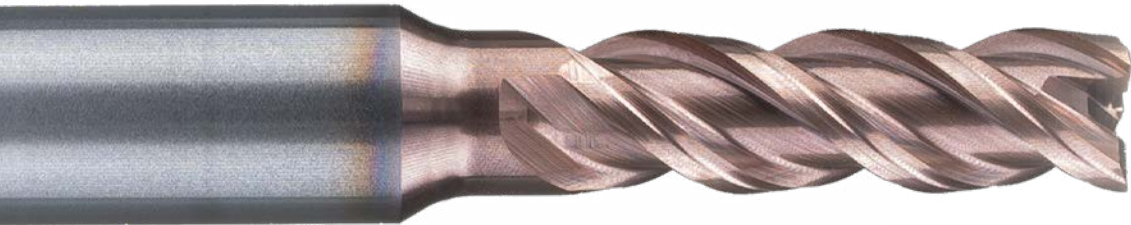


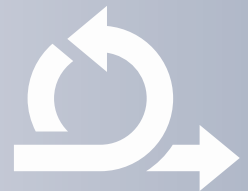
INOX GROOVER

3D plunge & ramp mill

HBmicrotec[®]
ACTIONTOOLS & ENGINEERING



ACTIONMILL[®]
by HB microtec
INOX-Groover



Description

The new ACTIONMILL® INOX-Groover from HB microtec® was developed specifically as a plunge & ramp mill to plunge at extreme angles. With the new Groover, the same mill can therefore be used for roughing and finishing.

Users can now ramp up to 70°, mill full slots and plunge vertically at 90° (drill) with just one milling tool – with high cutting values and cutting depths and consistently very good machining quality.

Particularly in medical technology, components have to be made from hard, heat-resistant, abrasive and difficult-to-machine materials such as cobalt-chrome, nickel and titanium alloys. With the new ACTIONMILL® INOX-Groover 3D plunge & ramp mills, this is achieved far more reliably and faster than before.

With or without internal cooling channels

There is one version without and a second with several cooling channels integrated in the shank of the milling tools (ACTIONMILL® Groover cooled).

The Groover cooled guide the coolant all around the entire tool circumference into the cutting zone. This reliably removes the chips and cools the tool more effectively.

The cutting lengths 1.5xD and 3xD are available from stock.

Resistant to changing temperatures

The Groovers are available from stock in diameters from 0.7 to 8 mm and for a maximum milling depth of up to 3xD. HB microtec offers a toric version with different corner radii and a version with a corner chamfer, which can be described as a protective chamfer. It is designed small at 45°, which is why it can be described as “sharp”.

A sophisticated, specially developed cutting edge geometry combined with very smooth surfaces, a high-performance coating and an ultra-fine-grain solid carbide with cooling channels through the shank make the ACTIONMILL® Groover the best-performance 3D plunge & ramp mill.

Thanks to the INOX cutting edge geometry, the three-flute mills generate less cutting pressure and thus place less stress on the component.

10x tool path life

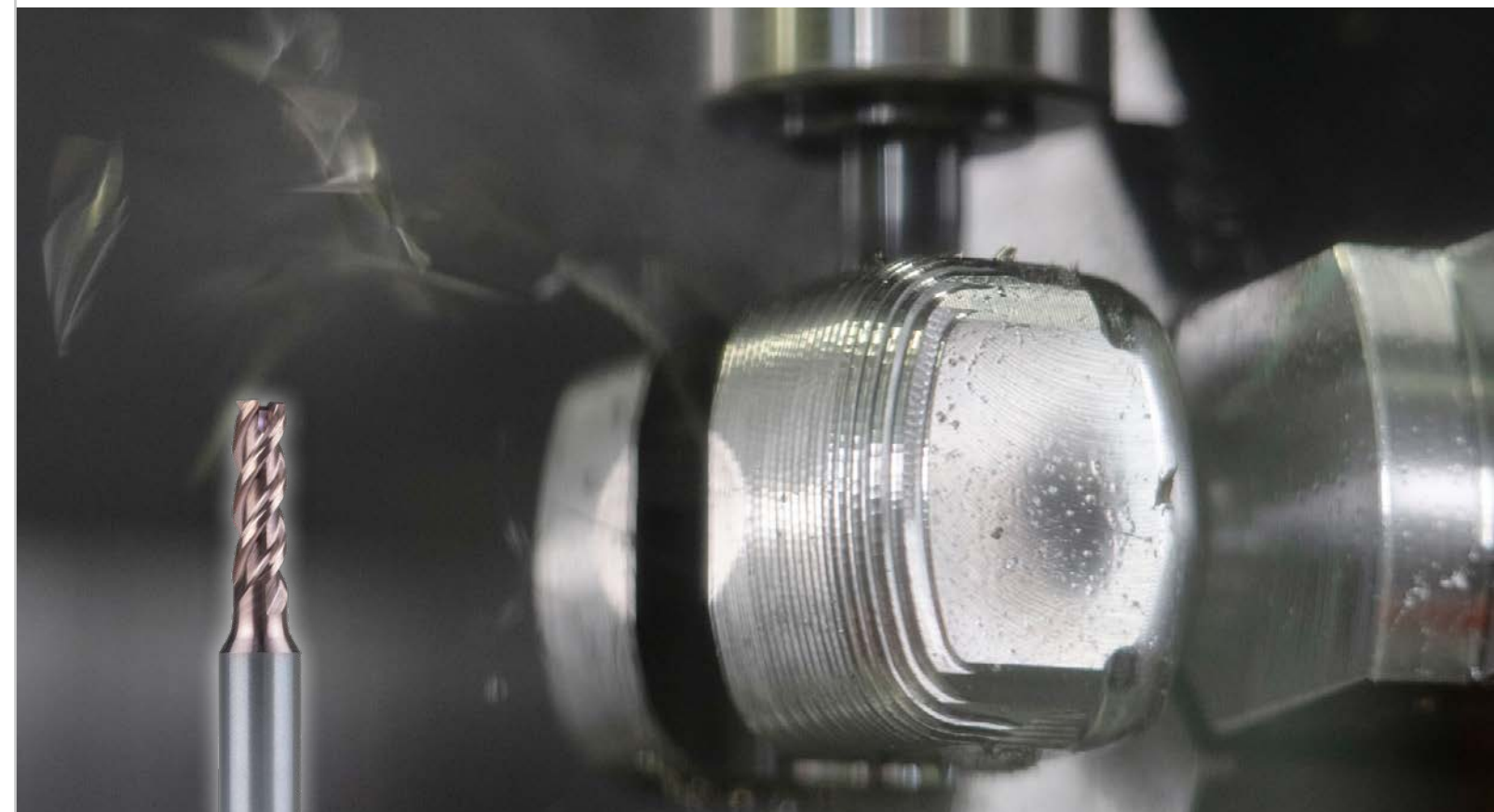
in 3D finishing of hard alloys!

4x tool path life

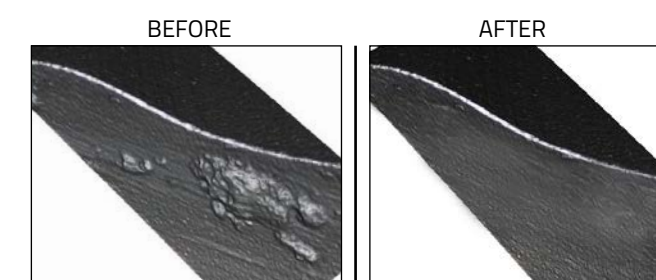
in 3D roughing of hard alloys!

The specific tool properties of the Groover plunge and ramp mills result from the geometry, the coating, the carbide substrate, the edge preparation and the internal cooling. All of these features affect tool life and performance.

HB microtec® will also be happy to develop custom-ground 3D plunge & ramp mills for you that are always geared to the machining task.



Surface and edge preparation



Cutting edge and surface in detail



INOX-Groover

from Ø 0.7
to Ø 8.0

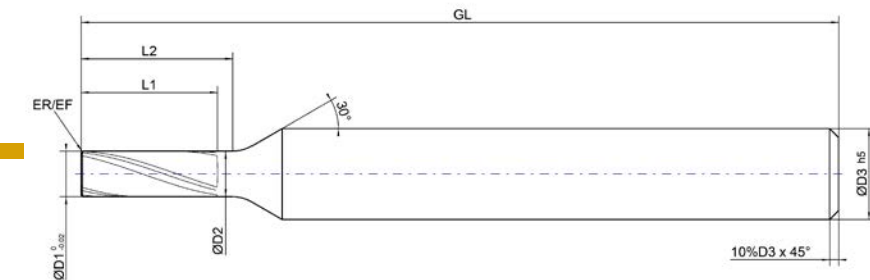
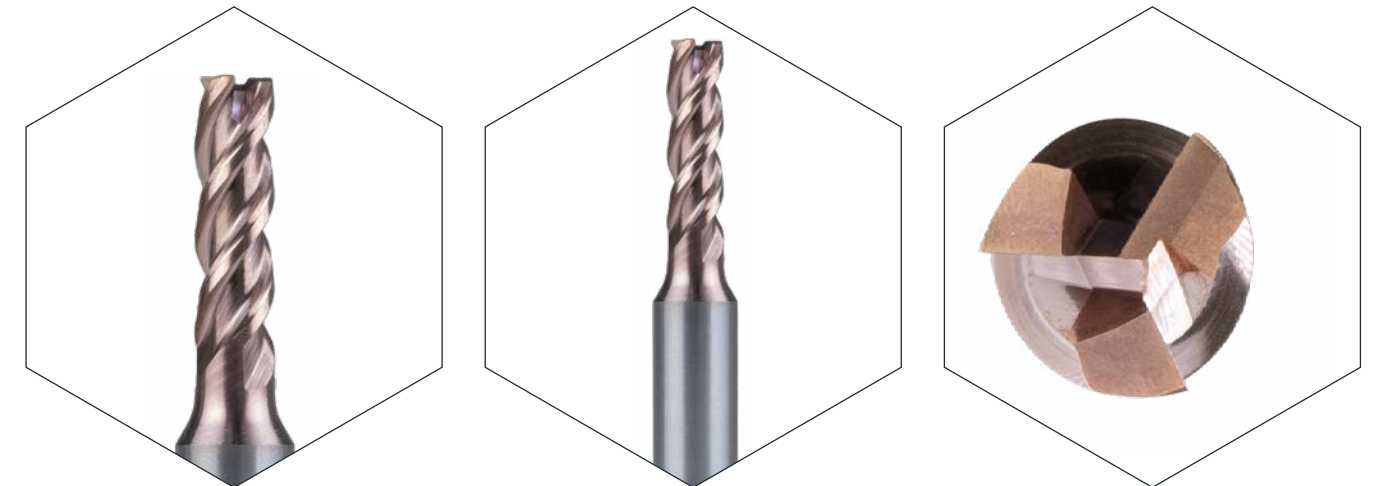
Face geometry optimized for
INOX with 3 flutes, suitable for
vertical plunging.

1.5xD & 3xD

The high-performance α -INOX
coating guarantees a long tool
life and prevents the cutting edge
from sticking.

The reinforced shank in h5
quality combined with an
optimized effective length
makes the tool robust and
vibration-free.

High feed and cutting
speeds are made possible
by the use of fine-grain solid
carbide with high fracture
toughness.



☐ Order

Order number: _____

☐ Inquiry

Dimensions:

D₁: _____ GL: _____ EF: ☐

D₂: _____ L₁: _____ ER: ☐

D₃: _____ L₂: _____ Z: _____

Coating:

☐ Coated*: _____

☐ Uncoated

Cooling channels:

☐ Yes ☐ No

Cutting direction:

☐ Left ☐ Right

Material to be machined:

Shank shape:

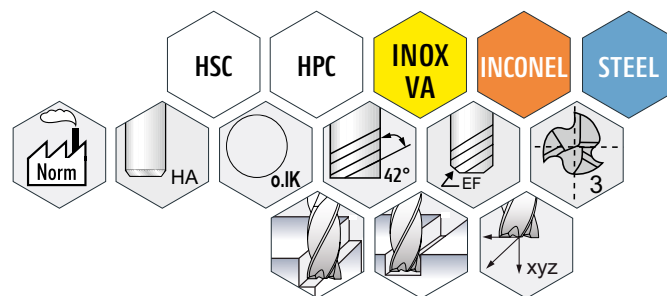
Quantity:

Date, signature & company stamp:

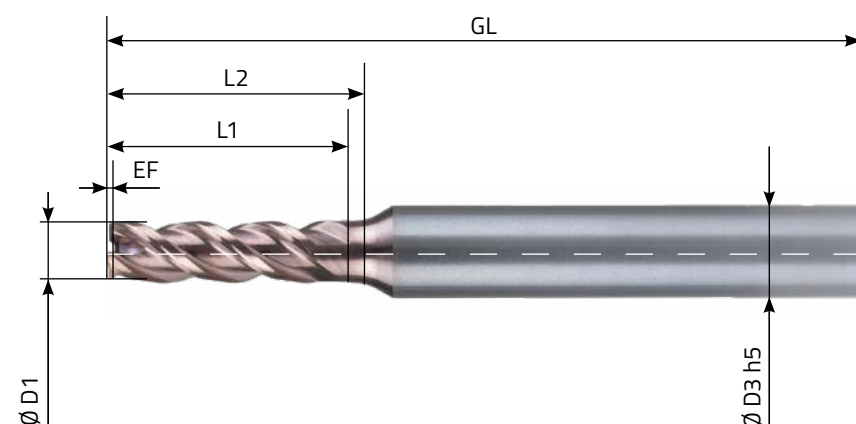
Contact person:

* Without further information, the most suitable coating will be used.

1.5xD INOX-Groover



ACTIONMILL Groover
AM.GR.100.150-1.5D
D1: Ø 1.00 mm L1: 1.50 mm



5 PRO's of the ACTIONMILL:

- Plunging, ramping (70°) or vertical (90°) drilling possible
- Roughing and finishing with just one tool
- High feed rates possible
- Short process times and high process reliability
- Long tool life

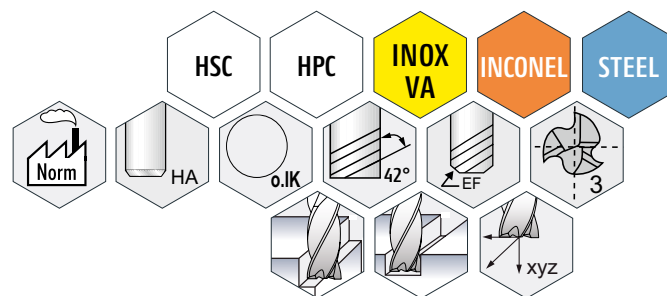
Article number	D1 +0/-0.02 (mm)	D1 (inch)	D3 h5 (mm)	L1 (1.5xD1/mm)	L2 (mm)	EF (45°) (mm)	GL (mm)
AM.GR.070.100-1.5D	Ø 0.700	-	Ø 4.00	1.00	1.80	0.02	40.00
AM.GR.080.120-1.5D	Ø 0.800	-	Ø 4.00	1.20	2.00	0.02	40.00
AM.GR.090.130-1.5D	Ø 0.900	-	Ø 4.00	1.30	2.30	0.02	40.00
AM.GR.100.150-1.5D	Ø 1.000	-	Ø 4.00	1.50	2.50	0.03	40.00
AM.GR.120.180-1.5D	Ø 1.200	-	Ø 4.00	1.80	3.00	0.03	40.00
AM.GR.150.220-1.5D	Ø 1.500	-	Ø 4.00	2.20	3.30	0.03	40.00
AM.GR.1587.240-1.5D	Ø 1.587	1/16"	Ø 4.00	2.40	3.40	0.03	40.00
AM.GR.180.270-1.5D	Ø 1.800	-	Ø 4.00	2.70	3.70	0.03	50.00
AM.GR.200.300-1.5D	Ø 2.000	-	Ø 4.00	3.00	4.00	0.03	50.00
AM.GR.220.330-1.5D	Ø 2.200	-	Ø 4.00	3.30	4.30	0.03	50.00
AM.GR.2381.360-1.5D	Ø 2.381	3/32"	Ø 4.00	3.60	4.60	0.05	50.00
AM.GR.250.370-1.5D	Ø 2.500	-	Ø 6.00	3.70	4.80	0.05	50.00
AM.GR.280.420-1.5D	Ø 2.800	-	Ø 6.00	4.20	5.20	0.05	50.00
AM.GR.300.450-1.5D	Ø 3.000	-	Ø 6.00	4.50	5.50	0.05	50.00
AM.GR.3175.480-1.5D	Ø 3.175	1/8"	Ø 6.00	4.80	5.80	0.05	50.00
AM.GR.350.520-1.5D	Ø 3.500	-	Ø 6.00	5.20	6.30	0.05	50.00
AM.GR.370.550-1.5D	Ø 3.700	-	Ø 6.00	5.50	6.60	0.05	50.00
AM.GR.3968.600-1.5D	Ø 3.968	5/32"	Ø 6.00	6.00	6.90	0.05	50.00
AM.GR.400.600-1.5D	Ø 4.000	-	Ø 6.00	6.00	6.90	0.05	50.00
AM.GR.430.650-1.5D	Ø 4.300	-	Ø 8.00	6.50	7.40	0.05	68.00
AM.GR.4762.710-1.5D	Ø 4.762	3/16"	Ø 8.00	7.10	8.20	0.05	68.00
AM.GR.500.750-1.5D	Ø 5.000	-	Ø 8.00	7.50	8.50	0.05	68.00
AM.GR.5556.830-1.5D	Ø 5.556	7/32"	Ø 8.00	8.30	9.40	0.05	68.00
AM.GR.600.900-1.5D	Ø 6.000	-	Ø 8.00	9.00	10.00	0.05	68.00
AM.GR.6350.900-1.5D	Ø 6.350	1/4"	Ø 10.00	9.00	10.00	0.05	80.00
AM.GR.800.1200-1.5D	Ø 8.000	-	Ø 10.00	12.00	13.00	0.05	80.00

Available from stock

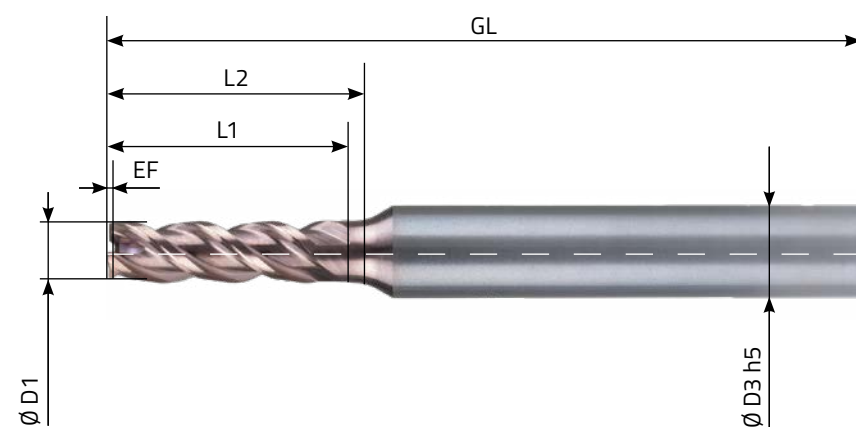
- α-INOX coated



3xD INOX-Groover



ACTIONMILL Groover
AM.GR.100.300
D1: Ø 1.00 mm L1: 3.00 mm



5 PRO's of the ACTIONMILL:

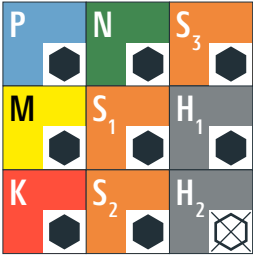
- Plunging, ramping (70°) or vertical (90°) drilling possible
- Roughing and finishing with just one tool
- High feed rates possible
- Short process times and high process reliability
- Long tool life

Article number	D1 +0/-0.02 (mm)	D1 (inch)	D3 h5 (mm)	L1 (3xD1/mm)	L2 (mm)	EF (45°) (mm)	GL (mm)
AM.GR.070.210	Ø 0.700	-	Ø 4.00	2.10	2.80	0.02	40.00
AM.GR.080.240	Ø 0.800	-	Ø 4.00	2.40	3.20	0.02	40.00
AM.GR.090.270	Ø 0.900	-	Ø 4.00	2.70	3.60	0.02	40.00
AM.GR.100.300	Ø 1.000	-	Ø 4.00	3.00	4.00	0.03	40.00
AM.GR.120.360	Ø 1.200	-	Ø 4.00	3.60	4.60	0.03	40.00
AM.GR.150.450	Ø 1.500	-	Ø 4.00	4.50	5.50	0.03	40.00
AM.GR.1587.480	Ø 1.587	1/16"	Ø 4.00	4.60	5.80	0.03	40.00
AM.GR.180.540	Ø 1.800	-	Ø 4.00	5.40	6.40	0.03	50.00
AM.GR.200.600	Ø 2.000	-	Ø 4.00	6.00	7.00	0.03	50.00
AM.GR.220.660	Ø 2.200	-	Ø 4.00	6.60	7.60	0.03	50.00
AM.GR.2381.720	Ø 2.381	3/32"	Ø 4.00	7.20	8.20	0.05	50.00
AM.GR.250.750	Ø 2.500	-	Ø 6.00	7.50	8.50	0.05	50.00
AM.GR.280.840	Ø 2.800	-	Ø 6.00	8.40	9.40	0.05	50.00
AM.GR.300.900	Ø 3.000	-	Ø 6.00	9.00	10.00	0.05	50.00
AM.GR.3175.960	Ø 3.175	1/8"	Ø 6.00	9.60	10.60	0.05	50.00
AM.GR.350.1050	Ø 3.500	-	Ø 6.00	10.50	11.50	0.05	50.00
AM.GR.370.1110	Ø 3.700	-	Ø 6.00	11.10	12.10	0.05	50.00
AM.GR.3968.1190	Ø 3.968	5/32"	Ø 6.00	11.90	12.90	0.05	50.00
AM.GR.400.1200	Ø 4.000	-	Ø 6.00	12.00	13.00	0.05	50.00
AM.GR.430.1290	Ø 4.300	-	Ø 8.00	12.90	13.90	0.05	68.00
AM.GR.4762.1430	Ø 4.762	3/16"	Ø 8.00	14.30	15.30	0.05	68.00
AM.GR.500.1500	Ø 5.000	-	Ø 8.00	15.00	16.00	0.05	68.00
AM.GR.5556.1670	Ø 5.556	7/32"	Ø 8.00	16.70	17.70	0.05	68.00
AM.GR.600.1800	Ø 6.000	-	Ø 8.00	18.00	19.00	0.05	68.00
AM.GR.6350.1910	Ø 6.350	1/4"	Ø 8.00	19.10	20.10	0.05	80.00
AM.GR.800.2400	Ø 8.000	-	Ø 8.00	24.00	25.00	0.05	80.00

Available from stock

- α-INOX coated





Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
			CrCoMo28	ASTM F1537
H	Hardened steels ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

Recommended use Highly suitable Partially suitable Not recommended

up to ap=2xD Ø 1 - Ø 2 mm		up to ap=2xD Ø 2 - Ø 3 mm		up to ap=2xD Ø 3 - Ø 4 mm		up to ap=2xD Ø 4 - Ø 6 mm		up to ap=2xD Ø 8 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.011 - 0.025	100-140	0.013 - 0.050	100-140	0.026 - 0.065	100-140	0.03 - 0.075	100-140	0.035 - 0.085
100-140	0.011 - 0.025	100-140	0.013 - 0.052	100-140	0.026 - 0.055	100-140	0.03 - 0.065	100-140	0.035 - 0.075
80-110	0.011 - 0.025	80-110	0.013 - 0.05	80-110	0.026 - 0.055	80-110	0.035 - 0.065	80-110	0.035 - 0.075
70-100	0.016 - 0.025	70-100	0.013 - 0.05	70-100	0.026 - 0.055	70-100	0.035 - 0.065	70-100	0.035 - 0.075
80-140	0.016 - 0.025	80-140	0.02 - 0.055	80-140	0.026 - 0.065	80-140	0.035 - 0.07	80-140	0.035 - 0.085
80-160	0.016 - 0.025	80-160	0.022 - 0.07	80-160	0.035 - 0.08	80-160	0.035 - 0.085	80-160	0.035 - 0.075
80-140	0.016 - 0.025	80-140	0.022 - 0.07	80-140	0.035 - 0.08	80-140	0.035 - 0.085	80-140	0.035 - 0.09
80-120	0.016 - 0.025	80-120	0.022 - 0.07	80-120	0.035 - 0.08	80-120	0.025 - 0.085	80-120	0.035 - 0.09
50 - 80	0.01 - 0.025	50 - 80	0.01 - 0.035	50 - 80	0.013 - 0.05	50 - 80	0.018 - 0.06	50 - 80	0.025 - 0.07
50-80	0.01 - 0.025	50-80	0.01 - 0.035	50-80	0.013 - 0.05	50-80	0.018 - 0.06	50-80	0.025 - 0.07
50-80	0.01 - 0.025	50-80	0.01 - 0.035	50-80	0.013 - 0.05	50-80	0.018 - 0.06	50-80	0.025 - 0.07
no data available									
no data available									

Economical milling in medical technology and aerospace

The ACTIONMILL® Inox-Groover 3D plunge & ramp mills for rough and finish milling of pockets and slots or free-form internal and external contours are suitable for all hard, heat-resistant and highly abrasive materials. This also applies to high-alloy, corrosion-resistant nickel-chromium steels (stainless steels). Compared to previous coated milling tools, they achieve up to ten times the tool path life.

They can therefore be used to advantage in medical technology, but also in all other industries that plunge or ramp mill components made of hard, heat-resistant metal alloys – including aerospace, tool and mold making, hydraulics and precision engineering. As standard, the milling tools are available in diameters of 0.7 to 8 mm (with or without cooling channels) with cutting lengths of 1.5xD and 3xD, toric with corner radii or with corner chamfers.

The Groovers are treated with a specially developed edge preparation. This alone ensures significantly longer tool path life and tool life when milling tough and hard materials. In addition, the thin, hard and highly heat-resistant α -Inox coating, applied in a hybrid process, is particularly smooth. It therefore prevents sticking, especially with titanium chips, and easily removes the chips from the cutting zone. This prevents the cutting edges from chipping and wearing prematurely due to jammed chips and overheating.

Thanks to their high-quality, tough base substrate of ultra-fine-grain carbide with selected additives, the plunge & ramp mills are particularly resistant to changing temperatures and to varying cutting forces caused by unequal cutting depths and engagement angles of individual cutting edges. This also helps them to mill reliably and without wear over long periods at high infeed depths

and high cutting speeds in tough, hard, corrosion-resistant alloys. With the new ACTIONMILL® INOX-Groover, users can now plunge vertically (drill), ramp up to 70°, rough and finish with just one milling tool – with high cutting and feed rates and a reliably long tool life.

Our technical field service says of the ACTIONMILL® INOX-Groover cooled plunge & ramp mills that they are milling tools for the markets of the future. Our cutting tool developers call the ACTIONMILL® products the world's best cutting tools, and our sales consultants are certain that they turn excellent machined parts into perfect products.

As an option, we can produce further dimensions according to your individual requirements.



We love challenges!

Put us to the test and send us your requirements today! At HB microtec, we love challenges – and the more special they are, the clearer it becomes that we can deliver the unique features you are looking for.

Call +49 7461 1657280 or write to us at kontakt@hb-microtec.de



ACTIONMILL®

by HB microtec

INOX-Groover



HB microtec®
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