



DIAMOND BURNISHING TOOL SQUARE SHANK, VARIABLE

For external machining of
shafts and contours

DIAMOND-BURNISHING TOOLS: FOR HIGHEST PRECISION

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, micropolished diamond glides over the surface. As soon as the yield point of the material is exceeded, the profile peaks of the workpiece surface flow into the adjacent recesses in the μm range.

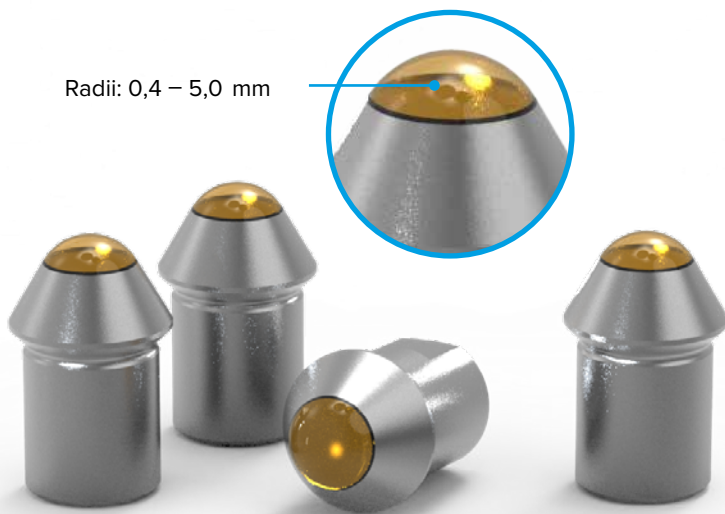
Compared to the machining by means of rollers, the contact area between the workpiece and the diamond is much smaller. Therefore, plastic cold working with a reduced influence of force can take place. Baublies diamond roller burnishing tools advance into hardness and diameter areas in which conventional 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.

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



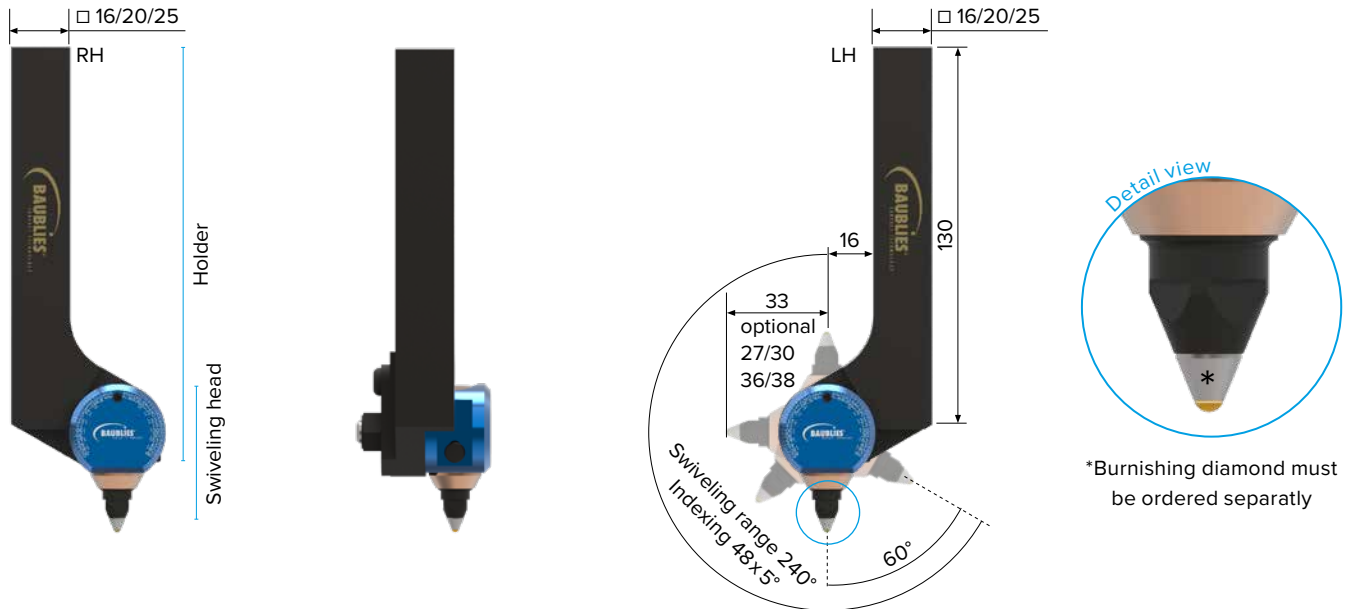
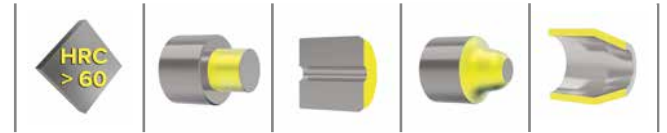
Radii: 0,4 – 5,0 mm



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

Variable 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 x 5°

Options

- 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 (Rz) up to 15 µm
Suitable for hard machining	

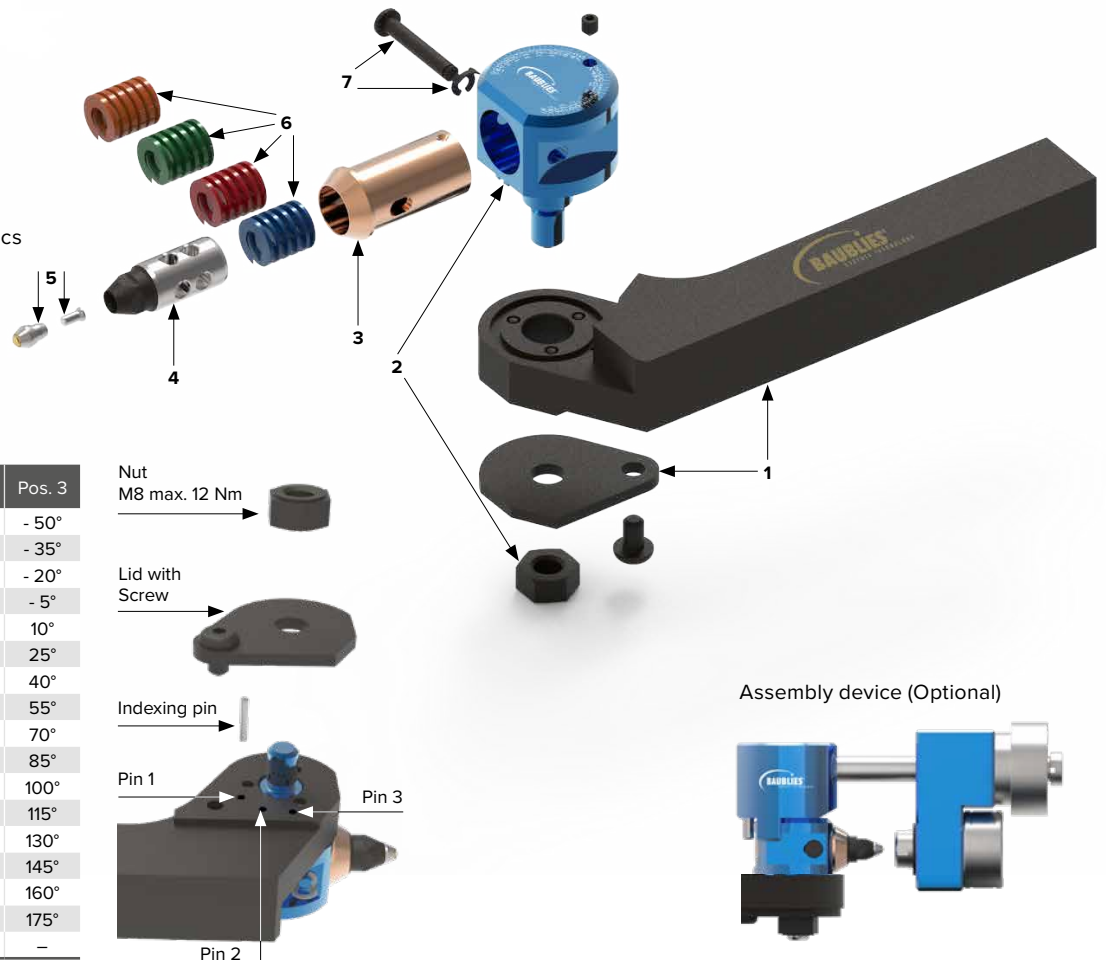
Variable diamond burnishing tools for external use are non-intrinsic tools for smoothing and work hardening of shafts and contours. Due to the swiveling diamond these tools are quite versatile.

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 pre-load 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 pre-load burnishing diamond (with assembly device). Insert pin with locking ring (7). Declamp burnishing diamond (5).

EXCHANGE OF SPRINGS

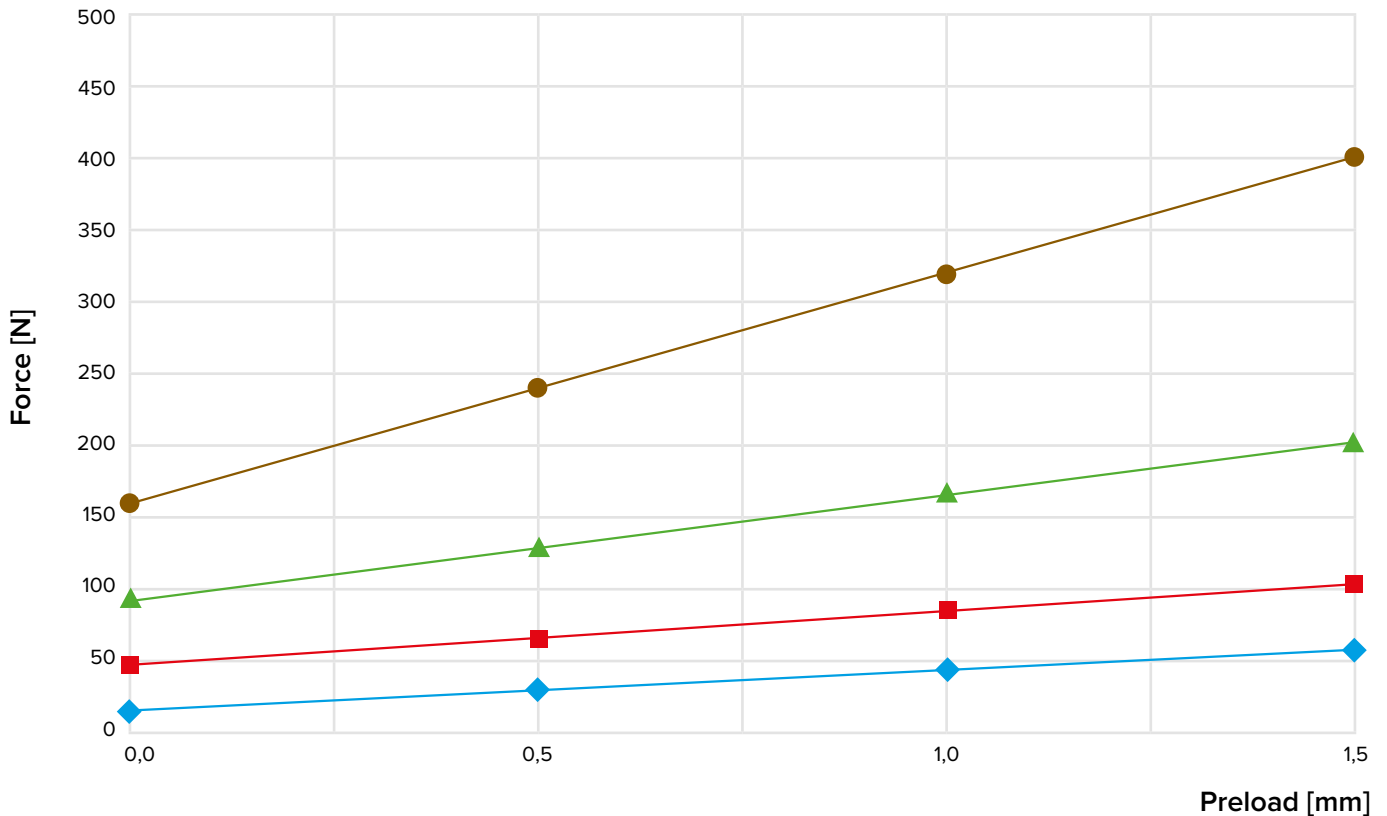
Slightly pre-load burnishing diamond (5) (with assembly device). Remove pin with locking ring (7). Disassemble the diamond holder (4) and change the desired spring (6). Look at page 4 for spring selection.

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 	25 – 60 N	400 MPa [N/mm ²]
Red 	40 – 100 N	1250 MPa [N/mm ²] or HRC 40
Green 	85 – 210 N	HRC 64
Brown 	160 – 400 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 60 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.