Advanced honing technology

Honing has become a worldwide leading high performance process. There is hardly anyone in the entire metal working industry who wants to go without the performance advantage we offer. Honing is a precision stock removal process for practically all materials.

The goals of honing are:
• to reach diameter tolerances in the range of µm
• improve form and position
• optimize the tribological characteristics

lifehone – high precision technology in an exclusive design

Small bore diameters often place different demands on the production technology as large ones. Problems such as an unfavorable length/diameter relationship between the bore can be addressed.

Due to the customer requirements we have continuously improved our lifehone machines. The modular design has been adapted to market requirements and the existing modules have been optimized further. The result: quality, shorter delivery times and functionally developed components.

Whether constructed as a multi-spindle transfer solution for mass production, or as single-spindle design for small batches – highly accurate parts with honing diameters up to 90 mm can be processed optimally with the appropriate machine. Characterized by ease of use and high performance, you will find the right solution for your requirements and process conditions.

Your advantages:
• High accuracy and precision
• High efficiency of the lifehone honing units
• Easy operation thanks to the program assistant
• Exclusive design combined with innovative technology
• Modular configuration options for individual technical variations
• Optimal configuration through standardized assemblies
• Stroke drive available with linear motor or ball screw
• Expert knowledge for the optimum process and machine design
• Complete system from one source (machine, fixture, tools, abrasives)

Cross hatch
Due to the increasing demand for friction-optimized sliding surfaces, the demands on the honing process increases. We as Gehring confront these challenges every day. We are confident to have developed the right solutions for our customers and their future needs! We offer honing technology for all applications from one source.
Easy operation and optimal configuration options

Depending on customer requirements and the product spectrum to be finished, the machine is equipped with matching honing units. The Gehring honing control allows for precision controlled stroke speeds and reversal precisions.

The user-friendly and clear graphic interface of the Gehring operator panel (GOP) as well as the program assistant eases machine operation. After entering a few relevant parameters about the component, material and tool, the process and stock removal can be defined, and honing can be started once the tool has been positioned. The stroke position and all other relevant parameters for machining the component are automatically calculated.

The bore diameter and the conicity will determined by a pneumatic gauging system and graphically presented on the screen of the Gehring operator panel. Depending on customers request, in-process as well as pre and post gauging systems can be installed.

To remove little burrs on edges, grooves or cross holes, it is possible to integrate a brushing process. In addition, a centrifugal or blow off station can be integrated to remove coolant from the part.

Gehring Operator Panel

Gauging station

Honing unit

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>L 200</th>
<th>L 630</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke length</td>
<td>mm</td>
<td>200</td>
</tr>
<tr>
<td>Honing diameter</td>
<td>mm</td>
<td>0.6 - 12</td>
</tr>
<tr>
<td>Spindle drive</td>
<td></td>
<td>Servomotor</td>
</tr>
<tr>
<td>RPM, max</td>
<td>1/min</td>
<td>6000</td>
</tr>
<tr>
<td>Torque</td>
<td>Nm</td>
<td>15</td>
</tr>
<tr>
<td>Stroke drive</td>
<td></td>
<td>Linear motor</td>
</tr>
<tr>
<td>Stroke speed, max</td>
<td>m/min</td>
<td>60</td>
</tr>
<tr>
<td>Stroke acceleration, max</td>
<td>m/s²</td>
<td>25</td>
</tr>
</tbody>
</table>

Subject to technical changes and variations in design and configuration.
A complete package for perfect results

The super finishing of high-precision components depends on the perfect coordination of all influencing factors to the honing process such as the honing tool, abrasives, fixtures, feeding and gauging systems. All of these elements must be perfectly matched to one another to achieve an optimal result. We supply you with the complete package from the abrasives to the machine, so that you always receive the perfect solution for your application.

The L series honing tool is especially designed for honing high-precision bores with a diameter range of 3–15 mm. The tool joint and base are assembled by means of “thermal shrinkage”. This joint features high concentric accuracy (≤ 5 µm) as well as the capability to transfer high torque and axial forces.

Our tooling system for the lifehone series also offers another feature. From a diameter range of 5mm and larger, we can offer you tools with an active honing stone retraction. The benefits are obvious. By eliminating the retraction bushing for abrasives, the tooling design gets shorter and so the stability increases.

In addition, the contact of the bore wall during expansion of the tool is avoided, thus increasing the quality.

Besides tools and abrasives, we offer you various automation concepts – Automatic loading or unloading with robot or gantry are possible.
Flexible 1-spindle honing center

The single-spindle version of lifehone series is impressive with its compact design and small footprint. Depending on the machining task and the batch size, this type of machine can be equipped with a fixed or rotary table and up to 4 stations.

Flexible 2-spindle honing center

This version can be equipped with 1 or 2 honing units. In general, rotary tables with 3 to 8 stations are installed. These stations can also be used for measuring or secondary processes. Compared to the single-spindle honing center, this version is 60 cm wider. The two spindles allow for a two-stage honing process.

Honing center for gears

Our two-spindle configuration machine is the standard solution for gear honing on the market. The integrated transport offers the possibility to cycle gears with different diameters. Furthermore, the user only needs one fixture below the two spindles.

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>1-spindle honing center</th>
<th>2-spindle honing center</th>
<th>Honing center for gears</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required space (W x D x H) mm</td>
<td>1400 x 2150 x 3500</td>
<td>2000 x 2900 x 3500</td>
<td>2000 x 2500 x 3500</td>
</tr>
<tr>
<td>Weight, net kg</td>
<td>3500</td>
<td>3650</td>
<td>3800</td>
</tr>
<tr>
<td>Application samples</td>
<td>injection pump components, housing, hydraulic components</td>
<td>especially designed for gear wheels</td>
<td></td>
</tr>
</tbody>
</table>
Honing center with inner column and rotary table

The Gehring honing center with inner column construction combines modern design with optimized accessibility. The rotary table placement around the inner column guarantees quick access to the processing stations, a good overview and a quick and easy changeover. The maintenance panels on each individual station facilitate maintenance.

Alternatively equipped with a six or eight sided inner column you can fix up to 7 honing spindles. With this we can assure short cycle times and multistep processes. Pre and post gauging stations are fixed on the opposite side to optimize the interior space use in the best way possible. Another advantage is the compact design and the resulting reduced space requirement in your facility. The Gehring Operator Panel can be rotated around the machine so that it is easily visible from any location, thus ensuring optimum flexibility and ease of use. In addition, the operation of the machine is simplified through the user-friendly interface of the Gehring Operator Panel (GOP) and the program assistant.

Technical data

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required space (W x D x H) (mm)</td>
<td>2100 x 2400 x 3600</td>
</tr>
<tr>
<td>Weight, net (kg)</td>
<td>3500</td>
</tr>
<tr>
<td>Application samples</td>
<td>gear wheel, pinion gear, injection pump components, housing, hydraulic components</td>
</tr>
</tbody>
</table>

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Horizontal honing machine for pinion gears

Our three-spindle lifehone series for pinion gear processing has already proven itself in the market and has become the standard solution. The main difference compared to the other lifehone machines is the horizontal honing of the workpieces.

The machine is loaded via an handling system from the pallet. In general, the number of workpieces per pallet is between 5 to 10 pinion gears. The advantage of pallet method is the shortened processing time per workpiece.

Multispindle transfer honing machine

The lifehone transfer design is usually recommended for solutions with four or more spindles. Depending upon the desired cycle time and the honing process, the machine is designed with the proper number of spindles. This design is also suitable when different bore diameters must be processed on one workpiece.

Technical data

<table>
<thead>
<tr>
<th></th>
<th>Honing machine for pinion gears</th>
<th>Transfer honing machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required space (W x D x H) mm</td>
<td>400 x 1800 x 2900</td>
<td>2300 x 3450 x 2400</td>
</tr>
<tr>
<td>Weight, net kg</td>
<td>3650</td>
<td>3800</td>
</tr>
<tr>
<td>Application samples</td>
<td>especially designed for pinion gears</td>
<td>connecting rod</td>
</tr>
</tbody>
</table>

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Worldwide Presence

With our presence on three continents and a total of twelve subsidiaries, we are very well-positioned and primed for the increasing globalization of the world economy.

Our representatives worldwide stand competently by your side and are your direct contacts in the market.

We are on the spot for you and provide the ideal solution for all honing applications.