                                                                                                                                                                                         | 0.02                                                          | 0.02  | 0.02 | 0.03  | 0.04 | 0.055 | 0.06  | 0.07  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 90                                                                                                                                                                                         | 0.035                                                         | 0.035 | 0.04 | 0.05  | 0.06 | 0.08  | 0.1   | 0.13  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                                            |                                                               |       |      |       |      |       |       |       |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

## Universal solid carbide end mills with two flutes UC2



### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Side milling <math>a_p = 1 \times DC</math>; <math>a_e = 0.1 \times DC</math></div>  |                                                             |       |       |       |       |      |      |     |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|------|------|-----|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                            | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |      |      |     |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                              | 4                                                           | 5     | 6     | 8     | 10    | 12   | 16   | 20  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 210                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 190                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 170                                                                                                                                                                          | 0.025                                                       | 0.025 | 0.035 | 0.045 | 0.06  | 0.07 | 0.08 | 0.1 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 150                                                                                                                                                                          | 0.025                                                       | 0.025 | 0.035 | 0.045 | 0.06  | 0.07 | 0.08 | 0.1 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 120                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 120                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 90                                                                                                                                                                           | 0.025                                                       | 0.025 | 0.033 | 0.038 | 0.045 | 0.06 | 0.08 | 0.1 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 140                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | 250                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 200                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 200                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 75                                                                                                                                                                           | 0.025                                                       | 0.025 | 0.035 | 0.045 | 0.06  | 0.07 | 0.08 | 0.1 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 200                                                                                                                                                                          | 0.05                                                        | 0.05  | 0.065 | 0.075 | 0.09  | 0.12 | 0.16 | 0.2 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                              |                                                             |       |       |       |       |      |      |     |

● = highly suitable ○ = suitable

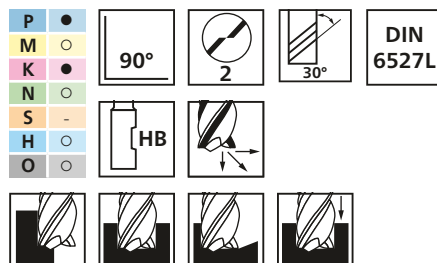
# Universal solid carbide end mills

## Universal solid carbide end mills with two flutes UC2



### Sharp corner design – metric

Mills for full slot milling, drill slot milling and roughing with high contact widths. Suitable for universal machining applications on a variety of materials.

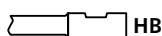


#### Special features:

- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.
- Good chip removal due to very large chip channel.

| DC<br>[mm] | DCON<br>[mm] | APMX<br>[mm] | LF<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|--------------|------------|------|--|----------|-------------|
|------------|--------------|--------------|------------|------|--|----------|-------------|

#### Long HB



|    |    |    |    |   |   |          |                           |
|----|----|----|----|---|---|----------|---------------------------|
| 4  | 6  | 8  | 57 | 2 | 1 | 23000124 | SCM-UC2-M040S-S57HB6 AL40 |
| 5  | 6  | 10 | 57 | 2 | 1 | 23000125 | SCM-UC2-M050S-S57HB6 AL40 |
| 6  | 6  | 10 | 57 | 2 | 1 | 23000126 | SCM-UC2-M060S-S57HB AL40  |
| 8  | 8  | 16 | 63 | 2 | 1 | 23000127 | SCM-UC2-M080S-S63HB AL40  |
| 10 | 10 | 19 | 72 | 2 | 1 | 23000128 | SCM-UC2-M100S-S72HB AL40  |
| 12 | 12 | 22 | 83 | 2 | 1 | 23000129 | SCM-UC2-M120S-S83HB AL40  |
| 16 | 16 | 26 | 92 | 2 | 1 | 23000130 | SCM-UC2-M160S-S92HB AL40  |

# Universal solid carbide end mills

## Universal solid carbide end mills with three flutes UC3



### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$ |                                                             |       |       |      |      |       |       |       |      |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-------------------------------------------------------------|-------------------------------------------------------------|-------|-------|------|------|-------|-------|-------|------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                           | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |      |      |       |       |       |      |
| 3              | 4                                | 5                                                           | 6                                  |             |                                                             | 8                                                           | 10    | 12    | 16   | 20   |       |       |       |      |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 130                                                         | 0.01                                                        | 0.016 | 0.03  | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 120                                                         | 0.01                                                        | 0.016 | 0.03  | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 100                                                         | 0.01                                                        | 0.016 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 80                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 45                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 50                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 40                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 130                                                         | 0.01                                                        | 0.016 | 0.03  | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 100                                                         | 0.01                                                        | 0.016 | 0.03  | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | 200                                                         | 0.03                                                        | 0.035 | 0.035 | 0.04 | 0.05 | 0.06  | 0.08  | 0.1   | 0.13 |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 180                                                         | 0.03                                                        | 0.035 | 0.035 | 0.04 | 0.05 | 0.06  | 0.08  | 0.1   | 0.13 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 200                                                         | 0.03                                                        | 0.035 | 0.035 | 0.04 | 0.05 | 0.06  | 0.08  | 0.1   | 0.13 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             | ○           | 35                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | Pure titanium                                               |                                    | ○           | 100                                                         | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 50                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 60                                                          | 0.01                                                        | 0.012 | 0.02  | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                             |                                                             |       |       |      |      |       |       |       |      |
|                |                                  |                                                             | over 58 HRC                        |             |                                                             |                                                             |       |       |      |      |       |       |       |      |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 110                                                         | 0.025                                                       | 0.035 | 0.035 | 0.04 | 0.05 | 0.06  | 0.08  | 0.1   | 0.13 |
|                |                                  | Duroplastics                                                |                                    |             |                                                             |                                                             |       |       |      |      |       |       |       |      |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                             |                                                             |       |       |      |      |       |       |       |      |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

## Universal solid carbide end mills with three flutes UC3



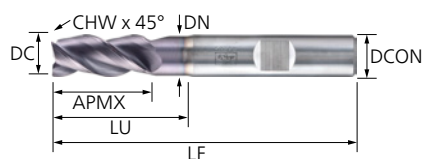
### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Side milling $a_p = 1 \times DC$ ; $a_e = 0.4 \times DC$  |                                                             |       |       |       |       |       |       |      |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                            | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |      |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                              | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16   | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                          | 0.01                                                        | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                          | 0.01                                                        | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 150                                                                                                                                          | 0.01                                                        | 0.016 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 110                                                                                                                                          | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 70                                                                                                                                           | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 75                                                                                                                                           | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 60                                                                                                                                           | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                          | 0.01                                                        | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 140                                                                                                                                          | 0.01                                                        | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | 250                                                                                                                                          | 0.04                                                        | 0.05  | 0.05  | 0.065 | 0.075 | 0.09  | 0.12  | 0.16 | 0.2   |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 200                                                                                                                                          | 0.04                                                        | 0.05  | 0.05  | 0.065 | 0.075 | 0.09  | 0.12  | 0.16 | 0.2   |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 200                                                                                                                                          | 0.04                                                        | 0.05  | 0.05  | 0.065 | 0.075 | 0.09  | 0.12  | 0.16 | 0.2   |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             | ○           | 45                                                                                                                                           | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | Pure titanium                                               |                                    | ○           | 110                                                                                                                                          | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 60                                                                                                                                           | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 75                                                                                                                                           | 0.01                                                        | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |      |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |      |       |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 200                                                                                                                                          | 0.04                                                        | 0.05  | 0.05  | 0.065 | 0.075 | 0.09  | 0.12  | 0.16 | 0.2   |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |      |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |      |       |

● = highly suitable ○ = suitable

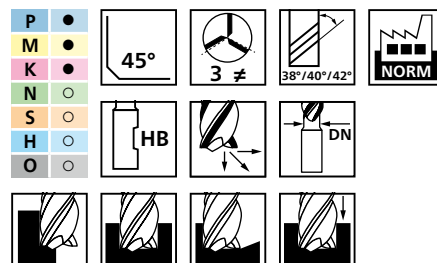
# Universal solid carbide end mills

## Universal solid carbide end mills with three flutes UC3



### Chamfer corner design – metric

Mills for full slot milling, drill slot milling and a wide range of roughing tasks. Suitable for universal machining applications on a variety of materials.

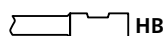


#### Special features:

- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.
- Design with neck chip channel.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|

#### Long HB



|    |    |     |    |    |    |      |   |   |          |                           |
|----|----|-----|----|----|----|------|---|---|----------|---------------------------|
| 3  | 6  | 2.8 | 8  | 57 | 11 | 0.1  | 3 | 1 | 23000131 | SCM-UC3-M030C-M57HB6 AL40 |
| 4  | 6  | 3.7 | 11 | 57 | 16 | 0.1  | 3 | 1 | 23000132 | SCM-UC3-M040C-M57HB6 AL40 |
| 5  | 6  | 4.7 | 13 | 57 | 18 | 0.15 | 3 | 1 | 23000133 | SCM-UC3-M050C-M57HB6 AL40 |
| 6  | 6  | 5.6 | 13 | 57 | 18 | 0.2  | 3 | 1 | 23000134 | SCM-UC3-M060C-M57HB AL40  |
| 8  | 8  | 7.5 | 19 | 63 | 26 | 0.2  | 3 | 1 | 23000135 | SCM-UC3-M080C-M63HB AL40  |
| 10 | 10 | 9.5 | 22 | 72 | 32 | 0.2  | 3 | 1 | 23000136 | SCM-UC3-M100C-M72HB AL40  |
| 12 | 12 | 11  | 26 | 83 | 36 | 0.3  | 3 | 1 | 23000137 | SCM-UC3-M120C-M83HB AL40  |
| 16 | 16 | 15  | 32 | 92 | 42 | 0.3  | 3 | 1 | 23000138 | SCM-UC3-M160C-M92HB AL40  |

# Universal solid carbide end mills

## Universal solid carbide end mills with four flutes UC4



### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>  </div> Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$ |                                                          |       |      |      |      |       |       |       |      |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|------|------|------|-------|-------|-------|------|
|                |                                  |                                                             |                                    |             | Cutting speed $v_c$ [m/min]                                                                                                                                  | Tooth feed $f_z$ [mm/tooth] for cutting diameter DC [mm] |       |      |      |      |       |       |       |      |
|                |                                  |                                                             |                                    |             |                                                                                                                                                              | 3                                                        | 4     | 5    | 6    | 8    | 10    | 12    | 16    | 20   |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 135                                                                                                                                                          | 0.01                                                     | 0.016 | 0.03 | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 130                                                                                                                                                          | 0.01                                                     | 0.016 | 0.03 | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 110                                                                                                                                                          | 0.01                                                     | 0.016 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 80                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 70                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 60                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 50                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 130                                                                                                                                                          | 0.01                                                     | 0.016 | 0.03 | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 100                                                                                                                                                          | 0.01                                                     | 0.016 | 0.03 | 0.03 | 0.04 | 0.06  | 0.06  | 0.085 | 0.1  |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | 200                                                                                                                                                          | 0.02                                                     | 0.03  | 0.04 | 0.05 | 0.06 | 0.07  | 0.08  | 0.1   | 0.11 |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 180                                                                                                                                                          | 0.02                                                     | 0.03  | 0.04 | 0.05 | 0.06 | 0.07  | 0.08  | 0.1   | 0.11 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 200                                                                                                                                                          | 0.02                                                     | 0.03  | 0.04 | 0.05 | 0.06 | 0.07  | 0.08  | 0.1   | 0.11 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             | ○           | 35                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | Pure titanium                                               |                                    | ○           | 100                                                                                                                                                          | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 50                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 60                                                                                                                                                           | 0.01                                                     | 0.012 | 0.02 | 0.02 | 0.03 | 0.045 | 0.045 | 0.06  | 0.07 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                              |                                                          |       |      |      |      |       |       |       |      |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                              |                                                          |       |      |      |      |       |       |       |      |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 180                                                                                                                                                          | 0.02                                                     | 0.03  | 0.04 | 0.05 | 0.06 | 0.07  | 0.08  | 0.1   | 0.11 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                              |                                                          |       |      |      |      |       |       |       |      |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                              |                                                          |       |      |      |      |       |       |       |      |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

## Universal solid carbide end mills with four flutes UC4



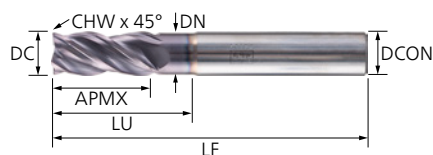
### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Side milling $a_p = 2 \times DC$ ; $a_e = 0.4 \times DC$  |                                                               |       |       |       |       |       |       |      |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------|-------|-------|-------|-------|-------|------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                            | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $DC$ [mm] |       |       |       |       |       |       |      |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                              | 3                                                             | 4     | 5     | 6     | 8     | 10    | 12    | 16   | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                          | 0.01                                                          | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                          | 0.01                                                          | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 150                                                                                                                                          | 0.01                                                          | 0.016 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 110                                                                                                                                          | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 85                                                                                                                                           | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 75                                                                                                                                           | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 65                                                                                                                                           | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                          | 0.01                                                          | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 140                                                                                                                                          | 0.01                                                          | 0.016 | 0.035 | 0.035 | 0.045 | 0.075 | 0.075 | 0.1  | 0.12  |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | 230                                                                                                                                          | 0.03                                                          | 0.035 | 0.035 | 0.04  | 0.05  | 0.06  | 0.08  | 0.1  | 0.13  |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 210                                                                                                                                          | 0.03                                                          | 0.035 | 0.035 | 0.04  | 0.05  | 0.06  | 0.08  | 0.1  | 0.13  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 230                                                                                                                                          | 0.03                                                          | 0.035 | 0.035 | 0.04  | 0.05  | 0.06  | 0.08  | 0.1  | 0.13  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             | ○           | 45                                                                                                                                           | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | Pure titanium                                               |                                    | ○           | 120                                                                                                                                          | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 70                                                                                                                                           | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 75                                                                                                                                           | 0.01                                                          | 0.012 | 0.025 | 0.025 | 0.035 | 0.055 | 0.055 | 0.07 | 0.085 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                              |                                                               |       |       |       |       |       |       |      |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                              |                                                               |       |       |       |       |       |       |      |       |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 210                                                                                                                                          | 0.04                                                          | 0.04  | 0.06  | 0.06  | 0.07  | 0.07  | 0.085 | 0.1  | 0.12  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                              |                                                               |       |       |       |       |       |       |      |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                              |                                                               |       |       |       |       |       |       |      |       |

● = highly suitable ○ = suitable

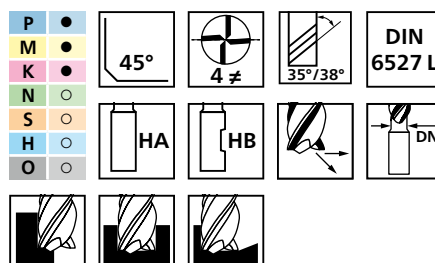
# Universal solid carbide end mills

## Universal solid carbide end mills with four flutes UC4



### Chamfer corner design – metric

Mills for various applications, from roughing through to finishing and ramping. Suitable for universal machining applications on a variety of materials.

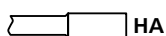


#### Special features:

- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.
- Design with neck chip channel.

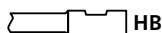
| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|

#### Long HA



|    |    |      |    |     |    |      |   |   |          |                           |
|----|----|------|----|-----|----|------|---|---|----------|---------------------------|
| 3  | 6  | 2.8  | 8  | 57  | 18 | 0.13 | 4 | 1 | 23000148 | SCM-UC4-M030C-M57HA6 AL40 |
| 4  | 6  | 3.6  | 11 | 57  | 21 | 0.13 | 4 | 1 | 23000149 | SCM-UC4-M040C-M57HA6 AL40 |
| 5  | 6  | 4.6  | 13 | 57  | 21 | 0.2  | 4 | 1 | 23000150 | SCM-UC4-M050C-M57HA6 AL40 |
| 6  | 6  | 5.5  | 13 | 57  | 21 | 0.2  | 4 | 1 | 23000151 | SCM-UC4-M060C-M57HA6 AL40 |
| 8  | 8  | 7.5  | 19 | 63  | 27 | 0.2  | 4 | 1 | 23000152 | SCM-UC4-M080C-M63HA AL40  |
| 10 | 10 | 9.5  | 22 | 72  | 32 | 0.2  | 4 | 1 | 23000153 | SCM-UC4-M100C-M72HA AL40  |
| 12 | 12 | 11.5 | 26 | 83  | 38 | 0.3  | 4 | 1 | 23000154 | SCM-UC4-M120C-M83HA AL40  |
| 16 | 16 | 15.5 | 32 | 92  | 44 | 0.3  | 4 | 1 | 23000155 | SCM-UC4-M160C-M92HA AL40  |
| 20 | 20 | 19.5 | 38 | 104 | 54 | 0.4  | 4 | 1 | 23000156 | SCM-UC4-M200C-M104HA AL40 |

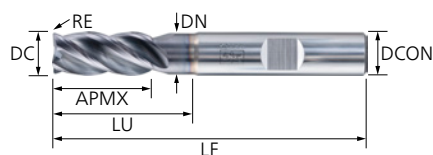
#### Long HB



|    |    |      |    |     |    |      |   |   |          |                           |
|----|----|------|----|-----|----|------|---|---|----------|---------------------------|
| 3  | 6  | 2.8  | 8  | 57  | 18 | 0.13 | 4 | 1 | 23000139 | SCM-UC4-M030C-M57HB6 AL40 |
| 4  | 6  | 3.6  | 11 | 57  | 21 | 0.13 | 4 | 1 | 23000140 | SCM-UC4-M040C-M57HB6 AL40 |
| 5  | 6  | 4.6  | 13 | 57  | 21 | 0.2  | 4 | 1 | 23000141 | SCM-UC4-M050C-M57HB6 AL40 |
| 6  | 6  | 5.5  | 13 | 57  | 21 | 0.2  | 4 | 1 | 23000142 | SCM-UC4-M060C-M57HB AL40  |
| 8  | 8  | 7.5  | 19 | 63  | 27 | 0.2  | 4 | 1 | 23000143 | SCM-UC4-M080C-M63HB AL40  |
| 10 | 10 | 9.5  | 22 | 72  | 32 | 0.2  | 4 | 1 | 23000144 | SCM-UC4-M100C-M72HB AL40  |
| 12 | 12 | 11.5 | 26 | 83  | 38 | 0.3  | 4 | 1 | 23000145 | SCM-UC4-M120C-M83HB AL40  |
| 16 | 16 | 15.5 | 32 | 92  | 44 | 0.3  | 4 | 1 | 23000146 | SCM-UC4-M160C-M92HB AL40  |
| 20 | 20 | 19.5 | 38 | 104 | 54 | 0.4  | 4 | 1 | 23000147 | SCM-UC4-M200C-M104HB AL40 |

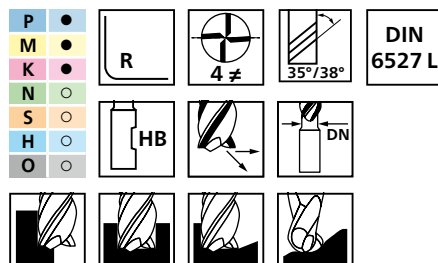
# Universal solid carbide end mills

## Universal solid carbide end mills with four flutes UC4



### Radius corner design – metric

Mills for various applications, from roughing through to finishing. The radius design enables free-form profile cutting. Suitable for universal machining applications on a variety of materials.



#### Special features:

- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.
- Design with neck chip channel.

| DC<br>[mm]     | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |   | Item no. | Designation                 |
|----------------|--------------|------------|--------------|------------|------------|------------|------|---|----------|-----------------------------|
| <b>Long HB</b> |              |            |              |            |            |            |      |   |          |                             |
| 8              | 8            | 7.46       | 19           | 63         | 27         | 0.5        | 4    | 1 | 23000157 | SCM-UC4-M080R05-M63HB AL40  |
|                |              |            |              |            |            | 1          | 4    | 1 | 23000158 | SCM-UC4-M080R10-M63HB AL40  |
|                |              |            |              |            |            | 1.5        | 4    | 1 | 23000159 | SCM-UC4-M080R15-M63HB AL40  |
|                |              |            |              |            |            | 2          | 4    | 1 | 23000160 | SCM-UC4-M080R20-M63HB AL40  |
| 10             | 10           | 9.5        | 22           | 72         | 32         | 0.5        | 4    | 1 | 23000161 | SCM-UC4-M100R05-M72HB AL40  |
|                |              |            |              |            |            | 1          | 4    | 1 | 23000162 | SCM-UC4-M100R10-M72HB AL40  |
|                |              |            |              |            |            | 1.5        | 4    | 1 | 23000163 | SCM-UC4-M100R15-M72HB AL40  |
|                |              |            |              |            |            | 2          | 4    | 1 | 23000164 | SCM-UC4-M100R20-M72HB AL40  |
| 12             | 12           | 11.5       | 26           | 83         | 38         | 0.5        | 4    | 1 | 23000165 | SCM-UC4-M120R05-M83HB AL40  |
|                |              |            |              |            |            | 1          | 4    | 1 | 23000166 | SCM-UC4-M120R10-M83HB AL40  |
|                |              |            |              |            |            | 1.5        | 4    | 1 | 23000167 | SCM-UC4-M120R15-M83HB AL40  |
|                |              |            |              |            |            | 2          | 4    | 1 | 23000168 | SCM-UC4-M120R20-M83HB AL40  |
| 16             | 16           | 15.5       | 32           | 92         | 44         | 1          | 4    | 1 | 23000169 | SCM-UC4-M160R10-M92HB AL40  |
|                |              |            |              |            |            | 1.5        | 4    | 1 | 23000170 | SCM-UC4-M160R15-M92HB AL40  |
|                |              |            |              |            |            | 2          | 4    | 1 | 23000171 | SCM-UC4-M160R20-M92HB AL40  |
| 20             | 20           | 19.5       | 38           | 104        | 54         | 1          | 4    | 1 | 23000172 | SCM-UC4-M200R10-M104HB AL40 |
|                |              |            |              |            |            | 2          | 4    | 1 | 23000173 | SCM-UC4-M200R20-M104HB AL40 |

# Universal solid carbide end mills

Universal solid carbide end mills with four flutes UCR4



## Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Side milling <math>a_p = \max</math>; <math>a_e = 0,4 \times DC</math></div> |                                                               |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                    | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $DC$ [mm] |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                      | 3                                                             | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                                                  | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                                                  | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 120                                                                                                                                                                  | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 95                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 70                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 60                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 50                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 160                                                                                                                                                                  | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ○           | 40                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
|                |                                  | Titanium alloys                                             |                                    | ○           | 30                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                      |                                                               |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

Universal solid carbide end mills with four flutes UCR4



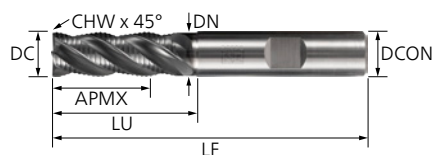
## Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Side milling <math>a_p = \max</math>; <math>a_e = 0,4 \times DC</math></div>  |                                                               |       |       |       |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $DC$ [mm] |       |       |       |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                             | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 120                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 95                                                                                                                                                                    | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 70                                                                                                                                                                    | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 60                                                                                                                                                                    | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 50                                                                                                                                                                    | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 160                                                                                                                                                                   | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    | ○           | 40                                                                                                                                                                    | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 30                                                                                                                                                                    | 0.020                                                         | 0.026 | 0.033 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

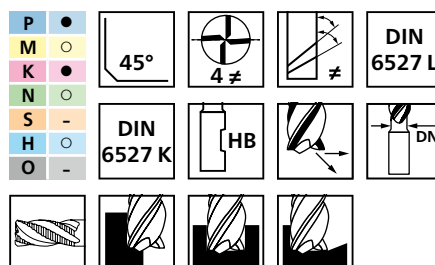
# Universal solid carbide end mills

## Universal solid carbide end mills with four flutes UCR4



### Chamfer corner design with roughing – metric

Mills with roughing for various applications, from roughing through to finishing and ramping. Suitable for universal machining applications on a variety of materials.

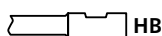


#### Special features:

- Design with neck chip channel.
- Optimum chip control thanks to roughing cut.
- Unequal pitch and unequal helix angle for low-vibration work with smooth running.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|

#### Short HB



|    |    |      |    |    |    |      |   |   |          |                           |
|----|----|------|----|----|----|------|---|---|----------|---------------------------|
| 6  | 6  | 5.4  | 10 | 54 | 18 | 0.15 | 4 | 1 | 23000356 | SCM-UCR4-M060C-S54HB AP40 |
| 8  | 8  | 7.4  | 12 | 58 | 22 | 0.2  | 4 | 1 | 23000357 | SCM-UCR4-M080C-S58HB AP40 |
| 10 | 10 | 9.4  | 15 | 66 | 26 | 0.3  | 4 | 1 | 23000358 | SCM-UCR4-M100C-S66HB AP40 |
| 12 | 12 | 11.2 | 18 | 73 | 28 | 0.4  | 4 | 1 | 23000359 | SCM-UCR4-M120C-S73HB AP40 |

#### Long HB



|    |    |      |    |     |    |      |   |   |          |                            |
|----|----|------|----|-----|----|------|---|---|----------|----------------------------|
| 6  | 6  | 5.4  | 15 | 57  | 21 | 0.15 | 4 | 1 | 23000350 | SCM-UCR4-M060C-M57HB AP40  |
| 8  | 8  | 7.4  | 20 | 63  | 27 | 0.2  | 4 | 1 | 23000351 | SCM-UCR4-M080C-M63HB AP40  |
| 10 | 10 | 9.4  | 25 | 72  | 32 | 0.3  | 4 | 1 | 23000352 | SCM-UCR4-M100C-M72HB AP40  |
| 12 | 12 | 11.2 | 30 | 83  | 38 | 0.4  | 4 | 1 | 23000353 | SCM-UCR4-M120C-M83HB AP40  |
| 16 | 16 | 15.2 | 32 | 92  | 42 | 0.5  | 4 | 1 | 23000354 | SCM-UCR4-M160C-M92HB AP40  |
| 20 | 20 | 19.2 | 40 | 104 | 54 | 0.6  | 4 | 1 | 23000355 | SCM-UCR4-M200C-M104HB AP40 |

# Universal solid carbide end mills

## Universal solid carbide end mills with five flutes UC5



### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$  |                                                             |       |       |       |       |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                               | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                 | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 140                                                                                                                                             | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 120                                                                                                                                             | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 90                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 70                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 70                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 60                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 50                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 120                                                                                                                                             | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 80                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    | ○           | 40                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 30                                                                                                                                              | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

## Universal solid carbide end mills with five flutes UC5



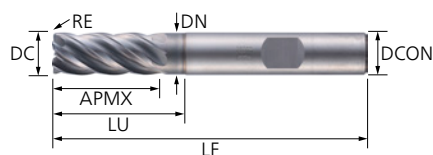
### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Side milling $a_p = 2 \times DC$ ; $a_e = 0.4 \times D$  |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                           | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                             | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 120                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 95                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 80                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 70                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 60                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 160                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 120                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ○           | 45                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | Titanium alloys                                             |                                    | ○           | 35                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

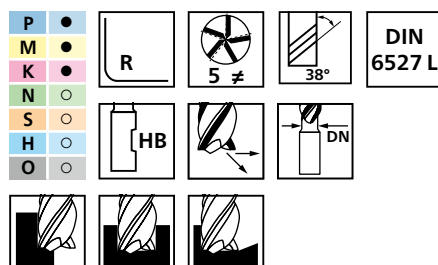
# Universal solid carbide end mills

## Universal solid carbide end mills with five flutes UC5



### Radius corner design – metric

Mills for various applications, from roughing through to finishing. Suitable for universal machining applications on a variety of materials.

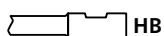


#### Special features:

- Unequal pitch for low-vibration work with smooth running.
- Long tool life due to modern tool coating.
- Design with neck chip channel.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

#### Long HB



|    |    |      |    |     |    |     |   |   |          |                             |
|----|----|------|----|-----|----|-----|---|---|----------|-----------------------------|
| 6  | 6  | 5.7  | 13 | 57  | 20 | 0.5 | 5 | 1 | 23000845 | SCM-UC5-M060R05-M57HB AP40  |
| 8  | 8  | 7.7  | 19 | 63  | 25 | 0.5 | 5 | 1 | 23000846 | SCM-UC5-M080R05-M63HB AP40  |
| 10 | 10 | 9.7  | 22 | 72  | 30 | 0.5 | 5 | 1 | 23000847 | SCM-UC5-M100R05-M72HB AP40  |
| 12 | 12 | 11.6 | 26 | 83  | 36 | 0.5 | 5 | 1 | 23000848 | SCM-UC5-M120R05-M83HB AP40  |
| 16 | 16 | 15.6 | 32 | 92  | 42 | 1   | 5 | 1 | 23000849 | SCM-UC5-M160R10-M92HB AP40  |
| 20 | 20 | 19.6 | 38 | 104 | 52 | 1   | 5 | 1 | 23000850 | SCM-UC5-M200R10-M104HB AP40 |
| 25 | 25 | 24.5 | 45 | 124 | 65 | 1   | 5 | 1 | 23000851 | SCM-UC5-M250R10-M124HB AP40 |

## Recommended cutting speeds [m/min] – radius corner design with chip divider, 2xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$ |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                           | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                             | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 140                                                         | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 120                                                         | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 90                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 70                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 70                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 60                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 50                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 120                                                         | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 80                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ○           | 40                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
|                |                                  | Titanium alloys                                             |                                    | ○           | 30                                                          | 0.014                                                       | 0.018 | 0.023 | 0.027 | 0.036 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Universal solid carbide end mills

Universal solid carbide end mills with five flutes UCD5



## Recommended cutting speeds [m/min] – radius corner design with chip divider, 2xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Side milling $a_p = 2 \times DC$ ; $a_e = 0.4 \times D$  |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                           | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                             | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 120                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 95                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 80                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 70                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 60                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 160                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 120                                                                                                                                         | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ○           | 45                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
|                |                                  | Titanium alloys                                             |                                    | ○           | 35                                                                                                                                          | 0.016                                                       | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 | 0.135 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                             |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

## Recommended cutting speeds [m/min] – radius corner design with chip divider, 3xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Dynamic milling $a_p = 3 \times DC$ ; $a_e = 0.08$  |                                                          |       |       |       |       |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting speed $v_c$ [m/min]                                                                                                            | Tooth feed $f_z$ [mm/tooth] for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                        | 3                                                        | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| <b>P</b>       | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 250                                                                                                                                    | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 220                                                                                                                                    | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 160                                                                                                                                    | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 130                                                                                                                                    | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
| <b>M</b>       | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 90                                                                                                                                     | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 80                                                                                                                                     | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 70                                                                                                                                     | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
| <b>K</b>       | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                    | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 160                                                                                                                                    | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
| <b>N</b>       | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
| <b>S</b>       | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    | ○           | 70                                                                                                                                     | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 50                                                                                                                                     | 0.034                                                    | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |
| <b>H</b>       | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
| <b>O</b>       | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                        |                                                          |       |       |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

## Recommended cutting speeds [m/min] – radius corner design with chip divider, 4xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Dynamic milling <math>a_p = 4 \times DC</math>; <math>a_e = 0.06</math></div> |                                                             |       |       |       |       |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 250                                                                                                                                                                   | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 220                                                                                                                                                                   | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 160                                                                                                                                                                   | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 130                                                                                                                                                                   | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 90                                                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 80                                                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 70                                                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                                                   | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 160                                                                                                                                                                   | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    | ○           | 70                                                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 50                                                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

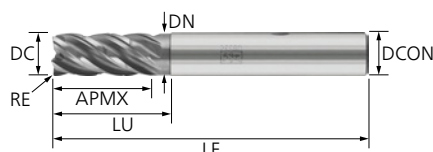
## Recommended cutting speeds [m/min] – radius corner design with chip divider, 5xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Dynamic milling <math>a_p = 5 \times DC</math>; <math>a_e = 0.06</math></div> |                                                             |       |       |       |       |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 250                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 220                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 160                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 130                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ○           | 90                                                                                                                                                                    | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ○           | 80                                                                                                                                                                    | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 70                                                                                                                                                                    | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 160                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    | ○           | 70                                                                                                                                                                    | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 50                                                                                                                                                                    | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

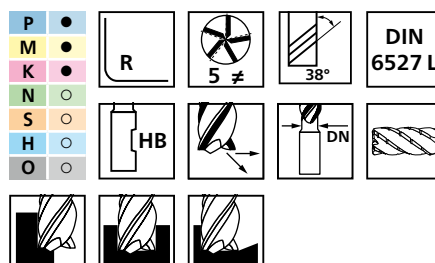
# Universal solid carbide end mills

## Universal solid carbide end mills with five flutes UCD5



### Radius corner design with chip divider, 2xD – metric

Mills with chip divider for various applications, from roughing through to finishing. Suitable for universal machining applications on a variety of materials.

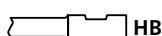


#### Special features:

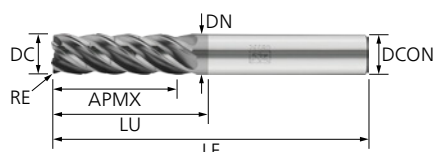
- Optimum chip control thanks to chip divider.
- Unequal pitch for low-vibration work with smooth running.
- Design with neck chip channel.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

#### Long HB

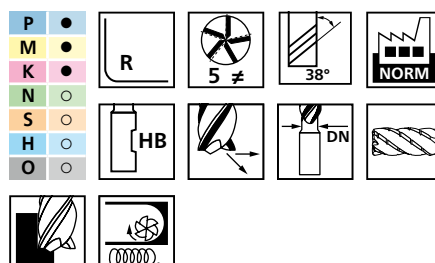


|    |    |      |    |     |    |     |   |   |          |                              |
|----|----|------|----|-----|----|-----|---|---|----------|------------------------------|
| 6  | 6  | 5.7  | 13 | 57  | 20 | 0.5 | 5 | 1 | 23000852 | SCM-UCD5-M060R05-M57HB AP40  |
| 8  | 8  | 7.7  | 19 | 63  | 25 | 0.5 | 5 | 1 | 23000853 | SCM-UCD5-M080R05-M63HB AP40  |
| 10 | 10 | 9.7  | 22 | 72  | 30 | 0.5 | 5 | 1 | 23000854 | SCM-UCD5-M100R05-M72HB AP40  |
| 12 | 12 | 11.6 | 26 | 83  | 36 | 0.5 | 5 | 1 | 23000855 | SCM-UCD5-M120R05-M83HB AP40  |
| 16 | 16 | 15.6 | 32 | 92  | 42 | 1   | 5 | 1 | 23000856 | SCM-UCD5-M160R10-M92HB AP40  |
| 20 | 20 | 19.6 | 38 | 104 | 52 | 1   | 5 | 1 | 23000857 | SCM-UCD5-M200R10-M104HB AP40 |
| 25 | 25 | 24.5 | 45 | 124 | 65 | 1   | 5 | 1 | 23000858 | SCM-UCD5-M250R10-M124HB AP40 |



### Radius corner design, 3xD – metric

Mills with chip divider and long usable length for dynamic machining and trochoidal milling. Suitable for universal machining applications on a variety of materials.

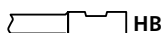


#### Special features:

- Optimum chip control thanks to chip divider.
- Unequal pitch for low-vibration work with smooth running.
- Design with neck chip channel.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

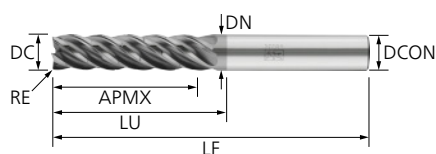
#### 3xD HB



|    |    |      |    |     |    |     |   |   |          |                              |
|----|----|------|----|-----|----|-----|---|---|----------|------------------------------|
| 6  | 6  | 5.7  | 19 | 66  | 23 | 0.5 | 5 | 1 | 23000859 | SCM-UCD5-M060R05-L66HB AP40  |
| 8  | 8  | 7.7  | 25 | 70  | 29 | 0.5 | 5 | 1 | 23000860 | SCM-UCD5-M080R05-L70HB AP40  |
| 10 | 10 | 9.7  | 31 | 78  | 35 | 0.5 | 5 | 1 | 23000861 | SCM-UCD5-M100R05-L78HB AP40  |
| 12 | 12 | 11.6 | 38 | 92  | 42 | 0.5 | 5 | 1 | 23000862 | SCM-UCD5-M120R05-L92HB AP40  |
| 16 | 16 | 15.6 | 50 | 110 | 56 | 1   | 5 | 1 | 23000863 | SCM-UCD5-M160R10-L110HB AP40 |
| 20 | 20 | 19.6 | 62 | 125 | 70 | 1   | 5 | 1 | 23000864 | SCM-UCD5-M200R10-L125HB AP40 |
| 25 | 25 | 24.5 | 78 | 150 | 88 | 1   | 5 | 1 | 23000865 | SCM-UCD5-M250R10-L150HB AP40 |

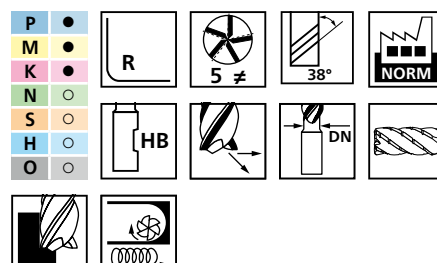
# Universal solid carbide end mills

## Universal solid carbide end mills with five flutes UCD5



### Radius corner design with chip divider, 4xD – metric

Mills with chip divider and long usable length for dynamic machining and trochoidal milling. Suitable for universal machining applications on a variety of materials.

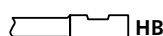


#### Special features:

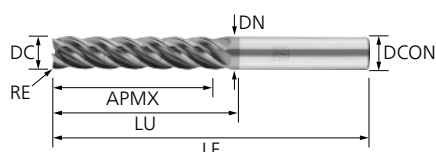
- Optimum chip control thanks to chip divider.
- Unequal pitch for low-vibration work with smooth running.
- Design with neck chip channel.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

#### 4xD HB

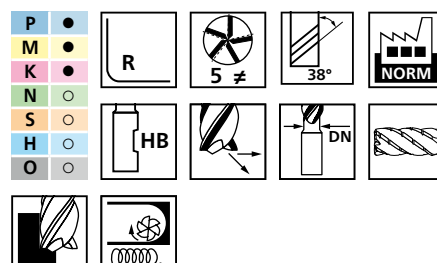


|    |    |      |     |     |     |     |   |   |          |                               |
|----|----|------|-----|-----|-----|-----|---|---|----------|-------------------------------|
| 6  | 6  | 5.7  | 24  | 66  | 29  | 0.5 | 5 | 1 | 23000866 | SCM-UCD5-M060R05-XL66HB AP40  |
| 8  | 8  | 7.7  | 32  | 74  | 37  | 0.5 | 5 | 1 | 23000867 | SCM-UCD5-M080R05-XL74HB AP40  |
| 10 | 10 | 9.7  | 40  | 88  | 45  | 0.5 | 5 | 1 | 23000868 | SCM-UCD5-M100R05-XL88HB AP40  |
| 12 | 12 | 11.6 | 48  | 105 | 54  | 0.5 | 5 | 1 | 23000869 | SCM-UCD5-M120R05-XL105HB AP40 |
| 16 | 16 | 15.6 | 64  | 124 | 72  | 1   | 5 | 1 | 23000870 | SCM-UCD5-M160R10-XL124HB AP40 |
| 20 | 20 | 19.6 | 80  | 148 | 90  | 1   | 5 | 1 | 23000871 | SCM-UCD5-M200R10-XL148HB AP40 |
| 25 | 25 | 24.5 | 100 | 182 | 115 | 1   | 5 | 1 | 23000872 | SCM-UCD5-M250R10-XL182HB AP40 |



### Radius corner design with chip divider, 5xD – metric

Mills with chip divider and long usable length for dynamic machining and trochoidal milling. Suitable for universal machining applications on a variety of materials.



#### Special features:

- Optimum chip control thanks to chip divider.
- Unequal pitch for low-vibration work with smooth running.
- Design with neck chip channel.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

#### 5xD HB



|    |    |      |     |     |     |     |   |   |          |                                |
|----|----|------|-----|-----|-----|-----|---|---|----------|--------------------------------|
| 6  | 6  | 5.7  | 30  | 74  | 35  | 0.5 | 5 | 1 | 23000873 | SCM-UCD5-M060R05-XXL74HB AP40  |
| 8  | 8  | 7.7  | 40  | 84  | 45  | 0.5 | 5 | 1 | 23000874 | SCM-UCD5-M080R05-XXL84HB AP40  |
| 10 | 10 | 9.7  | 50  | 100 | 55  | 0.5 | 5 | 1 | 23000875 | SCM-UCD5-M100R05-XXL100HB AP40 |
| 12 | 12 | 11.6 | 60  | 115 | 66  | 0.5 | 5 | 1 | 23000876 | SCM-UCD5-M120R05-XXL115HB AP40 |
| 16 | 16 | 15.6 | 80  | 142 | 88  | 1   | 5 | 1 | 23000877 | SCM-UCD5-M160R10-XXL142HB AP40 |
| 20 | 20 | 19.6 | 100 | 165 | 110 | 1   | 5 | 1 | 23000878 | SCM-UCD5-M200R10-XXL165HB AP40 |
| 25 | 25 | 24.5 | 125 | 200 | 138 | 1   | 5 | 1 | 23000879 | SCM-UCD5-M250R10-XXL200HB AP40 |

# Universal solid carbide end mills

Universal solid carbide end mills with six/eight flutes UC6/8



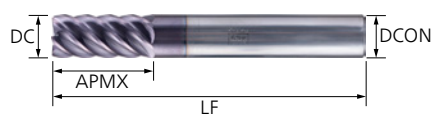
## Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Side milling <math>a_p = 1.5 \times DC</math>; <math>a_e = 0.05 \times DC</math></div> |                                                             |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                              | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                                | 6                                                           | 8     | 10    | 12    | 16    | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 200                                                                                                                                                                            | 0.035                                                       | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                                                            | 0.035                                                       | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 120                                                                                                                                                                            | 0.035                                                       | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 100                                                                                                                                                                            | 0.025                                                       | 0.03  | 0.04  | 0.05  | 0.065 | 0.08  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 100                                                                                                                                                                            | 0.025                                                       | 0.025 | 0.04  | 0.05  | 0.065 | 0.08  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 80                                                                                                                                                                             | 0.025                                                       | 0.03  | 0.04  | 0.05  | 0.065 | 0.08  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | 65                                                                                                                                                                             | 0.02                                                        | 0.025 | 0.03  | 0.04  | 0.05  | 0.065 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 170                                                                                                                                                                            | 0.03                                                        | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 140                                                                                                                                                                            | 0.03                                                        | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    |             |                                                                                                                                                                                |                                                             |       |       |       |       |       |
|                |                                  |                                                             | Al over 10% Si                     | ○           | 300                                                                                                                                                                            | 0.03                                                        | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ○           | 340                                                                                                                                                                            | 0.03                                                        | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             | ●           | 40                                                                                                                                                                             | 0.02                                                        | 0.025 | 0.03  | 0.035 | 0.045 | 0.065 |
|                |                                  | Pure titanium                                               |                                    | ●           | 80                                                                                                                                                                             | 0.02                                                        | 0.025 | 0.03  | 0.035 | 0.045 | 0.065 |
|                |                                  | Titanium alloys                                             |                                    | ●           | 70                                                                                                                                                                             | 0.02                                                        | 0.025 | 0.03  | 0.035 | 0.045 | 0.065 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 60                                                                                                                                                                             | 0.025                                                       | 0.03  | 0.03  | 0.035 | 0.045 | 0.065 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                                |                                                             |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                                |                                                             |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 300                                                                                                                                                                            | 0.03                                                        | 0.04  | 0.055 | 0.065 | 0.08  | 0.1   |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                                |                                                             |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                                |                                                             |       |       |       |       |       |

● = highly suitable ○ = suitable

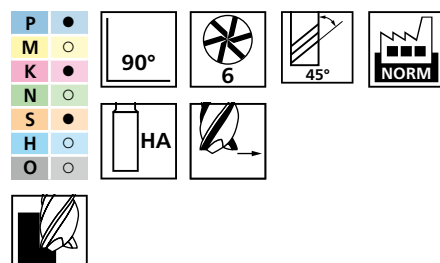
# Universal solid carbide end mills

## Universal solid carbide end mills with six/eight flutes UC6/8



### Sharp corner design – metric

Mills for finishing and for trimming of workpiece contours. The low tool deflection allows very precise working. Suitable for universal machining applications on a variety of materials.



#### Special features:

- High surface quality.
- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.

| DC<br>[mm]     | DCON<br>[mm] | APMX<br>[mm] | LF<br>[mm] | ZEFP |   | Item no. | Designation               |
|----------------|--------------|--------------|------------|------|---|----------|---------------------------|
| <b>Long HA</b> |              |              |            |      |   |          |                           |
| 6              | 6            | 13           | 57         | 6    | 1 | 23000174 | SCM-UC6-M060S-M57HA AL40  |
| 8              | 8            | 19           | 63         | 6    | 1 | 23000175 | SCM-UC6-M080S-M63HA AL40  |
| 10             | 10           | 22           | 72         | 6    | 1 | 23000176 | SCM-UC6-M100S-M72HA AL40  |
| 12             | 12           | 26           | 83         | 6    | 1 | 23000177 | SCM-UC6-M120S-M83HA AL40  |
| 16             | 16           | 32           | 92         | 6    | 1 | 23000178 | SCM-UC6-M160S-S92HA AL40  |
| 20             | 20           | 38           | 104        | 8    | 1 | 23000179 | SCM-UC8-M200S-S104HA AL40 |

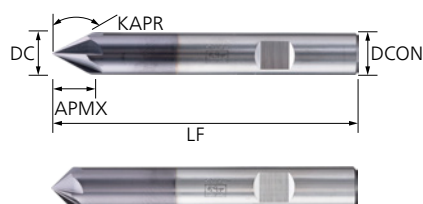
### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Chamfering/deburring <math>a_p = 0.2 \times DC</math>; <math>a_e = 0.1 \times DC</math></div> |                                                             |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting speed<br>$v_c$<br>[m/min]                                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                                       | 6                                                           | 8     | 10    | 12    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | 180                                                                                                                                                                                   | 0.045                                                       | 0.065 | 0.085 | 0.14  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | 160                                                                                                                                                                                   | 0.045                                                       | 0.065 | 0.085 | 0.14  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 140                                                                                                                                                                                   | 0.025                                                       | 0.04  | 0.045 | 0.075 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 120                                                                                                                                                                                   | 0.025                                                       | 0.04  | 0.045 | 0.075 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 100                                                                                                                                                                                   | 0.025                                                       | 0.04  | 0.045 | 0.075 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 75                                                                                                                                                                                    | 0.025                                                       | 0.04  | 0.045 | 0.075 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ●           | 60                                                                                                                                                                                    | 0.025                                                       | 0.04  | 0.045 | 0.075 |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | 180                                                                                                                                                                                   | 0.045                                                       | 0.065 | 0.085 | 0.14  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | 140                                                                                                                                                                                   | 0.025                                                       | 0.04  | 0.045 | 0.075 |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ●           | 300                                                                                                                                                                                   | 0.045                                                       | 0.065 | 0.085 | 0.14  |
|                |                                  |                                                             | Al over 10% Si                     | ●           | 260                                                                                                                                                                                   | 0.045                                                       | 0.065 | 0.085 | 0.14  |
|                |                                  | Copper, brass, bronze and red brass                         | ●                                  | 300         | 0.045                                                                                                                                                                                 | 0.065                                                       | 0.085 | 0.14  |       |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             | ○           | 50                                                                                                                                                                                    | 0.025                                                       | 0.04  | 0.045 | 0.075 |
|                |                                  | Pure titanium                                               |                                    | ○           | 140                                                                                                                                                                                   | 0.025                                                       | 0.04  | 0.045 | 0.075 |
|                |                                  | Titanium alloys                                             |                                    | ○           | 70                                                                                                                                                                                    | 0.025                                                       | 0.04  | 0.045 | 0.075 |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ○           | 70                                                                                                                                                                                    | 0.025                                                       | 0.04  | 0.045 | 0.075 |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                                       |                                                             |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                                       |                                                             |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | 300                                                                                                                                                                                   | 0.045                                                       | 0.065 | 0.085 | 0.14  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                                       |                                                             |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                                       |                                                             |       |       |       |

● = highly suitable ○ = suitable

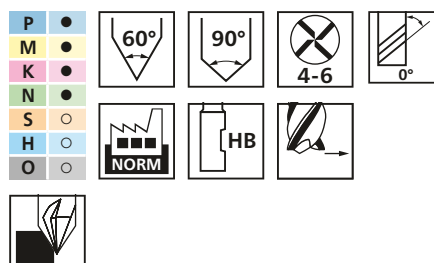
# Universal solid carbide end mills

## Universal deburring end mill UD



### Conical shape – metric

Mills for deburring and chamfering. Suitable for universal machining applications on a variety of materials.

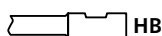


#### Special features:

- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.

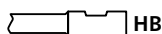
| DC<br>[mm] | DCON<br>[mm] | APMX<br>[mm] | LF<br>[mm] | KAPR | ZEFP |  | Item no. | Designation |
|------------|--------------|--------------|------------|------|------|--|----------|-------------|
|------------|--------------|--------------|------------|------|------|--|----------|-------------|

#### 60° HB



|    |    |      |    |    |   |   |          |                          |
|----|----|------|----|----|---|---|----------|--------------------------|
| 6  | 6  | 5.2  | 57 | 60 | 4 | 1 | 23000116 | SCM-UD4-M060A60°-HB AL40 |
| 8  | 8  | 6.9  | 63 | 60 | 5 | 1 | 23000117 | SCM-UD5-M080A60°-HB AL40 |
| 10 | 10 | 8.7  | 72 | 60 | 6 | 1 | 23000118 | SCM-UD6-M100A60°-HB AL40 |
| 12 | 12 | 10.4 | 83 | 60 | 6 | 1 | 23000119 | SCM-UD6-M120A60°-HB AL40 |

#### 90° HB

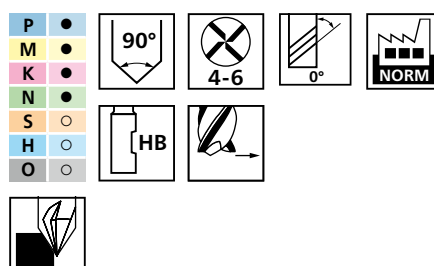


|    |    |   |    |    |   |   |          |                          |
|----|----|---|----|----|---|---|----------|--------------------------|
| 6  | 6  | 3 | 57 | 45 | 4 | 1 | 23000120 | SCM-UD4-M060A90°-HB AL40 |
| 8  | 8  | 4 | 63 | 45 | 5 | 1 | 23000121 | SCM-UD5-M080A90°-HB AL40 |
| 10 | 10 | 5 | 72 | 45 | 6 | 1 | 23000122 | SCM-UD6-M100A90°-HB AL40 |
| 12 | 12 | 6 | 83 | 45 | 6 | 1 | 23000123 | SCM-UD6-M120A90°-HB AL40 |



### Set SCM-UD-SET-M060/080/100 A90°HB AL40 3TLG

The set contains three solid carbide end mills for deburring and chamfering. The solid carbide end mills are suitable for universal use in a variety of materials.



#### Contents:

The set contains one each of the following:  
SCM-UD4-M060A90°-HB AL40, SCM-UD5-M080A90°-HB AL40 and SCM-UD6-M100A90°-HB AL40.

| Version | Contents<br>[Piece] | Contents tool diameter |  | Item no. | Designation |
|---------|---------------------|------------------------|--|----------|-------------|
|---------|---------------------|------------------------|--|----------|-------------|

|     |   |          |   |          |                                           |
|-----|---|----------|---|----------|-------------------------------------------|
| 90° | 3 | 6, 8, 10 | 1 | 23000203 | SCM-UD-SET-M060/080/100 A 90°HB AL40 3TLG |
|-----|---|----------|---|----------|-------------------------------------------|

### Recommended cutting speeds [m/min]

| Material group |                                        |                                                                | Specification/<br>example material | Suitability | Profile milling – use of tip  |                  |                                            |                                                                      |       |       |       |       |       |       |      |
|----------------|----------------------------------------|----------------------------------------------------------------|------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------|----------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|------|
|                |                                        |                                                                |                                    |             | a <sub>p</sub>                                                                                                   | a <sub>e</sub>   | Cutting<br>speed v <sub>c</sub><br>[m/min] | Tooth feed f <sub>z</sub> [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |      |
|                |                                        |                                                                |                                    |             |                                                                                                                  |                  |                                            | 3                                                                    | 4     | 5     | 6     | 8     | 10    | 12    | 16   |
| P              | Steel                                  | All types of steel and<br>cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 900                                        | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        |                                                                | 500 to 700 N/mm <sup>2</sup>       | ●           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 700                                        | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        |                                                                | 700 to 1,000 N/mm <sup>2</sup>     | ●           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 550                                        | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        |                                                                | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | up to<br>0.06 x D                                                                                                | up to<br>0.3 x D | 400                                        | 0.015                                                                | 0.025 | 0.03  | 0.04  | 0.045 | 0.055 | 0.065 | 0.08 |
| M              | Stainless<br>steel                     | Ferritic and<br>martensitic                                    | e.g. 1.4105, 1.4122                | ●           | up to<br>0.06 x D                                                                                                | up to<br>0.3 x D | 180                                        | 0.015                                                                | 0.025 | 0.03  | 0.04  | 0.045 | 0.055 | 0.065 | 0.08 |
|                |                                        | Austenitic                                                     | e.g. 1.4301, 1.4571                | ●           | up to<br>0.06 x D                                                                                                | up to<br>0.3 x D | 130                                        | 0.015                                                                | 0.025 | 0.03  | 0.04  | 0.045 | 0.055 | 0.065 | 0.08 |
|                |                                        | High-temperature-resistant and ferritic-austenitic<br>(duplex) |                                    | ○           | up to<br>0.06 x D                                                                                                | up to<br>0.3 x D | 100                                        | 0.01                                                                 | 0.018 | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07 |
| K              | Cast iron                              | Cast iron with flake<br>graphite (GJL, GG,<br>grey cast iron)  | up to 180 HB                       | ●           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 800                                        | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        | Cast iron with nodular<br>graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 750                                        | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
| N              | Non-ferrous<br>metals                  | Aluminium                                                      | Al up to 10% Si                    | ○           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 1.200                                      | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        |                                                                | Al over 10% Si                     | ●           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 850                                        | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        | Copper, brass, bronze and red brass                            |                                    |             | ●                                                                                                                | up to<br>0.1 x D | up to<br>0.3 x D                           | 1.100                                                                | 0.025 | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09 |
| S              | Super and<br>titanium<br>alloys        | Heat-resistant super<br>alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                  |                  |                                            |                                                                      |       |       |       |       |       |       |      |
|                |                                        | Pure titanium                                                  |                                    |             |                                                                                                                  |                  |                                            |                                                                      |       |       |       |       |       |       |      |
|                |                                        | Titanium alloys                                                |                                    |             |                                                                                                                  |                  |                                            |                                                                      |       |       |       |       |       |       |      |
| H              | Hard steels<br>and chilled<br>castings | Heat-treated and<br>hardened steels                            | up to 50 HRC                       | ●           | up to<br>0.06 x D                                                                                                | up to<br>0.3 x D | 200                                        | 0.01                                                                 | 0.018 | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07 |
|                |                                        |                                                                | up to 58 HRC                       | ○           | up to<br>0.06 x D                                                                                                | up to<br>0.3 x D | 150                                        | 0.01                                                                 | 0.018 | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07 |
|                |                                        |                                                                | over 58 HRC                        |             |                                                                                                                  |                  |                                            |                                                                      |       |       |       |       |       |       |      |
| O              | Other                                  | Thermoplastics                                                 |                                    | ○           | up to<br>0.1 x D                                                                                                 | up to<br>0.3 x D | 1.200                                      | 0.025                                                                | 0.04  | 0.055 | 0.065 | 0.075 | 0.08  | 0.09  | 0.12 |
|                |                                        | Duroplastics                                                   |                                    |             |                                                                                                                  |                  |                                            |                                                                      |       |       |       |       |       |       |      |
|                |                                        | GRP/CRP reinforced plastics, graphite                          |                                    |             |                                                                                                                  |                  |                                            |                                                                      |       |       |       |       |       |       |      |

● = highly suitable ○ = suitable

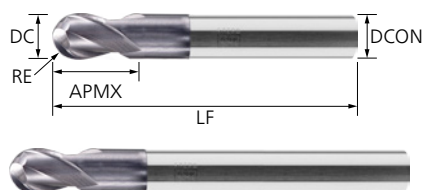
### Recommended cutting speeds [m/min]

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Profile milling – use of shoulder  |                |                             |                                                                |      |      |      |      |      |      |      |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------|----------------------------------------------------------------|------|------|------|------|------|------|------|
|                |                                  |                                                             |                                    |             | $a_p$                                                                                                                 | $a_e$          | Cutting speed $v_c$ [m/min] | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $D_C$ [mm] |      |      |      |      |      |      |      |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 570                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 450                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 350                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 250                         | 0.02                                                           | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.12 |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 130                         | 0.02                                                           | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.12 |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 80                          | 0.02                                                           | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.12 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ○           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 60                          | 0.015                                                          | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 550                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 500                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
| N              | Non-ferrous metals               | Aluminium                                                   | Al up to 10% Si                    | ○           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 750                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  |                                                             | Al over 10% Si                     | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 600                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 700                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                       |                |                             |                                                                |      |      |      |      |      |      |      |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                       |                |                             |                                                                |      |      |      |      |      |      |      |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                       |                |                             |                                                                |      |      |      |      |      |      |      |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       | ●           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 150                         | 0.02                                                           | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.12 |
|                |                                  |                                                             | up to 58 HRC                       | ○           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 110                         | 0.02                                                           | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.12 |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                       |                |                             |                                                                |      |      |      |      |      |      |      |
| O              | Other                            | Thermoplastics                                              |                                    | ○           | up to 0.1 x D                                                                                                         | up to 0.45 x D | 750                         | 0.04                                                           | 0.06 | 0.08 | 0.1  | 0.11 | 0.12 | 0.14 | 0.18 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                       |                |                             |                                                                |      |      |      |      |      |      |      |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                       |                |                             |                                                                |      |      |      |      |      |      |      |

● = highly suitable ○ = suitable

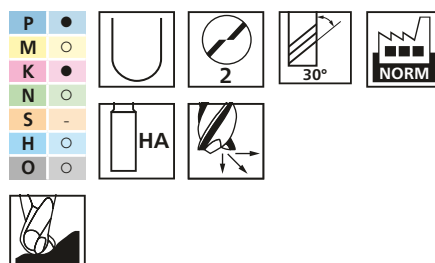
# Universal solid carbide end mills

## Universal ballnose mill UB



### Ballnose – metric

Mills for free-form profile cutting. Suitable for universal machining applications on a variety of materials.

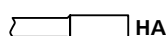


#### Special features:

- High productivity due to optimum stock removal rate.
- Long tool life due to modern tool coating.

| D <sub>c</sub><br>[mm] | DCON<br>[mm] | APMX<br>[mm] | LF<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------------------|--------------|--------------|------------|------------|------|--|----------|-------------|
|------------------------|--------------|--------------|------------|------------|------|--|----------|-------------|

#### Long HA



|    |    |    |    |     |   |   |          |                           |
|----|----|----|----|-----|---|---|----------|---------------------------|
| 3  | 6  | 5  | 54 | 1.5 | 2 | 1 | 23000100 | SCM-UB2-M030R-S54HA6 AL40 |
| 4  | 6  | 8  | 54 | 2   | 2 | 1 | 23000101 | SCM-UB2-M040R-S54HA6 AL40 |
| 5  | 6  | 9  | 54 | 2.5 | 2 | 1 | 23000102 | SCM-UB2-M050R-S54HA6 AL40 |
| 6  | 6  | 10 | 54 | 3   | 2 | 1 | 23000103 | SCM-UB2-M060R-S54HA6 AL40 |
| 8  | 8  | 12 | 58 | 4   | 2 | 1 | 23000104 | SCM-UB2-M080R-S58HA AL40  |
| 10 | 10 | 14 | 66 | 5   | 2 | 1 | 23000105 | SCM-UB2-M100R-S66HA AL40  |
| 12 | 12 | 16 | 73 | 6   | 2 | 1 | 23000106 | SCM-UB2-M120R-S73HA AL40  |
| 16 | 16 | 22 | 82 | 8   | 2 | 1 | 23000107 | SCM-UB2-M160R-S82HA AL40  |

#### Extra long HA



|    |    |    |     |     |   |   |          |                            |
|----|----|----|-----|-----|---|---|----------|----------------------------|
| 3  | 6  | 5  | 80  | 1.5 | 2 | 1 | 23000108 | SCM-UB2-M030R-S80HA6 AL40  |
| 4  | 6  | 8  | 80  | 2   | 2 | 1 | 23000109 | SCM-UB2-M040R-S80HA6 AL40  |
| 5  | 6  | 9  | 100 | 2.5 | 2 | 1 | 23000110 | SCM-UB2-M050R-S100HA6 AL40 |
| 6  | 6  | 10 | 100 | 3   | 2 | 1 | 23000111 | SCM-UB2-M060R-S100HA AL40  |
| 8  | 8  | 12 | 100 | 4   | 2 | 1 | 23000112 | SCM-UB2-M080R-S100HA AL40  |
| 10 | 10 | 14 | 100 | 5   | 2 | 1 | 23000113 | SCM-UB2-M100R-S100HA AL40  |
| 12 | 12 | 16 | 100 | 6   | 2 | 1 | 23000114 | SCM-UB2-M120R-S100HA AL40  |
| 16 | 16 | 22 | 150 | 8   | 2 | 1 | 23000115 | SCM-UB2-M160R-S150HA AL40  |

# Performance stainless solid carbide end mills

## Material suitability overview



### Performance stainless

| Material group |                                  |                                                             | Solid carbide mill<br>with four flutes<br>HC4M | Solid carbide mill<br>with five flutes<br>HCD5M |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------------------------|
| <b>P</b>       | Steel                            | All types of steel and cast steel                           |                                                |                                                 |
| <b>M</b>       | Stainless steel                  | Ferritic and martensitic                                    | ●                                              | ●                                               |
|                |                                  | Austenitic                                                  | ●                                              | ●                                               |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) | ●                                              | ●                                               |
| <b>K</b>       | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     |                                                |                                                 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  |                                                |                                                 |
| <b>N</b>       | Non-ferrous metals               | Aluminium                                                   | ○                                              | ○                                               |
|                |                                  | Copper, brass, bronze and red brass                         | ○                                              | ○                                               |
| <b>S</b>       | Super and titanium alloys        | Heat-resistant super alloys based on Fe, Ni and Co          |                                                |                                                 |
|                |                                  | Pure titanium                                               | ●                                              | ●                                               |
|                |                                  | Titanium alloys                                             | ●                                              | ●                                               |
| <b>H</b>       | Hard steels and chilled castings | Heat-treated and hardened steels up to 50 HRC               |                                                |                                                 |
|                |                                  | Hardened steels up to 58 HRC                                |                                                |                                                 |
|                |                                  | Hardened steels over 58 HRC                                 |                                                |                                                 |
| <b>O</b>       | Other                            | Thermoplastics                                              |                                                |                                                 |
|                |                                  | Duroplastics                                                |                                                |                                                 |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                                |                                                 |

● = highly suitable ○ = suitable

# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with four flutes HC4M



## Recommended cutting speeds [m/min]

| Material group |                                        |                                                               | Specification/<br>example<br>material | Suitability | Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$  |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------------|---------------------------------------------------------------|---------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                        |                                                               |                                       |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                               | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               |                                       |             |                                                                                                                                                 | 1                                                           | 2     | 3     | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                                  | All types of steel and<br>cast steel                          | up to 500 N/mm <sup>2</sup>           |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               | 500 to 700 N/mm <sup>2</sup>          |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               | 700 to<br>1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               | 1,000 to<br>1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
| M              | Stainless<br>steel                     | Ferritic and<br>martensitic                                   | e.g. 1.4105,<br>1.4122                | ●           | 100                                                                                                                                             | 0.005                                                       | 0.010 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |  |
|                |                                        | Austenitic                                                    | e.g. 1.4301,<br>1.4571                | ●           | 90                                                                                                                                              | 0.005                                                       | 0.010 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |  |
|                |                                        | High-temperature-resistant and ferritic-austenitic (duplex)   |                                       | ●           | 70                                                                                                                                              | 0.005                                                       | 0.010 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |  |
| K              | Cast iron                              | Cast iron with flake<br>graphite (GJL, GG,<br>grey cast iron) | up to 180 HB                          |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        | Cast iron with nodular<br>graphite (GJS, GGG)                 | 160 to 260 HB                         |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous<br>metals                  | Aluminium                                                     | Al up to 10% Si                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               | Al over 10% Si                        |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        | Copper, brass, bronze and red brass                           |                                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
| S              | Super and<br>titanium<br>alloys        | Heat-resistant super<br>alloys                                | Based on Fe, Ni<br>and Co             |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        | Pure titanium                                                 |                                       | ●           | 50                                                                                                                                              | 0.005                                                       | 0.010 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |  |
|                |                                        | Titanium alloys                                               |                                       | ●           | 40                                                                                                                                              | 0.005                                                       | 0.010 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |  |
| H              | Hard steels<br>and chilled<br>castings | Heat-treated and<br>hardened steels                           | up to 50 HRC                          |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               | up to 58 HRC                          |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        |                                                               | over 58 HRC                           |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
| O              | Other                                  | Thermoplastics                                                |                                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        | Duroplastics                                                  |                                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |
|                |                                        | GRP/CRP reinforced plastics, graphite                         |                                       |             |                                                                                                                                                 |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with four flutes HC4M



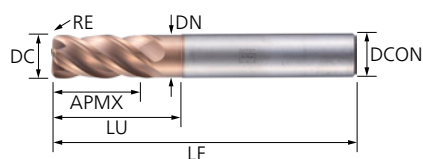
## Recommended cutting speeds [m/min]

| Material group |                                        |                                                               | Specification/<br>example<br>material | Suitability | Side milling $a_p = 2 \times DC$ ; $a_e = 0.4 \times DC$  |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|----------------|----------------------------------------|---------------------------------------------------------------|---------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|
|                |                                        |                                                               |                                       |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                            | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               |                                       |             |                                                                                                                                              | 1                                                           | 2     | 3     | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |  |
| P              | Steel                                  | All types of steel and<br>cast steel                          | up to 500 N/mm <sup>2</sup>           |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               | 500 to 700 N/mm <sup>2</sup>          |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               | 700 to<br>1,000 N/mm <sup>2</sup>     |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               | 1,000 to<br>1,400 N/mm <sup>2</sup>   |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
| M              | Stainless<br>steel                     | Ferritic and<br>martensitic                                   | e.g. 1.4105,<br>1.4122                | ●           | 110                                                                                                                                          | 0.006                                                       | 0.012 | 0.018 | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |  |  |
|                |                                        | Austenitic                                                    | e.g. 1.4301,<br>1.4571                | ●           | 100                                                                                                                                          | 0.006                                                       | 0.012 | 0.018 | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |  |  |
|                |                                        | High-temperature-resistant and ferritic-austenitic (duplex)   |                                       | ●           | 80                                                                                                                                           | 0.006                                                       | 0.012 | 0.018 | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |  |  |
| K              | Cast iron                              | Cast iron with flake<br>graphite (GJL, GG,<br>grey cast iron) | up to 180 HB                          |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        | Cast iron with nodular<br>graphite (GJS, GGG)                 | 160 to 260 HB                         |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
| N              | Non-ferrous<br>metals                  | Aluminium                                                     | Al up to 10% Si                       |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               | Al over 10% Si                        |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        | Copper, brass, bronze and red brass                           |                                       |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
| S              | Super and<br>titanium<br>alloys        | Heat-resistant super<br>alloys                                | Based on Fe, Ni<br>and Co             |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        | Pure titanium                                                 |                                       | ●           | 50                                                                                                                                           | 0.006                                                       | 0.012 | 0.018 | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |  |  |
|                |                                        | Titanium alloys                                               |                                       | ●           | 40                                                                                                                                           | 0.006                                                       | 0.012 | 0.018 | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |  |  |
| H              | Hard steels<br>and chilled<br>castings | Heat-treated and<br>hardened steels                           | up to 50 HRC                          |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               | up to 58 HRC                          |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        |                                                               | over 58 HRC                           |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
| O              | Other                                  | Thermoplastics                                                |                                       |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        | Duroplastics                                                  |                                       |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |
|                |                                        | GRP/CRP reinforced plastics, graphite                         |                                       |             |                                                                                                                                              |                                                             |       |       |       |       |       |       |       |       |       |       |       |  |  |

● = highly suitable ○ = suitable

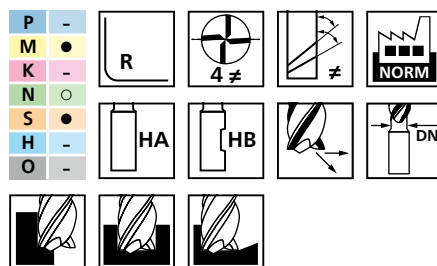
# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with four flutes HC4M



## Radius corner design – metric

Mills with neck chip channel for various applications from roughing through to finishing, as well as full slot milling up to 1xD. Thanks to their material-specific geometry and coating, the mills have been optimized for use in stainless materials.



### Special features:

- Unequal pitch and unequal helix angle for low-vibration work with smooth running.
- Optimized helix angle for improved chip evacuation.
- Optimum temperature control when working on materials that are difficult to machine.

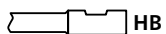
| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|-----|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|-----|--|----------|-------------|

### Long HA



|    |    |      |    |     |    |     |   |   |          |                              |
|----|----|------|----|-----|----|-----|---|---|----------|------------------------------|
| 6  | 6  | 5.7  | 13 | 57  | 20 | 0.5 | 4 | 1 | 23000892 | SCM-HC4M-M060R05-M57HA Ti40  |
|    |    |      |    |     |    | 1   | 4 | 1 | 23000893 | SCM-HC4M-M060R10-M57HA Ti40  |
| 8  | 8  | 7    | 19 | 63  | 25 | 0.5 | 4 | 1 | 23000894 | SCM-HC4M-M080R05-M63HA Ti40  |
|    |    |      |    |     |    | 1   | 4 | 1 | 23000895 | SCM-HC4M-M080R10-M63HA Ti40  |
|    |    |      |    |     |    | 2   | 4 | 1 | 23000896 | SCM-HC4M-M080R20-M63HA Ti40  |
| 10 | 10 | 9.7  | 22 | 72  | 30 | 0.5 | 4 | 1 | 23000897 | SCM-HC4M-M100R05-M72HA Ti40  |
|    |    |      |    |     |    | 1   | 4 | 1 | 23000898 | SCM-HC4M-M100R10-M72HA Ti40  |
|    |    |      |    |     |    | 2   | 4 | 1 | 23000899 | SCM-HC4M-M100R20-M72HA Ti40  |
| 12 | 12 | 11.6 | 26 | 83  | 36 | 0.5 | 4 | 1 | 23000900 | SCM-HC4M-M120R05-M83HA Ti40  |
|    |    |      |    |     |    | 1   | 4 | 1 | 23000901 | SCM-HC4M-M120R10-M83HA Ti40  |
|    |    |      |    |     |    | 2   | 4 | 1 | 23000902 | SCM-HC4M-M120R20-M83HA Ti40  |
|    |    |      |    |     |    | 3   | 4 | 1 | 23000903 | SCM-HC4M-M120R30-M83HA Ti40  |
| 16 | 16 | 15.6 | 32 | 92  | 42 | 1   | 4 | 1 | 23000904 | SCM-HC4M-M160R10-M92HA Ti40  |
|    |    |      |    |     |    | 2   | 4 | 1 | 23000905 | SCM-HC4M-M160R20-M92HA Ti40  |
|    |    |      |    |     |    | 3   | 4 | 1 | 23000906 | SCM-HC4M-M160R30-M92HA Ti40  |
|    |    |      |    |     |    | 4   | 4 | 1 | 23000907 | SCM-HC4M-M160R40-M92HA Ti40  |
| 20 | 20 | 19.6 | 38 | 104 | 52 | 1   | 4 | 1 | 23000908 | SCM-HC4M-M200R10-M104HA Ti40 |
|    |    |      |    |     |    | 2   | 4 | 1 | 23000909 | SCM-HC4M-M200R20-M104HA Ti40 |
|    |    |      |    |     |    | 3   | 4 | 1 | 23000910 | SCM-HC4M-M200R30-M104HA Ti40 |
|    |    |      |    |     |    | 4   | 4 | 1 | 23000911 | SCM-HC4M-M200R40-M104HA Ti40 |
| 25 | 25 | 24.5 | 45 | 125 | 65 | 2   | 4 | 1 | 23000912 | SCM-HC4M-M250R20-M125HA Ti40 |
|    |    |      |    |     |    | 3   | 4 | 1 | 23000913 | SCM-HC4M-M250R30-M125HA Ti40 |
|    |    |      |    |     |    | 4   | 4 | 1 | 23000914 | SCM-HC4M-M250R40-M125HA Ti40 |

### Long HB



|    |    |      |    |    |    |     |   |   |          |                             |
|----|----|------|----|----|----|-----|---|---|----------|-----------------------------|
| 6  | 6  | 5.7  | 13 | 57 | 20 | 0.5 | 4 | 1 | 23000927 | SCM-HC4M-M060R05-M57HB Ti40 |
|    |    |      |    |    |    | 1   | 4 | 1 | 23000928 | SCM-HC4M-M060R10-M57HB Ti40 |
| 8  | 8  | 7    | 19 | 63 | 25 | 0.5 | 4 | 1 | 23000929 | SCM-HC4M-M080R05-M63HB Ti40 |
|    |    |      |    |    |    | 1   | 4 | 1 | 23000930 | SCM-HC4M-M080R10-M63HB Ti40 |
|    |    |      |    |    |    | 2   | 4 | 1 | 23000931 | SCM-HC4M-M080R20-M63HB Ti40 |
|    |    |      |    |    |    | 2   | 4 | 1 | 23000932 | SCM-HC4M-M100R05-M72HB Ti40 |
| 10 | 10 | 9.7  | 22 | 72 | 30 | 0.5 | 4 | 1 | 23000933 | SCM-HC4M-M100R10-M72HB Ti40 |
|    |    |      |    |    |    | 1   | 4 | 1 | 23000934 | SCM-HC4M-M100R20-M72HB Ti40 |
| 12 | 12 | 11.6 | 26 | 83 | 36 | 0.5 | 4 | 1 | 23000935 | SCM-HC4M-M120R05-M83HB Ti40 |
|    |    |      |    |    |    | 1   | 4 | 1 | 23000936 | SCM-HC4M-M120R10-M83HB Ti40 |
|    |    |      |    |    |    | 2   | 4 | 1 | 23000937 | SCM-HC4M-M120R20-M83HB Ti40 |
|    |    |      |    |    |    | 3   | 4 | 1 | 23000938 | SCM-HC4M-M120R30-M83HB Ti40 |
| 16 | 16 | 15.6 | 32 | 92 | 42 | 1   | 4 | 1 | 23000939 | SCM-HC4M-M160R10-M92HB Ti40 |
|    |    |      |    |    |    | 2   | 4 | 1 | 23000940 | SCM-HC4M-M160R20-M92HB Ti40 |

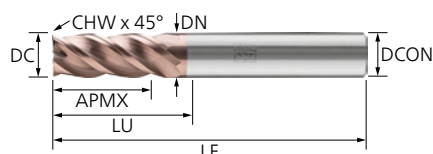
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# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with four flutes HC4M

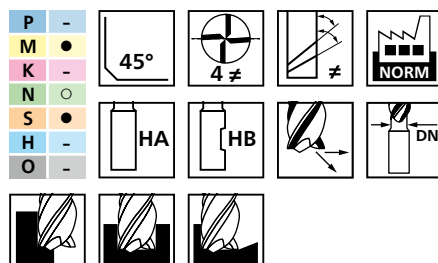


| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |   | Item no. | Designation                  |
|------------|--------------|------------|--------------|------------|------------|------------|------|---|----------|------------------------------|
| 16         | 16           | 15.6       | 32           | 92         | 42         | 3          | 4    | 1 | 23000941 | SCM-HC4M-M160R30-M92HB Ti40  |
|            |              |            |              |            |            | 4          | 4    | 1 | 23000942 | SCM-HC4M-M160R40-M92HB Ti40  |
| 20         | 20           | 19.6       | 38           | 104        | 52         | 1          | 4    | 1 | 23000943 | SCM-HC4M-M200R10-M104HB Ti40 |
|            |              |            |              |            |            | 2          | 4    | 1 | 23000944 | SCM-HC4M-M200R20-M104HB Ti40 |
|            |              |            |              |            |            | 3          | 4    | 1 | 23000945 | SCM-HC4M-M200R30-M104HB Ti40 |
|            |              |            |              |            |            | 4          | 4    | 1 | 23000946 | SCM-HC4M-M200R40-M104HB Ti40 |
| 25         | 25           | 24.5       | 45           | 125        | 65         | 2          | 4    | 1 | 23000947 | SCM-HC4M-M250R20-M125HB Ti40 |
|            |              |            |              |            |            | 3          | 4    | 1 | 23000948 | SCM-HC4M-M250R30-M125HB Ti40 |
|            |              |            |              |            |            | 4          | 4    | 1 | 23000949 | SCM-HC4M-M250R40-M125HB Ti40 |



## Chamfer corner design – metric

Mills with neck chip channel for various applications from roughing through to finishing, as well as full slot milling up to 1xD. Thanks to their material-specific geometry and coating, the mills have been optimized for use in stainless materials.



### Special features:

- Unequal pitch and unequal helix angle for low-vibration work with smooth running.
- Optimized helix angle for improved chip evacuation.
- Optimum temperature control when working on materials that are difficult to machine.

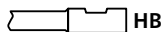
| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|-------------|------|--|----------|-------------|

### Long HA



|    |    |      |    |     |    |      |   |   |          |                            |
|----|----|------|----|-----|----|------|---|---|----------|----------------------------|
| 1  | 6  |      | 2  | 50  |    | 0.05 | 4 | 1 | 23000880 | SCM-HC4M-M010C-M50HA6 HP40 |
| 2  | 6  |      | 4  | 50  |    | 0.05 | 4 | 1 | 23000881 | SCM-HC4M-M020C-M50HA6 HP40 |
| 3  | 6  |      | 6  | 57  |    | 0.1  | 4 | 1 | 23000882 | SCM-HC4M-M030C-M57HA6 HP40 |
| 4  | 6  |      | 9  | 57  |    | 0.1  | 4 | 1 | 23000883 | SCM-HC4M-M040C-M57HA6 HP40 |
| 5  | 6  |      | 13 | 57  |    | 0.1  | 4 | 1 | 23000884 | SCM-HC4M-M050C-M57HA6 HP40 |
| 6  | 6  | 5.7  | 13 | 57  | 20 | 0.15 | 4 | 1 | 23000885 | SCM-HC4M-M060C-M57HA Ti40  |
| 8  | 8  | 7.7  | 19 | 63  | 25 | 0.2  | 4 | 1 | 23000886 | SCM-HC4M-M080C-M63HA Ti40  |
| 10 | 10 | 9.7  | 22 | 72  | 30 | 0.2  | 4 | 1 | 23000887 | SCM-HC4M-M100C-M72HA Ti40  |
| 12 | 12 | 11.6 | 26 | 83  | 36 | 0.25 | 4 | 1 | 23000888 | SCM-HC4M-M120C-M83HA Ti40  |
| 16 | 16 | 15.6 | 32 | 92  | 42 | 0.3  | 4 | 1 | 23000889 | SCM-HC4M-M160C-M92HA Ti40  |
| 20 | 20 | 19.6 | 38 | 104 | 52 | 0.3  | 4 | 1 | 23000890 | SCM-HC4M-M200C-M104HA Ti40 |
| 25 | 25 | 24.5 | 45 | 125 | 65 | 0.3  | 4 | 1 | 23000891 | SCM-HC4M-M250C-M125HA Ti40 |

### Long HB



|    |    |      |    |     |    |      |   |   |          |                            |
|----|----|------|----|-----|----|------|---|---|----------|----------------------------|
| 1  | 6  |      | 2  | 50  |    | 0.05 | 4 | 1 | 23000915 | SCM-HC4M-M010C-M50HB6 HP40 |
| 2  | 6  |      | 4  | 50  |    | 0.05 | 4 | 1 | 23000916 | SCM-HC4M-M020C-M50HB6 HP40 |
| 3  | 6  |      | 6  | 57  |    | 0.1  | 4 | 1 | 23000917 | SCM-HC4M-M030C-M57HB6 HP40 |
| 4  | 6  |      | 9  | 57  |    | 0.1  | 4 | 1 | 23000918 | SCM-HC4M-M040C-M57HB6 HP40 |
| 5  | 6  |      | 13 | 57  |    | 0.1  | 4 | 1 | 23000919 | SCM-HC4M-M050C-M57HB6 HP40 |
| 6  | 6  | 5.7  | 13 | 57  | 20 | 0.15 | 4 | 1 | 23000920 | SCM-HC4M-M060C-M57HB Ti40  |
| 8  | 8  | 7.7  | 19 | 63  | 25 | 0.2  | 4 | 1 | 23000921 | SCM-HC4M-M080C-M63HB Ti40  |
| 10 | 10 | 9.7  | 22 | 72  | 30 | 0.2  | 4 | 1 | 23000922 | SCM-HC4M-M100C-M72HB Ti40  |
| 12 | 12 | 11.6 | 26 | 83  | 36 | 0.25 | 4 | 1 | 23000923 | SCM-HC4M-M120C-M83HB Ti40  |
| 16 | 16 | 15.6 | 32 | 92  | 42 | 0.3  | 4 | 1 | 23000924 | SCM-HC4M-M160C-M92HB Ti40  |
| 20 | 20 | 19.6 | 38 | 104 | 52 | 0.3  | 4 | 1 | 23000925 | SCM-HC4M-M200C-M104HB Ti40 |
| 25 | 25 | 24.5 | 45 | 125 | 65 | 0.3  | 4 | 1 | 23000926 | SCM-HC4M-M250C-M125HB Ti40 |

# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with five flutes HCD5M



## Recommended cutting speeds [m/min] – radius corner design with chip divider, 2xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Dynamic milling <math>a_p = 2 \times DC</math>; <math>a_e = 0.08</math></div> |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 140                                                                                                                                                                   | 0.038                                                       | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 | 0.151 | 0.202 | 0.252 | 0.315 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 130                                                                                                                                                                   | 0.038                                                       | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 | 0.151 | 0.202 | 0.252 | 0.315 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ●           | 100                                                                                                                                                                   | 0.038                                                       | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 | 0.151 | 0.202 | 0.252 | 0.315 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ●           | 100                                                                                                                                                                   | 0.038                                                       | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 | 0.151 | 0.202 | 0.252 | 0.315 |  |
|                |                                  | Titanium alloys                                             |                                    | ●           | 100                                                                                                                                                                   | 0.038                                                       | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 | 0.151 | 0.202 | 0.252 | 0.315 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with five flutes HCD5M



## Recommended cutting speeds [m/min] – radius corner design with chip divider, 3xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Dynamic milling <math>a_p = 3 \times DC</math>; <math>a_e = 0.08</math></div> |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 140                                                                                                                                                                   | 0.034                                                       | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 130                                                                                                                                                                   | 0.034                                                       | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ●           | 100                                                                                                                                                                   | 0.034                                                       | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ●           | 100                                                                                                                                                                   | 0.034                                                       | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |  |
|                |                                  | Titanium alloys                                             |                                    | ●           | 100                                                                                                                                                                   | 0.034                                                       | 0.045 | 0.057 | 0.068 | 0.091 | 0.113 | 0.136 | 0.181 | 0.227 | 0.284 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with five flutes HCD5M



## Recommended cutting speeds [m/min] – radius corner design with chip divider, 4xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Dynamic milling $a_p = 4 \times DC$ ; $a_e = 0.06$  |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                      | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                        | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 140                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 130                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ●           | 100                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ●           | 100                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |  |
|                |                                  | Titanium alloys                                             |                                    | ●           | 100                                                                                                                                    | 0.030                                                       | 0.040 | 0.050 | 0.060 | 0.081 | 0.101 | 0.121 | 0.161 | 0.202 | 0.252 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                        |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with five flutes HCD5M



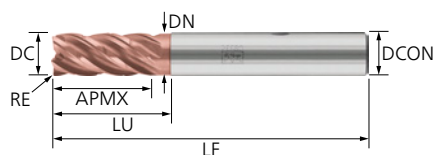
## Recommended cutting speeds [m/min] – radius corner design with chip divider, 5xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Dynamic milling <math>a_p = 5 \times DC</math>; <math>a_e = 0.06</math></div> |                                                             |       |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                           | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                | ●           | 140                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                | ●           | 130                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    | ●           | 100                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | Alu over 10% Si                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    | ●           | 100                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |  |
|                |                                  | Titanium alloys                                             |                                    | ●           | 100                                                                                                                                                                   | 0.026                                                       | 0.035 | 0.044 | 0.053 | 0.071 | 0.088 | 0.106 | 0.141 | 0.176 | 0.221 |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                             |       |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

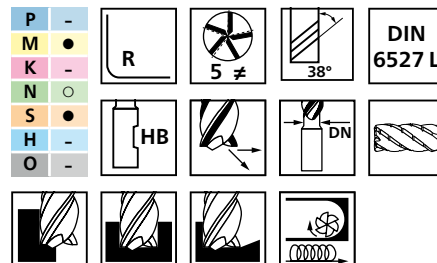
# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with five flutes HCD5M



## Radius corner design with chip divider, 2xD – metric

Mills with chip divider and neck chip channel for dynamic machining and trochoidal milling. Thanks to their material-specific geometry and coating, the mills have been optimized for use in stainless materials.



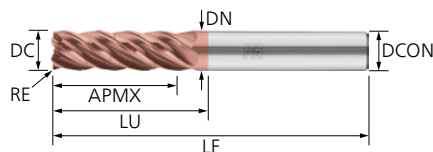
### Special features:

- Unequal pitch for low-vibration work with smooth running.
- Optimized helix angle for improved chip evacuation.
- Optimum temperature control when working on materials that are difficult to machine.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

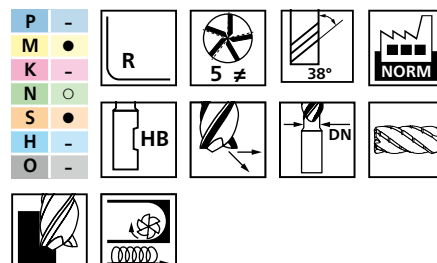
### Long HB

|    |    |      |    |     |    |     |   |   |          |                               |
|----|----|------|----|-----|----|-----|---|---|----------|-------------------------------|
| 6  | 6  | 5.7  | 13 | 57  | 20 | 0.5 | 5 | 1 | 23000950 | SCM-HCD5M-M060R05-M57HB Ti40  |
| 8  | 8  | 7.7  | 19 | 63  | 25 | 0.5 | 5 | 1 | 23000951 | SCM-HCD5M-M080R05-M63HB Ti40  |
| 10 | 10 | 9.7  | 22 | 72  | 30 | 0.5 | 5 | 1 | 23000952 | SCM-HCD5M-M100R05-M72HB Ti40  |
| 12 | 12 | 11.6 | 26 | 83  | 36 | 0.5 | 5 | 1 | 23000953 | SCM-HCD5M-M120R05-M83HB Ti40  |
| 16 | 16 | 15.6 | 32 | 92  | 42 | 1   | 5 | 1 | 23000954 | SCM-HCD5M-M160R10-M92HB Ti40  |
| 20 | 20 | 19.6 | 38 | 104 | 52 | 1   | 5 | 1 | 23000955 | SCM-HCD5M-M200R10-M104HB Ti40 |
| 25 | 25 | 24.5 | 45 | 124 | 65 | 1   | 5 | 1 | 23000956 | SCM-HCD5M-M250R10-M124HB Ti40 |



## Radius corner design with chip divider, 3xD – metric

Mills with chip divider and neck chip channel for dynamic machining and trochoidal milling. Thanks to their material-specific geometry and coating, the mills have been optimized for use in stainless materials.



### Special features:

- Unequal pitch for low-vibration work with smooth running.
- Optimized helix angle for improved chip evacuation.
- Optimum temperature control when working on materials that are difficult to machine.

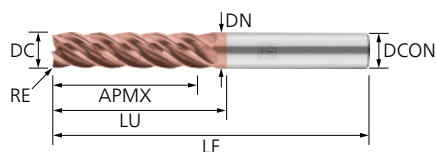
| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

### 3xD HB

|    |    |      |    |     |    |     |   |   |          |                               |
|----|----|------|----|-----|----|-----|---|---|----------|-------------------------------|
| 6  | 6  | 5.7  | 19 | 66  | 23 | 0.5 | 5 | 1 | 23000957 | SCM-HCD5M-M060R05-L66HB Ti40  |
| 8  | 8  | 7.7  | 25 | 70  | 29 | 0.5 | 5 | 1 | 23000958 | SCM-HCD5M-M080R05-L70HB Ti40  |
| 10 | 10 | 9.7  | 31 | 78  | 35 | 0.5 | 5 | 1 | 23000959 | SCM-HCD5M-M100R05-L78HB Ti40  |
| 12 | 12 | 11.6 | 38 | 92  | 42 | 0.5 | 5 | 1 | 23000960 | SCM-HCD5M-M120R05-L92HB Ti40  |
| 16 | 16 | 15.6 | 50 | 110 | 56 | 1   | 5 | 1 | 23000961 | SCM-HCD5M-M160R10-L110HB Ti40 |
| 20 | 20 | 19.6 | 62 | 125 | 70 | 1   | 5 | 1 | 23000962 | SCM-HCD5M-M200R10-L125HB Ti40 |
| 25 | 25 | 24.5 | 78 | 150 | 88 | 1   | 5 | 1 | 23000963 | SCM-HCD5M-M250R10-L150HB Ti40 |

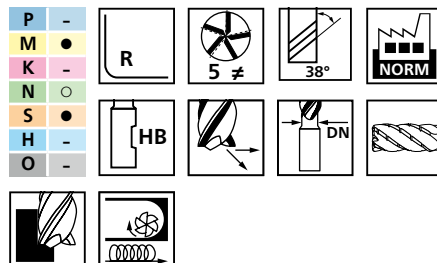
# Performance stainless solid carbide end mills

Performance stainless solid carbide end mills with five flutes HCD5M



## Radius corner design with chip divider, 4xD – metric

Mills with chip divider and neck chip channel for dynamic machining and trochoidal milling. Thanks to their material-specific geometry and coating, the mills have been optimized for use in stainless materials.



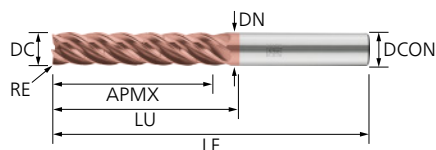
### Special features:

- Unequal pitch for low-vibration work with smooth running.
- Optimized helix angle for improved chip evacuation.
- Optimum temperature control when working on materials that are difficult to machine.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

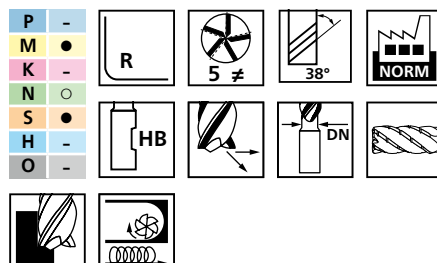
### 4xD HB

|    |    |      |     |     |     |     |   |   |          |                                |
|----|----|------|-----|-----|-----|-----|---|---|----------|--------------------------------|
| 6  | 6  | 5.7  | 24  | 66  | 29  | 0.5 | 5 | 1 | 23000964 | SCM-HCD5M-M060R05-XL66HB Ti40  |
| 8  | 8  | 7.7  | 32  | 74  | 37  | 0.5 | 5 | 1 | 23000965 | SCM-HCD5M-M080R05-XL74HB Ti40  |
| 10 | 10 | 9.7  | 40  | 88  | 45  | 0.5 | 5 | 1 | 23000966 | SCM-HCD5M-M100R05-XL88HB Ti40  |
| 12 | 12 | 11.6 | 48  | 105 | 54  | 0.5 | 5 | 1 | 23000967 | SCM-HCD5M-M120R05-XL105HB Ti40 |
| 16 | 16 | 15.6 | 64  | 124 | 72  | 1   | 5 | 1 | 23000968 | SCM-HCD5M-M160R10-XL124HB Ti40 |
| 20 | 20 | 19.6 | 80  | 148 | 90  | 1   | 5 | 1 | 23000969 | SCM-HCD5M-M200R10-XL148HB Ti40 |
| 25 | 25 | 24.5 | 100 | 182 | 115 | 1   | 5 | 1 | 23000970 | SCM-HCD5M-M250R10-XL182HB Ti40 |



## Radius corner design with chip divider, 5xD – metric

Mills with chip divider and neck chip channel for dynamic machining and trochoidal milling. Thanks to their material-specific geometry and coating, the mills have been optimized for use in stainless materials.



### Special features:

- Unequal pitch for low-vibration work with smooth running.
- Optimized helix angle for improved chip evacuation.
- Optimum temperature control when working on materials that are difficult to machine.

| DC<br>[mm] | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|
|------------|--------------|------------|--------------|------------|------------|------------|------|--|----------|-------------|

### 5xD HB

|    |    |      |     |     |     |     |   |   |          |                                 |
|----|----|------|-----|-----|-----|-----|---|---|----------|---------------------------------|
| 6  | 6  | 5.7  | 30  | 74  | 35  | 0.5 | 5 | 1 | 23000971 | SCM-HCD5M-M060R05-XXL74HB Ti40  |
| 8  | 8  | 7.7  | 40  | 84  | 45  | 0.5 | 5 | 1 | 23000972 | SCM-HCD5M-M080R05-XXL84HB Ti40  |
| 10 | 10 | 9.7  | 50  | 100 | 55  | 0.5 | 5 | 1 | 23000973 | SCM-HCD5M-M100R05-XXL100HB Ti40 |
| 12 | 12 | 11.6 | 60  | 115 | 66  | 0.5 | 5 | 1 | 23000974 | SCM-HCD5M-M120R05-XXL115HB Ti40 |
| 16 | 16 | 15.6 | 80  | 142 | 88  | 1   | 5 | 1 | 23000975 | SCM-HCD5M-M160R10-XXL142HB Ti40 |
| 20 | 20 | 19.6 | 100 | 165 | 110 | 1   | 5 | 1 | 23000976 | SCM-HCD5M-M200R10-XXL165HB Ti40 |
| 25 | 25 | 24.5 | 125 | 200 | 138 | 1   | 5 | 1 | 23000977 | SCM-HCD5M-M250R10-XXL200HB Ti40 |

# Performance aluminium solid carbide end mills

## Material suitability overview



### Performance Aluminium

| Material group |                                  |                                                             | Solid carbide mill<br>with three flutes<br>HC3N |
|----------------|----------------------------------|-------------------------------------------------------------|-------------------------------------------------|
| <b>P</b>       | Steel                            | All types of steel and cast steel                           |                                                 |
| <b>M</b>       | Stainless steel                  | Ferritic and martensitic                                    |                                                 |
|                |                                  | Austenitic                                                  |                                                 |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                                 |
| <b>K</b>       | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     |                                                 |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  |                                                 |
| <b>N</b>       | Non-ferrous metals               | Aluminium                                                   | ●                                               |
|                |                                  | Copper, brass, bronze and red brass                         | ●                                               |
| <b>S</b>       | Super and titanium alloys        | Heat-resistant super alloys based on Fe, Ni and Co          |                                                 |
|                |                                  | Pure titanium                                               |                                                 |
|                |                                  | Titanium alloys                                             |                                                 |
| <b>H</b>       | Hard steels and chilled castings | Heat-treated and hardened steels up to 50 HRC               |                                                 |
|                |                                  | Hardened steels up to 58 HRC                                |                                                 |
|                |                                  | Hardened steels over 58 HRC                                 |                                                 |
| <b>O</b>       | Other                            | Thermoplastics                                              | ●                                               |
|                |                                  | Duroplastics                                                | ●                                               |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                                 |

● = highly suitable ○ = suitable

# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N



## Recommended cutting speeds [m/min] – radius and chamfer corner designs

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$  |                                                          |       |       |       |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting speed $v_c$ [m/min]                                                                                                                     | Tooth feed $f_z$ [mm/tooth] for cutting diameter DC [mm] |       |       |       |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                 | 3                                                        | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   | ●           | 450                                                                                                                                             | 0.027                                                    | 0.036 | 0.045 | 0.055 | 0.073 | 0.091 | 0.109 | 0.145 | 0.182 |
|                |                                  |                                                             | Alu over 10% Si                    | ●           | 420                                                                                                                                             | 0.027                                                    | 0.036 | 0.045 | 0.055 | 0.073 | 0.091 | 0.109 | 0.145 | 0.182 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ●           | 350                                                                                                                                             | 0.027                                                    | 0.036 | 0.045 | 0.055 | 0.073 | 0.091 | 0.109 | 0.145 | 0.182 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ●           | 400                                                                                                                                             | 0.027                                                    | 0.036 | 0.045 | 0.055 | 0.073 | 0.091 | 0.109 | 0.145 | 0.182 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                 |                                                          |       |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N



## Recommended cutting speeds [m/min] – radius and chamfer corner designs

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Side milling <math>a_p = \max</math>; <math>a_e = 0.25 \times DC</math></div> |                                                               |       |       |       |       |       |       |       |       |  |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $DC$ [mm] |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                       | 3                                                             | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 20    |  |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   | ●           | 520                                                                                                                                                                   | 0.041                                                         | 0.055 | 0.068 | 0.082 | 0.109 | 0.136 | 0.164 | 0.218 | 0.273 |  |
|                |                                  |                                                             | Alu over 10% Si                    | ●           | 480                                                                                                                                                                   | 0.041                                                         | 0.055 | 0.068 | 0.082 | 0.109 | 0.136 | 0.164 | 0.218 | 0.273 |  |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ●           | 400                                                                                                                                                                   | 0.041                                                         | 0.055 | 0.068 | 0.082 | 0.109 | 0.136 | 0.164 | 0.218 | 0.273 |  |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
| O              | Other                            | Thermoplastics                                              |                                    | ●           | 450                                                                                                                                                                   | 0.041                                                         | 0.055 | 0.068 | 0.082 | 0.109 | 0.136 | 0.164 | 0.218 | 0.273 |  |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                       |                                                               |       |       |       |       |       |       |       |       |  |

● = highly suitable ○ = suitable

# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N



## Recommended cutting speeds [m/min] – chamfer corner design, excessive length

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Full slot milling $a_p = 1 \times DC$ ; $a_e = 1 \times DC$  |                                                             |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                               | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                 | 10                                                          | 12    | 16    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                 |                                                             |       |       |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    |             |                                                                                                                                                 |                                                             |       |       |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                 |                                                             |       |       |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   | ●           | 430                                                                                                                                             | 0.080                                                       | 0.100 | 0.120 |
|                |                                  |                                                             | Alu over 10% Si                    | ●           | 400                                                                                                                                             | 0.080                                                       | 0.100 | 0.120 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ●           | 320                                                                                                                                             | 0.080                                                       | 0.100 | 0.120 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                                 |                                                             |       |       |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                 |                                                             |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ●           | 450                                                                                                                                             | 0.080                                                       | 0.100 | 0.120 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                 |                                                             |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                 |                                                             |       |       |

● = highly suitable ○ = suitable

# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N



## Recommended cutting speeds [m/min] – chamfer corner design, excessive length

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | Side milling $a_p = \max$ ; $a_e = 0.4 \times DC$  |                                                               |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                     | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter $DC$ [mm] |       |       |
|                |                                  |                                                             |                                    | 10          |                                                                                                                                       | 12                                                            | 16    |       |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                       |                                                               |       |       |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                       |                                                               |       |       |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                       |                                                               |       |       |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                       |                                                               |       |       |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                |             |                                                                                                                                       |                                                               |       |       |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                |             |                                                                                                                                       |                                                               |       |       |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    |             |                                                                                                                                       |                                                               |       |       |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                       |                                                               |       |       |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                       |                                                               |       |       |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   | ●           | 490                                                                                                                                   | 0.092                                                         | 0.115 | 0.138 |
|                |                                  |                                                             | Alu over 10% Si                    | ●           | 450                                                                                                                                   | 0.092                                                         | 0.115 | 0.138 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ●           | 360                                                                                                                                   | 0.092                                                         | 0.115 | 0.138 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                       |                                                               |       |       |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                       |                                                               |       |       |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                       |                                                               |       |       |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                       |                                                               |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                       |                                                               |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                       |                                                               |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ●           | 450                                                                                                                                   | 0.092                                                         | 0.115 | 0.138 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                       |                                                               |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                       |                                                               |       |       |

● = highly suitable ○ = suitable

# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N



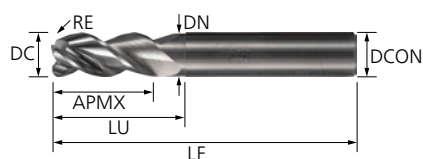
## Recommended cutting speeds [m/min] – chamfer corner design, >4xD

| Material group |                                  |                                                             | Specification/<br>example material | Suitability | <div>Dynamic milling <math>a_p = \max</math>; <math>a_e = 0.10</math></div>  |                                                             |       |       |       |       |       |
|----------------|----------------------------------|-------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-------|-------|-------|-------|
|                |                                  |                                                             |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                                                                               | Tooth feed $f_z$ [mm/tooth]<br>for cutting diameter DC [mm] |       |       |       |       |       |
|                |                                  |                                                             |                                    |             |                                                                                                                                                                 | 6                                                           | 8     | 10    | 12    | 16    | 20    |
| P              | Steel                            | All types of steel and cast steel                           | up to 500 N/mm <sup>2</sup>        |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  |                                                             | 500 to 700 N/mm <sup>2</sup>       |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  |                                                             | 700 to 1,000 N/mm <sup>2</sup>     |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  |                                                             | 1,000 to 1,400 N/mm <sup>2</sup>   |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
| M              | Stainless steel                  | Ferritic and martensitic                                    | e.g. 1.4105, 1.4122                |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  | Austenitic                                                  | e.g. 1.4301, 1.4571                |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) |                                    |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
| K              | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | up to 180 HB                       |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | 160 to 260 HB                      |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
| N              | Non-ferrous metals               | Aluminium                                                   | Alu up to 10% Si                   | ●           | 450                                                                                                                                                             | 0.067                                                       | 0.090 | 0.112 | 0.134 | 0.179 | 0.224 |
|                |                                  |                                                             | Alu over 10% Si                    | ●           | 420                                                                                                                                                             | 0.067                                                       | 0.090 | 0.112 | 0.134 | 0.179 | 0.224 |
|                |                                  | Copper, brass, bronze and red brass                         |                                    | ●           | 350                                                                                                                                                             | 0.067                                                       | 0.090 | 0.112 | 0.134 | 0.179 | 0.224 |
| S              | Super and titanium alloys        | Heat-resistant super alloys                                 | Based on Fe, Ni and Co             |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  | Pure titanium                                               |                                    |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  | Titanium alloys                                             |                                    |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
| H              | Hard steels and chilled castings | Heat-treated and hardened steels                            | up to 50 HRC                       |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  |                                                             | up to 58 HRC                       |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  |                                                             | over 58 HRC                        |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
| O              | Other                            | Thermoplastics                                              |                                    | ●           | 450                                                                                                                                                             | 0.067                                                       | 0.090 | 0.112 | 0.134 | 0.179 | 0.224 |
|                |                                  | Duroplastics                                                |                                    |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                    |             |                                                                                                                                                                 |                                                             |       |       |       |       |       |

● = highly suitable ○ = suitable

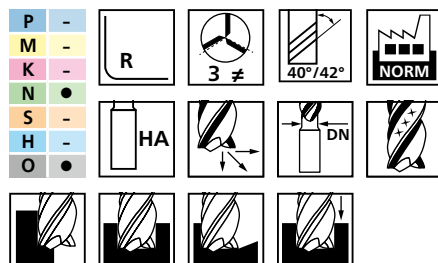
# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N



## Radius corner design – metric

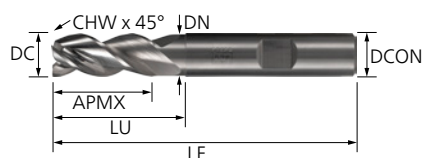
Mills for various applications, from roughing through to finishing. Ideally suited to machining aluminium alloys, non-ferrous metals and plastics.



### Special features:

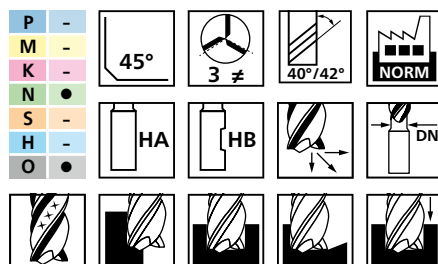
- Large polished chip channels for optimum chip control.
- Increased process reliability at high cutting speeds.
- Unequal pitch for low-vibration work with smooth running.

| DC<br>[mm]                                                                                | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | RE<br>[mm] | ZEFP |   | Item no. | Designation                  |
|-------------------------------------------------------------------------------------------|--------------|------------|--------------|------------|------------|------------|------|---|----------|------------------------------|
| Long HA  |              |            |              |            |            |            |      |   |          |                              |
| 6                                                                                         | 6            | 5.7        | 13           | 57         | 20         | 0.5        | 3    | 1 | 23000428 | SCM-HC3N-M060R05-M57HA UC40  |
| 8                                                                                         | 8            | 7.7        | 19           | 63         | 25         | 0.5        | 3    | 1 | 23000429 | SCM-HC3N-M080R05-M63HA UC40  |
|                                                                                           |              |            |              |            |            | 1          | 3    | 1 | 23000430 | SCM-HC3N-M080R10-M63HA UC40  |
|                                                                                           |              |            |              |            |            | 1          | 3    | 1 | 23000431 | SCM-HC3N-M100R10-M72HA UC40  |
| 10                                                                                        | 10           | 9.7        | 22           | 72         | 30         | 1.5        | 3    | 1 | 23000432 | SCM-HC3N-M100R15-M72HA UC40  |
|                                                                                           |              |            |              |            |            | 2          | 3    | 1 | 23000433 | SCM-HC3N-M100R20-M72HA UC40  |
|                                                                                           |              |            |              |            |            | 1          | 3    | 1 | 23000434 | SCM-HC3N-M120R10-M83HA UC40  |
| 12                                                                                        | 12           | 11.6       | 26           | 83         | 36         | 1.5        | 3    | 1 | 23000435 | SCM-HC3N-M120R15-M83HA UC40  |
|                                                                                           |              |            |              |            |            | 2          | 3    | 1 | 23000436 | SCM-HC3N-M120R20-M83HA UC40  |
|                                                                                           |              |            |              |            |            | 1          | 3    | 1 | 23000437 | SCM-HC3N-M160R10-M93HA UC40  |
| 16                                                                                        | 16           | 15.6       | 32           | 92         | 42         | 2          | 3    | 1 | 23000438 | SCM-HC3N-M160R20-M93HA UC40  |
|                                                                                           |              |            |              |            |            | 3          | 3    | 1 | 23000439 | SCM-HC3N-M160R30-M93HA UC40  |
|                                                                                           |              |            |              |            |            | 2          | 3    | 1 | 23000440 | SCM-HC3N-M200R20-M104HA UC40 |
| 20                                                                                        | 20           | 19.6       | 38           | 104        | 52         | 3          | 3    | 1 | 23000441 | SCM-HC3N-M200R30-M104HA UC40 |



## Chamfer corner design – metric

Mills for various applications, from roughing through to finishing. Ideally suited to machining aluminium alloys, non-ferrous metals and plastics.



### Special features:

- Large polished chip channels for optimum chip control.
- Increased process reliability at high cutting speeds.
- Unequal pitch for low-vibration work with smooth running.

| DC<br>[mm]                                                                                  | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |   | Item no. | Designation                |
|---------------------------------------------------------------------------------------------|--------------|------------|--------------|------------|------------|-------------|------|---|----------|----------------------------|
| Long HA  |              |            |              |            |            |             |      |   |          |                            |
| 3                                                                                           | 6            |            | 8            | 57         |            | 0.05        | 3    | 1 | 23000410 | SCM-HC3N-M030C-M57HA6 UC40 |
| 4                                                                                           | 6            |            | 11           | 57         |            | 0.05        | 3    | 1 | 23000411 | SCM-HC3N-M040C-M57HA6 UC40 |
| 5                                                                                           | 6            |            | 13           | 57         |            | 0.1         | 3    | 1 | 23000412 | SCM-HC3N-M050C-M57HA6 UC40 |
| 6                                                                                           | 6            | 5.7        | 13           | 57         | 20         | 0.1         | 3    | 1 | 23000413 | SCM-HC3N-M060C-M57HA UC40  |
| 8                                                                                           | 8            | 7.7        | 19           | 63         | 25         | 0.15        | 3    | 1 | 23000414 | SCM-HC3N-M080C-M63HA UC40  |
| 10                                                                                          | 10           | 9.7        | 22           | 72         | 30         | 0.2         | 3    | 1 | 23000415 | SCM-HC3N-M100C-M72HA UC40  |
| 12                                                                                          | 12           | 11.7       | 26           | 83         | 36         | 0.25        | 3    | 1 | 23000416 | SCM-HC3N-M120C-M83HA UC40  |
| 16                                                                                          | 16           | 15.6       | 32           | 92         | 42         | 0.3         | 3    | 1 | 23000417 | SCM-HC3N-M160C-M93HA UC40  |
| 20                                                                                          | 20           | 19.6       | 38           | 104        | 52         | 0.35        | 3    | 1 | 23000418 | SCM-HC3N-M200C-M104HA UC40 |

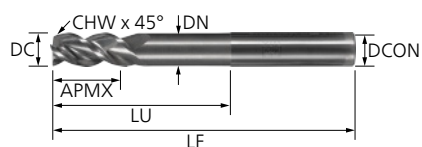
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# Performance aluminium solid carbide end mills

Performance aluminium solid carbide end mills with three flutes HC3N

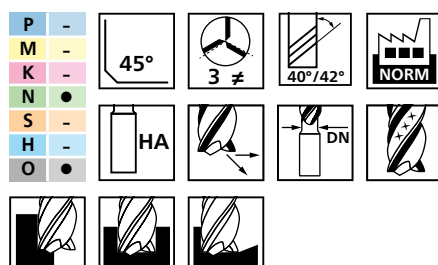


| DC<br>[mm]     | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |   | Item no. | Designation                |
|----------------|--------------|------------|--------------|------------|------------|-------------|------|---|----------|----------------------------|
| <b>Long HB</b> |              |            |              |            |            |             |      |   |          |                            |
| 3              | 6            |            | 8            | 57         |            | 0.05        | 3    | 1 | 23000419 | SCM-HC3N-M030C-M57HB6 UC40 |
| 4              | 6            |            | 11           | 57         |            | 0.05        | 3    | 1 | 23000420 | SCM-HC3N-M040C-M57HB6 UC40 |
| 5              | 6            |            | 13           | 57         |            | 0.05        | 3    | 1 | 23000421 | SCM-HC3N-M050C-M57HB6 UC40 |
| 6              | 6            | 5.7        | 13           | 57         | 20         | 0.1         | 3    | 1 | 23000422 | SCM-HC3N-M060C-M57HB UC40  |
| 8              | 8            | 7.7        | 19           | 63         | 25         | 0.15        | 3    | 1 | 23000423 | SCM-HC3N-M080C-M63HB UC40  |
| 10             | 10           | 9.7        | 22           | 72         | 30         | 0.2         | 3    | 1 | 23000424 | SCM-HC3N-M100C-M72HB UC40  |
| 12             | 12           | 11.7       | 26           | 83         | 36         | 0.25        | 3    | 1 | 23000425 | SCM-HC3N-M120C-M83HB UC40  |
| 16             | 16           | 15.6       | 32           | 92         | 42         | 0.3         | 3    | 1 | 23000426 | SCM-HC3N-M160C-M93HB UC40  |
| 20             | 20           | 19.6       | 38           | 104        | 52         | 0.35        | 3    | 1 | 23000427 | SCM-HC3N-M200C-M104HB UC40 |



## Chamfer corner design, extra-long – metric

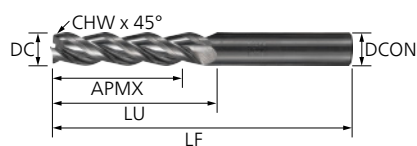
Mills with neck chip channel for use in large overhangs or deep cavities. Ideally suited to machining aluminium alloys, non-ferrous metals and plastics.



### Special features:

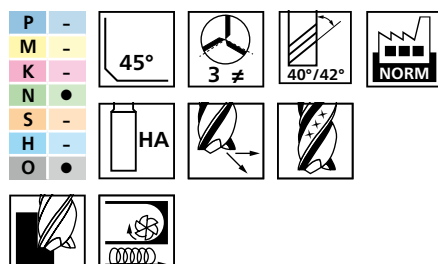
- Large polished chip channels for optimum chip control.
- Increased process reliability at high cutting speeds.
- Unequal pitch for low-vibration work with smooth running.

| DC<br>[mm]           | DCON<br>[mm] | DN<br>[mm] | APMX<br>[mm] | LF<br>[mm] | LU<br>[mm] | CHW<br>[mm] | ZEFP |   | Item no. | Designation                |
|----------------------|--------------|------------|--------------|------------|------------|-------------|------|---|----------|----------------------------|
| <b>Extra long HA</b> |              |            |              |            |            |             |      |   |          |                            |
| 10                   | 10           | 9.7        | 22           | 104        | 55         | 0.2         | 3    | 1 | 23000448 | SCM-HC3N-M100C-M104HA UC40 |
| 12                   | 12           | 11.6       | 26           | 110        | 64         | 0.25        | 3    | 1 | 23000449 | SCM-HC3N-M120C-M110HA UC40 |
| 16                   | 16           | 15.6       | 32           | 130        | 75         | 0.3         | 3    | 1 | 23000450 | SCM-HC3N-M160C-M130HA UC40 |



## Chamfer corner design, >4xD – metric

Mills with long usable length for dynamic machining and trochoidal milling. Ideally suited to machining aluminium alloys, non-ferrous metals and plastics.



### Special features:

- Large polished chip channels for optimum chip control.
- Increased process reliability at high cutting speeds.
- Unequal pitch for low-vibration work with smooth running.

| DC<br>[mm]        | DCON<br>[mm] | APMX<br>[mm] | LF<br>[mm] | CHW<br>[mm] | ZEFP |   | Item no. | Designation                  |
|-------------------|--------------|--------------|------------|-------------|------|---|----------|------------------------------|
| <b>&gt;4xD HA</b> |              |              |            |             |      |   |          |                              |
| 6                 | 6            | 26           | 75         | 0.1         | 3    | 1 | 23000442 | SCM-HC3N-M060C-XXL75HA UC40  |
| 8                 | 8            | 36           | 78         | 0.15        | 3    | 1 | 23000443 | SCM-HC3N-M080C-XXL78HA UC40  |
| 10                | 10           | 45           | 104        | 0.2         | 3    | 1 | 23000444 | SCM-HC3N-M100C-XXL104HA UC40 |
| 12                | 12           | 53           | 110        | 0.25        | 3    | 1 | 23000445 | SCM-HC3N-M120C-XXL110HA UC40 |
| 16                | 16           | 63           | 130        | 0.3         | 3    | 1 | 23000446 | SCM-HC3N-M160C-XXL130HA UC40 |
| 20                | 20           | 75           | 150        | 0.35        | 3    | 1 | 23000447 | SCM-HC3N-M200C-XXL150HA UC40 |

# Universal solid carbide drills

## Material suitability overview

| Material group |                                  |                                                             | Universal solid carbide drill U |
|----------------|----------------------------------|-------------------------------------------------------------|---------------------------------|
| <b>P</b>       | Steel                            | All types of steel and cast steel                           | ●                               |
| <b>M</b>       | Stainless steel                  | Ferritic and martensitic                                    | ●                               |
|                |                                  | Austenitic                                                  | ●                               |
|                |                                  | High-temperature-resistant and ferritic-austenitic (duplex) | ○                               |
| <b>K</b>       | Cast iron                        | Cast iron with flake graphite (GJL, GG, grey cast iron)     | ●                               |
|                |                                  | Cast iron with nodular graphite (GJS, GGG)                  | ●                               |
| <b>N</b>       | Non-ferrous metals               | Aluminium                                                   | ○                               |
|                |                                  | Copper, brass, bronze and red brass                         | ○                               |
| <b>S</b>       | Super and titanium alloys        | Heat-resistant super alloys based on Fe, Ni and Co          | ○                               |
|                |                                  | Pure titanium                                               | ○                               |
|                |                                  | Titanium alloys                                             | ○                               |
| <b>H</b>       | Hard steels and chilled castings | Heat-treated and hardened steels up to 50 HRC               | ●                               |
|                |                                  | Hardened steels up to 58 HRC                                | ○                               |
|                |                                  | Hardened steels over 58 HRC                                 | ○                               |
| <b>O</b>       | Other                            | Thermoplastics                                              | ○                               |
|                |                                  | Duroplastics                                                | ○                               |
|                |                                  | GRP/CRP reinforced plastics, graphite                       |                                 |

● = highly suitable ○ = suitable

## Explanation of pictograms used

### Geometry – Type



140° point angle

### Geometry – Number of flutes



Number of flutes

### Geometry – helix angle



Helix angle

### Norm



Company standard



DIN 6537 K



DIN 6537 L

### Shank type



Smooth cylindrical shank HA in accordance with DIN 6535

### Tool type



Internal coolant

### Feed direction



Feed z

### Applications



Drilling

# Universal solid carbide drills

## Formulae for cutting data calculation



$$n = \frac{v_c \times 1,000}{DC \times \pi} \text{ min}^{-1}$$

$$v_c = \frac{DC \times \pi \times n}{1,000} \text{ m/min}$$

$$v_f = f_n \times n \text{ mm/min}$$

Rotational speed

Cutting speed

Feeding speed

### Explanation of the abbreviations

- DC = cutting diameter in [mm]
- $f_n$  = feed per revolution

- n = spindle rotational speed in [rev/min]
- $v_c$  = cutting speed in [m/min]

- $v_f$  = feeding speed in [mm/min]

### Explanation of item designation

**SCD - U - 5D - M12.500 - 60IC LA40**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

#### ① Tool group

SCD = Solid Carbide Drill

#### ② Product line

U = Universal

#### ③ Shape

Omitted if a standard drill.

#### ④ Material group

ISO groups P, M, K, N, S, H, O.  
Combinations  
Example: MS  
Omitted unless specified.

#### ⑤ Working length in the ratio L/D

3D ~ 3xD  
5D ~ 5xD  
8D ~ 8xD

#### ⑥ Units

M = Metric

#### ⑦ Cutting diameter

Metric: mm x 1000  
Example: D 10.5 mm = 10,500  
Example: D 8.5 mm = 08.500

#### ⑧ Type

#### ⑨ Working length

Metric: Working length LU in mm

#### ⑩ Shank type

Blank if a cylindrical shank (HA)

#### ⑪ Coolant supply

Blank if no IC  
IC = Inner Coolant

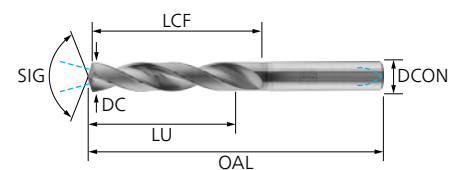
#### ⑫ \*

#### ⑬ Grade

\*Optional

### Explanation of short names in accordance with ISO 13399

- LU = working length
- DC = cutting diameter
- DCON = shank diameter
- OAL = overall length
- SIG = point angle
- LCF = flute length



### Recommended cutting speeds [m/min] – version 3xD and 5xD

| Material group |                                        |                                                                  | Specification/<br>example material | Suitability | Drilling (3-5xD with IC)<br> |                                                            |       |       |       |       |       |       |       |
|----------------|----------------------------------------|------------------------------------------------------------------|------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|
|                |                                        |                                                                  |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                               | Feed $f_n$ [mm/revolution]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |
|                |                                        |                                                                  |                                    |             |                                                                                                                 | 3                                                          | 4     | 5     | 6     | 8     | 10    | 12    | 16    |
| P              | Steel                                  | All types of steel<br>and cast steel                             | up to 500 N/mm <sup>2</sup>        | ●           | 110                                                                                                             | 0.110                                                      | 0.132 | 0.165 | 0.176 | 0.231 | 0.242 | 0.286 | 0.341 |
|                |                                        |                                                                  | 500 to 700 N/mm <sup>2</sup>       | ●           | 90                                                                                                              | 0.100                                                      | 0.120 | 0.150 | 0.160 | 0.210 | 0.220 | 0.260 | 0.310 |
|                |                                        |                                                                  | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 75                                                                                                              | 0.085                                                      | 0.102 | 0.128 | 0.136 | 0.179 | 0.187 | 0.221 | 0.264 |
|                |                                        |                                                                  | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 60                                                                                                              | 0.064                                                      | 0.077 | 0.096 | 0.102 | 0.134 | 0.140 | 0.166 | 0.198 |
| M              | Stainless<br>steel                     | Ferritic and<br>martensitic                                      | e.g. 1.4105, 1.4122                | ●           | 60                                                                                                              | 0.085                                                      | 0.102 | 0.128 | 0.136 | 0.179 | 0.187 | 0.221 | 0.264 |
|                |                                        | Austenitic                                                       | e.g. 1.4301, 1.4571                | ●           | 50                                                                                                              | 0.050                                                      | 0.075 | 0.088 | 0.100 | 0.110 | 0.130 | 0.140 | 0.170 |
|                |                                        | High-temperature-resistant and ferritic-austenitic (duplex)      |                                    | ○           | 35                                                                                                              | 0.038                                                      | 0.056 | 0.066 | 0.075 | 0.083 | 0.098 | 0.105 | 0.128 |
| K              | Cast iron                              | Cast iron with<br>flake graphite<br>(GJL, GG, grey<br>cast iron) | up to 180 HB                       | ●           | 110                                                                                                             | 0.150                                                      | 0.185 | 0.233 | 0.280 | 0.300 | 0.335 | 0.375 | 0,450 |
|                |                                        | Cast iron with<br>nodular graphite<br>(GJS, GGG)                 | 160 to 260 HB                      | ●           | 80                                                                                                              | 0.135                                                      | 0.167 | 0.209 | 0.252 | 0.270 | 0.302 | 0.338 | 0,405 |
| N              | Non-ferrous<br>metals                  | Aluminium                                                        | Al up to 10% Si                    | ○           | 250                                                                                                             | 0.150                                                      | 0.185 | 0.233 | 0.280 | 0.300 | 0.335 | 0.375 | 0,450 |
|                |                                        |                                                                  | Al over 10% Si                     | ○           | 220                                                                                                             | 0.135                                                      | 0.167 | 0.209 | 0.252 | 0.270 | 0.302 | 0.338 | 0,405 |
|                |                                        | Copper, brass, bronze and red brass                              | ○                                  | 160         | 0.100                                                                                                           | 0.120                                                      | 0.150 | 0.160 | 0.210 | 0.220 | 0.260 | 0.310 |       |
| S              | Super and<br>titanium<br>alloys        | Heat-resistant<br>super alloys                                   | Based on Fe, Ni<br>and Co          | ○           | 25                                                                                                              | 0.034                                                      | 0.047 | 0.051 | 0.055 | 0.068 | 0.085 | 0.102 | 0.119 |
|                |                                        | Pure titanium                                                    |                                    | ○           | 40                                                                                                              | 0.040                                                      | 0.055 | 0.060 | 0.065 | 0.080 | 0.100 | 0.120 | 0.140 |
|                |                                        | Titanium alloys                                                  |                                    | ○           | 30                                                                                                              | 0.034                                                      | 0.047 | 0.051 | 0.055 | 0.068 | 0.085 | 0.102 | 0.119 |
| H              | Hard steels<br>and chilled<br>castings | Heat-treated and<br>hardened steels                              | up to 50 HRC                       | ○           | 30                                                                                                              | 0.026                                                      | 0.035 | 0.038 | 0.041 | 0.051 | 0.064 | 0.077 | 0.089 |
|                |                                        |                                                                  | up to 58 HRC                       |             |                                                                                                                 |                                                            |       |       |       |       |       |       |       |
|                |                                        |                                                                  | over 58 HRC                        |             |                                                                                                                 |                                                            |       |       |       |       |       |       |       |
| O              | Other                                  | Thermoplastics                                                   |                                    |             |                                                                                                                 |                                                            |       |       |       |       |       |       |       |
|                |                                        | Duroplastics                                                     |                                    |             |                                                                                                                 |                                                            |       |       |       |       |       |       |       |
|                |                                        | GRP/CRP reinforced plastics, graphite                            |                                    |             |                                                                                                                 |                                                            |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

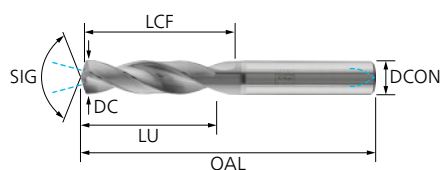
### Recommended cutting speeds [m/min] – version 8xD

| Material group |                                        |                                                                  | Specification/<br>example material | Suitability | Drilling (8xD with IC)  |                                                            |       |       |       |       |       |       |       |
|----------------|----------------------------------------|------------------------------------------------------------------|------------------------------------|-------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|
|                |                                        |                                                                  |                                    |             | Cutting<br>speed $v_c$<br>[m/min]                                                                          | Feed $f_n$ [mm/revolution]<br>for cutting diameter DC [mm] |       |       |       |       |       |       |       |
|                |                                        |                                                                  |                                    |             |                                                                                                            | 3                                                          | 4     | 5     | 6     | 8     | 10    | 12    | 16    |
| P              | Steel                                  | All types of steel<br>and cast steel                             | up to 500 N/mm <sup>2</sup>        | ●           | 102                                                                                                        | 0.102                                                      | 0.123 | 0.153 | 0.164 | 0.215 | 0.225 | 0.266 | 0.317 |
|                |                                        |                                                                  | 500 to 700 N/mm <sup>2</sup>       | ●           | 84                                                                                                         | 0.093                                                      | 0.112 | 0.140 | 0.149 | 0.195 | 0.205 | 0.242 | 0.288 |
|                |                                        |                                                                  | 700 to 1,000 N/mm <sup>2</sup>     | ●           | 70                                                                                                         | 0.079                                                      | 0.095 | 0.119 | 0.126 | 0.166 | 0.174 | 0.206 | 0.245 |
|                |                                        |                                                                  | 1,000 to 1,400 N/mm <sup>2</sup>   | ●           | 56                                                                                                         | 0.059                                                      | 0.071 | 0.089 | 0.095 | 0.125 | 0.130 | 0.154 | 0.184 |
| M              | Stainless<br>steel                     | Ferritic and<br>martensitic                                      | e.g. 1.4105, 1.4122                | ●           | 56                                                                                                         | 0.079                                                      | 0.095 | 0.119 | 0.126 | 0.166 | 0.174 | 0.206 | 0.245 |
|                |                                        | Austenitic                                                       | e.g. 1.4301, 1.4571                | ●           | 47                                                                                                         | 0.047                                                      | 0.070 | 0.081 | 0.093 | 0.102 | 0.121 | 0.130 | 0.158 |
|                |                                        | High-temperature-resistant and ferritic-<br>austenitic (duplex)  |                                    | ○           | 33                                                                                                         | 0.035                                                      | 0.052 | 0.061 | 0.070 | 0.077 | 0.091 | 0.098 | 0.119 |
| K              | Cast iron                              | Cast iron with<br>flake graphite<br>(GJL, GG, grey<br>cast iron) | up to 180 HB                       | ●           | 102                                                                                                        | 0.140                                                      | 0.172 | 0.216 | 0.260 | 0.279 | 0.312 | 0.349 | 0,419 |
|                |                                        | Cast iron with<br>nodular graphite<br>(GJS, GGG)                 | 160 to 260 HB                      | ●           | 74                                                                                                         | 0.126                                                      | 0.155 | 0.195 | 0.234 | 0.251 | 0.280 | 0.314 | 0.377 |
| N              | Non-ferrous<br>metals                  | Aluminium                                                        | Al up to 10% Si                    | ○           | 233                                                                                                        | 0.140                                                      | 0.172 | 0.216 | 0.260 | 0.279 | 0.312 | 0.349 | 0,419 |
|                |                                        |                                                                  | Al over 10% Si                     | ○           | 205                                                                                                        | 0.126                                                      | 0.155 | 0.195 | 0.234 | 0.251 | 0.280 | 0.314 | 0.377 |
|                |                                        | Copper, brass, bronze and red brass                              |                                    | ○           | 149                                                                                                        | 0.093                                                      | 0.112 | 0.140 | 0.149 | 0.195 | 0.205 | 0.242 | 0.288 |
| S              | Super and<br>titanium<br>alloys        | Heat-resistant<br>super alloys                                   | Based on Fe, Ni<br>and Co          | ○           | 23                                                                                                         | 0.032                                                      | 0.043 | 0.047 | 0.051 | 0.063 | 0.079 | 0.095 | 0.111 |
|                |                                        | Pure titanium                                                    |                                    | ○           | 37                                                                                                         | 0.037                                                      | 0.051 | 0.056 | 0.060 | 0.074 | 0.093 | 0.112 | 0.130 |
|                |                                        | Titanium alloys                                                  |                                    | ○           | 28                                                                                                         | 0.032                                                      | 0.043 | 0.047 | 0.051 | 0.063 | 0.079 | 0.095 | 0.111 |
| H              | Hard steels<br>and chilled<br>castings | Heat-treated and<br>hardened steels                              | up to 50 HRC                       |             |                                                                                                            |                                                            |       |       |       |       |       |       |       |
|                |                                        |                                                                  | up to 58 HRC                       |             |                                                                                                            |                                                            |       |       |       |       |       |       |       |
|                |                                        |                                                                  | over 58 HRC                        |             |                                                                                                            |                                                            |       |       |       |       |       |       |       |
| O              | Other                                  | Thermoplastics                                                   |                                    |             |                                                                                                            |                                                            |       |       |       |       |       |       |       |
|                |                                        | Duroplastics                                                     |                                    |             |                                                                                                            |                                                            |       |       |       |       |       |       |       |
|                |                                        | GRP/CRP reinforced plastics, graphite                            |                                    |             |                                                                                                            |                                                            |       |       |       |       |       |       |       |

● = highly suitable ○ = suitable

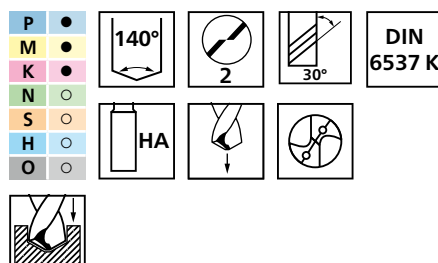
# Universal solid carbide drills

## Universal solid carbide drill U



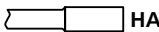
### 3xD type – metric

Solid carbide drills with inner coolant supply and state-of-the-art coating for universal use on a variety of materials.



#### Special features:

- Double margin flute for increased process stability and high-quality bores.
- Inner coolant supply for increased tool life and controlled chip removal.
- Optimised surface finishing for high performance.

| DC<br>[mm]                                                                                   | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |   | Item no. | Designation                |
|----------------------------------------------------------------------------------------------|--------------|-------------|------------|-------------|------|---|----------|----------------------------|
| HA with IC  |              |             |            |             |      |   |          |                            |
| 3                                                                                            | 6            | 62          | 14         | 20          | 2    | 1 | 23000494 | SCD-U-3D-M03.000-14IC LA40 |
| 3.1                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000495 | SCD-U-3D-M03.100-14IC LA40 |
| 3.2                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000496 | SCD-U-3D-M03.200-14IC LA40 |
| 3.3                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000497 | SCD-U-3D-M03.300-14IC LA40 |
| 3.4                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000498 | SCD-U-3D-M03.400-14IC LA40 |
| 3.5                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000499 | SCD-U-3D-M03.500-14IC LA40 |
| 3.6                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000500 | SCD-U-3D-M03.600-14IC LA40 |
| 3.7                                                                                          | 6            | 62          | 14         | 20          | 2    | 1 | 23000501 | SCD-U-3D-M03.700-14IC LA40 |
| 3.8                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000502 | SCD-U-3D-M03.800-17IC LA40 |
| 3.9                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000503 | SCD-U-3D-M03.900-17IC LA40 |
| 4                                                                                            | 6            | 66          | 17         | 24          | 2    | 1 | 23000504 | SCD-U-3D-M04.000-17IC LA40 |
| 4.1                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000505 | SCD-U-3D-M04.100-17IC LA40 |
| 4.2                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000506 | SCD-U-3D-M04.200-17IC LA40 |
| 4.3                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000507 | SCD-U-3D-M04.300-17IC LA40 |
| 4.4                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000508 | SCD-U-3D-M04.400-17IC LA40 |
| 4.5                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000509 | SCD-U-3D-M04.500-17IC LA40 |
| 4.6                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000510 | SCD-U-3D-M04.600-17IC LA40 |
| 4.7                                                                                          | 6            | 66          | 17         | 24          | 2    | 1 | 23000511 | SCD-U-3D-M04.700-17IC LA40 |
| 4.8                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000512 | SCD-U-3D-M04.800-20IC LA40 |
| 4.9                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000513 | SCD-U-3D-M04.900-20IC LA40 |
| 5                                                                                            | 6            | 66          | 20         | 28          | 2    | 1 | 23000514 | SCD-U-3D-M05.000-20IC LA40 |
| 5.1                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000515 | SCD-U-3D-M05.100-20IC LA40 |
| 5.2                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000516 | SCD-U-3D-M05.200-20IC LA40 |
| 5.3                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000517 | SCD-U-3D-M05.300-20IC LA40 |
| 5.4                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000518 | SCD-U-3D-M05.400-20IC LA40 |
| 5.5                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000519 | SCD-U-3D-M05.500-20IC LA40 |
| 5.6                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000520 | SCD-U-3D-M05.600-20IC LA40 |
| 5.7                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000521 | SCD-U-3D-M05.700-20IC LA40 |
| 5.8                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000522 | SCD-U-3D-M05.800-20IC LA40 |
| 5.9                                                                                          | 6            | 66          | 20         | 28          | 2    | 1 | 23000523 | SCD-U-3D-M05.900-20IC LA40 |
| 6                                                                                            | 6            | 66          | 20         | 28          | 2    | 1 | 23000524 | SCD-U-3D-M06.000-20IC LA40 |
| 6.2                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000525 | SCD-U-3D-M06.200-24IC LA40 |
| 6.3                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000526 | SCD-U-3D-M06.300-24IC LA40 |
| 6.4                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000527 | SCD-U-3D-M06.400-24IC LA40 |
| 6.5                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000528 | SCD-U-3D-M06.500-24IC LA40 |
| 6.6                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000529 | SCD-U-3D-M06.600-24IC LA40 |
| 6.7                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000530 | SCD-U-3D-M06.700-24IC LA40 |
| 6.8                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000531 | SCD-U-3D-M06.800-24IC LA40 |
| 6.9                                                                                          | 8            | 79          | 24         | 34          | 2    | 1 | 23000532 | SCD-U-3D-M06.900-24IC LA40 |
| 7                                                                                            | 8            | 79          | 24         | 34          | 2    | 1 | 23000533 | SCD-U-3D-M07.000-24IC LA40 |

Continued on next page

# Universal solid carbide drills

## Universal solid carbide drill U



| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |  | Item no. | Designation                |
|------------|--------------|-------------|------------|-------------|------|-----------------------------------------------------------------------------------|----------|----------------------------|
| 7.2        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000534 | SCD-U-3D-M07.200-29IC LA40 |
| 7.3        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000535 | SCD-U-3D-M07.300-29IC LA40 |
| 7.4        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000536 | SCD-U-3D-M07.400-29IC LA40 |
| 7.5        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000537 | SCD-U-3D-M07.500-29IC LA40 |
| 7.6        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000538 | SCD-U-3D-M07.600-29IC LA40 |
| 7.7        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000539 | SCD-U-3D-M07.700-29IC LA40 |
| 7.8        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000540 | SCD-U-3D-M07.800-29IC LA40 |
| 7.9        | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000541 | SCD-U-3D-M07.900-29IC LA40 |
| 8          | 8            | 79          | 29         | 41          | 2    | 1                                                                                 | 23000542 | SCD-U-3D-M08.000-29IC LA40 |
| 8.1        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000543 | SCD-U-3D-M08.100-35IC LA40 |
| 8.2        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000544 | SCD-U-3D-M08.200-35IC LA40 |
| 8.3        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000545 | SCD-U-3D-M08.300-35IC LA40 |
| 8.4        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000546 | SCD-U-3D-M08.400-35IC LA40 |
| 8.5        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000547 | SCD-U-3D-M08.500-35IC LA40 |
| 8.6        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000548 | SCD-U-3D-M08.600-35IC LA40 |
| 8.7        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000549 | SCD-U-3D-M08.700-35IC LA40 |
| 8.8        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000550 | SCD-U-3D-M08.800-35IC LA40 |
| 9          | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000551 | SCD-U-3D-M09.000-35IC LA40 |
| 9.2        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000552 | SCD-U-3D-M09.200-35IC LA40 |
| 9.3        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000553 | SCD-U-3D-M09.300-35IC LA40 |
| 9.4        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000554 | SCD-U-3D-M09.400-35IC LA40 |
| 9.5        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000555 | SCD-U-3D-M09.500-35IC LA40 |
| 9.6        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000556 | SCD-U-3D-M09.600-35IC LA40 |
| 9.8        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000557 | SCD-U-3D-M09.800-35IC LA40 |
| 9.9        | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000558 | SCD-U-3D-M09.900-35IC LA40 |
| 10         | 10           | 89          | 35         | 47          | 2    | 1                                                                                 | 23000559 | SCD-U-3D-M10.000-35IC LA40 |
| 10.1       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000560 | SCD-U-3D-M10.100-40IC LA40 |
| 10.2       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000561 | SCD-U-3D-M10.200-40IC LA40 |
| 10.3       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000562 | SCD-U-3D-M10.300-40IC LA40 |
| 10.4       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000563 | SCD-U-3D-M10.400-40IC LA40 |
| 10.5       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000564 | SCD-U-3D-M10.500-40IC LA40 |
| 10.8       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000565 | SCD-U-3D-M10.800-40IC LA40 |
| 11         | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000566 | SCD-U-3D-M11.000-40IC LA40 |
| 11.2       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000567 | SCD-U-3D-M11.200-40IC LA40 |
| 11.3       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000568 | SCD-U-3D-M11.300-40IC LA40 |
| 11.5       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000569 | SCD-U-3D-M11.500-40IC LA40 |
| 11.6       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000570 | SCD-U-3D-M11.600-40IC LA40 |
| 11.8       | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000571 | SCD-U-3D-M11.800-40IC LA40 |
| 12         | 12           | 102         | 40         | 55          | 2    | 1                                                                                 | 23000572 | SCD-U-3D-M12.000-40IC LA40 |
| 12.1       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000573 | SCD-U-3D-M12.100-43IC LA40 |
| 12.2       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000574 | SCD-U-3D-M12.200-43IC LA40 |
| 12.5       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000575 | SCD-U-3D-M12.500-43IC LA40 |
| 12.7       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000576 | SCD-U-3D-M12.700-43IC LA40 |
| 12.9       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000577 | SCD-U-3D-M12.900-43IC LA40 |
| 13         | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000578 | SCD-U-3D-M13.000-43IC LA40 |
| 13.1       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000579 | SCD-U-3D-M13.100-43IC LA40 |
| 13.5       | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000580 | SCD-U-3D-M13.500-43IC LA40 |
| 14         | 14           | 107         | 43         | 60          | 2    | 1                                                                                 | 23000581 | SCD-U-3D-M14.000-43IC LA40 |
| 14.1       | 16           | 115         | 45         | 65          | 2    | 1                                                                                 | 23000582 | SCD-U-3D-M14.100-45IC LA40 |
| 14.2       | 16           | 115         | 45         | 65          | 2    | 1                                                                                 | 23000583 | SCD-U-3D-M14.200-45IC LA40 |
| 14.5       | 16           | 115         | 45         | 65          | 2    | 1                                                                                 | 23000584 | SCD-U-3D-M14.500-45IC LA40 |
| 14.7       | 16           | 115         | 45         | 65          | 2    | 1                                                                                 | 23000585 | SCD-U-3D-M14.700-45IC LA40 |
| 15         | 16           | 115         | 45         | 65          | 2    | 1                                                                                 | 23000586 | SCD-U-3D-M15.000-45IC LA40 |
| 15.1       | 16           | 115         | 45         | 65          | 2    | 1                                                                                 | 23000587 | SCD-U-3D-M15.100-45IC LA40 |

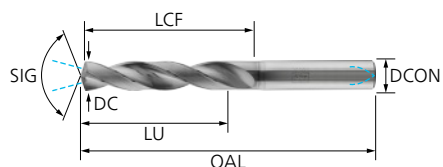
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# Universal solid carbide drills

## Universal solid carbide drill U

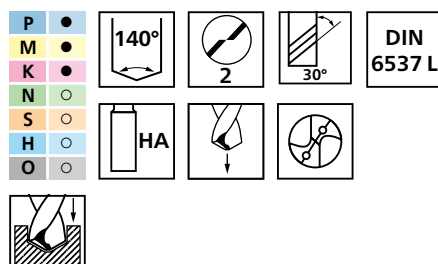


| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |   | Item no. | Designation                |
|------------|--------------|-------------|------------|-------------|------|---|----------|----------------------------|
| 15.2       | 16           | 115         | 45         | 65          | 2    | 1 | 23000588 | SCD-U-3D-M15.200-45IC LA40 |
| 15.5       | 16           | 115         | 45         | 65          | 2    | 1 | 23000589 | SCD-U-3D-M15.500-45IC LA40 |
| 15.8       | 16           | 115         | 45         | 65          | 2    | 1 | 23000590 | SCD-U-3D-M15.800-45IC LA40 |
| 16         | 16           | 115         | 45         | 65          | 2    | 1 | 23000591 | SCD-U-3D-M16.000-45IC LA40 |



### 5xD type – metric

Solid carbide drills with inner coolant supply and state-of-the-art coating for universal use on a variety of materials.



#### Special features:

- Double margin flute for increased process stability and high-quality bores.
- Inner coolant supply for increased tool life and controlled chip removal.
- Optimised surface finishing for high performance.

| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|-------------|------------|-------------|------|--|----------|-------------|
|------------|--------------|-------------|------------|-------------|------|--|----------|-------------|

#### HA with IC



|     |   |    |    |    |   |   |          |                            |
|-----|---|----|----|----|---|---|----------|----------------------------|
| 3   | 6 | 66 | 23 | 27 | 2 | 1 | 23000592 | SCD-U-5D-M03.000-23IC LA40 |
| 3.1 | 6 | 66 | 23 | 27 | 2 | 1 | 23000593 | SCD-U-5D-M03.100-23IC LA40 |
| 3.2 | 6 | 66 | 23 | 27 | 2 | 1 | 23000594 | SCD-U-5D-M03.200-23IC LA40 |
| 3.3 | 6 | 66 | 23 | 27 | 2 | 1 | 23000595 | SCD-U-5D-M03.300-23IC LA40 |
| 3.4 | 6 | 66 | 23 | 27 | 2 | 1 | 23000596 | SCD-U-5D-M03.400-23IC LA40 |
| 3.5 | 6 | 66 | 23 | 27 | 2 | 1 | 23000597 | SCD-U-5D-M03.500-23IC LA40 |
| 3.6 | 6 | 66 | 23 | 27 | 2 | 1 | 23000598 | SCD-U-5D-M03.600-23IC LA40 |
| 3.7 | 6 | 66 | 23 | 27 | 2 | 1 | 23000599 | SCD-U-5D-M03.700-23IC LA40 |
| 3.8 | 6 | 74 | 29 | 36 | 2 | 1 | 23000600 | SCD-U-5D-M03.800-29IC LA40 |
| 3.9 | 6 | 74 | 29 | 36 | 2 | 1 | 23000601 | SCD-U-5D-M03.900-29IC LA40 |
| 4   | 6 | 74 | 29 | 36 | 2 | 1 | 23000602 | SCD-U-5D-M04.000-29IC LA40 |
| 4.1 | 6 | 74 | 29 | 36 | 2 | 1 | 23000603 | SCD-U-5D-M04.100-29IC LA40 |
| 4.2 | 6 | 74 | 29 | 36 | 2 | 1 | 23000604 | SCD-U-5D-M04.200-29IC LA40 |
| 4.3 | 6 | 74 | 29 | 36 | 2 | 1 | 23000605 | SCD-U-5D-M04.300-29IC LA40 |
| 4.4 | 6 | 74 | 29 | 36 | 2 | 1 | 23000606 | SCD-U-5D-M04.400-29IC LA40 |
| 4.5 | 6 | 74 | 29 | 36 | 2 | 1 | 23000607 | SCD-U-5D-M04.500-29IC LA40 |
| 4.6 | 6 | 74 | 29 | 36 | 2 | 1 | 23000608 | SCD-U-5D-M04.600-29IC LA40 |
| 4.7 | 6 | 74 | 29 | 36 | 2 | 1 | 23000609 | SCD-U-5D-M04.700-29IC LA40 |
| 4.8 | 6 | 82 | 35 | 44 | 2 | 1 | 23000610 | SCD-U-5D-M04.800-35IC LA40 |
| 4.9 | 6 | 82 | 35 | 44 | 2 | 1 | 23000611 | SCD-U-5D-M04.900-35IC LA40 |
| 5   | 6 | 82 | 35 | 44 | 2 | 1 | 23000612 | SCD-U-5D-M05.000-35IC LA40 |
| 5.1 | 6 | 82 | 35 | 44 | 2 | 1 | 23000613 | SCD-U-5D-M05.100-35IC LA40 |
| 5.2 | 6 | 82 | 35 | 44 | 2 | 1 | 23000614 | SCD-U-5D-M05.200-35IC LA40 |
| 5.3 | 6 | 82 | 35 | 44 | 2 | 1 | 23000615 | SCD-U-5D-M05.300-35IC LA40 |
| 5.4 | 6 | 82 | 35 | 44 | 2 | 1 | 23000616 | SCD-U-5D-M05.400-35IC LA40 |
| 5.5 | 6 | 82 | 35 | 44 | 2 | 1 | 23000617 | SCD-U-5D-M05.500-35IC LA40 |
| 5.6 | 6 | 82 | 35 | 44 | 2 | 1 | 23000618 | SCD-U-5D-M05.600-35IC LA40 |
| 5.7 | 6 | 82 | 35 | 44 | 2 | 1 | 23000619 | SCD-U-5D-M05.700-35IC LA40 |
| 5.8 | 6 | 82 | 35 | 44 | 2 | 1 | 23000620 | SCD-U-5D-M05.800-35IC LA40 |
| 5.9 | 6 | 82 | 35 | 44 | 2 | 1 | 23000621 | SCD-U-5D-M05.900-35IC LA40 |
| 6   | 6 | 82 | 35 | 44 | 2 | 1 | 23000622 | SCD-U-5D-M06.000-35IC LA40 |
| 6.1 | 8 | 91 | 43 | 53 | 2 | 1 | 23000623 | SCD-U-5D-M06.100-43IC LA40 |

Continued on next page

# Universal solid carbide drills

## Universal solid carbide drill U



| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |  | Item no. | Designation                |
|------------|--------------|-------------|------------|-------------|------|-----------------------------------------------------------------------------------|----------|----------------------------|
| 6.2        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000624 | SCD-U-5D-M06.200-43IC LA40 |
| 6.3        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000625 | SCD-U-5D-M06.300-43IC LA40 |
| 6.4        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000626 | SCD-U-5D-M06.400-43IC LA40 |
| 6.5        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000627 | SCD-U-5D-M06.500-43IC LA40 |
| 6.6        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000628 | SCD-U-5D-M06.600-43IC LA40 |
| 6.7        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000629 | SCD-U-5D-M06.700-43IC LA40 |
| 6.8        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000630 | SCD-U-5D-M06.800-43IC LA40 |
| 6.9        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000631 | SCD-U-5D-M06.900-43IC LA40 |
| 7          | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000632 | SCD-U-5D-M07.000-43IC LA40 |
| 7.2        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000633 | SCD-U-5D-M07.200-43IC LA40 |
| 7.3        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000634 | SCD-U-5D-M07.300-43IC LA40 |
| 7.4        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000635 | SCD-U-5D-M07.400-43IC LA40 |
| 7.5        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000636 | SCD-U-5D-M07.500-43IC LA40 |
| 7.6        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000637 | SCD-U-5D-M07.600-43IC LA40 |
| 7.7        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000638 | SCD-U-5D-M07.700-43IC LA40 |
| 7.8        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000639 | SCD-U-5D-M07.800-43IC LA40 |
| 7.9        | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000640 | SCD-U-5D-M07.900-43IC LA40 |
| 8          | 8            | 91          | 43         | 53          | 2    | 1                                                                                 | 23000641 | SCD-U-5D-M08.000-43IC LA40 |
| 8.1        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000642 | SCD-U-5D-M08.100-49IC LA40 |
| 8.2        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000643 | SCD-U-5D-M08.200-49IC LA40 |
| 8.3        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000644 | SCD-U-5D-M08.300-49IC LA40 |
| 8.4        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000645 | SCD-U-5D-M08.400-49IC LA40 |
| 8.5        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000646 | SCD-U-5D-M08.500-49IC LA40 |
| 8.6        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000647 | SCD-U-5D-M08.600-49IC LA40 |
| 8.7        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000648 | SCD-U-5D-M08.700-49IC LA40 |
| 8.8        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000649 | SCD-U-5D-M08.800-49IC LA40 |
| 9          | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000650 | SCD-U-5D-M09.000-49IC LA40 |
| 9.2        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000651 | SCD-U-5D-M09.200-49IC LA40 |
| 9.3        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000652 | SCD-U-5D-M09.300-49IC LA40 |
| 9.4        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000653 | SCD-U-5D-M09.400-49IC LA40 |
| 9.5        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000654 | SCD-U-5D-M09.500-49IC LA40 |
| 9.6        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000655 | SCD-U-5D-M09.600-49IC LA40 |
| 9.8        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000656 | SCD-U-5D-M09.800-49IC LA40 |
| 9.9        | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000657 | SCD-U-5D-M09.900-49IC LA40 |
| 10         | 10           | 103         | 49         | 61          | 2    | 1                                                                                 | 23000658 | SCD-U-5D-M10.000-49IC LA40 |
| 10.1       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000659 | SCD-U-5D-M10.100-56IC LA40 |
| 10.2       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000660 | SCD-U-5D-M10.200-56IC LA40 |
| 10.3       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000661 | SCD-U-5D-M10.300-56IC LA40 |
| 10.4       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000662 | SCD-U-5D-M10.400-56IC LA40 |
| 10.5       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000663 | SCD-U-5D-M10.500-56IC LA40 |
| 10.8       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000664 | SCD-U-5D-M10.800-56IC LA40 |
| 11         | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000665 | SCD-U-5D-M11.000-56IC LA40 |
| 11.2       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000666 | SCD-U-5D-M11.200-56IC LA40 |
| 11.3       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000667 | SCD-U-5D-M11.300-56IC LA40 |
| 11.5       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000668 | SCD-U-5D-M11.500-56IC LA40 |
| 11.6       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000669 | SCD-U-5D-M11.600-56IC LA40 |
| 11.8       | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000670 | SCD-U-5D-M11.800-56IC LA40 |
| 12         | 12           | 118         | 56         | 71          | 2    | 1                                                                                 | 23000671 | SCD-U-5D-M12.000-56IC LA40 |
| 12.1       | 14           | 124         | 60         | 77          | 2    | 1                                                                                 | 23000672 | SCD-U-5D-M12.100-60IC LA40 |
| 12.2       | 14           | 124         | 60         | 77          | 2    | 1                                                                                 | 23000673 | SCD-U-5D-M12.200-60IC LA40 |
| 12.5       | 14           | 124         | 60         | 77          | 2    | 1                                                                                 | 23000674 | SCD-U-5D-M12.500-60IC LA40 |
| 12.7       | 14           | 124         | 60         | 77          | 2    | 1                                                                                 | 23000675 | SCD-U-5D-M12.700-60IC LA40 |
| 12.9       | 14           | 124         | 60         | 77          | 2    | 1                                                                                 | 23000676 | SCD-U-5D-M12.900-60IC LA40 |
| 13         | 14           | 124         | 60         | 77          | 2    | 1                                                                                 | 23000677 | SCD-U-5D-M13.000-60IC LA40 |

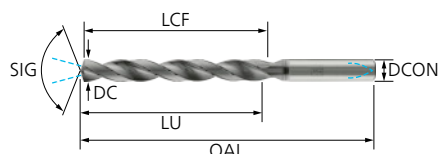
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# Universal solid carbide drills

## Universal solid carbide drill U

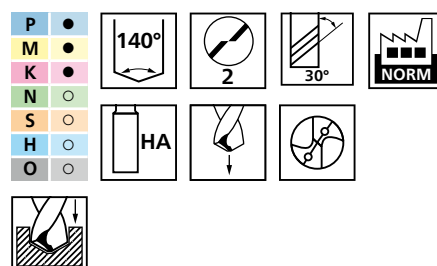


| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |   | Item no. | Designation                |
|------------|--------------|-------------|------------|-------------|------|---|----------|----------------------------|
| 13.1       | 14           | 124         | 60         | 77          | 2    | 1 | 23000678 | SCD-U-5D-M13.100-60IC LA40 |
| 13.3       | 14           | 124         | 60         | 77          | 2    | 1 | 23000679 | SCD-U-5D-M13.300-60IC LA40 |
| 13.5       | 14           | 124         | 60         | 77          | 2    | 1 | 23000680 | SCD-U-5D-M13.500-60IC LA40 |
| 13.8       | 14           | 124         | 60         | 77          | 2    | 1 | 23000681 | SCD-U-5D-M13.800-60IC LA40 |
| 14         | 14           | 124         | 60         | 77          | 2    | 1 | 23000682 | SCD-U-5D-M14.000-60IC LA40 |
| 14.1       | 16           | 133         | 63         | 83          | 2    | 1 | 23000683 | SCD-U-5D-M14.100-63IC LA40 |
| 14.2       | 16           | 133         | 63         | 83          | 2    | 1 | 23000684 | SCD-U-5D-M14.200-63IC LA40 |
| 14.5       | 16           | 133         | 63         | 83          | 2    | 1 | 23000685 | SCD-U-5D-M14.500-63IC LA40 |
| 14.7       | 16           | 133         | 63         | 83          | 2    | 1 | 23000686 | SCD-U-5D-M14.700-63IC LA40 |
| 14.8       | 16           | 133         | 63         | 83          | 2    | 1 | 23000687 | SCD-U-5D-M14.800-63IC LA40 |
| 15         | 16           | 133         | 63         | 83          | 2    | 1 | 23000688 | SCD-U-5D-M15.000-63IC LA40 |
| 15.1       | 16           | 133         | 63         | 83          | 2    | 1 | 23000689 | SCD-U-5D-M15.100-63IC LA40 |
| 15.2       | 16           | 133         | 63         | 83          | 2    | 1 | 23000690 | SCD-U-5D-M15.200-63IC LA40 |
| 15.5       | 16           | 133         | 63         | 83          | 2    | 1 | 23000691 | SCD-U-5D-M15.500-63IC LA40 |
| 15.8       | 16           | 133         | 63         | 83          | 2    | 1 | 23000692 | SCD-U-5D-M15.800-63IC LA40 |
| 16         | 16           | 133         | 63         | 83          | 2    | 1 | 23000693 | SCD-U-5D-M16.000-63IC LA40 |



### 8xD type – metric

Solid carbide drills with inner coolant supply and state-of-the-art coating for universal use on a variety of materials.



#### Special features:

- Double margin flute for increased process stability and high-quality bores.
- Inner coolant supply for increased tool life and controlled chip removal.
- Optimised surface finishing for high performance.

| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |  | Item no. | Designation |
|------------|--------------|-------------|------------|-------------|------|--|----------|-------------|
|------------|--------------|-------------|------------|-------------|------|--|----------|-------------|

#### HA with IC



|     |   |    |    |    |   |   |          |                            |
|-----|---|----|----|----|---|---|----------|----------------------------|
| 3   | 6 | 74 | 29 | 35 | 2 | 1 | 23000694 | SCD-U-8D-M03.000-29IC LA40 |
| 3.2 | 6 | 74 | 30 | 35 | 2 | 1 | 23000695 | SCD-U-8D-M03.200-30IC LA40 |
| 3.3 | 6 | 74 | 30 | 35 | 2 | 1 | 23000696 | SCD-U-8D-M03.300-30IC LA40 |
| 3.4 | 6 | 74 | 30 | 35 | 2 | 1 | 23000697 | SCD-U-8D-M03.400-30IC LA40 |
| 3.5 | 6 | 74 | 30 | 35 | 2 | 1 | 23000698 | SCD-U-8D-M03.500-30IC LA40 |
| 3.6 | 6 | 74 | 30 | 35 | 2 | 1 | 23000699 | SCD-U-8D-M03.600-30IC LA40 |
| 3.7 | 6 | 74 | 30 | 35 | 2 | 1 | 23000700 | SCD-U-8D-M03.700-30IC LA40 |
| 3.8 | 6 | 82 | 37 | 44 | 2 | 1 | 23000701 | SCD-U-8D-M03.800-37IC LA40 |
| 3.9 | 6 | 82 | 37 | 44 | 2 | 1 | 23000702 | SCD-U-8D-M03.900-37IC LA40 |
| 4   | 6 | 82 | 37 | 44 | 2 | 1 | 23000703 | SCD-U-8D-M04.000-37IC LA40 |
| 4.1 | 6 | 82 | 37 | 44 | 2 | 1 | 23000704 | SCD-U-8D-M04.100-37IC LA40 |
| 4.2 | 6 | 82 | 37 | 44 | 2 | 1 | 23000705 | SCD-U-8D-M04.200-37IC LA40 |
| 4.3 | 6 | 82 | 37 | 44 | 2 | 1 | 23000706 | SCD-U-8D-M04.300-37IC LA40 |
| 4.5 | 6 | 82 | 37 | 44 | 2 | 1 | 23000707 | SCD-U-8D-M04.500-37IC LA40 |
| 5   | 6 | 95 | 48 | 57 | 2 | 1 | 23000708 | SCD-U-8D-M05.000-48IC LA40 |
| 5.1 | 6 | 95 | 48 | 57 | 2 | 1 | 23000709 | SCD-U-8D-M05.100-48IC LA40 |
| 5.2 | 6 | 95 | 48 | 57 | 2 | 1 | 23000710 | SCD-U-8D-M05.200-48IC LA40 |
| 5.3 | 6 | 95 | 48 | 57 | 2 | 1 | 23000711 | SCD-U-8D-M05.300-48IC LA40 |
| 5.5 | 6 | 95 | 48 | 57 | 2 | 1 | 23000712 | SCD-U-8D-M05.500-48IC LA40 |
| 5.6 | 6 | 95 | 48 | 57 | 2 | 1 | 23000713 | SCD-U-8D-M05.600-48IC LA40 |

Continued on next page

# Universal solid carbide drills

## Universal solid carbide drill U



| DC<br>[mm] | DCON<br>[mm] | OAL<br>[mm] | LU<br>[mm] | LCF<br>[mm] | ZEFP |  | Item no. | Designation                 |
|------------|--------------|-------------|------------|-------------|------|-----------------------------------------------------------------------------------|----------|-----------------------------|
| 5.8        | 6            | 95          | 48         | 57          | 2    | 1                                                                                 | 23000714 | SCD-U-8D-M05.800-48IC LA40  |
| 6          | 6            | 95          | 48         | 57          | 2    | 1                                                                                 | 23000715 | SCD-U-8D-M06.000-48IC LA40  |
| 6.2        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000716 | SCD-U-8D-M06.200-66IC LA40  |
| 6.5        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000717 | SCD-U-8D-M06.500-66IC LA40  |
| 6.6        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000718 | SCD-U-8D-M06.600-66IC LA40  |
| 6.8        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000719 | SCD-U-8D-M06.800-66IC LA40  |
| 6.9        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000720 | SCD-U-8D-M06.900-66IC LA40  |
| 7          | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000721 | SCD-U-8D-M07.000-66IC LA40  |
| 7.4        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000722 | SCD-U-8D-M07.400-66IC LA40  |
| 7.5        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000723 | SCD-U-8D-M07.500-66IC LA40  |
| 7.8        | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000724 | SCD-U-8D-M07.800-66IC LA40  |
| 8          | 8            | 114         | 66         | 76          | 2    | 1                                                                                 | 23000725 | SCD-U-8D-M08.000-66IC LA40  |
| 8.1        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000726 | SCD-U-8D-M08.100-84IC LA40  |
| 8.2        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000727 | SCD-U-8D-M08.200-84IC LA40  |
| 8.5        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000728 | SCD-U-8D-M08.500-84IC LA40  |
| 8.6        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000729 | SCD-U-8D-M08.600-84IC LA40  |
| 8.7        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000730 | SCD-U-8D-M08.700-84IC LA40  |
| 8.8        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000731 | SCD-U-8D-M08.800-84IC LA40  |
| 9          | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000732 | SCD-U-8D-M09.000-84IC LA40  |
| 9.5        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000733 | SCD-U-8D-M09.500-84IC LA40  |
| 9.6        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000734 | SCD-U-8D-M09.600-84IC LA40  |
| 9.8        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000735 | SCD-U-8D-M09.800-84IC LA40  |
| 9.9        | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000736 | SCD-U-8D-M09.900-84IC LA40  |
| 10         | 10           | 138         | 84         | 96          | 2    | 1                                                                                 | 23000737 | SCD-U-8D-M10.000-84IC LA40  |
| 10.2       | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000738 | SCD-U-8D-M10.200-100IC LA40 |
| 10.3       | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000739 | SCD-U-8D-M10.300-100IC LA40 |
| 10.5       | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000740 | SCD-U-8D-M10.500-100IC LA40 |
| 11         | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000741 | SCD-U-8D-M11.000-100IC LA40 |
| 11.2       | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000742 | SCD-U-8D-M11.200-100IC LA40 |
| 11.5       | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000743 | SCD-U-8D-M11.500-100IC LA40 |
| 11.8       | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000744 | SCD-U-8D-M11.800-100IC LA40 |
| 12         | 12           | 162         | 100        | 115         | 2    | 1                                                                                 | 23000745 | SCD-U-8D-M12.000-100IC LA40 |
| 12.5       | 14           | 181         | 117        | 134         | 2    | 1                                                                                 | 23000746 | SCD-U-8D-M12.500-117IC LA40 |
| 13         | 14           | 181         | 117        | 134         | 2    | 1                                                                                 | 23000747 | SCD-U-8D-M13.000-117IC LA40 |
| 13.1       | 14           | 181         | 117        | 134         | 2    | 1                                                                                 | 23000748 | SCD-U-8D-M13.100-117IC LA40 |
| 13.5       | 14           | 181         | 117        | 134         | 2    | 1                                                                                 | 23000749 | SCD-U-8D-M13.500-117IC LA40 |
| 14         | 14           | 181         | 117        | 134         | 2    | 1                                                                                 | 23000750 | SCD-U-8D-M14.000-117IC LA40 |
| 14.5       | 16           | 203         | 133        | 153         | 2    | 1                                                                                 | 23000751 | SCD-U-8D-M14.500-133IC LA40 |
| 15         | 16           | 203         | 133        | 153         | 2    | 1                                                                                 | 23000752 | SCD-U-8D-M15.000-133IC LA40 |
| 15.5       | 16           | 203         | 133        | 153         | 2    | 1                                                                                 | 23000753 | SCD-U-8D-M15.500-133IC LA40 |
| 16         | 16           | 203         | 133        | 153         | 2    | 1                                                                                 | 23000774 | SCD-U-8D-M16.000-133IC LA40 |

Subject to technical modifications.

06/2025