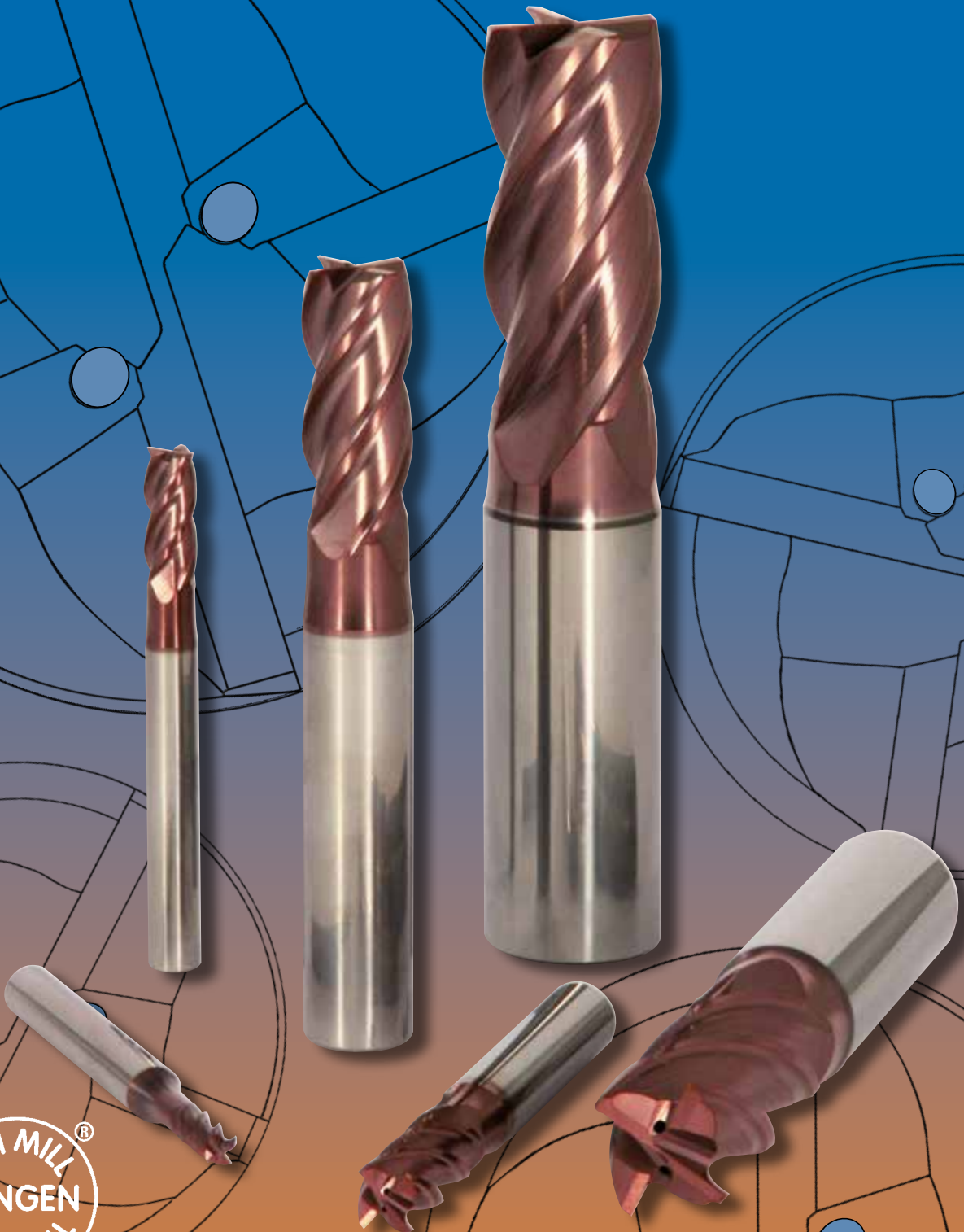




Jongen Werkzeugtechnik

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:

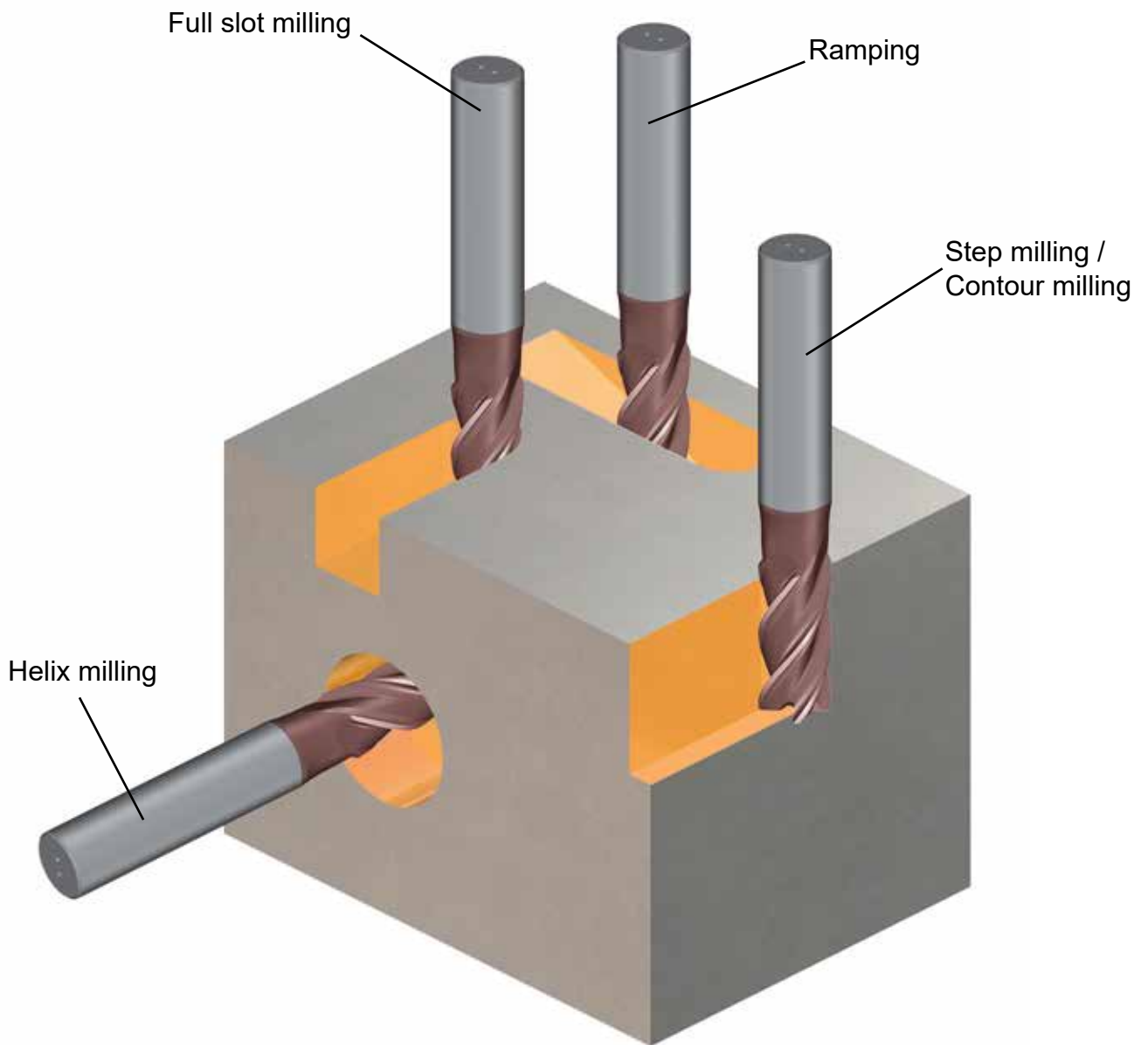
Special finest grain quality (1,0µm grain size) in the field of K10-K20 with middle hardness, very good wear resistance and edge stability with extraordinary high flexural strength.

The Coating :

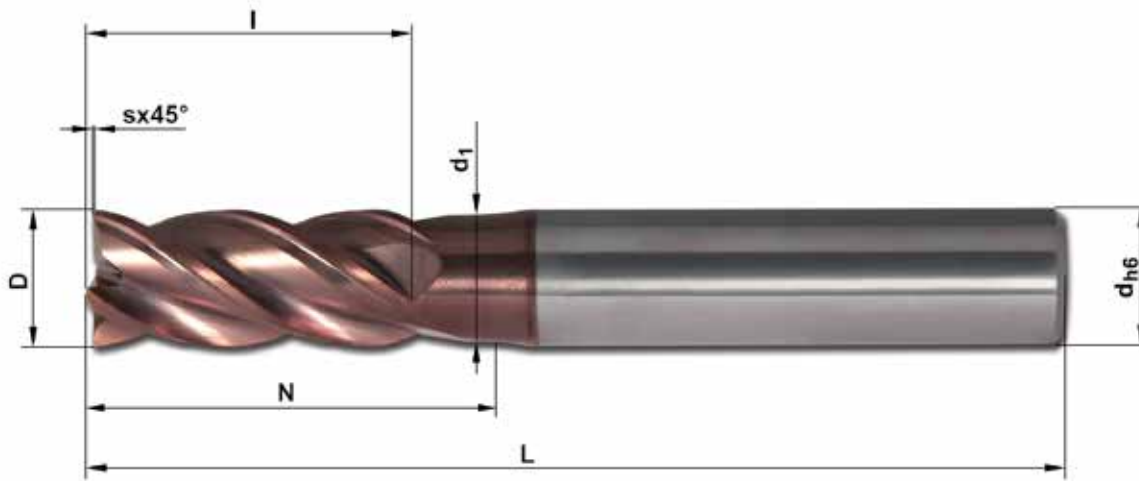
TiAlSiN-based HiPIMS(High Power Impulse Magnetron Sputtering)-layer of the latest development stage

- 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:

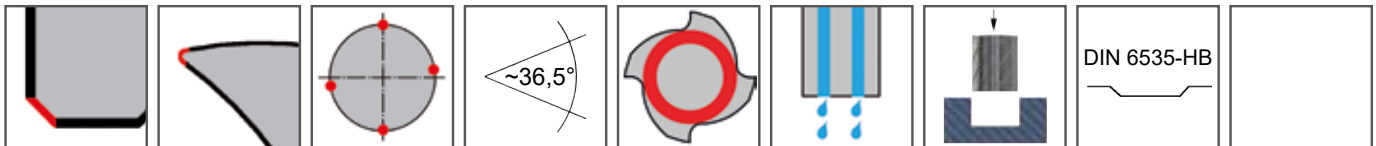


Technical Data VHM 478W HD08



Tolerance D

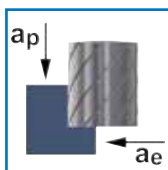
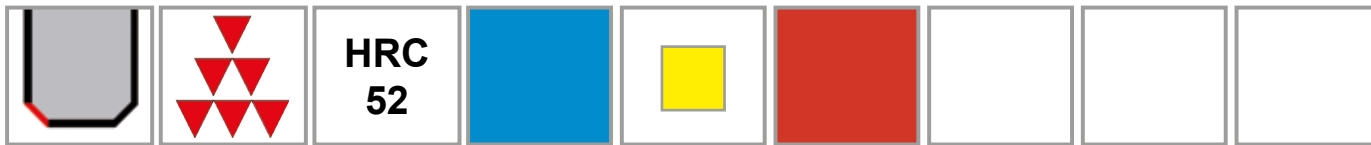
$\varnothing 4,0-25,0 = \begin{matrix} -0,02 \\ -0,04 \end{matrix}$



Order No.	D	s	l	N	d ₁	d	L	Z	IC
VHM 478W-04 HD08	4	0,100	8	13	3,7	6	58	4	x
VHM 478W-05 HD08	5	0,125	10	13	4,6	6	58	4	x
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

Cutting Data Recommendations VHM 478W HD08 - Step Milling

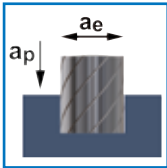


Material	D [mm]	Z	Vc [m/min]	fz [mm]	ap [mm]	ae [mm]	n [min ⁻¹]	Vf [mm/min]	Q [cm ³ /min]
Structural steel Unalloyed steel <800 N/mm ²	4	4	250 (225-275)	0,030 (0,029-0,032)	5,80	1,80	20.040	2.425	25,3
	5	4	250 (225-275)	0,040 (0,036-0,040)	7,70	2,25	16.010	2.420	41,9
	6	4	250 (225-275)	0,045 (0,043-0,048)	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 Alloyed steel 800-1.200 N/mm ²	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 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 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 ae up to 0,2 x D, the values Vc and fz can be increased by up to 50%.

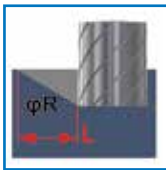
Cutting Data Recommendations VHM 478W HD08 - Full Slot Milling



Material	D [mm]	Z	Vc [m/min]	fz [mm]	ap [mm]	ae [mm]	n [min ⁻¹]	Vf [mm/min]	Q [cm ³ /min]
Structural steel Unalloyed steel <800 N/mm ²	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 Alloyed steel 800-1.200 N/mm ²	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 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 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

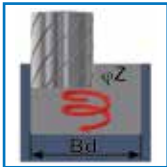


Material	D [mm]	Z	Vc [m/min]	fz [mm]	ap max. [mm]	ae [mm]	φR max. [°]	L [mm]	n [min ⁻¹]	Vf [mm/min]
Structural steel Unalloyed steel <800 N/mm ²	4	4	230 (205-255)	0,020 (0,019-0,021)	3,00	4,00	35	4,2	18.440	1.450
	5	4	230 (205-255)	0,025 (0,023-0,026)	3,80	5,00	35	5,4	14.730	1.445
	6	4	230 (205-255)	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 Alloyed steel 800-1.200 N/mm ²	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 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 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 ⁻¹]	Vf [mm/min]
Structural steel Unalloyed steel <800 N/mm ²	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 Alloyed steel 800-1.200 N/mm ²	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 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 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.

