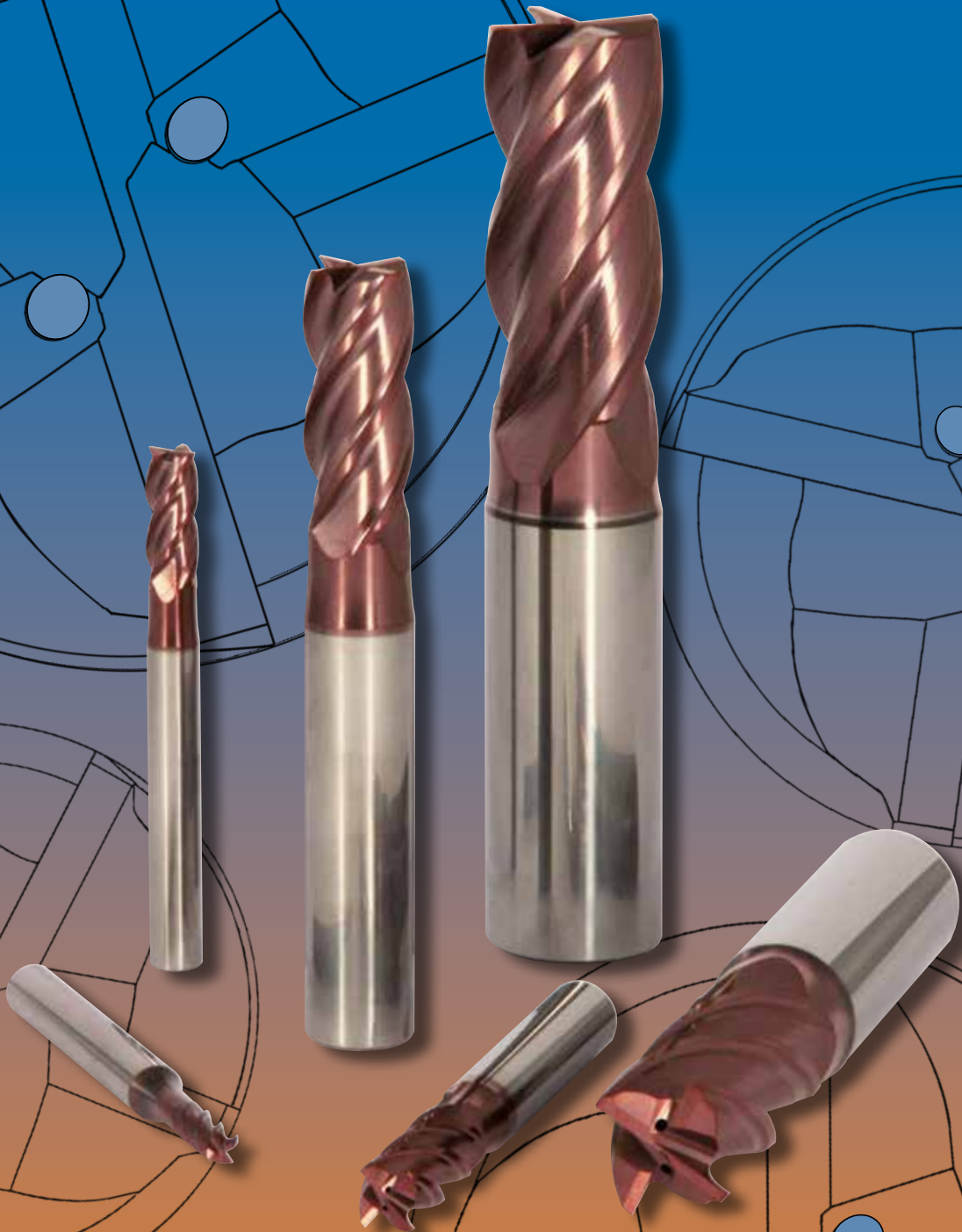




Jongen Werkzeugtechnik



# VHM 478W HD08



Products from



Willich



North-Rhine  
Westphalia



Germany



Europe

for



Europe

and the



## The Tool

The new Jongen UNI-MILL solid carbide end mills VHM 478W HD08 with internal coolant channels have been designed especially for the heavy-duty machining of all usual steel materials, like low alloyed and high alloyed steels, as well as cast iron materials. It is however also possible to process stainless steel.

Furthermore these end mills are suitable for all milling operations under adverse conditions, e.g. with clamping fixtures with vibration sensitivity and / or older machines with vibration sensitivity.

### The Geometry:

- Unequal helix angles and unequal front surface pitch against vibrations.
- Optimal balance between big chip spaces and stable core.
- Two straight coolant channels with front side exit, as a result better cooling and chip flow with full slot milling, ramping, helix and pocket milling.
- Optimized toric cut with flowing transitions to the shank => improved tool stiffness with higher tolerance against vibrations
- Stable edge blade geometry for more unstable operations, as well as vibration sensitive operations.
- Homogeneous cutting edge with marked edge radius for longest tool lives and reliable high process safety, under difficult circumstances.



### The Quality HD08:

#### The Carbide:

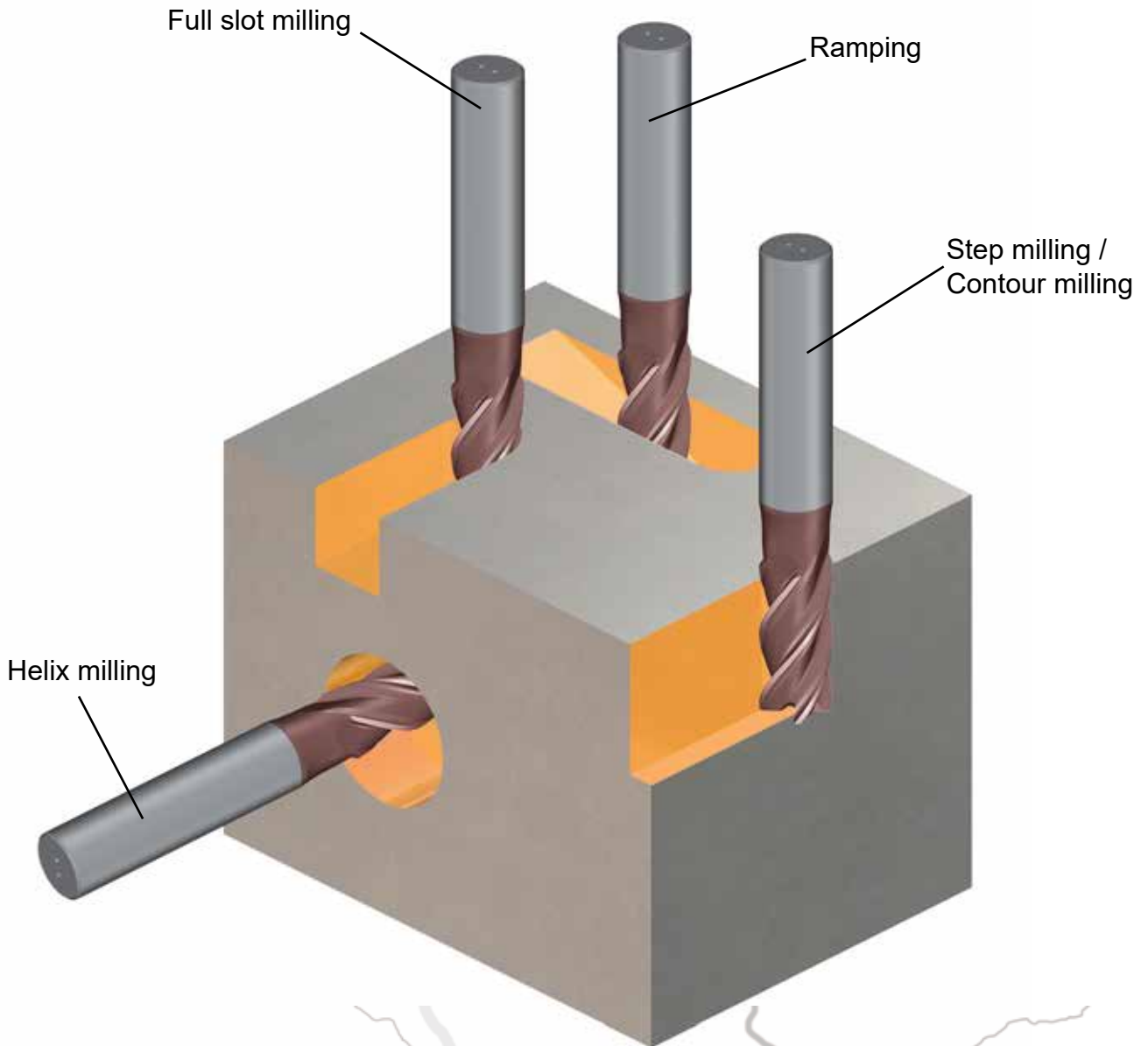
Special finest grain quality (1,0µm grain size) in the field of K10-K20 with middle hardness, very good wear resistance and edge stability with extraordinary high flexural strength.

#### The Coating :

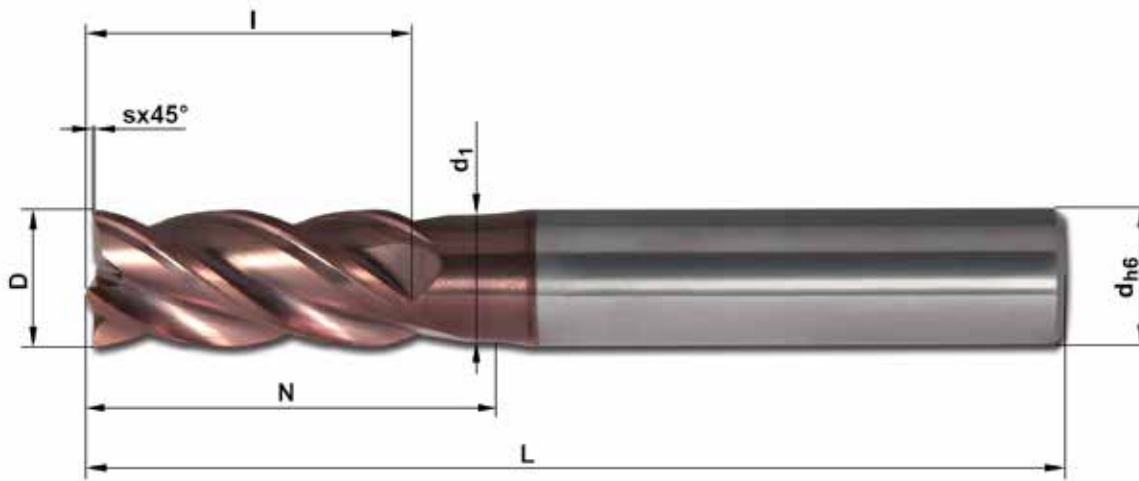
TiAlSiN-based HiPIMS(High Power Impulse Magnetron Sputtering)-layer of the latest development stage

- Thanks to dotation of silicon very high hardness and temperature stability.
- Thanks to the HiPIMS-technology extremely homogeneous and still efficient layer structure.
- Maximal operating temperature up to 1.100°C

## Application Areas:

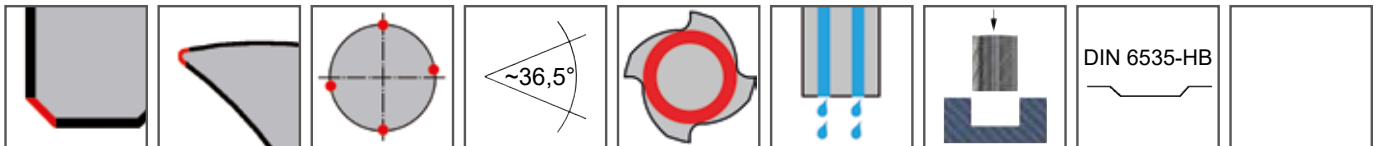


# Technical Data VHM 478W HD08



Tolerance D

$\varnothing 4,0-25,0 = \begin{matrix} -0,02 \\ -0,04 \end{matrix}$



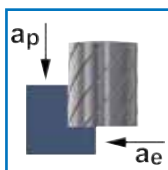
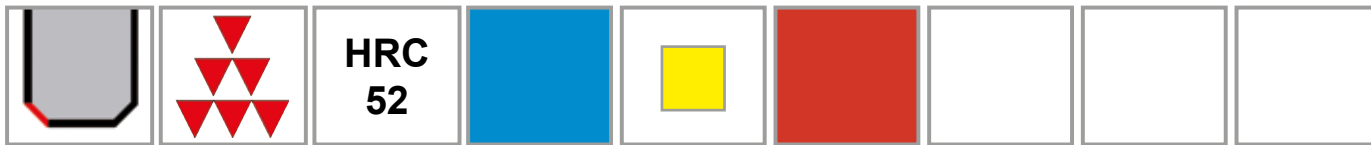
| Order No.        | D  | s     | l  | N  | d <sub>1</sub> | d  | L   | Z | IC |
|------------------|----|-------|----|----|----------------|----|-----|---|----|
| VHM 478W-04 HD08 | 4  | 0,100 | 8  | 13 | 3,7            | 6  | 58  | 4 | ✗  |
| VHM 478W-05 HD08 | 5  | 0,125 | 10 | 13 | 4,6            | 6  | 58  | 4 | ✗  |
| VHM 478W-06 HD08 | 6  | 0,150 | 13 | 19 | 5,5            | 6  | 58  | 4 | ✓  |
| VHM 478W-08 HD08 | 8  | 0,200 | 18 | 26 | 7,3            | 8  | 64  | 4 | ✓  |
| VHM 478W-10 HD08 | 10 | 0,250 | 22 | 30 | 9,3            | 10 | 73  | 4 | ✓  |
| VHM 478W-12 HD08 | 12 | 0,300 | 26 | 36 | 11,2           | 12 | 84  | 4 | ✓  |
| VHM 478W-14 HD08 | 14 | 0,350 | 30 | 38 | 13,2           | 14 | 84  | 4 | ✓  |
| VHM 478W-16 HD08 | 16 | 0,400 | 34 | 45 | 15,0           | 16 | 93  | 4 | ✓  |
| VHM 478W-20 HD08 | 20 | 0,500 | 42 | 54 | 19,0           | 20 | 104 | 4 | ✓  |
| VHM 478W-25 HD08 | 25 | 0,600 | 54 | 70 | 24,0           | 25 | 130 | 4 | ✓  |

IC = Internal Cooling

## Key to symbols

|  |                          |  |   |  |  |
|--|--------------------------|--|---|--|--|
|  | Roughing                 |  | Pre-Finishing                               |  | Finishing  |
|  | Steel                    |  | High grade steel                            |  | Cast iron GG(G)  |
|  | Edge Chamfer             |  | Rounded cutting edge                        |  | Uneven cutting pitch   |
|  | Unequal spiral angle     |  | Conical core                                |  | The tool has multiple internal channels with front side exit |
|  | Submersible milling tool |  | Shaft shape made to<br>DIN 6535-HB (Weldon) |  |  |

# Cutting Data Recommendations VHM 478W HD08 - Step Milling

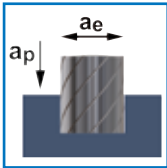


| Material  | D [mm] | Z             | Vc [m/min]          | fz [mm]             | ap [mm] | ae [mm] | n [min <sup>-1</sup> ] | Vf [mm/min] | Q [cm <sup>3</sup> /min] |
|---|--------|---------------|---------------------|---------------------|---------|---------|------------------------|-------------|--------------------------|
| Structural steel<br>Unalloyed steel<br><800 N/mm <sup>2</sup> | 4      | 4             | 250 (225-275)       | 0,030 (0,029-0,032) | 5,80    | 1,80    | 20.040                 | 2.425       | 25,3                     |
|   | 5      | 4             | 250 (225-275)       | 0,040 (0,036-0,040) | 7,70    | 2,25    | 16.010                 | 2.420       | 41,9                     |
|   | 6      | 4             | 250 (225-275)       | 0,045 (0,043-0,048) | 10,50   | 2,70    | 13.330                 | 2.415       | 68,5                     |
|   | 8      | 4             | 250 (225-275)       | 0,060 (0,057-0,063) | 15,30   | 3,60    | 9.980                  | 2.415       | 133,0                    |
|   | 10     | 4             | 250 (225-275)       | 0,075 (0,072-0,079) | 19,10   | 4,50    | 7.980                  | 2.410       | 207,1                    |
|   | 12     | 4             | 250 (225-275)       | 0,090 (0,086-0,095) | 22,90   | 5,40    | 6.650                  | 2.410       | 298,0                    |
|   | 14     | 4             | 250 (225-275)       | 0,105 (0,100-0,111) | 26,70   | 6,30    | 5.700                  | 2.410       | 405,4                    |
|   | 16     | 4             | 250 (225-275)       | 0,120 (0,115-0,127) | 30,50   | 7,20    | 4.980                  | 2.410       | 529,2                    |
|   | 20     | 4             | 250 (225-275)       | 0,150 (0,144-0,159) | 38,10   | 9,00    | 3.980                  | 2.410       | 826,4                    |
| 25  | 4      | 250 (225-275) | 0,190 (0,179-0,198) | 49,60               | 11,25   | 3.190   | 2.410                  | 1.344,8     |                          |
| Tool steel<br>Alloyed steel<br>800-1.200 N/mm <sup>2</sup>    | 4      | 4             | 170 (145-195)       | 0,030 (0,028-0,031) | 5,50    | 1,68    | 13.630                 | 1.585       | 14,6                     |
|   | 5      | 4             | 170 (145-195)       | 0,035 (0,035-0,038) | 7,40    | 2,10    | 10.890                 | 1.580       | 24,6                     |
|   | 6      | 4             | 170 (145-195)       | 0,045 (0,041-0,046) | 10,20   | 2,52    | 9.060                  | 1.580       | 40,6                     |
|   | 8      | 4             | 170 (145-195)       | 0,060 (0,055-0,061) | 14,80   | 3,36    | 6.790                  | 1.580       | 78,6                     |
|   | 10     | 4             | 170 (145-195)       | 0,075 (0,069-0,076) | 18,60   | 4,20    | 5.430                  | 1.580       | 123,4                    |
|   | 12     | 4             | 170 (145-195)       | 0,085 (0,083-0,092) | 22,30   | 5,04    | 4.520                  | 1.575       | 177,0                    |
|   | 14     | 4             | 170 (145-195)       | 0,100 (0,097-0,107) | 26,00   | 5,88    | 3.870                  | 1.575       | 240,8                    |
|   | 16     | 4             | 170 (145-195)       | 0,115 (0,110-0,122) | 29,70   | 6,72    | 3.390                  | 1.575       | 314,3                    |
|   | 20     | 4             | 170 (145-195)       | 0,145 (0,138-0,153) | 37,20   | 8,40    | 2.710                  | 1.575       | 492,2                    |
| 25  | 4      | 170 (145-195) | 0,180 (0,173-0,191) | 48,30               | 10,50   | 2.170   | 1.575                  | 798,8       |                          |
| Cast Iron<br>GG(G)  | 4      | 4             | 160 (135-185)       | 0,030 (0,027-0,030) | 5,50    | 1,60    | 12.830                 | 1.455       | 12,8                     |
|   | 5      | 4             | 160 (135-185)       | 0,035 (0,034-0,037) | 7,40    | 2,00    | 10.250                 | 1.455       | 21,5                     |
|   | 6      | 4             | 160 (135-185)       | 0,045 (0,040-0,045) | 10,20   | 2,40    | 8.530                  | 1.450       | 35,5                     |
|   | 8      | 4             | 160 (135-185)       | 0,055 (0,054-0,060) | 14,80   | 3,20    | 6.390                  | 1.450       | 68,7                     |
|   | 10     | 4             | 160 (135-185)       | 0,070 (0,067-0,074) | 18,60   | 4,00    | 5.110                  | 1.450       | 107,9                    |
|   | 12     | 4             | 160 (135-185)       | 0,085 (0,081-0,089) | 22,30   | 4,80    | 4.250                  | 1.450       | 155,2                    |
|   | 14     | 4             | 160 (135-185)       | 0,100 (0,094-0,104) | 26,00   | 5,60    | 3.650                  | 1.445       | 210,4                    |
|   | 16     | 4             | 160 (135-185)       | 0,115 (0,108-0,119) | 29,70   | 6,40    | 3.190                  | 1.445       | 274,7                    |
|   | 20     | 4             | 160 (135-185)       | 0,140 (0,135-0,149) | 37,20   | 8,00    | 2.550                  | 1.445       | 430,0                    |
| 25  | 4      | 160 (135-185) | 0,175 (0,168-0,186) | 48,30               | 10,00   | 2.040   | 1.445                  | 697,9       |                          |
| High grade steel<br>High alloyed steel                        | 4      | 4             | 120 (95-135)        | 0,025 (0,026-0,028) | 5,20    | 1,50    | 9.620                  | 1.040       | 8,1                      |
|   | 5      | 4             | 120 (95-135)        | 0,035 (0,032-0,035) | 6,90    | 1,88    | 7.690                  | 1.040       | 13,5                     |
|   | 6      | 4             | 120 (95-135)        | 0,040 (0,039-0,043) | 9,50    | 2,25    | 6.400                  | 1.040       | 22,2                     |
|   | 8      | 4             | 120 (95-135)        | 0,055 (0,051-0,057) | 13,90   | 3,00    | 4.790                  | 1.035       | 43,2                     |
|   | 10     | 4             | 120 (95-135)        | 0,070 (0,064-0,071) | 17,30   | 3,75    | 3.830                  | 1.035       | 67,1                     |
|   | 12     | 4             | 120 (95-135)        | 0,080 (0,077-0,085) | 20,80   | 4,50    | 3.190                  | 1.035       | 96,9                     |
|   | 14     | 4             | 120 (95-135)        | 0,095 (0,090-0,099) | 24,30   | 5,25    | 2.730                  | 1.035       | 132,0                    |
|   | 16     | 4             | 120 (95-135)        | 0,110 (0,103-0,114) | 27,80   | 6,00    | 2.390                  | 1.035       | 172,6                    |
|   | 20     | 4             | 120 (95-135)        | 0,135 (0,128-0,142) | 34,70   | 7,50    | 1.910                  | 1.035       | 269,4                    |
| 25  | 4      | 120 (95-135)  | 0,170 (0,160-0,177) | 45,20               | 9,38    | 1.530   | 1.035                  | 438,6       |                          |

The mentioned cutting parameters are standard values that may vary depending on processing, type of machine and material grade.

For trochoidal milling with  $a_e$  up to  $0,2 \times D$ , the values  $V_c$  and  $f_z$  can be increased by up to 50%.

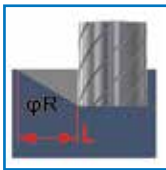
# Cutting Data Recommendations VHM 478W HD08 - Full Slot Milling



| Material  | D [mm] | Z             | Vc [m/min]          | fz [mm]             | ap [mm] | ae [mm] | n [min <sup>-1</sup> ] | Vf [mm/min] | Q [cm <sup>3</sup> /min] |
|---|--------|---------------|---------------------|---------------------|---------|---------|------------------------|-------------|--------------------------|
| Structural steel<br>Unalloyed steel<br><800 N/mm <sup>2</sup> | 4      | 4             | 230 (205-255)       | 0,020 (0,019-0,021) | 5,30    | 4,00    | 18.440                 | 1.475       | 31,3                     |
|   | 5      | 4             | 230 (205-255)       | 0,025 (0,023-0,026) | 6,60    | 5,00    | 14.730                 | 1.475       | 48,7                     |
|   | 6      | 4             | 230 (205-255)       | 0,030 (0,028-0,031) | 8,00    | 6,00    | 12.260                 | 1.470       | 70,6                     |
|   | 8      | 4             | 230 (205-255)       | 0,040 (0,037-0,041) | 10,60   | 8,00    | 9.190                  | 1.470       | 124,7                    |
|   | 10     | 4             | 230 (205-255)       | 0,050 (0,047-0,052) | 13,00   | 10,00   | 7.340                  | 1.470       | 191,1                    |
|   | 12     | 4             | 230 (205-255)       | 0,060 (0,056-0,062) | 15,60   | 12,00   | 6.120                  | 1.470       | 275,2                    |
|   | 14     | 4             | 230 (205-255)       | 0,070 (0,065-0,072) | 18,20   | 14,00   | 5.240                  | 1.465       | 373,3                    |
|   | 16     | 4             | 230 (205-255)       | 0,080 (0,075-0,082) | 20,80   | 16,00   | 4.580                  | 1.465       | 487,6                    |
|   | 20     | 4             | 230 (205-255)       | 0,100 (0,093-0,103) | 25,60   | 20,00   | 3.670                  | 1.470       | 752,6                    |
| 25  | 4      | 230 (205-255) | 0,125 (0,117-0,129) | 32,00               | 25,00   | 2.930   | 1.465                  | 1.172,0     |                          |
| Tool steel<br>Alloyed steel<br>800-1.200 N/mm <sup>2</sup>    | 4      | 4             | 150 (125-175)       | 0,020 (0,018-0,019) | 5,10    | 4,00    | 12.030                 | 895         | 18,3                     |
|   | 5      | 4             | 150 (125-175)       | 0,025 (0,022-0,024) | 6,30    | 5,00    | 9.610                  | 890         | 28,0                     |
|   | 6      | 4             | 150 (125-175)       | 0,030 (0,026-0,029) | 7,60    | 6,00    | 8.000                  | 890         | 40,6                     |
|   | 8      | 4             | 150 (125-175)       | 0,035 (0,035-0,039) | 10,10   | 8,00    | 5.990                  | 890         | 71,9                     |
|   | 10     | 4             | 150 (125-175)       | 0,045 (0,044-0,049) | 12,40   | 10,00   | 4.790                  | 890         | 110,4                    |
|   | 12     | 4             | 150 (125-175)       | 0,055 (0,053-0,058) | 14,90   | 12,00   | 3.990                  | 890         | 159,1                    |
|   | 14     | 4             | 150 (125-175)       | 0,065 (0,062-0,068) | 17,40   | 14,00   | 3.420                  | 890         | 216,8                    |
|   | 16     | 4             | 150 (125-175)       | 0,075 (0,071-0,078) | 19,90   | 16,00   | 2.990                  | 890         | 283,4                    |
|   | 20     | 4             | 150 (125-175)       | 0,095 (0,088-0,097) | 24,40   | 20,00   | 2.390                  | 885         | 431,9                    |
| 25  | 4      | 150 (125-175) | 0,115 (0,110-0,122) | 30,50               | 25,00   | 1.910   | 885                    | 674,8       |                          |
| Cast Iron<br>GG(G)  | 4      | 4             | 140 (115-165)       | 0,020 (0,017-0,019) | 5,10    | 4,00    | 11.230                 | 815         | 16,6                     |
|   | 5      | 4             | 140 (115-165)       | 0,025 (0,022-0,024) | 6,30    | 5,00    | 8.970                  | 810         | 25,5                     |
|   | 6      | 4             | 140 (115-165)       | 0,025 (0,026-0,029) | 7,60    | 6,00    | 7.460                  | 810         | 36,9                     |
|   | 8      | 4             | 140 (115-165)       | 0,035 (0,034-0,038) | 10,10   | 8,00    | 5.590                  | 810         | 65,4                     |
|   | 10     | 4             | 140 (115-165)       | 0,045 (0,043-0,048) | 12,40   | 10,00   | 4.470                  | 810         | 100,4                    |
|   | 12     | 4             | 140 (115-165)       | 0,055 (0,052-0,057) | 14,90   | 12,00   | 3.720                  | 810         | 144,8                    |
|   | 14     | 4             | 140 (115-165)       | 0,065 (0,060-0,067) | 17,40   | 14,00   | 3.190                  | 810         | 197,3                    |
|   | 16     | 4             | 140 (115-165)       | 0,070 (0,069-0,076) | 19,90   | 16,00   | 2.790                  | 810         | 257,9                    |
|   | 20     | 4             | 140 (115-165)       | 0,090 (0,086-0,095) | 24,40   | 20,00   | 2.230                  | 810         | 395,3                    |
| 25  | 4      | 140 (115-165) | 0,115 (0,108-0,119) | 30,50               | 25,00   | 1.780   | 810                    | 617,6       |                          |
| High grade steel<br>High alloyed steel                        | 4      | 4             | 100 (75-110)        | 0,020 (0,017-0,018) | 4,70    | 4,00    | 8.020                  | 565         | 10,6                     |
|   | 5      | 4             | 100 (75-110)        | 0,020 (0,021-0,023) | 5,80    | 5,00    | 6.400                  | 565         | 16,4                     |
|   | 6      | 4             | 100 (75-110)        | 0,025 (0,025-0,028) | 7,00    | 6,00    | 5.330                  | 565         | 23,7                     |
|   | 8      | 4             | 100 (75-110)        | 0,035 (0,033-0,037) | 9,30    | 8,00    | 3.990                  | 560         | 41,7                     |
|   | 10     | 4             | 100 (75-110)        | 0,045 (0,042-0,046) | 11,40   | 10,00   | 3.190                  | 560         | 63,8                     |
|   | 12     | 4             | 100 (75-110)        | 0,055 (0,050-0,055) | 13,70   | 12,00   | 2.660                  | 560         | 92,1                     |
|   | 14     | 4             | 100 (75-110)        | 0,060 (0,059-0,065) | 16,00   | 14,00   | 2.280                  | 560         | 125,4                    |
|   | 16     | 4             | 100 (75-110)        | 0,070 (0,067-0,074) | 18,30   | 16,00   | 1.990                  | 560         | 164,0                    |
|   | 20     | 4             | 100 (75-110)        | 0,090 (0,084-0,092) | 22,40   | 20,00   | 1.590                  | 560         | 250,9                    |
| 25  | 4      | 100 (75-110)  | 0,110 (0,105-0,116) | 28,00               | 25,00   | 1.270   | 560                    | 392,0       |                          |

The mentioned cutting parameters are standard values that may vary depending on processing, type of machine and material grade.

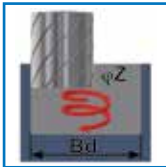
# Cutting Data Recommendations VHM 478W HD08 - Ramping



| Material  | D [mm] | Z             | Vc [m/min]          | fz [mm]             | ap max. [mm] | ae [mm] | φR max. [°] | L [mm] | n [min <sup>-1</sup> ] | Vf [mm/min] |
|---|--------|---------------|---------------------|---------------------|--------------|---------|-------------|--------|------------------------|-------------|
| Structural steel<br>Unalloyed steel<br><800 N/mm <sup>2</sup> | 4      | 4             | 230 (205-255)       | 0,020 (0,019-0,021) | 3,00         | 4,00    | 35          | 4,2    | 18.440                 | 1.450       |
|   | 5      | 4             | 230 (205-255)       | 0,025 (0,023-0,026) | 3,80         | 5,00    | 35          | 5,4    | 14.730                 | 1.445       |
|   | 6      | 4             | 230 (205-255)       | 0,030 (0,028-0,031) | 4,50         | 6,00    | 35          | 6,4    | 12.260                 | 1.445       |
|   | 8      | 4             | 230 (205-255)       | 0,040 (0,037-0,041) | 6,00         | 8,00    | 35          | 8,5    | 9.190                  | 1.445       |
|   | 10     | 4             | 230 (205-255)       | 0,050 (0,047-0,052) | 7,50         | 10,00   | 35          | 10,7   | 7.340                  | 1.440       |
|   | 12     | 4             | 230 (205-255)       | 0,060 (0,056-0,062) | 9,00         | 12,00   | 35          | 12,8   | 6.120                  | 1.440       |
|   | 14     | 4             | 230 (205-255)       | 0,070 (0,065-0,072) | 10,50        | 14,00   | 35          | 14,9   | 5.240                  | 1.440       |
|   | 16     | 4             | 230 (205-255)       | 0,080 (0,075-0,082) | 12,00        | 16,00   | 35          | 17,1   | 4.580                  | 1.440       |
|   | 20     | 4             | 230 (205-255)       | 0,100 (0,093-0,103) | 15,00        | 20,00   | 35          | 21,4   | 3.670                  | 1.440       |
| 25  | 4      | 230 (205-255) | 0,125 (0,117-0,129) | 18,80               | 25,00        | 35      | 26,8        | 2.930  | 1.440                  |             |
| Tool steel<br>Alloyed steel<br>800-1.200 N/mm <sup>2</sup>    | 4      | 4             | 150 (125-175)       | 0,020 (0,018-0,019) | 2,70         | 4,00    | 20          | 7,4    | 12.030                 | 895         |
|   | 5      | 4             | 150 (125-175)       | 0,025 (0,022-0,024) | 3,40         | 5,00    | 20          | 9,3    | 9.610                  | 890         |
|   | 6      | 4             | 150 (125-175)       | 0,030 (0,026-0,029) | 4,10         | 6,00    | 20          | 11,2   | 8.000                  | 890         |
|   | 8      | 4             | 150 (125-175)       | 0,035 (0,035-0,039) | 5,40         | 8,00    | 20          | 14,8   | 5.990                  | 890         |
|   | 10     | 4             | 150 (125-175)       | 0,045 (0,044-0,049) | 6,80         | 10,00   | 20          | 18,6   | 4.790                  | 890         |
|   | 12     | 4             | 150 (125-175)       | 0,055 (0,053-0,058) | 8,10         | 12,00   | 20          | 22,2   | 3.990                  | 890         |
|   | 14     | 4             | 150 (125-175)       | 0,065 (0,062-0,068) | 9,50         | 14,00   | 20          | 26,1   | 3.420                  | 890         |
|   | 16     | 4             | 150 (125-175)       | 0,075 (0,071-0,078) | 10,80        | 16,00   | 20          | 29,6   | 2.990                  | 890         |
|   | 20     | 4             | 150 (125-175)       | 0,095 (0,088-0,097) | 13,50        | 20,00   | 20          | 37,0   | 2.390                  | 885         |
| 25  | 4      | 150 (125-175) | 0,115 (0,110-0,122) | 16,90               | 25,00        | 20      | 46,4        | 1.910  | 885                    |             |
| Cast Iron<br>GG(G)  | 4      | 4             | 140 (115-165)       | 0,020 (0,017-0,019) | 2,70         | 4,00    | 20          | 7,4    | 11.230                 | 815         |
|   | 5      | 4             | 140 (115-165)       | 0,025 (0,022-0,024) | 3,40         | 5,00    | 20          | 9,3    | 8.970                  | 810         |
|   | 6      | 4             | 140 (115-165)       | 0,025 (0,026-0,029) | 4,10         | 6,00    | 20          | 11,2   | 7.460                  | 810         |
|   | 8      | 4             | 140 (115-165)       | 0,035 (0,034-0,038) | 5,40         | 8,00    | 20          | 14,8   | 5.590                  | 810         |
|   | 10     | 4             | 140 (115-165)       | 0,045 (0,043-0,048) | 6,80         | 10,00   | 20          | 18,6   | 4.470                  | 810         |
|   | 12     | 4             | 140 (115-165)       | 0,055 (0,052-0,057) | 8,10         | 12,00   | 20          | 22,2   | 3.720                  | 810         |
|   | 14     | 4             | 140 (115-165)       | 0,065 (0,060-0,067) | 9,50         | 14,00   | 20          | 26,1   | 3.190                  | 810         |
|   | 16     | 4             | 140 (115-165)       | 0,070 (0,069-0,076) | 10,80        | 16,00   | 20          | 29,6   | 2.790                  | 810         |
|   | 20     | 4             | 140 (115-165)       | 0,090 (0,086-0,095) | 13,50        | 20,00   | 20          | 37,0   | 2.230                  | 810         |
| 25  | 4      | 140 (115-165) | 0,115 (0,108-0,119) | 16,90               | 25,00        | 20      | 46,4        | 1.780  | 810                    |             |
| High grade steel<br>High alloyed steel                        | 4      | 4             | 100 (75-110)        | 0,020 (0,017-0,018) | 2,40         | 4,00    | 5           | 27,4   | 8.020                  | 565         |
|   | 5      | 4             | 100 (75-110)        | 0,020 (0,021-0,023) | 3,00         | 5,00    | 5           | 34,2   | 6.400                  | 565         |
|   | 6      | 4             | 100 (75-110)        | 0,025 (0,025-0,028) | 3,60         | 6,00    | 5           | 41,1   | 5.330                  | 565         |
|   | 8      | 4             | 100 (75-110)        | 0,035 (0,033-0,037) | 4,80         | 8,00    | 5           | 54,8   | 3.990                  | 560         |
|   | 10     | 4             | 100 (75-110)        | 0,045 (0,042-0,046) | 6,00         | 10,00   | 5           | 68,5   | 3.190                  | 560         |
|   | 12     | 4             | 100 (75-110)        | 0,055 (0,050-0,055) | 7,20         | 12,00   | 5           | 82,2   | 2.660                  | 560         |
|   | 14     | 4             | 100 (75-110)        | 0,060 (0,059-0,065) | 8,40         | 14,00   | 5           | 96,0   | 2.280                  | 560         |
|   | 16     | 4             | 100 (75-110)        | 0,070 (0,067-0,074) | 9,60         | 16,00   | 5           | 109,7  | 1.990                  | 560         |
|   | 20     | 4             | 100 (75-110)        | 0,090 (0,084-0,092) | 12,00        | 20,00   | 5           | 137,1  | 1.590                  | 560         |
| 25  | 4      | 100 (75-110)  | 0,110 (0,105-0,116) | 15,00               | 25,00        | 5       | 171,4       | 1.270  | 560                    |             |

The mentioned cutting parameters are standard values that may vary depending on processing, type of machine and material grade. For boring operations, we recommend to reduce the above mentioned ramping feed rate  $f_z$  by 50%.

# Cutting Data Recommendations VHM 478W HD08 - Helix Milling



| Material  | D [mm] | Z             | Vc [m/min]          | fz [mm]             | ap max./turn [mm] | ae [mm] | φZ max. [°] | Bd [mm] | n [min <sup>-1</sup> ] | Vf [mm/min] |
|---|--------|---------------|---------------------|---------------------|-------------------|---------|-------------|---------|------------------------|-------------|
| Structural steel<br>Unalloyed steel<br><800 N/mm <sup>2</sup> | 4      | 4             | 230 (205-255)       | 0,020 (0,019-0,021) | 3,00              | 4,00    | 15,6        | 7,40    | 18.440                 | 1.450       |
|   | 5      | 4             | 230 (205-255)       | 0,025 (0,023-0,026) | 3,80              | 5,00    | 16,0        | 9,20    | 14.730                 | 1.445       |
|   | 6      | 4             | 230 (205-255)       | 0,030 (0,028-0,031) | 4,50              | 6,00    | 15,6        | 11,10   | 12.260                 | 1.445       |
|   | 8      | 4             | 230 (205-255)       | 0,040 (0,037-0,041) | 6,00              | 8,00    | 15,6        | 14,80   | 9.190                  | 1.445       |
|   | 10     | 4             | 230 (205-255)       | 0,050 (0,047-0,052) | 7,50              | 10,00   | 15,6        | 18,50   | 7.340                  | 1.440       |
|   | 12     | 4             | 230 (205-255)       | 0,060 (0,056-0,062) | 9,00              | 12,00   | 15,6        | 22,20   | 6.120                  | 1.440       |
|   | 14     | 4             | 230 (205-255)       | 0,070 (0,065-0,072) | 10,50             | 14,00   | 15,6        | 25,90   | 5.240                  | 1.440       |
|   | 16     | 4             | 230 (205-255)       | 0,080 (0,075-0,082) | 12,00             | 16,00   | 15,6        | 29,60   | 4.580                  | 1.440       |
|   | 20     | 4             | 230 (205-255)       | 0,100 (0,093-0,103) | 15,00             | 20,00   | 15,6        | 37,00   | 3.670                  | 1.440       |
| 25  | 4      | 230 (205-255) | 0,125 (0,117-0,129) | 18,80               | 25,00             | 15,7    | 46,20       | 2.930   | 1.440                  |             |
| Tool steel<br>Alloyed steel<br>800-1.200 N/mm <sup>2</sup>    | 4      | 4             | 150 (125-175)       | 0,020 (0,018-0,019) | 2,70              | 4,00    | 14,1        | 7,40    | 12.030                 | 895         |
|   | 5      | 4             | 150 (125-175)       | 0,025 (0,022-0,024) | 3,40              | 5,00    | 14,4        | 9,20    | 9.610                  | 890         |
|   | 6      | 4             | 150 (125-175)       | 0,030 (0,026-0,029) | 4,10              | 6,00    | 14,3        | 11,10   | 8.000                  | 890         |
|   | 8      | 4             | 150 (125-175)       | 0,035 (0,035-0,039) | 5,40              | 8,00    | 14,1        | 14,80   | 5.990                  | 890         |
|   | 10     | 4             | 150 (125-175)       | 0,045 (0,044-0,049) | 6,80              | 10,00   | 14,2        | 18,50   | 4.790                  | 890         |
|   | 12     | 4             | 150 (125-175)       | 0,055 (0,053-0,058) | 8,10              | 12,00   | 14,1        | 22,20   | 3.990                  | 890         |
|   | 14     | 4             | 150 (125-175)       | 0,065 (0,062-0,068) | 9,50              | 14,00   | 14,2        | 25,90   | 3.420                  | 890         |
|   | 16     | 4             | 150 (125-175)       | 0,075 (0,071-0,078) | 10,80             | 16,00   | 14,1        | 29,60   | 2.990                  | 890         |
|   | 20     | 4             | 150 (125-175)       | 0,095 (0,088-0,097) | 13,50             | 20,00   | 14,1        | 37,00   | 2.390                  | 885         |
| 25  | 4      | 150 (125-175) | 0,115 (0,110-0,122) | 16,90               | 25,00             | 14,2    | 46,20       | 1.910   | 885                    |             |
| Cast Iron<br>GG(G)  | 4      | 4             | 140 (115-165)       | 0,020 (0,017-0,019) | 2,70              | 4,00    | 14,1        | 7,40    | 11.230                 | 815         |
|   | 5      | 4             | 140 (115-165)       | 0,025 (0,022-0,024) | 3,40              | 5,00    | 14,4        | 9,20    | 8.970                  | 810         |
|   | 6      | 4             | 140 (115-165)       | 0,025 (0,026-0,029) | 4,10              | 6,00    | 14,3        | 11,10   | 7.460                  | 810         |
|   | 8      | 4             | 140 (115-165)       | 0,035 (0,034-0,038) | 5,40              | 8,00    | 14,1        | 14,80   | 5.590                  | 810         |
|   | 10     | 4             | 140 (115-165)       | 0,045 (0,043-0,048) | 6,80              | 10,00   | 14,2        | 18,50   | 4.470                  | 810         |
|   | 12     | 4             | 140 (115-165)       | 0,055 (0,052-0,057) | 8,10              | 12,00   | 14,1        | 22,20   | 3.720                  | 810         |
|   | 14     | 4             | 140 (115-165)       | 0,065 (0,060-0,067) | 9,50              | 14,00   | 14,2        | 25,90   | 3.190                  | 810         |
|   | 16     | 4             | 140 (115-165)       | 0,070 (0,069-0,076) | 10,80             | 16,00   | 14,1        | 29,60   | 2.790                  | 810         |
|   | 20     | 4             | 140 (115-165)       | 0,090 (0,086-0,095) | 13,50             | 20,00   | 14,1        | 37,00   | 2.230                  | 810         |
| 25  | 4      | 140 (115-165) | 0,115 (0,108-0,119) | 16,90               | 25,00             | 14,2    | 46,20       | 1.780   | 810                    |             |
| High grade steel<br>High alloyed steel                        | 4      | 4             | 100 (75-110)        | 0,020 (0,017-0,018) | 2,40              | 4,00    | 12,6        | 7,40    | 8.020                  | 565         |
|   | 5      | 4             | 100 (75-110)        | 0,020 (0,021-0,023) | 3,00              | 5,00    | 12,8        | 9,20    | 6.400                  | 565         |
|   | 6      | 4             | 100 (75-110)        | 0,025 (0,025-0,028) | 3,60              | 6,00    | 12,6        | 11,10   | 5.330                  | 565         |
|   | 8      | 4             | 100 (75-110)        | 0,035 (0,033-0,037) | 4,80              | 8,00    | 12,6        | 14,80   | 3.990                  | 560         |
|   | 10     | 4             | 100 (75-110)        | 0,045 (0,042-0,046) | 6,00              | 10,00   | 12,6        | 18,50   | 3.190                  | 560         |
|   | 12     | 4             | 100 (75-110)        | 0,055 (0,050-0,055) | 7,20              | 12,00   | 12,6        | 22,20   | 2.660                  | 560         |
|   | 14     | 4             | 100 (75-110)        | 0,060 (0,059-0,065) | 8,40              | 14,00   | 12,6        | 25,90   | 2.280                  | 560         |
|   | 16     | 4             | 100 (75-110)        | 0,070 (0,067-0,074) | 9,60              | 16,00   | 12,6        | 29,60   | 1.990                  | 560         |
|   | 20     | 4             | 100 (75-110)        | 0,090 (0,084-0,092) | 12,00             | 20,00   | 12,6        | 37,00   | 1.590                  | 560         |
| 25  | 4      | 100 (75-110)  | 0,110 (0,105-0,116) | 15,00               | 25,00             | 12,6    | 46,20       | 1.270   | 560                    |             |

The mentioned cutting parameters are standard values that may vary depending on processing, type of machine and material grade.

Errors, omissions and technical modifications are reserved.

