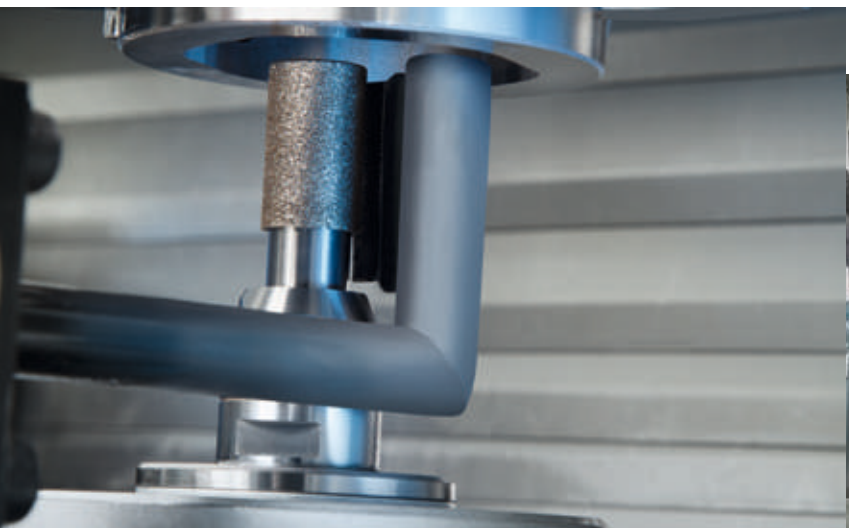


# VERTICAL GRINDING MACHINE VG 110

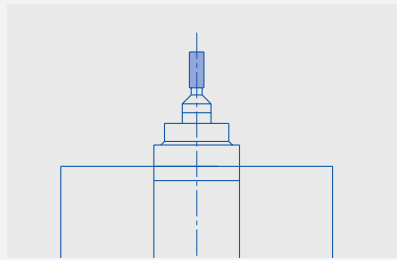


# CLASSIC OR COMBINED MACHINING

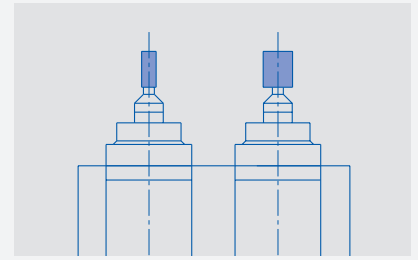
**The trend towards the miniaturization of components continues, while simultaneously, the requirements for precision are increasing.**

To meet these requirements, EMAG has developed the VG product family – designed for the vertical high-speed machining of small workpieces. Practical experience, particularly in the automotive and hydraulic industries, show that the quality of the finished products and success in the user's market place, increase through good machining quality.

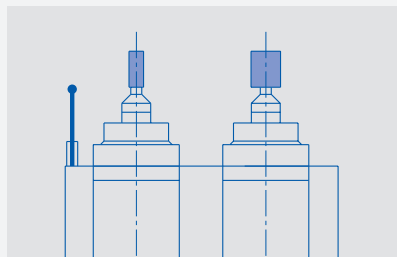
This vertical production grinding machine is a true complete solution when it comes to the precision machining of small chucked parts. Thanks to the modular VG 110 series, the user can select either a "traditional" grinding process, or can make full use of the multiple functions available on the machine, which allow for a combination of turning and grinding. The primary use for the VG 110 is the economical machining of small workpieces with a diameter of between 2 and 60 mm, in large batch sizes.



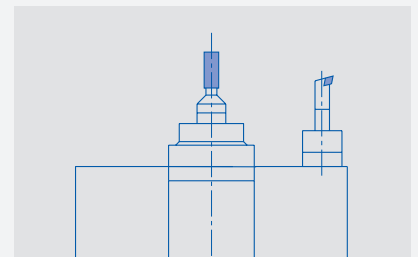
One or two grinding spindles can be mounted on the Z-axis.



The grinding spindles are configured depending on the workpiece range.



In addition to the grinding process, honing and measuring can also be completed.



The tool carrier can be fitted with a turning tool instead of a second internal grinding spindle. This ensures that the complete workpiece production process is extremely cost-efficient and quick.

The traditional internal and external circular grinding and non-circular grinding processes are used in addition to machining processes involving hard turning and grinding. This allows all sections of the workpiece that can be machined with turning processes to be hard or soft-finish turned, then finish-ground in the same clamping operation (mainly after the pre-turning operation), if this is necessary to meet the required quality level. This streamlined process guarantees higher workpiece quality, while simultaneously reducing cycle times. Additionally, this process decreases the wear on grinding tools requiring them to be dressed less often.



Non-circular grinding



Post-process measurement



Hard turning and finish-grinding

# TECHNICAL DATA AND BENEFITS AT A GLANCE

Due to the modular machine concept, the tool equipment can be customized to fit the required machining task. The following variations are available:

- + One or two internal grinding spindles for circular or non-circular grinding
- + One internal or external grinding spindle and one turning tool

## THE BENEFITS:

- + High precision
- + Optimum accessibility, quick machine set-up
- + Small footprint
- + Low chip-to-chip time
- + Chips fall downward
- + Complete machining in a single clamping operation
- + Optional: Turning tool
- + Ease of operation
- + Pre- and post-process measurement possible
- + Circular and non-circular grinding

## TECHNICAL DATA

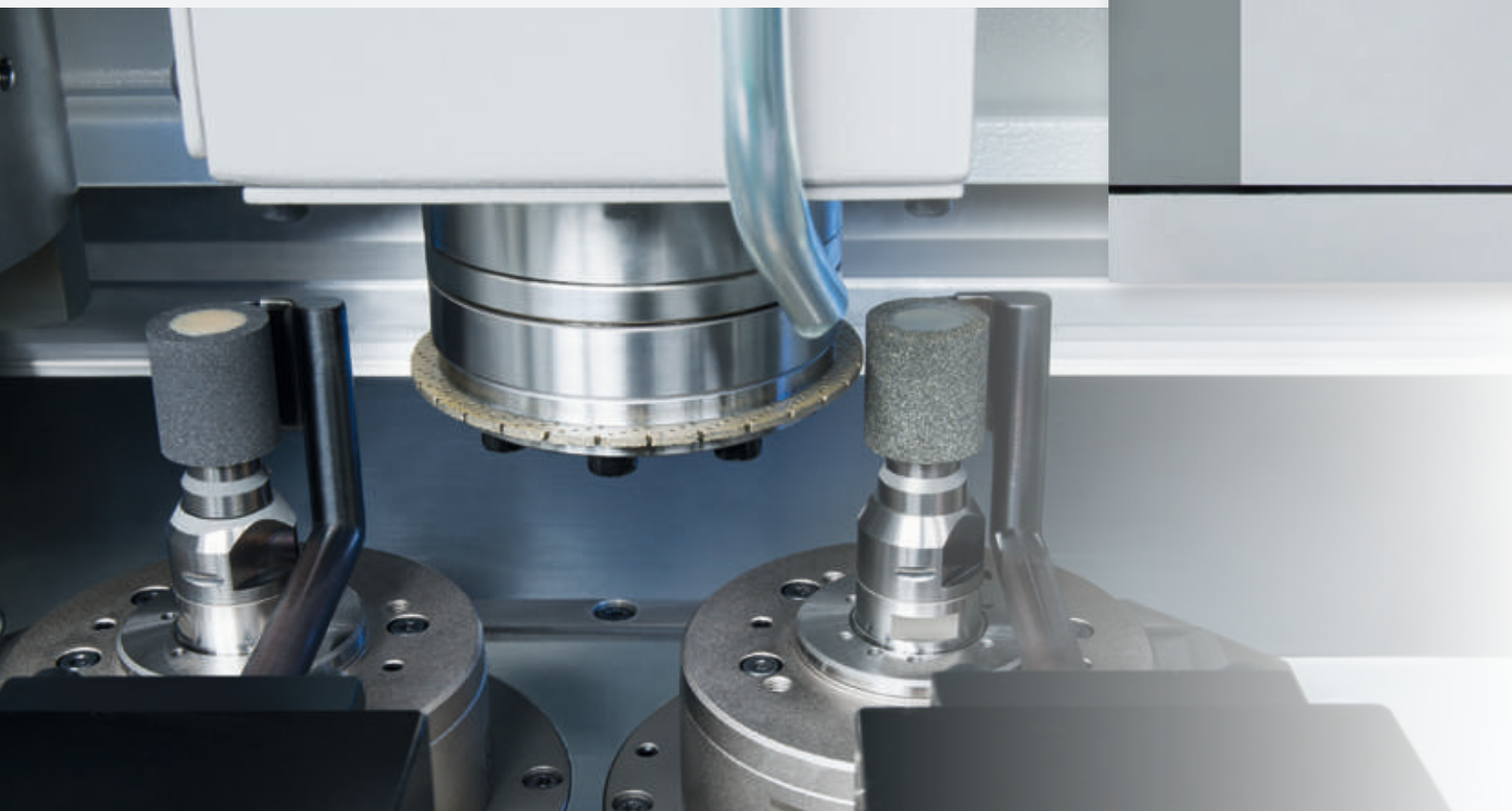
|   |                     |
|---|---------------------|
| Chuck diameter                                      | up to 190 mm        |
| Machining diameter                                  | up to 100 mm        |
| X-axis travel                                       | 460 mm              |
| Z-axis travel                                       | 225 mm              |
| Spindle flange to DIN 55026                         | Size 5              |
| Max. number of revolutions, non-circular / circular | 500 / 6,000 rpm     |
| Grinding spindle speed                              | 30,000 – 90,000 rpm |
| Tool unit   | 1 or 2              |

# EXCEPTIONAL, COMPACT DESIGN

The VG 110 is characterized by its extremely compact design with no additional units. The machining area can be accessed via the front of the machine. The energy container and the fluid and electrical components are mounted at the back.

## The VG 110 offers all modern grinding technologies:

- + Grinding tools – e.g., ceramic or galvanized CBN grinding wheels
- + Sensor technology – adaptive grinding, initial cut detection, touch dressing
- + Dressing technology – dressing spindle for use of diamond form rolls





By combining this machine concept with an automatic loading and unloading system, the VG 110 is able to achieve the lowest cost per piece, while guaranteeing a low-intervention operation. Once the grinding process is completed, the finished workpieces are returned to the same pallet they were originally taken from.

An additional benefit is the easy to use Sinumerik 840 Dsl control unit – software from EMAG makes the programming and operation of this machine simple.



# LOADING AND UNLOADING – FLEXIBLE OR WORKPIECE-SPECIFIC

The VG 110 stands out thanks to its unbeatable accessibility and the ease with which tooling can be performed. A front loading door has been included which provides easy access to the entire machining area. This front panel can be opened to give direct access to all moving components if maintenance is required. The increased accessibility makes the loading process very convenient, which is essential in order to achieve shorter machining times.

An additional decrease in machining times can be achieved by loading using a workpiece shuttle. Workpieces are transported to the machining area with the shuttle and then lifted to the clamping fixture by a lift-up loader. With this system a loading/unloading time of approximately 5 seconds can be achieved, depending on the clamping device.



Workpiece check



VERTICAL GRINDING MACHINE VG 110 | Loading and Unloading

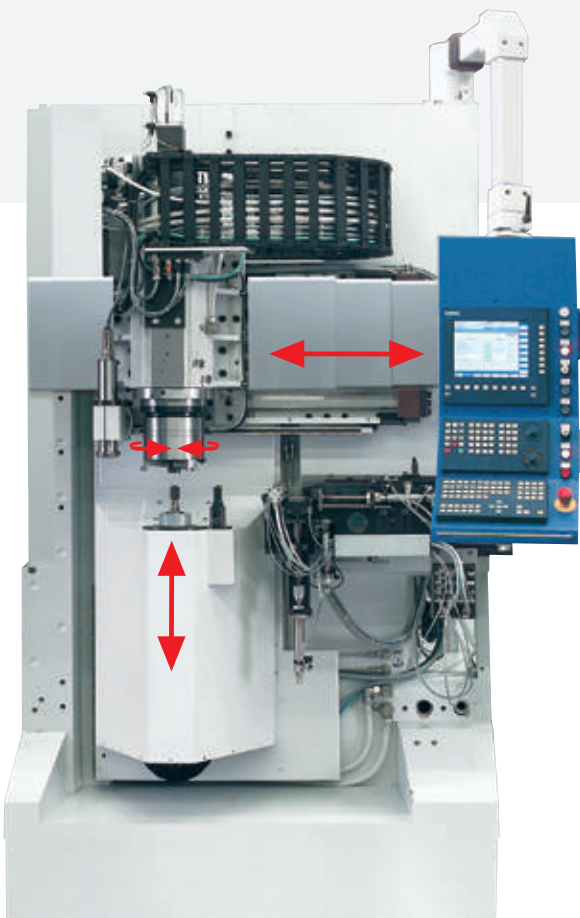


Loading position

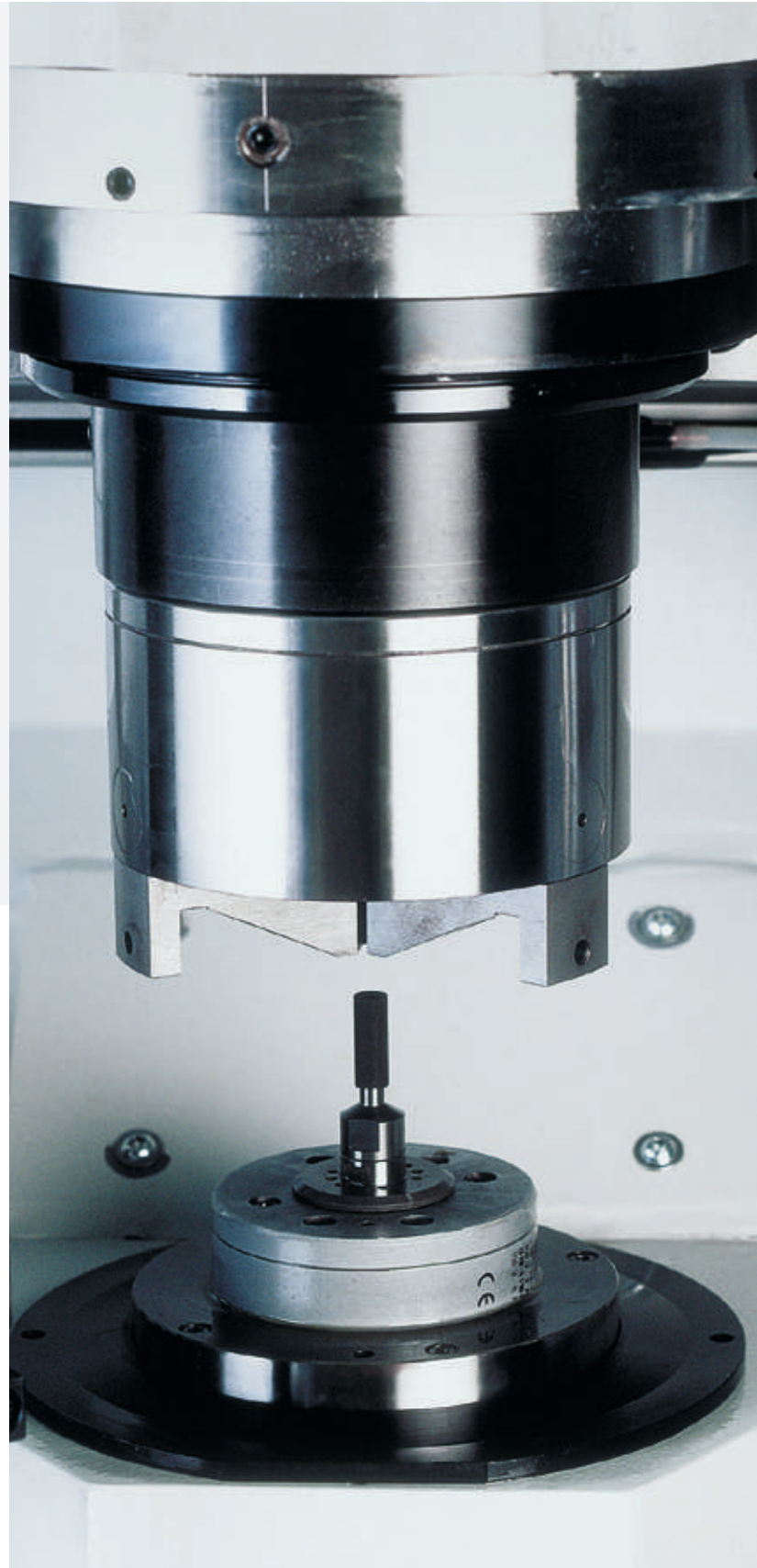
# HIGH PRODUCTIVITY AND PRECISION THANKS TO SEPARATE AXES

**Short travel distances, high speeds, outstanding rigidity and an integrated cooling system lead to short idle times, high productivity and high precision.**

The X- and Z-axes are separate so that maximum accuracy can be achieved when machining small workpieces. The vertical Z-axis is equipped with a linear drive unit, which allows the grinding spindles to make short, quick oscillating strokes. The X-axis determines the accuracy and is completely removed from the machining area in the vertical arrangement. The high-resolution measuring system is positioned a mere 100 mm from the machining area, creating optimum conditions for extremely high accuracy.



Arrangement of axes



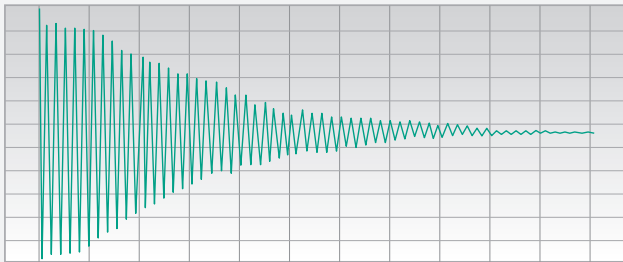
C-axis

The workpiece spindle is characterized by highly accurate bearings with a high degree of positioning accuracy.

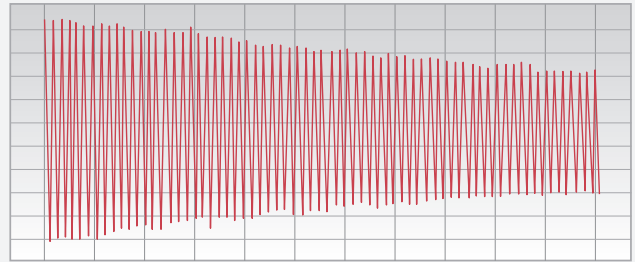


# MINERALIT POLYMER CONCRETE® – MAKES PRODUCTION DREAMS COME TRUE

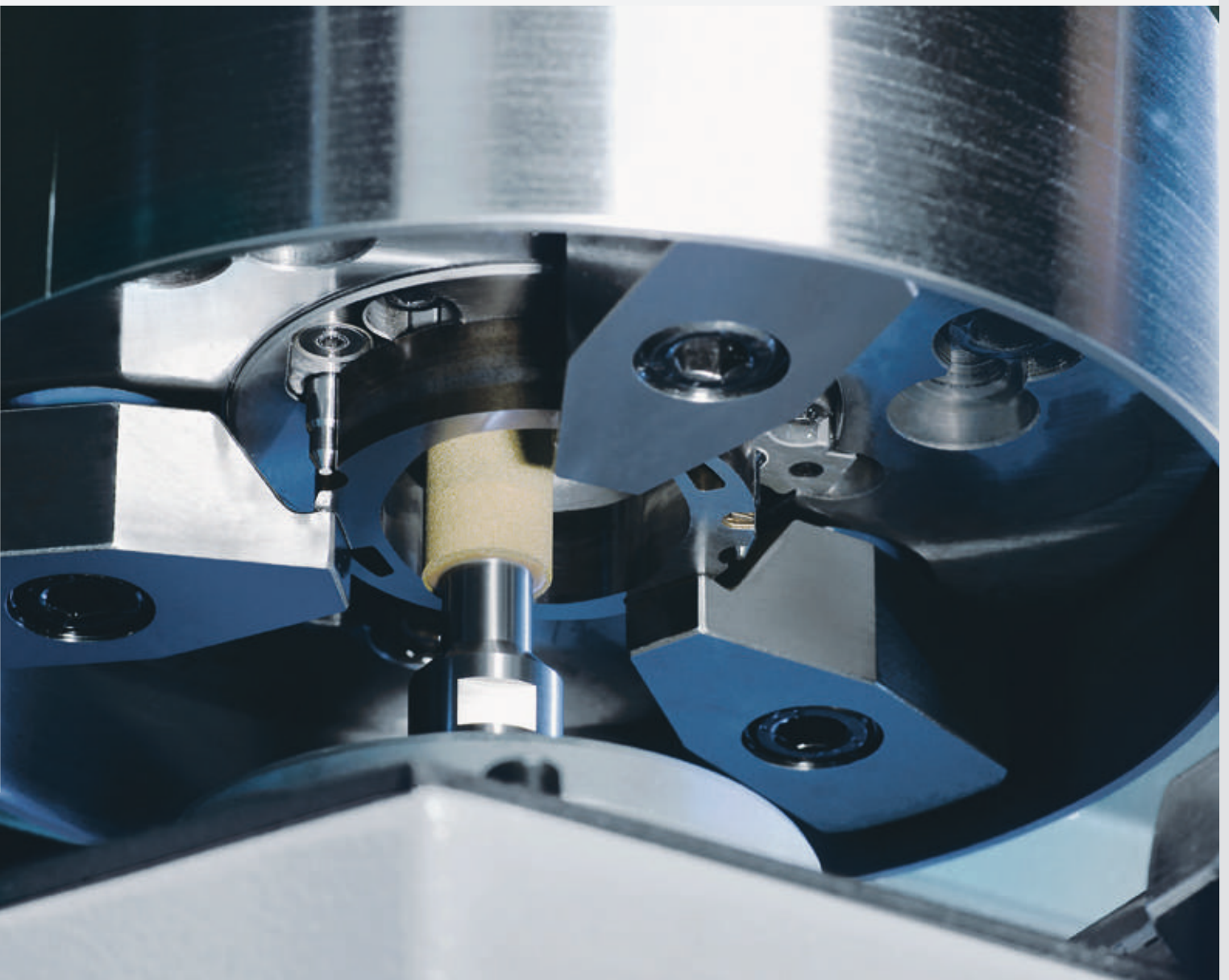
All production grinding machines in the VG series have a machine base made of MINERALIT® polymer concrete which has eight times better damping properties than gray cast iron.



Vibration damping by EMAG machine bases made of MINERALIT® polymer concrete



In comparison: Vibration damping by machine bases made of gray cast iron





Turning

Milling

Grinding

Gear Hobbing

Power Skiving

# AT HOME ALL OVER THE WORLD.

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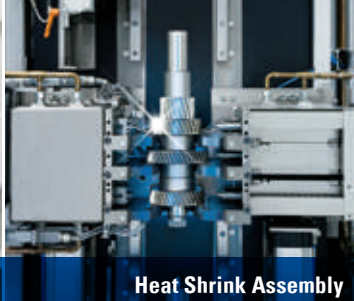
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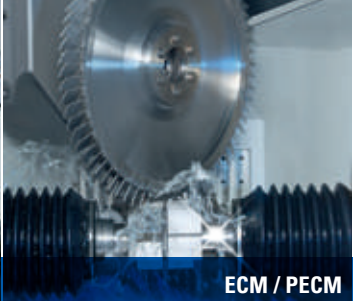
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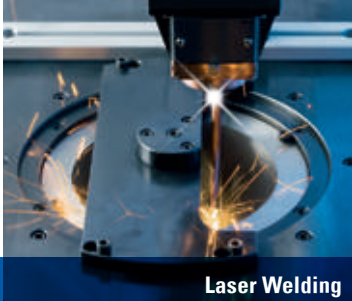
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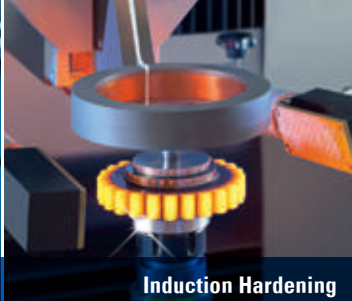
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