



# DEBURRING HONING

[www.gerber-maschinen.ch](http://www.gerber-maschinen.ch)

René Gerber AG

Leading machine supplier for deburring and edge-honing

# AGENDA

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- ▶ The René Gerber AG
- ▶ Global presence
- ▶ Overview: product portfolio
- ▶ Applications
  - ▶ Edge-honing
  - ▶ Deburring
- ▶ Technology
  - ▶ What is brushing and deburring?
- ▶ The success factors

# THE RENÉ GERBER AG

## Company portrait

### **Precision, quality and profitability**

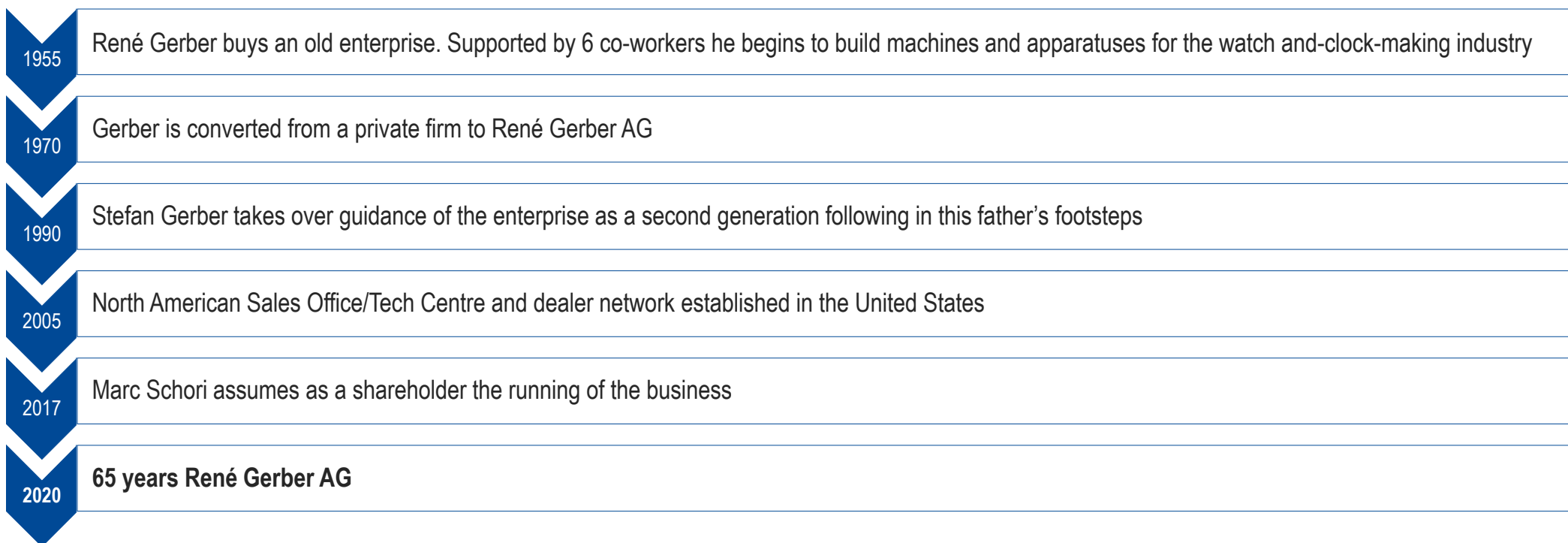
As a technology leader in process development and the construction of brush deburring and edge honing systems, we have been the solution for our customers in the areas of deburring, edge-honing, polishing and brushing for more than 60 years.

As an established manufacturer of machines for edge-honing and polishing a variety of materials, we are a long-term supplier of systems in the tool, automotive, watch and medical industry.



# RENÉ GERBER AG

## The milestones



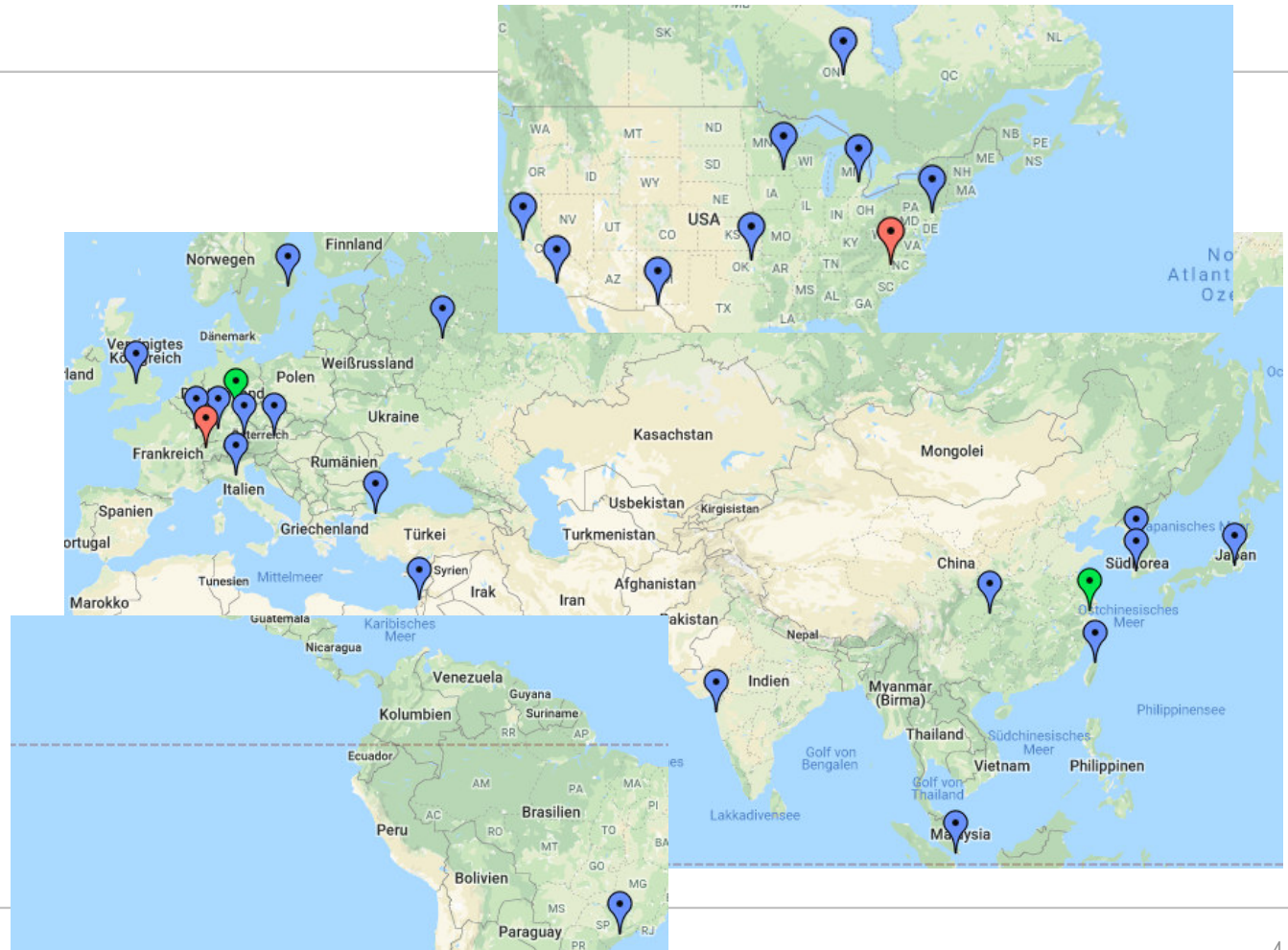


# RENÉ GERBER AG

## Global presence

### Around the globe

With service centre's and representative offices in 19 countries we maintain a close co-operation. Therewith we are looking for the close proximity of our customers to meet their needs.



# PRODUCT PORTFOLIO

Leading supplier of machines for deburring, edge-honing and polishing



- ▶ We manufacture deburring, edge-honing and polishing machines for materials from soft to ultra hard
- ▶ We produce clamping mandrels in first class Swiss-quality
- ▶ We are the partner for consumables, spare parts and maintenance
- ▶ We manufacture deburring, honing and polishing high-quality parts on a contract basis in our «Surface Expert Centre»



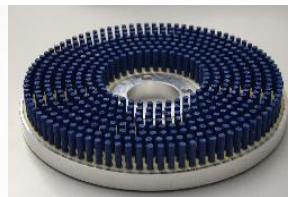
Brushing, Edge-Preparation, Deburring



Polishing



Clamping mandrels, Thickness grading apparatuses



Brushes, Spare parts

## PRODUCT PORTFOLIO

### Further products

#### **Toraxor clamping mandrels**

Gerber has been producing expanding clamping mandrels under the name TORAXOR since 1972. They are ideal for clamping tasks in which precision is a top priority.

**Cylindrical and precision grinding, precision turning, Balancing**

#### **Thickness grading apparatuses**

Thickness grading apparatuses from Gerber were developed to simplify work processes in amazingly simple ways.

**Sorting, measuring, classifying**

#### **SurfaceExpertCentre**

We recommend ourselves for contract work in the field of deburring, honing and surface polishing. The optimal result from the professional for your workpieces.

**Optimizing, completion, outsourcing**

# BRUSHING AND DEBURRING

Applications: Brush deburring of serial parts

## Gerber Brushing Process

Highly efficient and reliable deburring of serial parts.

- ▶ Different workpieces
- ▶ Different materials
- ▶ Edge-Honing
- ▶ Deburring
- ▶ Polishing



Type: BS Power



Type: BS Eco





# THE APPLICATION

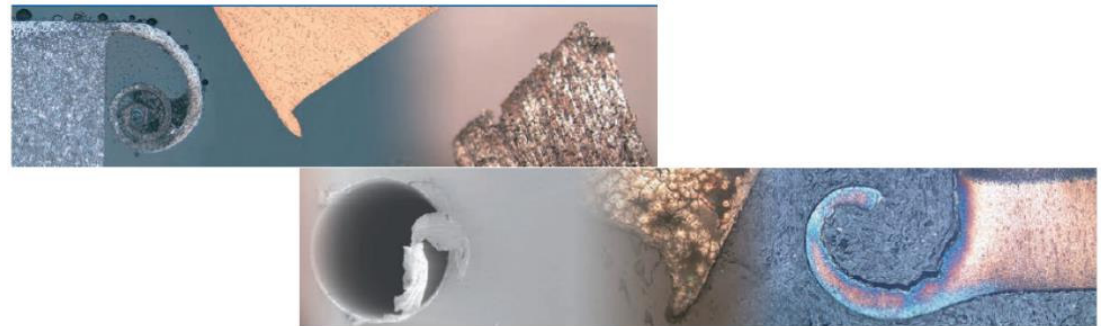
## Brushing and Deburring

### **The ridge, the annoying accessory during punching, fineblanking and machining**

There are in practice different methods for removing the burr in practice.

But which is the right for you?

- ▶ Brush deburring
- ▶ ECD (Electro chemical deburring)
- ▶ High pressure waterjet deburring
- ▶ Machine deburring (with deburring cutter etc.)
- ▶ Drag grinding
- ▶ TCM (Thermal deburring)
- ▶ Trowelling / sliding grinding

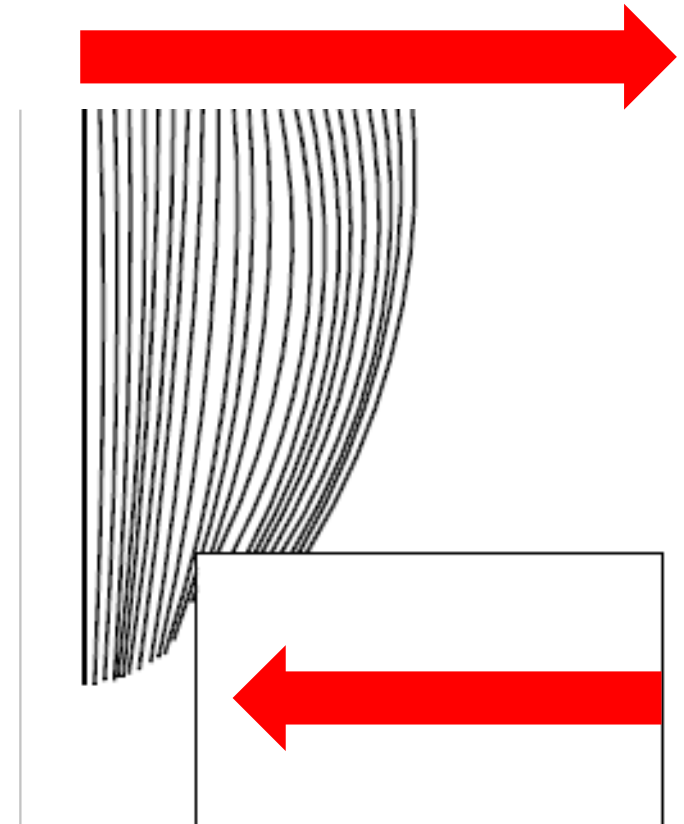


# BRUSHING AND DEBURRING

## The brush principle

The process allows a brush, which is coated with an abrasive or which consists of bristles with incorporated abrasive grains, to slide over a sharp-edged workpiece, an edge rounding results.

- ▶ No secondary burr is produced during rounding / deburring with brushes
- ▶ The rounding is absolutely reproducible due to the setting parameters

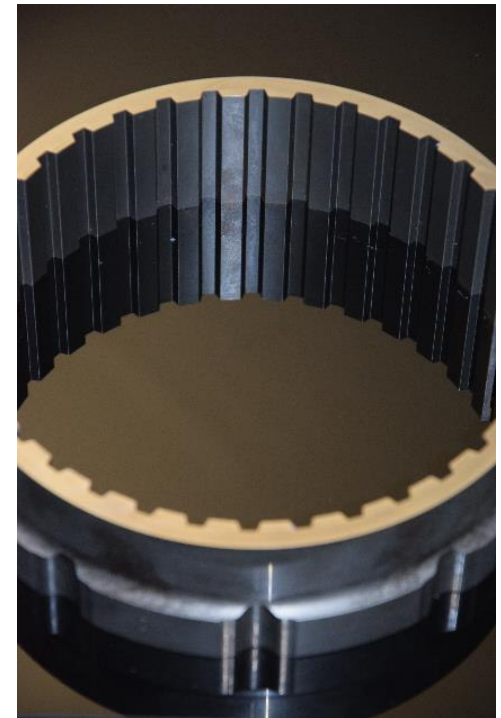


# BRUSHING AND DEBURRING

## Influence on the surface

When deburring, the tips are smoothed in the surface without affecting the workpiece thickness significantly. This means that the surface is polished during edge trimming.

- ▶ Reduction of roughness by polishing
- ▶ Optical surface improvement
- ▶ There is no influence on the dimension

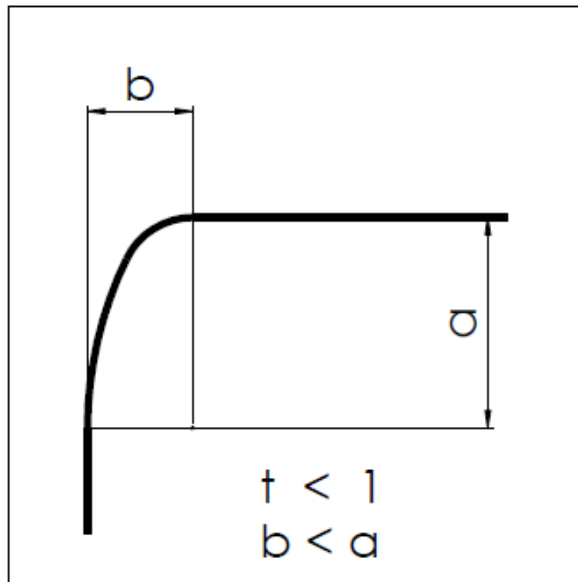


Quelle: Feintool AG; CH-Lyss

# BRUSHING AND DEBURRING

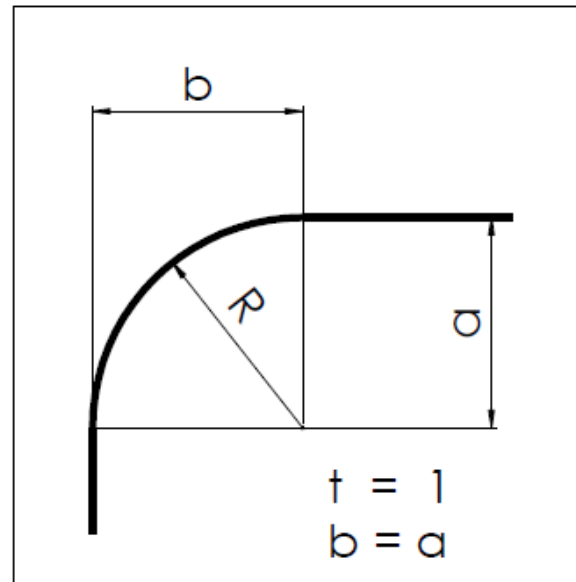
## Required results

Waterfall



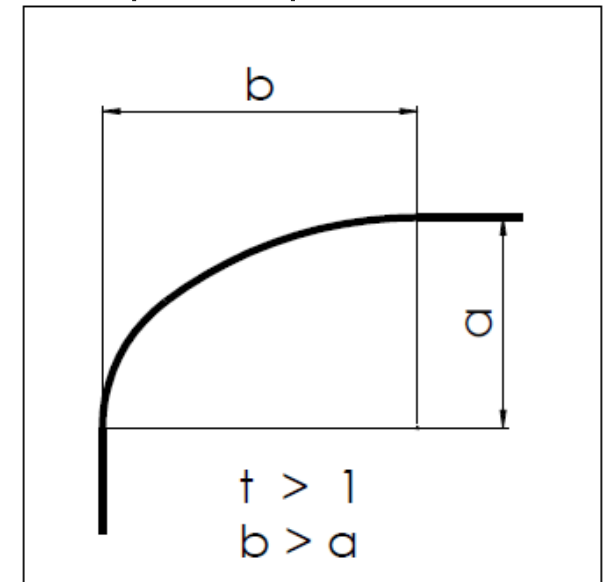
K-Factor  $< 1$

Exact Radius



K-Factor 1

Trumpet Shape



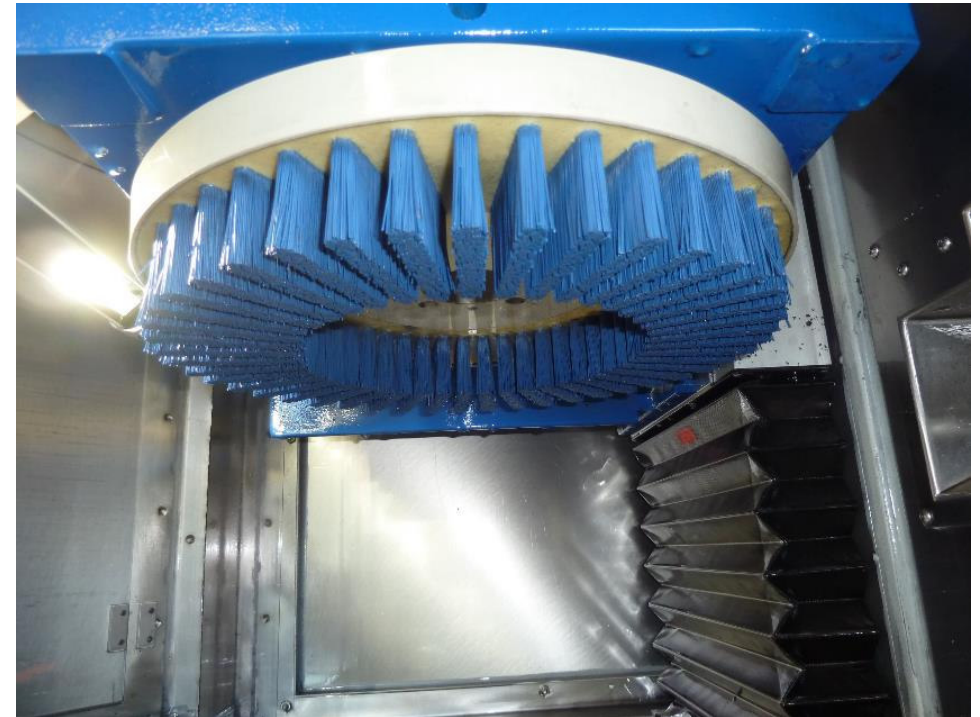
K-Factor  $> 1$

# BRUSHING AND DEBURRING

## Brushing process

The following parameters affect the shape of the edge-honing:

- ▶ Cutting depth
- ▶ Angle between brush direction and edge
- ▶ Brush speed
- ▶ Brushing time
- ▶ Bristle type
- ▶ Construction of the brush (stiffness)

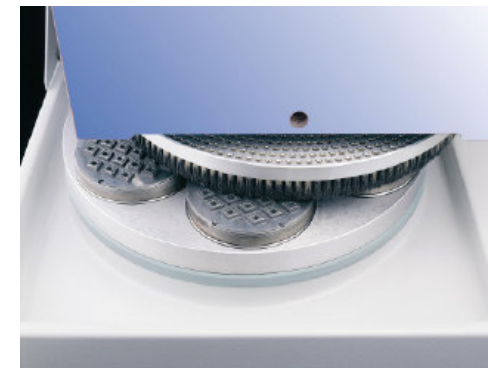
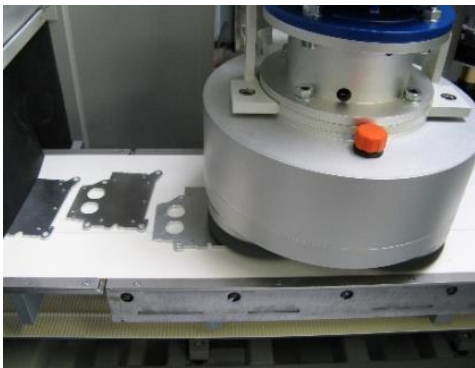




# GERBER BRUSHING PROCESS

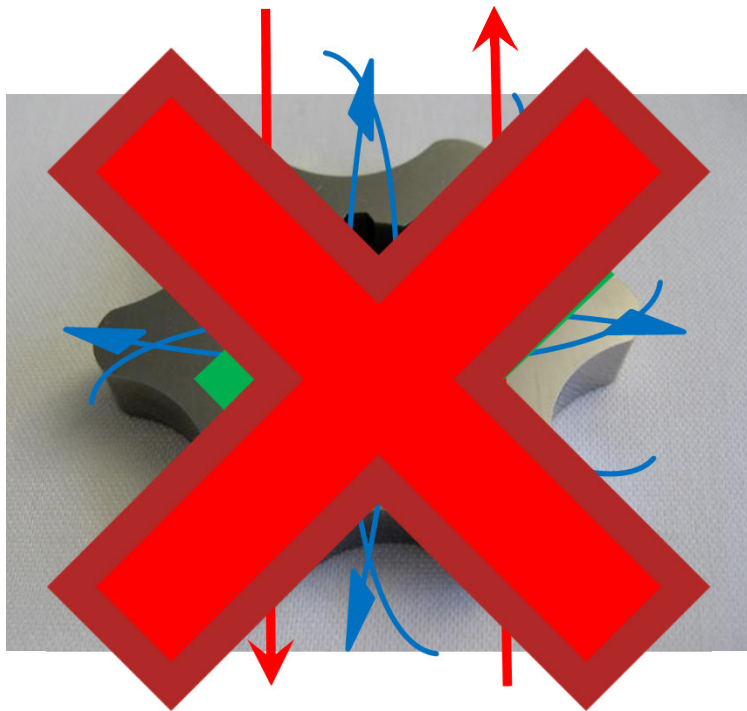
## Reproducible and process-safe rounding

Clearly defined techniques are needed to ensure that the **results are reproducible and reliable**. The company Gerber has developed solutions for the defined **deburring, rounding and polishing** of precision parts using **brush technology**.



# THE GERBER TECHNOLOGY OF THE BRUSHING PROCESS

Reproducible and process-reliable rounding

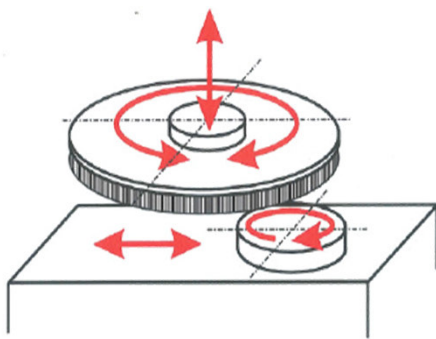


## Uniformly processed

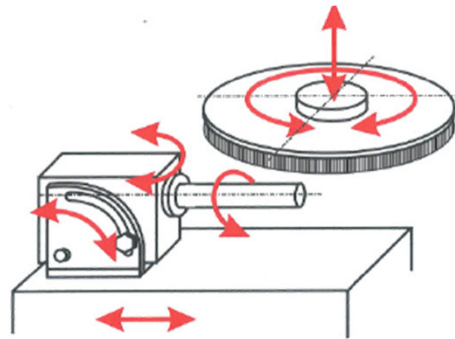
- ▶ Aligned 360° brushing
- ▶ Evenly rounded contour
- ▶ Uniform polish
- ▶ Process-safe; reproducible

# GERBER BRUSHING PROCESS

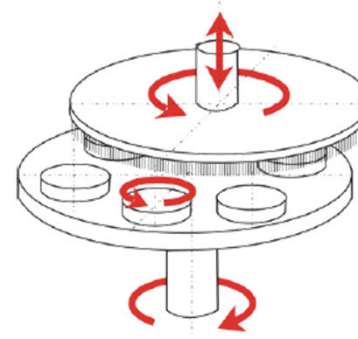
## Reproducible and process-safe rounding



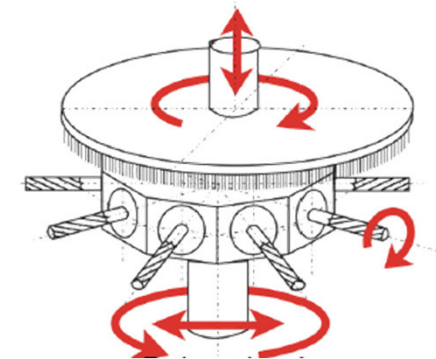
1. Oscillation table



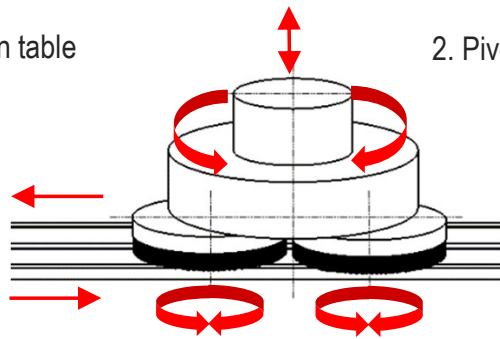
2. Pivoting spindle



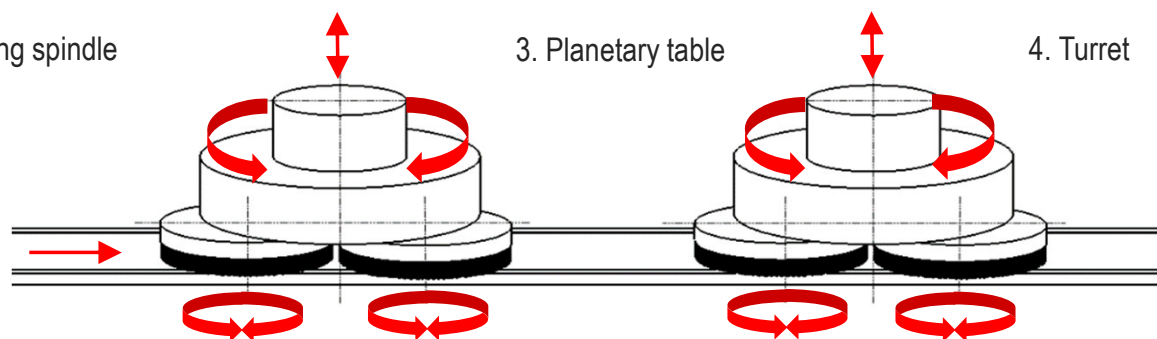
3. Planetary table



4. Turret



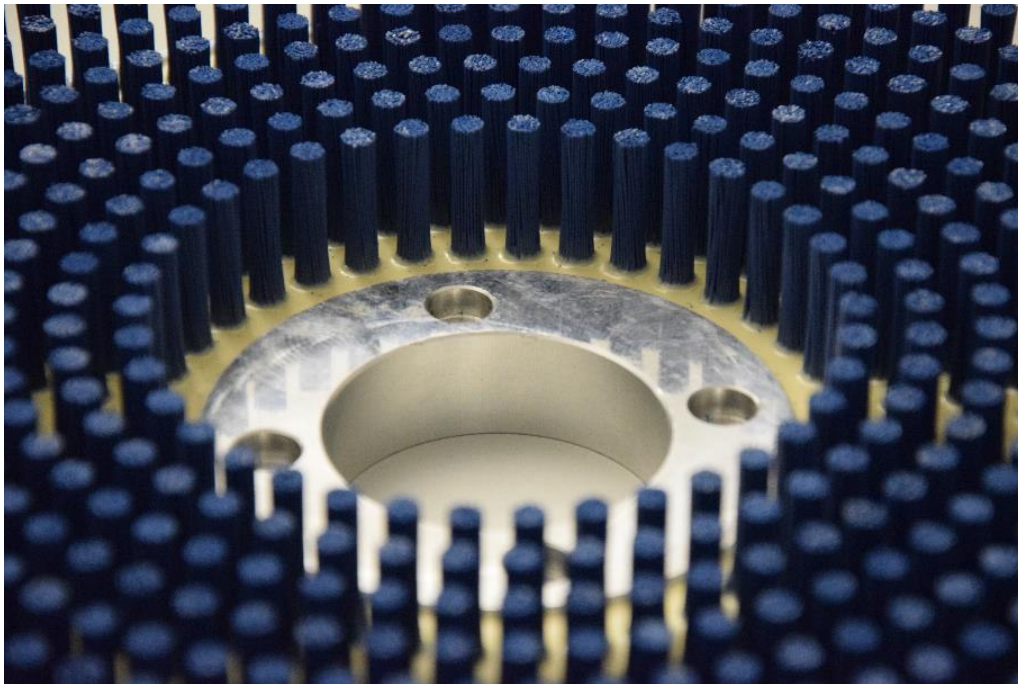
5. Planetary brush head with/without turning station



6. Several planetary heads in series

# GERBER BRUSHING PROCESS

## Brushing Tool

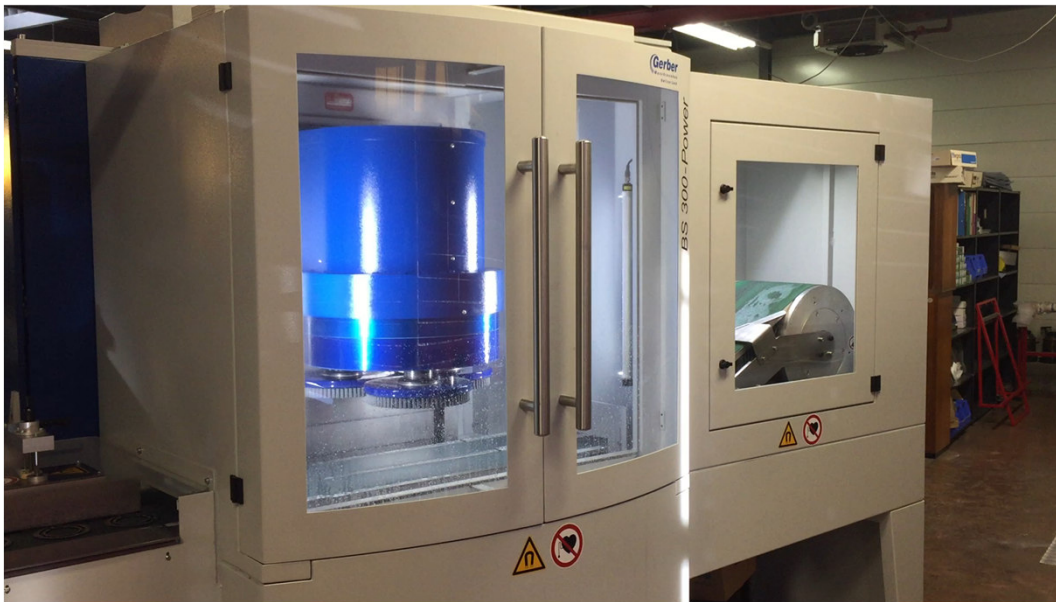


## Brush properties

- ▶ Different bristle types
- ▶ Embedded abrasive grains
- ▶ Natural bristles in combination with diamond paste for hard materials (hard metal, ceramic)

## GERBER BRUSHING PROCESS

Deburring of serial parts in continuous process

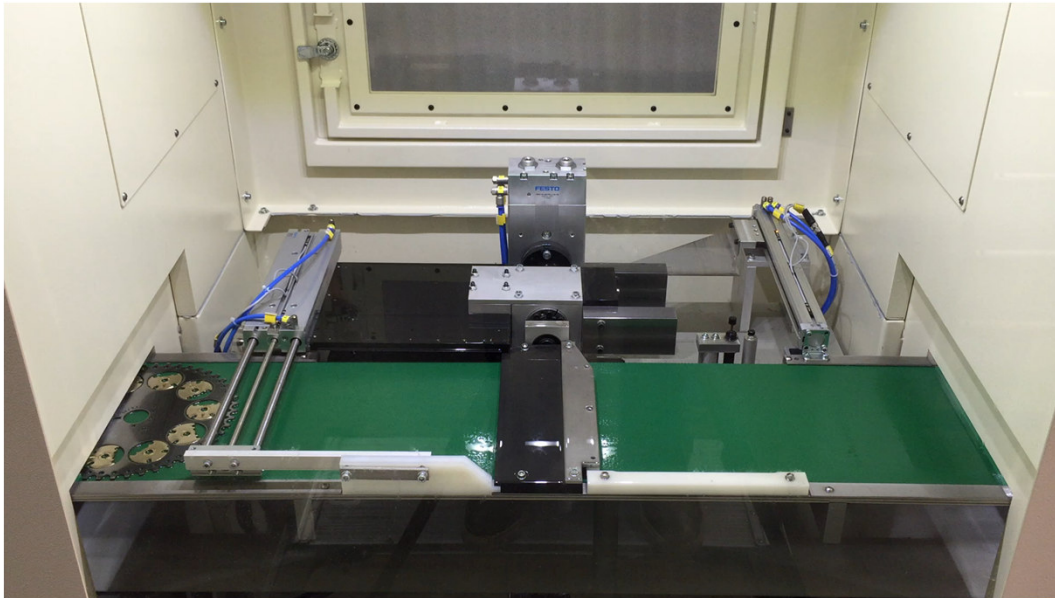


- ▶ **Deburring machine BS Power** > Conveyor belt max. 350mm or 2 x 175mm
- ▶ With reversing station (magnetic watering wheel)



## GERBER BRUSHING PROCESS

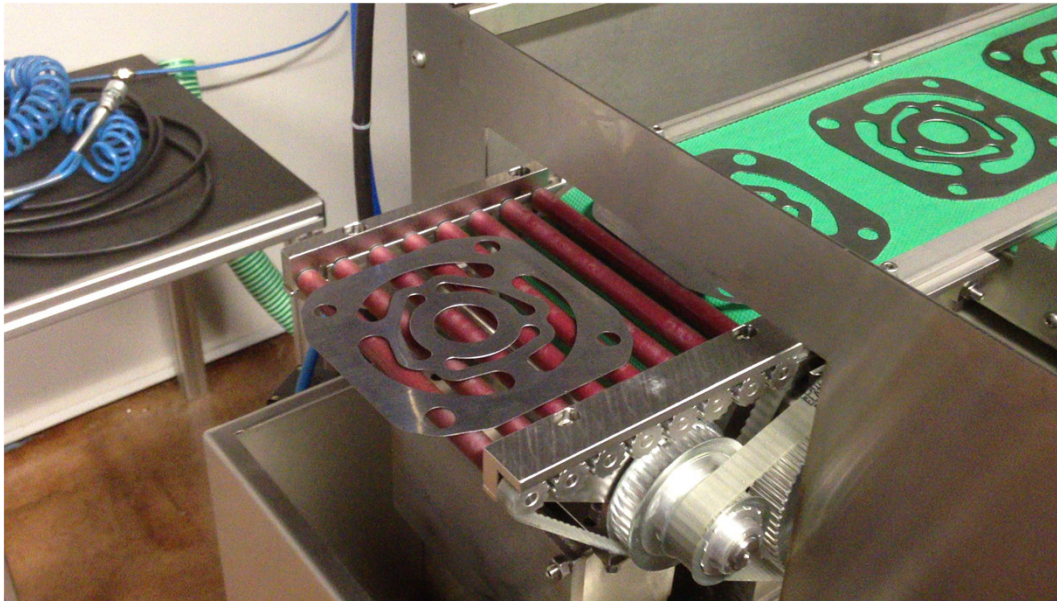
Deburring of serial parts in continuous process



- ▶ **Deburring machine BS Double Power** > Conveyor belt 300mm
- ▶ For non magnetic parts with reversing station

## GERBER BRUSHING PROCESS

Deburring of serial parts in continuous process



► **Deburring machine BS 250** > INOX > Conveyour 2 x 120mm

# CUTTING EDGE PREPARATION BY TARGETED ROUNDING OF EDGES

## Edge preparation



Type: BP Mx



Type: BP Smart

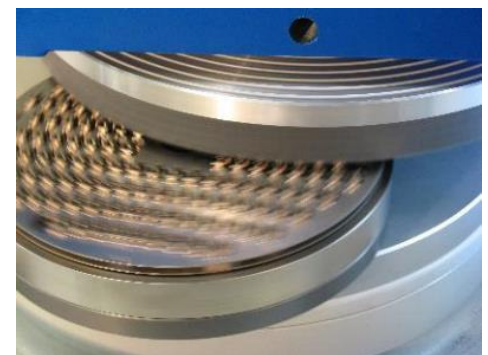
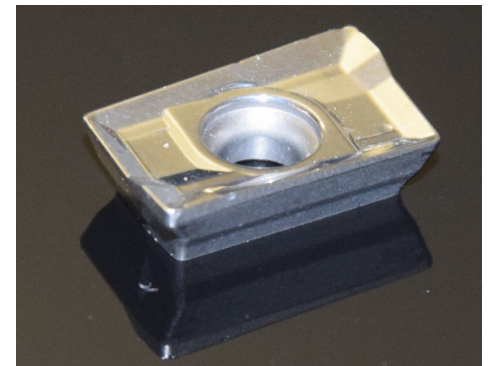


## CUTTING EDGE PREPARATION BY BRUSHING

Increased tool life during milling, turning and drilling

Brush polishing not only prepares the edges of the cutting edge, but also smooths the surface. This means that the surface is simultaneously polished during edge rounding.

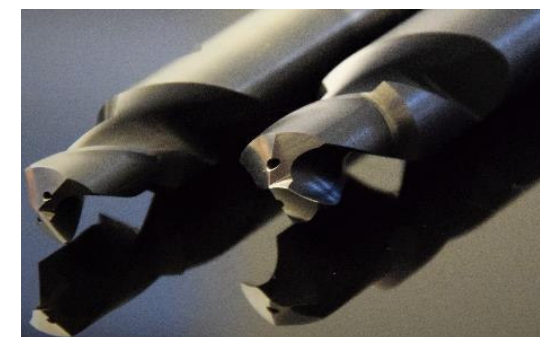
- ▶ Optimal preparation of cutting edges
- ▶ Polished surface for chip removal
- ▶ Short machining time and absolutely reproducible



# CUTTING EDGE PREPARATION BY BRUSHING

Increased tool life during milling, turning and drilling

<b>Part description</b>	Drills
<b>Material</b>	Carbide
<b>Industry</b>	Automotive Industry
<b>Required operations</b>	Edge preparation on drill bits
<b>Machine</b>	Gerber BP-Smart with drill fixing
<b>Brush</b>	Diaflex, a diamond impregnated brush
<b>Workpiece mounting</b>	10 pieces drill fixation
<b>Production</b>	10 pieces in 20 second (2 sec. per piece)
<b>Notice</b>	Cycle time 20 sec. to achieve a 0.0008 "(0.02mm) uniform edge hone. Repeat accuracy of 0.0001 "(0.0025mm). Application for new and reground drill bits.





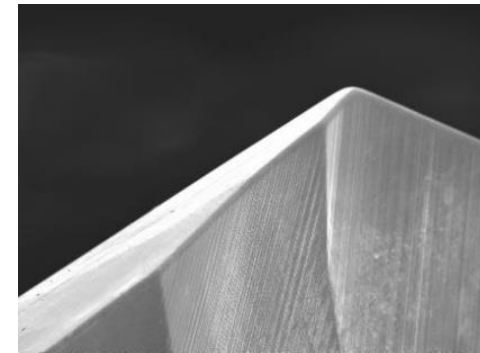
## CUTTING EDGE PREPARATION ON CARBIDE DRILLS

Increased tool life during milling, turning and drilling

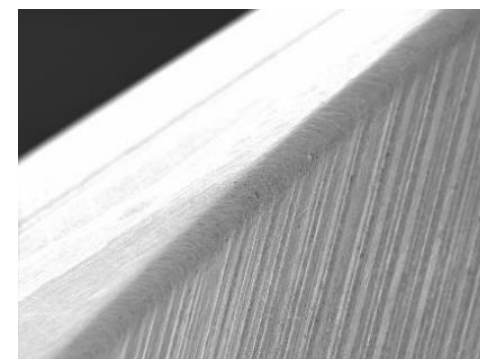
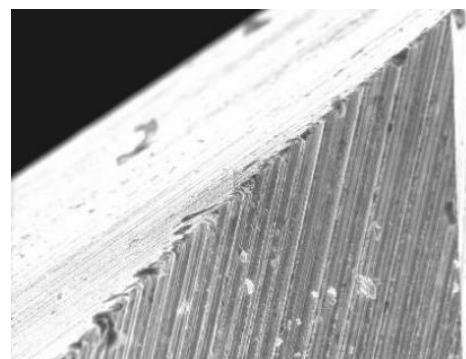
**With the prepared drill tip for optimum tool life and clean holes.**



Unprocessed cutting edge.....



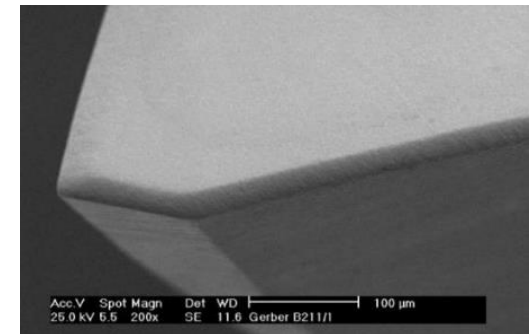
Cutting edge preparation, brushed



## CUTTING EDGE PREPARATION BY BRUSHING

Increased tool life during milling, turning and drilling

- ▶ Maximum service life thanks to defined cutting edge
- ▶ K-factor clearly  $>1$
- ▶ Optimal preparation for the coating gives maximum layer adhesion
- ▶ Reproducible, defined cutting edge thanks to Gerber brush process



Defines rounded cutting edge



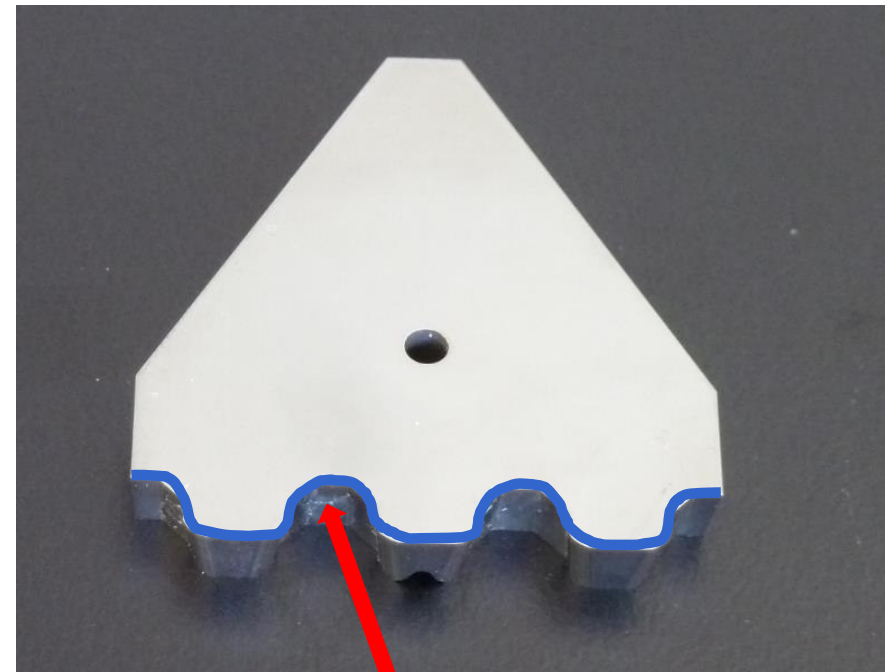
Indexable inserts

## EDGE HONING

### The application

1. To increase the service life of cutting elements the cutting contour is carefully prepared
2. This result in a 30-500% improvement in the lifetime / cutting performance

Not only defined radii are produced in the 0.01mm range, but also the cutting edge surface is reduced by a factor of 3 and cutting faces / grooves are polished.



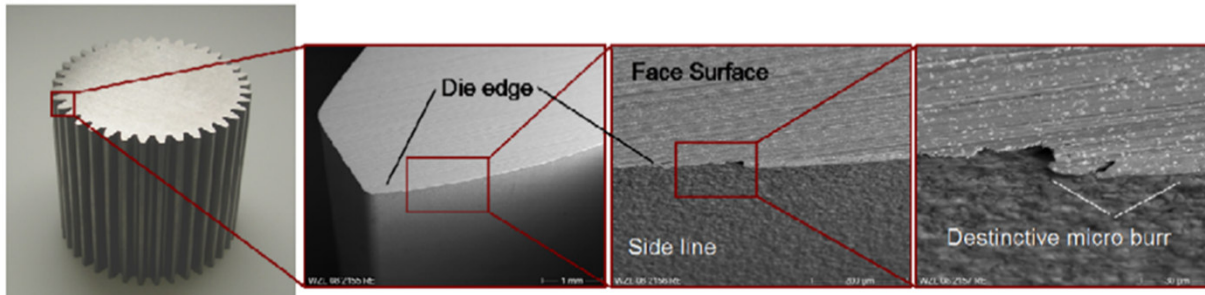
Edge to be rounded

# CUTTING EDGE-HONING FOR TOOLS

Initial situation for stamping – and fine blanking punches

**Increase of the life time as a driver of economy –**

**Reproducible cutting edge-honing by selective brushing**



Cutting edges on tooth punch before cutting edge brushing

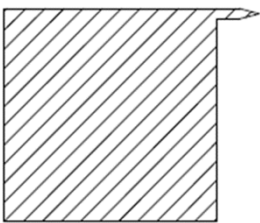
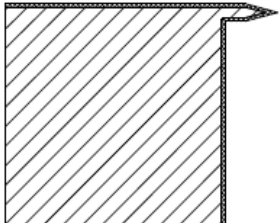
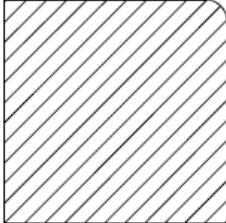
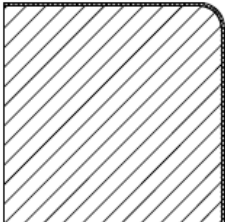
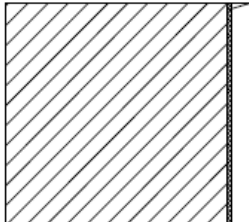
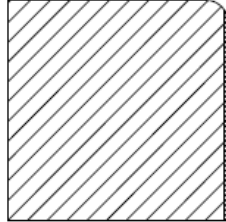


Source: Feintool AG; CH-Lyss

**30% - 200% longer tool life thanks to an optimal cutting edge-honing**

# CUTTING EDGE-HONING FOR TOOLS

Increased tool life during punching / fine blanking

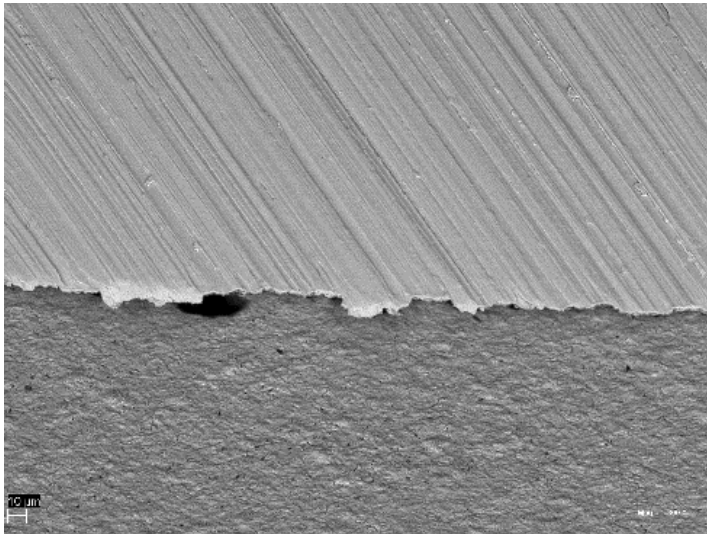
Uncoated with grinding burr	Coated with grinding burr	Brushed, uncoated
		
Brushed, coated	Coated, end face re-ground with burr	Coated, end face re-ground, brushed
 <p><b>By far best service life</b></p>		 <p><b>Second best service life</b></p>



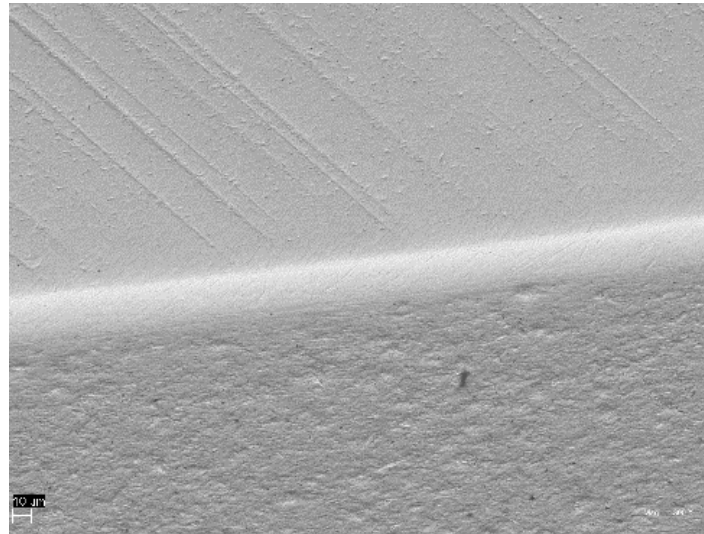
# CUTTING EDGE PREPARATION BY BRUSHING

Increased tool life during punching / fine blanking

Source: Feintool AG; CH-Lyss



Unbrushed cutting edge

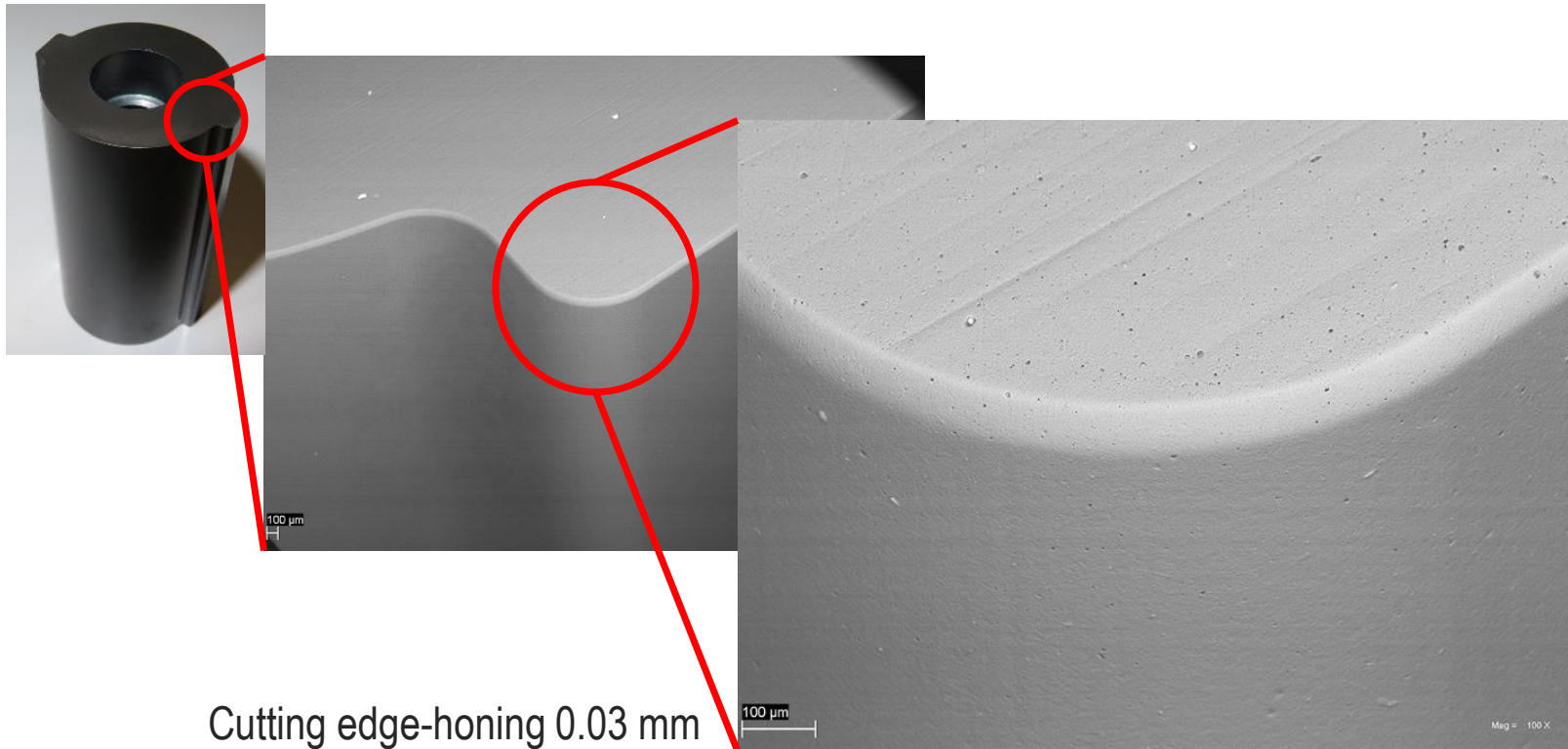


Defined rounded cutting edge

- ▶ Maximum service life in case of defined cutting edge
- ▶ Optimized preparation for coating > maximum film adhesion
- ▶ Reproducible, defined cutting edge in case to the Gerber Brushing-process

## CUTTING EDGE PREPARATION BY BRUSHING

Coated punch / cutting edge brushed



Source:  
Feintool AG; CH-Lyss

## PRODUCTS AND SERVICES OF «RENE GERBER AG»

### Brushing, honing, deburring

- ▶ Brushing process development
- ▶ Brushing tests
- ▶ Brushing systems for cutting element preparation
- ▶ Brushing systems for efficient deburring of parts
- ▶ Brushing tools
- ▶ Service and spare parts
- ▶ New and demonstration brushing machines

### For brushing systems to «René Gerber AG»

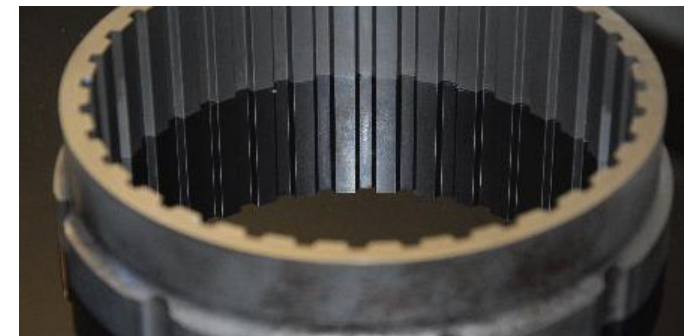


Source: Feintool AG; CH-Lyss

## OUR SPECIALITIES

### Our success factors

- ▶ Polishing machines for super-hard materials such as sapphire, ruby, tungsten carbide, CBN, PCD or industrial ceramic(s) using a brush composed of various materials depending on material
- ▶ Brushing-deburring machines for precision parts from steel for maximum tool lifetime in case of cutting edge-honing
- ▶ Precision devices for work holding (clamping mandrels)
- ▶ Thickness grading machines for sorting out various sizes of parts for the watch making industry
- ▶ Deburring, honing and polishing in the subcontracting sectors. For contract processing in the Gerber «Surface Expert Centre»

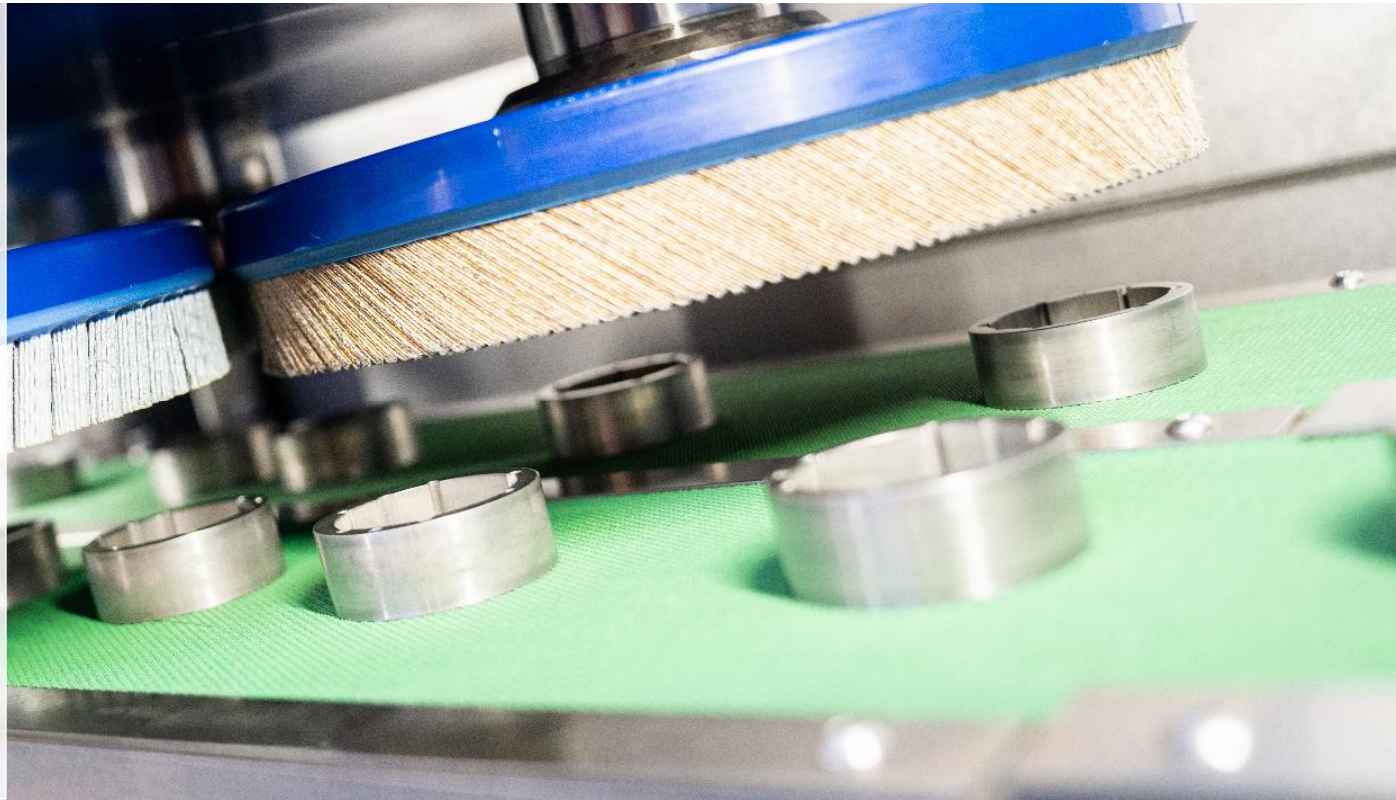






# DEBURRING HONING

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René Gerber AG

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