

Tooling Systems and Abrasives

Standard and customized solutions




Excellence in motion.
Future in mind.

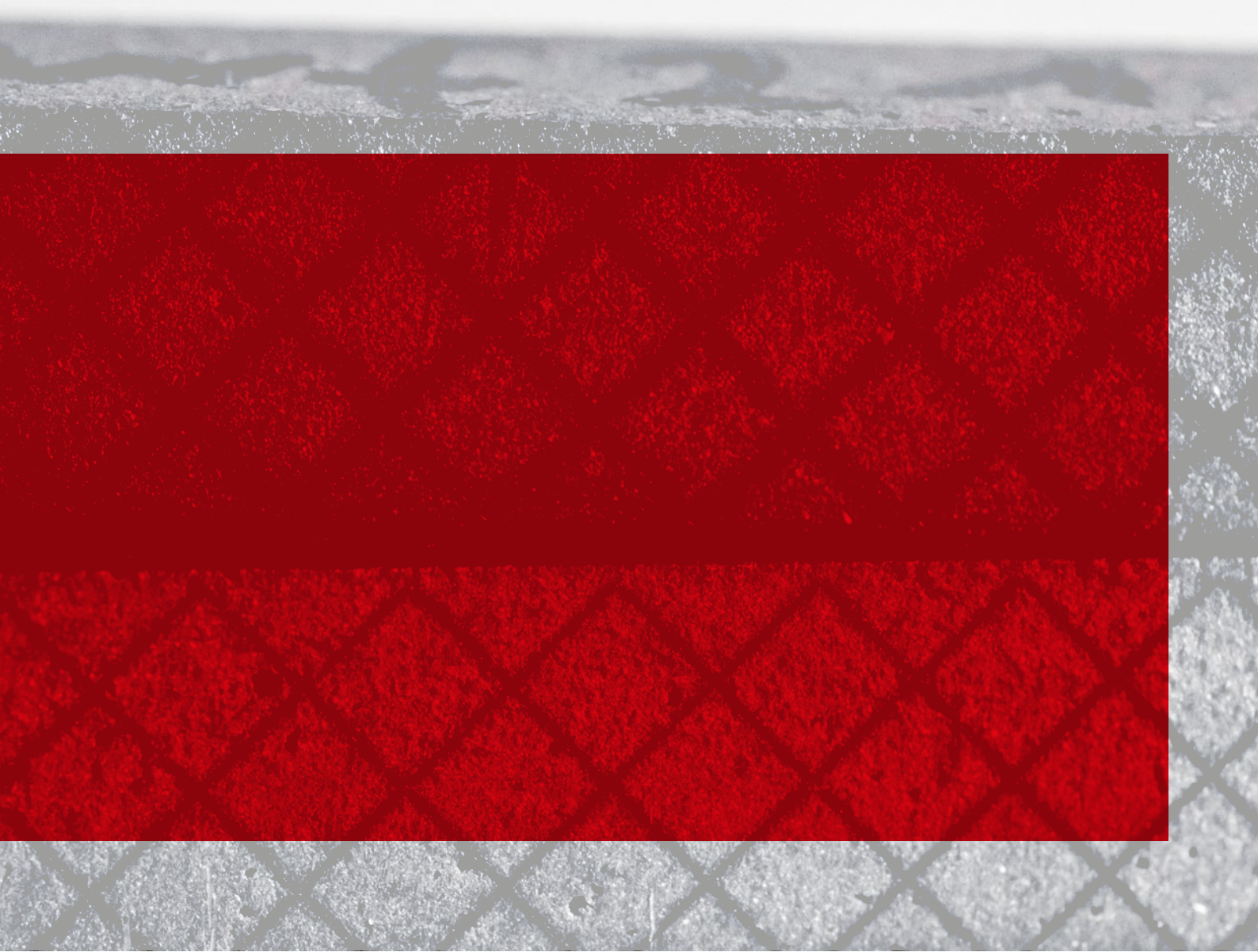
Tooling Systems



Precision and longevity are the hallmarks of our tooling systems. With our tooling systems, we guarantee the highest level of efficiency, optimized surfaces and highly accurate bore geometries.



ING FEMS



PT Series Tooling System

Standardized precision

The newly developed multiple-stone PT tooling system is designed for honing bores with a diameter range of 68–110 mm. A special feature is the re-structured modular system which distinguishes itself with the use of standardized components.



PT connecting piece

Technical highlights

The so-called tool string consists of the honing tool and connecting piece for the spindle. The revision of the joint kinematics in the tool string as a whole – in particular the integration of the lower joint into the honing tool – leads to an ideal compensation of the angular deviation and offset of the workpiece bore to the machine spindle. The adjustability of the joints ensures an extremely long life.

The newly designed air and coolant supply of the tool string enables optimal cooling on the area being worked on as well as an in-process gauging in two levels. These technical features ensure that machining tasks meet the quality requirements for shape and dimensional tolerances of 5–10 µm. This applies to all the industry-standard surface requirements of our customers.

RIES



PT honing tool

Typical areas of application

Cylinder crank cases in the most diverse models are applications for the PT series.

Your benefits

In addition to the technical and application-related advantages the modular structure of the tooling system enables the best delivery times both for new tools as well as tooling rework. A high degree of standardization results in reduced production costs – an additional customer benefit in respect of economy in the application.

L Series Tooling System

SERIES

Standardized precision

The newly developed single-stone L series tooling system is designed for honing high-precision bores with a diameter range of 3–15 mm.

A special feature is the re-structured modular system, which distinguishes itself with the use of standardized components.

Honing tool L series



Technical highlights

The tool joint and base are assembled by means of "thermal shrinkage". This joint features high concentric accuracy ($\leq 5 \mu\text{m}$) as well as the transfer of high torques and axial forces.

Additional quality features are the high-precision guiding of the expansion cone in the tool body as well as an optional internal coolant supply. These technical features of the tool ensure

that machining tasks meet the quality requirements for shape and dimensional tolerances $< 1 \mu\text{m}$.



Honing tool L series

Your benefits

In addition to the technical and application-related advantages the modular structure of the tooling system enables the best delivery times both for new tools as well as tooling rework.

A high degree of standardization results in reduced production costs – an additional customer benefit in respect of economy in the application.

Typical areas of application

Injection pump components, control valves as well as pneumatic and hydraulic components are common applications for the newly developed L series.

TN/TS Series Tooling System

Proven precision

The multiple-stone honing tools of the TN/TS series distinguish themselves by their wide range of application.

This series, tried and trusted for many years, is used for the honing of bores with a diameter range of 5–1,000 mm.

Technical highlights

The design of the TN/TS series enables the machining of through and blind bores and meets today's quality requirements in the most varied of applications. Due to the solid construction of the tooling system, a wide range of diameters can be covered

with just one honing tool, a characteristic that is of particular benefit to small-scale series production. These tools are hardened and precision-ground in all key functional areas and are thus unsurpassed in their precision.



TN honing tool

Therefore, they guarantee the best possible bore geometries and surfaces.

On demand, further technical information is available on a technical data sheet.

SERIES

Typical areas of application

Besides its universal applicability in a wide range of applications, cylinder tube processing is the most common area of application.

Your benefits

Profit from successfully tried-and-tested components with longevity and short delivery times. Suitable for the most varied of applications, the TN/TS series covers a wide range of diameters – an additional customer benefit in respect of economy in the application.

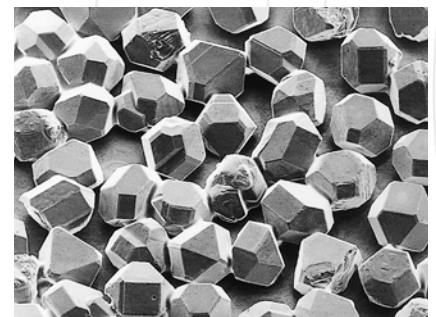
ABRASIVES

Abrasives

In view of our current ecological and economic challenges it becomes apparent: Honing with diamond or boron nitride cutting shoes is indispensable in modern production processes.

Numerous factors determine the honing result. The ideal composition of the honing stone and all other influencing factors to the honing process need to be coordinated in order to achieve optimal end results. High production quality, short cycle times and longevity of the tools are achieved this way.

Defining a suitable honing stone is the task of our specialists with many years of practical experience in the most diverse of applications in the entire field of honing technology.



IVES



Honing stone

In principle, the perfect honing stone consists of three different main components, which offer the required cutting properties as a uniform whole.

The basis and thus the most important component of each honing stone is the abrasive. Synthetic diamonds or cubic boron nitride (CBN) in various grit sizes are used.

The second component is the metal bonding which is responsible for the proper adhesion of the abrasive crystals warranting excellent wear performance.

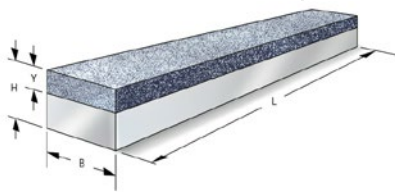
The copper-plated steel blank is the third and last component and is the support material of each stone in a drawn, galvanized form.



Standard honing stone

The abrasive layer is produced with a steel blank and the honing stone is soldered or bonded onto the stone holder of the tool.

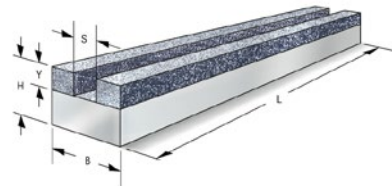
How to order: $W \times H \times L \times Y$
 Example: 5.00 x 6.00 x 100.00 x 2.0



Slotted standard honing stone

The same structure as for the standard honing stone only with longitudinally slotted abrasive.

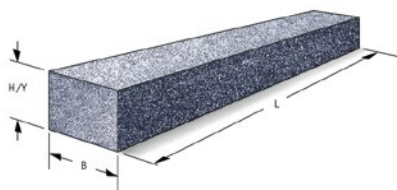
How to order: $W \times H \times L \times Y \times S$
 Example: 6.00 x 6.00 x 80.00 x 2.5 S 2.0



Solid honing stone

Consists only of an abrasive layer without a steel blank and is also soldered or bonded onto the stone holder/holder segment of the tool.

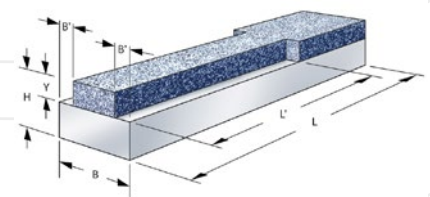
How to order: $W \times H \times L \times Y$
 Example: 3.00 x 2.00 x 60.00 x 2.0

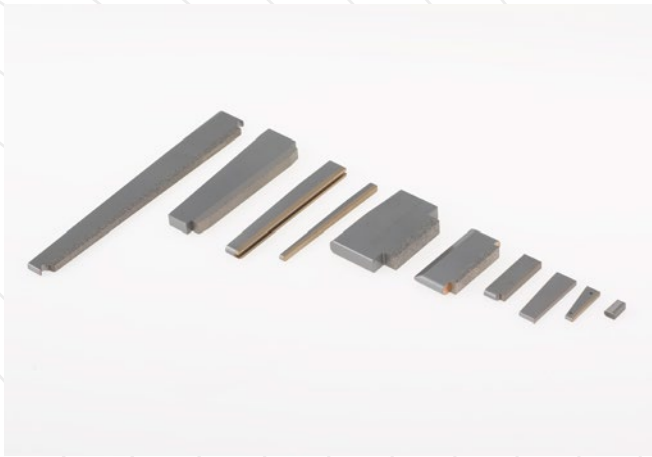


Standard honing stone type T

Stone with T-shaped profile with a narrow reduced section and a short wide work element in the lower area.

How to order: $W \times H \times L \times Y \times G \times L'$
 Example: 3.00 x 3.00 x 45.00 x 2.0 G 7.5

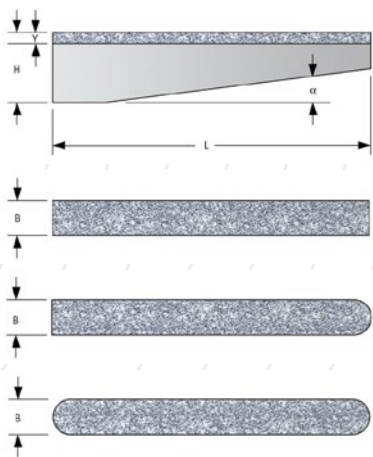




Compact honing stone

A ready to be installed stone for direct use in the tool body. This stone type is used in tooling systems for the machining of high precision bores. In general, the structural form is rounded angular.

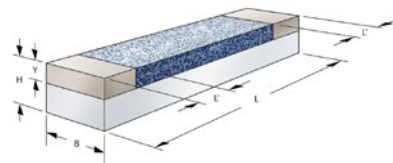
How to order: $W \times H \times L \times Y$
 Stone drawings required
 Example: 3.00 x 7.40 x 40.00 x 1.0



Standard/compact or solid honing stone type G

Honing stone with upper and lower guide arranged symmetrically

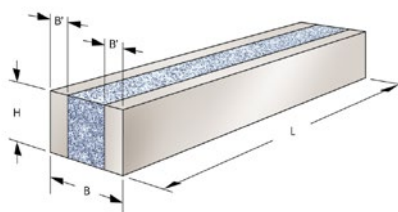
How to order: $W \times H \times L \times Y \times G \times L'$
 Example: 3.00 x 3.00 x 45.00 x 2.0 G 7.5



Solid honing stone type P

Honing stone with narrow cutting part and lateral guides which are arranged symmetrically. Application. Cylinder block and bushings

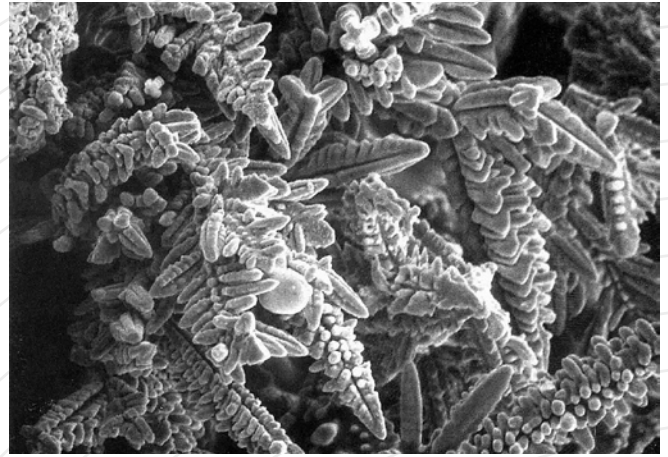
How to order: $W \times H \times L \times Y \times P \times W'$
 Example: 6.00 x 5.00 x 80.00 x 2.0 P 1.5
 (Stone width W not equal to stone height H)



HONING

The specification

defines the exact composition of the respective abrasive layer of each honing stone. Each individual component directly influences the cutting characteristics and quality of the bores to be honed. In principle, four components need be taken into account.



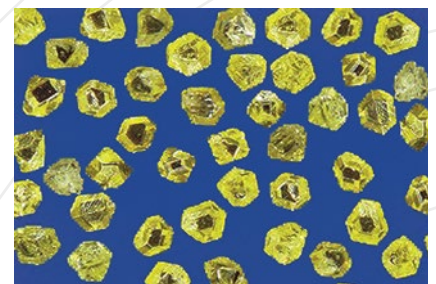
Microscope image: Bonding material

The concentration

describes the number of carats of diamond or boron nitride crystal per cm^3 in the abrasive layer.

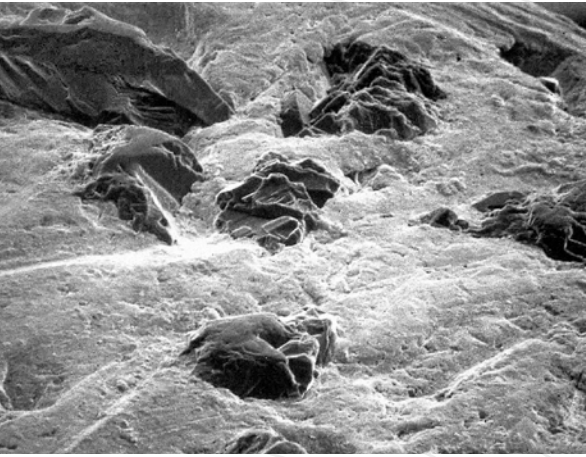
The type of bond

and its characteristics are determined by the stability of shape, the wear performance and the adhesion of the cutting crystal. Whether a bond has to be hard, tough or brittle depends on the material which is to be honed.



Microscope image: Individual crystals

HONING STONES



The types of crystal

are available in various forms depending on the process parameters for the diamond synthesis.

They differ in color, hardness, form, structure and stability.

These characteristics also determine the cutting behavior of each respective crystal.

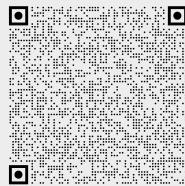
The grit size

generally determines the achievable depth of roughness or surface profile and is responsible for the stock removal capacity of the honing stone.

This means that "coarse" grit sizes are used for rough honing in order to be able to make use of the high cutting efficiency. In the case of finish honing on the other hand, "fine" grit sizes are used to obtain low surface profiles.



www.gehring-group.com



Gehring Technologies GmbH + Co. KG
Gehringstraße 28 | D-73760 Ostfildern
T +49 711/3405-0 | E info@gehring-group.com