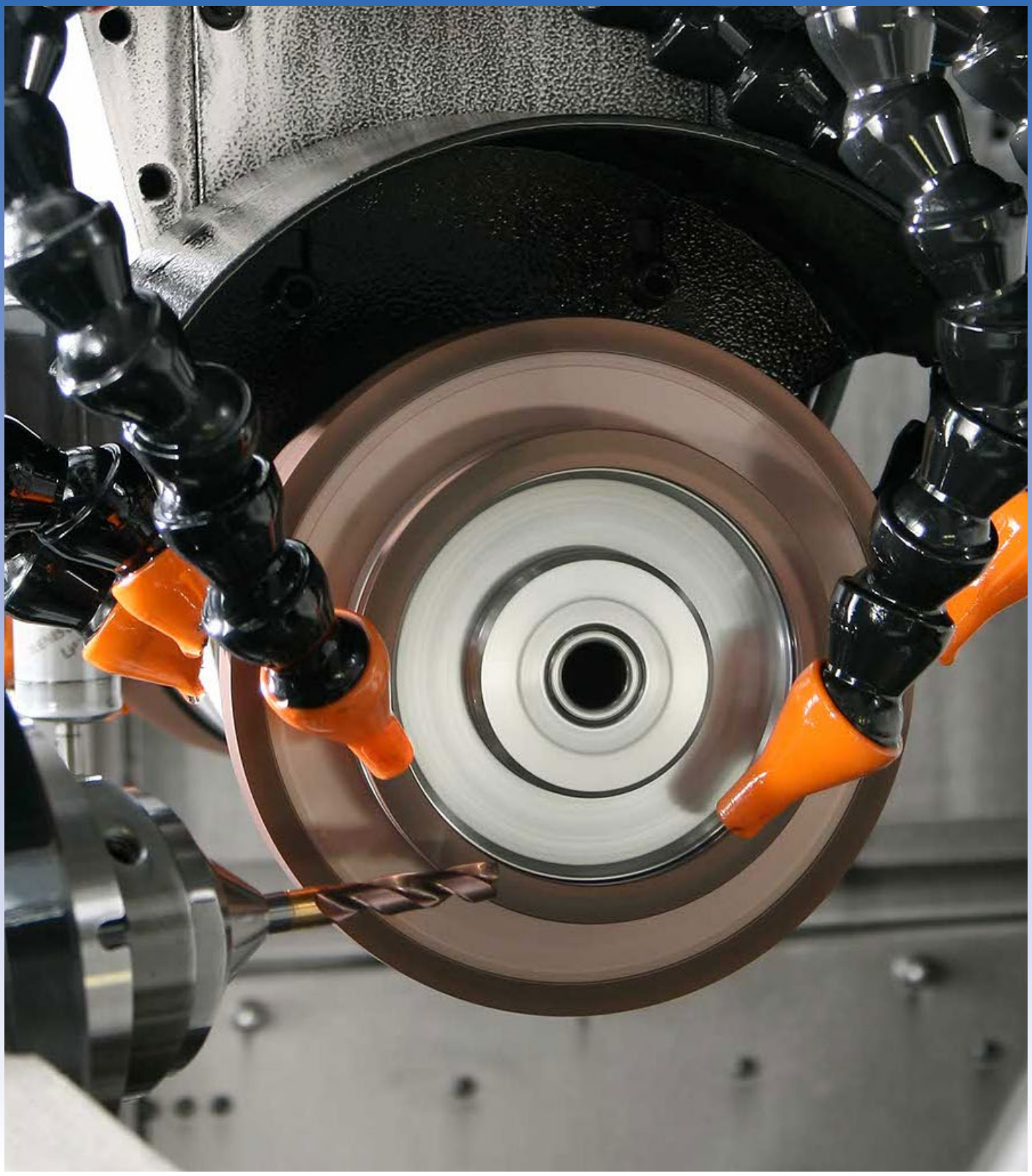
WNT RESTART

04.06.2018

Regrinding instead of buying new – with the regrind service from WNT



TOTAL TOOLING = QUALITY x SERVICE ^{2}

www.wnt.com

CERATIZIT GROUP

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WNT RESTART

Bringing the old back to life

WNT Restart – regrinding, not replacing

Your used precision tool is in the best possible hands with us. We return your tool to you with the original finish, coating and geometry – as good as new and ready for use back in the machine. What is more, you can also enjoy a practically full service life in comparison to new product. Reduce the pressure on your budget by reusing your old tools! Take advantage of this Service² from WNT.

If you require something different from the standard grind, please specify this on the despatch note. The despatch note is delivered with our regrind box and is also available to download from our homepage.

"As much as is necessary, but as little as possible"

In all cases your tools will be reground according to extent of the wear sustained. You can help to ensure that this is possible by changing your tools as soon as the cutting edges have worn by the defined amount. It is also important not to use your tools for so long that heavy chipping is suffered along the cutting edges.

Good to know

WNT RESTART

Service is a priority at WNT –
this also applies to the re-processing of used tools

Original Grinding

- Original Geometry

Original Coating

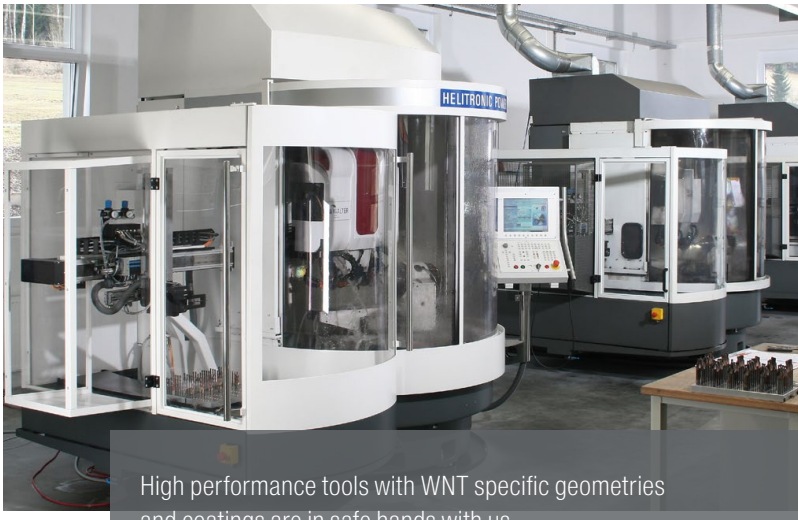
This guarantees that your recycled tools achieve almost 100 % of the service life and cutting performance of a new tool again.

Fair and transparent prices

- No surcharges for cutting off, roughing, etc.
- Prices shown are valid irrespective of the delivery condition of your tool. If regrind of a tool is uneconomical, the tool will be returned unprocessed.

Lead Time

Our standard delivery time is **15 working days**, starting on receipt of your order. Tools with special geometries or special coatings, which have a different delivery time are indicated accordingly.



High performance tools with WNT specific geometries and coatings are in safe hands with us.

Terms and conditions

All tools that have been reground are marked to indicate this. Non-WNT tools received for regrinding are ground according to WNT geometric guidelines.

Your benefits

- high process reliability by application of identical parameters as for new tools
- Reduction of your production and tooling costs
- low tool stockholding thanks to fast service
- ease of use with the WNT regrind box

A simple route to your reground tool

Send us your used tools

On request we can provide a regrind box free of charge to be available so your tools can be transported safely. See below to request a regrind box quickly and free of charge:

Free phone:	0800 073 2073
Fax:	0800 073 2074
E-Mail:	orders@wnt.com

Size of the box in mm
300 x 200 x 138

Your tools are checked on arrival at our regrind center, whether or to what extent they can be reworked.

Then your tools are professionally sharpened and optionally coated.

Needless to say, the prepared tools are subject to our strict quality control by experienced professionals before they are returned.

The WNT regrind box route

2 A quick phone call to the WNT UK number is enough to request the completed order collection.

1 You get the WNT regrind box with a regrind delivery note.

WNT RESTART

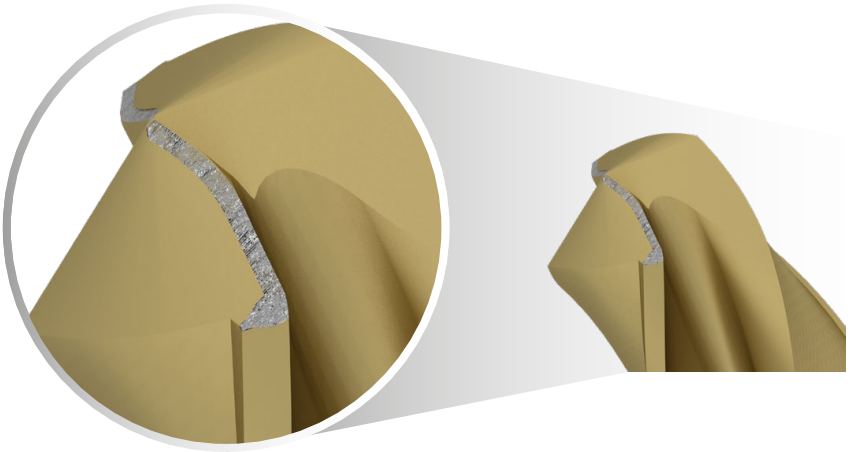
3 On the same or no later than the next working day, the filled box of regrinds will be picked up by DHL. WNT will cover the cost of transportation.

5 You provide the tools for original regrinding, we provide you with the usual WNT packaging for WNT Tool-Xpress.

WNT TOOL-XPRESS

4 Whilst we take care of the original regrinding of your tools, you automatically get an empty box for your returns.

Normal drill wear



Under ideal conditions, uniform wear should be seen along the entire cutting edge.

- Cutting speed OK
- Feed rate OK
- Drill and workpiece are clamped correctly

Maximum wear prior to regrinding

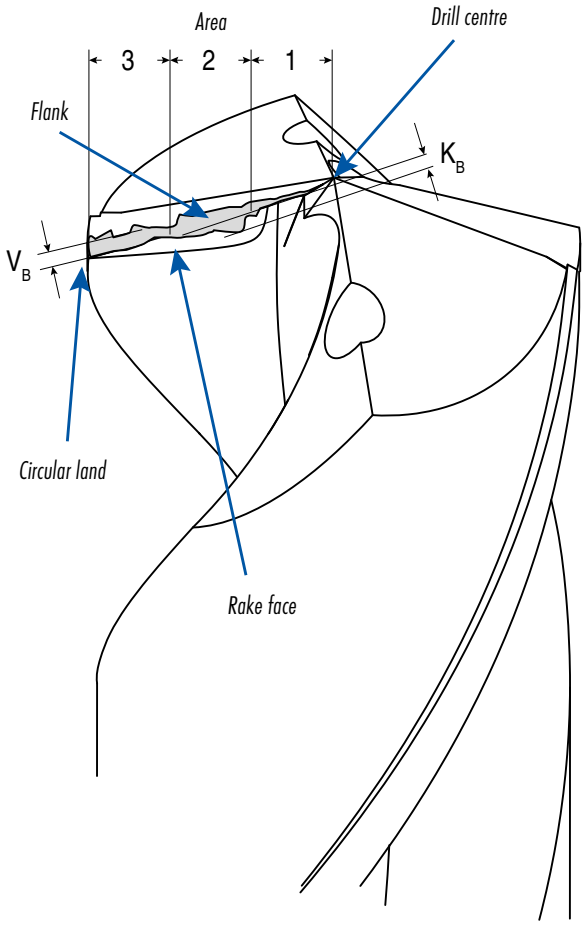
Drilling tools should be reground when the wear land has grown to a specific width (V_B) along with a certain amount of cratering (K_B).

Maximum flank wear (V_B) in mm

Drill diameter in mm	Area		
	3	2	1
3,00 – 6,00	0,20	0,20	0,20
6,01 – 10,00	0,25	0,20	0,20
10,01 – 14,00	0,25	0,25	0,25
14,01 – 17,00	0,30	0,25	0,25
17,01 – 20,00	0,35	0,30	0,30

Crater wear (K_B) in mm

Drill diameter in mm	Area		
	3	2	1
3,00 – 6,00	0,20	0,20	0,20
6,01 – 10,00	0,25	0,25	0,25
10,01 – 14,00	0,30	0,30	0,30
14,01 – 17,00	0,30	0,30	0,30
17,01 – 20,00	0,35	0,35	0,35

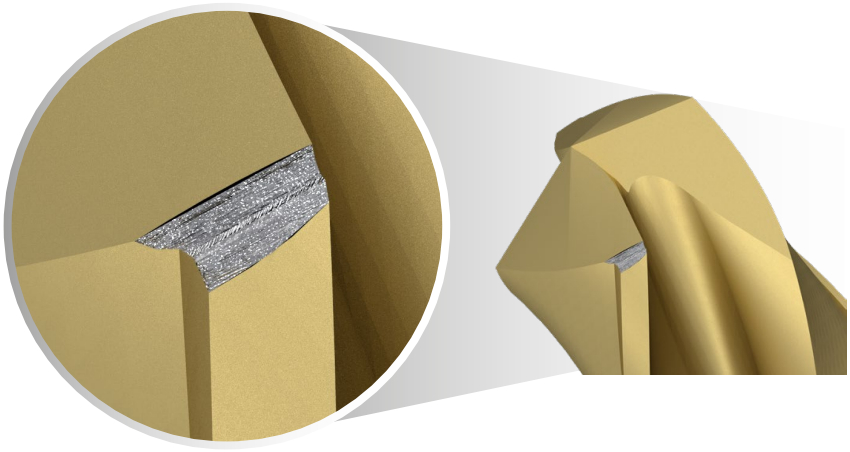


Types of wear on HSS and solid carbide drills

Splintering on edges

Cause

- Workpiece moves when the drill enters the material (e.g. workpiece is not clamped properly)
- Insufficient cooling
- Runout error too large



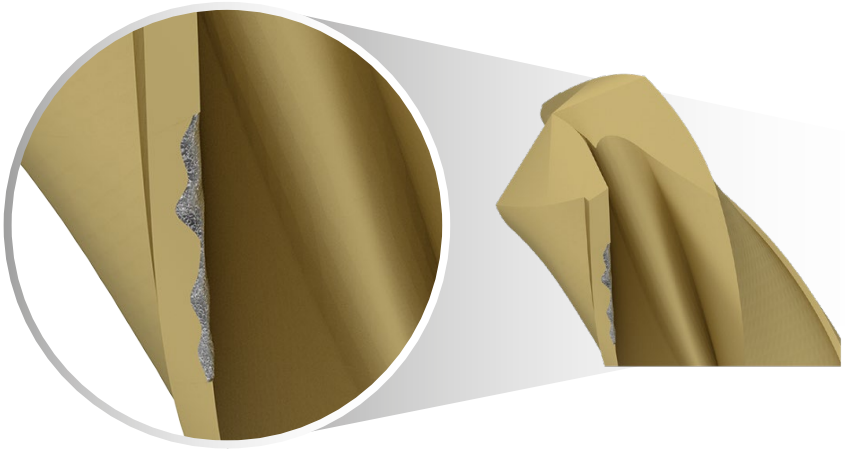
Solutions

- Check clamping element (check for play in the spindle unit)
- Check coolant supply
- Optimise runout

Splintering on guide lands

Cause

- Movement of the workpiece
- Incorrect handling or transport



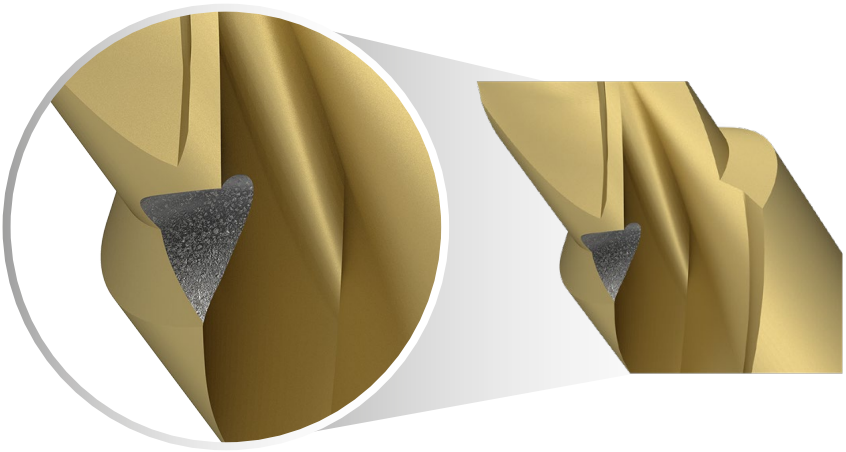
Solutions

- Check workpiece clamping and tool stability
- Use original packaging for storage and transport

Splintering on steps

Cause

- Insufficient stability
- Chuck is not strong or precise enough



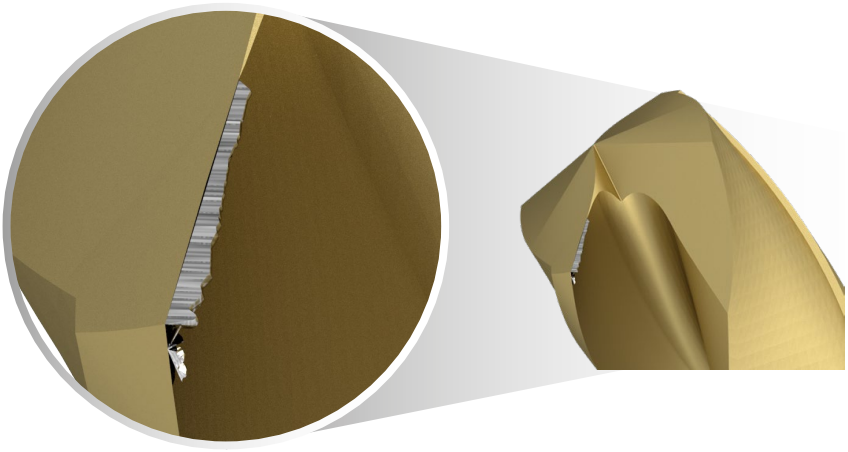
Solutions

- Check clamping device
- Use high-precision chucks

Built-up edge

Cause

- Cutting speed too low
- Negative bevel on cutting edges
- Insufficient cooling



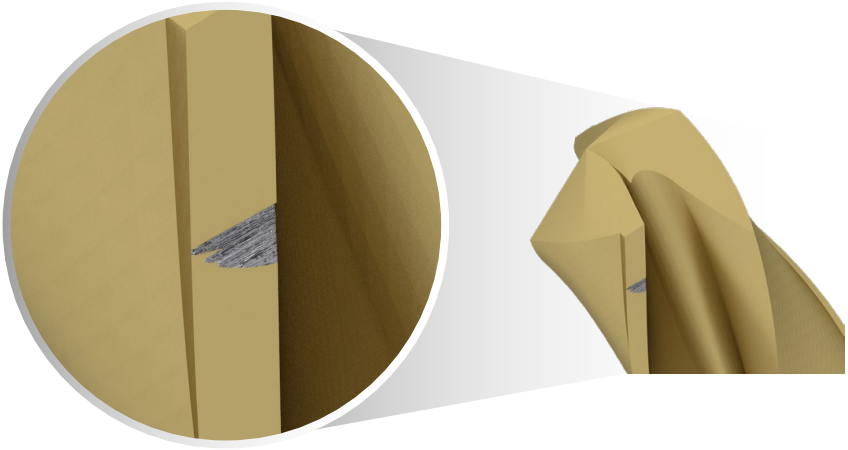
Solutions

- Increase cutting speed
- Use a drill with sharper cutting edge preparation
- Check coolant supply

Chipping on guide lands

Cause

- Workpiece is moving when the drill exits the material; "springback"
- Insufficient cooling



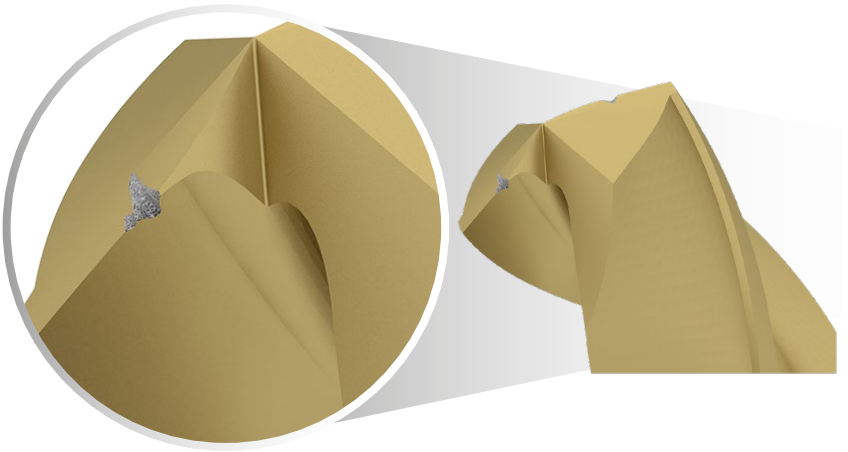
Solutions

- Check workpiece clamping
- Check coolant, increase coolant pressure

Chipping on main cutting edge

Cause

- Unstable drilling conditions
- Interrupted cut
- Maximum wear width exceeded



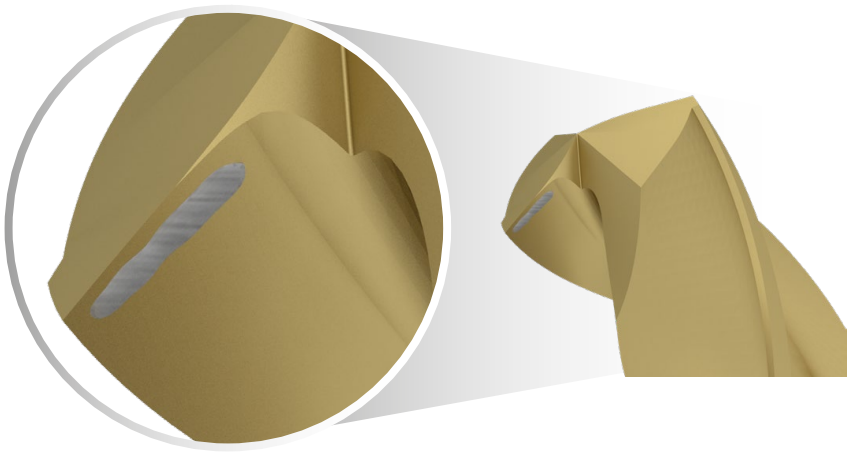
Solutions

- Optimise workpiece and tool clamping
- Reduce feed rate
- Change tool earlier

Types of wear on HSS and solid carbide drills

Cratering

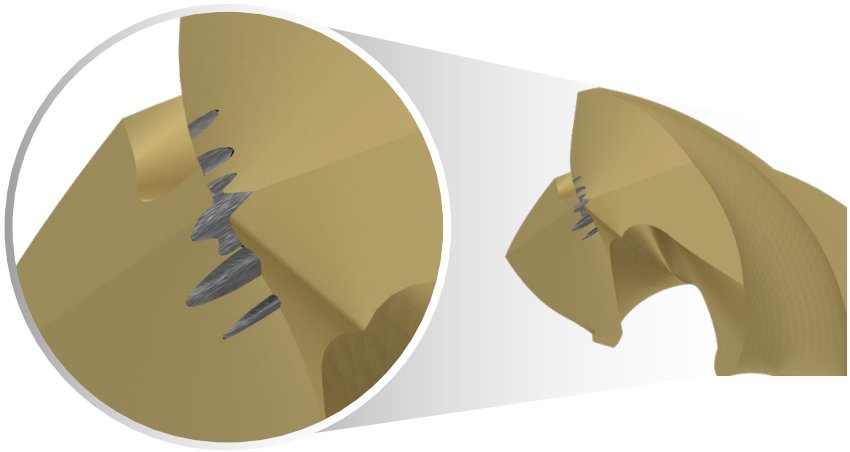
Cause
- Cutting speed to low
- Insufficient cooling



Solutions
- Increase cutting speed
- Increase coolant pressure

Point angle fragmentation

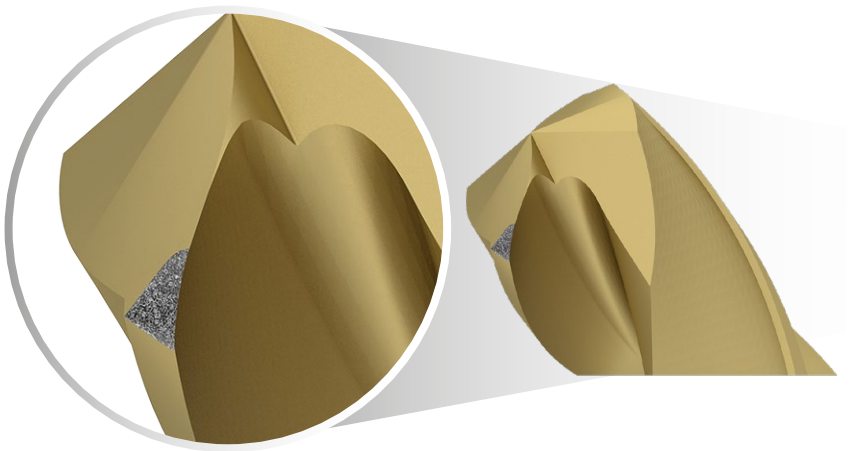
Cause
- Feed rate too low
- Drill not running true



Solutions
- Increase feed rate
- Runout < 0.02 mm

Excessive flank wear on the cutting edge

Cause
- Cutting speed too high
- Feed rate too low
- Insufficient cooling
- Drilling from two sides or interrupted cut on exit from material

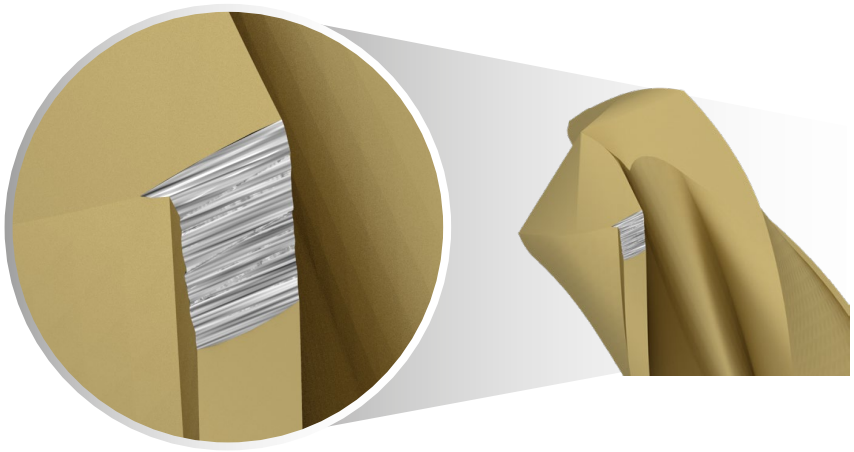


Solutions
- Reduce cutting speed
- Increase feed rate
- Use higher-quality coolant (higher concentration, increase pressure, nozzle placement?)
- Check drill exit from material

Excessive wear on the cutting edge

Cause

- Cutting speed too high
- Coolant pressure too low
- Drill not running true



Solutions

- Reduce cutting speed, increase feed rate
- Increase coolant pressure
- Runout < 0.02 mm

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Twist drills and core drills

- up to 10xD hole depth



Cutting-Ø-range mm	Regrinding Z0 Article no. 98 100 ... EUR		Regrinding Coating TiCN Z0 Article no. 98 241 ... EUR		Regrinding Coating TiAlN Z0 Article no. 98 244 ... EUR		Regrinding Coating TiN Z0 Article no. 98 350 ... EUR	
Ø 2.0 to Ø 4.0	4,63	040	7,71	040	7,71	040	7,71	040
≤ Ø 6,0	3,08	060	7,71	060	7,71	060	7,71	060
≤ Ø 8,0	3,08	080	10,79	080	10,79	080	10,79	080
≤ Ø 10,0	3,08	100	10,79	100	10,79	100	10,79	100
≤ Ø 12,0	4,63	120	12,31	120	12,31	120	12,31	120
≤ Ø 14,0	4,63	140	15,40	140	15,40	140	15,40	140
≤ Ø 16,0	6,17	160	16,96	160	16,96	160	16,96	160
≤ Ø 18,0	6,17	180	23,13	180	23,13	180	23,13	180
≤ Ø 20,0	6,17	200	24,65	200	24,65	200	24,65	200
≤ Ø 22,0	10,79	220	33,90	220			33,90	220
≤ Ø 26,0	13,88	260	33,90	260			33,90	260
≤ Ø 32,0	16,96	320	38,52	320			38,52	320
≤ Ø 36,0	21,56	360	46,21	360			46,21	360
≤ Ø 40,0	26,19	400	58,55	400			58,55	400

Grinding process:

- These tools are reground on the main cutting edge and receive, if present, their original coating.
- With heavy wear to the guide land, the tools will be reduced accordingly and then reground.

Step drill with 1 step – NC spot drills, short and long

- Point angle 90° and 120°



Cutting-Ø-range mm	Regrinding Z0 Article no. 98 106 ... EUR		Regrinding Coating TiN Z0 Article no. 98 242 ... EUR	
Ø 4.0 to Ø 6.0	15,40	060	20,03	060
≤ Ø 8,0	15,40	080	20,03	080
≤ Ø 10,0	15,40	100	20,03	100
≤ Ø 12,0	16,96	120	21,56	120
≤ Ø 14,0	18,48	140	24,65	140
≤ Ø 16,0	20,03	160	26,19	160
≤ Ø 18,0	23,13	180	32,36	180
≤ Ø 20,0	23,13	200	33,90	200

Grinding process:

- These tools are reground on the main cutting edge and receive, if present, their original coating.
- Stepped drills are also reground on the countersink angle.

WPC – High-performance drills

UNI **VA**

- 3xD, 5xD, 8xD and 12xD hole depth

Cutting-Ø-range mm	Regrinding Coating TiAlN Z0 Article no. 98 029 ...	
	EUR	
Ø 2.0 to Ø 6.0	21,56	060
≤ Ø 8,0	23,13	080
≤ Ø 10,0	23,13	100
≤ Ø 12,0	30,82	120
≤ Ø 14,0	30,82	140
≤ Ø 16,0	38,52	160
≤ Ø 18,0	38,52	180
≤ Ø 20,0	43,13	200

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – High-performance drills

UNI **VA** **H** **GG**

- 3xD, 5xD and 8xD hole depth

Cutting-Ø-range mm	Regrinding Coating Ti700 Z0 Article no. 98 022 ...		Regrinding Coating DPX74S Z0 Article no. 98 002 ...	
	EUR		EUR	
Ø 2.0 to Ø 6.0	21,56	060	21,56	060
≤ Ø 8,0	24,65	080	24,65	080
≤ Ø 10,0	24,65	100	24,65	100
≤ Ø 12,0	32,36	120	32,36	120
≤ Ø 14,0	32,36	140	32,36	140
≤ Ø 16,0	40,05	160	40,05	160
≤ Ø 18,0	40,05	180	40,05	180
≤ Ø 20,0	44,69	200	44,69	200
≤ Ø 25,0	44,69	250	44,69	250

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – High-performance drills

Quattro

- 5xD, 8xD and 12xD hole depth
- Article groups: **10 742 ...**, **10 747 ...**, **10 751 ...** and **10 755 ...**

Cutting-Ø-range mm	Regrinding Coating Ti700 Z0 Article no. 98 031 ... EUR	
Ø 3.0 to Ø 6.0	21,56	**060**
≤ Ø 8,0	24,65	**080**
≤ Ø 10,0	24,65	**100**
≤ Ø 12,0	32,36	**120**
≤ Ø 14,0	32,36	**140**
≤ Ø 16,0	40,05	**160**
≤ Ø 18,0	40,05	**180**
≤ Ø 20,0	57,01	**200**

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – High-performance drills

Speed UNI | **Speed VA** | **180** | **Feed UNI**

- 3xD, 5xD and 8xD hole depth
- WTX – Speed UNI/VA (**10 750 ...**, **10 754 ...**, **10 757 ...** and **10 773 ...**)
- WTX – 180 (**10 720 ...**, **10 721 ...**, **10 722 ...** and **10 723 ...**)
- WTX – Feed UNI (**10 790 ...** and **10 795 ...**)
- **Delivery time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating DPZ74S/Ti 800 Z0 Article no. 98 009 ... EUR	
Ø 3.0 to Ø 6.0	30,82	**060**
≤ Ø 8,0	33,90	**080**
≤ Ø 10,0	38,52	**100**
≤ Ø 12,0	46,21	**120**
≤ Ø 14,0	47,75	**140**
≤ Ø 16,0	53,92	**160**
≤ Ø 18,0	57,01	**180**
≤ Ø 20,0	64,69	**200**

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – High-performance drills

Ti

- 3xD: **10 786 ...** and 5xD: **10 787 ...** Hole depth
- **Delivery time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating DPA54 Z0 Article no. 98 069 ... EUR	
Ø 4.0 to Ø 6.0	29,27	060
≤ Ø 8,0	35,44	080
≤ Ø 10,0	36,96	100
≤ Ø 12,0	41,61	120
≤ Ø 14,0	44,69	140
≤ Ø 16,0	46,21	160
≤ Ø 18,0	50,84	180
≤ Ø 20,0	53,92	200

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – High-performance drills

AL

- 5xD: **10 725 ...**, 8xD: **10 728 ...** and 12xD: **10 729 ...** Hole depth
- **Delivery time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti1005 Z0 Article no. 98 028 ... EUR	
Ø 3.0 to Ø 6.0	29,27	060
≤ Ø 8,0	35,44	080
≤ Ø 10,0	36,96	100
≤ Ø 12,0	41,61	120
≤ Ø 14,0	44,69	140
≤ Ø 16,0	46,21	160
≤ Ø 18,0	50,84	180
≤ Ø 20,0	53,92	200

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – High-performance drills

Finish BR | **Finish BR100**

- 3xD: **10 760 ...** and **10 761 ...** and 5xD: **10 762 ...** Hole depth

Cutting-Ø-range mm	Regrinding Coating Ti700 Z0 Article no. 98 023 ... EUR	
Ø 3.97 to Ø 8.05	35,44	080
≤ Ø 10,05	40,05	100
≤ Ø 12,05	44,69	120
≤ Ø 14,05	49,30	140
≤ Ø 20,0	52,38	160

Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

Drill reamers can usually be reground and recoated up to three times.

WTX – High performance deep hole drills

TB 16 | **TB 20** | **TB 25** | **TB 30** | **TB 40** | **TB 50**

- UNI ≤ 20xD **11 016 ...**, **11 020 ...** with TiAlN coating
- UNI ≤ 30xD **11 025 ...**, **11 030 ...** with TiAlN coating
- UNI ≤ 50xD **11 040 ...**, **11 050 ...** with TiAlN coating
- ALU ≤ 20xD **11 017 ...**, **11 021 ...** with DLC coating
- ALU ≤ 30xD **11 026 ...**, **11 031 ...** with DLC coating
- **Delivery time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating ≤ 20xD TiAlN/DLC Z0 Article no. 98 026 ... EUR		Regrinding Coating ≤ 30xD TiAlN/DLC Z0 Article no. 98 027 ... EUR		Regrinding Coating ≤ 50xD TiAlN/DLC Z0 Article no. 98 050 ... EUR	
Ø 2.0 to Ø 6.0	29,27	060	32,36	060	35,44	060
≤ Ø 8,0	33,90	080	35,44	080	41,61	080
≤ Ø 10,0	36,96	100	38,52	100	44,69	090
≤ Ø 12,0	40,05	120	41,61	120		

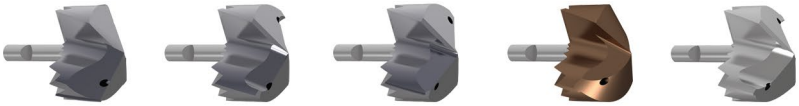
Grinding process:

- The drills are completely reground on the cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

WTX – Solid carbide drill head

Change UNI	Change P	Change VA	Change GG	Change AL

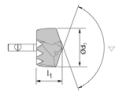
- Article groups: **10 920 ...**, **10 921 ...**, **10 922 ...**, **10 923 ...** and **10 924 ...**



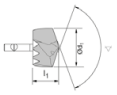
Cutting-Ø-range mm	Regrinding Coating Ti700/Ti750/TiSi/TiB Z0 Article no. 98 001 ... EUR	
Ø 12.0 to Ø 15.5	40,05	**155**
≤ Ø 18,0	40,05	**180**
≤ Ø 20,0	43,13	**200**
≤ Ø 22,0	44,69	**220**
≤ Ø 24,0	44,69	**240**
≤ Ø 25,5	46,21	**255**
≤ Ø 28,0	49,30	**280**
≤ Ø 30,0	52,38	**300**
≤ Ø 32,49	55,46	**320**
≤ Ø 35,49	61,61	**350**
≤ Ø 38,49	67,78	**380**
≤ Ø 41,00	73,94	**410**

Grinding process:

- The drill heads are completely reground on the cutting edges and recoated with the original coating.
- Depending on the wear drills can be reground up to two times, critical head length is l_1 min.
- The drill head is marked accordingly.



for cutting-Ø-range	New Drill head length l_1 mm	l_1 min. drill head length mm
12,00 – 13,49	10,7	8,0
13,50 – 15,49	11,3	9,3
15,50 – 16,49	11,9	9,6
16,50 – 20,49	13,4	11,0
20,50 – 24,49	15,4	12,0
24,50 – 26,49	17,4	14,0



for cutting-Ø-range	New Drill head length l_1 mm	l_1 min. drill head length mm
26,50 – 30,49	17,4	15,0
30,50 – 32,49	18,4	16,0
32,50 – 35,49	24,30	22,0
35,50 – 38,49	26,30	23,0
38,50 – 41,00	26,30	24,0

WTX – Drilling Head for Exchangeable drills

Change FEED UNI

- Article group: **10 925 ...**

Cutting-Ø-range mm	Regrinding Coating Ti750 NEW Z0 Article no. 98 093 ... EUR	
Ø 14.0 to Ø 15.4	66,15	154
≤ Ø 17,40	70,47	174
≤ Ø 19,40	74,93	194
≤ Ø 22,40	78,57	224
≤ Ø 24,40	82,35	244
≤ Ø 26,40	93,02	264
≤ Ø 28,40	96,93	284
≤ Ø 30,40	102,60	304
≤ Ø 32,00	106,79	320

Grinding process:

- The drill heads are completely reground on the cutting edges and recoated with the original coating.
- Depending on the wear drills can be reground up to two times, critical head length is l_1 min.
- The drill head is marked accordingly.

WTX – Step drills

SB

- Article groups: **10 758 ...** and **10 759 ...**

Cutting-Ø-range mm	Regrinding Coating Ti700 Z0 Article no. 98 025 ... EUR	
Ø 2.5 to Ø 6.0	24,65	060
≤ Ø 8,0	27,73	080
≤ Ø 10,0	30,82	100
≤ Ø 12,0	35,44	120
≤ Ø 14,0	36,96	140
≤ Ø 16,0	40,05	160
≤ Ø 18,0	43,13	180

Grinding process:

- These tools are reground on the main cutting edge and the countersink angle and recoated.

WTX – Configurable step drills

UNI **VA**

- Item groups: **10 991 ...**, **10 992 ...**, **10 993 ...**, **10 994 ...**, **10 995 ...**, **10 996 ...**, **10 997 ...** and **10 998 ...**

	Regrinding	
	Coating	
	DPX74S/Ti 700	
	Z0	
Shank Ø	**Article no. 98 991 ...**	
mm	**EUR**	
Ø 4	32,82	**040**
Ø 6	32,82	**060**
Ø 8	35,13	**080**
Ø 10	36,96	**100**
Ø 12	39,45	**120**
Ø 14	41,12	**140**
Ø 16	42,98	**160**

Grinding process:

- These tools are reground on the main cutting edge and the countersink angle and recoated.

Twist drill – Standard version

N

- 3xD and 5xD hole depth
- Article groups: **10 700 ...** and **10 710 ...**

	Regrinding	
	Z0	
Cutting-Ø-range	**Article no. 98 307 ...**	
mm	**EUR**	
Ø 3.0 to Ø 11.9	7,71	**119**
≤ Ø 20,0	12,31	**200**

Grinding process:

- The drills are reground on the main cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

Three-flute drills

N

- Up to 3xD hole depth
- Article group: **10 715 ...**

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 132 ... EUR	
Ø 3.0 to Ø 4.0	18,48	040
≤ Ø 6,0	18,48	060
≤ Ø 8,0	21,56	080
≤ Ø 10,0	23,13	100
≤ Ø 12,0	26,19	120
≤ Ø 14,0	27,73	140
≤ Ø 16,0	29,27	160
≤ Ø 18,0	30,82	180
≤ Ø 20,0	33,90	200

Grinding process:

- The drills are reground on the main cutting edge.
- If the wear to the circular lands is excessive, the corresponding area is cut-off and then proceed as above.

NC spot drills

NC-A

- Point Angle 90°, 120°, 142°

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 135 ... EUR		Regrinding Coating TiAlN Z0 Article no. 98 243 ... EUR	
Ø 3.0 to Ø 4.0	13,88	040	18,48	040
≤ Ø 6,0	13,88	060	18,48	060
≤ Ø 8,0	18,48	080	24,65	080
≤ Ø 10,0	18,48	100	24,65	100
≤ Ø 12,0	18,48	120	24,65	120
≤ Ø 14,0	21,56	140	27,73	140
≤ Ø 16,0	21,56	160	30,82	160
≤ Ø 18,0	21,56	180	33,90	180
≤ Ø 20,0	21,56	200	35,44	200

Grinding process:

- These tools are reground on the main cutting edge and receive, if present, their original coating.

DIHART Monomax® – High Performance Reamers, short / long

- For intermediate sizes and special tolerances
- From 2 pcs per size you get 12 %, from 5 items 15 % volume discount
- **Lead Time:** 15 working days for CWC 10 version and 20 working days for CWN 10 version


	Retipping		Retipping Coating		Retipping		Retipping Coating	
	short		short		long		long	
	CWC10		CWN10		CWC10		CWN10	
	XX		XX		XX		XX	
Cutting-Ø-range	Article no. 98 620 ...		Article no. 98 600 ...		Article no. 98 621 ...		Article no. 98 601 ...	
mm	EUR		EUR		EUR		EUR	
Ø 5.6 to Ø 8.89	227,99	056	227,99	056	227,99	056	227,99	056
≤ Ø 9,89					325,05	089	257,26	089
≤ Ø 15,89	325,05	089	257,26	089	338,90	099	294,23	099
≤ Ø 18,89	346,61	159	325,05	159	346,61	159	325,05	159
≤ Ø 25,89	411,32	189	411,32	189	411,32	189	411,32	189

Grinding process:

- The segments are removed, new segments brazed in, ground and coated if required.

DIHART Monomax® – High Performance Reamers, short / long

- **For preferred diameter within H7**
- **Lead Time:** 15 working days for CWC 10 version and 20 working days for CWN 10 version


	Retipping		Retipping Coating		Retipping		Retipping Coating	
	short		short		long		long	
	CWC10		CWN10		CWC10		CWN10	
	Z0		Z0		Z0		Z0	
Cutting-Ø-range	Article no. 98 620 ...		Article no. 98 600 ...		Article no. 98 621 ...		Article no. 98 601 ...	
mm	EUR		EUR		EUR		EUR	
Ø 6,0	209,51	060	209,51	060	209,51	060	209,51	060
Ø 8,0	215,68	080	215,68	080	215,68	080	215,68	080
Ø 10,0	235,70	100	235,70	100	235,70	100	235,70	100
Ø 12,0	241,87	120	241,87	120	241,87	120	241,87	120
Ø 14,0	258,80	140	258,80	140	258,80	140	258,80	140
Ø 15,0	264,96	150	264,96	150	264,96	150	264,96	150
Ø 16,0	271,12	160	271,12	160	271,12	160	271,12	160
Ø 18,0	291,15	180	291,15	180	291,15	180	291,15	180
Ø 20,0	312,73	200	312,73	200	312,73	200	312,73	200

Grinding process:

- The segments are removed, new segments brazed in, ground and coated if required.

Solid carbide machine reamers

UNI HSR | **VA HSR** | **H HSR**

- UNI-HSR / TiAlN: **40 460 ...**, **40 461 ...** and **40 465 ...**
- VA-HSR / TiAlN: **40 450 ...** – **40 455 ...**
- H-HSR / AlTiN: **40 456 ...**, **40 457 ...** and **40 458 ...**

	Regrinding Coating TiAlN Z0 **Article no.** **98 652 ...**		Regrinding Coating AlTiN Z0 **Article no.** **98 654 ...**	
Cutting-Ø-range mm	**EUR**		**EUR**	
Ø 2.80 to Ø 6.20	63,17	**026**	63,17	**026**
≤ Ø 14,2	67,78	**060**	67,78	**060**
≤ Ø 20,2	73,94	**140**	73,94	**140**

Grinding process:

- With these tools, the end, the tooth face, and the diameter is brought forward by default.
- Maximum two regrinds.

CBN and PCD – Inserts

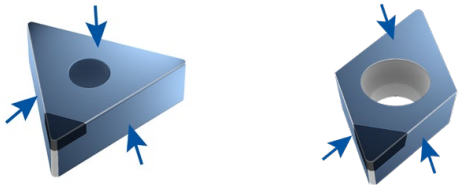
- Exclusively WNT products
- Price per piece
- **Lead Time:** 20 working days

Entire cutting edge

		Regrinding XX Article no. 98 640 ... EUR		Regrinding XX Article no. 98 641 ... EUR		Regrinding NEW XX Article no. 98 642 ... EUR	
PKD – PDC entire cutting edge	1 - 9					67,50	**001**
	10 - 24					60,75	**001**
	25 - 49					54,00	**001**
	50 - 99					48,60	**001**
	≥ 100					43,20	**001**
CBN – PBC10 / PBC25 / PBC40 / SBC1 / SBC25	1 - 9			27,03	**001**		
	10 - 24			22,88	**001**		
	25 - 49			18,72	**001**		
	50 - 99			16,65	**001**		
	≥ 100			13,88	**001**		
PKD – PDC / PDC-S	1 - 9	51,99	**001**				
	10 - 24	47,84	**001**				
	25 - 49	41,61	**001**				
	50 - 99	37,44	**001**				
	≥ 100	32,36	**001**				

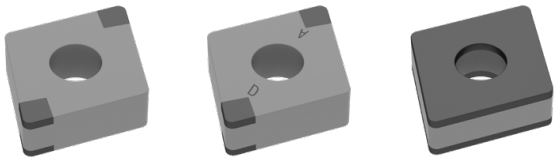
The prices listed apply per order and item for WNT products only.
Regrinding is only performed if the segment is still suitable.

CBN – PBC10 / PBC25 / PBC40 / SBC1 / SBC25



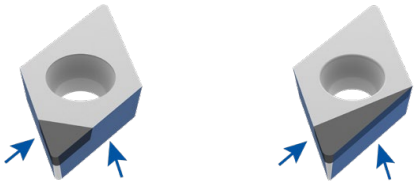
The surfaces indicated are reground

The following indexable inserts can only be reground upon special request:



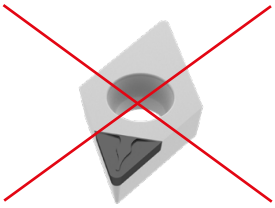
CNMX 1204..

PKD – PDC / PDC-S



The surfaces indicated are reground

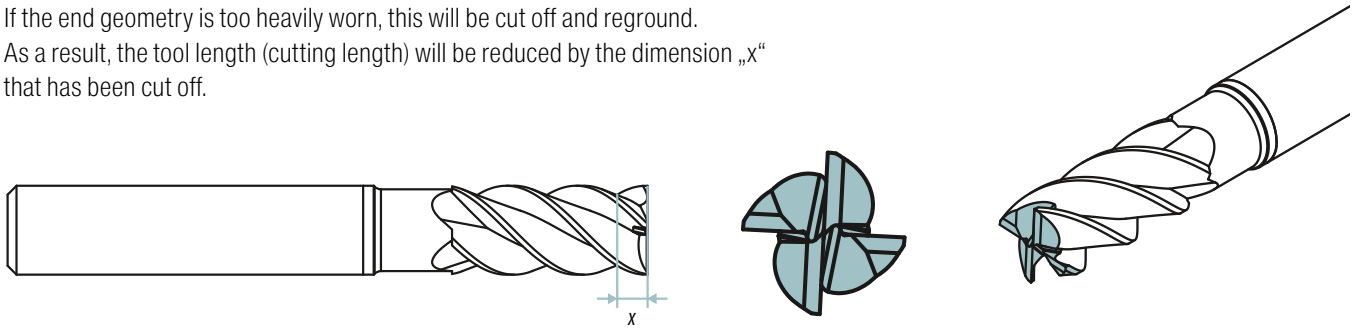
Indexable inserts with lasered chip breakers cannot be reground.



What effect does regrinding have on the milling cutter?

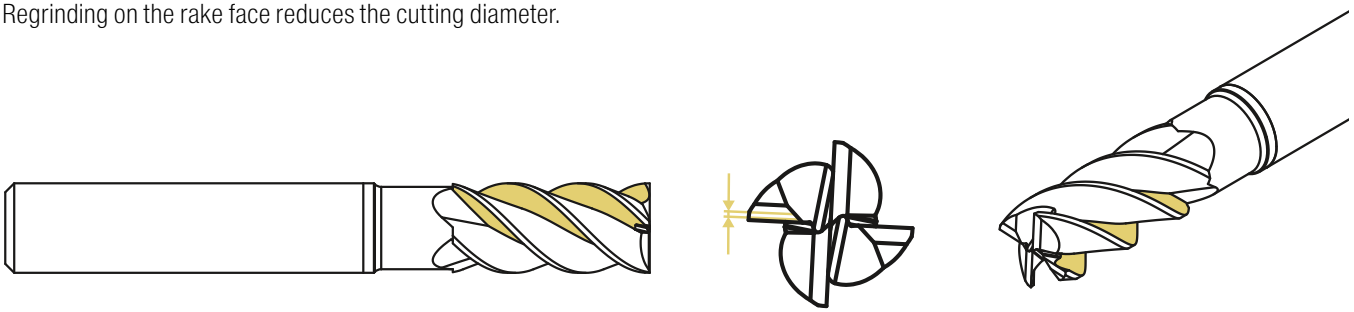
End

If the end geometry is too heavily worn, this will be cut off and reground.
As a result, the tool length (cutting length) will be reduced by the dimension „x“ that has been cut off.



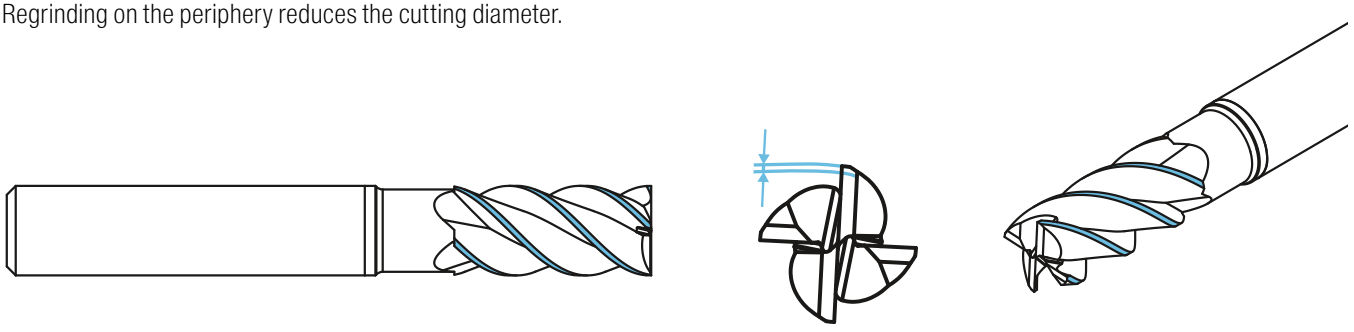
Rake faces

Regrinding on the rake face reduces the cutting diameter.



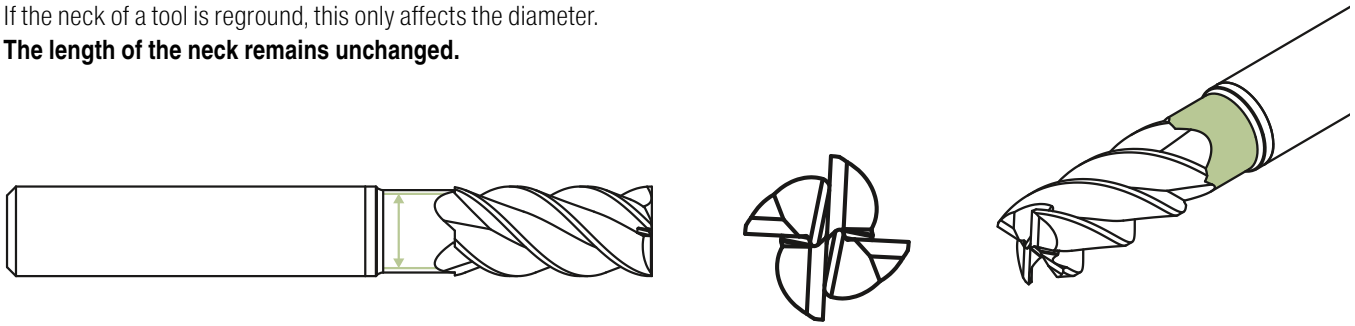
Diameter

Regrinding on the periphery reduces the cutting diameter.



Neck

If the neck of a tool is reground, this only affects the diameter.
The length of the neck remains unchanged.



List of contents

End milling cutter

N

- Article groups: **50 000 ...**, **50 001 ...** and **50 002 ...**

Cutting-Ø-range mm	Regrinding Neck Coating short Al200Pro Z0 Article no. 98 275 ... EUR		Regrinding Neck Coating medium Al200Pro Z0 Article no. 98 276 ... EUR		Regrinding Neck Coating long Al200Pro Z0 Article no. 98 277 ... EUR	
Ø 6,0	7,83	060	8,80	060	10,02	060
Ø 8,0	10,45	080	11,31	080	11,81	080
Ø 10,0	10,99	100	12,22	100	12,81	100
Ø 12,0	12,70	120	13,07	120	14,92	120
Ø 16,0	18,48	160	19,47	160	22,18	160
Ø 20,0	26,87	200	28,85	200	32,78	200

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

Powdersteel end milling cutter

H

- Article groups: **50 007 ...** and **50 008 ...**

Cutting-Ø-range mm	Regrinding Neck Coating short Ti200Pro Z0 Article no. 98 281 ... EUR		Regrinding Neck Coating long Ti200Pro Z0 Article no. 98 282 ... EUR	
Ø 25,0	134,33	252	173,77	252
Ø 25,0	140,49	254	178,69	254
Ø 32,0	216,90	322	280,98	322
Ø 32,0	223,06	324	287,15	324

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

Powdersteel fine roughing cutter

HR

- Article groups: **50 004 ...**, **50 005 ...** and **50 006 ...**

Cutting-Ø-range mm		Regrinding Neck Coating short Al200Pro Z0 Article no. 98 278 ... EUR		Regrinding Neck Coating medium Al200Pro Z0 Article no. 98 279 ... EUR		Regrinding Neck Coating long Al200Pro Z0 Article no. 98 280 ... EUR	
Ø 6,0	060	12,22	060	18,74	060	21,32	060
Ø 8,0	080	12,93	080	22,80	080	25,88	080
Ø 10,0	100	14,18	100	24,53	100	27,85	100
Ø 12,0	120	16,39	120	27,61	120	31,43	120
Ø 16,0	160	21,20	160	36,86	160	41,90	160
Ø 20,0	200	31,19	200	50,65	200	57,55	200

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End mills with a cutting length of up to 3xD

- Finish, Rough-Finish and Rough Versions



Cutting-Ø-range mm		Regrinding Z0 Article no. 98 110 ... EUR		Regrinding Coating Ti100 Black Z0 Article no. 98 008 ... EUR		Regrinding Neck Z0 Article no. 98 386 ... EUR		Regrinding Neck Coating Ti100 Black Z0 Article no. 98 004 ... EUR	
Ø 6.01 to Ø 8.00	080	15,40	080	20,03	080	23,13	080	26,19	080
≤ Ø 10,0	100	15,40	100	20,03	100	23,13	100	27,73	100
≤ Ø 12,0	120	15,40	120	21,56	120	23,13	120	29,27	120
≤ Ø 14,0	140	15,40	140	21,56	140	23,13	140	29,27	140
≤ Ø 16,0	160	16,96	160	24,65	160	24,65	160	30,82	160
≤ Ø 18,0	180	16,96	180	27,73	180	24,65	180	35,44	180
≤ Ø 20,0	200	16,96	200	29,27	200	24,65	200	36,96	200
≤ Ø 22,0	220	18,48	220	33,90	220	24,65	220	40,05	220
≤ Ø 26,0	260	23,13	260	38,52	260	29,27	260	43,13	260
≤ Ø 32,0	320	23,13	320	40,05	320	29,27	320	46,21	320
≤ Ø 36,0	360	30,82	360	55,46	360	35,44	360	61,61	360
≤ Ø 40,0	400	35,44	400	77,03	400	41,61	400	83,17	400

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End mills with a cutting length of 3xD to 5xD

- Finish, Rough-Finish and Rough Versions

	Regrinding		Regrinding Coating Ti100 Black		Regrinding Neck		Regrinding Neck Coating Ti100 Black	
	Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 111 ... EUR		Article no. 98 003 ... EUR		Article no. 98 387 ... EUR		Article no. 98 007 ... EUR	
Ø 6.01 to Ø 8.00	20,03	080	23,13	080	26,19	080	30,82	080
≤ Ø 10,0	20,03	100	24,65	100	27,73	100	30,82	100
≤ Ø 12,0	26,19	120	32,36	120	33,90	120	38,52	120
≤ Ø 14,0	26,19	140	33,90	140	33,90	140	40,05	140
≤ Ø 16,0	32,36	160	41,61	160	38,52	160	46,21	160
≤ Ø 18,0	32,36	180	41,61	180	38,52	180	49,30	180
≤ Ø 20,0	32,36	200	44,69	200	38,52	200	50,84	200
≤ Ø 22,0	32,36	220	47,75	220	47,75	220	53,92	220
≤ Ø 26,0	36,96	260	57,01	260	43,13	260	60,09	260
≤ Ø 32,0	41,61	320	61,61	320	47,75	320	64,69	320
≤ Ø 36,0	47,75	360			53,92	360		
≤ Ø 40,0	52,38	400	93,99	400	58,55	400	98,59	400

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

Ball-nosed end mills

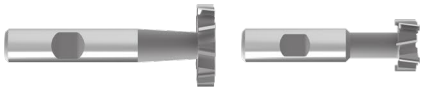
- Z = number of flutes

	Regrinding Z = 2		Regrinding Z ≤ 5		Regrinding Coating Z = 2 Ti100 Black		Regrinding Coating Z ≤ 5 Ti100 Black	
	Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 120 ... EUR		Article no. 98 121 ... EUR		Article no. 98 006 ... EUR		Article no. 98 043 ... EUR	
Ø 6.01 to Ø 8.00	20,03	080	27,73	080	23,13	080	33,90	080
≤ Ø 10,0	20,03	100	29,27	100	24,65	100	33,90	100
≤ Ø 12,0	20,03	120	30,82	120	24,65	120	35,44	120
≤ Ø 14,0	20,03	140	30,82	140	26,19	140		
≤ Ø 16,0	32,36	160	41,61	160	38,52	160	47,75	160
≤ Ø 18,0	32,36	180	41,61	180	41,61	180		
≤ Ø 20,0	32,36	200	41,61	200			52,38	200
≤ Ø 22,0	33,90	220	41,61	220	46,21	220		
≤ Ø 26,0	44,69	260	57,01	260	58,55	260	70,86	260
≤ Ø 32,0	57,01	320	61,61	320				

Grinding process:

- Ball Nosed cutters are reground only on the end, because grinding the rake face of the cutting diameter would make the radius smaller!
- Radius tolerance ± 0,05 mm

Slot and T-slot milling cutters



Cutting-Ø-range mm	Regrinding only on the periphery Z0 Article no. 98 070 ... EUR		Regrinding complete Z0 Article no. 98 071 ... EUR	
Ø 10.5 to Ø 16.0	23,13	160	33,90	160
≤ Ø 22,0	27,73	220	41,61	220
≤ Ø 36,0	40,05	360	57,01	360
≤ Ø 45,0	50,84	450	66,26	450
≤ Ø 60,0	57,01	600	81,65	600

Grinding process:

- With low wear the tool is reground only on the periphery.
- If the clearance angle is too worn, the tool is completely reground.

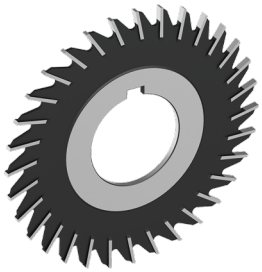
Face milling cutters, DIN 1880

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 073 ... EUR		Regrinding Coating Ti100 Black Z0 Article no. 98 005 ... EUR	
Ø 40,0	26,19	040	41,61	040
Ø 50,0	30,82	050	47,75	050
Ø 63,0	36,96	063	61,61	063
Ø 80,0	49,30	080	98,59	080
Ø 100,0	66,26	100	146,35	100
Ø 125,0	72,40	125		

Grinding process:

- Shell mills and saws are reground on the rake angle and periphery!

Side and face milling cutters, DIN 1834



Cutting-Ø-range mm	Regrinding cross cut Z0 Article no. 98 090 ... EUR		Regrinding straight cut Z0 Article no. 98 091 ... EUR		Regrinding coarse cross cut Z0 Article no. 98 092 ... EUR	
Ø 63,0	35,44	063	40,05	063	27,73	063
Ø 80,0	40,05	080	44,69	080	29,27	080
Ø 100,0	44,69	100	49,30	100	32,36	100
Ø 125,0	50,84	125	55,46	125	35,44	125
Ø 160,0	60,09	160	64,69	160	38,52	160

Grinding process:

- Shell mills and saws are reground on the rake angle and periphery!

Side and face milling cutters, DIN 885 A

Cutting-Ø-range mm	Regrinding coarse cross cut Z0 Article no. 98 085 ... EUR		Regrinding fine cross cut Z0 Article no. 98 084 ... EUR	
Ø 50,0	27,73	050	35,44	050
Ø 63,0	27,73	063	35,44	063
Ø 80,0	29,27	080	41,61	080
Ø 100,0	33,90	100	44,69	100
Ø 125,0	36,96	125	47,75	125
Ø 160,0	41,61	160	50,84	160

Grinding process:

- Shell mills and saws are reground on the rake angle and periphery!

MonsterMill – End milling cutter

SCR | HPC

- Article groups: **52 600 ...**, **52 601 ...**, **52 602 ...**, **52 603 ...** and **52 604 ...**
- Z = number of flutes

	Regrinding		Regrinding	
	Coating		Coating	
	Z = 4		Z = 5	
	Ti1200		Ti1200	
	Z0		Z0	
	Article no.		Article no.	
Cutting-Ø-range mm	98 670 ...		98 670 ...	
	EUR		EUR	
Ø 6,0	13,88	060		
≤ Ø 8,0	16,96	080		
≤ Ø 10,0	23,13	100		
≤ Ø 12,0	36,96	120		
≤ Ø 14,0	46,21	140		
≤ Ø 16,0	58,55	160	61,61	161
≤ Ø 18,0	78,57	180	83,17	181
≤ Ø 20,0	89,34	200	93,99	201

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- When present the neck Ø is reground.
- Depending on wear the tools can be reground up to 2 times.
- If the end is severely worn, the tool will be cut-off and reground.

MonsterMill – End milling cutter

SCR | HPC

- Article group: **52 605 ...**
- Z = number of flutes

	Regrinding		Regrinding	
	Coating		Coating	
	Z = 4		Z = 5	
	Ti1200		Ti1200	
	Z0		Z0	
	Article no.		Article no.	
Cutting-Ø-range mm	98 671 ...		98 671 ...	
	EUR		EUR	
Ø 6,0	15,40	060		
Ø 8,0	20,03	080		
Ø 10,0	26,19	100		
Ø 12,0	41,61	120		
Ø 14,0	57,01	140		
Ø 16,0	69,34	160	72,40	161
Ø 18,0	97,05	180	101,68	181
Ø 20,0	109,38	200	113,99	201

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- When present the neck Ø is reground.
- Depending on wear the tools can be reground up to 2 times.
- If the end is severely worn, the tool will be cut-off and reground.

MonsterMill – End milling cutter

SCR | HPC

- Article group: **52 606 ...**

Cutting-Ø-range mm	Regrinding Coating with IK Ti1200 Z0 Article no. 98 672 ... EUR	
Ø 6,0	16,96	060
Ø 8,0	21,56	080
Ø 10,0	27,73	100
Ø 12,0	43,13	120
Ø 14,0	60,09	140
Ø 16,0	73,94	160
Ø 18,0	101,68	180
Ø 20,0	117,07	200

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- If the end is severely worn, the tool will be cut-off and reground.
- Depending on wear the tools can be reground up to 2 times.

MonsterMill – End milling cutter

SCR | HPC

- Article group: **52 608 ...** / Number of teeth = 6

Cutting-Ø-range mm	Regrinding Coating short/long Ti1200 Z0 Article no. 98 674 ... EUR		Regrinding Coating extra long Ti1200 Z0 Article no. 98 674 ... EUR	
Ø 6,0	16,96	060	20,03	062
Ø 8,0	23,13	080	26,19	082
Ø 10,0	30,82	100	33,90	102
Ø 12,0	47,75	120	53,92	122
Ø 16,0	75,49	160	87,82	162
Ø 20,0	117,07	200	140,20	202

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- If the end is severely worn, the tool will be cut-off and reground.
- Depending on wear the tools can be reground up to 2 times.

MonsterMill – End milling cutter with corner radius

SCR | HPC

- Article group: **52 607 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1200 Z0 Article no. 98 673 ... EUR	
Ø 6,0	15,40	060
Ø 8,0	20,03	080
Ø 10,0	26,19	100
Ø 12,0	41,61	120
Ø 14,0	52,38	140
Ø 16,0	66,26	160
Ø 20,0	101,68	200

Grinding process:

- These tools are completely reground on the periphery, end and waist.
- For tools with reduced neck, the neck Ø will also be reground.
- Depending on the amount of wear, the tool can be reground up to two times.
- If the end is too severely worn, the end will be cut off and the tool reground.
- Radius tolerance ± 0,01 mm

MonsterMill – End milling cutter

ICR | HPC

- Article groups: **52 784 ...** and **52 786 ...**

Cutting-Ø-range mm	Regrinding Coating 52 784 ..1 Ti1500 Z0 Article no. 98 661 ... EUR		Regrinding Coating 52 784 ..2 52 784 ..6 Ti1500 Z0 Article no. 98 661 ... EUR		Regrinding Coating 52 784 ..5 Ti1500 Z0 Article no. 98 661 ... EUR		Regrinding Coating 52 784 ..3 52 786 ..3 Ti1500 Z0 Article no. 98 666 ... EUR		Regrinding Coating 52 784 ..4 52 786 ..4 Ti1500 Z0 Article no. 98 666 ... EUR	
Ø 6,0			18,48	062					20,03	062
Ø 8,0			21,56	082					23,13	082
Ø 10,0			27,73	102					30,82	102
Ø 12,0			36,96	122					40,05	122
Ø 14,0			52,38	142					57,01	142
Ø 16,0	66,26	163	64,69	162	61,61	164	67,78	163	70,86	162
Ø 18,0	87,82	183	87,82	182	81,65	184	87,82	183	92,43	182
Ø 20,0	100,13	203	100,13	202	93,99	204	103,22	203	109,38	202

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.
- If the end is too severely worn, the end will be cut off and the tool reground.

MonsterMill – End milling cutter

TCR | HPC

- Article groups: **52 500 ...** and **52 501 ...**
- **Delivery time:** 20 working days

	Regrinding		Regrinding Neck	
	Coating		Coating	
	AlTi		AlTi	
	Z0		Z0	
Cutting-Ø-range	**Article no.**		**Article no.**	
	98 189 ...		**98 239 ...**	
mm	**EUR**		**EUR**	
Ø 5,0	13,88	**050**	21,56	**050**
Ø 6,0	15,40	**060**	21,56	**060**
Ø 8,0	15,40	**080**	23,13	**080**
Ø 10,0	18,48	**100**	26,19	**100**
Ø 12,0	24,65	**120**	32,36	**120**
Ø 16,0	29,27	**160**	36,96	**160**
Ø 20,0	36,96	**200**	43,13	**200**

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

MonsterMill – End milling cutter with corner radius

TCR | HPC

- Article group: **52 502 ...**
- **Delivery time:** 20 working days

	Regrinding		Regrinding Neck	
	Coating		Coating	
	AlTi		AlTi	
	Z0		Z0	
Cutting-Ø-range	**Article no.**		**Article no.**	
	98 188 ...		**98 238 ...**	
mm	**EUR**		**EUR**	
Ø 5,0	15,40	**050**	23,13	**050**
Ø 6,0	15,40	**060**	23,13	**060**
Ø 8,0	16,96	**080**	24,65	**080**
Ø 10,0	18,48	**100**	26,19	**100**
Ø 12,0	26,19	**120**	32,36	**120**
Ø 16,0	32,36	**160**	40,05	**160**
Ø 20,0	38,52	**200**	46,21	**200**

Grinding process:

- Cutters with corner radius will be reground on the end, the rake face and the radius.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- Radius tolerance ± 0,05 mm

MonsterMill – Rough milling cutter

MCR

- Article group: **52 752 ...**

Cutting-Ø-range mm	Regrinding Coating short Ti1000 Z0 Article no. 98 659 ... EUR		Regrinding Coating long Ti1000 Z0 Article no. 98 659 ... EUR		Regrinding Coating extra long Ti1000 Z0 Article no. 98 659 ... EUR	
Ø 6,0	26,19	**060**	27,73	**061**	26,19	**062**
Ø 8,0	29,27	**080**	33,90	**081**	29,27	**082**
Ø 10,0	32,36	**100**	35,44	**101**	33,90	**102**
Ø 12,0	40,05	**120**	43,13	**121**	41,61	**122**
Ø 14,0	46,21	**140**	47,75	**141**	49,30	**142**
Ø 16,0	64,69	**160**	69,34	**161**	69,34	**162**
Ø 20,0	86,27	**200**	90,90	**201**	93,99	**202**

Grinding process:

- These tools are completely reground on the ripper profile, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.
- If the end is too severely worn, the end will be cut off and the tool reground.

MonsterMill – Rough milling cutter

ACR

- Article group: **52 754 ...**

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 660 ... EUR	
Ø 6,0	40,05	**060**
Ø 8,0	46,21	**080**
Ø 10,0	53,92	**100**
Ø 12,0	69,34	**120**
Ø 16,0	90,90	**160**
Ø 20,0	135,55	**200**
Ø 25,0	200,26	**250**

Grinding process:

- These tools are completely reground on the ripper profile, end and waist as well as the reduced neck.
- Depending on the amount of wear, the tool can be reground up to two times.
- If the end is too severely worn, the end will be cut off and the tool reground.

MonsterMill – Rough milling cutter with corner radius

ACR

- Article group: **52 754 ...**

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 660 ... EUR	
Ø 12,0	75,49	**126**
Ø 16,0	100,13	**166**
Ø 20,0	149,43	**206**
Ø 25,0	220,29	**256**

Grinding process:

- These tools are completely reground on the ripper profile, end and waist as well as the reduced neck.
- Depending on the amount of wear, the tool can be reground up to two times.
- If the end is too severely worn, the end will be cut off and the tool reground.
- Radius tolerance ± 0,01 mm

MonsterMill – End milling cutter with corner radius

PCR UNI **HPC**

- Article groups: **52 613 ...** – **52 615 ...**

Cutting-Ø-range mm	Regrinding Coating short APA72S NEW Z0 Article no. 98 067 ... EUR		Regrinding Neck Coating long/extra long APA72S NEW Z0 Article no. 98 068 ... EUR	
Ø 6,0	56,12	**060**	59,81	**060**
≤ Ø 8,0	60,43	**080**	64,75	**080**
≤ Ø 10,0	65,60	**100**	70,25	**100**
≤ Ø 12,0	72,09	**120**	77,64	**120**
≤ Ø 14,0	75,99	**140**	80,49	**140**
≤ Ø 16,0	83,89	**160**	90,68	**160**
≤ Ø 18,0	88,86	**180**	96,23	**180**
≤ Ø 20,0	97,50	**200**	106,08	**200**

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.
- Radius tolerance ± 0,03 mm

MonsterMill – End milling cutter with corner radius

PCR ALU | HPC

- Article groups: **52 616 ...** and **52 617 ...**

Cutting-Ø-range mm	Regrinding Neck Coating long/extra long DLC NEW Z0 Article no. 98 094 ... EUR	
Ø 8,7 bis Ø 10	140,91	100
≤ Ø 12,0	159,61	120
≤ Ø 14,0	177,81	140
≤ Ø 16,0	192,83	160
≤ Ø 18,0	210,42	180
≤ Ø 20,0	235,25	200

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.
- Radius tolerance ± 0,03 mm

CircularLine – End milling cutter

CCR UNI | HPC

- Article groups: **53 585 ...** and **53 587 ...** – **53 589 ...**

Cutting-Ø-range mm	Regrinding Coating short/long DPX72S Z0 Article no. 98 203 ... EUR		Regrinding Neck Coating short/long DPX72S Z0 Article no. 98 204 ... EUR		Regrinding Coating extra long DPX72S Z0 Article no. 98 207 ... EUR		Regrinding Neck Coating extra long DPX72S Z0 Article no. 98 208 ... EUR	
Ø 6,0	29,27	060	35,44	060	30,82	060	38,52	060
Ø 8,0	29,27	080	36,96	080	32,36	080	40,05	080
Ø 10,0	32,36	100	40,05	100	36,96	100	43,13	100
Ø 12,0	35,44	120	43,13	120	41,61	120	49,30	120
Ø 16,0	43,13	160	50,84	160	47,75	160	55,46	160
Ø 20,0	50,84	200	58,55	200	55,46	200	63,17	200

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.

CircularLine – End milling cutter with corner radius

CCR UNI | HPC

- Article group: **53 586 ...**, **53 592 ...** and **53 593 ...**

Cutting-Ø-range mm	Regrinding Coating short/long DPX72S Z0 Article no. 98 205 ...		Regrinding Neck Coating short/long DPX72S Z0 Article no. 98 206 ...		Regrinding Coating extra long DPX72S Z0 Article no. 98 209 ...		Regrinding Neck Coating extra long DPX72S Z0 Article no. 98 210 ...	
	EUR		EUR		EUR		EUR	
Ø 6,0	30,82	**060**	38,52	**060**	32,36	**060**	35,44	**060**
Ø 8,0	33,90	**080**	41,61	**080**	33,90	**080**	38,52	**080**
Ø 10,0	38,52	**100**	46,21	**100**	40,05	**100**	44,69	**100**
Ø 12,0	41,61	**120**	49,30	**120**	49,30	**120**	53,92	**120**
Ø 16,0	50,84	**160**	58,55	**160**	61,61	**160**	66,26	**160**
Ø 20,0	58,55	**200**	66,26	**200**	77,03	**200**	81,65	**200**

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.
- Radius tolerance ± 0,05 mm

CircularLine – End milling cutter

CCR AL | HPC

- Article groups: **53 590 ...** and **53 591 ...**

Cutting-Ø-range mm	Regrinding Coating long DPX72S Z0 Article no. 98 245 ...		Regrinding Neck Coating long DPX72S Z0 Article no. 98 246 ...		Regrinding Coating extra long DPX72S Z0 Article no. 98 249 ...		Regrinding Neck Coating extra long DPX72S Z0 Article no. 98 250 ...	
	EUR		EUR		EUR		EUR	
Ø 6,0	26,19	**060**	29,27	**060**	27,73	**060**	30,82	**060**
Ø 8,0	27,73	**080**	32,36	**080**	29,27	**080**	33,90	**080**
Ø 10,0	30,82	**100**	35,44	**100**	33,90	**100**	36,96	**100**
Ø 12,0	40,05	**120**	44,69	**120**	43,13	**120**	47,75	**120**
Ø 16,0	47,75	**160**	52,38	**160**	52,38	**160**	55,46	**160**
Ø 20,0	61,61	**200**	64,69	**200**	66,26	**200**	70,86	**200**

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.

CircularLine – End milling cutter with corner radius

CCR AL **HPC**

- Article groups: **53 594 ...** and **53 595 ...**

Cutting-Ø-range mm	Regrinding Coating long DLC Z0 Article no. 98 247 ... EUR		Regrinding Neck Coating long DLC Z0 Article no. 98 248 ... EUR		Regrinding Coating extra long DLC Z0 Article no. 98 251 ... EUR		Regrinding Neck Coating extra long DLC Z0 Article no. 98 252 ... EUR	
Ø 6,0	29,27	**060**	32,36	**060**	30,82	**060**	33,90	**060**
Ø 8,0	30,82	**080**	35,44	**080**	33,90	**080**	36,96	**080**
Ø 10,0	41,61	**100**	44,69	**100**	44,69	**100**	49,30	**100**
Ø 12,0	44,69	**120**	49,30	**120**	47,75	**120**	53,92	**120**
Ø 16,0	53,92	**160**	60,09	**160**	57,01	**160**	63,17	**160**
Ø 20,0	86,27	**200**	95,51	**200**	93,99	**200**	103,22	**200**

Grinding process:

- These tools are completely reground on the external Ø, end and waist as well as the reduced neck and then recoated.
- Depending on the amount of wear, the tool can be reground up to two times.
- Radius tolerance ± 0,05 mm

S-Cut – End mills with a cutting length of up to 3xD

SC UNI **HPC**

- Article groups: **52 223 ...** – **52 227 ...**, **52 229 ...**, **52 230 ...**

Cutting-Ø-range mm	Regrinding Neck Coating APX72S Z0 Article no. 98 211 ... EUR	
Ø 3.0 to Ø 4.0	38,52	**040**
≤ Ø 6,0	38,52	**060**
≤ Ø 8,0	43,13	**080**
≤ Ø 10,0	49,30	**100**
≤ Ø 12,0	57,01	**120**
≤ Ø 14,0	64,69	**140**
≤ Ø 16,0	72,40	**160**
≤ Ø 18,0	83,17	**180**
≤ Ø 20,0	87,82	**200**
≤ Ø 25,0	98,59	**250**

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- When present the neck Ø is reground.
- Depending on wear the tools can be reground up to 2 times.
- If the end is severely worn, the tool will be cut-off and reground.

S-Cut – End mills with a cutting length of 3xD to 5xD

SC UNI | HPC

- Article group: **52 226 ...**

Cutting-Ø-range mm	Regrinding Neck Coating APX72S Z0 Article no. 98 212 ... EUR	
Ø 3.0 to Ø 4.0	41,61	040
Ø 5.0 to Ø 6.0	41,61	060
Ø 8,0	47,75	080
Ø 10,0	55,46	100
Ø 12,0	63,17	120
Ø 14,0	70,86	140
Ø 16,0	80,11	160
Ø 18,0	92,43	180
Ø 20,0	95,51	200
Ø 25,0	109,38	250

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- When present the neck Ø is reground.
- Depending on wear the tools can be reground up to 2 times.
- If the end is severely worn, the tool will be cut-off and reground.

S-Cut – End milling cutter with corner radius

SC UNI | HPC

- Article group: **52 228 ...**

Cutting-Ø-range mm	Regrinding Neck Coating APX72S Z0 Article no. 98 213 ... EUR	
Ø 3,0	58,55	040
Ø 4.0 to Ø 6.0	58,55	060
Ø 8,0	70,86	080
Ø 10,0	77,03	100
Ø 12,0	89,34	120
Ø 14,0	98,59	140
Ø 16,0	109,38	160
Ø 18,0	120,16	180
Ø 20,0	124,78	200
Ø 25,0	143,26	250

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- When present the neck Ø is reground.
- Depending on wear the tools can be reground up to 2 times.
- If the end is severely worn, the tool will be cut-off and reground.
- Radius tolerance ± 0,015 mm

SilverLine – End milling cutter

N | HPC

- Article groups: **50 951 ...**, **50 954 ...**, **50 955 ...**, **50 964 ...** and **50 965 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1010 Z0 Article no. 98 190 ... EUR		Regrinding Neck Coating Ti1010 Z0 Article no. 98 240 ... EUR	
Ø 5,0	13,88	050	16,96	050
Ø 6,0	15,40	060	18,48	060
Ø 8,0	16,96	080	20,03	080
Ø 10,0	18,48	100	21,56	100
Ø 12,0	24,65	120	27,73	120
Ø 14,0	27,73	140	30,82	140
Ø 16,0	30,82	160	33,90	160
Ø 18,0	32,36	180	35,44	180
Ø 20,0	36,96	200	40,05	200

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

SilverLine – End milling cutter with corner radius

N | HPC

- Article groups: **50 952 ...** and **50 968 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1010 Z0 Article no. 98 191 ... EUR		Regrinding Neck Coating Ti1010 Z0 Article no. 98 354 ... EUR	
Ø 5,0	15,40	050	18,48	050
Ø 6,0	15,40	060	18,48	060
Ø 8,0	16,96	080	20,03	080
Ø 10,0	20,03	100	23,13	100
Ø 12,0	26,19	120	29,27	120
Ø 14,0	29,27	140	32,36	140
Ø 16,0	32,36	160	35,44	160
Ø 18,0	35,44	180	38,52	180
Ø 20,0	38,52	200	41,61	200

Grinding process:

- Corner radius milling cutters and milling cutters with irregular pitch will be reground on the end, the rake face and the radius.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

SilverLine – High Accuracy Finish Milling Cutter

N | HPC

- Article group: **50 959 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1010 Z0 Article no. 98 193 ... EUR		Regrinding Neck Coating Ti1010 Z0 Article no. 98 352 ... EUR	
Ø 6,0	21,56	060	24,65	060
Ø 8,0	24,65	080	27,73	080
Ø 10,0	27,73	100	30,82	100
Ø 12,0	35,44	120	35,44	120
Ø 16,0	43,13	160	46,21	160
Ø 20,0	50,84	200	53,92	200
Ø 25,0	67,78	250	60,09	250

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Maximum run-out and maximum rejuvenation of 0.015 mm

AluLine – End mills with up to 5 teeth and a cutting length of up to 3xD

W | HPC

- **Delivery time:** 20 working days

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 080 ... EUR		Regrinding Coating Ti1005 Z0 Article no. 98 076 ... EUR		Regrinding Coating DLC Z0 Article no. 98 504 ... EUR		Regrinding Neck Z0 Article no. 98 390 ... EUR		Regrinding Neck Coating Ti1005 Z0 Article no. 98 362 ... EUR		Regrinding Neck Coating DLC Z0 Article no. 98 505 ... EUR	
Ø 5,0	15,40	050	18,48	050	18,98	050	18,48	050	21,56	050	23,03	050
≤ Ø 6,0	15,40	060	20,03	060	20,59	060	18,48	060	23,13	060	24,65	060
≤ Ø 8,0	16,96	080	20,03	080	22,56	080	20,03	080	24,65	080	26,61	080
≤ Ø 10,0	18,48	100	23,13	100	25,14	100	21,56	100	26,19	100	29,20	100
≤ Ø 12,0	24,65	120	29,27	120	33,76	120	27,73	120	32,36	120	37,83	120
≤ Ø 14,0	24,65	140	30,82	140	36,36	140	27,73	140	33,90	140	40,43	140
≤ Ø 16,0	27,73	160	33,90	160	40,43	160	30,82	160	36,96	160	44,48	160
≤ Ø 18,0	29,27	180	35,44	180	44,48	180	32,36	180	38,52	180	48,55	180
≤ Ø 20,0	30,82	200	40,05	200	52,64	200	35,44	200	43,13	200	56,69	200
≤ Ø 25,0	43,13	250	53,92	250	72,23	250	46,21	250	57,01	250	76,28	250

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

AluLine – End mills with up to 5 teeth and a cutting length over 3,1xD to 5xD

W HPC

- **Delivery time:** 20 working days

	Regrinding		Regrinding Neck		Regrinding Coating DLC		Regrinding Neck Coating DLC		Regrinding Coating Ti1005		Regrinding Neck Coating Ti1005	
	Z0		Z0		Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 502 ... EUR		Article no. 98 503 ... EUR		Article no. 98 506 ... EUR		Article no. 98 507 ... EUR		Article no. 98 572 ... EUR		Article no. 98 573 ... EUR	
Ø 5,0	15,04	050	19,35	050	20,59	050	24,65	050	18,48	050	22,68	050
≤ Ø 6,0	15,78	060	19,85	060	22,06	060	26,12	060	19,09	060	23,42	060
≤ Ø 8,0	17,98	080	22,06	080	24,29	080	28,34	080	21,20	080	25,26	080
≤ Ø 10,0	21,07	100	25,14	100	27,36	100	31,43	100	25,14	100	29,20	100
≤ Ø 12,0	28,70	120	32,78	120	37,22	120	41,16	120	33,28	120	37,34	120
≤ Ø 14,0	32,16	140	36,23	140	40,54	140	44,60	140	37,34	140	41,54	140
≤ Ø 16,0	35,84	160	39,93	160	44,25	160	48,30	160	41,54	160	45,60	160
≤ Ø 18,0	39,80	180	43,88	180	48,18	180	52,26	180	45,95	180	50,04	180
≤ Ø 20,0	47,21	200	51,26	200	57,67	200	61,74	200	54,47	200	58,55	200
≤ Ø 25,0	70,25	250	74,32	250	80,72	250	84,79	250	79,99	250	84,04	250

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

AluLine – End mills with up to 5 teeth and a corner radius, cutting length of up to 3xD

W HPC

	Regrinding		Regrinding Neck		Regrinding Coating Ti1005		Regrinding Neck Coating Ti1005	
	Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 081 ... EUR		Article no. 98 368 ... EUR		Article no. 98 077 ... EUR		Article no. 98 370 ... EUR	
Ø 5,0	15,40	050	20,03	050	20,03	050	23,13	050
≤ Ø 6,0	16,96	060	20,03	060	20,03	060	23,13	060
≤ Ø 8,0	18,48	080	21,56	080	21,56	080	24,65	080
≤ Ø 10,0	18,48	100	23,13	100	23,13	100	26,19	100
≤ Ø 12,0	24,65	120	27,73	120	29,27	120	32,36	120
≤ Ø 14,0	26,19	140	29,27	140	32,36	140	35,44	140
≤ Ø 16,0	29,27	160	32,36	160	35,44	160	38,52	160
≤ Ø 18,0	30,82	180	33,90	180	36,96	180	41,61	180
≤ Ø 20,0	33,90	200	36,96	200	41,61	200	44,69	200
≤ Ø 25,0	49,30	250	52,38	250	58,55	250	63,17	250

Grinding process:

- Corner radius milling cutters and milling cutters with irregular pitch will be reground on the end, the rake face and the radius.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

AluLine – Roughing-finishing milling cutters with up to 5 teeth, cutting length of up to 3xD

W HPC

Cutting-Ø-range mm	Regrinding Coating Ti1005 Z0 Article no. 98 079 ...		Regrinding Neck Coating Ti1005 Z0 Article no. 98 366 ...	
	EUR		EUR	
Ø 5,0	18,48	050	23,13	050
≤ Ø 6,0	20,03	060	23,13	060
≤ Ø 8,0	21,56	080	24,65	080
≤ Ø 10,0	23,13	100	26,19	100
≤ Ø 12,0	29,27	120	32,36	120
≤ Ø 14,0	30,82	140	33,90	140
≤ Ø 16,0	33,90	160	36,96	160
≤ Ø 18,0	35,44	180	38,52	180
≤ Ø 20,0	40,05	200	43,13	200
≤ Ø 25,0	55,46	250	58,55	250

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

AluLine – High Accuracy Finish Milling Cutter

W HPC

Cutting-Ø-range mm	Regrinding Coating Ti1005 Z0 Article no. 98 557 ...		Regrinding Neck Coating Ti1005 Z0 Article no. 98 558 ...	
	EUR		EUR	
Ø 5.1 to Ø 6.0	25,62	060	29,70	060
≤ Ø 8,0	29,57	080	33,64	080
≤ Ø 10,0	34,76	100	38,81	100
≤ Ø 12,0	44,12	120	48,18	120
≤ Ø 14,0	49,55	140	52,88	140
≤ Ø 16,0	54,84	160	58,91	160
≤ Ø 18,0	60,49	180	64,58	180
≤ Ø 20,0	70,25	200	74,32	200

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Maximum run-out and maximum rejuvenation of 0.015 mm

BlueLine – Finish milling cutter

H

- Article groups: **52 133 ...**, **52 134 ...** and **52 344 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti2000 Z0 Article no. 98 197 ... EUR	
Ø 6,0	21,56	**060**
Ø 8,0	23,13	**080**
Ø 10,0	32,36	**100**
Ø 12,0	41,61	**120**
Ø 14,0	50,84	**140**
Ø 16,0	61,61	**160**
Ø 18,0	64,69	**180**
Ø 20,0	72,40	**200**

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- If the wear width is too large, the tool is cut-off and reground.
- For tools with reduced neck the neck Ø is reground.

BlueLine – Finish milling cutter

H

- Article groups: **52 135 ...**, **52 136 ...** and **52 348 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti2000 Z0 Article no. 98 198 ... EUR	
Ø 6,0	24,65	**060**
Ø 8,0	29,27	**080**
Ø 10,0	41,61	**100**
Ø 12,0	52,38	**120**
Ø 14,0	61,61	**140**
Ø 16,0	70,86	**160**
Ø 18,0	78,57	**180**
Ø 20,0	89,34	**200**

Grinding process:

- These tools are reground on the end, on the rake face and the outside Ø.
- If the wear width is too large, the tool is cut-off and reground.
- For tools with reduced neck the neck Ø is reground.

BlueLine – Finish milling cutter with corner radius

H

- Article groups: **52 138 ...**, **52 139 ...**, **52 325 ...** and **52 326 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti2000 Z0 Article no. 98 195 ... EUR	
Ø 6,0	30,82	060
Ø 8,0	33,90	080
Ø 10,0	50,84	100
Ø 12,0	63,17	120
Ø 14,0	73,94	140
Ø 16,0	92,43	160
Ø 18,0	107,82	180
Ø 20,0	110,92	200

Grinding process:

- Corner radius milling cutters and milling cutters with graduated flute depth are reground on the end, rake face and radius or step.
- If the end is too severely worn, the end will be cut off and the tool reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Radius tolerance ± 0,01 mm

BlueLine – Finish milling cutter with corner radius

H

- Article groups: **52 137 ...**, **52 140 ...**, **52 141 ...**, **52 324 ...**, **52 353 ...**, **52 354 ...** and **52 361 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti2000 Z0 Article no. 98 194 ... EUR	
Ø 6,0	27,73	060
Ø 8,0	29,27	080
Ø 10,0	41,61	100
Ø 12,0	52,38	120
Ø 14,0	60,09	140
Ø 16,0	77,03	160
Ø 18,0	83,17	180
Ø 20,0	93,99	200

Grinding process:

- Corner radius milling cutters and milling cutters with graduated flute depth are reground on the end, rake face and radius or step.
- If the end is too severely worn, the end will be cut off and the tool reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Radius tolerance ± 0,01 mm

End mills with a cutting length of up to 3xD

- Finish, Rough-Finish and Roughing Cutter, Cutter with irregular pitch

	Regrinding		Regrinding		Regrinding		Regrinding		Regrinding Neck		Regrinding Neck		Regrinding Neck		Regrinding Neck	
			Coating TiCN		Coating Ti400		Coating Ti1000				Coating TiCN		Coating Ti400		Coating Ti1000	
	Z0		Z0		Z0		Z0		Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 150 ... EUR		Article no. 98 310 ... EUR		Article no. 98 312 ... EUR		Article no. 98 316 ... EUR		Article no. 98 388 ... EUR		Article no. 98 318 ... EUR		Article no. 98 320 ... EUR		Article no. 98 324 ... EUR	
Ø 3.0 to Ø 4.0	20,03	040	21,56	040	21,56	040	23,13	040	29,27	040	32,36	040	32,36	040	33,90	040
≤ Ø 6,0	21,56	060	24,65	060	24,65	060	26,19	060	32,36	060	35,44	060	35,44	060	35,44	060
≤ Ø 8,0	21,56	080	26,19	080	26,19	080	26,19	080	32,36	080	35,44	080	35,44	080	36,96	080
≤ Ø 10,0	21,56	100	26,19	100	26,19	100	27,73	100	32,36	100	36,96	100	36,96	100	38,52	100
≤ Ø 12,0	24,65	120	30,82	120	30,82	120	30,82	120	35,44	120	40,05	120	40,05	120	41,61	120
≤ Ø 14,0	24,65	140	30,82	140	30,82	140	30,82	140	35,44	140	41,61	140	41,61	140	41,61	140
≤ Ø 16,0	29,27	160	36,96	160	36,96	160	36,96	160	40,05	160	46,21	160	46,21	160	47,75	160
≤ Ø 18,0	29,27	180	40,05	180	40,05	180	41,61	180	40,05	180	50,84	180	50,84	180	50,84	180
≤ Ø 20,0	29,27	200	41,61	200	41,61	200	43,13	200	40,05	200	52,38	200	52,38	200	53,92	200
≤ Ø 22,0	29,27	220	44,69	220	44,69	220	50,84	220	40,05	220	55,46	220	55,46	220	61,61	220
≤ Ø 26,0	35,44	260	52,38	260	52,38	260	60,09	260	46,21	260	61,61	260	61,61	260	69,34	260
≤ Ø 32,0	36,96	320	57,01	320	57,01	320	64,69	320	46,21	320	66,26	320	66,26	320	75,49	320

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End mills with a cutting length of 3xD to 5xD

- Finish, Rough-Finish and Roughing Cutter, Cutter with irregular pitch

	Regrinding		Regrinding		Regrinding		Regrinding		Regrinding Neck		Regrinding Neck		Regrinding Neck		Regrinding Neck	
			Coating TiCN		Coating Ti400		Coating Ti1000				Coating TiCN		Coating Ti400		Coating Ti1000	
	Z0		Z0		Z0		Z0		Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 151 ... EUR		Article no. 98 311 ... EUR		Article no. 98 313 ... EUR		Article no. 98 317 ... EUR		Article no. 98 389 ... EUR		Article no. 98 319 ... EUR		Article no. 98 321 ... EUR		Article no. 98 325 ... EUR	
Ø 3.0 to Ø 4.0	21,56	040	24,65	040	24,65	040	26,19	040	32,36	040	35,44	040	35,44	040	35,44	040
≤ Ø 6,0	24,65	060	27,73	060	27,73	060	29,27	060	33,90	060	36,96	060	36,96	060	38,52	060
≤ Ø 8,0	24,65	080	27,73	080	27,73	080	29,27	080	33,90	080	38,52	080	38,52	080	38,52	080
≤ Ø 10,0	24,65	100	29,27	100	29,27	100	30,82	100	33,90	100	40,05	100	40,05	100	40,05	100
≤ Ø 12,0	29,27	120	35,44	120	35,44	120	35,44	120	40,05	120	44,69	120	44,69	120	46,21	120
≤ Ø 14,0	29,27	140	35,44	140	35,44	140	36,96	140	40,05	140	46,21	140	46,21	140	46,21	140
≤ Ø 16,0	33,90	160	41,61	160	41,61	160	41,61	160	43,13	160	50,84	160	50,84	160	52,38	160
≤ Ø 18,0	33,90	180	44,69	180	44,69	180	46,21	180	43,13	180	53,92	180	53,92	180	55,46	180
≤ Ø 20,0	35,44	200	49,30	200	49,30	200	49,30	200	46,21	200	58,55	200	58,55	200	60,09	200
≤ Ø 22,0	35,44	220	50,84	220	50,84	220	58,55	220	46,21	220	61,61	220	61,61	220	67,78	220
≤ Ø 26,0	44,69	260	60,09	260	60,09	260	67,78	260	53,92	260	70,86	260	70,86	260	78,57	260
≤ Ø 32,0	44,69	320	64,69	320	64,69	320	73,94	320	53,92	320	75,49	320	75,49	320	83,17	320

Grinding process:

- Standard cutters are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End mills with a corner radius up to 3xD (also with graduated flute depth)

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 202 ... EUR		Regrinding Coating Ti1000 Z0 Article no. 98 328 ... EUR		Regrinding Neck Z0 Article no. 98 332 ... EUR		Regrinding Neck Coating Ti1000 Z0 Article no. 98 334 ... EUR	
Ø 3.0 to Ø 4.0	24,65	040	27,73	040	35,44	040	38,52	040
≤ Ø 6,0	27,73	060	30,82	060	36,96	060	41,61	060
≤ Ø 8,0	27,73	080	32,36	080	36,96	080	41,61	080
≤ Ø 10,0	27,73	100	33,90	100	36,96	100	43,13	100
≤ Ø 12,0	30,82	120	36,96	120	40,05	120	47,75	120
≤ Ø 14,0	30,82	140	36,96	140	40,05	140	47,75	140
≤ Ø 16,0	36,96	160	44,69	160	46,21	160	55,46	160
≤ Ø 18,0	36,96	180	49,30	180	46,21	180	58,55	180
≤ Ø 20,0	36,96	200	50,84	200	46,21	200	60,09	200
≤ Ø 22,0	36,96	220	58,55	220	46,21	220	69,34	220
≤ Ø 26,0	44,69	260	67,78	260	55,46	260	78,57	260
≤ Ø 32,0	47,75	320	73,94	320	61,61	320	84,74	320

Grinding process:

- Corner radius milling cutters and milling cutters with irregular pitch will be reground on the end, the rake face and the radius.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

End milling cutter

AL

- Article groups: **52 639 ...** and **52 669 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti10/Ti 20 Z0 Article no. 98 665 ... EUR	
Ø 6,0	26,19	060
Ø 8,0	32,36	080
Ø 10,0	40,05	103
Ø 10,0	40,05	104
Ø 12,0	49,30	124
Ø 12,0	50,84	126
Ø 16,0	70,86	160
Ø 20,0	112,47	200

Grinding process:

- These tools are reground on the end and rake face.
- If the wear width is too large, the external diameter will be ground.
- If the end is too severely worn, the end will be cut off and the tool reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Depending on the amount of wear, the tool can be reground up to two times.

Endmill

W HPC

- Uncoated article groups: **50 960 ...**, **54 590 ...**, **54 591 ...**, **54 610 ...**, **54 611 ...**, **54 630 ...**, **54 631 ...**, **54 650 ...**
- Ti 1005 article groups: **54 592 ...**, **54 593 ...**, **54 612 ...**, **54 613 ...**, **54 632 ...**, **54 633 ...**, **54 652 ...**

	Regrinding		Regrinding Coating Ti1005		Regrinding Neck		Regrinding Neck Coating Ti1005	
	Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 080 ... EUR		Article no. 98 076 ... EUR		Article no. 98 390 ... EUR		Article no. 98 362 ... EUR	
Ø 5,0	15,40	050	18,48	050	18,48	050	21,56	050
≤ Ø 6,0	15,40	060	20,03	060	18,48	060	23,13	060
≤ Ø 8,0	16,96	080	20,03	080	20,03	080	24,65	080
≤ Ø 10,0	18,48	100	23,13	100	21,56	100	26,19	100
≤ Ø 12,0	24,65	120	29,27	120	27,73	120	32,36	120
≤ Ø 14,0	24,65	140	30,82	140	27,73	140	33,90	140
≤ Ø 16,0	27,73	160	33,90	160	30,82	160	36,96	160
≤ Ø 18,0	29,27	180	35,44	180	32,36	180	38,52	180
≤ Ø 20,0	30,82	200	40,05	200	35,44	200	43,13	200
≤ Ø 25,0	43,13	250	53,92	250	46,21	250	57,01	250

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End milling cutter with corner radius

W HPC

- Uncoated article groups: **54 594 ...**, **54 595 ...**, **54 620 ...**
- Ti 1005 article groups: **54 596 ...**, **54 597 ...**, **54 622 ...**

	Regrinding		Regrinding Neck		Regrinding Coating Ti1005		Regrinding Neck Coating Ti1005	
	Z0		Z0		Z0		Z0	
Cutting-Ø-range mm	Article no. 98 081 ... EUR		Article no. 98 368 ... EUR		Article no. 98 077 ... EUR		Article no. 98 370 ... EUR	
Ø 5,0	15,40	050	20,03	050	20,03	050	23,13	050
≤ Ø 6,0	16,96	060	20,03	060	20,03	060	23,13	060
≤ Ø 8,0	18,48	080	21,56	080	21,56	080	24,65	080
≤ Ø 10,0	18,48	100	23,13	100	23,13	100	26,19	100
≤ Ø 12,0	24,65	120	27,73	120	29,27	120	32,36	120
≤ Ø 14,0	26,19	140	29,27	140	32,36	140	35,44	140
≤ Ø 16,0	29,27	160	32,36	160	35,44	160	38,52	160
≤ Ø 18,0	30,82	180	33,90	180	36,96	180	41,61	180
≤ Ø 20,0	33,90	200	36,96	200	41,61	200	44,69	200
≤ Ø 25,0	49,30	250	52,38	250	58,55	250	63,17	250

Grinding process:

- Corner radius milling cutters and milling cutters with irregular pitch will be reground on the end, the rake face and the radius.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

Endmill

W | HPC

- Uncoated article groups: **54 624 ...**, **54 626 ...**, **54 660 ...**, **54 662 ...**
- Ti 1005 article groups: **54 625 ...**, **54 627 ...**

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 083 ... EUR		Regrinding Neck Z0 Article no. 98 392 ... EUR		Regrinding Coating Ti1005 Z0 Article no. 98 079 ... EUR		Regrinding Neck Coating Ti1005 Z0 Article no. 98 366 ... EUR	
Ø 5,0	15,40	050	18,48	050	18,48	050	23,13	050
≤ Ø 6,0	16,96	060	20,03	060	20,03	060	23,13	060
≤ Ø 8,0	16,96	080	20,03	080	21,56	080	24,65	080
≤ Ø 10,0	18,48	100	21,56	100	23,13	100	26,19	100
≤ Ø 12,0	24,65	120	27,73	120	29,27	120	32,36	120
≤ Ø 14,0	24,65	140	29,27	140	30,82	140	33,90	140
≤ Ø 16,0	27,73	160	30,82	160	33,90	160	36,96	160
≤ Ø 18,0	29,27	180	32,36	180	35,44	180	38,52	180
≤ Ø 20,0	32,36	200	35,44	200	40,05	200	43,13	200
≤ Ø 25,0	46,21	250	49,30	250	55,46	250	58,55	250

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End milling cutter

W

- Article group: **50 900 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1001 Z0 Article no. 98 220 ... EUR		Regrinding Neck Coating Ti1001 Z0 Article no. 98 380 ... EUR	
Ø 5,0	13,88	050	16,96	050
≤ Ø 6,0	13,88	060	16,96	060

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

Roughing-Finishing Cutter

WF

- Article groups: **52 164 ...**, **52 165 ...**, **52 166 ...** and **52 167 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating short Ti10 Z0 Article no. 98 235 ... EUR		Regrinding Coating long Ti10 Z0 Article no. 98 236 ... EUR	
Ø 4.0 to Ø 5.0	16,96	050	20,03	050
≤ Ø 6,0	16,96	060	20,03	060
≤ Ø 8,0	18,48	080	21,56	080
≤ Ø 10,0	23,13	100	27,73	100
≤ Ø 12,0	30,82	120	36,96	120
≤ Ø 16,0	44,69	160	55,46	160
≤ Ø 20,0	63,17	200	73,94	200

Grinding process:

- These tools are reground on the end and rake face.
- If the end is too severely worn, the end will be cut off and the tool reground.
- For tools with reduced neck, the neck Ø will also be reground.

End milling cutter

N **HPC**

- Article groups: **54 001 ...** – **54 006 ...**, **54 050 ...** – **54 052 ...** and **54 060 ...** – **54 062 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1000 Z0 Article no. 98 214 ... EUR		Regrinding Neck Coating Ti1000 Z0 Article no. 98 215 ... EUR	
Ø 8,0	16,96	080	20,03	080
Ø 10,0	18,48	100	21,56	100
Ø 12,0	24,65	120	27,73	120
Ø 16,0	30,82	160	33,90	160
Ø 20,0	36,96	200	40,05	200

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

End milling cutter with corner radius

N | HPC

- Article groups: **54 053 ...**, **54 054 ...**, **54 063 ...** and **54 064 ...**

Cutting-Ø-range mm		Regrinding Neck Coating Ti1000 NEW Z0 Article no. 98 049 ... EUR	
Ø 8,0		20,03	080
Ø 10,0		23,13	100
Ø 12,0		29,27	120
Ø 16,0		35,44	160
Ø 20,0		41,61	200

Grinding process:

- These tools are reground on the end and on the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

Multi-flute milling cutter

N

- Article groups: **50 631 ...**, **52 109 ...**, **52 129 ...** and **52 716 ...**

Cutting-Ø-range mm		Regrinding Z0 Article no. 98 144 ... EUR		Regrinding Coating Ti400 Z0 Article no. 98 290 ... EUR		Regrinding Coating Ti1000 Z0 Article no. 98 292 ... EUR		Regrinding Neck Z0 Article no. 98 396 ... EUR		Regrinding Neck Coating Ti400 Z0 Article no. 98 294 ... EUR		Regrinding Neck Coating Ti1000 Z0 Article no. 98 296 ... EUR	
Ø 4,0		38,52	040	41,61	040	43,13	040	49,30	040	50,84	040	52,38	040
≤ Ø 6,0		38,52	060	41,61	060	43,13	060	49,30	060	50,84	060	52,38	060
≤ Ø 8,0		38,52	080	43,13	080	43,13	080	49,30	080	52,38	080	53,92	080
≤ Ø 10,0		43,13	100	47,75	100	49,30	100	52,38	100	58,55	100	58,55	100
≤ Ø 12,0		43,13	120	49,30	120	49,30	120	52,38	120	58,55	120	60,09	120
≤ Ø 14,0		52,38	140	58,55	140	58,55	140	61,61	140	67,78	140	69,34	140
≤ Ø 16,0		52,38	160	58,55	160	60,09	160	61,61	160	69,34	160	69,34	160
≤ Ø 18,0		52,38	180	63,17	180	63,17	180	61,61	180	72,40	180	73,94	180
≤ Ø 20,0		52,38	200	64,69	200	66,26	200	61,61	200	73,94	200	75,49	200
≤ Ø 22,0		61,61	220	77,03	220	83,17	220	70,86	220	86,27	220	92,43	220
≤ Ø 26,0		61,61	260	77,03	260	84,74	260	70,86	260	87,82	260	93,99	260

Grinding process:

- Fine-tooth cutters are reground only on the end and the rake face.
- If the wear width is too large, the outside diameter is ground.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

Multi-flute milling cutter

N | HSC

- Article group: **52 723 ...**

Cutting-Ø-range mm	Regrinding	Neck	Coating	Ti1000	Z0	Article no. 98 662 ...
					EUR	
Ø 6,0					21,56	060
Ø 8,0					29,27	080
Ø 10,0					36,96	100
Ø 12,0					50,84	120
Ø 16,0					89,34	160

Grinding process:

- Multi-flute milling cutters are only reground on the end and rake face.
- However, if the wear width is too large, the outside diameter will be ground.
- If the end is too severely worn, it will be cut off and the tool will be reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Depending on the amount of wear, the tool can be reground up to two times.

Rough milling cutter

HR

- Article groups: **52 338 ..., 52 339 ..., 52 340 ..., 52 341 ..., 52 342 ...** and **52 343 ...**
- **Delivery time:** 20 working days

Cutting-Ø-range mm	Regrinding	Neck	Coating	Ti1000	Z0	Article no. 98 664 ...
					EUR	
Ø 6,0					29,27	060
Ø 8,0					32,36	080
Ø 10,0					40,05	100
Ø 12,0					46,21	120
Ø 14,0					50,84	140
Ø 16,0					55,46	160
Ø 18,0					61,61	180
Ø 20,0					67,78	200
Ø 25,0					87,82	250

Grinding process:

- These tools are completely reground on the end and waist as well as the reduced neck and then recoated.

MonsterMill – Ball Nosed Cutter

SCR

- Article groups: **52 611 ...** and **52 612 ...**

Cutting-Ø-range mm	Regrinding Coating short Ti1200 Z0 Article no. 98 677 ... EUR		Regrinding Coating long Ti1200 Z0 Article no. 98 678 ... EUR	
Ø 6,0	15,40	**060**	15,40	**060**
Ø 8,0	20,03	**080**	21,56	**080**
Ø 10,0	26,19	**100**	27,73	**100**
Ø 12,0	41,61	**120**	43,13	**120**
Ø 16,0	66,26	**160**	69,34	**160**

Grinding process:

- Ball-nosed end mills are usually reground on the end only.
- If the end is too severely worn, it is cut off and reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Depending on the amount of wear, the tool can be reground up to two times.
- Radius tolerance ± 0,01 mm

MonsterMill – Torus Face Milling Cutter

SCR

- Article groups: **52 609 ...** and **52 610 ...**

Cutting-Ø-range mm	Regrinding Coating long Ti1200 Z0 Article no. 98 675 ... EUR		Regrinding Coating extra long Ti1200 Z0 Article no. 98 676 ... EUR	
Ø 3,0	33,90	**030**		
Ø 4,0	35,44	**040**		
Ø 5,0	38,52	**050**		
Ø 6,0	35,44	**060**		
Ø 8,0	40,05	**080**	47,75	**080**
Ø 10,0	47,75	**100**	50,84	**100**
Ø 12,0	61,61	**120**	66,26	**120**
Ø 16,0	95,51	**160**	101,68	**160**

Grinding process:

- Torus cutters are usually reground on the end and radius only.
- If the end is too severely worn, it is cut off and reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Depending on the amount of wear, the tool can be reground up to two times.

SilverLine – Ball-nosed end mills and torus cutters

N **HPC**

- Article groups: **50 953 ...**, **50 956 ...**, **50 957 ...**, **50 961 ...** and **50 962 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1010 Z0 Article no. 98 192 ... EUR		Regrinding Neck Coating Ti1010 Z0 Article no. 98 356 ... EUR	
Ø 5,0	16,96	050	20,03	050
Ø 6,0	18,48	060	21,56	060
Ø 8,0	20,03	080	23,13	080
Ø 10,0	21,56	100	24,65	100
Ø 12,0	27,73	120	30,82	120
Ø 16,0	35,44	160	38,52	160
Ø 20,0	41,61	200	44,69	200

Grinding process:

- Ball Nosed cutters are reground only on the end, because grinding the rake face of the cutting diameter would make the radius smaller!
- Torus cutters will be reground only on the end and the radius.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

BlueLine – Ball Nosed Cutter

H

- Article groups: **52 256 ...** – **52 259 ...**, **52 302 ...** – **52 305 ...**, **52 352 ...**, **52 355 ...**, **52 404 ...** and **52 405 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating Ti2000 Z0 Article no. 98 196 ... EUR	
Ø 6,0	27,73	060
Ø 8,0	27,73	080
Ø 10,0	32,36	100
Ø 12,0	41,61	120
Ø 14,0	47,75	140
Ø 16,0	50,84	160
Ø 20,0	58,55	200

Grinding process:

- Ball Nosed cutters are reground only on the end, because grinding the rake face of the cutting diameter would make the radius smaller!
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,01 mm

Ball-nosed end mills and torus cutters

- Z = number of flutes

	Regrinding	Regrinding	Regrinding Neck	Regrinding Neck	Regrinding Neck Coating	Regrinding Neck Coating	Regrinding Coating	Regrinding Coating
	Z = 2	Z = 4	Z = 2	Z = 4	Z = 2 Ti1000	Z = 4 Ti1000	Z = 2 Ti1000	Z = 4 Ti1000
	Z0	Z0	Z0	Z0	Z0	Z0	Z0	Z0
Cutting-Ø-range mm	Article no. 98 160 ... EUR	Article no. 98 161 ... EUR	Article no. 98 426 ... EUR	Article no. 98 428 ... EUR	Article no. 98 422 ... EUR	Article no. 98 424 ... EUR	Article no. 98 414 ... EUR	Article no. 98 416 ... EUR
Ø 3.0 to Ø 4.0	21,56 040	30,82 040	30,82 040	40,05 040	35,44 040	43,13 040	24,65 040	33,90 040
≤ Ø 6,0	21,56 060	30,82 060	30,82 060	40,05 060	35,44 060	44,69 060	24,65 060	33,90 060
≤ Ø 8,0	23,13 080	32,36 080	33,90 080	43,13 080	38,52 080	47,75 080	27,73 080	36,96 080
≤ Ø 10,0	23,13 100	32,36 100	33,90 100	43,13 100	40,05 100	47,75 100	29,27 100	38,52 100
≤ Ø 12,0	26,19 120	36,96 120	35,44 120	46,21 120	41,61 120	53,92 120	32,36 120	43,13 120
≤ Ø 14,0	27,73 140	36,96 140	35,44 140	46,21 140	43,13 140	53,92 140	33,90 140	43,13 140
≤ Ø 16,0	32,36 160	40,05 160	43,13 160	50,84 160	50,84 160	58,55 160	40,05 160	49,30 160
≤ Ø 18,0	33,90 180	40,05 180	43,13 180	50,84 180	53,92 180	63,17 180	44,69 180	52,38 180
≤ Ø 20,0	36,96 200	43,13 200	43,13 200	50,84 200	57,01 200	64,69 200	46,21 200	55,46 200

Grinding process:

- Ball Nosed cutters are reground only on the end, because grinding the rake face of the cutting diameter would make the radius smaller!
- Torus cutters will be reground only on the end and the radius.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

AluLine – Ball Nosed Cutter

W HPC

- Article groups: **54 640 ...**, **54 642 ...**, **53 508 ...** – **53 511 ...**

	Regrinding	Regrinding Coating Ti1005	Regrinding Neck	Regrinding Neck Coating Ti1005
	Z0	Z0	Z0	Z0
Cutting-Ø-range mm	Article no. 98 082 ... EUR	Article no. 98 078 ... EUR	Article no. 98 394 ... EUR	Article no. 98 374 ... EUR
Ø 5,0	18,48 050	21,56 050	21,56 050	26,19 050
≤ Ø 6,0	18,48 060	23,13 060	21,56 060	26,19 060
≤ Ø 8,0	20,03 080	23,13 080	23,13 080	26,19 080
≤ Ø 10,0	21,56 100	26,19 100	24,65 100	29,27 100
≤ Ø 12,0	26,19 120	32,36 120	30,82 120	35,44 120
≤ Ø 14,0	29,27 140	33,90 140	32,36 140	36,96 140
≤ Ø 16,0	30,82 160	36,96 160	35,44 160	41,61 160
≤ Ø 18,0	33,90 180	40,05 180	36,96 180	43,13 180
≤ Ø 20,0	35,44 200	43,13 200	38,52 200	46,21 200

Grinding process:

- Torus cutters will be reground only on the end and the radius.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

Ball Nosed Cutter

W

- Article groups: **50 903 ...** and **50 904 ...**

Cutting-Ø-range mm		Regrinding Coating Ti1001 Z0 Article no. 98 222 ... EUR		Regrinding Neck Coating Ti1001 Z0 Article no. 98 382 ... EUR	
Ø 5,0		16,96	050	20,03	050
≤ Ø 6,0		16,96	060	20,03	060
≤ Ø 8,0		18,48	080	21,56	080
≤ Ø 10,0		20,03	100	23,13	100
≤ Ø 12,0		26,19	120	29,27	120
≤ Ø 14,0		29,27	140	32,36	140
≤ Ø 16,0		32,36	160	35,44	160
≤ Ø 18,0		33,90	180	36,96	180
≤ Ø 20,0		38,52	200	41,61	200

Grinding process:

- Ball Nosed cutters are reground only on the end, because grinding the rake face of the cutting diameter would make the radius smaller!
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

Ball Nosed Cutter

N **HPC**

- Article groups: **54 055 ...** – **54 058 ...**

Cutting-Ø-range mm		Regrinding Coating Ti1000 NEW Z0 Article no. 98 044 ... EUR		Regrinding Neck Coating Ti1000 NEW Z0 Article no. 98 060 ... EUR	
Ø 8,0		20,03	080	23,13	080
Ø 10,0		21,56	100	24,65	100
Ø 12,0		27,73	120	30,82	120
Ø 16,0		35,44	160	38,52	160
Ø 20,0		41,61	200	44,69	200

Grinding process:

- Ball Nosed cutters are reground only on the end, because grinding the rake face of the cutting diameter would make the radius smaller!
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

Torus Cutter

W

- Article groups: **50 901 ...** and **50 902 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1001 Z0 Article no. 98 221 ... EUR		Regrinding Neck Coating Ti1001 Z0 Article no. 98 384 ... EUR	
Ø 5,0	13,88	050	16,96	050
≤ Ø 6,0	15,40	060	18,48	060
≤ Ø 8,0	15,40	080	20,03	080
≤ Ø 10,0	18,48	100	21,56	100
≤ Ø 12,0	24,65	120	27,73	120

Grinding process:

- Torus cutters will be reground only on the end and the radius.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,05 mm

Torus Cutter

W HSC

- Article groups: **52 333 ...** and **52 334 ...**
- **Lead Time:** 20 working days

Cutting-Ø-range mm	Regrinding Coating long Ti10 Z0 Article no. 98 237 ... EUR		Regrinding Coating extra long Ti10 Z0 Article no. 98 234 ... EUR	
Ø 3.0 to Ø 6.0	24,65	060	26,19	060
Ø 8,0	26,19	080	27,73	080
Ø 10,0	35,44	100	36,96	100
Ø 12,0	44,69	120	50,84	120
Ø 16,0	58,55	160	78,57	160

Grinding process:

- Torus cutters will be reground only on the end and the radius.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.
- Radius tolerance ± 0,01 mm

Torus Cutter

- Article groups: **52 731 ...**, **52 732 ...** and **52 733 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1000 Z0 Article no. 98 159 ... EUR	
Ø 6,0	23,13	**065**
Ø 8,0	30,82	**086**
Ø 10,0	40,05	**107**
Ø 12,0	52,38	**128**
Ø 16,0	78,57	**169**

Grinding process:

- Torus cutters are only reground on the end and radius.
- If the end is too severely worn, it is cut off and reground.
- For tools with reduced neck, the neck Ø will also be reground.
- Radius tolerance ± 0,01 mm

High Feed Cutter

N | **HFC**

- Article groups: **56 900 ...**, **56 902 ...** and **56 904 ...**

Cutting-Ø-range mm	Regrinding Coating TiAlN Z0 Article no. 98 187 ... EUR	
Ø 6,0	27,73	060
Ø 8,0	29,27	080
Ø 10,0	32,36	100
Ø 12,0	41,61	120
Ø 16,0	52,38	160

Grinding process:

- Torus cutters will be reground only on the end and the radius.
- If the end is severely worn, the tool will be cut-off and reground.
- For tools with reduced neck the neck diameter is reground.

Quarter-round profile milling cutters / engraving cutters / die-sinking cutters

N

Cutting-Ø-range mm	Regrinding ≤ 3xD Z0 Article no. 98 200 ... EUR		Regrinding > 3xD ≤ 5xD Z0 Article no. 98 201 ... EUR		Regrinding Coating > 3xD ≤ 5xD Ti1000 Z0 Article no. 98 344 ... EUR		Regrinding Coating ≤ 3xD Ti1000 Z0 Article no. 98 342 ... EUR	
Ø 3.0 to Ø 4.0	23,13	040	26,19	040	29,27	040	26,19	040
≤ Ø 6,0	26,19	060	27,73	060	32,36	060	29,27	060
≤ Ø 8,0	26,19	080	27,73	080	32,36	080	29,27	080
≤ Ø 10,0	26,19	100	27,73	100	33,90	100	30,82	100
≤ Ø 12,0	27,73	120	33,90	120	40,05	120	33,90	120
≤ Ø 14,0	30,82	140	33,90	140	40,05	140	35,44	140
≤ Ø 16,0	33,90	160	38,52	160	46,21	160	41,61	160
≤ Ø 18,0	33,90	180	38,52	180	50,84	180	46,21	180
≤ Ø 20,0	35,44	200	41,61	200	55,46	200	47,75	200
≤ Ø 22,0	38,52	220	43,13	220	63,17	220	55,46	220
≤ Ø 26,0	41,61	260	50,84	260	73,94	260	64,69	260
≤ Ø 32,0	44,69	320	55,46	320	80,11	320	70,86	320

Grinding process:

- Quarter round profile cutters and tapered die cutters can be reground only on the rake angle.
- Engraving Cutters are completely reground

NC deburring cutters

N

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 130 ... EUR		Regrinding Coating Ti1000 Z0 Article no. 98 346 ... EUR	
Ø 4,0	16,96	040	21,56	040
Ø 6,0	16,96	060	21,56	060
Ø 8,0	16,96	080	21,56	080
Ø 10,0	16,96	100	23,13	100
Ø 12,0	16,96	120	23,13	120

Grinding process:

- These tools are completely reground

NC front and rear chamfer milling cutters

N

Cutting-Ø-range mm	Regrinding Z0 Article no. 98 138 ... EUR		Regrinding Coating Ti1000 Z0 Article no. 98 348 ... EUR	
Ø 3.0 to Ø 4.0	16,96	040	21,56	040
≤ Ø 6,0	16,96	060	21,56	060
≤ Ø 8,0	16,96	080	21,56	080
≤ Ø 10,0	16,96	100	23,13	100
≤ Ø 12,0	16,96	120	23,13	120

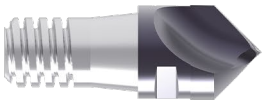
Grinding process:

- These tools are reground only on the rake face.

MultiChange – Solid Carbide NC Spot Drills

NC-A

- Article groups: **10 709 ...**, **10 712 ...** and **10 714 ...**



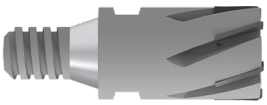
	Regrinding	
	Coating	
	Ti1050	
	Z0	
Cutting-Ø-range	**Article no.**	
	98 690 ...	
mm	**EUR**	
Ø 8,0	18,48	**080**
Ø 10,0	23,13	**100**
Ø 12,0	30,82	**120**
Ø 16,0	35,44	**160**
Ø 20,0	43,13	**200**

Grinding process:

- These spot drills are reground on the main cutting edge.

MultiChange – Exchange Head Reamers

- Article groups: **40 210 ...** – **40 213 ...**, **40 240 ...** – **40 243 ...**, **40 245 ...** – **40 247 ...** (Regrind)
- Article groups: **40 220 ...** – **40 223 ...**, **40 230 ...** – **40 233 ...** (Regrind and recoat)



	Regrinding		Regrinding	
			Coating	
			TiAlN	
	Z0		Z0	
Cutting-Ø-range	**Article no.**		**Article no.**	
	98 691 ...		**98 692 ...**	
mm	**EUR**		**EUR**	
Ø 8.00 to Ø 15.99	50,84	**080**	57,01	**080**
≤ Ø 17,99	53,92	**160**	60,09	**160**
≤ Ø 21,99	57,01	**180**	63,17	**180**
≤ Ø 30,20	60,09	**220**	69,34	**220**

Grinding process:

- These tools can be reground only on the cutting chamfer so that the cutting and diameter tolerance is maintained.
- If regrinding is not feasible, the tools are returned unprocessed!
- Maximum two regrinds.

MultiChange – Solid Carbide End Mills

N

- Article groups: **52 860 ...** and **52 861 ...**

Cutting-Ø-range mm	Regrinding Coating Z = 4 Ti1100 Z0 Article no. 98 680 ... EUR		Regrinding Coating Z = 3 Ti1100 Z0 Article no. 98 681 ... EUR	
Ø 8,0	18,48	080	21,56	080
Ø 10,0	23,13	100	27,73	100
Ø 12,0	30,82	120	40,05	120
Ø 16,0	35,44	160	41,61	160
Ø 20,0	43,13	200	50,84	200

Grinding process:

- Regrind on end and cutting edges
- If the wear width is too large, the outside diameter is ground.

Attention: Note shank relief after regrinding!

MultiChange – Solid Carbide Finishing Cutter

N

- Article group: **52 863 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1100 Z0 Article no. 98 683 ... EUR	
Ø 8,0	21,56	080
Ø 10,0	27,73	100
Ø 12,0	35,44	120
Ø 16,0	41,61	160
Ø 20,0	50,84	200

Grinding process:

- Regrind on end and cutting edges
- If the wear width is too large, the outside diameter is ground.

MultiChange – Solid Carbide Rough-Finish Cutter

N

- Article group: **52 862 ...**

Cutting-Ø-range mm	Regrinding	Coating	Ti1100	Z0	Article no. 98 682 ...
				EUR	
Ø 8,0				24,65	080
Ø 10,0				29,27	100
Ø 12,0				35,44	120
Ø 16,0				40,05	160
Ø 20,0				47,75	200

Grinding process:

- Regrind on end and cutting edges
- If the wear width is too large, the tool is considered as "not re-sharpened."

MultiChange – Solid Carbide High Feed Cutter

N

- Article group: **52 864 ...**

Cutting-Ø-range mm	Regrinding	Coating	Ti1100	Z0	Article no. 98 684 ...
				EUR	
Ø 8,0				21,56	080
Ø 10,0				27,73	100
Ø 12,0				35,44	120
Ø 16,0				41,61	160
Ø 20,0				50,84	200

Grinding process:

- Regrind on end and cutting edges
- If the wear width is too large, the outside diameter is ground.

MultiChange – Solid Carbide Torus Cutter

N

- Article group: **52 865 ...**

Cutting-Ø-range mm	Regrinding	Coating	Article no. 98 685 ... EUR	
		Ti1100	Z0	
Ø 8,0			24,65	080
Ø 10,0			30,82	100
Ø 12,0			38,52	120
Ø 16,0			47,75	160
Ø 20,0			57,01	200

Grinding process:

- Regrind on end only
- If the wear width is too large, the tool is considered as "not re-sharpened."
- Radius tolerance ± 0,02 mm

MultiChange – Solid Carbide Quarter Round Cutter

N

- Article group: **52 869 ...**

Cutting-Ø-range mm	Regrinding	Coating	Article no. 98 693 ... EUR	
		Ti1100	Z0	
Ø 8,0			29,27	080
Ø 10,0			32,36	100
Ø 12,0			33,90	120
Ø 16,0			43,13	160
Ø 20,0			55,46	200

Grinding process:

- Regrind on end only
- If the wear width is too large, the tool is considered as "not re-sharpened."
- Radius tolerance ± 0,03 mm

MultiChange – Solid Carbide Ball Nosed Cutter

N

- Article group: **52 866 ...**

Cutting-Ø-range mm	Regrinding Coating Ti1100 Z0 Article no. 98 686 ... EUR	
Ø 10,0	29,27	**100**
Ø 12,0	35,44	**120**
Ø 16,0	40,05	**160**
Ø 20,0	47,75	**200**

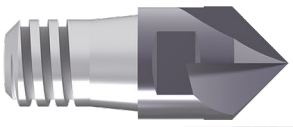
Grinding process:

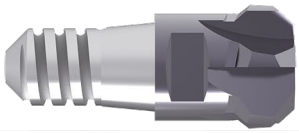
- Regrind on end only
- If the wear width is too large, the tool is considered as "not re-sharpened."
- Radius tolerance ± 0,02 mm

MultiChange – Solid Carbide Chamfer Cutters

N

- Article groups: **52 867 ...** and **52 868 ...**





Cutting-Ø-range mm	Regrinding Coating Ti1050 Z0 Article no. 98 687 ... EUR		Regrinding Coating Ti1100 Z0 Article no. 98 688 ... EUR	
Ø 10,0	23,13	**100**	27,73	**100**
Ø 12,0	30,82	**120**	35,44	**120**
Ø 16,0	35,44	**160**	41,61	**160**
Ø 20,0	43,13	**200**	50,84	**200**

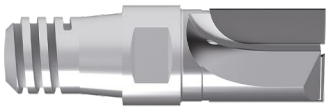
Grinding process:

- Regrinding on end only for article group **52 867 ...**
- Regrinding on cutting edges for article group **52 868...**
- If the wear width is too large, the tool is considered as „not re-sharpened."

MultiChange – PCD End Mills

PDC

- Article group: **52 880 ...**



Cutting-Ø-range mm	Regrinding Z0 Article no. 98 610 ... EUR		Retipping Z0 Article no. 98 612 ... EUR	
Ø 6.01 to Ø 8.00	129,40	080	157,13	080
≤ Ø 10,0	150,97	100	184,86	100
≤ Ø 12,0	174,08	120	211,05	120
≤ Ø 16,0	229,54	160	277,29	160

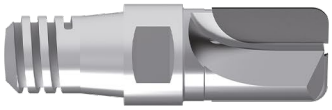
Grinding process:

- PCD end milling cutters can be reground on the face 1 time.
- From the 2nd time the segments are removed, new segments brazed in and ground.

MultiChange – PCD Torus cutters

PDC

- Article group: **52 882 ...**



Cutting-Ø-range mm	Regrinding Z0 Article no. 98 616 ... EUR		Retipping Z0 Article no. 98 618 ... EUR	
Ø 6.01 to Ø 8.00	120,16	080	154,05	080
≤ Ø 10,0	132,48	100	170,99	100
≤ Ø 12,0	143,26	120	184,86	120

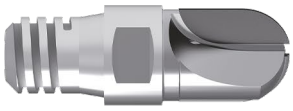
Grinding process:

- PCD Torus cutters can be reground on the end and radius 1 time.
- From the 2nd time the segments are removed, new segments brazed in and ground.
- Radius tolerance ± 0,01 mm

MultiChange – PCD Ball Nosed Cutters

PDC

- Article group: **52 881 ...**



Cutting-Ø-range mm	Retipping Z0 Article no. 98 614 ... EUR	
Ø 6.01 to Ø 8.00	175,61	**080**
≤ Ø 10,0	183,33	**100**
≤ Ø 12,0	220,29	**120**
≤ Ø 16,0	254,19	**160**

Grinding process:

- The segments are removed, new segments brazed in and ground.
- Radius tolerance ± 0,05 mm

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TOTAL TOOLING = QUALITY x SERVICE [2]

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