microcut
swiss honing systems

UniBore 831-M

Precision honing machine with highest flexibility in terms of parts variety

Machine with one machining station for bores from Ø **0.25 – 8 mm**

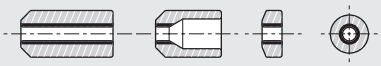
UniBore 831-M

Typical field of application

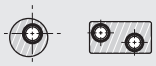
Mould making, hot runner nozzle production, needle guides and ejector pin bores in injection mould making, setting rings

Typical workpieces, diameter range and material of the workpieces

Rotationally symmetrical
Workpiece



Non-rotationally symmetrical workpiece
Workpiece with several bores



Bore diameter:	ø 0.25 – 8 mm (in planning up to 12 mm)
Material:	PCD, sapphire, ceramic, carbide, steel, etc.

Machine description

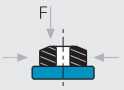
- 1 spindle machine
- Air bearing table for simple and optimal centring of the bore to the honing spindle axis
- Manual feeding and clamping of the workpieces
- Fully automatic honing process according to the innovative Microcut Honing System technology
- Quick changeover for a new workpiece

Typical batch sizes

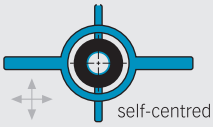
Smaller batch sizes such as 1- 200 pcs.

UniBore 831-M Workpiece clamping

Clamping of workpieces

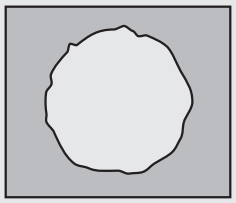


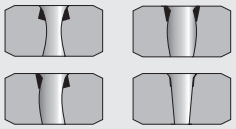
Universal: radial, axial, centering by bore hole

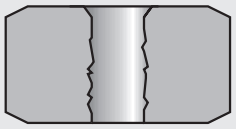


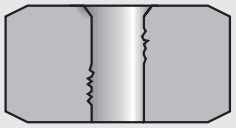
Bore quality before and after Microcut Honing System

Before

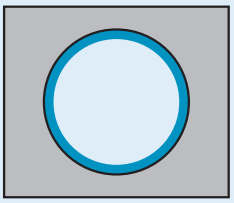


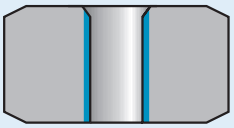


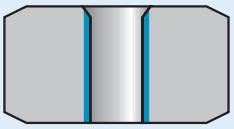


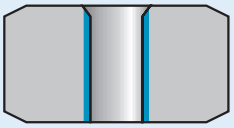


After









Roundness of the bore of < 0.1 µm can be achievable, as rotating full-surface coated tool is in contact with the entire bore. Also ideal for bores with clearance and cross holes

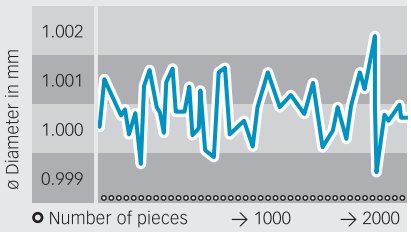
Parallelism, cylindricity < 0.5 µm are achievable. The process results in a cylindrical bore without constant adjustment of parameters.

Surface roughness values of Ra 0.01 µm (Rz 0.1 µm) are achieved depending on the material, as the honing process is carried out with very small grains. In addition, a lapping or polishing process can be applied on the same machine.

Bore areas that have been damaged in **the surface structure by heat** (eroding, sintering, laser, etc.) are removed by the cold, metal-cutting honing process. There even a densification of the surface takes place through the honing process.

Other technologies

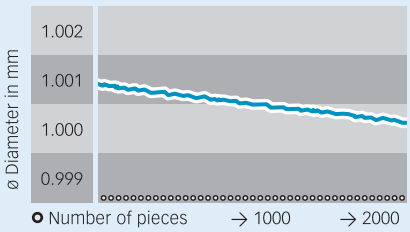
Conventional honing, internal grinding



- Measurement control required
- Corrections to machining parameters

Advantages of the Microcut Honing System

Microcut Honing System



- without measurement control

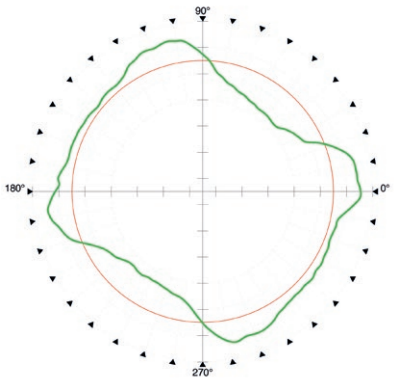
High reproducibility of dimension and bore quality

- Independent on machine, employee and temperature.
- The tool with many abrasive grains offers the best conditions for the longest possible tool life.

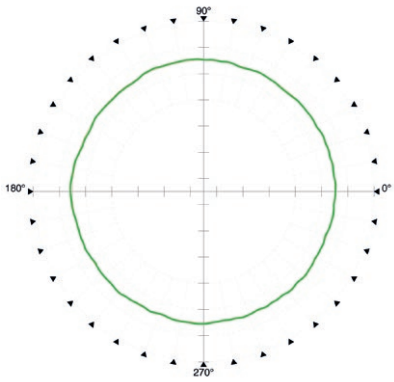
System advantages

- **Correction of the perpendicularity of the hole to the face:**
  - Possible with special machine design
- **No change in the borehole position, due to the following points:**
  - only minimum allowance necessary
  - Machining of very short and/or small bores in relation to the workpiece dimensions possible
  - Simple workpiece clamping possible
  - Quality control through process analysis
  - removal rates per honing step from 2 – 100 µm depending on bore diameter, bore length and material

Roundness

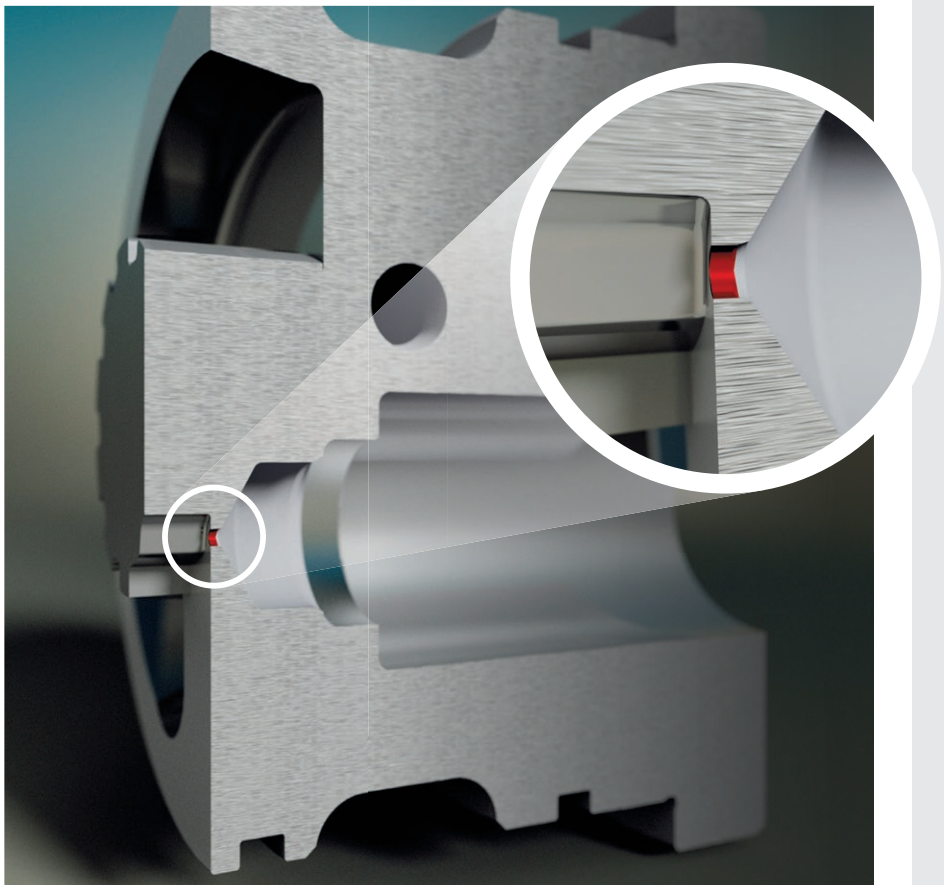


Jig grinder | Roundness = 2.31 µm



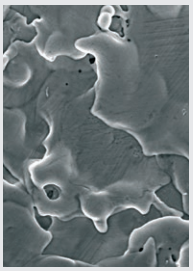
Microcut Honing System | Roundness = 0.12 µm

High precision gate bore



Sectional view of bores

Roughly eroded
Rz - 10 µm



Fine-eroded
Rz - 1.5 µm

Microcut Honing System
Rz - 0.12 µm

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Technical specifications of the machine

Interchangeable spindle

- Typ XS: Bore diameter 0.3 – 0.9 mm; spindle speed up to 10'000 min^{-1}
- Typ S: Bore diameter 0.6 – 2.5 mm; spindle speed up to 10'000 min^{-1}
- Typ L: Bore diameter 2.5 – 8 mm; spindle speed up to 3000 min^{-1}

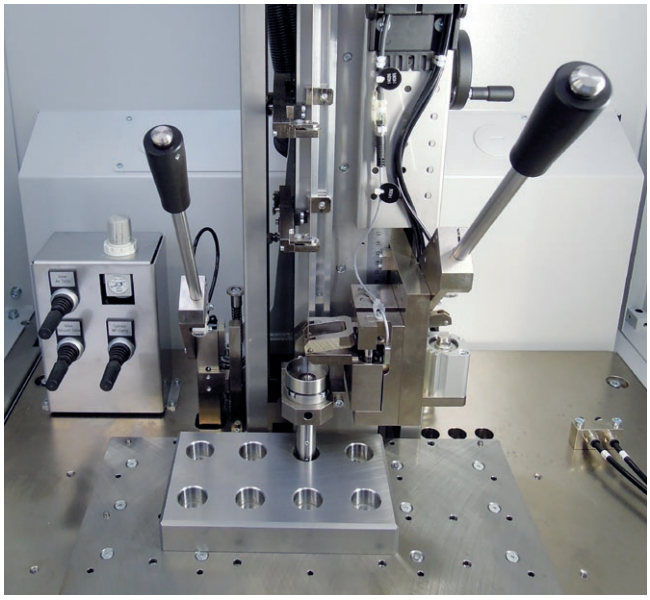
Control: Beckhoff

- Different access levels for operators, maintenance technicians, etc.
- All machining process parameters are software controlled
- Library for parameter profiles for different workpiece types
- Remote diagnostics via internet (optional)

Information

Electrical connection:	3 x 400 V+N+E, 50/60 Hz
Power consumption:	2.5 kVA
Air connection:	5.5 bar (filtered, dry)
Dimensions with lamp and shuttle L x W x H:	930 x 1100 x 2000
Weight:	max. 550 kg

Detailed views



Subject to modifications

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