

Jongen Werkzeugtechnik

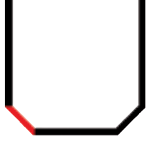
VHM 389 AL05

long solid carbide end mills
for the aluminium machining

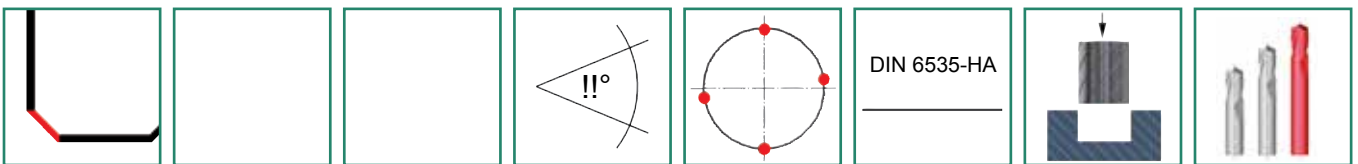
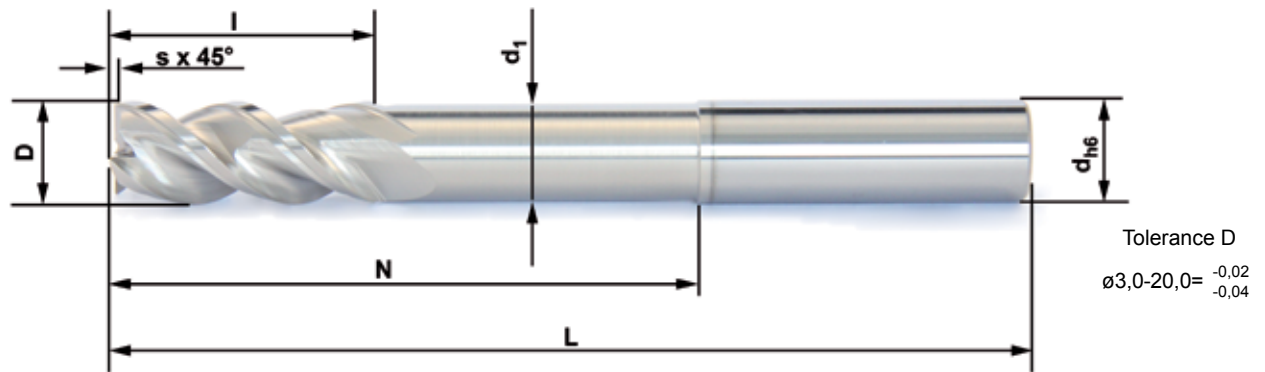


VHM 389 AL05 - Characteristics

The Jongen solid carbide end mill type VHM 389, has been designed especially for machining aluminium, non-ferrous metals and plastics.

Characteristics	VHM 389
Geometry → with edge chamfer	
Number of cutting edges	3
Constantly high cutting quality with highest productivity	✓
Universally applicable - for boring and pre-boring - for step milling - for slot milling - for roughing and finishing	✓
The roughing milling operation stands out by a smooth running with highest metal cutting performance	✓
Holding fixture made to DIN 6535-HA → compatible with collet chucks and hydro clamp chucks → also suitable for shrinking → Subsequent application of Weldon clamping flats starting from diam. 6 mm is possible	✓
Increasing neck length → increment of utility length up to DIN-clamping length	✓
Differential tooth pitch → extremely smooth running also for slot milling operations	✓
Dynamic spiral angle → extremely smooth running also with max. depth of cut	✓
Optimized chip space → stable tool core → generously carried out chip spaces	✓
Optimized macro geometry → high cutting volume	✓
Optimized micro geometry → highest tool live	✓
Quality: AL05 Finest grain carbide, Iso-field K05-K10 for highest wearing quality	✓
Coating → low friction coefficient → prevention of gluing and build-up material → optimal chip flow → high cutting parameters → high protection against wearing	✓

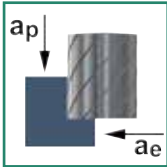
VHM 389 AL05 - Technical Data



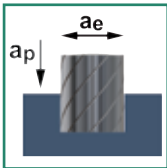
Order-No.	D	s	l	N	d ₁	d _{h6}	L	Z
VHM 389-03 AL05	3	0,10x45°	9,0	34,0	2,7	6	73,0	3
VHM 389-04 AL05	4	0,10x45°	12,0	35,0	3,7	6	73,0	3
VHM 389-05 AL05	5	0,10x45°	15,0	35,0	4,7	6	73,0	3
VHM 389-06 AL05	6	0,10x45°	18,0	35,0	5,7	6	73,0	3
VHM 389-08 AL05	8	0,15x45°	24,0	46,0	7,4	8	84,0	3
VHM 389-10 AL05	10	0,15x45°	27,0	51,0	9,2	10	93,0	3
VHM 389-12 AL05	12	0,20x45°	33,0	63,0	11,0	12	110,0	3
VHM 389-16 AL05	16	0,20x45°	40,0	90,0	15,0	16	140,0	3
VHM 389-20 AL05	20	0,25x45°	50,0	90,0	19,0	20	150,0	3



VHM 389 AL05 - Cutting Data Recommendations



Material	D [mm]	V _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	V _f [mm/min]	Q [cm ³ /min]
Alu long chipping	3	500 (460-560)	0,06 (0,04-0,08)	8,0	0,6	53.050	9.550	45,8
	4	500 (460-560)	0,06 (0,04-0,08)	11,0	0,8	39.790	7.160	63,0
	5	500 (460-560)	0,09 (0,07-0,10)	14,0	1,0	31.830	8.595	120,3
	6	500 (460-560)	0,10 (0,08-0,12)	17,0	1,2	26.530	7.960	162,4
	8	500 (460-560)	0,10 (0,08-0,12)	23,0	1,6	19.890	5.965	219,5
	10	500 (460-560)	0,11 (0,09-0,13)	26,0	2,0	15.920	5.255	273,3
	12	500 (460-560)	0,11 (0,09-0,13)	32,0	2,4	13.260	4.375	336,0
	16	500 (460-560)	0,13 (0,11-0,15)	39,0	3,2	9.950	3.880	484,2
Alu short chipping >6% Si	20	500 (460-560)	0,16 (0,14-0,18)	49,0	4,0	7.960	3.820	748,7
	3	480 (400-520)	0,06 (0,04-0,08)	8,0	0,6	50.930	9.165	44,0
	4	480 (400-520)	0,06 (0,04-0,08)	11,0	0,8	38.200	6.875	60,5
	5	480 (400-520)	0,09 (0,07-0,10)	14,0	1,0	30.560	8.250	115,5
	6	480 (400-520)	0,10 (0,08-0,12)	17,0	1,2	25.460	7.640	155,9
	8	480 (400-520)	0,10 (0,08-0,12)	23,0	1,6	19.100	5.730	210,9
	10	480 (400-520)	0,10 (0,08-0,12)	26,0	2,0	15.280	4.585	238,4
	12	480 (400-520)	0,10 (0,08-0,12)	32,0	2,4	12.730	3.820	293,4
Cast aluminium >10% Si	16	480 (460-560)	0,13 (0,11-0,15)	39,0	3,2	9.550	3.725	464,9
	20	480 (460-560)	0,22 (0,20-0,24)	49,0	4,0	7.640	5.040	987,8
	3	250 (200-300)	0,06 (0,04-0,08)	8,0	0,6	26.530	4.775	22,9
	4	250 (200-300)	0,06 (0,04-0,08)	11,0	0,8	19.890	3.580	31,5
	5	250 (200-300)	0,08 (0,08-0,12)	14,0	1,0	15.920	3.820	53,5
	6	250 (200-300)	0,09 (0,07-0,11)	17,0	1,2	13.260	3.580	73,0
	8	250 (200-300)	0,09 (0,07-0,11)	23,0	1,6	9.950	2.685	98,8
	10	250 (200-300)	0,09 (0,07-0,11)	26,0	2,0	7.960	2.150	111,8
CuZn alloys	12	250 (200-300)	0,09 (0,07-0,11)	32,0	2,4	6.630	1.790	137,5
	16	250 (200-300)	0,15 (0,13-0,17)	39,0	3,2	4.970	2.235	278,9
	20	250 (200-300)	0,20 (0,18-0,22)	49,0	4,0	3.980	2.390	468,4
	3	270 (230-300)	0,05 (0,04-0,08)	8,0	0,6	28.650	4.300	20,6
	4	270 (230-300)	0,05 (0,04-0,08)	11,0	0,8	21.490	3.225	28,4
	5	270 (230-300)	0,08 (0,07-0,10)	14,0	1,0	17.190	4.125	57,8
	6	270 (230-300)	0,08 (0,08-0,12)	17,0	1,2	14.320	3.435	70,1
	8	270 (230-300)	0,08 (0,08-0,12)	23,0	1,6	10.740	2.580	94,9
CuZn alloys	10	270 (230-300)	0,08 (0,09-0,13)	26,0	2,0	8.590	2.060	107,1
	12	270 (230-300)	0,08 (0,09-0,13)	32,0	2,4	7.160	1.720	132,1
	16	270 (230-300)	0,12 (0,11-0,15)	39,0	3,2	5.370	1.935	241,5
	20	270 (230-300)	0,16 (0,14-0,18)	49,0	4,0	4.300	2.065	404,7



Material	D [mm]	V _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	V _f [mm/min]	Q [cm ³ /min]
Alu long chipping	3	500 (460-560)	0,05 (0,03-0,07)	0,6	3,0	53.050	7.960	14,3
	4	500 (460-560)	0,05 (0,03-0,07)	0,8	4,0	39.790	5.970	19,1
	5	500 (460-560)	0,07 (0,05-0,09)	1,0	5,0	31.830	6.685	33,4
	6	500 (460-560)	0,08 (0,06-0,10)	1,2	6,0	26.530	6.365	45,8
	8	500 (460-560)	0,08 (0,06-0,10)	1,6	8,0	19.890	4.775	61,1
	10	500 (460-560)	0,09 (0,07-0,11)	2,0	10,0	15.920	4.300	86,0
	12	500 (460-560)	0,09 (0,07-0,11)	2,4	12,0	13.260	3.580	103,1
	16	500 (460-560)	0,11 (0,09-0,13)	3,2	16,0	9.950	3.285	168,2
Alu short chipping >6% Si	20	500 (460-560)	0,14 (0,12-0,16)	4,0	20,0	7.960	3.345	267,6
	3	480 (400-520)	0,03 (0,01-0,05)	0,6	3,0	50.930	4.585	8,3
	4	480 (400-520)	0,03 (0,01-0,05)	0,8	4,0	38.200	3.440	11,0
	5	480 (400-520)	0,05 (0,03-0,07)	1,0	5,0	30.560	4.585	22,9
	6	480 (400-520)	0,06 (0,04-0,08)	1,2	6,0	25.460	4.585	33,0
	8	480 (400-520)	0,06 (0,04-0,08)	1,6	8,0	19.100	3.440	44,0
	10	480 (400-520)	0,06 (0,04-0,08)	2,0	10,0	15.280	2.750	55,0
	12	480 (400-520)	0,06 (0,04-0,08)	2,4	12,0	12.730	2.290	66,0
Cast aluminium >10% Si	16	500 (460-560)	0,09 (0,07-0,11)	3,2	16,0	9.950	2.685	137,5
	20	500 (460-560)	0,16 (0,14-0,18)	4,0	20,0	7.960	3.820	305,6
	3	250 (200-300)	0,03 (0,01-0,05)	0,6	3,0	26.530	2.390	4,3
	4	250 (200-300)	0,03 (0,01-0,05)	0,8	4,0	19.890	1.790	5,7
	5	250 (200-300)	0,04 (0,02-0,06)	1,0	5,0	15.920	1.910	9,6
	6	250 (200-300)	0,05 (0,03-0,07)	1,2	6,0	13.260	1.990	14,3
	8	250 (200-300)	0,05 (0,03-0,07)	1,6	8,0	9.950	1.495	19,1
	10	250 (200-300)	0,05 (0,03-0,07)	2,0	10,0	7.960	1.195	23,9
CuZn alloys	12	250 (200-300)	0,05 (0,03-0,07)	2,4	12,0	6.630	995	28,7
	16	250 (200-300)	0,12 (0,10-0,14)	3,2	16,0	4.970	1.790	91,6
	20	250 (200-300)	0,16 (0,14-0,18)	4,0	20,0	3.980	1.910	152,8
	3	270 (230-300)	0,02 (0,01-0,04)	0,6	3,0	28.650	1.720	3,1
	4	270 (230-300)	0,02 (0,01-0,04)	0,8	4,0	21.490	1.290	4,1
	5	270 (230-300)	0,04 (0,02-0,06)	1,0	5,0	17.190	2.065	10,3
	6	270 (230-300)	0,04 (0,02-0,06)	1,2	6,0	14.320	1.720	12,4
	8	270 (230-300)	0,04 (0,02-0,06)	1,6	8,0	10.740	1.290	16,5
CuZn alloys	10	270 (230-300)	0,04 (0,02-0,06)	2,0	10,0	8.590	1.030	20,6
	12	270 (230-300)	0,04 (0,02-0,06)	2,4	12,0	7.160	860	24,8
	16	270 (230-300)	0,08 (0,06-0,10)	3,2	16,0	5.370	1.290	66,0
	20	270 (230-300)	0,12 (0,10-0,14)	4,0	20,0	4.300	1.550	124,0

* The above mentioned parameters are starting values!

Up and down corrections are possible depending on the machine type, the working piece and the holding fixture. It is essential to respect the average chip thickness for the circumferential milling operations.