Jongen Werkzeugtechnik

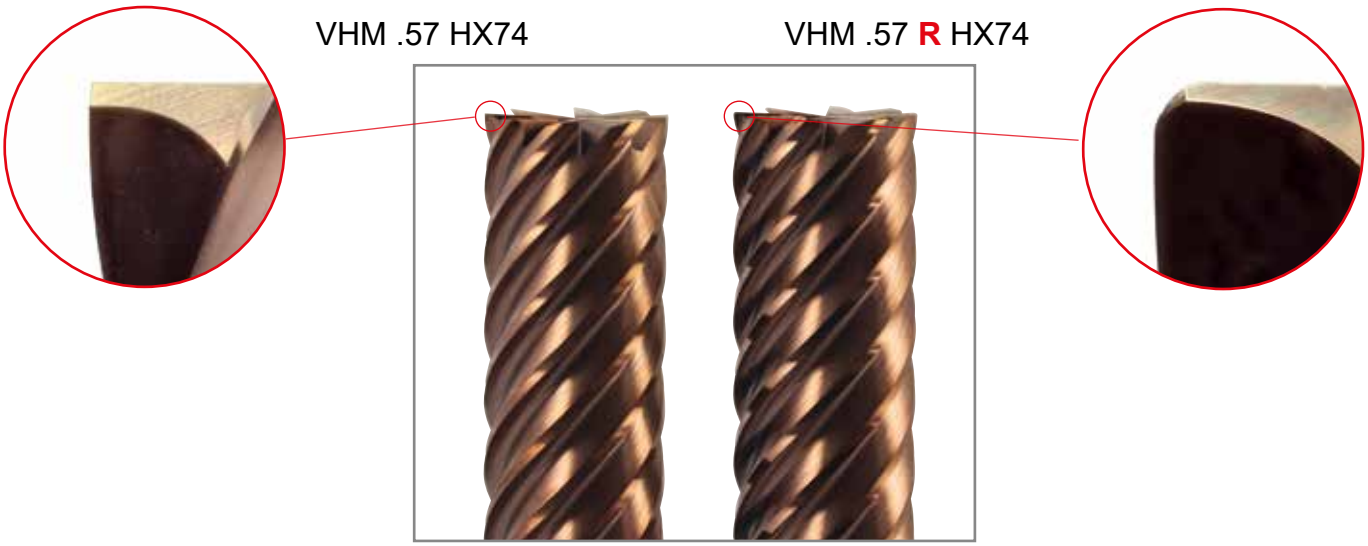
VHM .56 (R) HX74
VHM .57 (R) HX74
VHM .58 (R) HX74

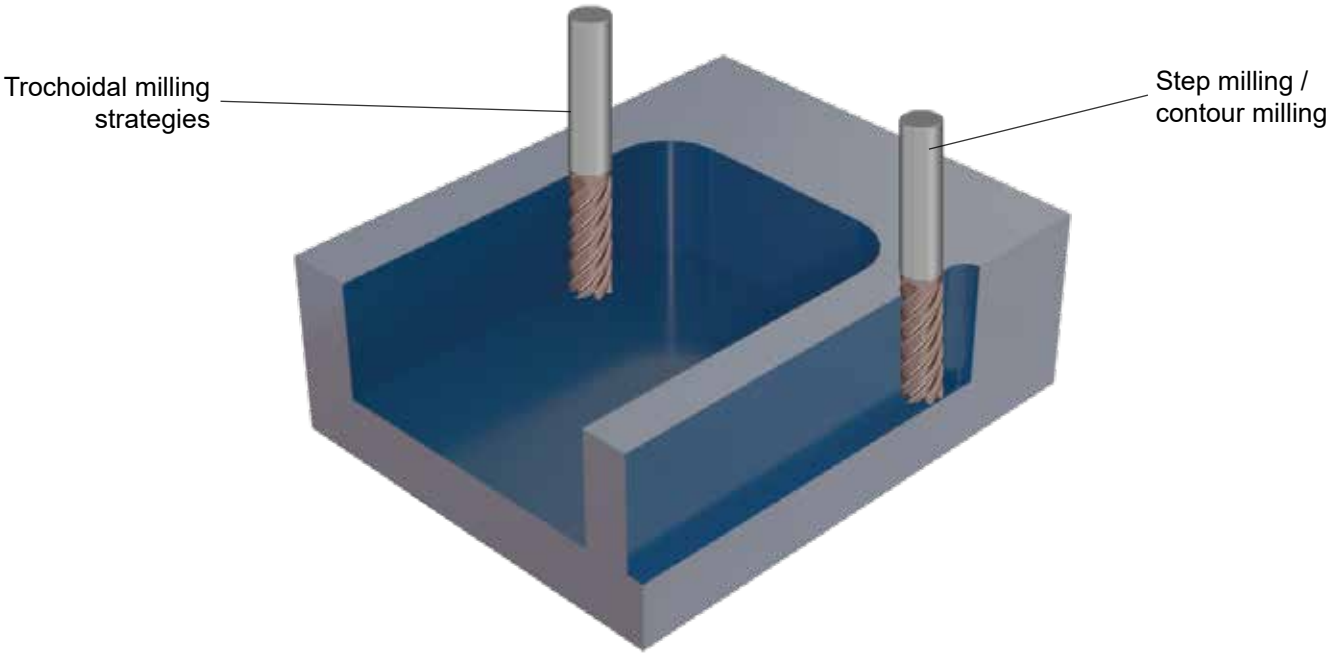


Products from Willich → North-Rhine Westphalia → Germany → Europe for Europe and the

The tool

This newly developed tool range has been specifically designed for reliable, high-speed cutting (HSC) of hardened steel materials in the hardness range of 45 to 70 HRC.
It therefore meets the particularly high demands placed on solid carbide tools in the challenging field of tool and mould making.
The different length variants enable the optimum combination of the required cutting length and tool stability.
The tools are characterized by their high application flexibility and are equally suitable for step milling, peripheral milling and trochoidal milling.
These different machining strategies can be implemented efficiently while maintaining consistently high surface quality.
During the development of this tool range, particular emphasis was placed on achieving a balanced combination of high performance and reliable process stability.
Optimized cutting-edge geometries and a robust tool design ensure smooth running, reduced tool load and extended tool life. The result is stable, reproducible machining processes, even under demanding operating conditions.



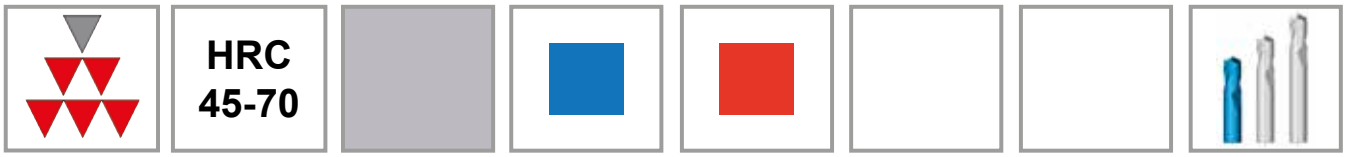


Characteristics

* HiPIMS = **H**igh **P**ower **I**mpulse **M**agnetron **S**puttering

Features	Advantages
Different length variants	.56 (R) : Short and highly stable .57 (R) : Medium cutting length, more stable than .58 (R) .58 (R) : Longest cutting length
High performance cutter ø3 up to ø20mm	-Max. process reliability with high productivity
Versatile areas of application	- Pre-finishing - Finishing - Steel materials 45-70 HRC
Coupling made to DIN 6535-HA (cylindrical shape h_6)	- Precise tool holding manner → High concentricity
4-, 6-, or 8 cutting edge tools with an especially rigid core	- High stability and low displacement with step, contour and trochoidal milling
VHM .56 .57 .58 HX74 Edge design: 90°	- Creating contours without transition angles or transition radii in the base
VHM .56 .57 .58 R HX74 Edge design: Radius	- Creating contours with transition radii in the base
Optimized macro geometry	- Stable cutting edge = High process reliability - Stable tool core = Reduced deflection, high precision
Optimized micro geometry	- High layer adhesion - Increased edge stability - Improved surface quality of the cutting edge = High wear resistance and long tool life
The carbide	- The ultra-finest grain grade is specially designed for HSC-machining of tempered steels up to 70 HRC - Grain size of 0.5µm - ISO range K10-K20 - Hardness of 1.930 [HV30] and flexural strength of 4.400 [MPa] for high wear resistance with high flexural strength
The coating	New silicon-doped HiPIMS* coating for economical hard machining, even under extreme conditions. Exceptionally high Si content with a very dense structure for high thermal stability (operating temperature up to 1.100°C). HiPIMS technology ensures very high surface quality and excellent adhesion.
Carbide + Coating = The quality HX74	Extremely powerful combination for high thermo mechanical loads in hard machining
Reconditioning of the tools possible from ø 4mm	- High cost-benefit factor

Technical Data VHM .56 (R) HX74



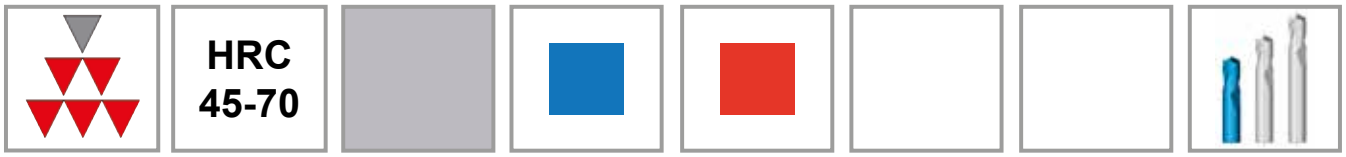


Tolerance D
ø3,0-20,0= $^{-0,02}_{-0,04}$



Order-No.	Article	D	l	N	d_1	d_{h6}	L	Z
VH457S03A-HX74	VHM 456-03 HX74	3	6	8	2,9	6	58	4
VH457S04A-HX74	VHM 456-04 HX74	4	8	10	3,8	6	58	4
VH457S05A-HX74	VHM 456-05 HX74	5	10	13	4,8	6	58	4
VH657S06A-HX74	VHM 656-06 HX74	6	12	15	5,8	6	58	6

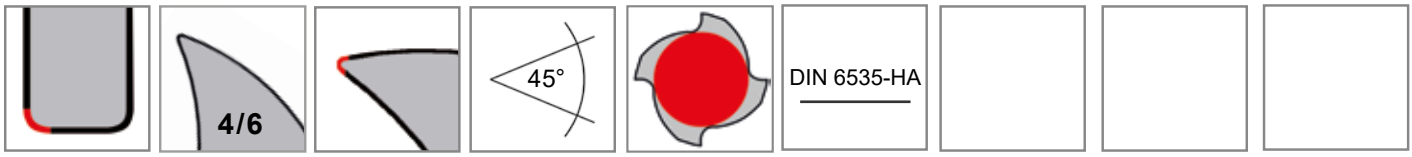
Technical Data VHM .56 R HX74





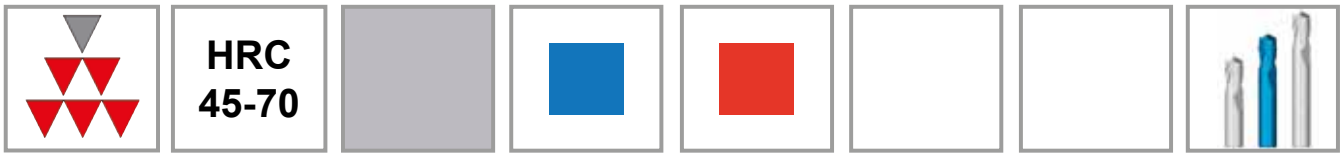
Tolerance D
ø3,0-20,0= $^{-0,02}_{-0,04}$

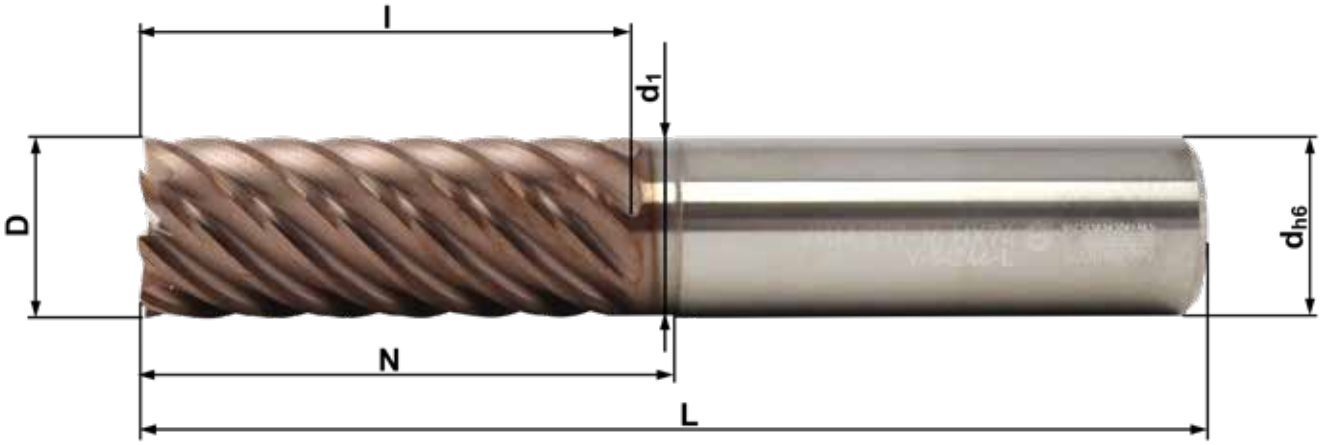
Tolerance R
ø3,0-20,0= $^{+0,01}_{-0,01}$



Order-No.	Article	D	R	l	N	d_1	d_{h6}	L	Z
VH457S03R01A-HX74	VHM 456-03 R01 HX74	3	0,1	6	8	2,9	6	58	4
VH457S04R01A-HX74	VHM 456-04 R01 HX74	4	0,1	8	10	3,8	6	58	4
VH457S05R01A-HX74	VHM 456-05 R01 HX74	5	0,1	10	13	4,8	6	58	4
VH657S06R01A-HX74	VHM 656-06 R01 HX74	6	0,1	12	15	5,8	6	58	6

Technical Data VHM .57 HX74



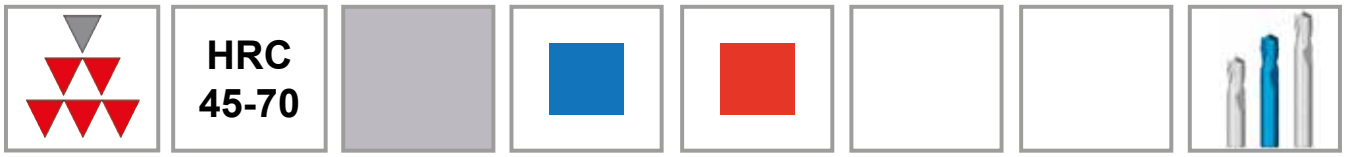


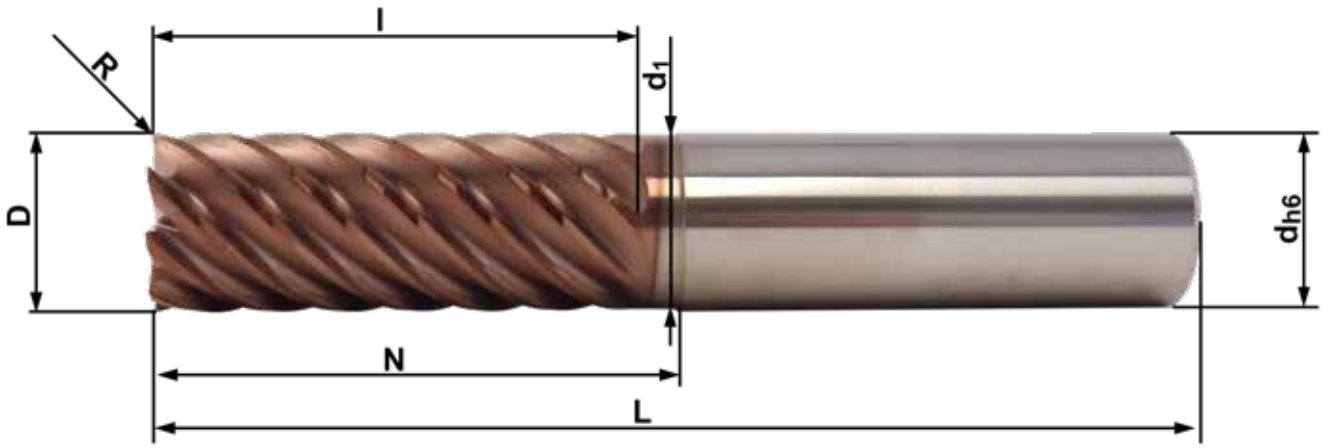
Tolerance D
ø3,0-20,0= $^{-0,02}_{-0,04}$



Order-No.	Article	D	l	N	d_1	d_{h6}	L	Z
VH457M03A-HX74	VHM 457-03 HX74	3	9	15	2,85	6	64	4
VH457M04A-HX74	VHM 457-04 HX74	4	12	18	3,80	6	64	4
VH457M05A-HX74	VHM 457-05 HX74	5	15	22	4,75	6	64	4
VH657M06A-HX74	VHM 657-06 HX74	6	18	24	5,75	6	64	6
VH657M08A-HX74	VHM 657-08 HX74	8	22	26	7,75	8	64	6
VH657M10A-HX74	VHM 657-10 HX74	10	27	31	9,75	10	73	6
VH657M12A-HX74	VHM 657-12 HX74	12	32	37	11,75	12	84	6
VH857M14A-HX74	VHM 857-14 HX74	14	36	42	13,75	14	93	8
VH857M16A-HX74	VHM 857-16 HX74	16	40	44	15,75	16	93	8
VH857M20A-HX74	VHM 857-20 HX74	20	45	52	19,75	20	104	8

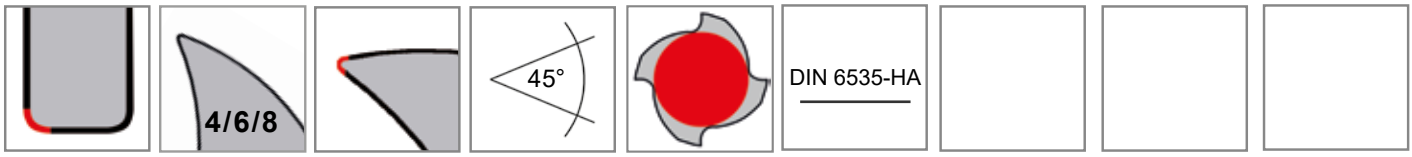
Technical Data VHM .57 R HX74





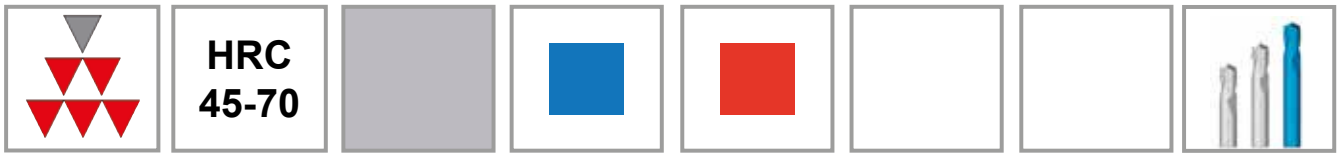
Tolerance D
ø3,0-20,0= $^{-0,02}_{-0,04}$

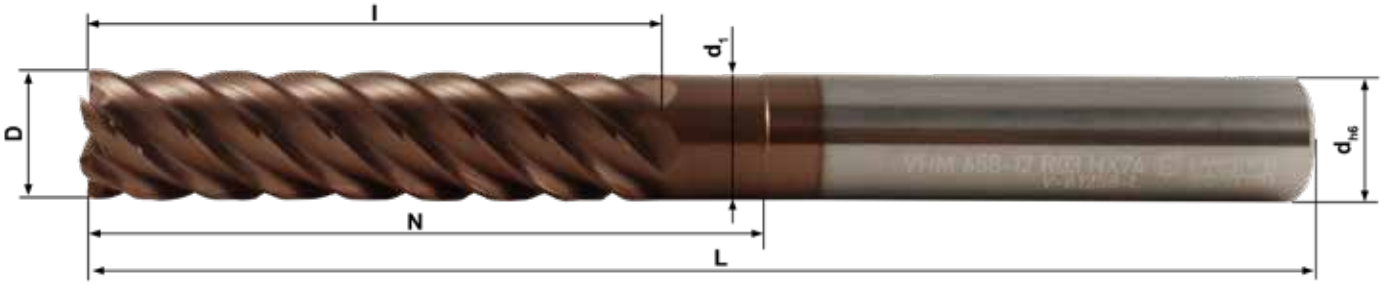
Tolerance R
ø3,0-20,0= $^{+0,01}_{-0,01}$



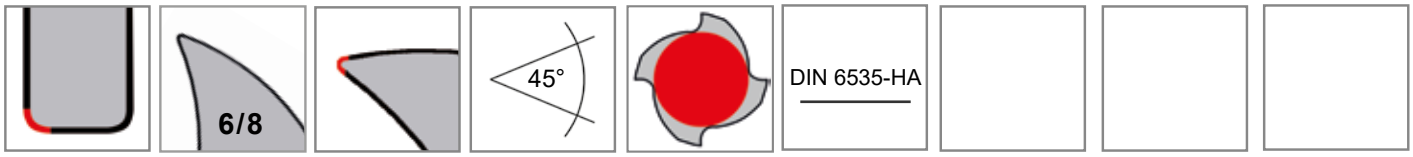
Order-No.	Article	D	R	l	N	d_1	d_{h6}	L	Z
VH457M03R01A-HX74	VHM 457-03 R01 HX74	3	0,1	9	15	2,85	6	64	4
VH457M04R01A-HX74	VHM 457-04 R01 HX74	4	0,1	12	18	3,80	6	64	4
VH457M05R01A-HX74	VHM 457-05 R01 HX74	5	0,1	15	22	4,75	6	64	4
VH657M06R01A-HX74	VHM 657-06 R01 HX74	6	0,1	18	24	5,75	6	64	6
VH657M08R02A-HX74	VHM 657-08 R02 HX74	8	0,2	22	26	7,75	8	64	6
VH657M10R02A-HX74	VHM 657-10 R02 HX74	10	0,2	27	31	9,75	10	73	6
VH657M12R03A-HX74	VHM 657-12 R03 HX74	12	0,3	32	37	11,75	12	84	6
VH857M14R03A-HX74	VHM 857-14 R03 HX74	14	0,3	36	42	13,75	14	93	8
VH857M16R03A-HX74	VHM 857-16 R03 HX74	16	0,3	40	44	15,75	16	93	8
VH857M20R04A-HX74	VHM 857-20 R04 HX74	20	0,4	45	52	19,75	20	104	8

Technical Data VHM .58 HX74



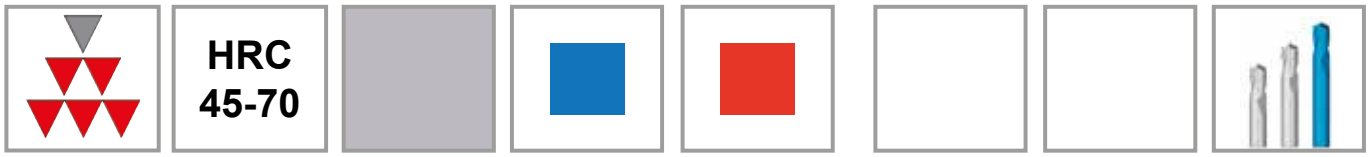


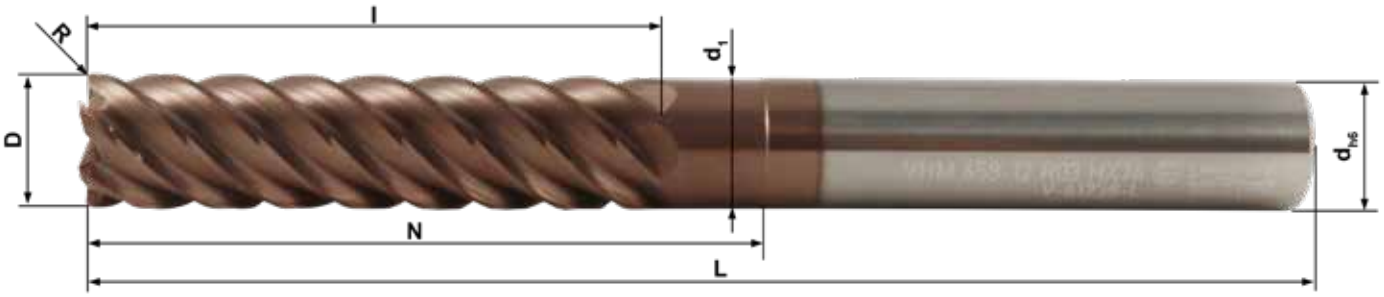
Tolerance D
ø3,0-20,0= $^{-0,02}_{-0,04}$



Order-No.	Article	D	l	N	d_1	d_{h6}	L	Z
VH657L08A-HX74	VHM 658-08 HX74	8	32	40	7,8	8	84	6
VH657L10A-HX74	VHM 658-10 HX74	10	40	50	9,8	10	93	6
VH657L12A-HX74	VHM 658-12 HX74	12	48	60	11,8	12	110	6
VH857L14A-HX74	VHM 858-14 HX74	14	56	70	13,8	14	120	8
VH857L16A-HX74	VHM 858-16 HX74	16	64	80	15,8	16	135	8
VH857L20A-HX74	VHM 858-20 HX74	20	80	100	19,8	20	150	8

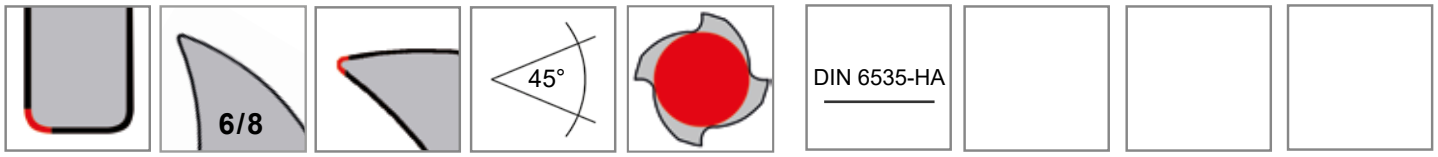
Technical Data VHM .58 R HX74





Tolerance D
ø3,0-20,0= $^{-0,02}_{-0,04}$

Tolerance R
ø3,0-20,0= $^{+0,01}_{-0,01}$



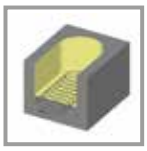
Order-No.	Article	D	R	l	N	d_1	d_{h6}	L	Z
VH657L08R02A-HX74	VHM 658-08 R02 HX74	8	0,2	32	40	7,8	8	84	6
VH657L10R02A-HX74	VHM 658-10 R02 HX74	10	0,2	40	50	9,8	10	93	6
VH657L12R03A-HX74	VHM 658-12 R03 HX74	12	0,3	48	60	11,8	12	110	6
VH857L14R03A-HX74	VHM 858-14 R03 HX74	14	0,3	56	70	13,8	14	120	8
VH857L16R03A-HX74	VHM 858-16 R03 HX74	16	0,3	64	80	15,8	16	135	8
VH857L20R04A-HX74	VHM 858-20 R04 HX74	20	0,4	80	100	19,8	20	150	8

Recommended Cutting Data – VHM .56 (R) HX74
STEP MILLING & TROCHOIDAL MILLING



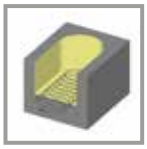
a_p < 1xD

Material	D [mm]	z	V_c [m/min]	f_z [mm]	a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	3	4	110 (90-130)	0,014 (0,007-0,020)	2,3	0,120	0,381	11.671	654
	4	4	110 (90-130)	0,021 (0,010-0,029)	3,1	0,160	0,508	8.754	736
	5	4	110 (90-130)	0,028 (0,014-0,040)	3,9	0,200	0,636	7.003	785
	6	6	110 (90-130)	0,036 (0,017-0,051)	3,1	0,240	0,764	5.836	1.261
Tool steel Tempered steel 56-63 HRC	3	4	100 (80-120)	0,013 (0,008-0,016)	2,3	0,168	0,381	10.610	552
	4	4	100 (80-120)	0,018 (0,011-0,023)	3,1	0,225	0,508	7.958	573
	5	4	100 (80-120)	0,025 (0,015-0,032)	3,9	0,282	0,636	6.366	637
	6	6	100 (80-120)	0,030 (0,019-0,039)	3,1	0,338	0,764	5.305	955
Tool steel Tempered steel 63-70 HRC	3	4	80 (60-100)	0,011 (0,009-0,011)	2,3	0,269	0,381	8.488	374
	4	4	80 (60-100)	0,014 (0,012-0,015)	3,1	0,360	0,508	6.366	357
	5	4	80 (60-100)	0,020 (0,016-0,021)	3,9	0,451	0,636	5.093	408
	6	6	80 (60-100)	0,025 (0,020-0,027)	3,1	0,541	0,764	4.244	637

a_p
1xD to 1,5xD

Material	D [mm]	z	V_c [m/min]	f_z [mm]	a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	3	4	145 (125-165)	0,026 (0,011-0,034)	4,7	0,038	0,153	15.385	1.601
	4	4	145 (125-165)	0,039 (0,017-0,050)	6,2	0,051	0,204	11.539	1.801
	5	4	145 (125-165)	0,053 (0,023-0,070)	7,8	0,064	0,255	9.231	1.957
	6	6	145 (125-165)	0,067 (0,029-0,089)	6,3	0,077	0,306	7.692	3.093
Tool steel Tempered steel 56-63 HRC	3	4	135 (115-155)	0,021 (0,012-0,028)	4,7	0,061	0,153	14.324	1.204
	4	4	135 (115-155)	0,031 (0,018-0,042)	6,2	0,082	0,204	10.743	1.333
	5	4	135 (115-155)	0,042 (0,024-0,057)	7,8	0,102	0,255	8.594	1.444
	6	6	135 (115-155)	0,053 (0,031-0,072)	6,3	0,123	0,306	7.162	2.278
Tool steel Tempered steel 63-70 HRC	3	4	120 (100-140)	0,015 (0,010-0,016)	4,7	0,125	0,153	12.732	764
	4	4	120 (100-140)	0,023 (0,015-0,024)	6,2	0,167	0,204	9.549	879
	5	4	120 (100-140)	0,030 (0,019-0,032)	7,8	0,210	0,255	7.639	917
	6	6	120 (100-140)	0,038 (0,024-0,040)	6,3	0,252	0,306	6.366	1.452

a_p
> 1,5xD

Material	D [mm]	z	V_c [m/min]	f_z [mm]	a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	3	4	160 (140-180)	0,039 (0,012-0,058)	7,0	0,023	0,076	16.977	2.649
	4	4	160 (140-180)	0,057 (0,017-0,085)	9,4	0,030	0,101	12.732	2.903
	5	4	160 (140-180)	0,079 (0,023-0,118)	11,7	0,038	0,126	10.186	3.219
	6	6	160 (140-180)	0,101 (0,030-0,151)	12,5	0,045	0,152	8.488	5.144
Tool steel Tempered steel 56-63 HRC	3	4	150 (130-170)	0,031 (0,015-0,038)	7,0	0,023	0,076	15.915	1.974
	4	4	150 (130-170)	0,045 (0,022-0,056)	9,4	0,030	0,101	11.937	2.149
	5	4	150 (130-170)	0,062 (0,030-0,077)	11,7	0,038	0,126	9.549	2.369
	6	6	150 (130-170)	0,078 (0,038-0,098)	12,5	0,045	0,152	7.958	3.725
Tool steel Tempered steel 63-70 HRC	3	4	135 (115-155)	0,022 (0,014-0,028)	7,0	0,034	0,076	14.324	1.261
	4	4	135 (115-155)	0,031 (0,020-0,040)	9,4	0,046	0,101	10.743	1.333
	5	4	135 (115-155)	0,042 (0,026-0,055)	11,7	0,058	0,126	8.594	1.444
	6	6	135 (115-155)	0,053 (0,033-0,069)	12,5	0,069	0,152	7.162	2.278

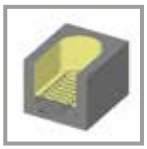
Recommended Cutting Data – VHM .57 HX74 & VHM .57 R HX74
STEP MILLING



$a_p < 1xD$

Material	D [mm]	z	V_c [m/min]		f_z [mm]		a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	3	4	110	(90-130)	0,014	(0,007-0,020)	2,3	0,120	0,369	11.671	630
	4	4	110	(90-130)	0,020	(0,010-0,029)	3,1	0,160	0,493	8.754	693
	5	4	110	(90-130)	0,027	(0,014-0,040)	3,9	0,200	0,617	7.003	756
	6	6	110	(90-130)	0,034	(0,017-0,051)	3,1	0,240	0,741	5.836	1.198
	8	6	110	(90-130)	0,049	(0,024-0,073)	4,2	0,321	0,989	4.377	1.276
	10	6	110	(90-130)	0,060	(0,030-0,090)	5,2	0,401	1,237	3.501	1.254
	12	6	110	(90-130)	0,071	(0,035-0,106)	6,3	0,482	1,485	2.918	1.240
	14	8	110	(90-130)	0,082	(0,041-0,123)	5,5	0,562	1,733	2.501	1.639
	16	8	110	(90-130)	0,094	(0,046-0,141)	6,3	0,643	1,982	2.188	1.638
	20	8	110	(90-130)	0,116	(0,057-0,175)	7,8	0,804	2,478	1.751	1.626
Tool steel Tempered steel 56-63 HRC	3	4	100	(80-120)	0,012	(0,008-0,016)	2,3	0,168	0,369	10.610	497
	4	4	100	(80-120)	0,017	(0,011-0,023)	3,1	0,225	0,493	7.958	544
	5	4	100	(80-120)	0,023	(0,015-0,032)	3,9	0,282	0,617	6.366	596
	6	6	100	(80-120)	0,029	(0,019-0,039)	3,1	0,338	0,741	5.305	917
	8	6	100	(80-120)	0,041	(0,026-0,056)	4,2	0,452	0,989	3.979	988
	10	6	100	(80-120)	0,051	(0,032-0,069)	5,2	0,565	1,237	3.183	968
	12	6	100	(80-120)	0,060	(0,038-0,082)	6,3	0,679	1,485	2.653	955
	14	8	100	(80-120)	0,069	(0,044-0,095)	5,5	0,792	1,733	2.274	1.261
	16	8	100	(80-120)	0,078	(0,050-0,107)	6,3	0,905	1,982	1.989	1.246
	20	8	100	(80-120)	0,097	(0,061-0,133)	7,8	1,132	2,478	1.592	1.238
Tool steel Tempered steel 63-70 HRC	3	4	80	(60-100)	0,010	(0,009-0,011)	2,3	0,269	0,369	8.488	336
	4	4	80	(60-100)	0,014	(0,012-0,015)	3,1	0,360	0,493	6.366	344
	5	4	80	(60-100)	0,019	(0,016-0,021)	3,9	0,451	0,617	5.093	385
	6	6	80	(60-100)	0,023	(0,020-0,027)	3,1	0,541	0,741	4.244	596
	8	6	80	(60-100)	0,033	(0,029-0,038)	4,2	0,723	0,989	3.183	636
	10	6	80	(60-100)	0,040	(0,034-0,046)	5,2	0,904	1,237	2.546	614
	12	6	80	(60-100)	0,047	(0,040-0,054)	6,3	1,085	1,485	2.122	600
	14	8	80	(60-100)	0,054	(0,046-0,062)	5,5	1,267	1,733	1.819	786
	16	8	80	(60-100)	0,061	(0,052-0,070)	6,3	1,448	1,982	1.592	779
	20	8	80	(60-100)	0,077	(0,065-0,088)	7,8	1,811	2,478	1.273	779

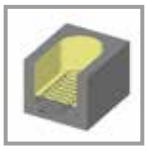
Recommended Cutting Data – VHM.57 HX74 & Solid Carbide .57 R HX74
STEP MILLING & TROCHOIDAL MILLING

ap
1xD to 1,5xD

Material	D [mm]	Z	V_c [m/min]		f_z [mm]		a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	3	4	145	(125-165)	0,025	(0,011-0,034)	4,7	0,038	0,148	15.385	1.551
	4	4	145	(125-165)	0,037	(0,017-0,050)	6,2	0,051	0,198	11.539	1.703
	5	4	145	(125-165)	0,051	(0,023-0,070)	7,8	0,064	0,247	9.231	1.894
	6	6	145	(125-165)	0,065	(0,029-0,089)	6,3	0,077	0,297	7.692	2.991
	8	6	145	(125-165)	0,093	(0,041-0,127)	8,3	0,102	0,397	5.769	3.209
	10	6	145	(125-165)	0,114	(0,050-0,156)	10,4	0,128	0,496	4.615	3.148
	12	6	145	(125-165)	0,135	(0,059-0,185)	12,5	0,153	0,596	3.846	3.108
	14	8	145	(125-165)	0,156	(0,068-0,214)	11,0	0,179	0,696	3.297	4.107
	16	8	145	(125-165)	0,177	(0,078-0,244)	12,5	0,205	0,795	2.885	4.092
	20	8	145	(125-165)	0,221	(0,097-0,304)	15,7	0,256	0,994	2.308	4.071
Tool steel Tempered steel 56-63 HRC	3	4	135	(115-155)	0,020	(0,012-0,028)	4,7	0,061	0,148	14.324	1.134
	4	4	135	(115-155)	0,030	(0,018-0,042)	6,2	0,082	0,198	10.743	1.276
	5	4	135	(115-155)	0,041	(0,024-0,057)	7,8	0,102	0,247	8.594	1.392
	6	6	135	(115-155)	0,051	(0,031-0,072)	6,3	0,123	0,297	7.162	2.204
	8	6	135	(115-155)	0,073	(0,043-0,103)	8,3	0,164	0,397	5.371	2.349
	10	6	135	(115-155)	0,089	(0,053-0,126)	10,4	0,205	0,496	4.297	2.297
	12	6	135	(115-155)	0,105	(0,062-0,148)	12,5	0,246	0,596	3.581	2.262
	14	8	135	(115-155)	0,122	(0,072-0,171)	11,0	0,288	0,696	3.069	2.983
	16	8	135	(115-155)	0,139	(0,082-0,196)	12,5	0,329	0,795	2.686	2.978
	20	8	135	(115-155)	0,172	(0,101-0,243)	15,7	0,411	0,994	2.149	2.955
Tool steel Tempered steel 63-70 HRC	3	4	120	(100-140)	0,014	(0,010-0,016)	4,7	0,125	0,148	12.732	733
	4	4	120	(100-140)	0,022	(0,015-0,024)	6,2	0,167	0,198	9.549	825
	5	4	120	(100-140)	0,029	(0,019-0,032)	7,8	0,210	0,247	7.639	880
	6	6	120	(100-140)	0,036	(0,024-0,040)	6,3	0,252	0,297	6.366	1.375
	8	6	120	(100-140)	0,051	(0,034-0,057)	8,3	0,336	0,397	4.775	1.470
	10	6	120	(100-140)	0,062	(0,041-0,069)	10,4	0,420	0,496	3.820	1.423
	12	6	120	(100-140)	0,073	(0,048-0,081)	12,5	0,505	0,596	3.183	1.392
	14	8	120	(100-140)	0,084	(0,055-0,093)	11,0	0,589	0,696	2.728	1.827
	16	8	120	(100-140)	0,095	(0,063-0,106)	12,5	0,673	0,795	2.387	1.822
	20	8	120	(100-140)	0,118	(0,077-0,132)	15,7	0,842	0,994	1.910	1.802

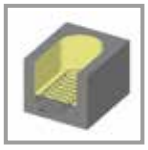
Recommended Cutting Data – VHM.57 HX74 & Solid Carbide .57 R HX74
STEP MILLING & TROCHOIDAL MILLING

ap
> 1,5xD

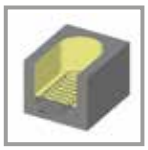
Material	D [mm]	Z	V_c [m/min]		f_z [mm]		a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	3	4	160	(140-180)	0,038	(0,012-0,058)	7,0	0,023	0,073	16.977	2.567
	4	4	160	(140-180)	0,055	(0,017-0,085)	9,4	0,030	0,098	12.732	2.796
	5	4	160	(140-180)	0,077	(0,023-0,118)	11,7	0,038	0,122	10.186	3.117
	6	6	160	(140-180)	0,097	(0,030-0,151)	12,5	0,045	0,147	8.488	4.950
	8	6	160	(140-180)	0,140	(0,042-0,216)	16,7	0,061	0,196	6.366	5.328
	10	6	160	(140-180)	0,171	(0,052-0,265)	20,9	0,076	0,245	5.093	5.216
	12	6	160	(140-180)	0,202	(0,061-0,313)	25,1	0,091	0,295	4.244	5.141
	14	8	160	(140-180)	0,233	(0,070-0,362)	27,4	0,106	0,344	3.638	6.784
	16	8	160	(140-180)	0,266	(0,080-0,412)	31,4	0,121	0,393	3.183	6.761
	20	8	160	(140-180)	0,330	(0,099-0,513)	39,2	0,152	0,491	2.546	6.728
Tool steel Tempered steel 56-63 HRC	3	4	150	(130-170)	0,030	(0,015-0,038)	7,0	0,023	0,073	15.915	1.891
	4	4	150	(130-170)	0,043	(0,022-0,056)	9,4	0,030	0,098	11.937	2.063
	5	4	150	(130-170)	0,059	(0,030-0,077)	11,7	0,038	0,122	9.549	2.269
	6	6	150	(130-170)	0,076	(0,038-0,098)	12,5	0,045	0,147	7.958	3.610
	8	6	150	(130-170)	0,108	(0,055-0,140)	16,7	0,061	0,196	5.968	3.867
	10	6	150	(130-170)	0,132	(0,067-0,170)	20,9	0,076	0,245	4.775	3.773
	12	6	150	(130-170)	0,155	(0,078-0,201)	25,1	0,091	0,295	3.979	3.710
	14	8	150	(130-170)	0,179	(0,090-0,232)	27,4	0,106	0,344	3.410	4.886
	16	8	150	(130-170)	0,203	(0,102-0,263)	31,4	0,121	0,393	2.984	4.856
	20	8	150	(130-170)	0,253	(0,127-0,327)	39,2	0,152	0,491	2.387	4.829
Tool steel Tempered steel 63-70 HRC	3	4	135	(115-155)	0,021	(0,014-0,028)	7,0	0,034	0,073	14.324	1.186
	4	4	135	(115-155)	0,030	(0,020-0,040)	9,4	0,046	0,098	10.743	1.276
	5	4	135	(115-155)	0,041	(0,026-0,055)	11,7	0,058	0,122	8.594	1.392
	6	6	135	(115-155)	0,051	(0,033-0,069)	12,5	0,069	0,147	7.162	2.204
	8	6	135	(115-155)	0,072	(0,047-0,097)	16,7	0,092	0,196	5.371	2.320
	10	6	135	(115-155)	0,088	(0,057-0,119)	20,9	0,115	0,245	4.297	2.259
	12	6	135	(115-155)	0,103	(0,067-0,140)	25,1	0,139	0,295	3.581	2.217
	14	8	135	(115-155)	0,119	(0,077-0,161)	27,4	0,162	0,344	3.069	2.917
	16	8	135	(115-155)	0,134	(0,086-0,182)	31,4	0,185	0,393	2.686	2.882
	20	8	135	(115-155)	0,167	(0,107-0,226)	39,2	0,231	0,491	2.149	2.862

Recommended Cutting Data – VHM .58 (R) HX74
STEP MILLING

ap
1,5xD to 2,5xD

Material	D [mm]	z	V_c [m/min]		f_z [mm]		a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	8	6	160	(140-180)	0,137	(0,042-0,216)	16,7	0,061	0,196	6.366	5.328
	10	6	160	(140-180)	0,167	(0,052-0,265)	20,9	0,076	0,245	5.093	5.216
	12	6	160	(140-180)	0,198	(0,061-0,313)	25,1	0,091	0,295	4.244	5.141
	14	8	160	(140-180)	0,228	(0,070-0,362)	27,4	0,106	0,344	3.638	6.784
	16	8	160	(140-180)	0,260	(0,080-0,412)	31,4	0,121	0,393	3.183	6.761
	20	8	160	(140-180)	0,324	(0,099-0,513)	39,2	0,152	0,491	2.546	6.728
Tool steel Tempered steel 56-63 HRC	8	6	150	(130-170)	0,106	(0,055-0,140)	16,7	0,061	0,196	5.968	3.867
	10	6	150	(130-170)	0,129	(0,067-0,170)	20,9	0,076	0,245	4.775	3.773
	12	6	150	(130-170)	0,152	(0,078-0,201)	25,1	0,091	0,295	3.979	3.710
	14	8	150	(130-170)	0,176	(0,090-0,232)	27,4	0,106	0,344	3.410	4.886
	16	8	150	(130-170)	0,199	(0,102-0,263)	31,4	0,121	0,393	2.984	4.856
	20	8	150	(130-170)	0,248	(0,127-0,327)	39,2	0,152	0,491	2.387	4.829
Tool steel Tempered steel 63-70 HRC	8	6	135	(115-155)	0,071	(0,047-0,097)	16,7	0,092	0,196	5.371	2.320
	10	6	135	(115-155)	0,086	(0,057-0,119)	20,9	0,115	0,245	4.297	2.259
	12	6	135	(115-155)	0,101	(0,067-0,140)	25,1	0,139	0,295	3.581	2.217
	14	8	135	(115-155)	0,116	(0,077-0,161)	27,4	0,162	0,344	3.069	2.917
	16	8	135	(115-155)	0,131	(0,086-0,182)	31,4	0,185	0,393	2.686	2.882
	20	8	135	(115-155)	0,163	(0,107-0,226)	39,2	0,231	0,491	2.149	2.862

ap
< 2,5xD

Material	D [mm]	z	V_c [m/min]		f_z [mm]		a_p [mm]	min a_e [mm]	max a_e [mm]	n [min^{-1}]	V_f [mm/min]
Tool steel Tempered steel 1.200-1.600 N/mm² 45-56 HRC	8	6	150	(140-180)	0,137	(0,042-0,216)	29,2	0,061	0,186	5.968	4.895
	10	6	150	(140-180)	0,167	(0,052-0,265)	36,5	0,076	0,232	4.774	4.791
	12	6	150	(140-180)	0,198	(0,061-0,313)	43,8	0,091	0,280	3.978	4.722
	14	8	150	(140-180)	0,228	(0,070-0,362)	54,8	0,106	0,326	3.410	6.231
	16	8	150	(140-180)	0,260	(0,080-0,412)	62,7	0,121	0,373	2.984	6.211
	20	8	150	(140-180)	0,324	(0,099-0,513)	78,4	0,152	0,466	2.387	6.181
Tool steel Tempered steel 56-63 HRC	8	6	140	(130-170)	0,106	(0,055-0,140)	29,2	0,061	0,186	5.570	3.537
	10	6	140	(130-170)	0,129	(0,067-0,170)	36,5	0,076	0,232	4.456	3.450
	12	6	140	(130-170)	0,152	(0,078-0,201)	43,8	0,091	0,280	3.713	3.392
	14	8	140	(130-170)	0,176	(0,090-0,232)	54,8	0,106	0,326	3.183	4.469
	16	8	140	(130-170)	0,199	(0,102-0,263)	62,7	0,121	0,373	2.785	4.441
	20	8	140	(130-170)	0,248	(0,127-0,327)	78,4	0,152	0,466	2.228	4.417
Tool steel Tempered steel 63-70 HRC	8	6	120	(115-155)	0,071	(0,047-0,097)	29,2	0,092	0,186	4.774	2.021
	10	6	120	(115-155)	0,086	(0,057-0,119)	36,5	0,115	0,232	3.819	1.967
	12	6	120	(115-155)	0,101	(0,067-0,140)	43,8	0,139	0,280	3.183	1.931
	14	8	120	(115-155)	0,116	(0,077-0,161)	54,8	0,162	0,326	2.728	2.540
	16	8	120	(115-155)	0,131	(0,086-0,182)	62,7	0,185	0,373	2.387	2.509
	20	8	120	(115-155)	0,163	(0,107-0,226)	78,4	0,231	0,466	1.909	2.491



Explanation of symbols


Pre-finishing


Finishing


Hard machining


Steel


Cast iron GG(G)


Step milling,
contour milling


Milling with trochoidal
strategy



Depending on the diameter,
these tools feature 4, 6, or 8
cutting edges


Edge design of the milling
cutter: Sharp (90°)


Edge design of the milling
cutter: with radius



Helix angle



Cylindrical shank


Stable core


Prepared
cutting edge



This tool is designed with
a short-size length



This tool has a medium-
long design



This tool is designed with
a long-size length

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.

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