



## DIAMOND BURNISHING TOOL SQUARE SHANK, VARIABLE

For external machining of  
shafts and contours

# DIAMANT-GLÄTTWERKZEUGE: FÜR HÖCHSTE PRÄZISION

## DIAMOND-BURNISHING TOOLS: FOR HIGHEST PRECISION



Diamant-Glättwerkzeuge erweitern das Einsatzspektrum zum Glätten und Verfestigen von Oberflächen gehärteter Werkstoffe bis über 60 HRC. Dabei gleitet ein Diamant über die zu glättende Fläche. Sobald die Fließgrenze des Werkstoffes überschritten wird, fließen die Profilspitzen an der

Diamond-burnishing tools expand the range of applications of roller burnishing technology, as even hardened materials up to approximately 60 HRC can be roller burnished.

In the process, a high-precision, micro-polished diamond glides over the surface. As soon as the yield point of the material is exceeded, the profile peaks

Werkstückoberfläche im  $\mu\text{m}$ -Bereich in die angrenzenden Vertiefungen. Da die Kontaktfläche zwischen Werkstück und Diamant geringer ist als bei der Bearbeitung mittels Rollen, kann die plastische Kaltverformung bei geringerer Krafteinwirkung erfolgen. Diamant-Glättwerkzeuge kommen in

of the workpiece surface flow into the adjacent recesses in the  $\mu\text{m}$  range. Compared to the machining by means of rollers, the contact area between the workpiece and the diamond is much smaller. Therefore, plastic cold working with a reduced influence of force can take place. Baublies diamond roller burnishing tools advance into hardness

Bereichen zum Einsatz, in denen Ein- und Mehrrollenwerkzeuge aufgrund von Werkstoffeigenschaften oder der Geometrie des Werkstücks an ihre Grenzen stoßen. Diamant-Glättwerkzeuge sind sowohl für die Innen- als auch für die Außenbearbeitung verfügbar.

and diameter areas in which conventional roller burnishing tools cannot be used due to the workpiece characteristics or geometry. With diamond-burnishing tools, all contours – internally and externally – can be roller-burnished and deep-rolled.

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## DIAMOND-BURNISHING TOOLS: FOR HIGHEST PRECISION

### VORTEILE

- Maximale Prozesssicherheit
- Höchste Oberflächengüten
- Härtere Randschichten
- Glätten von gehärteten Bauteilen
- Kein zusätzliches Equipment wie etwa Hydraulikaggregate und Leitungen erforderlich
- Zunahme der Dauerschwingfestigkeit
- Größere Traganteile durch Plateaubildung
- Höherer Widerstand der Oberflächen gegen Verschleiß und Korrosion
- Verschieben der Werkstoffermüdungsgrenzen
- Reduzierte Gleitreibungszahlen

### ADVANTAGES

- Maximum process reliability
- Top surface qualities
- Harder outer layers
- Smoothing of hardened components
- No need for additional equipment such as hydraulic units
- Increase in fatigue strength
- Larger contact area ratios due to plateau formation
- Higher surface resistance to wear and corrosion
- Expanding of material fatigue limits
- Reduced sliding friction coefficients

### DRÜCK- UND GLÄTTDIAMANTEN

- Verschiedene Diamanteinsätze für Glättwerkzeuge möglich
- Werkstoffe über 60 HRC können geglättet werden
- Rautiefen unter  $R_z$  1,0  $\mu\text{m}$  möglich
- Diamantausführung mit den Radien 0,4–5,0 mm; weitere auf Anfrage

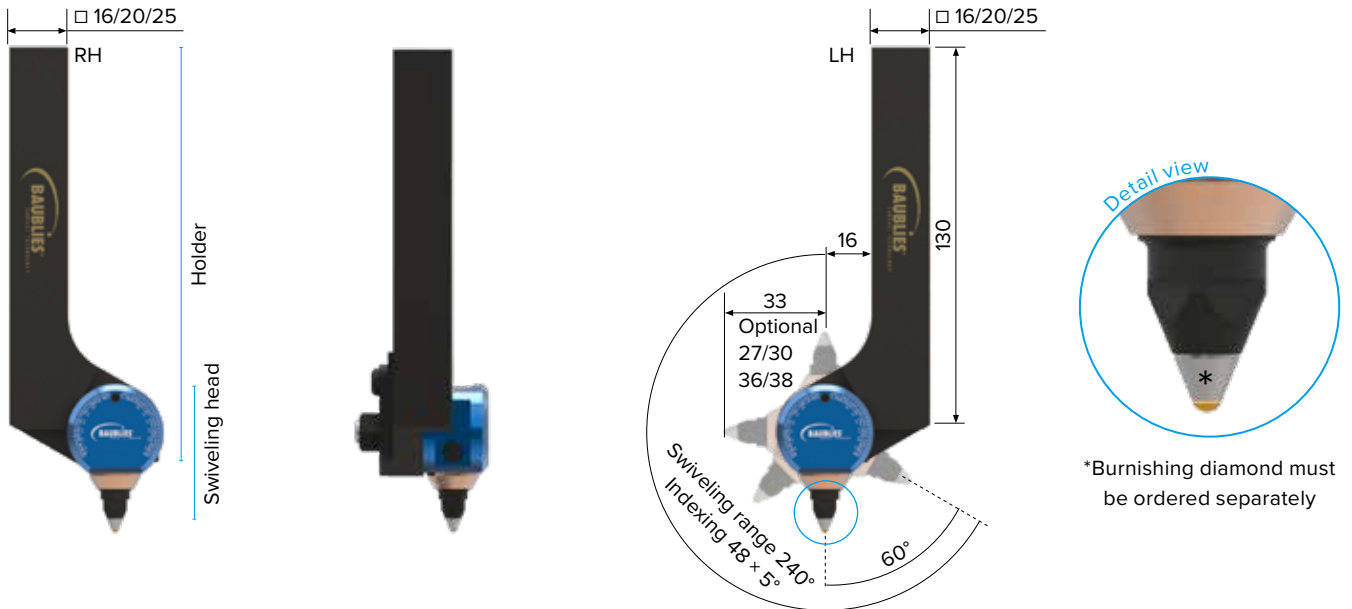
### PRESSING- AND BURNISHING DIAMONDS

- Various diamond inserts for burnishing tools possible
- Materials above 60 HRC can be burnished
- Roughness below  $R_z$  1.0  $\mu\text{m}$  possible
- Diamond version with the radii 0.4–5.0 mm, others available on request

Radien: 0,4–5,0 mm  
Radii: 0.4–5.0 mm



## Diamond burnishing tool square shank, variable



### Technical details

Application	external shafts and contours
Standard fixture	square shank 16/20/25 mm left or right hand
Swiveling range	240°
Indexing	48 × 5°

### Options

- Tailor made fixtures VDI, HSK, etc.
- Tailor made diamond shape
- Assembly device

### Application parameters

**Please note that this information represents standard values which must be adapted to the individual cases.**

Speed	up to 150 m/min
Feed rate	0.05–0.2 mm/rev
Workpiece allowance	up to 0.02 mm
Tool preload	up to 1 mm
Lubrication	emulsion or oil; filtration of the lubricant (< 40 µm) can improve the surface quality and the tool life
Pre-machining of workpiece	surface roughness (R <sub>a</sub> ) up to 15 µm
Suitable for hard machining	

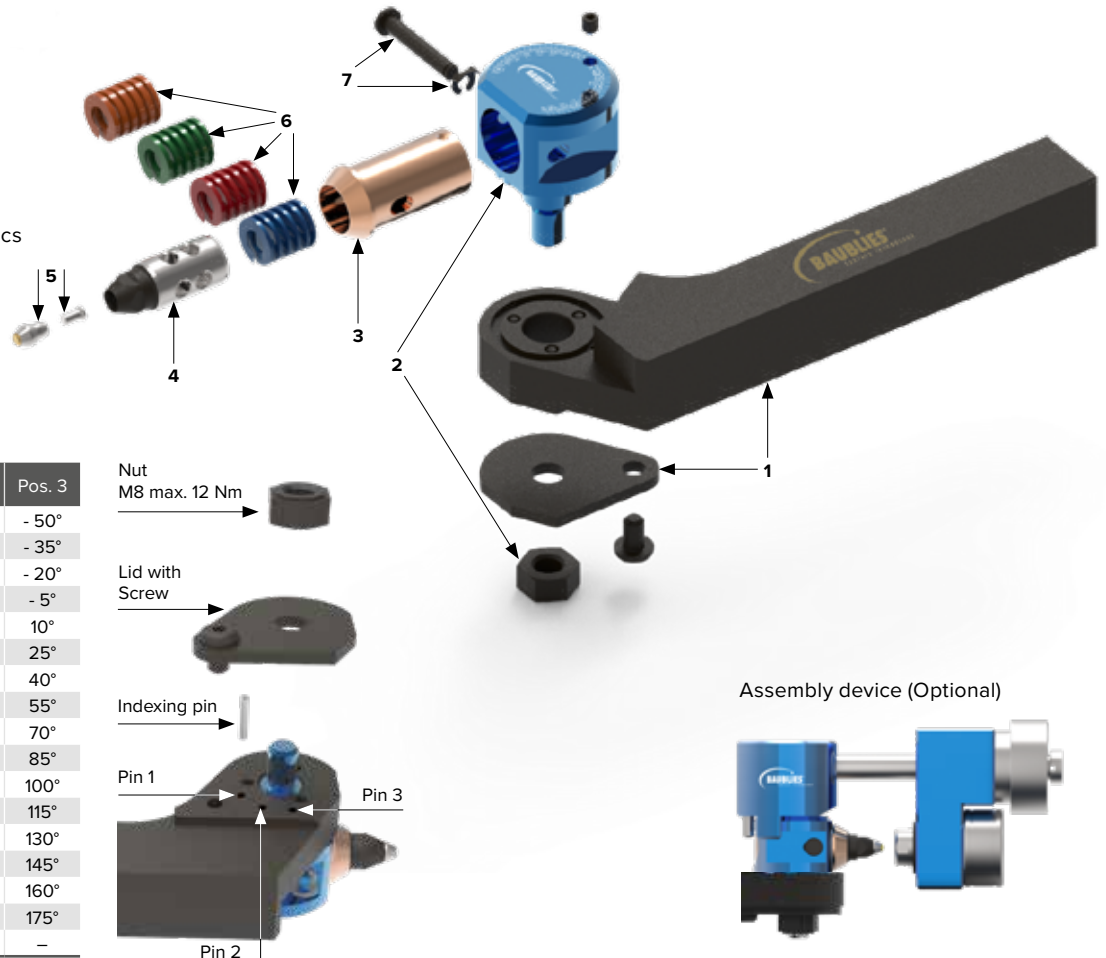
Variable diamond burnishing tools for external use are non-intrinsic tools for smoothing and work hardening of shafts and contours. Due to the swiveling diamond these tools are very versatile.

### ADVANTAGES

- Simple to use
- Compact design available for machines with limited tool space
- Can be adapted to all materials by means of four spring elements (included in delivery)
- Diamond radii from 0.4–5 mm available
- Diamond indexed for multiple machining
- Highest surface quality and hardening
- Universally applicable
- Ideal for contour machining
- For hard machining and thin-walled workpieces
- Tolerance compensation through spring-loaded design
- Changeable diamond insert
- Re-grinding of the diamond is possible
- Cost-effective/low investment

## Tool assembly/handling and replacing components

- 1 Fixture
- 2 Swiveling head
- 3 Slide bushing
- 4 Diamond holder
- 5 Burnishing diamond insert with screw
- 6 Springs with different compression characteristics
- 7 Pin with locking ring



### ADJUSTING THE ANGLE

Disassemble nut (2). Lift swiveling head (2). Place indexing pin into position 1/2/3 according to table. Set required position of swiveling head (2). Assemble nut (2) (max. torque 12 Nm).

### REPLACING BURNISHING DIAMOND

Slightly preload burnishing diamond (5) (with assembly device). Remove pin with locking ring (7). Declamp burnishing diamond. Remove or rotate burnishing diamond into the next position. During assembly pay attention to the position of the pin hole in the diamond holder (4). Slightly preload burnishing diamond (with assembly device). Insert pin with locking ring (7). Declamp burnishing diamond (5).

### EXCHANGE OF SPRINGS

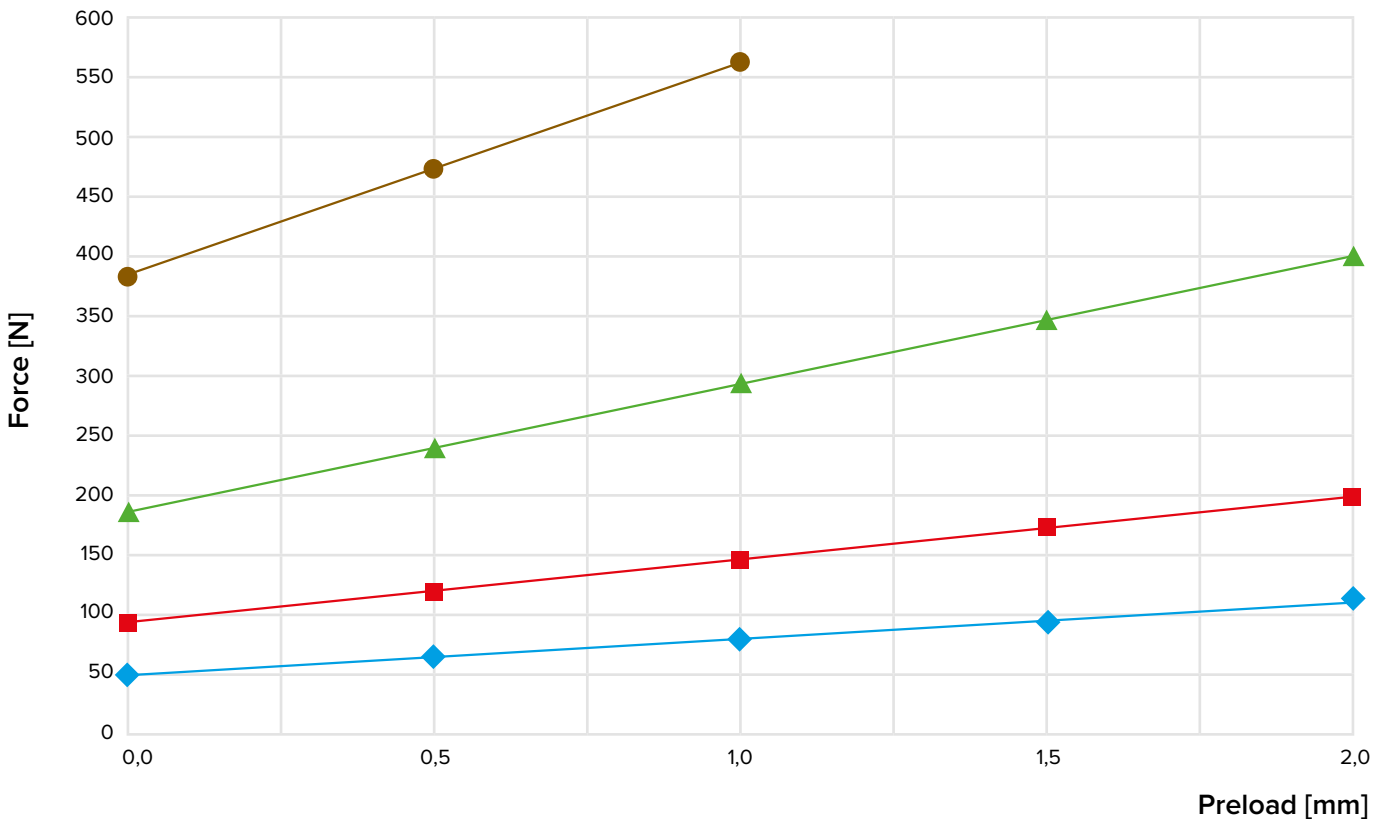
Slightly preload burnishing diamond (5) (with assembly device). Remove pin with locking ring (7). Disassemble the diamond holder (4) and change the desired spring (6). Look at page 5 for spring selection.

### TIP





- The preload of the tool during burnishing should be in a range between 0.1 and 0.5 mm.
- If the position is not vertical to the work-piece surface the wearpoint of the burnishing diamond is excentric and then the burnishing diamond can be used 4 times by rotating it in steps of 90°.
- Coolant must be used at any time and avoid interrupted cuts.
- If the burnishing diamond is not badly damaged (cracks) regrinding is possible.

## Information Classification Force – Spring Deflection

### Force – Spring Deflection



#### Recommended Applications According to Material Properties

Spring colour	Force	Up to a tensile strength of
Blue 	50 – 120 N	400 MPa [N/mm <sup>2</sup> ]
Red 	90 – 200 N	1250 MPa [N/mm <sup>2</sup> ] or HRC 40
Green 	180 – 400 N	HRC 64
Brown 	380 – 570 N	Use only in special applications

#### EXAMPLE:

If the red spring is installed, an preload at the workpiece of 0.25 mm corresponds to a force of approximately 100 N.

Depending on the material properties the use of an according spring is recommended. The table should serve as a guideline. Usually an preload of up to 0,5 mm is used. If a higher force is required a stronger spring should be used.