

Jongen Werkzeugtechnik

VHM 341(W) T108



High performance tools made by

JONGEN.



VHM 341(W) TI08

Many traditional and modern materials represent a challenge in machining, due to their high ductility and tendency to stick.

The unsatisfactory chip flow is in most cases the factor limiting performance.

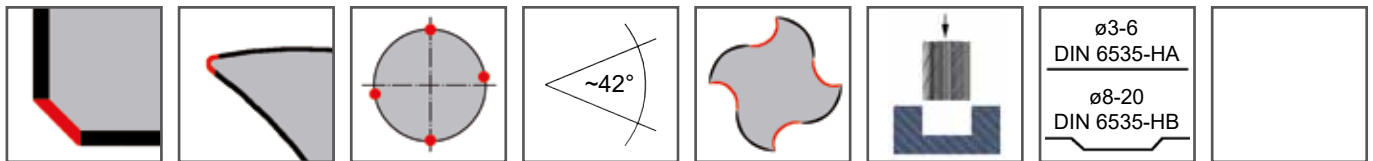
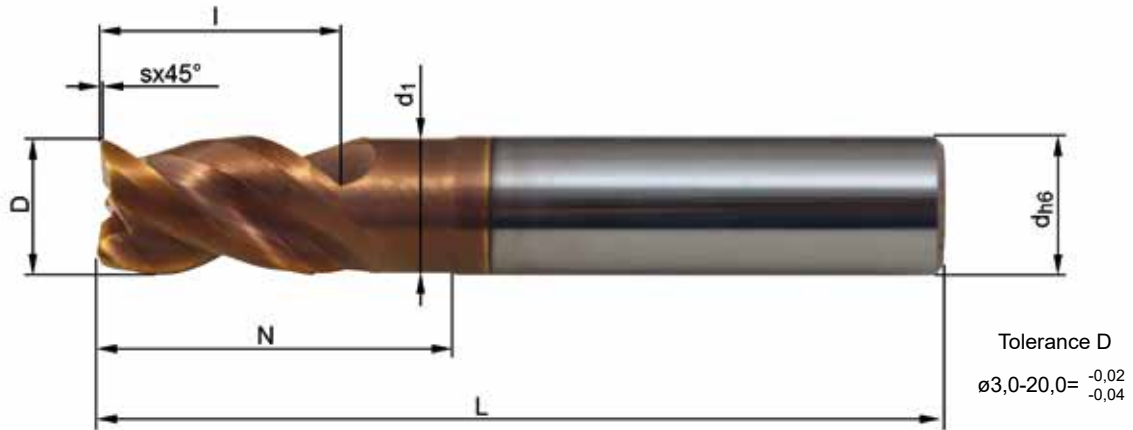
To generate process reliability and cutting performance for this application area, Jongen Werkzeugtechnik GmbH developed the solid carbide milling cutter type VHM 341(W) TI08.

Large-scale chip grooves in combination with a stable basic construction and a positive cutting edge geometry with a special cutting edge preparation are those properties that make this tool type so powerful and durable.

The carbide and the silicon-doped PVD sputter coating form the combination of toughness and wear resistance at high process temperatures required for machining these materials



Technical Data

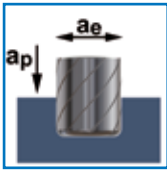


Order-No.	D	s	l	N	d ₁	d	L	Z
VHM 341-03 TI08	3	0,06x45°	4	7	2,8	6	50	3
VHM 341-04 TI08	4	0,09x45°	6	10	3,8	6	50	3
VHM 341-05 TI08	5	0,11x45°	7	12	4,7	6	50	3
VHM 341-06 TI08	6	0,13x45°	9	15	5,7	6	54	3
VHM 341W-08 TI08	8	0,18x45°	12	20	7,7	8	64	3
VHM 341W-10 TI08	10	0,22x45°	15	25	9,6	10	73	3
VHM 341W-12 TI08	12	0,27x45°	18	30	11,6	12	84	3
VHM 341W-14 TI08	14	0,32x45°	21	35	13,6	14	84	3
VHM 341W-16 TI08	16	0,36x45°	24	40	15,5	16	93	3
VHM 341W-20 TI08	20	0,45x45°	30	50	19,5	20	104	3

Key to symbols

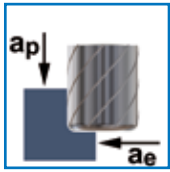
	Roughing		Pre-Finishing		Finishing
	Steel		High grade steel		Highly heat-resistant materials
	Edge Chamfer		Rounded cutting edge		Uneven cutting pitch
	Average spiral angle		Special slot geometry		Submersible milling tool
	Shank shape made to DIN 6535-HB (Weldon)		Shank shape made to DIN 6535-HA (cylindrical)		

Cutting Data Recommendation SLOT MILLING



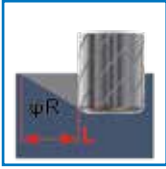
Material	D [mm]	Z	Vc [m/min]	fz [mm]	ap [mm]	ae [mm]	n [min ⁻¹]	Vf [mm/min]	Q [cm ³ /min]
INOX, ferritic, sulphurised	3	3	80 (60-110)	0,011 (0,009-0,014)	3,0	3,0	8.550	270	2,439
	4	3	80 (60-110)	0,014 (0,012-0,018)	4,0	4,0	6.400	270	4,336
	5	3	80 (60-110)	0,018 (0,015-0,023)	5,0	5,0	5.110	270	6,775
	6	3	80 (60-110)	0,021 (0,018-0,027)	6,0	6,0	4.260	270	9,65
	8	3	80 (60-110)	0,028 (0,025-0,035)	8,0	8,0	3.190	270	17,15
	10	3	80 (60-110)	0,035 (0,031-0,044)	10,0	10,0	2.550	270	26,70
	12	3	80 (60-110)	0,043 (0,038-0,054)	12,0	12,0	2.130	270	39,46
	14	3	80 (60-110)	0,050 (0,045-0,063)	14,0	14,0	1.820	270	53,51
	16	3	80 (60-110)	0,057 (0,051-0,072)	16,0	16,0	1.590	270	69,63
INOX, martensitic	20	3	80 (60-110)	0,072 (0,064-0,090)	20,0	20,0	1.270	280	110,00
	3	3	60 (40-90)	0,011 (0,009-0,014)	3,0	3,0	6.410	200	1,83
	4	3	60 (40-90)	0,014 (0,012-0,018)	4,0	4,0	4.800	200	3,25
	5	3	60 (40-90)	0,018 (0,015-0,023)	5,0	5,0	3.840	200	5,08
	6	3	60 (40-90)	0,021 (0,018-0,027)	6,0	6,0	3.190	200	7,24
	8	3	60 (40-90)	0,028 (0,025-0,035)	8,0	8,0	2.390	200	12,86
	10	3	60 (40-90)	0,035 (0,031-0,044)	10,0	10,0	1.910	200	20,00
	12	3	60 (40-90)	0,043 (0,038-0,054)	12,0	12,0	1.590	210	29,52
	14	3	60 (40-90)	0,050 (0,045-0,063)	14,0	14,0	1.370	200	39,98
INOX, austenitic	16	3	60 (40-90)	0,057 (0,051-0,072)	16,0	16,0	1.200	200	52,22
	20	3	60 (40-90)	0,072 (0,064-0,090)	20,0	20,0	960	210	82,40
	3	3	70 (50-100)	0,011 (0,009-0,014)	3,0	3,0	7.480	240	2,13
	4	3	70 (50-100)	0,014 (0,012-0,018)	4,0	4,0	5.600	240	3,79
	5	3	70 (50-100)	0,018 (0,015-0,023)	5,0	5,0	4.470	240	5,93
	6	3	70 (50-100)	0,021 (0,018-0,027)	6,0	6,0	3.730	230	8,42
	8	3	70 (50-100)	0,028 (0,025-0,035)	8,0	8,0	2.790	230	14,98
	10	3	70 (50-100)	0,035 (0,031-0,044)	10,0	10,0	2.230	230	23,40
	12	3	70 (50-100)	0,043 (0,038-0,054)	12,0	12,0	1.860	240	34,42
Titanium alloys	14	3	70 (50-100)	0,050 (0,045-0,063)	14,0	14,0	1.590	240	46,65
	16	3	70 (50-100)	0,057 (0,051-0,072)	16,0	16,0	1.390	240	60,93
	20	3	70 (50-100)	0,072 (0,064-0,090)	20,0	20,0	1.120	240	96,00
	3	3	35 (25-55)	0,007 (0,006-0,010)	3,0	3,0	3.740	80	0,73
	4	3	35 (25-55)	0,010 (0,008-0,013)	4,0	4,0	2.800	80	1,30
	5	3	35 (25-55)	0,012 (0,010-0,016)	5,0	5,0	2.240	80	2,03
	6	3	35 (25-55)	0,014 (0,012-0,018)	6,0	6,0	1.860	80	2,81
	8	3	35 (25-55)	0,019 (0,017-0,024)	8,0	8,0	1.400	80	5,06
	10	3	35 (25-55)	0,024 (0,021-0,030)	10,0	10,0	1.120	80	8,00
Nickel-base alloy - hardenable	12	3	35 (25-55)	0,030 (0,027-0,038)	12,0	12,0	930	80	11,95
	14	3	35 (25-55)	0,035 (0,031-0,044)	14,0	14,0	800	80	16,27
	16	3	35 (25-55)	0,040 (0,036-0,050)	16,0	16,0	700	80	21,25
	20	3	35 (25-55)	0,050 (0,045-0,063)	20,0	20,0	560	80	33,20
	3	3	20 (10-40)	0,007 (0,006-0,010)	3,0	3,0	2.140	50	0,41
	4	3	20 (10-40)	0,010 (0,008-0,013)	4,0	4,0	1.600	50	0,74
	5	3	20 (10-40)	0,012 (0,010-0,016)	5,0	5,0	1.280	50	1,15
	6	3	20 (10-40)	0,014 (0,012-0,018)	6,0	6,0	1.060	40	1,58
	8	3	20 (10-40)	0,019 (0,017-0,024)	8,0	8,0	800	50	2,88
General structural steel, unalloyed steel	10	3	20 (10-40)	0,024 (0,021-0,030)	10,0	10,0	640	50	4,50
	12	3	20 (10-40)	0,030 (0,027-0,038)	12,0	12,0	530	50	6,77
	14	3	20 (10-40)	0,035 (0,031-0,044)	14,0	14,0	460	50	9,21
	16	3	20 (10-40)	0,040 (0,036-0,050)	16,0	16,0	400	50	12,03
	20	3	20 (10-40)	0,050 (0,045-0,063)	20,0	20,0	320	50	18,80
	3	3	130 (110-160)	0,015 (0,013-0,019)	3,0	3,0	13.890	620	5,58
	4	3	130 (110-160)	0,020 (0,017-0,025)	4,0	4,0	10.400	620	9,92
	5	3	130 (110-160)	0,025 (0,022-0,032)	5,0	5,0	8.310	620	15,50
	6	3	130 (110-160)	0,030 (0,027-0,038)	6,0	6,0	6.920	620	22,39
8	3	130 (110-160)	0,040 (0,036-0,050)	8,0	8,0	5.190	620	39,81	
10	3	130 (110-160)	0,050 (0,045-0,063)	10,0	10,0	4.150	620	62,10	
12	3	130 (110-160)	0,061 (0,054-0,077)	12,0	12,0	3.450	630	91,01	
14	3	130 (110-160)	0,071 (0,063-0,089)	14,0	14,0	2.960	630	123,48	
16	3	130 (110-160)	0,081 (0,072-0,102)	16,0	16,0	2.590	630	161,02	
20	3	130 (110-160)	0,101 (0,090-0,127)	20,0	20,0	2.070	630	250,80	

Cutting Data Recommendation 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]
INOX, ferritic, sulphurised	3	3	110 (90-140)	0,013 (0,011-0,016)	3,8	1,3	11.750	450	2,28
	4	3	110 (90-140)	0,017 (0,015-0,022)	5,0	1,8	8.800	450	4,00
	5	3	110 (90-140)	0,021 (0,019-0,027)	6,3	2,2	7.030	450	6,30
	6	3	110 (90-140)	0,025 (0,022-0,032)	7,5	2,7	5.860	440	8,82
	8	3	110 (90-140)	0,033 (0,029-0,042)	10,0	3,6	4.390	430	15,54
	10	3	110 (90-140)	0,041 (0,036-0,052)	12,5	4,5	3.510	430	24,14
	12	3	110 (90-140)	0,051 (0,045-0,064)	15,0	5,4	2.920	450	36,14
	14	3	110 (90-140)	0,059 (0,053-0,074)	17,5	6,3	2.500	440	48,76
	16	3	110 (90-140)	0,068 (0,061-0,085)	20,0	7,2	2.190	450	64,13
20	3	110 (90-140)	0,084 (0,075-0,105)	25,0	9,0	1.750	440	99,11	
INOX, martensitic	3	3	80 (60-110)	0,013 (0,011-0,016)	3,8	1,3	8.550	320	1,66
	4	3	80 (60-110)	0,017 (0,015-0,022)	5,0	1,8	6.400	320	2,91
	5	3	80 (60-110)	0,021 (0,019-0,027)	6,3	2,2	5.110	320	4,58
	6	3	80 (60-110)	0,025 (0,022-0,032)	7,5	2,7	4.260	320	6,41
	8	3	80 (60-110)	0,033 (0,029-0,042)	10,0	3,6	3.190	320	11,28
	10	3	80 (60-110)	0,041 (0,036-0,052)	12,5	4,5	2.550	310	17,53
	12	3	80 (60-110)	0,051 (0,045-0,064)	15,0	5,4	2.130	330	26,28
	14	3	80 (60-110)	0,059 (0,053-0,074)	17,5	6,3	1.820	320	35,44
	16	3	80 (60-110)	0,068 (0,061-0,085)	20,0	7,2	1.590	320	46,59
20	3	80 (60-110)	0,084 (0,075-0,105)	25,0	9,0	1.270	320	72,14	
INOX, austenitic	3	3	90 (70-120)	0,013 (0,011-0,016)	3,8	1,2	9.610	370	1,66
	4	3	90 (70-120)	0,017 (0,015-0,022)	5,0	1,6	7.200	370	2,91
	5	3	90 (70-120)	0,021 (0,019-0,027)	6,3	2,0	5.750	370	4,58
	6	3	90 (70-120)	0,025 (0,022-0,032)	7,5	2,4	4.790	360	6,41
	8	3	90 (70-120)	0,033 (0,029-0,042)	10,0	3,2	3.590	360	11,29
	10	3	90 (70-120)	0,041 (0,036-0,052)	12,5	4,0	2.870	350	17,56
	12	3	90 (70-120)	0,051 (0,045-0,064)	15,0	4,8	2.390	370	26,23
	14	3	90 (70-120)	0,059 (0,053-0,074)	17,5	5,6	2.050	360	35,41
	16	3	90 (70-120)	0,068 (0,061-0,085)	20,0	6,4	1.790	370	46,65
20	3	90 (70-120)	0,085 (0,076-0,107)	25,0	8,0	1.430	370	72,91	
Titanium alloys	3	3	50 (40-70)	0,009 (0,008-0,012)	3,8	1,0	5.340	140	0,57
	4	3	50 (40-70)	0,012 (0,010-0,015)	5,0	1,4	4.000	140	1,00
	5	3	50 (40-70)	0,015 (0,013-0,019)	6,3	1,7	3.200	140	1,57
	6	3	50 (40-70)	0,017 (0,015-0,022)	7,5	2,1	2.660	140	2,11
	8	3	50 (40-70)	0,023 (0,020-0,029)	10,0	2,8	1.990	140	3,81
	10	3	50 (40-70)	0,029 (0,026-0,037)	12,5	3,5	1.590	140	6,00
	12	3	50 (40-70)	0,036 (0,032-0,045)	15,0	4,2	1.330	140	8,99
	14	3	50 (40-70)	0,042 (0,037-0,053)	17,5	4,9	1.140	140	12,24
	16	3	50 (40-70)	0,048 (0,043-0,060)	20,0	5,6	1.000	140	15,99
20	3	50 (40-70)	0,059 (0,053-0,074)	25,0	7,0	800	140	24,47	
Nickel-base alloy - hardenable	3	3	30 (20-50)	0,009 (0,008-0,012)	3,8	1,0	3.200	90	0,34
	4	3	30 (20-50)	0,012 (0,010-0,015)	5,0	1,4	2.400	90	0,60
	5	3	30 (20-50)	0,015 (0,013-0,019)	6,3	1,7	1.920	90	0,94
	6	3	30 (20-50)	0,017 (0,015-0,022)	7,5	2,1	1.600	80	1,26
	8	3	30 (20-50)	0,023 (0,020-0,029)	10,0	2,8	1.200	80	2,28
	10	3	30 (20-50)	0,029 (0,026-0,037)	12,5	3,5	960	80	3,61
	12	3	30 (20-50)	0,036 (0,032-0,045)	15,0	4,2	800	90	5,41
	14	3	30 (20-50)	0,042 (0,037-0,053)	17,5	4,9	680	90	7,36
	16	3	30 (20-50)	0,048 (0,043-0,060)	20,0	5,6	600	90	9,50
20	3	30 (20-50)	0,059 (0,053-0,074)	25,0	7,0	480	80	14,68	
General structural steel, unalloyed steel	3	3	160 (140-190)	0,018 (0,016-0,023)	3,8	1,3	17.090	920	4,71
	4	3	160 (140-190)	0,024 (0,021-0,030)	5,0	1,8	12.800	920	8,26
	5	3	160 (140-190)	0,030 (0,027-0,038)	6,3	2,2	10.230	920	13,00
	6	3	160 (140-190)	0,035 (0,031-0,044)	7,5	2,7	8.520	890	17,97
	8	3	160 (140-190)	0,047 (0,042-0,059)	10,0	3,6	6.380	900	32,18
	10	3	160 (140-190)	0,059 (0,053-0,074)	12,5	4,5	5.100	900	50,57
	12	3	160 (140-190)	0,072 (0,064-0,090)	15,0	5,4	4.250	920	74,22
	14	3	160 (140-190)	0,084 (0,075-0,105)	17,5	6,3	3.640	920	101,05
	16	3	160 (140-190)	0,096 (0,086-0,120)	20,0	7,2	3.190	920	131,86
20	3	160 (140-190)	0,119 (0,107-0,149)	25,0	9,0	2.550	910	204,30	

Cutting Data Recommendation 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]
INOX, ferritic, sulphurised	3	3	80 (60-110)	0,011 (0,009-0,014)	3,0	3,0	10	17,0	8.550	280
	4	3	80 (60-110)	0,015 (0,013-0,019)	4,0	4,0	10	22,7	6.400	290
	5	3	80 (60-110)	0,018 (0,016-0,023)	5,0	5,0	10	28,4	5.110	280
	6	3	80 (60-110)	0,021 (0,018-0,027)	6,0	6,0	10	34,0	4.260	270
	8	3	80 (60-110)	0,028 (0,025-0,035)	8,0	8,0	10	45,4	3.190	270
	10	3	80 (60-110)	0,035 (0,031-0,044)	10,0	10,0	10	56,7	2.550	270
	12	3	80 (60-110)	0,043 (0,038-0,054)	12,0	12,0	10	68,1	2.130	270
	14	3	80 (60-110)	0,050 (0,045-0,063)	14,0	14,0	10	79,4	1.820	270
	16	3	80 (60-110)	0,057 (0,051-0,072)	16,0	16,0	10	90,7	1.590	270
20	3	80 (60-110)	0,072 (0,064-0,090)	20,0	20,0	10	113,4	1.270	280	
INOX, martensitic	3	3	60 (40-90)	0,011 (0,009-0,014)	3,0	3,0	5	34,3	6.410	210
	4	3	60 (40-90)	0,015 (0,013-0,019)	4,0	4,0	5	45,7	4.800	220
	5	3	60 (40-90)	0,018 (0,016-0,023)	5,0	5,0	5	57,2	3.840	210
	6	3	60 (40-90)	0,021 (0,018-0,027)	6,0	6,0	5	68,6	3.190	200
	8	3	60 (40-90)	0,028 (0,025-0,035)	8,0	8,0	5	91,4	2.390	200
	10	3	60 (40-90)	0,035 (0,031-0,044)	10,0	10,0	5	114,3	1.910	200
	12	3	60 (40-90)	0,043 (0,038-0,054)	12,0	12,0	5	137,2	1.590	210
	14	3	60 (40-90)	0,050 (0,045-0,063)	14,0	14,0	5	160,0	1.370	200
	16	3	60 (40-90)	0,057 (0,051-0,072)	16,0	16,0	5	182,9	1.200	200
20	3	60 (40-90)	0,072 (0,064-0,090)	20,0	20,0	5	228,6	960	210	
INOX, austenitic	3	3	70 (50-100)	0,011 (0,009-0,014)	3,0	3,0	5	34,3	7.480	250
	4	3	70 (50-100)	0,015 (0,013-0,019)	4,0	4,0	5	45,7	5.600	250
	5	3	70 (50-100)	0,018 (0,016-0,023)	5,0	5,0	5	57,2	4.470	240
	6	3	70 (50-100)	0,021 (0,018-0,027)	6,0	6,0	5	68,6	3.730	230
	8	3	70 (50-100)	0,028 (0,025-0,035)	8,0	8,0	5	91,4	2.790	230
	10	3	70 (50-100)	0,035 (0,031-0,044)	10,0	10,0	5	114,3	2.230	230
	12	3	70 (50-100)	0,043 (0,038-0,054)	12,0	12,0	5	137,2	1.860	240
	14	3	70 (50-100)	0,050 (0,045-0,063)	14,0	14,0	5	160,0	1.590	240
	16	3	70 (50-100)	0,057 (0,051-0,072)	16,0	16,0	5	182,9	1.390	240
20	3	70 (50-100)	0,072 (0,064-0,090)	20,0	20,0	5	228,6	1.120	240	
Titanium alloys	3	3	35 (25-55)	0,008 (0,007-0,010)	3,0	3,0	3	57,2	3.740	90
	4	3	35 (25-55)	0,010 (0,009-0,013)	4,0	4,0	3	76,3	2.800	80
	5	3	35 (25-55)	0,013 (0,011-0,017)	5,0	5,0	3	95,4	2.240	90
	6	3	35 (25-55)	0,014 (0,012-0,018)	6,0	6,0	3	114,5	1.860	80
	8	3	35 (25-55)	0,019 (0,017-0,024)	8,0	8,0	3	152,6	1.400	80
	10	3	35 (25-55)	0,024 (0,021-0,030)	10,0	10,0	3	190,8	1.120	80
	12	3	35 (25-55)	0,030 (0,027-0,038)	12,0	12,0	3	229,0	930	80
	14	3	35 (25-55)	0,035 (0,031-0,044)	14,0	14,0	3	267,1	800	80
	16	3	35 (25-55)	0,040 (0,036-0,050)	16,0	16,0	3	305,3	700	80
20	3	35 (25-55)	0,050 (0,045-0,063)	20,0	20,0	3	381,6	560	80	
Nickel-base alloy - hardenable	3	3	20 (10-40)	0,008 (0,007-0,010)	3,0	3,0	3	57,2	2.140	50
	4	3	20 (10-40)	0,010 (0,009-0,013)	4,0	4,0	3	76,3	1.600	50
	5	3	20 (10-40)	0,013 (0,011-0,017)	5,0	5,0	3	95,4	1.280	50
	6	3	20 (10-40)	0,014 (0,012-0,018)	6,0	6,0	3	114,5	1.060	40
	8	3	20 (10-40)	0,019 (0,017-0,024)	8,0	8,0	3	152,6	800	50
	10	3	20 (10-40)	0,024 (0,021-0,030)	10,0	10,0	3	190,8	640	50
	12	3	20 (10-40)	0,030 (0,027-0,038)	12,0	12,0	3	229,0	530	50
	14	3	20 (10-40)	0,035 (0,031-0,044)	14,0	14,0	3	267,1	460	50
	16	3	20 (10-40)	0,040 (0,036-0,050)	16,0	16,0	3	305,3	400	50
20	3	20 (10-40)	0,050 (0,045-0,063)	20,0	20,0	3	381,6	320	50	
General structural steel, unalloyed steel	3	3	130 (110-160)	0,016 (0,014-0,020)	3,0	3,0	15	11,2	13.890	670
	4	3	130 (110-160)	0,021 (0,018-0,027)	4,0	4,0	15	14,9	10.400	660
	5	3	130 (110-160)	0,026 (0,023-0,033)	5,0	5,0	15	18,7	8.310	650
	6	3	130 (110-160)	0,030 (0,027-0,038)	6,0	6,0	15	22,4	6.920	620
	8	3	130 (110-160)	0,040 (0,036-0,050)	8,0	8,0	15	29,9	5.190	620
	10	3	130 (110-160)	0,050 (0,045-0,063)	10,0	10,0	15	37,3	4.150	620
	12	3	130 (110-160)	0,061 (0,054-0,077)	12,0	12,0	15	44,8	3.450	630
	14	3	130 (110-160)	0,071 (0,063-0,089)	14,0	14,0	15	52,2	2.960	630
	16	3	130 (110-160)	0,081 (0,072-0,102)	16,0	16,0	15	59,7	2.590	630
20	3	130 (110-160)	0,101 (0,090-0,127)	20,0	20,0	15	74,6	2.070	630	

For drilling operations ($\phi R = 90^\circ$), we recommend to reduce f_z (feed speed per tooth) by 50%.

Cutting Data Recommendation HELIX MILLING



Material	D [mm]	Z	Vc [m/min]	fz [mm]	ap max./Umdr. [mm]	ae [mm]	φZ max. [°]	Bd [mm]	n [min ⁻¹]	Vf [mm/min]
INOX, ferritic, sulphurised	3	3	110 (90-140)	0,011 (0,009-0,014)	2,0	3,0	14,02	5,55	11.750	390
	4	3	110 (90-140)	0,015 (0,013-0,019)	2,7	4,0	14,19	7,40	8.800	400
	5	3	110 (90-140)	0,018 (0,016-0,023)	3,3	5,0	13,88	9,25	7.030	380
	6	3	110 (90-140)	0,021 (0,018-0,027)	4,0	6,0	14,02	11,10	5.860	370
	8	3	110 (90-140)	0,028 (0,025-0,035)	5,4	8,0	14,19	14,80	4.390	370
	10	3	110 (90-140)	0,035 (0,031-0,044)	6,7	10,0	14,08	18,50	3.510	370
	12	3	110 (90-140)	0,043 (0,038-0,054)	8,1	12,0	14,19	22,20	2.920	380
	14	3	110 (90-140)	0,050 (0,045-0,063)	9,4	14,0	14,11	25,90	2.500	380
	16	3	110 (90-140)	0,057 (0,051-0,072)	10,8	16,0	14,19	29,60	2.190	370
	20	3	110 (90-140)	0,072 (0,064-0,090)	13,5	20,0	14,19	37,00	1.750	380
INOX, martensitic	3	3	80 (60-110)	0,011 (0,009-0,014)	2,0	3,0	14,02	5,55	8.550	280
	4	3	80 (60-110)	0,015 (0,013-0,019)	2,7	4,0	14,19	7,40	6.400	290
	5	3	80 (60-110)	0,018 (0,016-0,023)	3,3	5,0	13,88	9,25	5.110	280
	6	3	80 (60-110)	0,021 (0,018-0,027)	4,0	6,0	14,02	11,10	4.260	270
	8	3	80 (60-110)	0,028 (0,025-0,035)	5,4	8,0	14,19	14,80	3.190	270
	10	3	80 (60-110)	0,035 (0,031-0,044)	6,7	10,0	14,08	18,50	2.550	270
	12	3	80 (60-110)	0,043 (0,038-0,054)	8,1	12,0	14,19	22,20	2.130	270
	14	3	80 (60-110)	0,050 (0,045-0,063)	9,4	14,0	14,11	25,90	1.820	270
	16	3	80 (60-110)	0,057 (0,051-0,072)	10,8	16,0	14,19	29,60	1.590	270
	20	3	80 (60-110)	0,072 (0,064-0,090)	13,5	20,0	14,19	37,00	1.270	280
INOX, austenitic	3	3	90 (70-120)	0,011 (0,009-0,014)	2,0	3,0	14,02	5,55	9.610	320
	4	3	90 (70-120)	0,015 (0,013-0,019)	2,7	4,0	14,19	7,40	7.200	320
	5	3	90 (70-120)	0,018 (0,016-0,023)	3,3	5,0	13,88	9,25	5.750	310
	6	3	90 (70-120)	0,021 (0,018-0,027)	4,0	6,0	14,02	11,10	4.790	300
	8	3	90 (70-120)	0,028 (0,025-0,035)	5,4	8,0	14,19	14,80	3.590	300
	10	3	90 (70-120)	0,035 (0,031-0,044)	6,7	10,0	14,08	18,50	2.870	300
	12	3	90 (70-120)	0,043 (0,038-0,054)	8,1	12,0	14,19	22,20	2.390	310
	14	3	90 (70-120)	0,050 (0,045-0,063)	9,4	14,0	14,11	25,90	2.050	310
	16	3	90 (70-120)	0,057 (0,051-0,072)	10,8	16,0	14,19	29,60	1.790	310
	20	3	90 (70-120)	0,072 (0,064-0,090)	13,5	20,0	14,19	37,00	1.430	310
Titanium alloys	3	3	50 (40-70)	0,008 (0,007-0,010)	1,5	3,0	10,61	5,55	5.340	130
	4	3	50 (40-70)	0,010 (0,009-0,013)	2,1	4,0	11,12	7,40	4.000	120
	5	3	50 (40-70)	0,013 (0,011-0,017)	2,6	5,0	11,02	9,25	3.200	120
	6	3	50 (40-70)	0,014 (0,012-0,018)	3,1	6,0	10,95	11,10	2.660	110
	8	3	50 (40-70)	0,019 (0,017-0,024)	4,2	8,0	11,12	14,80	1.990	110
	10	3	50 (40-70)	0,024 (0,021-0,030)	5,2	10,0	11,02	18,50	1.590	110
	12	3	50 (40-70)	0,030 (0,027-0,038)	6,3	12,0	11,12	22,20	1.330	120
	14	3	50 (40-70)	0,035 (0,031-0,044)	7,3	14,0	11,05	25,90	1.140	120
	16	3	50 (40-70)	0,040 (0,036-0,050)	8,4	16,0	11,12	29,60	1.000	120
	20	3	50 (40-70)	0,050 (0,045-0,063)	10,5	20,0	11,12	37,00	800	120
Nickel-base alloy - hardenable	3	3	30 (20-50)	0,008 (0,007-0,010)	1,5	3,0	10,61	5,55	3.200	80
	4	3	30 (20-50)	0,010 (0,009-0,013)	2,1	4,0	11,12	7,40	2.400	70
	5	3	30 (20-50)	0,013 (0,011-0,017)	2,6	5,0	11,02	9,25	1.920	70
	6	3	30 (20-50)	0,014 (0,012-0,018)	3,1	6,0	10,95	11,10	1.600	70
	8	3	30 (20-50)	0,019 (0,017-0,024)	4,2	8,0	11,12	14,80	1.200	70
	10	3	30 (20-50)	0,024 (0,021-0,030)	5,2	10,0	11,02	18,50	960	70
	12	3	30 (20-50)	0,030 (0,027-0,038)	6,3	12,0	11,12	22,20	800	70
	14	3	30 (20-50)	0,035 (0,031-0,044)	7,3	14,0	11,05	25,90	680	70
	16	3	30 (20-50)	0,040 (0,036-0,050)	8,4	16,0	11,12	29,60	600	70
	20	3	30 (20-50)	0,050 (0,045-0,063)	10,5	20,0	11,12	37,00	480	70
General structural steel, unalloyed steel	3	3	160 (140-190)	0,016 (0,014-0,020)	2,1	3,0	14,69	5,55	17.090	820
	4	3	160 (140-190)	0,021 (0,018-0,027)	2,8	4,0	14,69	7,40	12.800	810
	5	3	160 (140-190)	0,026 (0,023-0,033)	3,5	5,0	14,69	9,25	10.230	800
	6	3	160 (140-190)	0,030 (0,027-0,038)	4,2	6,0	14,69	11,10	8.520	770
	8	3	160 (140-190)	0,040 (0,036-0,050)	5,7	8,0	14,94	14,80	6.380	770
	10	3	160 (140-190)	0,050 (0,045-0,063)	7,1	10,0	14,89	18,50	5.100	770
	12	3	160 (140-190)	0,061 (0,054-0,077)	8,5	12,0	14,86	22,20	4.250	780
	14	3	160 (140-190)	0,071 (0,063-0,089)	9,9	14,0	14,83	25,90	3.640	780
	16	3	160 (140-190)	0,081 (0,072-0,102)	11,4	16,0	14,94	29,60	3.190	770
	20	3	160 (140-190)	0,101 (0,090-0,127)	14,2	20,0	14,89	37,00	2.550	770

341(W) Vollhartmetallfräser

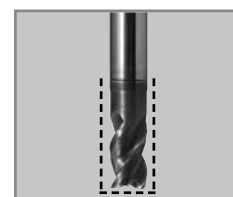
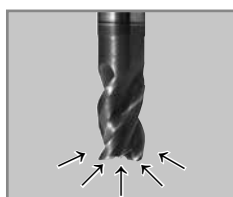
Solid carbide cutters, Fraise carbure monobloc, Fresa a candela di metallo duro



Order-No.	Euro/Piece*
VHM 341-03 TI08	33,50 €
VHM 341-04 TI08	33,50 €
VHM 341-05 TI08	33,50 €
VHM 341-06 TI08	34,50 €
VHM 341W-08 TI08	44,50 €
VHM 341W-10 TI08	52,90 €
VHM 341W-12 TI08	64,70 €
VHM 341W-14 TI08	78,90 €
VHM 341W-16 TI08	104,00 €
VHM 341W-20 TI08	148,00 €

**341(W) Vollhartmetallfräser - Nachschleifservice**

Regrinding service, Service de réaffûtage, Servizio riaffilatura



Bestellnummer Order-No. Numéro de commande Numero di ordinazione	Preis pro Stück(**) für Nachschleifservice bei gleichzeitiger Zusendung von: Price per piece(**) for the regrinding service while sending at the same time: Prix unitaire(**) pour le service de réaffûtage pour l'envoi de : Prezzo per pezzo(**) servizio riaffilatura considerando la consegna di:			
	1 - 4	5 - 9	10 - 19	20 +
NG-VHM 341-05 TI08	21,24 €* 21,24 €*	18,83 €* 18,83 €*	14,56 €* 14,56 €*	12,43 €* 12,43 €*
NG-VHM 341-06 TI08	23,71 €* 23,71 €*	21,68 €* 21,68 €*	17,41 €* 17,41 €*	15,28 €* 15,28 €*
NG-VHM 341W-08 TI08	25,17 €* 25,17 €*	23,47 €* 23,47 €*	19,29 €* 19,29 €*	17,20 €* 17,20 €*
NG-VHM 341W-10 TI08	25,79 €* 25,79 €*	24,19 €* 24,19 €*	20,01 €* 20,01 €*	17,92 €* 17,92 €*
NG-VHM 341W-12 TI08	37,41 €* 37,41 €*	32,73 €* 32,73 €*	24,90 €* 24,90 €*	20,99 €* 20,99 €*
NG-VHM 341W-14 TI08	46,67 €* 46,67 €*	36,24 €* 36,24 €*	28,41 €* 28,41 €*	24,50 €* 24,50 €*
NG-VHM 341W-16 TI08	49,94 €* 49,94 €*	39,51 €* 39,51 €*	31,68 €* 31,68 €*	27,77 €* 27,77 €*
NG-VHM 341W-20 TI08	53,87 €* 53,87 €*	43,44 €* 43,44 €*	35,61 €* 35,61 €*	31,70 €* 31,70 €*

* alle Preise zzgl. MwSt. - Irrtümer und Auslassungen vorbehalten!

* all prices plus V.A.T. - Errors and omissions excepted!

* les prix s'entendent net H.T. - sous réserve d'erreurs!

* Sui prezzi indicati verrà aggiunta l'I.V.A. - Salvo errori ed omissioni!

** Die Staffelung 1-4 / 5-9 / 10-19 und 20+ bezieht sich auf die gleichzeitige Zusendung von nachschleifbaren Werkzeugen! Nicht nachschleifbare Werkzeuge werden von der Gesamtmenge abgezogen.** The scale 1-4 / 5-9 / 10-19 and 20+ is referred to the simultaneous delivery of regrindable tools! Not regrindable tools are reduced from the total sum of tools.

** Veuillez noter que les quantités de 1 à 4, de 5 à 9, de 10 à 19 et 20 et +, prennent en compte uniquement les fraises retournées en même temps et réaffûtées.

** La classificazione delle quantità 1-4/5-9/10-19 e 20+ si riferisce alla quantità di utensili inviati alla Jongen i quali sono riaffilabili! Utensili non riaffilabili non vengono prese in considerazione e di conseguenza detratte dalla quantità totale inviati.