PRECISION
TOOLS

HUMM **MILL**

VHM CUTTERS FOR METAL

2025

CONTENTS

HUMM MILL **CUTTERS**

Did you know that hummingbirds are not only the smallest but also the fastest birds in the world? The frequency of their precise wing movements is around 80-90 per second. It was this remarkable bird that inspired the creation of our nevertheless unique collection of cutters, which we have named HUMM MILL - HUMMER for hummingbird, MILL for milling. Key features:

- Very high manufacturing accuracy
- Specially designed geometry
- Optimised for high cutting parameters
- Special carbides with sub-micron structure
- Ultra-smooth PVD coating

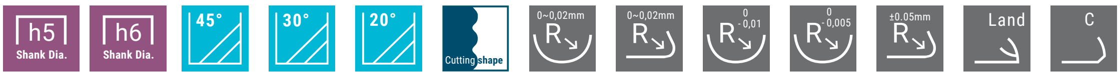
MATERIAL GROUPS:

P	P	P	M	K	N	S	S	H	H	H	H
~ 750 N/mm2	~ 30 HRC	30-44 HRC	Stainless steel	Cast iron	Aluminum and non-cast iron	Titanium alloys	Heat-resistant alloy	~ 55 HRC	~ 62 HRC	~ 65 HRC	~ 68 HRC

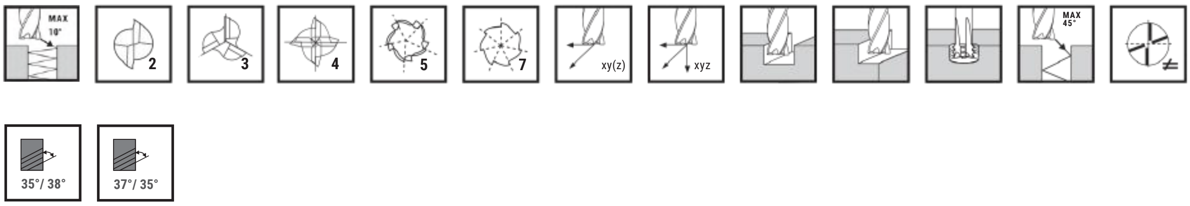
PVD COATING TYPES:

M-LOX | D-LOX | H-LOX | S-LOX | Micro-LOX

TECHNICAL PARAMETERS:



APPLICATION TYPES:

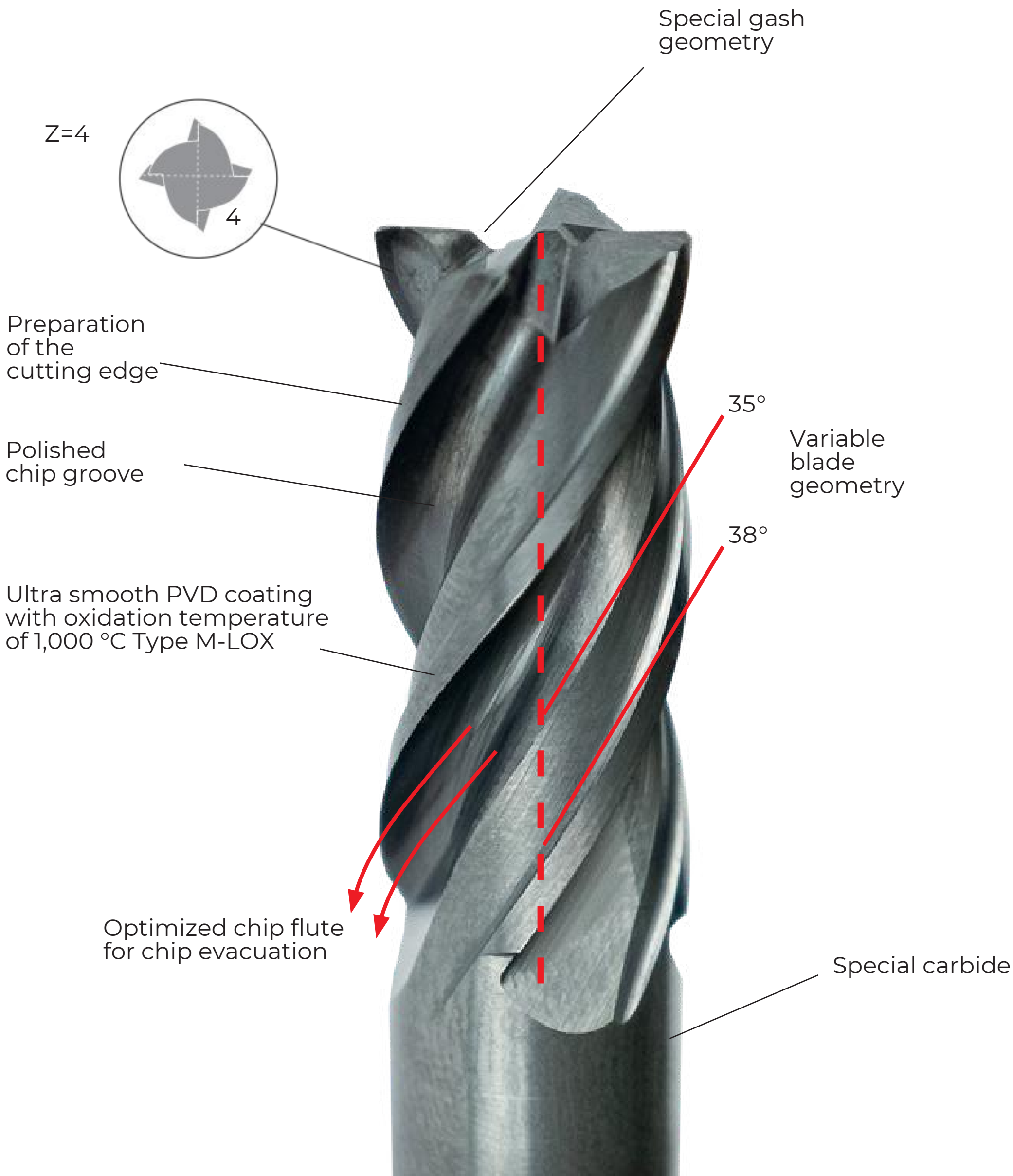


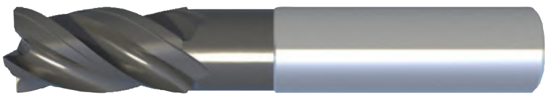
HUMM **STEEL**

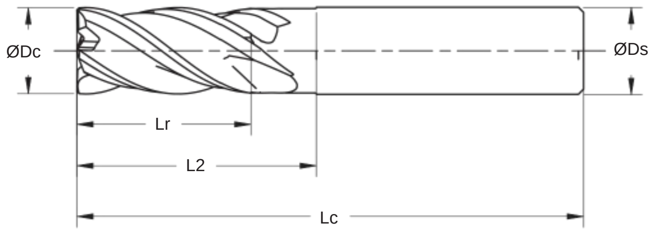
special gash geometry | 45° ramp work | prepared cutting edge

Humm Steel cutters are distinguished by a specially designed gash geometry, which allows work on a 45-degree ramp. Our tool works like a drill and a cutter in one - so in practice it allows you to reduce the number of tools needed and saves the time needed to replace it, which in turn affects the reduction of costs.

Humm Steel cutters also have a prepared cutting edge, which results in significantly increased service life. They are also distinguished by a polished chip flute and its optimized shape, which allows you to increase parameters by up to 30% while maintaining the full service life of the tool.



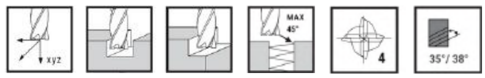




RECOMMENDATIONS

P	P	P	K
~ 750 N/mm2	~ 30 HRC	30-44 HRC	Cast iron

C | ±0.05mm | h6 Shank Dia. | M-LOX



STOCK ITEMS

Dc	Ds	Lr	L2	Lc	C	Z	Article No.
6	6	13	21	57	0,13	4	800.060.00
8	8	19	27	63	0,15	4	800.080.00
10	10	22	32	72	0,2	4	800.100.00
12	12	26	38	83	0,25	4	800.120.00
16	16	32	44	92	0,35	4	800.160.00
20	20	38	54	104	0,4	4	800.200.00
Dc	**Ds**	**Lr**	**L2**	**Lc**	**R**	**Z**	**Article No.**
6	6	13	21	57	1	4	800.060.10
8	8	19	27	63	1	4	800.080.10
10	10	22	32	72	1	4	800.100.10
12	12	26	38	83	1	4	800.120.10
16	16	32	44	92	1	4	800.160.10
20	20	38	54	104	1	4	800.200.10
Dc	**Ds**	**Lr**	**L2**	**Lc**	**R**	**Z**	**Article No.**
6	6	13	21	57	0,5	4	800.060.05
8	8	19	27	63	0,5	4	800.080.05
10	10	22	32	72	0,5	4	800.100.05
12	12	26	38	83	0,5	4	800.120.05
16	16	32	44	92	0,5	4	800.160.05
20	20	38	54	104	0,5	4	800.200.05

RECOMMENDED MILLING CONDITIONS

Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16	ø20
To 750 N/mm2	1Dc x 0.5Dc	Spindle rotation (min^-1)	9 000	7 100	5 400	4 500	3 300	2 700
		Feed(mm/min)	900	880	840	800	780	700
To 30 HRC	1Dc x 0.2Dc	Spindle rotation (min^-1)	8 600	6 800	5 200	4 300	3 000	2 400
		Feed(mm/min)	900	680	820	800	750	650
30-44 HRC	1Dc x 0.5Dc	Spindle rotation (min^-1)	8 400	6 600	5 000	4 300	3 200	2 600
		Feed(mm/min)	750	720	700	640	600	550
Cast iron	1Dc x 0.5Dc	Spindle rotation (min^-1)	8 800	6 600	5 100	4 200	3 200	2 500
		Feed(mm/min)	1 100	950	910	860	800	780

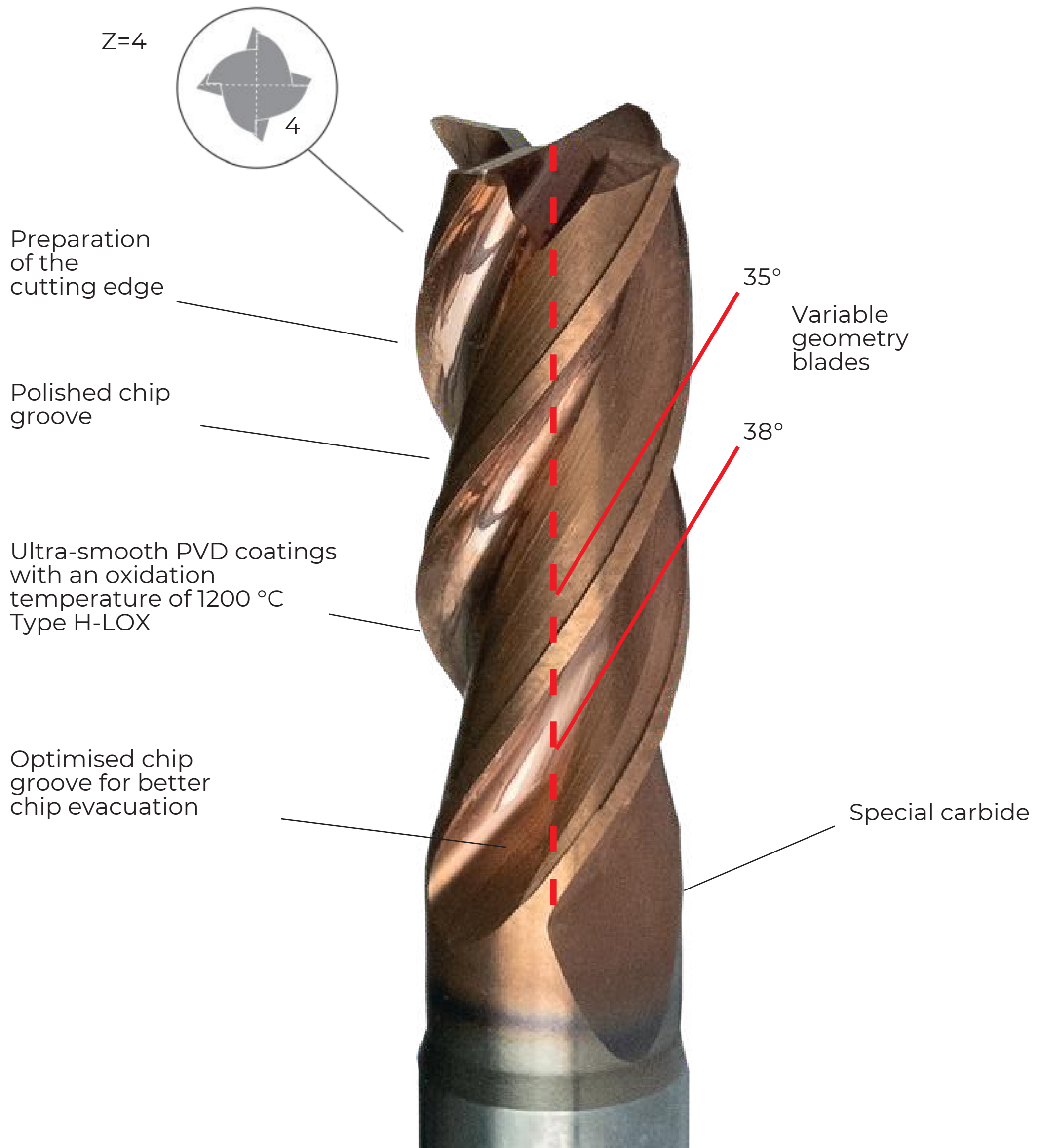
Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16	ø20
To 750 N/mm2	1Dc x 1Dc	Spindle rotation (min^-1)	9 000	7 100	5 400	4 500	3 300	2 700
		Feed(mm/min)	900	880	840	800	780	700
To 30 HRC	1Dc x 1Dc	Spindle rotation (min^-1)	8 600	6 800	5 200	4 300	3 000	2 400
		Feed(mm/min)	900	680	820	800	750	650
30-44 HRC	1Dc x 1Dc	Spindle rotation (min^-1)	8 400	6 600	5 000	4 300	3 200	2 600
		Feed(mm/min)	750	720	700	640	600	550
Cast iron	1Dc x 1Dc	Spindle rotation (min^-1)	8 800	6 600	5 100	4 200	3 200	2 500
		Feed(mm/min)	1 100	950	910	860	800	780

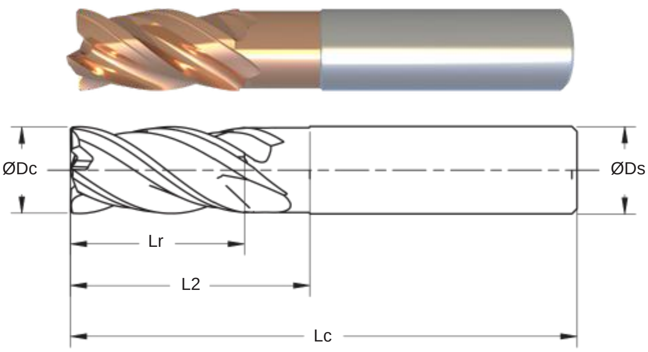
HUMM **INOX**

reinforced blade | high oxidation temperature | reduced vibrations | easy chip evacuation

Humm Inox mills have specially designed flank angles, i.e so-called bald spot to strengthen the blade and reduce material pick-up or galling the back of the mill. They are also distinguished by a special coating based on high silicon oxidation temperature of more than 1 200 C.

In our Humm Inox mills, we also used a polished chip flute to improve the chip evacuation and variable geometry, reducing vibrations, giving the ability to work at higher parameters.





RECOMMENDATIONS

P	M	S	S
~ 30 HRC	Stainless steel	Titanium alloys	Heat-resistant alloy

STOCK ITEMS

Dc	Ds	Lr	L2	Lc	C	Z	Article No.
6	6	13	21	57	0,13	4	810.060.00
8	8	19	27	63	0,15	4	810.080.00
10	10	22	32	72	0,2	4	810.100.00
12	12	26	38	83	0,25	4	810.120.00
16	16	32	44	92	0,35	4	810.160.00
20	20	38	54	104	0,4	4	810.200.00

Dc	Ds	Lr	L2	Lc	R	Z	Article No.
6	6	13	21	57	1	4	810.060.10
8	8	19	27	63	1	4	810.080.10
10	10	22	32	72	1	4	810.100.10
12	12	26	38	83	1	4	810.120.10
16	16	32	44	92	1	4	810.160.10
20	20	38	54	104	1	4	810.200.10

Dc	Ds	Lr	L2	Lc	R	Z	Article No.
6	6	13	21	57	0,5	4	810.060.05
8	8	19	27	63	0,5	4	810.080.05
10	10	22	32	72	0,5	4	810.100.05
12	12	26	38	83	0,5	4	810.120.05
16	16	32	44	92	0,5	4	810.160.05
20	20	38	54	104	0,5	4	810.200.05

RECOMMENDED MILLING CONDITIONS

Material	Parameters machining (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16	ø20
To 30 HRC	1Dc x 0.5Dc	Spindle rotation (min^-1)	8 800	6 600	5 300	4 400	3 300	2 600
		Feed (mm/min)	1 400	1 580	1 260	1 230	990	950
Stainless steel	1Dc x 0.5Dc	Spindle rotation (min^-1)	5 500	4 100	3 300	2 700	2 100	1 600
		Feed (mm/min)	880	820	790	710	570	490
Heat-resistant materials	1Dc x 0.2Dc	Spindle rotation (min^-1)	1 600	1 200	1 000	800	600	500
		Feed (mm/min)	110	130	120	120	120	110
Titanium alloys	1Dc x 0.5Dc	Spindle rotation (min^-1)	2 900	2 200	1 800	1 500	1 100	900
		Feed (mm/min)	230	260	220	220	200	210

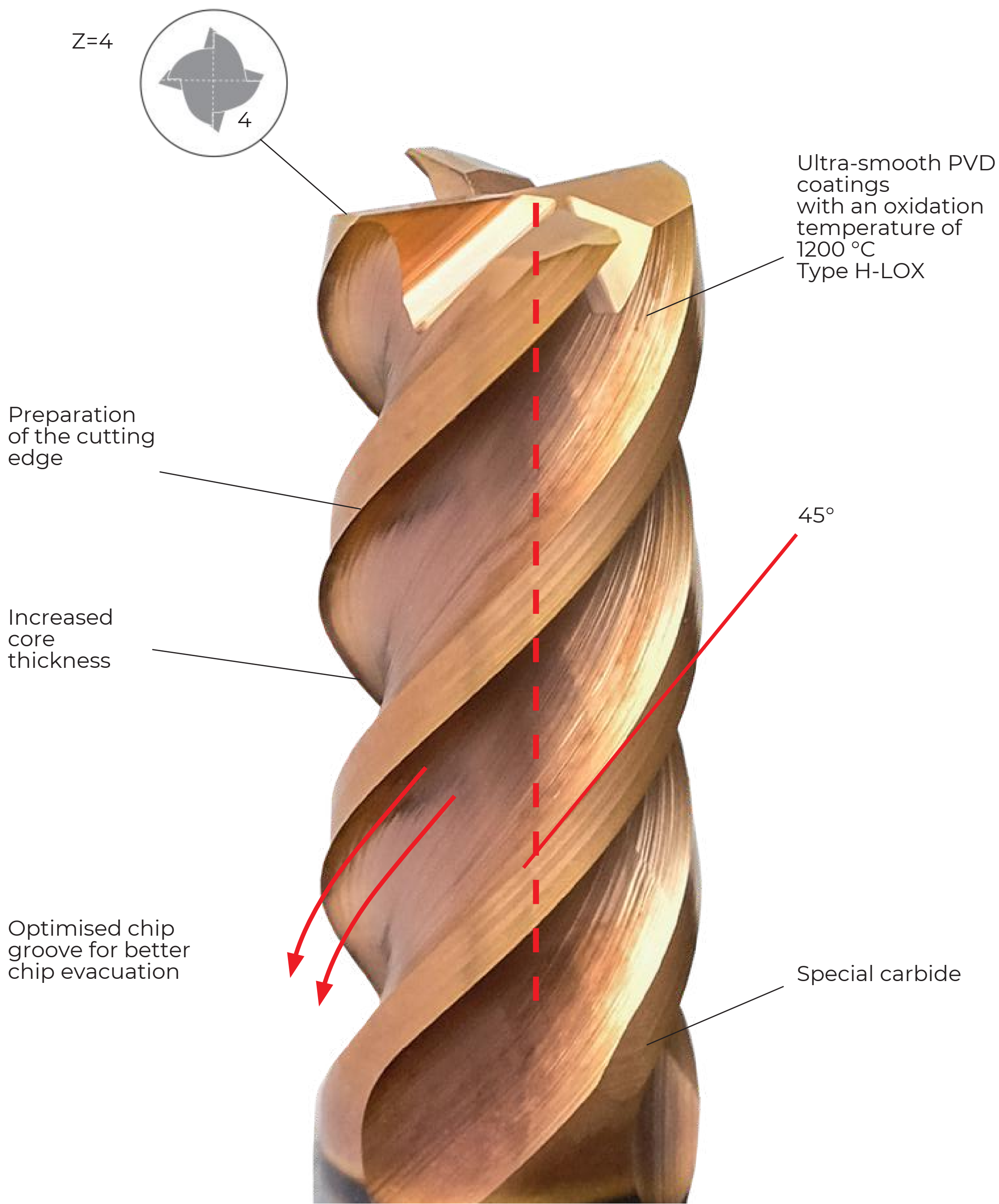
Material	Parameters machining (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16	ø20
To 30 HRC	1Dc x 1Dc	Spindle rotation (min^-1)	8 000	6 000	4 800	4 000	3 000	2 400
		Feed (mm/min)	1 300	1 400	1 100	1 100	900	900
Stainless steel	1Dc x 1Dc	Spindle rotation (min^-1)	4 800	3 600	2 900	2 400	1 800	1 400
		Feed (mm/min)	760	720	690	620	500	430
Heat-resistant materials	1Dc x 1Dc	Spindle rotation (min^-1)	1 300	1 000	800	700	500	400
		Feed (mm/min)	90	110	100	100	100	90
Titanium alloys	1Dc x 1Dc	Spindle rotation (min^-1)	2 700	2 000	1 600	1 300	1 000	800
		Feed (mm/min)	210	240	200	200	180	180

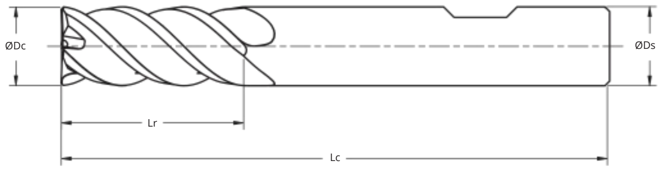
HUMM **UNI**

for various materials | increased rigidity | special PVD coating

A key criterion in the design of Humm Uni cutters was to create a highly versatile tool - one that can work in a variety of materials.

We decided to increase the thickness of the core in order to achieve greater rigidity and to eliminate the possibility of the tool bending during heavy machining. Here, too, we used a special PVD coating with a high oxidation temperature of over 1200° C.

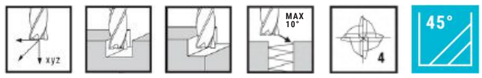




RECOMMENDATIONS

P ~ 750 N/mm2 | P ~ 30 HRC | P 30-44 HRC | K Cast iron

C | h6 Shank Dia. | H-LOX



STOCK ITEMS

	Dc	Ds	Lr	Lc	C	Z	Article No.
	6	6	13	57	0,13	4	820.060.00
	8	8	19	63	0,15	4	820.080.00
	10	10	22	72	0,2	4	820.100.00
	12	12	26	83	0,25	4	820.120.00
*	16	16	32	92	0,35	4	820.160.00

* conditional use for Dc x 1Dc work

RECOMMENDED MILLING CONDITIONS

Materiał	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
To 750 N/mm2	1Dc x 0.5Dc	Spindle rotation (min^-1)	9 000	7 100	5 400	4 500	3 300
		Feed (mm/min)	900	880	840	800	780
To 30 HRC	1Dc x 0.2Dc	Spindle rotation (min^-1)	3 600	6 800	5 200	4 300	3 000
		Feed (mm/min)	900	680	820	800	750
30-44 HRC	1Dc x 0.5Dc	Spindle rotation (min^-1)	8 400	6 600	5 000	4 300	3 200
		Feed (mm/min)	750	720	700	640	600
Cast iron	1Dc x 0.5Dc	Spindle rotation (min^-1)	8 800	6 600	5 100	4 200	3 200
		Feed (mm/min)	1 100	950	910	860	800

RECOMMENDED MILLING CONDITIONS D/D

Materiał	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
To 750 N/mm2	1Dc x 1Dc	Spindle rotation (min^-1)	8 000	6 200	5 000	4 000	2 900
		Feed (mm/min)	760	720	690	620	580
To 30 HRC	1Dc x 1Dc	Spindle rotation (min^-1)	7 800	6 000	4 800	4 000	3 000
		Feed (mm/min)	750	730	710	680	650
30-44 HRC	1Dc x 1Dc	Spindle rotation (min^-1)	6 100	4 500	3 500	3 200	2 300
		Feed (mm/min)	590	550	550	540	510
Cast iron	1Dc x 1Dc	Spindle rotation (min^-1)	6 200	4 600	3 700	3 200	2 400
		Feed (mm/min)	650	620	580	560	550

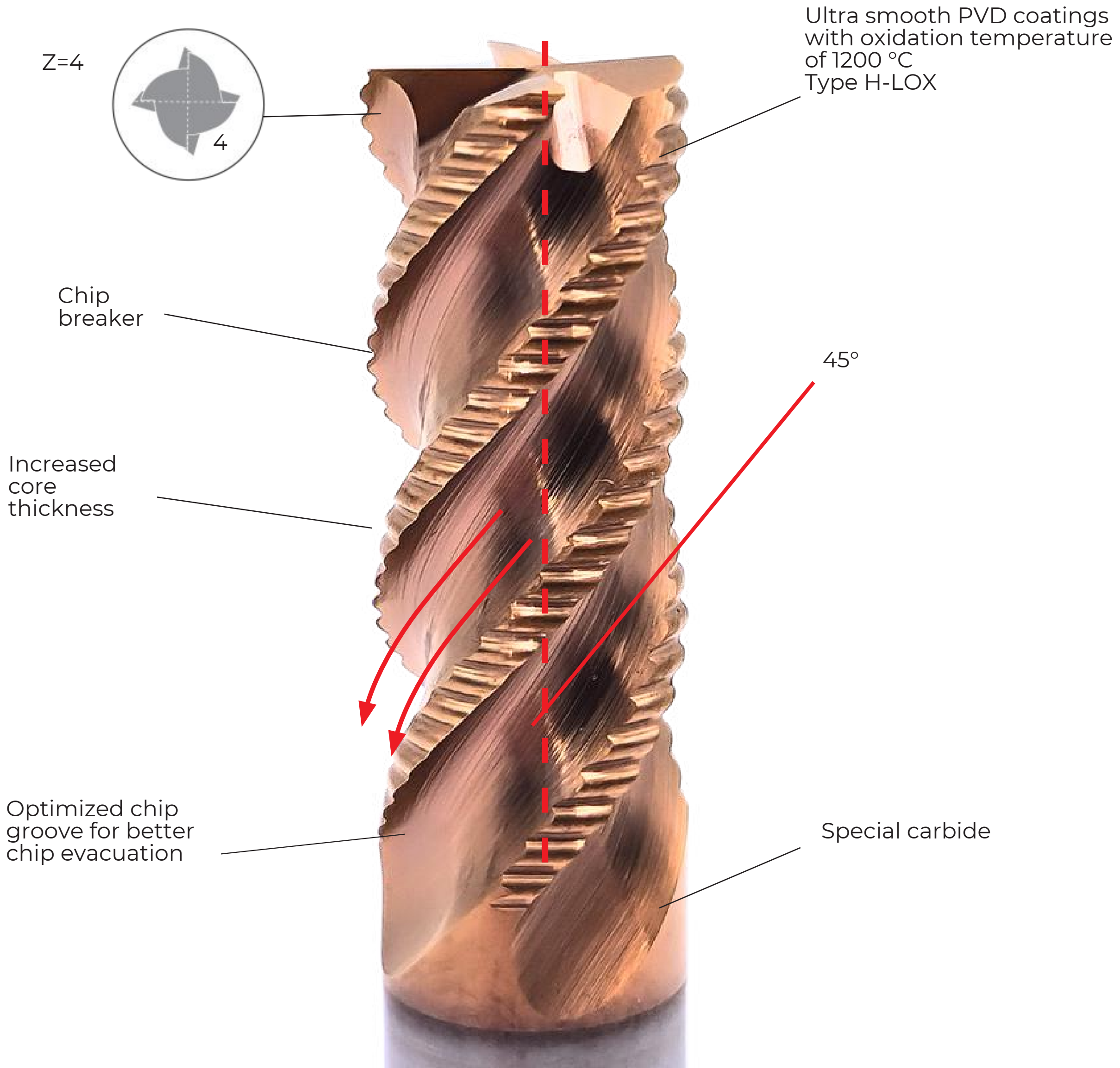
HUMM **UNI+**

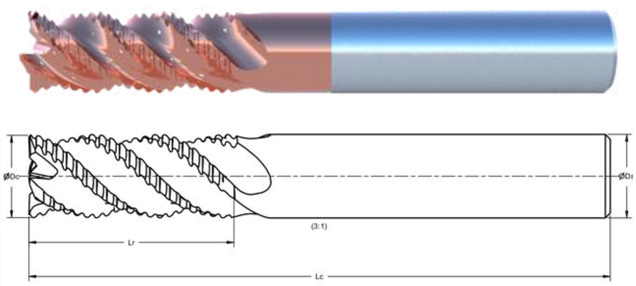
for various materials | greater stiffness | chip breaker

The Uni+ cutter is a versatile tool for working in a variety of materials, with the addition of a chip breaker. This is the only difference to its big brother, the Humm Uni version.

The chipbreaker is designed to break up the chips that are created in the machining process, thus facilitating their removal from the cutter's work surface and preventing them from wrapping around the cutter, which can result in damage to the work surface.

The high thickness of the core provides increased rigidity, thus eliminating the possibility of tool bending in heavy machining. Here, as with the Uni series, we have used a special PVD coating with a high oxidation temperature of over 1200° C.

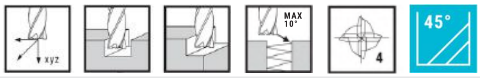




RECOMMENDATIONS

P ~ 750 N/mm2 | P ~ 30 HRC | P 30-44 HRC | K Cast iron

C | h6 Shank Dia. | H-LOX



STOCK ITEMS

	Dc	Ds	Lr	Lc	C	Z	Article No.
	6	6	13	57	0,13	4	920.060.00
	8	8	19	63	0,15	4	920.080.00
	10	10	22	72	0,2	4	920.100.00
	12	12	26	83	0,25	4	920.120.00
*	16	16	32	92	0,35	4	920.160.00

* conditional use for Dc x 1Dc work

RECOMMENDED MILLING CONDITIONS

Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
To 750 N/mm2	1Dc x 0.5Dc	spindle rotation (min^-1)	9 000	7 100	5 400	4 500	3 300
		feed (mm/min)	1 080	1 050	1 000	960	930
To 30 HRC	1Dc x 0.2Dc	spindle rotation (min^-1)	3 600	6 800	5 200	4 300	3 000
		feed (mm/min)	1 080	820	980	960	900
30-44 HRC	1Dc x 0.5Dc	spindle rotation (min^-1)	8 400	6 600	5 000	4 300	3 200
		feed (mm/min)	900	860	840	760	720
Cast iron	1Dc x 0.5Dc	spindle rotation (min^-1)	8 800	6 600	5 100	4 200	3 200
		feed (mm/min)	1 320	1 140	1 090	1 030	960

RECOMMENDED MILLING CONDITIONS D/D

Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
To 750 N/mm2	1Dc x 1Dc	spindle rotation (min^-1)	8 000	6 200	5 000	4 000	2 900
		feed (mm/min)	910	860	1 150	750	700
To 30 HRC	1Dc x 1Dc	spindle rotation (min^-1)	7 800	6 000	4 800	4 000	3 000
		feed (mm/min)	900	870	850	810	780
30-44 HRC	1Dc x 1Dc	spindle rotation (min^-1)	6 100	4 500	3 500	3 200	2 300
		feed (mm/min)	710	660	660	640	610
Cast iron	1Dc x 1Dc	spindle rotation (min^-1)	6 200	4 600	3 700	3 200	2 400
		feed (mm/min)	780	750	700	670	660

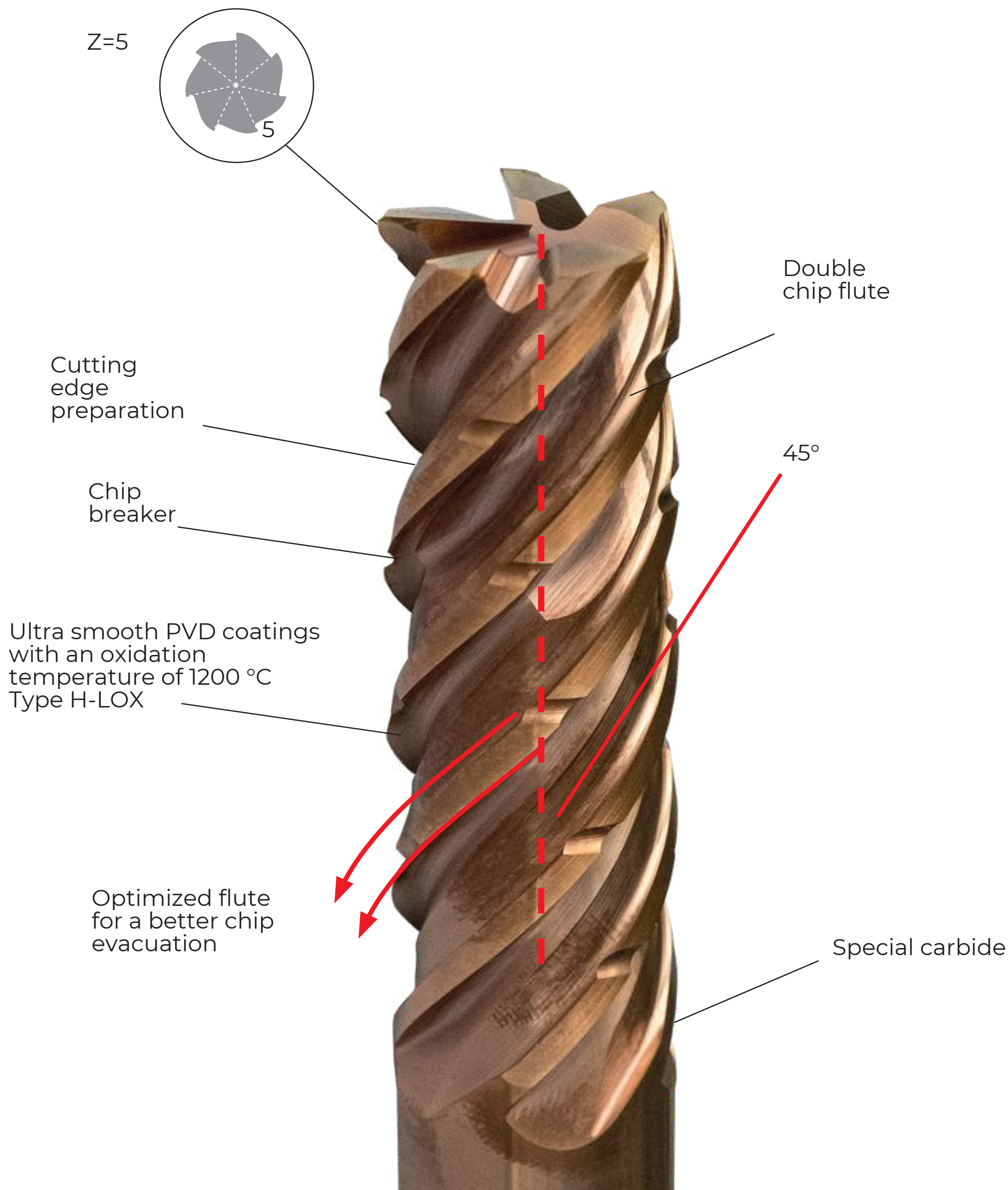
JG PRECISION TOOLS

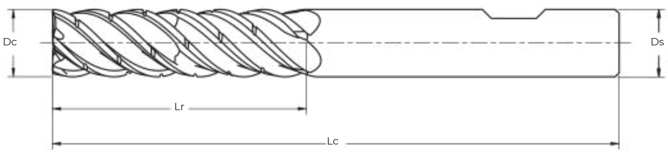
HUMM **VOLU**

high-performance processing | variable blade geometry | double chip groove

Humm Volu mills have a specially developed stepped flute to deliver high-performance machining. They are distinguished by an ultra-smooth, high-temperature PVD coating oxidation, over 1200°C.

The tool shows very high resistance to adhesion and abrasion, thanks to using special carbide.

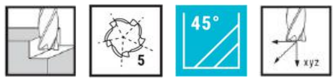




RECOMMENDATIONS

P ~ 750 N/mm2 | P ~ 30 HRC | P 30-44 HRC | K Cast iron | M Stainless steel

C | h6 Shank Dia. | H-LOX



STOCK ITEMS

Dc	Ds	Lr	Lc	C	Z	Article No.
6	6	23	70	0,08	5	830.060.00
8	8	32	75	0,1	5	830.080.00
10	10	40	85	0,1	5	830.100.00
12	12	45	100	0,15	5	830.120.00
16	16	55	115	0,2	5	830.160.00

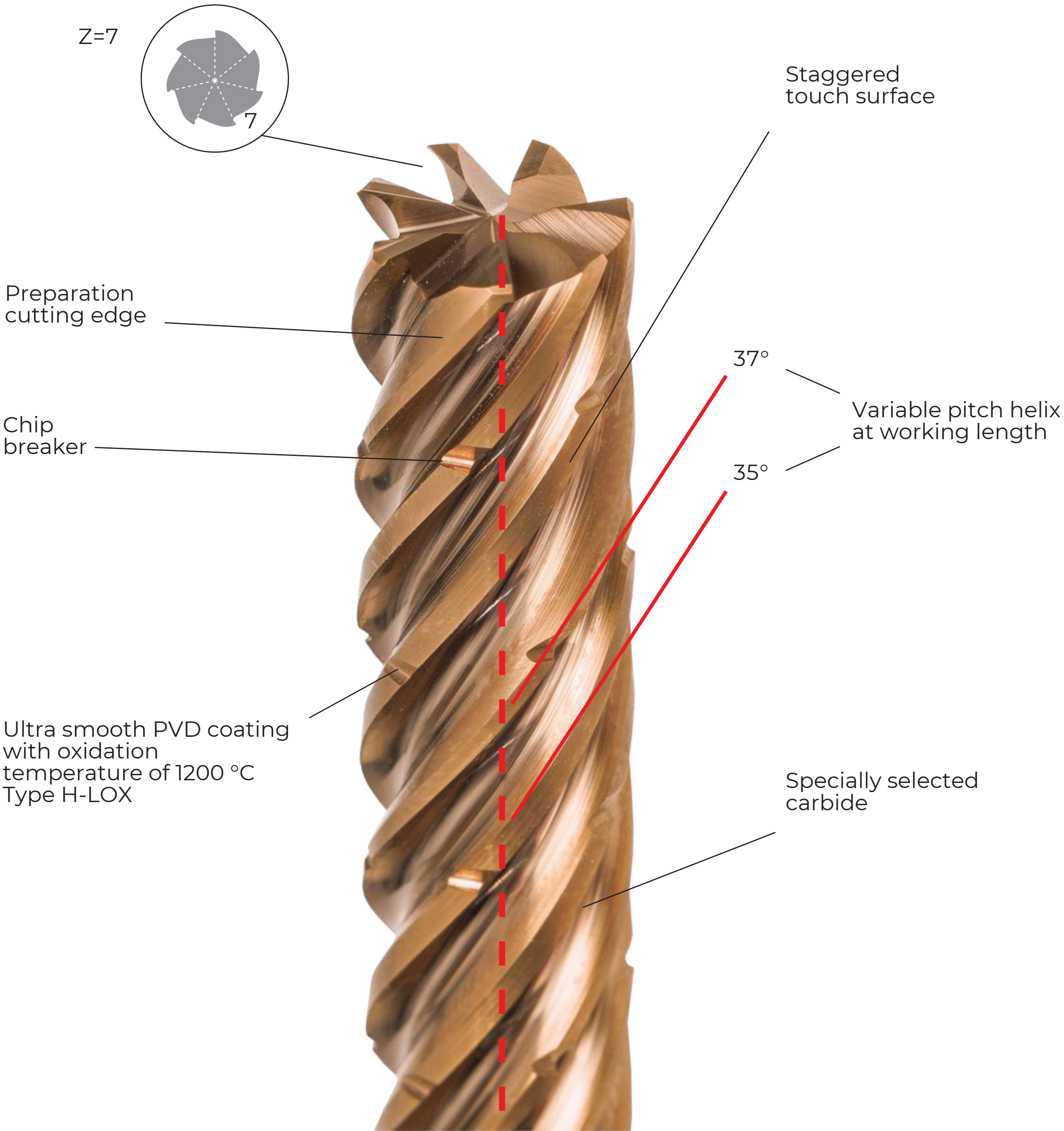
RECOMMENDED MILLING CONDITIONS

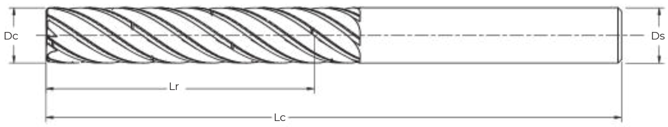
Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
To 750 N/mm2	3Dc x 0.1Dc	spindle rotation (min^-1)	14 500	11 100	9 200	7 650	5 700
		feed (mm/min)	5 300	5 100	4 800	4 500	4 000
To 30 HRC	3Dc x 0.1Dc	spindle rotation (min^-1)	13 100	10 000	7 950	6 630	4 900
		feed (mm/min)	5 000	4 800	4 600	4 300	4 000
30-44 HRC	3Dc x 0.1Dc	spindle rotation (min^-1)	11 620	8 700	7 000	5 800	4 300
		feed (mm/min)	3 800	3 600	3 500	3 400	3 100
Stainless steel	3Dc x 0.1Dc	spindle rotation (min^-1)	9 100	6 700	5 400	4 500	3 400
		feed (mm/min)	1 900	1 800	1 800	1 600	1 600
Cast iron	3Dc x 0.1Dc	spindle rotation (min^-1)	13 250	9 950	7 960	6 600	4 900
		feed (mm/min)	3 300	3 200	3 100	2 900	2 500

HUMM **VOLU+**

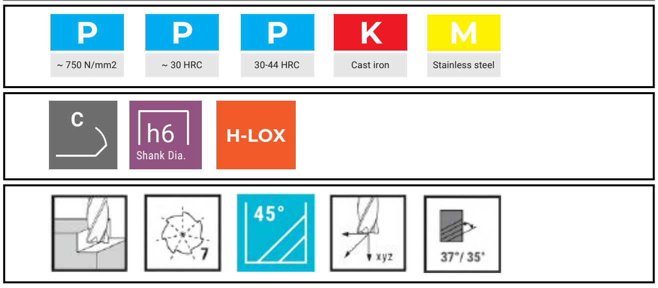
high-performance machining | variable blade geometry | high speed machining

The Humm Volu+ series of milling cutters is perfect for high-speed machining, where the entire working length of the milling cutter is used and high cutting speeds are used. Thanks to the use of 7 blades, even more efficient machining is possible compared to the classic version. The larger core diameter reduces vibrations and lower cutting resistance, which in turn affects greater machining stability. The use of the H-Lox coating increases resistance and resistance to adhesion and abrasion, which increases the tool's service life.





RECOMMENDATIONS



STOCK ITEMS

Dc	Ds	Lr	Lc	C	Z	Article No.
6	6	24	70	0,2	7	840.060.00
8	8	32	90	0,2	7	840.080.00
10	10	40	100	0,3	7	840.100.00
12	12	48	110	0,3	7	840.120.00
16	16	64	131	0,3	7	840.160.00

RECOMMENDED MILLING CONDITIONS

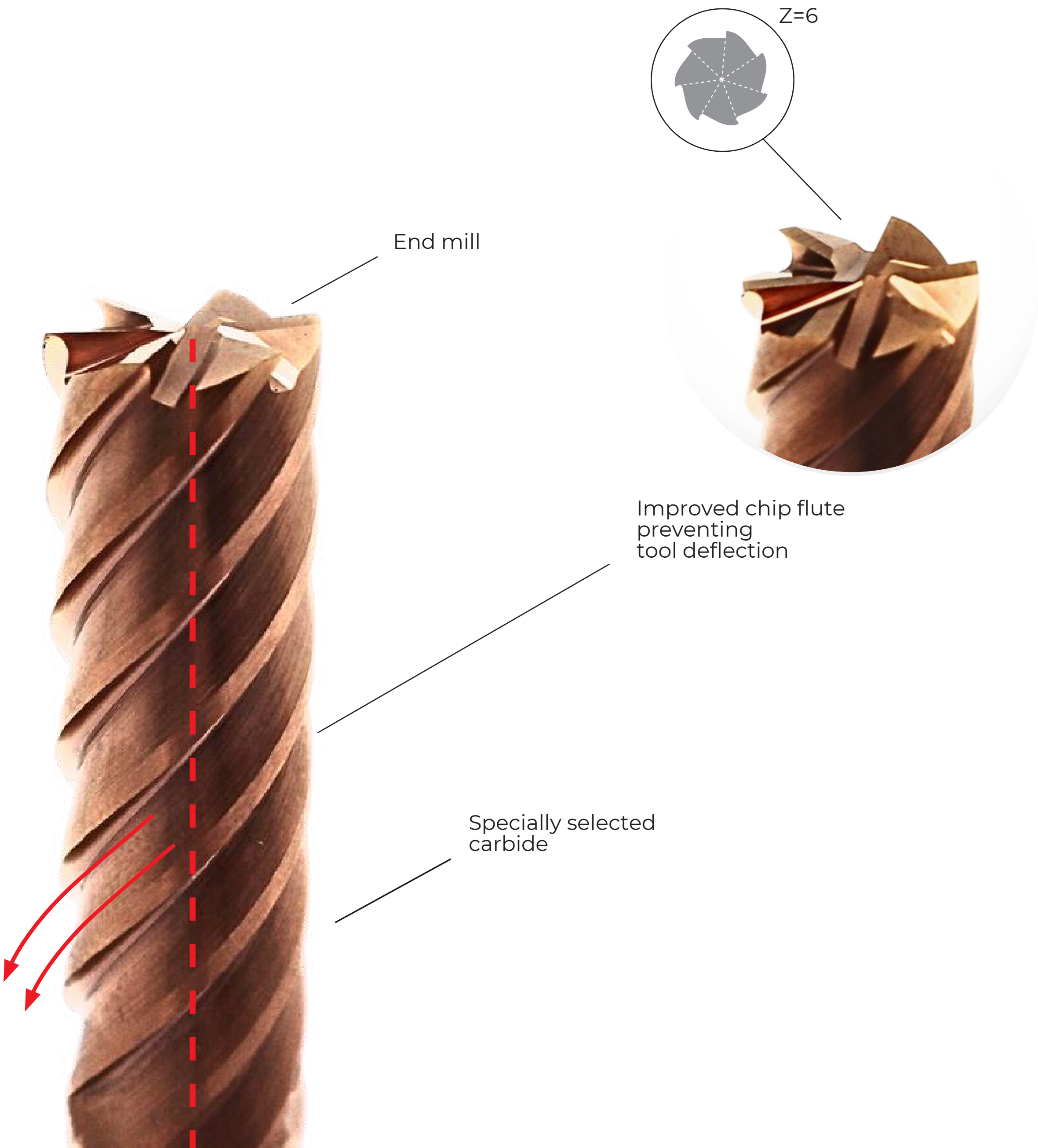
Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
To 750 N/mm2	3Dc x 0.1Dc	spindle rotation (min^-1)	10 150	7 700	6 440	5 323	3 990
		feed (mm/min)	3 696	3 584	3 360	3 192	2 800
To 30 HRC	3Dc x 0.1Dc	spindle rotation (min^-1)	9 170	7 000	5 565	4 641	3 430
		feed (mm/min)	3 472	3 360	3 192	3 024	3 800
30-44 HRC	3Dc x 0.1Dc	spindle rotation (min^-1)	7 400	5 500	4 500	3 700	2 500
		feed(mm/min)	2 688	2 520	2 464	2 352	2 184
Stainless steel	3Dc x 0.1Dc	spindle rotation (min^-1)	9 275	6 965	5 572	4 620	3 430
		feed (mm/min)	2 296	2 240	2 184	2 016	1 736
Cast iron	3Dc x 0.1Dc	spindle rotation (min^-1)	6 660	4 950	4 050	3 330	2 250
		feed (mm/min)	2 419	2 268	2 217	2 116	1 965

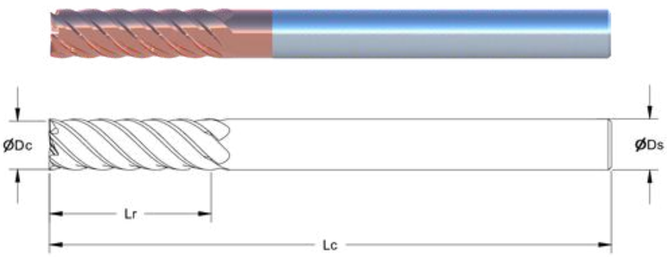
HUMM **HARD**

roughing machining | end milling cutter | for hardened steel

Humm Hard series milling cutters are 6-flute end milling tools for machining hardened steel. They are characterized by stability and long service life in the case of hardness from 48 to 65 HRC.

Advanced chip flute design provides improved milling deflection. The use of PVD coating increases resistance to adhesion and abrasion, which additionally increases the service life of the tool.





RECOMMENDATIONS

H ~ 55 HRC | H ~ 62 HRC | H ~ 65 HRC

Land | R | h6 Shank Dia. | H-LOX

MAX 45° | 6 | 45°

STOCK ITEMS

Dc	Ds	Lr	Lc	R	Z	Article No.
6	6	18	57	-	6	860.060.00
6	6	18	57	0,2	6	860.060.02
6	6	18	57	0,3	6	860.060.03
6	6	18	57	0,5	6	860.060.05
6	6	18	57	1	6	860.060.10
8	8	24	65	-	6	860.080.00
8	8	24	65	0,3	6	860.080.03
8	8	24	65	0,5	6	860.080.05
8	8	24	65	1	6	860.080.10
8	8	24	65	1,5	6	860.080.15
10	10	30	72	-	6	860.100.00
10	10	30	72	0,3	6	860.100.03
10	10	30	72	0,5	6	860.100.05
10	10	30	72	1	6	860.100.10
10	10	30	72	1,5	6	860.100.15
12	12	35	82	-	6	860.120.00
12	12	35	82	0,5	6	860.120.05
12	12	35	82	1	6	860.120.10
12	12	35	82	1,5	6	860.120.15
12	12	35	82	2	6	860.120.20

RECOMMENDED MILLING CONDITIONS

Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12
~ 55 HRC	1.5Dc x 0.03Dc	Spindle rotation (min^-1)	5 800	4 300	3 400	2 800
		Feed (mm/min)	1 600	1 800	1 800	1 800
~ 62 HRC	1.5Dc x 0.02Dc	Spindle rotation (min^-1)	4 800	3 600	2 800	2 300
		Feed (mm/min)	1 000	1 200	1 400	1 400
~ 65 HRC	1.5Dc x 0.02Dc	Spindle rotation (min^-1)	4 200	3 000	2 300	2 000
		Feed (mm/min)	600	800	800	800

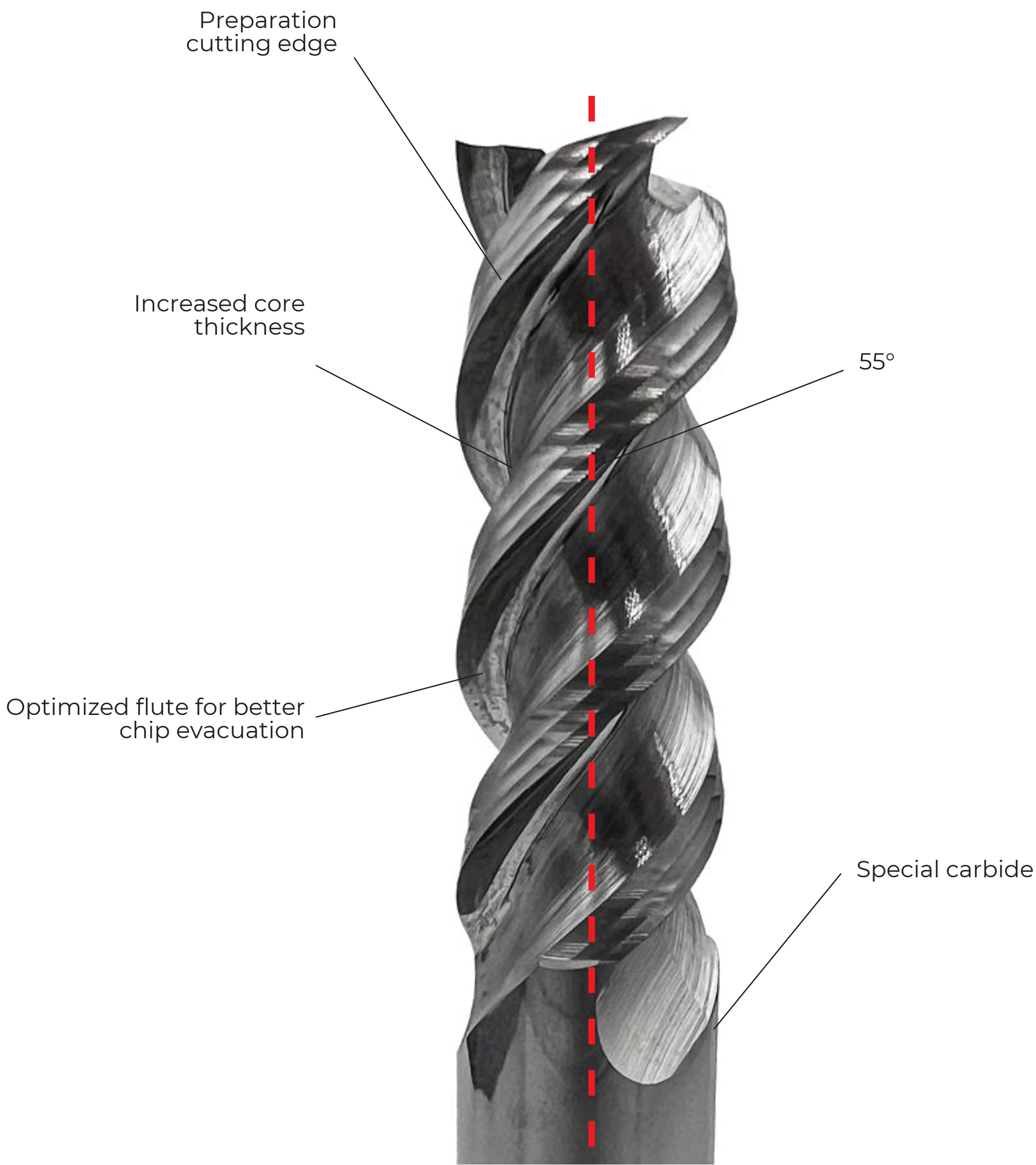
Materiał	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12
~ 55 HRC	1.5Dc x 0.03Dc	Spindle rotation (min^-1)	5 000	3 800	3 000	2 500
		Feed (mm/min)	600	700	800	800
~ 62 HRC	1.5Dc x 0.02Dc	Spindle rotation (min^-1)	4 200	3 200	2 500	2 000
		Feed (mm/min)	400	500	600	600
~ 65 HRC	1.5Dc x 0.01Dc	Spindle rotation (min^-1)	3 600	2 700	2 000	1 800
		Feed (mm/min)	200	250	300	300

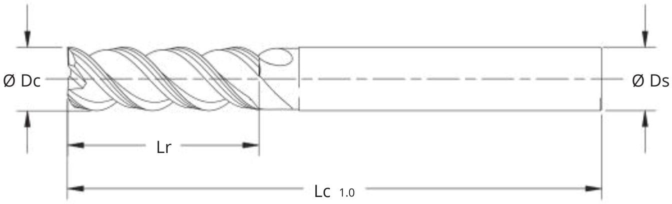
HUMM **ALU**

polished flute | greater stiffness | edge preparation

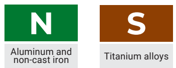
The basic criterion when designing Humm Alu mills was to create a tool that could work in aluminum alloys.

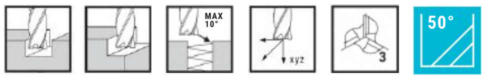
We decided to increase the thickness of the core so as to obtain greater stiffness and eliminate the possibility of bending the tool during heavy machining. In this case, we used a polished flute and properly prepared the cutting edge so that the tool worked as effectively as possible in aluminum alloys.





RECOMENDATIONS





STOCK ITEMS

Dc	Ds	Lr	Lc	Z	Article No.
6	6	18	50	3	850.060.00
8	8	20	60	3	850.080.00
10	10	30	75	3	850.100.00
12	12	32	75	3	850.120.00
16	16	45	100	3	850.160.00

RECOMMENDED MILLING CONDITIONS

Material	Machining parameters (ap x ae) (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
~ 55 HRC	1.5Dc x 0.03Dc	Spindle rotation (min^-1)	15 000	11 000	9 000	7 000	5 000
		Feed (mm/min)	300	300	300	300	300

RECOMMENDED MILLING CONDITIONS D/D

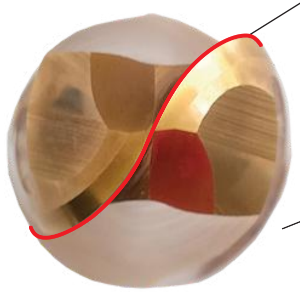
Material	Outer diameter (mm)	Outer diameter (mm)	ø6	ø8	ø10	ø12	ø16
~ 55 HRC	1.5Dc x 0.03Dc	Spindle rotation (min^-1)	11 000	8 000	6 000	5 000	4 000
		Feed (mm/min)	200	200	200	200	200

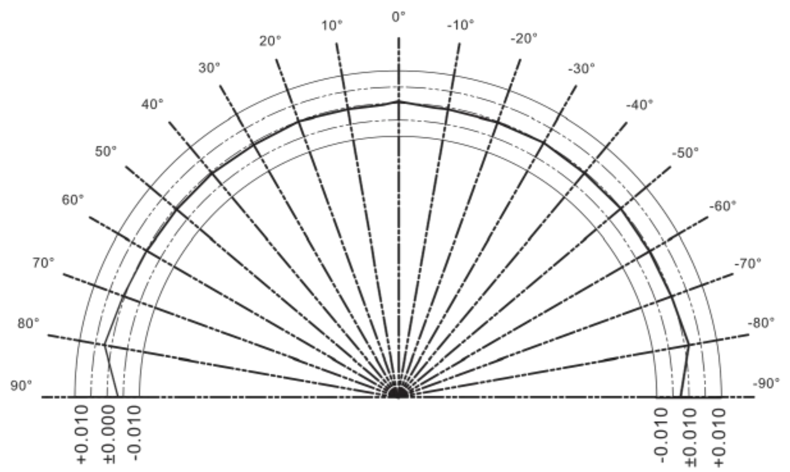
HUMM **BALL**

ball cutter | short working part | 2 blades

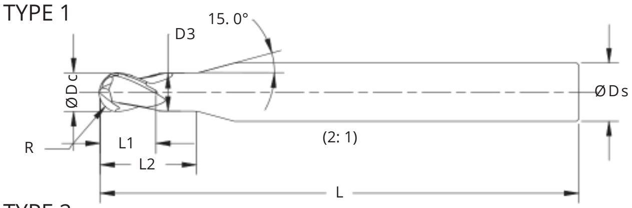
Humm Ball cutters have an optimized S-shaped cutting edge, which allows for very gentle and smooth operation. The use of appropriate carbide and a polished cutting edge improves the properties during work and directly affects the extension of its durability.

The Humm Ball cutter is perfect for profile machining and for materials with a hardness of up to 68 HRC.

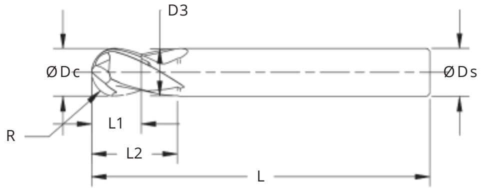




TYPE 1



TYPE 2



RECOMENDATIONS

P 30-44 HRC

H ~ 68 HRC

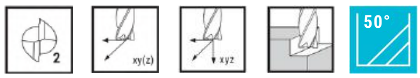
h5 Shank Dia.

H-LOX

R $^{0}_{-0,005}$

R $^{0}_{-0,005}$

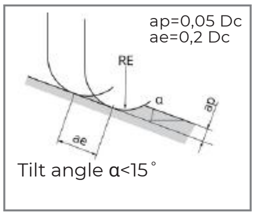
R≤6 $^{0}_{-0,005}$
R>6 $^{0}_{-0,01}$



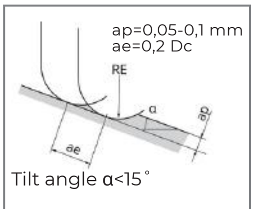
STOCK ITEMS

R	Dc	Ds	D3	L1	L2	Z	Type	Article No.
1	2	6	1,9	2	4	2	1	600.020.00
1,5	3	6	2,9	3	6	2	1	600.030.00
2	4	6	3,9	4	8	2	1	600.040.00
2,5	5	6	4,9	5	10	2	1	600.050.00
3	6	6	5,85	6	12	2	2	600.060.00
4	8	8	7,85	8	14	2	2	600.080.00
5	10	10	9,7	10	18	2	2	600.100.00
6	12	12	11,7	12	22	2	2	600.120.00

RECOMMENDED MILLING CONDITIONS



Roughing machining	Radius R (mm)	1	1,5	2	2,5	3	4	5	6
30-44 HRC	Spindle rotation (min^-1)	20 000	16 000	12 000	10 000	8 000	6 000	4 800	4 000
	Feed (mm/min)	1 160	1 440	1 460	1 460	1 470	1 510	1 500	1 340
Do 68 HRC	Spindle rotation (min^-1)	13 000	8 500	6 400	5 300	4 200	3 200	2 500	2 100
	Feed (mm/min)	560	580	600	590	590	600	590	530



Finishing	Radius R (mm)	1	1,5	2	2,5	3	4	5	6
30-44 HRC	Spindle rotation (min^-1)	20 000	17 000	13 000	9 750	8 500	6 400	5 100	4 200
	Feed (mm/min)	2 400	2 380	2 210	2 040	1 870	1 540	1 330	1 130
Do 68 HRC	Spindle rotation (min^-1)	15 000	13 000	9 600	7 500	6 400	4 800	2 500	3 200
	Feed (mm/min)	1 350	1 560	1 440	1 380	1 280	1 060	590	800

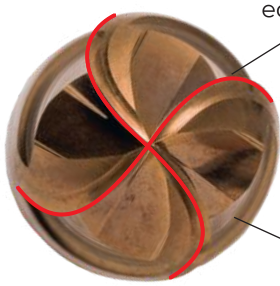
HUMM **BALL Q**

ball cutter | 4 blades

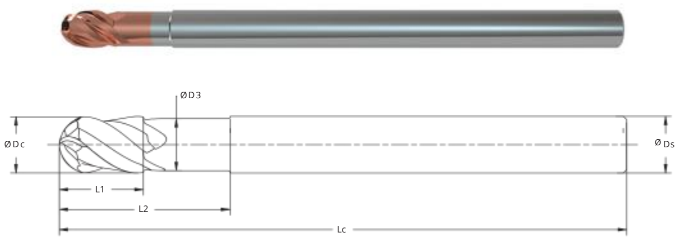
The Humm Ball Q cutter, thanks to two additional blades, can work in solid material at higher processing parameters. The S-shaped cutting edge geometry allows for gentle and smooth operation.

The wide chip groove provides excellent chip evacuation, which additionally improves cutting stability.

The cutters from this series are great for machining hardened steel up to 72HRC.



HUMM **BALL Q**



RECOMENDATIONS

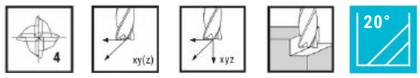
P 30-44 HRC

H ~ 68 HRC

h5 Shank Dia.

H-LOX

R≤6 -0,005
R>6 -0,01

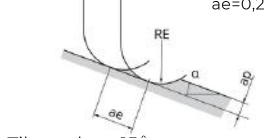


STOCK ITEMS

R	Dc	Ds	D3	L1	L2	L	Z	Article No.
3	6	6	5,7	9	18	80	4	604.060.00
4	8	8	7,6	12	24	90	4	604.080.00
5	10	10	9,5	15	30	90	4	604.100.00
6	12	12	11,5	18	36	90	4	604.120.00

RECOMMENDED MILLING CONDITIONS

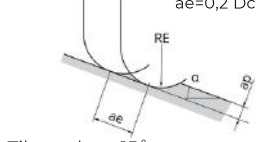
ap=0,05 Dc
ae=0,2 Dc



Tilt angle α<15˚

Roughing machining	Radius R (mm)	3	4	5	6
30-44 HRC	Spindle rotation (min^-1)	8 000	6 000	4 800	4 000
	Feed (mm/min)	1 250	1 283	1 275	1 139
Do 68 HRC	Spindle rotation (min^-1)	3 700	2 800	2 200	1 900
	Feed (mm/min)	750	780	770	760

ap=0,05-0,1 mm
ae=0,2 Dc



Tilt angle α<15˚

Finishing machining	Radius R (mm)	3	4	5	6
30-44 HRC	Spindle rotation (min^-1)	11 100	8 400	6 700	5 600
	Feed (mm/min)	3 230	3 360	3 350	3 190
Do 68 HRC	Spindle rotation (min^-1)	6 400	4 800	3 800	3 200
	Feed (mm/min)	1 020	1 060	1 050	1 000

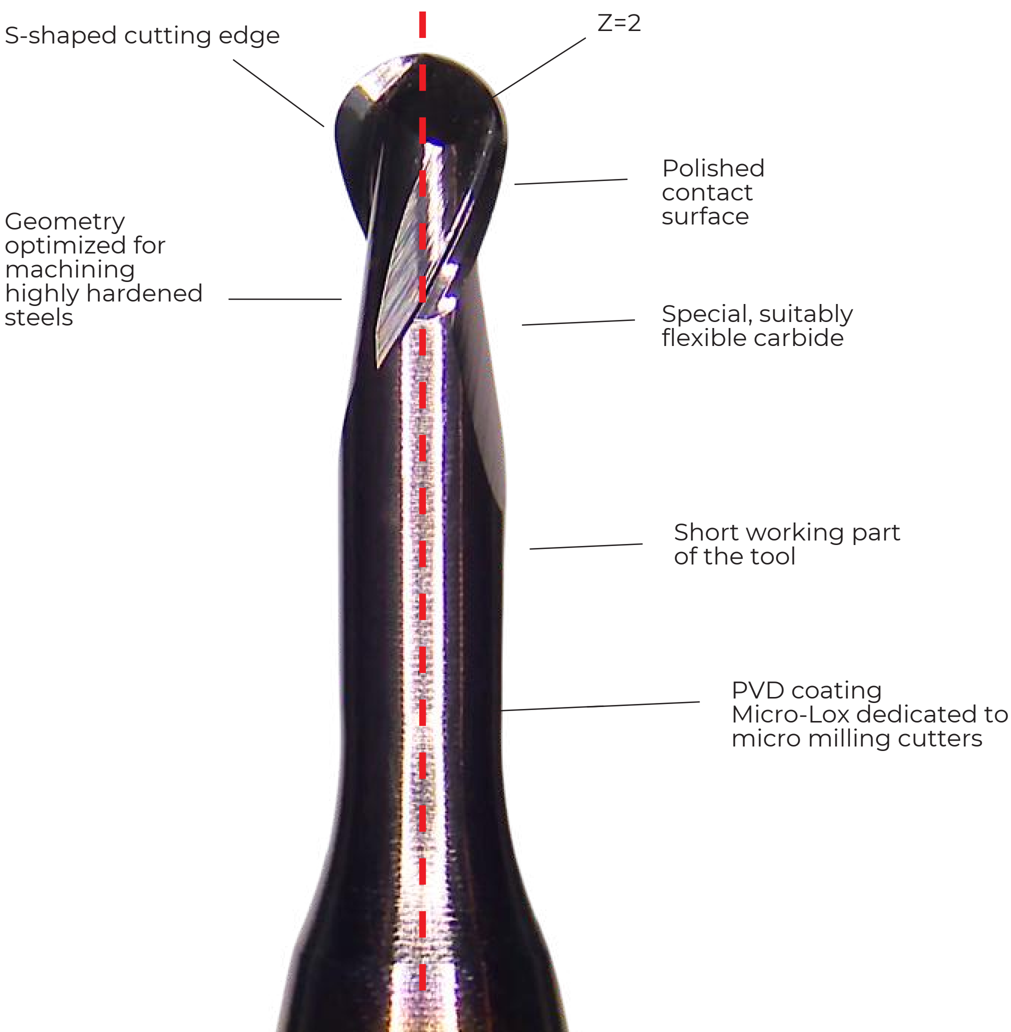
HUMM
MICRO BALL

micro milling cutter | two blades | for processing hard materials

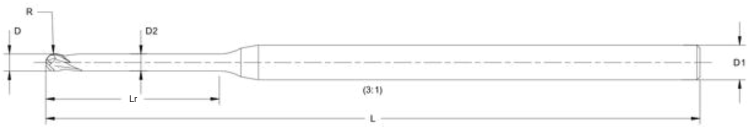
Humm Micro ball nose cutters are two-edge tools designed for work especially in extremely hard materials - hardened steel with hardnesses in the range of 52 - 65HRC.

Thanks to appropriately selected carbide, cutters from this series enable precise machining of complex shapes and details, both convex and concave. Their geometry allows machining at various angles and promotes effective chip evacuation, which reduces the risk of tool overheating and improves surface quality.

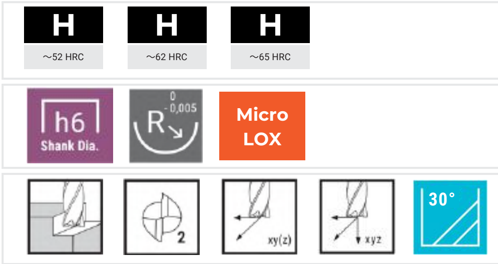
Humm Micro cutters are ideal for the production of difficult shapes in molds or matrices, in the aviation industry for curved structural elements, and in the medical industry they are an irreplaceable tool for the production of implants, prostheses and small devices.



HUMM **MICRO BALL**



RECOMENDATIONS



STOCK ITEMS AND RECOMMENDED MILLING PARAMETERS

Article No.	D	D1	D2	Lr	R	L	~52 HRC			~62 HRC			~65 HRC		
							ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)
602.010.04	1	4	0,95	4	0,5	75	0,1	40 000	2 500	0,05	30 000	1 800	0,05	25 000	1 200
602.010.06	1	4	0,95	6	0,5	75	0,1	30 000	1 800	0,04	25 000	1 200	0,02	20 000	740
602.010.08	1	4	0,95	8	0,5	75	0,04	30 000	1 000	0,03	25 000	860	0,02	20 000	560
602.010.10	1	4	0,95	10	0,5	75	0,03	25 000	750	0,02	20 000	620	0,01	18 000	450
602.010.12	1	4	0,95	12	0,5	75	0,01	20 000	600	0,007	18 000	520	0,005	16 000	400
602.010.14	1	4	0,95	14	0,5	75	0,005	20 000	420	0,003	18 000	360	0,002	16 000	320
602.010.16	1	4	0,95	16	0,5	75	0,005	18 000	300	0,003	16 000	250	0,002	14 000	200
602.010.18	1	4	0,95	18	0,5	75	0,003	18 000	180	0,002	16 000	120	0,002	14 000	85
602.010.20	1	4	0,95	20	0,5	75	0,003	16 000	100	0,002	14 000	75	0,002	12 000	60
602.010.22	1	4	0,95	22	0,5	75	0,002	14 000	50	0,002	12 000	40	0,001	10 000	35
602.010.24	1	4	0,95	24	0,5	75	0,002	12 000	45	0,001	10 000	20	0,001	9 000	18
602.010.26	1	4	0,95	26	0,5	75	0,001	10 000	20	0,001	9 000	18	0,001	8 000	16
602.010.28	1	4	0,95	28	0,5	75	0,001	9 000	18	0,001	8 000	16	0,001	7 000	14
602.010.30	1	4	0,95	30	0,5	75	0,001	8 000	16	0,001	7 000	14	0,001	6 000	12
602.012.04	1,2	4	1,15	4	0,6	75	0,1	30 000	2 500	0,07	30 000	2 000	0,05	25 000	1 600
602.012.06	1,2	4	1,15	6	0,6	75	0,07	30 000	2 000	0,05	25 000	1 600	0,03	20 000	1 200
602.012.08	1,2	4	1,15	8	0,6	75	0,05	30 000	1 600	0,03	25 000	1 200	0,02	20 000	920
602.012.10	1,2	4	1,15	10	0,6	75	0,03	20 000	1 200	0,02	20 000	860	0,01	18 000	680
602.012.12	1,2	4	1,15	12	0,6	75	0,02	20 000	860	0,01	20 000	620	0,007	18 000	480
602.012.14	1,2	4	1,15	14	0,6	75	0,02	18 000	600	0,01	18 000	400	0,005	16 000	300
602.012.16	1,2	4	1,15	16	0,6	75	0,01	16 000	350	0,005	16 000	250	0,003	14 000	130
602.012.18	1,2	4	1,15	18	0,6	75	0,007	15 000	300	0,005	15 000	200	0,003	13 000	100
602.012.20	1,2	4	1,15	20	0,6	75	0,007	14 000	250	0,003	14 000	150	0,002	12 000	90
602.012.22	1,2	4	1,15	22	0,6	75	0,005	13 000	200	0,003	13 000	120	0,002	11 000	80
602.012.24	1,2	4	1,15	24	0,6	75	0,005	12 000	150	0,002	12 000	100	0,001	10 000	70
602.012.26	1,2	4	1,15	26	0,6	75	0,002	11 000	90	0,001	11 000	80	0,001	9 000	60
602.012.28	1,2	4	1,15	28	0,6	75	0,002	10 000	60	0,001	9 000	50	0,001	8 000	40
602.012.30	1,2	4	1,15	30	0,6	75	0,001	9 000	40	0,001	7 000	30	0,001	6 000	20
602.012.32	1,2	4	1,15	32	0,6	75	0,001	8 000	25	0,001	6 000	20	0,001	5 000	15
602.014.04	1,4	4	1,35	4	0,7	75	0,12	30 000	2 500	0,1	30 000	2 200	0,05	25 000	1 800
602.014.06	1,4	4	1,35	6	0,7	75	0,12	30 000	2 500	0,08	27 000	2 000	0,05	22 000	1 300
602.014.08	1,4	4	1,35	8	0,7	75	0,12	30 000	2 500	0,08	20 000	1 800	0,03	20 000	1 000
602.014.10	1,4	4	1,35	10	0,7	75	0,007	25 000	2 000	0,05	19 000	1 500	0,02	19 000	900
602.014.12	1,4	4	1,35	12	0,7	75	0,07	20 000	1 400	0,04	18 000	1 100	0,015	18 000	700
602.014.14	1,4	4	1,35	14	0,7	75	0,07	18 000	1 100	0,03	17 500	900	0,01	17 000	500
602.014.16	1,4	4	1,35	16	0,7	75	0,02	17 000	700	0,01	17 000	600	0,008	16 000	450
602.014.18	1,4	4	1,35	18	0,7	75	0,02	16 000	500	0,01	16 000	450	0,008	15 000	350
602.014.20	1,4	4	1,35	20	0,7	75	0,02	15 000	350	0,01	15 000	300	0,008	14 000	250
602.014.22	1,4	4	1,35	22	0,7	75	0,02	14 000	300	0,01	14 000	250	0,008	13 000	200

HUMM **MICRO BALL**

STOCK ITEMS AND RECOMMENDED MILLING PARAMETERS

Article No.	D	D1	D2	Lr	R	L	□52 HRC			□62 HRC			□65 HRC		
							ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)
602.014.24	1,4	4	1,35	24	0,7	75	0,002	13 000	250	0,008	13 000	200	0,005	12 000	150
602.014.26	1,4	4	1,35	26	0,7	75	0,001	12 000	200	0,001	12 000	180	0,001	11 000	100
602.014.28	1,4	4	1,35	28	0,7	75	0,001	11 000	150	0,001	11 000	100	0,001	10 000	90
602.014.30	1,4	4	1,35	30	0,7	75	0,001	10 000	100	0,001	10 000	90	0,001	9 000	80
602.014.32	1,4	4	1,35	32	0,7	75	0,001	9 000	90	0,001	9 000	80	0,001	8 000	60
602.014.34	1,4	4	1,35	34	0,7	75	0,001	8 000	80	0,001	8 000	60	0,001	7 000	40
602.016.06	1,6	4	1,55	6	0,8	75	0,15	30 000	3 000	0,1	23 000	2 000	0,07	20 000	1 600
602.016.08	1,6	4	1,55	8	0,8	75	0,1	25 000	2 500	0,07	20 000	2 000	0,05	18 000	1 200
602.016.10	1,6	4	1,55	10	0,8	75	0,1	22 000	2 100	0,07	18 000	1 700	0,05	16 000	1 200
602.016.12	1,6	4	1,55	12	0,8	75	0,07	20 000	1 800	0,05	16 000	1 500	0,03	14 000	1 200
602.016.14	1,6	4	1,55	14	0,8	75	0,07	18 000	1 400	0,05	15 000	1 000	0,03	13 000	600
602.016.16	1,6	4	1,55	16	0,8	75	0,03	16 000	720	0,02	14 000	600	0,015	12 000	480
602.016.18	1,6	4	1,55	18	0,8	75	0,03	15 000	600	0,02	13 000	480	0,015	11 000	380
602.016.20	1,6	4	1,55	20	0,8	75	0,01	14 000	500	0,01	12 000	380	0,01	10 000	300
602.016.22	1,6	4	1,55	22	0,8	75	0,01	13 000	450	0,01	11 000	300	0,01	9 000	250
602.016.24	1,6	4	1,55	24	0,8	75	0,01	12 000	400	0,01	10 000	250	0,005	8 000	200
602.016.26	1,6	4	1,55	26	0,8	75	0,008	11 000	350	0,006	9 000	200	0,005	7 000	180
602.016.28	1,6	4	1,55	28	0,8	75	0,008	10 000	300	0,006	8 000	150	0,005	6 000	160
602.016.30	1,6	4	1,55	30	0,8	75	0,005	9 000	250	0,002	7 000	160	0,001	5 000	120
602.016.32	1,6	4	1,55	32	0,8	75	0,005	8 000	200	0,002	6 000	120	0,001	4 000	100
602.016.34	1,6	4	1,55	34	0,8	75	0,005	7 000	150	0,002	5 000	100	0,001	3 000	80
602.016.36	1,6	4	1,55	36	0,8	75	0,002	6 000	100	0,002	4 000	80	0,001	2 000	60
602.018.06	1,8	4	1,75	6	0,9	75	0,15	27 000	3 000	0,12	25 000	2 500	0,1	18 000	1 600
602.018.08	1,8	4	1,75	8	0,9	75	0,1	25 000	2 500	0,08	23 000	2 300	0,08	17 000	1 400
602.018.10	1,8	4	1,75	10	0,9	75	0,1	20 000	2 000	0,08	18 000	1 700	0,008	14 000	1 100
602.018.12	1,8	4	1,75	12	0,9	75	0,07	20 000	1 600	0,05	17 000	1 300	0,05	13 000	900
602.018.14	1,8	4	1,75	14	0,9	75	0,07	19 000	1 400	0,05	16 500	1 250	0,04	12 500	800
602.018.16	1,8	4	1,75	16	0,9	75	0,07	18 000	1 200	0,05	16 000	1 000	0,03	12 000	720
602.018.18	1,8	4	1,75	18	0,9	75	0,05	15 000	1 000	0,03	14 000	800	0,02	11 000	600
602.018.20	1,8	4	1,75	20	0,9	75	0,05	15 000	800	0,03	13 000	640	0,02	9 000	430
602.018.22	1,8	4	1,75	22	0,9	75	0,03	15 000	650	0,02	12 000	520	0,015	8 000	340
602.018.24	1,8	4	1,75	24	0,9	75	0,03	14 000	550	0,02	12 000	450	0,015	7 500	300
602.018.26	1,8	4	1,75	26	0,9	75	0,02	13 000	450	0,01	11 000	350	0,01	6 500	250
602.018.28	1,8	4	1,75	28	0,9	75	0,02	13 000	350	0,01	11 000	250	0,01	6 000	200
602.018.30	1,8	4	1,75	30	0,9	75	0,01	12 000	300	0,007	10 000	210	0,005	6 000	120
602.018.32	1,8	4	1,75	32	0,9	75	0,01	11 000	250	0,007	9 000	190	0,005	5 000	110
602.018.34	1,8	4	1,75	34	0,9	75	0,01	10 000	200	0,005	8 000	170	0,002	4 000	100
602.018.36	1,8	4	1,75	36	0,9	75	0,008	9 000	180	0,005	7 000	150	0,002	3 000	90
602.018.38	1,8	4	1,75	38	0,9	75	0,008	8 000	150	0,005	6 000	130	0,002	2 000	80
602.020.06	2	4	1,92	6	1	75	0,2	25 000	2 500	0,2	25 000	2 000	0,15	20 000	1 600
602.020.08	2	4	1,92	8	1	75	0,3	20 000	2 000	0,1	18 000	1 600	0,1	16 000	1 200
602.020.10	2	4	1,92	10	1	75	0,1	18 000	2 000	0,1	16 000	1 200	0,1	14 000	1 200
602.020.12	2	4	1,92	12	1	75	0,1	16 000	1 600	0,1	14 000	1 200	0,05	12 000	940
602.020.14	2	4	1,92	14	1	75	0,07	16 000	1 600	0,05	14 000	1 200	0,03	12 000	940
602.020.16	2	4	1,92	16	1	75	0,07	16 000	1 600	0,05	14 000	1 200	0,03	12 000	940
602.020.18	2	4	1,92	18	1	75	0,05	14 000	1 400	0,03	12 000	1 000	0,02	10 000	850
602.020.20	2	4	1,92	20	1	75	0,05	14 000	1 000	0,03	12 000	820	0,02	10 000	720
602.020.22	2	4	1,92	22	1	75	0,03	14 000	850	0,02	10 000	560	0,02	10 000	600
602.020.24	2	4	1,92	24	1	75	0,03	13 000	750	0,02	10 000	500	0,01	8 000	500

STOCK ITEMS AND RECOMMENDED MILLING PARAMETERS

Article No.	D	D1	D2	Lr	R	L	□52 HRC			□62 HRC			□65 HRC		
							ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)
602.020.26	2	4	1,92	26	1	75	0,03	13 000	600	0,02	10 000	400	0,01	8 000	400
602.020.28	2	4	1,92	28	1	75	0,02	12 000	500	0,01	10 000	350	0,01	8 000	300
602.020.30	2	4	1,92	30	1	75	0,02	12 000	360	0,01	10 000	300	0,008	8 500	240
602.020.32	2	4	1,92	32	1	75	0,02	10 000	230	0,01	8 000	120	0,008	6 800	150
602.020.34	2	4	1,92	34	1	75	0,01	10 000	180	0,005	8 000	110	0,005	6 800	130
602.020.36	2	4	1,92	36	1	75	0,01	10 000	150	0,005	8 000	100	0,005	6 800	100
602.020.38	2	4	1,92	38	1	75	0,005	1 000	120	0,003	8 000	90	0,002	6 800	80
602.020.40	2	4	1,92	40	1	75	0,005	10 000	100	0,003	8 000	80	0,002	6 800	50
602.025.08	2,5	4	2,4	8	1,25	75	0,1	19 000	2 100	0,08	17 000	1 700	0,06	11 000	900
602.025.12	2,5	4	2,4	12	1,25	75	0,09	18 000	1 900	0,07	16 000	1 500	0,05	10 000	850
602.025.16	2,5	4	2,4	16	1,25	75	0,08	17 000	1 700	0,06	15 000	1 300	0,04	9 000	800
602.025.20	2,5	4	2,4	20	1,25	75	0,07	16 000	1 500	0,05	14 000	1 200	0,03	8 000	720
602.025.24	2,5	4	2,4	24	1,25	75	0,06	15 000	1 400	0,04	13 000	1 000	0,02	7 000	600
602.025.28	2,5	4	2,4	28	1,25	75	0,05	14 000	1 000	0,03	12 000	800	0,01	6 000	450
602.025.32	2,5	4	2,4	32	1,25	75	0,04	13 000	800	0,02	11 000	500	0,008	5 000	300
602.025.36	2,5	4	2,4	36	1,25	75	0,03	12 000	500	0,01	10 000	350	0,008	4 000	200
602.025.40	2,5	4	2,4	40	1,25	75	0,02	11 000	380	0,008	9 000	250	0,005	3 000	150
602.030.08	3	4	2,9	8	1,5	75	0,2	20 000	3 000	0,2	18 000	2 500	0,2	14 000	2 000
602.030.12	3	4	2,9	12	1,5	75	0,2	20 000	2 500	0,2	18 000	2 000	0,1	14 000	1 500
602.030.16	3	4	2,9	16	1,5	75	0,1	18 000	2 000	0,1	16 000	1 600	0,1	12 000	1 200
602.030.20	3	4	2,9	20	1,5	75	0,1	18 000	1 600	0,1	16 000	1 200	0,1	12 000	960
602.030.24	3	4	2,9	24	1,5	75	0,1	17 000	1 400	0,05	14 000	1 000	0,03	11 000	800
602.030.28	3	4	2,9	28	1,5	75	0,05	16 000	1 000	0,05	12 000	800	0,03	10 000	600
602.030.32	3	4	2,9	32	1,5	75	0,05	14 000	800	0,02	10 000	600	0,02	9 000	400
602.030.36	3	4	2,9	36	1,5	75	0,05	12 000	600	0,02	9 000	400	0,02	8 000	300
602.030.40	3	4	2,9	40	1,5	75	0,03	10 000	450	0,02	8 200	320	0,01	6 400	260
602.030.44	3	4	2,9	44	1,5	75	0,03	9 000	400	0,02	7 500	280	0,01	5 000	170

JG PRECISION TOOLS

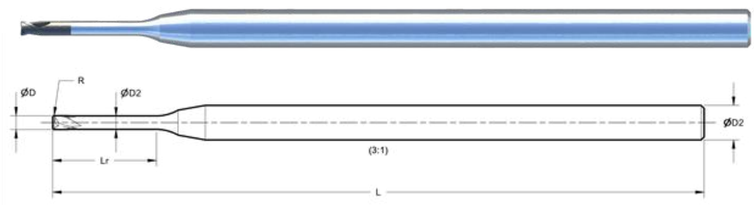
HUMM
MICRO MILL

micro milling | two blades | for processing hard materials

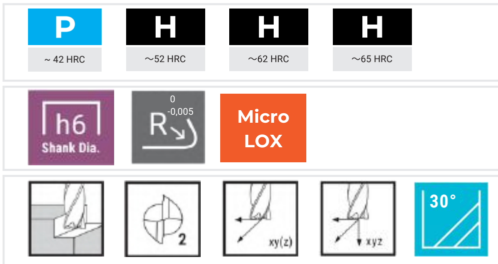
Humm Micro Mill micro cutters are tools equipped with two cutting blades. They are designed to work in both alloy steel and exceptionally hard materials - steel hardened to a hardness not exceeding 65 HRC.

Thanks to the appropriately selected micro-grained carbide, the cutters from this series are characterized by high durability and precision, even with diameters of 1 mm. A dedicated PVD coating for micro tools - Micro-Lox, increases abrasion resistance and allows the processing of hardened steels.

The tools from this series are designed for side machining and milling of flat surfaces, especially recommended for precise micro-machining of molds, dies, and other elements requiring high surface quality.



RECOMENDATIONS



STOCK ITEMS AND RECOMMENDED MILLING PARAMETERS

Article No.	D	D1	D2	Lr	R	L	~42 HRC			~55 HRC			~62 HRC			~65 HRC		
							ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)
880.010.04	1	4	0,95	4	0,1	75	0,055	25 000	2 200	0,04	21 000	1 800	0,03	18 000	1 500	0,02	14 000	1 100
880.010.06	1	4	0,95	6	0,1	75	0,045	20 000	1 700	0,02	16 000	1 400	0,01	14 000	1 200	0,007	11 000	850
880.010.08	1	4	0,95	8	0,1	75	0,035	18 000	1 400	0,015	15 000	1 100	0,008	13 000	900	0,005	10 000	650
880.010.10	1	4	0,95	10	0,1	75	0,025	16 000	1 000	0,01	13 000	800	0,006	11 000	700	0,005	10 000	650
880.010.12	1	4	0,95	12	0,1	75	0,025	15 000	800	0,01	12 000	700	0,006	9 000	650	0,005	8 000	550
880.010.14	1	4	0,95	14	0,1	75	0,02	14 000	700	0,01	11 000	650	0,006	8 000	550	0,005	7 000	400
880.010.16	1	4	0,95	16	0,1	75	0,02	13 000	650	0,01	10 000	550	0,006	7 000	400	0,005	6 000	250
880.010.18	1	4	0,95	18	0,1	75	0,015	12 000	550	0,007	9 000	400	0,003	6 000	250	0,002	5 000	185
880.010.20	1	4	0,95	20	0,1	75	0,013	11 000	400	0,007	8 000	250	0,003	5 000	185	0,002	4 000	160
880.010.22	1	4	0,95	22	0,1	75	0,01	10 000	250	0,005	7 000	185	0,002	4 000	160	0,001	3 000	135
880.010.24	1	4	0,95	24	0,1	75	0,01	9 000	185	0,005	6 000	160	0,002	3 000	135	0,001	2 000	110
880.010.26	1	4	0,95	26	0,1	75	0,005	8 000	160	0,003	5 000	135	0,001	2 000	110	0,001	1 000	90
880.010.28	1	4	0,95	28	0,1	75	0,005	7 000	135	0,003	4 000	110	0,001	1 000	90	0,001	900	70
880.010.30	1	4	0,95	30	0,1	75	0,003	6 000	110	0,002	3 000	90	0,001	900	70	0,001	800	50
880.012.04	1,2	4	1,15	4	0,12	75	0,07	25 000	2 500	0,06	21 000	2 000	0,02	18 000	1 800	0,01	13 000	1 400
880.012.06	1,2	4	1,15	6	0,12	75	0,06	20 000	2 200	0,05	16 000	1 800	0,02	14 000	1 400	0,007	11 000	1 100
880.012.08	1,2	4	1,15	8	0,12	75	0,05	18 000	1 700	0,04	15 000	1 400	0,01	13 000	1 100	0,007	10 000	950
880.012.10	1,2	4	1,15	10	0,12	75	0,04	16 000	1 400	0,03	13 000	1 100	0,01	11 000	950	0,005	9 000	700
880.012.12	1,2	4	1,15	12	0,12	75	0,04	15 000	1 000	0,03	12 000	800	0,008	9 000	700	0,005	8 000	650
880.012.14	1,2	4	1,15	14	0,12	75	0,035	14 000	800	0,02	11 000	700	0,006	8 000	650	0,005	7 000	550
880.012.16	1,2	4	1,15	16	0,12	75	0,03	13 000	700	0,02	10 000	650	0,006	7 000	550	0,005	6 000	400
880.012.18	1,2	4	1,15	18	0,12	75	0,03	12 000	650	0,01	9 000	550	0,003	6 000	400	0,004	5 000	250
880.012.20	1,2	4	1,15	20	0,12	75	0,025	11 000	550	0,01	8 000	400	0,003	5 000	250	0,004	4 000	185
880.012.22	1,2	4	1,15	22	0,12	75	0,025	9 000	400	0,007	7 000	250	0,002	4 000	185	0,003	3 000	160
880.012.24	1,2	4	1,15	24	0,12	75	0,02	8 000	250	0,007	6 000	185	0,002	3 000	160	0,003	2 000	135
880.012.26	1,2	4	1,15	26	0,12	75	0,02	7 000	185	0,005	5 000	160	0,001	2 000	135	0,002	1 000	110
880.012.28	1,2	4	1,15	28	0,12	75	0,01	6 000	160	0,005	4 000	135	0,001	1 000	110	0,002	900	90
880.012.30	1,2	4	1,15	30	0,12	75	0,01	5 000	135	0,003	3 000	110	0,001	900	90	0,001	800	70
880.012.32	1,2	4	1,15	32	0,12	75	0,006	4 000	110	0,003	2 000	90	0,001	800	70	0,001	700	50
880.014.04	1,4	4	1,35	4	0,14	75	0,08	25 000	2 700	0,07	21 000	2 200	0,04	18 000	2 000	0,015	13 000	1 600
880.014.06	1,4	4	1,35	6	0,14	75	0,07	20 000	2 500	0,06	16 000	2 000	0,03	14 000	1 800	0,015	11 000	1 400
880.014.08	1,4	4	1,35	8	0,14	75	0,06	18 000	2 200	0,05	15 000	1 800	0,025	13 000	1 400	0,01	10 000	1 100
880.014.10	1,4	4	1,35	10	0,14	75	0,05	16 000	1 700	0,04	13 000	1 400	0,02	11 000	1 100	0,01	9 000	950
880.014.12	1,4	4	1,35	12	0,14	75	0,04	15 000	1 400	0,03	12 000	1 100	0,015	9 000	800	0,007	8 000	700
880.014.14	1,4	4	1,35	14	0,14	75	0,04	14 000	1 000	0,02	11 000	800	0,01	8 000	700	0,007	7 000	650
880.014.16	1,4	4	1,35	16	0,14	75	0,035	13 000	800	0,02	10 000	700	0,01	7 000	650	0,005	6 000	550
880.014.18	1,4	4	1,35	18	0,14	75	0,03	12 000	700	0,01	9 000	650	0,007	6 000	550	0,005	5 000	400
880.014.20	1,4	4	1,35	20	0,14	75	0,025	11 000	650	0,01	8 000	550	0,007	5 000	400	0,003	4 000	250
880.014.22	1,4	4	1,35	22	0,14	75	0,025	10 000	550	0,007	7 000	400	0,005	4 000	250	0,003	3 000	185

HUMM **MICRO MILL**

STOCK ITEMS AND RECOMMENDED MILLING PARAMETERS

Article No.	D	D1	D2	Lr	R	L	~42 HRC			~55 HRC			~62 HRC			~65 HRC		
							ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)
880.014.24	1,4	4	1,35	24	0,14	75	0,02	9 000	400	0,007	6 000	250	0,005	3 000	185	0,003	2 000	160
880.014.26	1,4	4	1,35	26	0,14	75	0,01	8 000	250	0,005	5 000	185	0,003	2 500	160	0,002	1 500	135
880.014.28	1,4	4	1,35	28	0,14	75	0,01	7 000	185	0,005	4 000	160	0,003	3 000	135	0,002	1 000	110
880.014.30	1,4	4	1,35	30	0,14	75	0,006	6 000	160	0,003	3 000	135	0,002	2 000	110	0,001	900	90
880.014.32	1,4	4	1,35	32	0,14	75	0,006	5 000	135	0,003	2 500	110	0,002	1 500	90	0,001	800	70
880.014.34	1,4	4	1,35	34	0,14	75	0,004	4 000	110	0,002	2 000	90	0,001	1 000	70	0,001	700	50
880.016.06	1,6	4	1,55	6	0,16	75	0,09	25 000	3 000	0,08	21 000	2 700	0,07	18 000	2 500	0,06	16 000	2 200
880.016.08	1,6	4	1,55	8	0,16	75	0,08	20 000	2 700	0,07	18 000	2 500	0,06	16 000	2 200	0,05	15 000	1 700
880.016.10	1,6	4	1,55	10	0,16	75	0,07	18 000	2 500	0,06	16 000	2 200	0,05	15 000	1 700	0,04	14 000	1 400
880.016.12	1,6	4	1,55	12	0,16	75	0,06	16 000	2 200	0,05	15 000	1 700	0,04	14 000	1 400	0,035	13 000	1 000
880.016.14	1,6	4	1,55	14	0,16	75	0,05	15 000	1 700	0,04	14 000	1 400	0,035	13 000	1 000	0,03	12 000	800
880.016.16	1,6	4	1,55	16	0,16	75	0,04	14 000	1 400	0,035	13 000	1 000	0,03	12 000	800	0,025	11 000	700
880.016.18	1,6	4	1,55	18	0,16	75	0,035	13 000	1 000	0,03	12 000	800	0,025	11 000	700	0,025	10 000	650
880.016.20	1,6	4	1,55	20	0,16	75	0,03	12 000	800	0,025	11 000	700	0,025	10 000	650	0,02	9 000	550
880.016.22	1,6	4	1,55	22	0,16	75	0,025	11 000	700	0,025	10 000	650	0,02	9 000	550	0,01	8 000	400
880.016.24	1,6	4	1,55	24	0,16	75	0,025	10 000	650	0,02	9 000	550	0,01	8 000	400	0,01	7 000	250
880.016.26	1,6	4	1,55	26	0,16	75	0,02	9 000	550	0,01	8 000	400	0,01	7 000	250	0,006	6 000	185
880.016.28	1,6	4	1,55	28	0,16	75	0,01	8 000	400	0,01	7 000	250	0,006	6 000	185	0,006	5 000	160
880.016.30	1,6	4	1,55	30	0,16	75	0,01	7 000	250	0,006	6 000	185	0,006	5 000	160	0,004	4 000	135
880.016.32	1,6	4	1,55	32	0,16	75	0,006	6 000	185	0,006	5 000	160	0,004	4 000	135	0,004	3 000	110
880.016.34	1,6	4	1,55	34	0,16	75	0,006	5 000	160	0,004	4 000	135	0,004	3 000	110	0,002	2 000	90
880.016.36	1,6	4	1,55	36	0,16	75	0,004	4 000	135	0,004	3 000	110	0,002	2 000	90	0,002	1 000	70
880.018.06	1,8	4	1,75	6	0,18	75	0,1	24 000	2 700	0,09	20 000	2 500	0,08	18 000	2 200	0,07	16 000	1 700
880.018.08	1,8	4	1,75	8	0,18	75	0,09	20 000	2 500	0,08	18 000	2 200	0,07	16 000	1 700	0,06	15 000	1 400
880.018.10	1,8	4	1,75	10	0,18	75	0,08	18 000	2 200	0,07	16 000	1 700	0,06	15 000	1 400	0,05	14 000	1 000
880.018.12	1,8	4	1,75	12	0,18	75	0,07	16 000	1 700	0,06	15 000	1 400	0,05	14 000	1 000	0,04	13 00	800
880.018.14	1,8	4	1,75	14	0,18	75	0,06	15 000	1 400	0,05	14 000	1 000	0,04	13 000	800	0,035	12 000	700
880.018.16	1,8	4	1,75	16	0,18	75	0,05	14 000	1 000	0,04	13 000	800	0,035	12 000	700	0,03	11 000	650
880.018.18	1,8	4	1,75	18	0,18	75	0,04	13 000	800	0,035	12 000	700	0,03	11 000	650	0,025	10 000	550
880.018.20	1,8	4	1,75	20	0,18	75	0,035	12 000	700	0,03	11 000	650	0,025	10 000	550	0,025	9 000	400
880.018.22	1,8	4	1,75	22	0,18	75	0,03	11 000	650	0,025	10 000	550	0,025	9 000	400	0,02	8 000	250
880.018.24	1,8	4	1,75	24	0,18	75	0,025	10 000	550	0,025	9 000	400	0,02	8 000	250	0,01	7 000	185
880.018.26	1,8	4	1,75	26	0,18	75	0,025	9 000	400	0,02	8 000	250	0,01	7 000	185	0,01	6 000	160
880.018.28	1,8	4	1,75	28	0,18	75	0,02	8 000	250	0,01	7 000	185	0,01	6 000	160	0,006	5 000	135
880.018.30	1,8	4	1,75	30	0,18	75	0,01	7 000	185	0,01	6 000	160	0,006	5 000	135	0,006	4 000	110
880.018.32	1,8	4	1,75	32	0,18	75	0,01	6 000	160	0,006	5 000	135	0,006	4 000	110	0,004	3 000	90
880.018.34	1,8	4	1,75	34	0,18	75	0,006	5 000	135	0,006	4 000	110	0,004	3 000	90	0,004	2 000	70
880.018.36	1,8	4	1,75	36	0,18	75	0,006	4 000	110	0,004	3 000	90	0,004	2 000	70	0,002	1 000	50
880.018.38	1,8	4	1,75	38	0,18	75	0,004	3 000	90	0,004	2 000	70	0,002	1 000	50	0,002	900	45
880.020.06	2	4	1,92	6	0,2	75	0,12	22 000	2 500	0,06	18 000	2 100	0,05	15 000	1 800	0,03	12 000	1 300
880.020.08	2	4	1,92	8	0,2	75	0,11	20 000	2 200	0,05	16 000	1 800	0,04	14 000	1 500	0,02	11 000	1 100
880.020.10	2	4	1,92	10	0,2	75	0,1	18 000	1 900	0,05	14 000	1 500	0,03	13 000	1 300	0,015	10 000	950
880.020.12	2	4	1,92	12	0,2	75	0,09	16 000	1 700	0,04	13 000	1 400	0,03	11 000	1 200	0,01	9 000	850
880.020.14	2	4	1,92	14	0,2	75	0,08	15 000	1 500	0,04	12 000	1 200	0,02	10 000	1 100	0,01	8 000	700
880.020.16	2	4	1,92	16	0,2	75	0,07	14 000	1 400	0,03	11 000	1 100	0,02	9 500	950	0,007	7 500	650
880.020.18	2	4	1,92	18	0,2	75	0,06	12 000	1 000	0,03	10 000	900	0,01	8 000	800	0,007	6 500	500
880.020.20	2	4	1,92	20	0,2	75	0,05	10 000	800	0,02	8 000	650	0,01	7 000	550	0,005	5 500	400
880.020.22	2	4	1,92	22	0,2	75	0,04	9 000	700	0,02	7 000	600	0,01	6 000	400	0,005	5 000	350
880.020.24	2	4	1,92	24	0,2	75	0,035	8 000	650	0,025	6 000	550	0,007	5 000	350	0,005	4 000	250

STOCK ITEMS AND RECOMMENDED MILLING PARAMETERS

Article No.	D	D1	D2	Lr	R	L	□42 HRC			□55 HRC			□62 HRC			□65 HRC		
							ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)	ap	Spindle rotation (min^-1)	Feed (mm/min)
880.020.26	2	4	1,92	26	0,2	75	0,03	7 000	550	0,025	5 000	400	0,007	4 000	250	0,005	3 000	185
880.020.28	2	4	1,92	28	0,2	75	0,025	6 000	400	0,02	4 000	250	0,005	3 000	185	0,003	2 000	160
880.020.30	2	4	1,92	30	0,2	75	0,025	5 000	250	0,02	3 000	185	0,005	2 000	160	0,003	1 500	135
880.020.32	2	4	1,92	32	0,2	75	0,02	4 000	185	0,01	2 000	160	0,003	1 500	135	0,002	1 000	110
880.020.34	2	4	1,92	34	0,2	75	0,01	3 000	160	0,006	1 500	135	0,003	1 000	110	0,002	1 000	90
880.020.36	2	4	1,92	36	0,2	75	0,01	2 000	135	0,006	1 000	110	0,003	1 000	90	0,002	900	70
880.020.38	2	4	1,92	38	0,2	75	0,006	1 500	110	0,003	1 000	90	0,002	900	70	0,001	850	50
880.020.40	2	4	1,92	40	0,2	75	0,006	1 000	90	0,003	900	70	0,002	850	50	0,001	800	30
880.025.08	2,5	4	2,4	8	0,25	75	0,14	14 000	2 200	0,12	13 000	2 000	0,06	12 000	1 800	0,03	9 000	1 100
880.025.12	2,5	4	2,4	12	0,25	75	0,12	13 000	2 000	0,1	12 000	1 800	0,05	11 000	1 400	0,03	8 000	950
880.025.16	2,5	4	2,4	16	0,25	75	0,1	12 000	1 800	0,08	11 000	1 400	0,04	9 000	1 100	0,02	7 000	750
880.025.20	2,5	4	2,4	20	0,25	75	0,08	11 000	1 400	0,04	9 000	1 100	0,02	7 500	950	0,01	6 000	650
880.025.24	2,5	4	2,4	24	0,25	75	0,07	10 000	1 000	0,04	9 500	800	0,02	7 000	750	0,01	5 500	600
880.025.28	2,5	4	2,4	28	0,25	75	0,06	9 000	800	0,03	8 000	700	0,015	6 500	700	0,007	5 000	550
880.025.32	2,5	4	2,4	32	0,25	75	0,05	8 000	700	0,03	7 000	650	0,015	5 500	600	0,007	4 500	500
880.025.36	2,5	4	2,4	36	0,25	75	0,04	7 000	650	0,02	6 000	600	0,01	5 000	550	0,005	4 000	450
880.025.40	2,5	4	2,4	40	0,25	75	0,03	6 000	600	0,02	5 500	550	0,01	4 500	500	0,005	3 500	400
880.030.08	3	4	2,9	8	0,3	75	0,16	14 000	2 200	0,1	11 000	1 800	0,07	9 500	1 500	0,05	7 500	1 100
880.030.12	3	4	2,9	12	0,3	75	0,16	13 500	2 000	0,08	11 000	1 600	0,06	9 500	1 400	0,04	7 500	1 000
880.030.16	3	4	2,9	16	0,3	75	0,14	12 000	1 800	0,07	10 000	1 500	0,05	8 500	1 300	0,03	7 000	9 000
880.030.20	3	4	2,9	20	0,3	75	0,12	10 000	1 400	0,05	8 000	1 100	0,04	7 000	950	0,02	5 500	700
880.030.24	3	4	2,9	24	0,3	75	0,1	9 000	1 000	0,05	7 500	800	0,04	6 500	700	0,02	5 000	650
880.030.28	3	4	2,9	28	0,3	75	0,09	8 000	800	0,04	7 000	700	0,03	6 000	650	0,015	4 500	600
880.030.32	3	4	2,9	32	0,3	75	0,08	7 000	700	0,04	6 000	650	0,03	5 000	600	0,015	4 000	550
880.030.36	3	4	2,9	36	0,3	75	0,07	6 000	650	0,03	5 000	600	0,02	4 500	550	0,01	3 500	500
880.030.40	3	4	2,9	40	0,3	75	0,06	5 000	600	0,03	4 500	550	0,02	4 000	500	0,01	3 000	450
880.030.44	3	4	2,9	44	0,3	75	0,05	4 000	550	0,02	4 000	500	0,01	3 500	450	0,005	2 500	400

HUMM **DT**

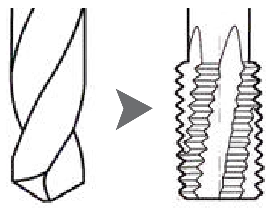
2 operations with 1 tool | no guide hole | thread to the bottom of the hole

The Humm DT series of thread mills has a special geometry that allows for the production of a thread in solid material without the need for a pilot hole.

Due to the low cutting resistance, the thread mills are more durable than traditional machine taps and can be used on machines with lower power.

The advantage of this solution is the possibility of making a thread to the bottom of the hole. Thanks to the special H-Lox coating, this tool can make threads in material with a hardness of up to 62 HRC and the obtained threads are characterized by a higher quality of surface finish than in the case of using traditional threading methods.

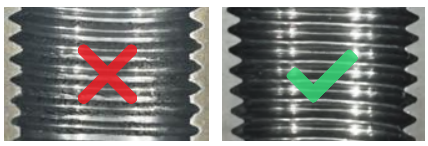
2 processes
1 tool



drilling threading

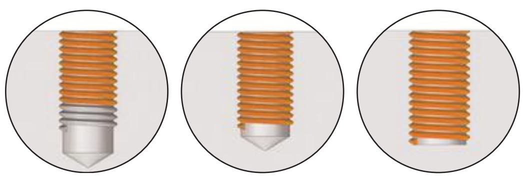
Reduced risk of tool damage/breakage

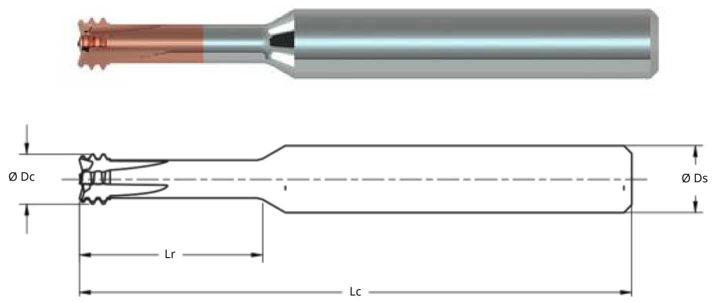
Improved quality
processed surface



Precisely cuts chips, eliminates tearing and galling.

Obtaining a complete profile
thread to the bottom of the hole

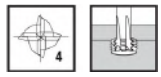




RECOMENDATIONS

P ~ 30 HRC | P 30-44 HRC | H ~ 55 HRC | H ~ 62 HRC

h5 Shank Dia. | H-LOX



STOCK ITEMS

	D1	Dc	Ds	Lr	Lc	Z	Article No.
	M3x0,5	2,4	6	7,5	50	4	200.050.03
	M4x0,7	3,1	6	10	50	4	200.070.04
	M5x0,8	3,8	6	12,5	50	4	200.080.05
	M6x1	4,6	6	15	50	4	200.100.06
	M8x1,25	6,2	10	20	70	4	200.125.08
*	M10x1,5	7,5	10	25	70	4	200.150.10
*	M12x1,75	9	10	30	80	4	200.175.12

*no cooling holes

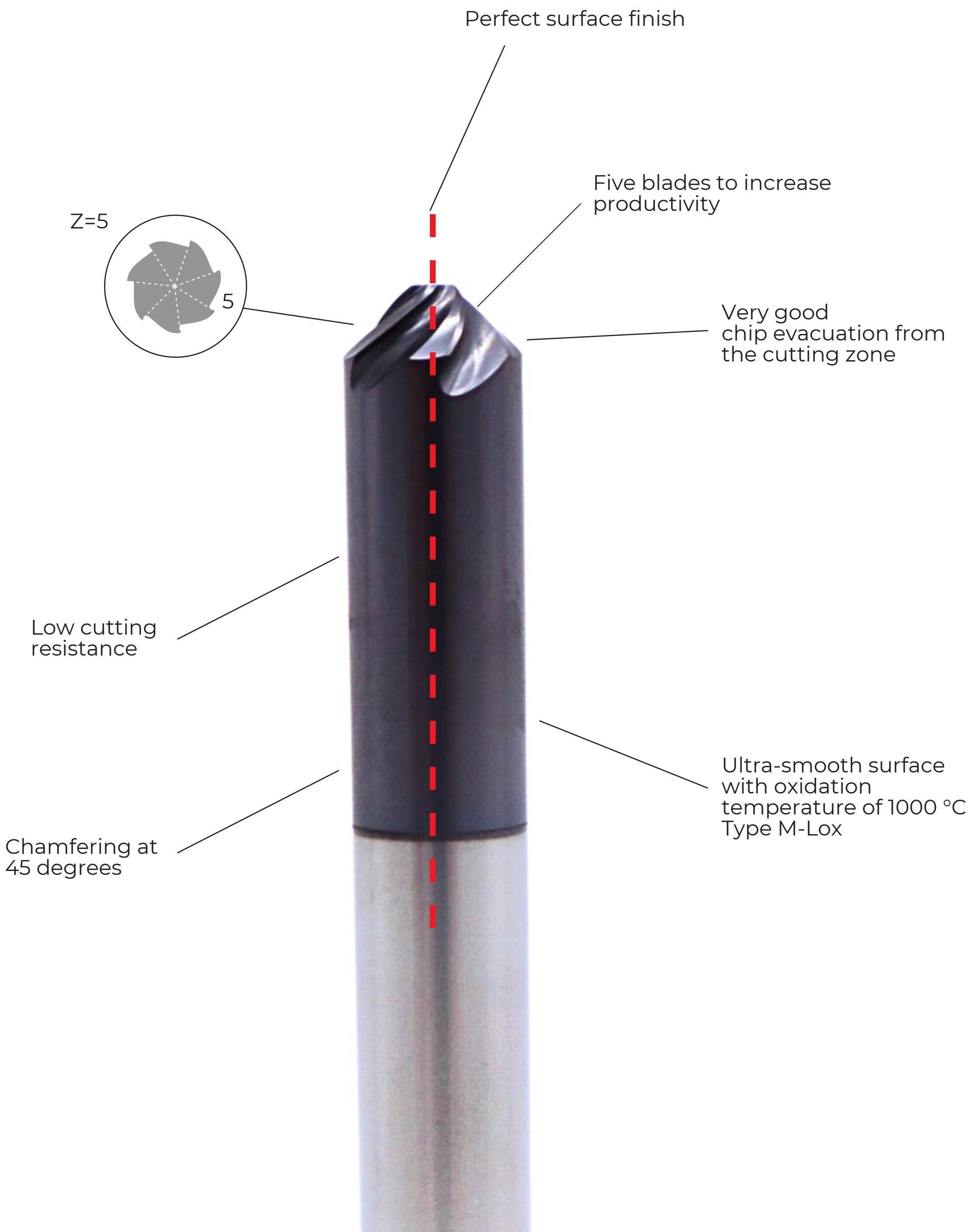
RECOMMENDED CONDITIONS FOR THREAD MILLING

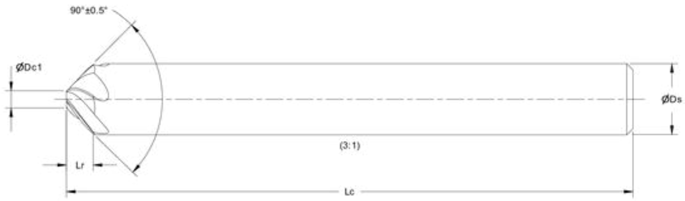
Material	Outer diameter (mm)	M3x0,5	M4x0,7	M5x0,8	M6x1	M8x1,25	M10x1,5	M12x1,75
To 30 HRC	Spindle rotation (min^-1)	9 900	7 700	6 300	5 200	3 900	3 200	2 700
	Feed (mm/min)	127	152	163	170	165	179	184
30-44 HRC	Spindle rotation (min^-1)	8 600	6 700	5 400	4 500	3 300	2 800	2 300
	Feed (mm/min)	103	127	130	134	128	148	145
55 HRC	Spindle rotation (min^-1)	7 300	5 600	4 600	3 800	2 800	2 300	1 900
	Feed (mm/min)	82	96	102	106	101	113	112
62 HRC	Spindle rotation (min^-1)	6 000	4 600	3 800	3 100	2 300	1 900	1 600
	Feed (mm/min)	53	62	66	67	64	72	72

HUMM **EDGE**

Shank cutter | 5-blades | 45 degree chamfer | large helix angle

HUMM chamfers are a line of end mills equipped with 5 flutes with straight cutting edges. The high helix angle (40 degrees) and the 5-flute design increase the tool's efficiency compared to straight two- and four-flute chamfers. The use of PVD M-Lox coated carbide makes HUMM EDGE chamfers suitable for high-speed machining.



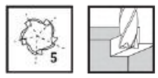


RECOMENDATIONS

P	P	H	K	N	M
Alloy steel	Carbon steel	Hardened steel	Cast iron	Aluminum and non-cast iron	Stainless steel

M-LOX

40°



STOCK ITEMS

Dc	Dc1	Ds	Lc	Lr	Z	Article No.
4,00	1	4,00	57	1,5	5	870.040.00
6,00	1,5	6,00	57	2,25	5	870.060.00
8,00	2	8,00	63	3,00	5	870.080.00
10,00	2,5	10,00	72	3,80	5	870.100.00
12,00	3	12,00	83	4,50	5	870.120.00
16,00	4	16,00	92	6,00	5	870.160.00

RECOMMENDED CHAMFERING CONDITIONS

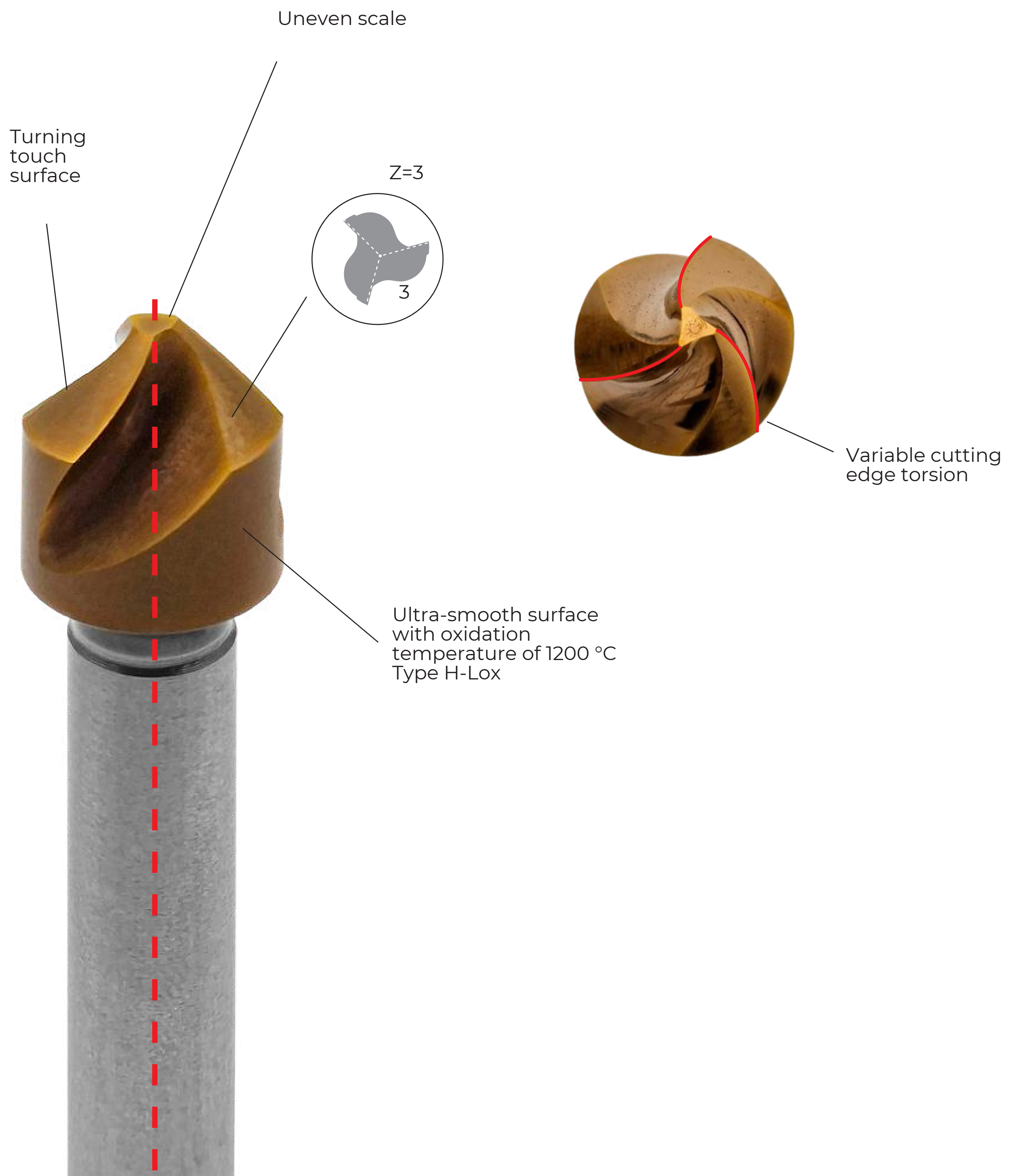
Material	Chamfering speed Vc (m/min)	fz (mm/tooth)					
		Ø4	Ø6	Ø8	Ø10	Ø12	Ø16
Carbon and alloy steel	170 - 220	0,005-0,04	0,01-0,05	0.015 - 0.060	0.020 - 0.070	0.025 - 0.080	0.030 - 0.100
Hardened steel	30 - 50	0,003-0,03	0,005-0,04	0.010-0.050	0.015-0.060	0.020-0.070	0.025-0.080
Stainless steel	140 - 180	0,005-0,04	0,01-0,05	0.015-0.060	0.020-0.070	0.025-0.080	0.030-0.100
Cast iron	120 - 150	0,01-0,04	0,015-0,05	0.020-0.060	0.025-0.070	0.030-0.080	0.040-0.100
Aluminum alloys	220 - 260	0,01-0,1	0,015-0,12	0.020-0.140	0.025-0.160	0.030-0.180	0.040-0.200

HUMM **SC-ASP**

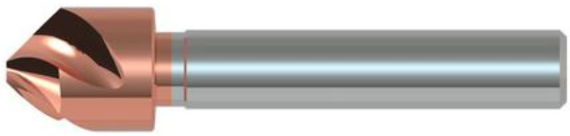
Variable pitch | Variable helicity | Variable blade geometry | Z=3

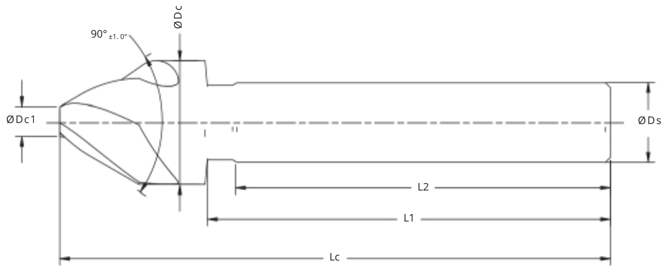
Series 120 tools have three unequally pitched blades, in addition to each blade has a variable twist. The combination of these two factors results in quiet and smooth operation without vibration.

The geometry allows you to work with little force, the tools are perfect for manual processing. The countersinks are designed for universal use.



HUMM **SC-ASP**





RECOMENDATIONS

P	P	P	K	N
~ 30 HRC	30-44 HRC	~ 750 N/mm2	Cast iron	Aluminum and non-cast iron

h6 Shank Dia.

H-LOX

STOCK ITEMS

Dc	Dc1	Ds	Lc	Z	L1	L2	Article No.
8,5	2	6	56	3	41	38	120.085.90
10,5	2,5	6	56	3	41	38	120.105.90
12,5	2,8	8	56	3	41	38	120.125.90
16,5	3,2	10	63	3	41	40	120.165.90
20,5	3,5	10	67	3	41	40	120.205.90

RECOMMENDED MILLING CONDITIONS

Material	Outer diameter (mm)	Ø8,5	Ø10,5	Ø12,5	Ø16,5	Ø20,5
To 750 N/mm2	Spindle rotation (min^-1)	37	37	37	37	37
	Feed (mm/min)	0,14	0,15	0,15	0,18	0,21
To 30HRC	Spindle rotation (min^-1)	29	29	29	29	29
	Feed (mm/min)	0,14	0,15	0,15	0,18	0,21
30-44 HRC	Spindle rotation (min^-1)	9	9	9	9	9
	Feed (mm/min)	0,06	0,06	0,06	0,08	0,09
Cast iron	Spindle rotation (min^-1)	18	18	18	18	18
	Feed (mm/min)	0,14	0,15	0,15	0,18	0,21
Aluminum alloys	Spindle rotation (min^-1)	104	104	104	104	104
	Feed (mm/min)	0,17	0,18	0,19	0,23	0,26

NOTES

PRECISION
TOOLS

MEMBER OF
GROUP

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