HOFMANN & VRATNY — SC MILLING CUTTERS EN

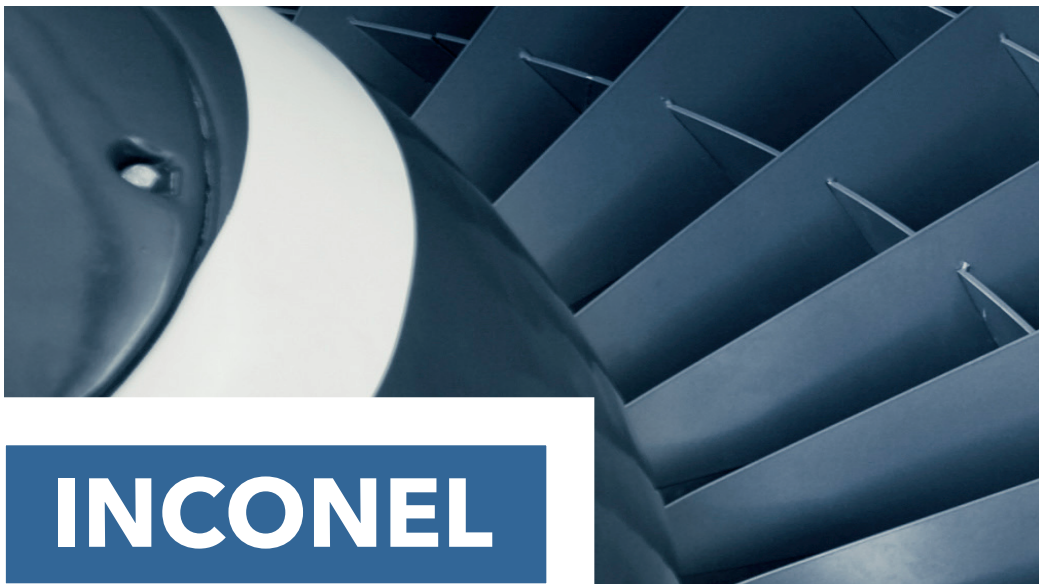
INCONEL

Expert

7

SC EXPERT
INCONEL
MILLING CUTTERS

H&V



INCONEL

3
PRODUCTION SITES

43
YEARS OF EXPERIENCE

120
MOTIVATED EMPLOYEES

OUR EXPERT-LINE MILLING CUTTERS FOR NICKEL-BASED ALLOYS.

Machining extreme materials such as Inconel, Hastelloy and Waspalloy requires special tools for the machining process. Inconel is a material developed for special requirements. It is used in components under extreme load, such as in turbine construction. Milling cutters machining Inconel therefore need to withstand even higher loads.

There are many reasons why inconel is challenging to machine:

- EXTREMELY HIGH CUTTING FORCES
- HIGH TORQUE ON THE MILLING CUTTER
- THE CHIPS' TENDENCY TO ADHERE
- THE MILLING CUTTER IS EXPOSED TO VERY HIGH TEMPERATURES
- LOW CUTTING SPEED

We have developed our Inconel milling cutters with the aim of creating a tool that is precisely tailored to machining nickel-based alloys.

Our Inconel milling cutters are distinguished above all by a particularly soft-cutting geometry calculated in numerous analyses. The cutters achieve very good results in terms of wear and tool life with their precise balance between toughness and hardness of the material. Due to the extreme changes in the structure when cutting Inconel, an ingenious adjustment of the cutter geometry is necessary to cover all eventualities. We have developed our Inconel Expert-line to meet these challenges, in which cold welding (built-up edges) is completely prevented.

CORNER RADIUS

Optimised corner radius to increase service life.

CHIP SPACES

Specially developed chip spaces to ensure smooth chip disposal.

HELICAL PITCH

Dynamic helical pitch for exceptional performance.

HELIX

Brow for dipping, ramping and retracting in the helix. Specifically designed for high loads.

BLADES

Unequal tooth pitch of the blades for particularly smooth running and high surface quality.

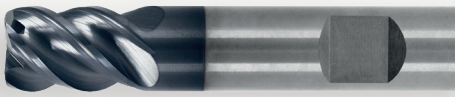
CUTTING EDGES

Extremely sharp cutting edges, specially reinforced for optimum tool life.

H&V EXPERTS FOR INCONEL

SC END MILL CUTTERS

K201764

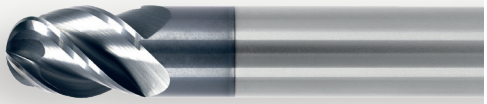


K201759

SC TORUS CUTTERS

K202414

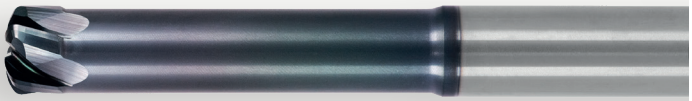
SC
FULL RADIUS
CUTTERS



K203398

K203393

SC
FACE TORUS
CUTTERS



K207048

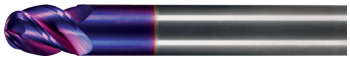
K207043

NUMBERING SYSTEM

ARTICLEGROUP

SC milling cutter

Catalog item



K 2 03 388

Product group

Product name

MILLING CUTTERS

Articlegroup

K201673 - 16

Cutting diameter

MILLING CUTTERS DISTINGUISHED BY LENGTH

Articlegroup

K201123 - 2 X 8

Cutting diameter

Distinction by length of cut or length of undercut

MILLING CUTTERS WITH ADDITIONAL DISTINGUISHING FEATURE

Articlegroup

K202223 - 8 / 3

Cutting diameter

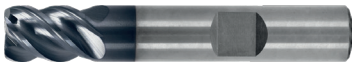
Distinction by corner radius or shank diameter

Cooling	
Tolerance	e8
Coating	TiSiN- α

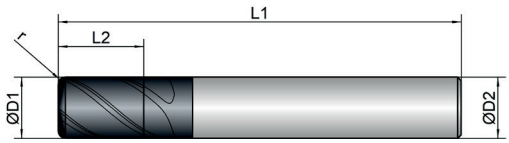
HB ETC HPC ≠

NEW

Expert



HB K201759



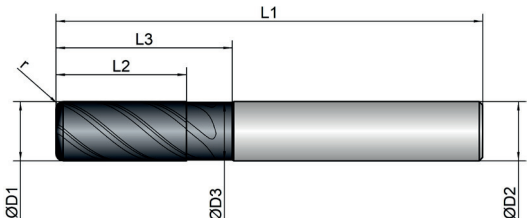
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

K201759	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	°
4	4.0	8.0	54.0	6.0	4	0.10	40
5	5.0	9.0	54.0	6.0	4	0.20	40
6	6.0	10.0	54.0	6.0	4	0.20	40
8	8.0	12.0	58.0	8.0	4	0.20	40
10	10.0	14.0	66.0	10.0	4	0.20	40
12	12.0	16.0	73.0	12.0	4	0.20	40
16	16.0	22.0	82.0	16.0	4	0.30	40
20	20.0	26.0	92.0	20.0	4	0.30	40

Cooling	
Tolerance	e8
Coating	TiSiN-α

HB ETC HPC ≠ NEW Expert

HB K201764



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

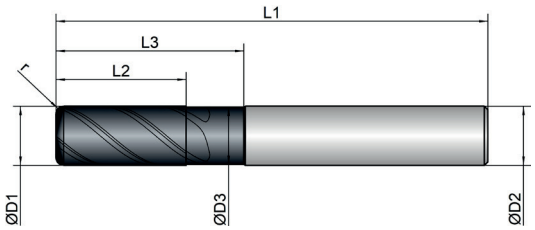
K201764	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	°
6	6.0	5.8	13.0	19.0	57.0	6.0	5	0.10	40
8	8.0	7.7	19.0	25.0	63.0	8.0	5	0.20	40
10	10.0	9.7	22.0	30.0	72.0	10.0	5	0.20	40
12	12.0	11.6	26.0	36.0	83.0	12.0	5	0.20	40
16	16.0	15.5	36.0	42.0	92.0	16.0	5	0.30	40
20	20.0	19.5	41.0	52.0	104.0	20.0	5	0.30	40

Cooling	
Tolerance	e8
Coating	TiSiN-α

HB ETC HPC MTC ≠

Expert

HB K202414



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

K202414	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	°
4/0,3	4.0	3.8	11.0	20.0	58.0	6.0	4	0.30	40
4/1	4.0	3.8	11.0	20.0	58.0	6.0	4	1.00	40
5/0,3	5.0	4.8	13.0	20.0	58.0	6.0	4	0.30	40
5/1	5.0	4.8	13.0	20.0	58.0	6.0	4	1.00	40
6/0,3	6.0	5.8	13.0	20.0	58.0	6.0	4	0.30	40
6/1	6.0	5.8	13.0	20.0	58.0	6.0	4	1.00	40
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	4	0.30	40
8/1	8.0	7.7	19.0	25.0	63.0	8.0	4	1.00	40
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	4	0.30	40
10/1	10.0	9.7	22.0	32.0	73.0	10.0	4	1.00	40
10/2	10.0	9.7	22.0	32.0	73.0	10.0	4	2.00	40
12/0,3	12.0	11.6	26.0	38.0	85.0	12.0	4	0.30	40
12/1	12.0	11.6	26.0	38.0	85.0	12.0	4	1.00	40
12/2	12.0	11.6	26.0	38.0	85.0	12.0	4	2.00	40
16/0,3	16.0	15.5	32.0	44.0	93.0	16.0	4	0.30	40
16/1	16.0	15.5	32.0	44.0	93.0	16.0	4	1.00	40
16/2	16.0	15.5	32.0	44.0	93.0	16.0	4	2.00	40
20/0,3	20.0	19.5	38.0	54.0	104.0	20.0	4	0.30	40
20/1	20.0	19.5	38.0	54.0	104.0	20.0	4	1.00	40
20/2	20.0	19.5	38.0	54.0	104.0	20.0	4	2.00	40

SC full radius cutter short TiSiN HPC / HSC | K203393

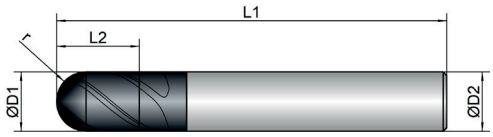
Cooling	
Tolerance	f8
Coating	TiSiN-α

HA HSC HPC

NEW

Expert

HA K203393



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													40			

K203393	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r R mm	°
2	2.0	4.0	54.0	6.0	4	1.00	40
3	3.0	5.0	54.0	6.0	4	1.50	40
4	4.0	8.0	54.0	6.0	4	2.00	40
5	5.0	9.0	54.0	6.0	4	2.50	40
6	6.0	10.0	54.0	6.0	4	3.00	40
8	8.0	12.0	58.0	8.0	4	4.00	40
10	10.0	14.0	66.0	10.0	4	5.00	40
12	12.0	16.0	73.0	12.0	4	6.00	40
16	16.0	20.0	82.0	16.0	4	8.00	40

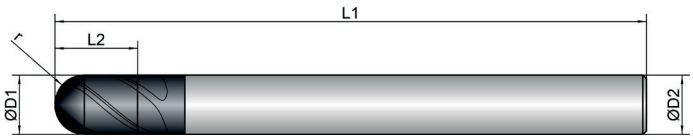
Cooling	
Tolerance	f8
Coating	TiSiN- α

HA HSC HPC

NEW

Expert

HA K203398



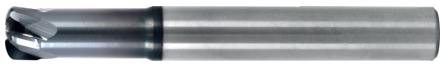
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

K203398	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	°
2	2.0	4.0	83.0	6.0	4	1.00	40
3	3.0	5.0	83.0	6.0	4	1.50	40
4	4.0	8.0	83.0	6.0	4	2.00	40
5	5.0	9.0	83.0	6.0	4	2.50	40
6	6.0	10.0	83.0	6.0	4	3.00	40
8	8.0	12.0	100.0	8.0	4	4.00	40
10	10.0	14.0	100.0	10.0	4	5.00	40
12	12.0	16.0	100.0	12.0	4	6.00	40

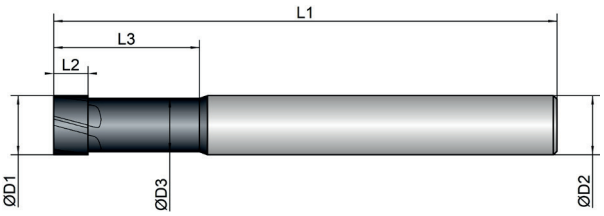
SC face torus cutter TiSiN HSC | K207043

Cooling	
Tolerance	h9
Coating	TiSiN-α

HA HSC NEW Expert



HA K207043



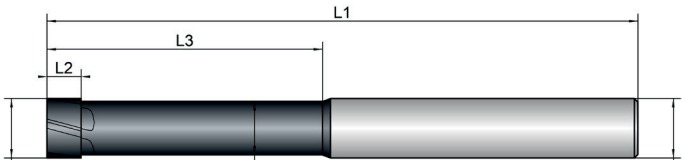
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													55			

K207043	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	mm	mm max	°
2	2.0	1.7	1.5	13.0	54.0	6.0	2	0.3	0.06	15
3	3.0	2.7	1.5	15.0	54.0	6.0	2	0.3	0.10	15
4	4.0	3.6	2.5	16.0	57.0	6.0	2	0.5	0.15	15
5	5.0	4.6	3.5	18.0	68.0	6.0	4	0.5	0.17	15
6	6.0	5.2	3.5	20.0	68.0	6.0	4	1.0	0.20	15
8	8.0	7.0	4.8	24.0	70.0	8.0	5	1.5	0.25	15
10	10.0	9.0	5.8	26.0	85.0	10.0	5	2.0	0.30	15
12	12.0	11.0	6.8	30.0	93.0	12.0	5	2.0	0.40	15
16	16.0	14.5	8.8	35.0	100.0	16.0	5	2.5	0.50	15

Cooling	
Tolerance	h9
Coating	TiSiN-α

HA HSC NEW Expert

HA K207048



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													50			

K207048	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	mm	mm max	°
2	2.0	1.7	1.5	18.0	75.0	6.0	2	0.3	0.06	15
3	3.0	2.7	1.5	20.0	75.0	6.0	2	0.3	0.10	15
4	4.0	3.6	2.5	24.0	83.0	6.0	2	0.5	0.15	15
5	5.0	4.6	2.5	28.0	100.0	6.0	4	0.5	0.17	15
6	6.0	5.2	3.5	28.0	100.0	6.0	4	1.0	0.20	15
8	8.0	7.0	4.8	40.0	100.0	8.0	5	1.5	0.25	15
10	10.0	9.0	5.8	48.0	100.0	10.0	5	2.0	0.30	15
12	12.0	11.0	6.8	56.0	119.0	12.0	5	2.0	0.40	15
16	16.0	14.5	8.8	65.0	150.0	16.0	5	2.5	0.50	15

LEGEND

PROPERTIES

	Cutting diameter		Small cutting diameter		Large cutting diameter
	Undercut diameter		Lenght of cut		Tool bezel length
	Length of undercut		Total length		Shank diameter
	Number of cutting edges		Corner radius		Corner bezel
	Programming radius		Maximum cutting depth		Helical pitch

SPECIAL FEATURES

HA	No Weldon	HB	Weldon HB	ETC	Extended Trochoidal Cutting
HSC	High Speed Cutting	HPC	High Performance Cutting	MTC	Multi-Task Cutting
UNI	Universal machining		Engraving	≠	Unequal tooth pitch
	Coolant duct system		Multipass milling		Trimming
	Chip breaking		Full slot		Forward and backward deburring
	Serrated edge		Deburring		Corner rounding
2xD	2xD	3xD	3xD	4xD	4xD
5xD	5xD		Dynamic helical pitch		

COOLING

	Air-cooled		Dry		Oil
	Water^{max}		Water^{min}		

COATINGS

Our coatings are optimised in unison with the cutters' geometry by testing in both an extensive internal procedure an under the customers real applictaion conditions. The selection is perfectly matched to the respective field of application.

TiN-α	TiN Alpha	TiSiN- α	TiSiN Alpha	TiAlN-α	TiAlN Alpha
Diamond-α	Diamond Alpha	TAC-α	TAC Alpha	ZrCn-α	ZrCrN Alpha
TiCn-α	TiCN Alpha				

PRODUCT GROUPS

01	End mill cutter	02	Torus cutter	03	Full radius cutter
04	Form cutter	05	Chamfer cutter	06	Roughing cutter
07	Face torus cutter				

APPLICATION TABLE

The values given in the application table are only guidelines. These values depend largely on the individual application parameters.

ILLUSTRATIONS

All illustrated technical drawings and photographs are exemplary. Deviations from the original produduct in color and dimensions are possible.

MADE IN
BAVARIA

PROVEN QUALITY

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INCONEL–BROCHURE EN

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