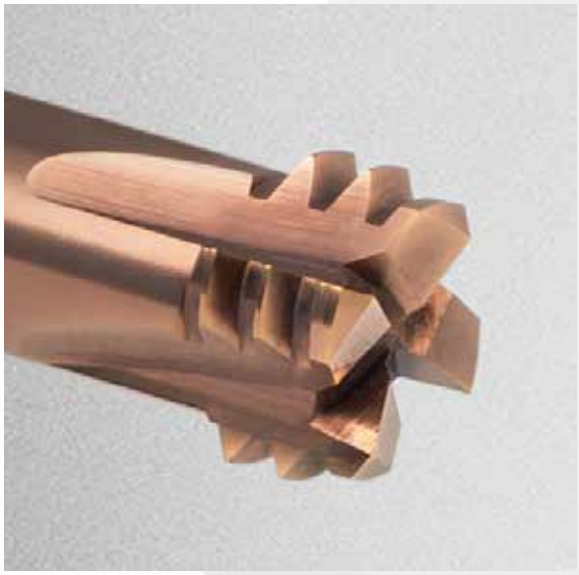
EN

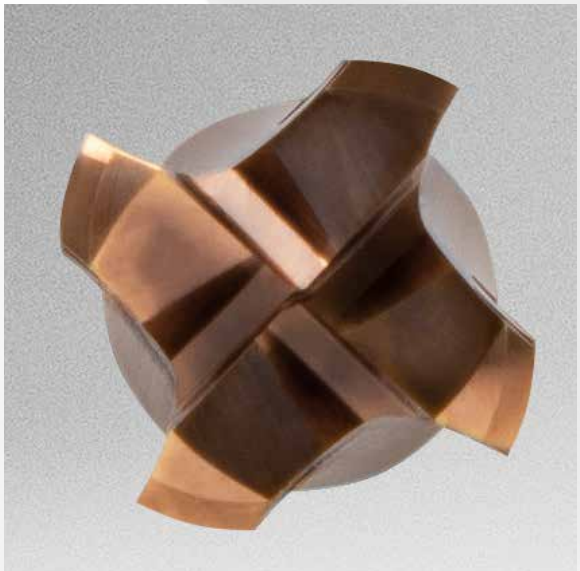
HARTNER

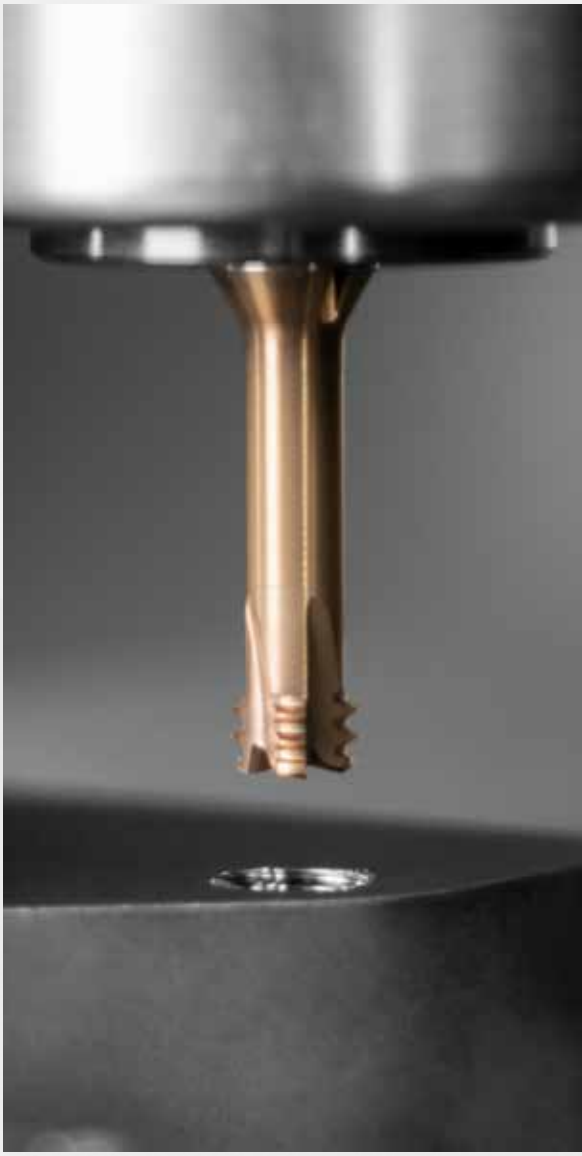
Precision Cutting Tools

HELICAL DRILL THREAD MILLING CUTTER

HELICAL DRILL THREAD MILLING INTO SOLID MATERIAL
UP TO 66 HRC



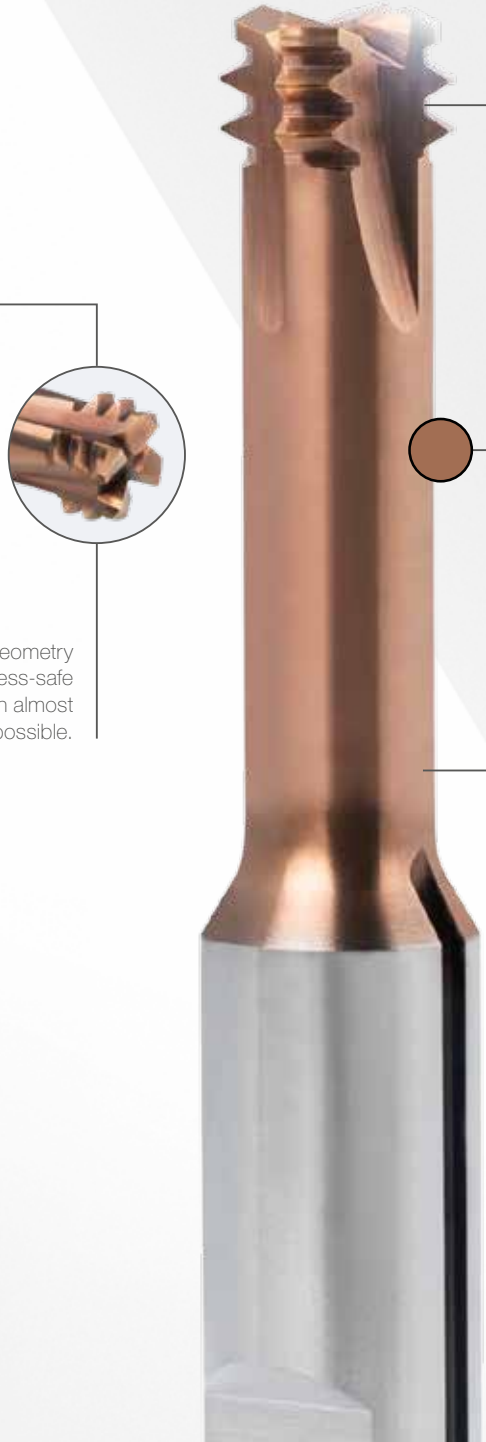




+ NEW: Free programming software to download

HELICAL DRILL THREAD MILLING INTO SOLID MATERIAL UP TO 66 HRC MGFRH 3-Z

- process reliability and true to gauge threads guaranteed
- excellent machining results in dry and wet machining
- core holes and threads in one step: significantly shorter cycle and setting time
- universally applicable in unhardened and hardened materials up to 66 HRC



Thanks to the **left cutting geometry** the tool stabilises itself during the climb milling process – perfect, true to gauge threads up to 66 HRC are guaranteed.

Two oil grooves on the shaft ensure optimum cooling with emulsion or air.

Thanks to the **temperature-resistant TiSiN coating,** dry and wet machining is possible.

Thanks to the special face geometry with hollow grinding, the process-safe core hole and thread milling in almost all steels is possible.

The MGFRH 3-Z is made of a **special fine-grained carbide,** which is characterised by its high hardness and is optimally suited for hard machining.

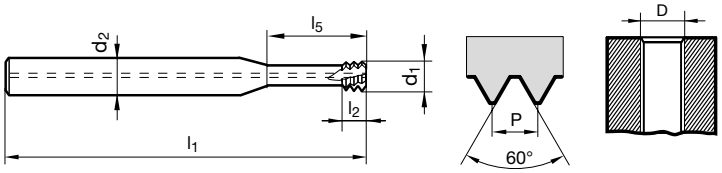
Micro thread milling cutters

Article no. 80356

P	M	K	N	S	H
•	•	•	•	•	≤ 65

VHM | MGFRH 3-Z | 2,5xD | WN | L | HB | C

with cooling grooves



D	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	Z	Code no.
M2	0.400	1.400	3.000	39.000	1.200	5.000	4	2.000
M2.5	0.450	1.800	3.000	39.000	1.300	6.500	4	2.500
M3	0.500	2.400	6.000	58.000	1.500	7.500	4	3.000
M3.5	0.600	2.700	6.000	58.000	1.800	9.000	4	3.500
M4	0.700	3.100	6.000	58.000	2.100	10.000	4	4.000
M5	0.800	3.800	6.000	58.000	2.400	12.500	4	5.000
M6 + M7	1.000	4.600	8.000	64.000	3.000	15.000	4	6.000
M8 + M9	1.250	6.200	8.000	64.000	3.600	20.000	4	8.000
M10 + M12	1.500	7.500	10.000	73.000	4.500	25.000	4	10.000
M12	1.750	9.000	10.000	73.000	5.200	30.000	4	12.000
M16	2.000	11.500	12.000	90.000	6.000	40.000	4	16.000

APPLICATION EXAMPLE

Component:	Injection moulding tool
Thread dimension:	M8x(1.25), depth 16 mm, blind hole
Tool:	Article 80356 MGFRH 3-Z M8 2.5xD
Material:	1.2379 / 60+2 HRC
Parameter:	v_c = 30 m/min, f_z = 0.02 mm (climb milling, M4 counter clockwise)
Coolant:	dry (with air)

60+2 HRC

› ***Tool life: 138 threads incl. core holes***

APPLICATION EXAMPLE

Component:	Holder
Thread dimension:	M6x(1), depth 13 mm, blind hole
Tool:	Article 80356 MGFRH 3-Z M6 2.5xD
Material:	1.4301
Parameter:	v_c = 50 m/min, f_z = 0.02 mm (climb milling, M4 counter clockwise)
Coolant:	Emulsion 8 %

VA 1.4301

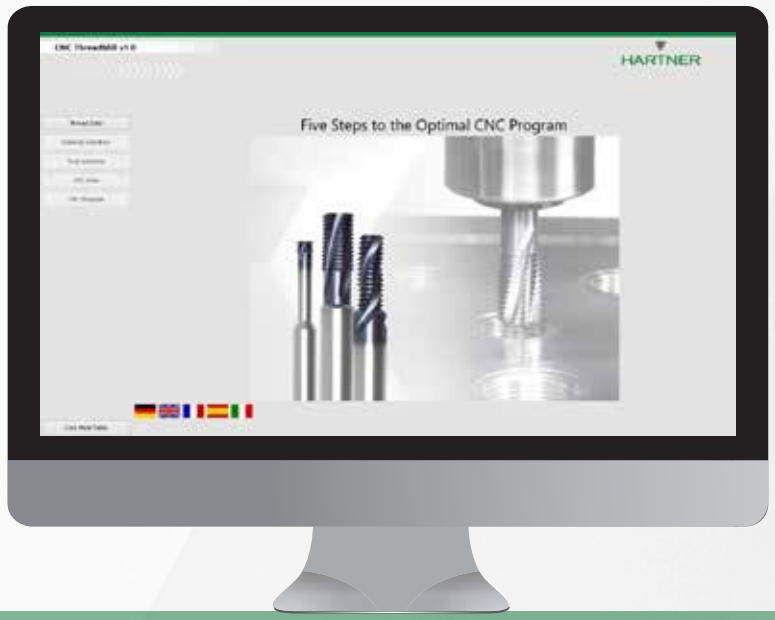
› ***Tool life: 618 threads incl. core holes***

CNC ThreadMill

Version v1.0

Free programming software

for thread milling cutters and drill thread milling cutters



In order to make the machining with Hartner thread milling cutters even more user friendly, we have developed the intuitive "CNC ThreadMill v1.0".

"CNC ThreadMill v1.0" is available free-of-charge. Simply download it from our homepage www.hartner.de!

To the optimal CNC programme in five steps

1. Specify the thread data
   Select from all current thread standards
2. Select the material
   You are always referred to the optimal parameters
3. Select the tool
   Technical data, drawing, machining time and video simplify selection
4. Record CNC data
   Enter required milling strategy and parameters
5. Receive CNC programme with code and data sheet
   Programming data (Sinumerik, Haidenhain, Fanuc, Philips, Mazatrol or Hurco) are imported and automatically recognised

Application recommendations MGFRH 3-Z

Please note, M4 counter clockwise

ISO		Material group	Hardness	Example materials	Material no.	Cutting speed v_c (m/min)
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	< 800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	80
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800-1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	70
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800-1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	70
M	M1	Stainless steels, sulphured, austenitic	< 1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	55
	M2	Stainless- and acidresistant steels, martensitic	< 1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	50
	M3	Duplex and Super Duplex	< 1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWn25-7-4	1.4462 1.441 1.4501	50
K	K1	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.603	80
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.704 0.706 0.707	75
	K3	ADI, GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		65
N	N1	Aluminium and wrought alloys	< 450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.025 3.2315 3.4335	x
	N2	Al cast alloys	< 600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	120
	N3	Magnesium alloys	< 500 N/mm²	GDMgAl8Zn1	3.5812.08	x
	N4	Copper and copper alloys	long-chipping short-chipping	CuZn20 CuZn37Pb0,5 CuZn39Pb2 CuZn43Pb2	2.025 2.0332 2.038 2.041	80
	N5	Copper special alloys	< 1400 N/mm²	Ampco		65
	N6	Plastics［Thermoplastics, Duroplastics］	long-chipping short-chipping	PMMA, POM,PVC Pertinax		x
S	S1	Ti and Ti alloys	< 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.7025 3.7115 3.7165	45
	S2	Nickel, cobalt and iron alloys	< 1400 N/mm²	Hasteloy C4 Inconel 718 Nimonic	2.461 2.4668 2.4634	45
H	H1 H2	High tensile steels, hardened steels	45-55 HRC 55-66 HRC	Hardox PM30		40 30

Please note:
The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)
Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30 %!

80356


Milling part diameter [d1] / feed per tooth [f_z] [climb milling]											
M2	**M2.5**	**M3**	**M3.5**	**M4**	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**	
0,4	**0,45**	**0,5**	**0,6**	**0,7**	**0,8**	**1,0**	**1,25**	**1,5**	**1,75**	**2**	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
0.008	0.008	0.012	0.014	0.018	0.026	0.028	0.030	0.035	0.040	0.048	●●
0.008	0.008	0.012	0.014	0.018	0.026	0.028	0.030	0.035	0.040	0.048	●●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●
0.005	0.005	0.007	0.008	0.010	0.014	0.016	0.018	0.020	0.026	0.033	●●
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●
0.007	0.007	0.011	0.013	0.015	0.018	0.022	0.028	0.033	0.038	0.046	●●
x	x	x	x	x	x	x	x	x	x	x	○
0.007	0.007	0.011	0.013	0.015	0.018	0.022	0.028	0.033	0.038	0.046	●●
x	x	x	x	x	x	x	x	x	x	x	○
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.048	●●
x	x	x	x	x	x	x	x	x	x	x	○
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●
0.007 0.005	0.007 0.005	0.010 0.008	0.011 0.009	0.012 0.010	0.016 0.014	0.020 0.018	0.025 0.022	0.030 0.028	0.036 0.033	0.044 0.042	●● ●●

●● optimally suited
● suited
○ not suitable

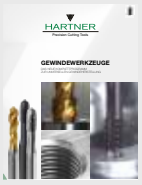
THE HARTNER PROGRAMME

▼ FU 500 / FN 500

▼ GUN DRILLS

▼ INOX DRILLS

▼ MICRO-PRECISION DRILLS



▼ THREADING TOOLS

▼ TS-DRILLS

▼ TF 100 MULTI-MILL

▼ SOLID CARBIDE
MILLING CUTTERS

▼ CHAMFERING
MILLING CUTTERS

▼ MULTIPLEX

▼ MULTIPLEX HPC

▼ TM VENDING MACHINES

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