Mikron

MILL P 900
GF Machining Solutions: all about you
When all you need is everything, it’s good to know that there is one company that you can count on to deliver complete solutions and services. From world-class electrical discharge machines (EDM), Laser texturing and Additive Manufacturing through to first-class Milling and Spindles, Tooling, Automation and software systems — all backed by unrivalled customer service and support — we, through our AgieCharmilles, Mikron, Liechti, Step-Tec and System 3R technologies, help you raise your game and increase your competitive edge.
One solution for roughing and finishing
Achieve real roughing and finishing performance on the same machine with the vertical 3-Axis Mikron MILL P 900. Seize mold making and parts production opportunities in ICT, automotive, home appliances and consumer goods, thanks to the robust portal structure with high static stiffness.
Market segments and applications

**Typical 3-Axis applications**

- **Electronic components**
- **Information and communications technology (ICT)**
- **Packaging**
Automotive

Home appliances

General machinery
High-performance Milling triggers your success

+ Best surface finish
+ Accuracy
+ High chip removal
+ Outstanding efficiency
Solutions

The right solution— for you

Rigid, stable and precise machine construction based on symmetrical portal architecture allows roughing and finishing in one machine setup.

Integrated Automation and chip management to accelerate your productivity and efficiency.

Best surface quality and high positioning and contour accuracy, thanks to this high-performance machine’s polymer concrete base, thermal management and direct measuring on all axes.

+ Polymer concrete machine base for best damping characteristics
+ Thermostabilized machine body
+ Renowned and stable Fanuc control
+ High-performance Swiss-quality Spindle
+ Ergonomic accessibility
+ Easy to automate
Robust and precise

**MILL P core components**

+ **Robust construction**

With its robust portal structure featuring high dynamic stiffness, this solution is especially designed for mold and die and part producers looking for best surface quality and very high positioning and contour accuracy.

+ **Fifty-year legacy of machine design expertise**
 Stable accuracy

Experience the high precision that comes from long-term stability and robustness—even in hard Milling. This machine’s symmetrical portal design, polymer concrete structure and high thermostability are your foundation for precision.

- Thermostabilized body
- Cooling system for Spindle
- Thermal-controlled drive motors
- Temperature-controlled coolant
- Cooling loop inside table

Power at your fingertip

Experience the power of real roughing and finishing performance on a single machine. This machine range’s one-touch process puts them both at your fingertip.
The new dimension in modern production

This includes a range of modules that are collectively referred to under the generic term “smart machine” and that fulfill various functions. In order to make the Milling process “intelligent,” various requirements have to be implemented.

**Saving energy**
smart machine modules like Econowatt are an ecological necessity with an interesting economic advantage.

**Precision**
smart machine modules like ITC, ITM, OSS and Kinematic opt support the precise base of your machining center to reach an even more precise final part for your customers.

**Protection**
smart machine modules like PFP and APS protect your machine and process.

**Time**
smart machine modules like OSS, APS or software tools like rConncet or CAMplete will boost your productivity.

1st Establishing comprehensive communication between man and machine, which makes available precise information that the operator requires to assess the Milling process.

2nd Supporting the operator in the optimization of the process, which considerably improves the performance.

3rd The machine optimizing the Milling process, which improves process safety and workpiece quality - especially important in unmanned operation.

**The facts**
+ Greater accuracy in shorter machining times
+ Increase in the workpiece surface quality as well as the surface and shape accuracy
+ Recognition of critical machining strategies
+ Improved process safety
+ Higher availability
+ Better operating comfort
+ Considerable increase in reliability in unmanned operation

**smart machine construction kit system**
Each of the modules fulfills a specific task. Just like in a construction kit, the user can select the modules that seem to him to be the best option for improving his process.

- Produce your workpieces in a process-secure and precise manner
- Increase reliability in unmanned operation
- Boost the service life of the machine
- Significantly reduce production costs
High-tech motor Spindles

Best surface finish for both roughing and finishing

The high-performance Spindles from Step-Tec are designed to do heavy roughing and Milling to best surface finish all in one. With a bearing design with three preloaded hybrid ball bearings in the front and a thermally robust hybrid cylindrical roller bearing on the back, you are guaranteed a super-rigid rotating system that enables Milling with extra-long tools reaching into deep cavities. Ramp up your chip removal, thanks the feed rates made possible by this solution’s absorption of high Milling forces at the tool tip.

Incorporated into the HPC190 line is the well-proven OptiCool principle that keeps the front bearing area cool while the extra heat barrier cooling loop keeps the motor heat away from the Spindle nose. That results in a thermally balanced Spindle thus assuring a high level of precision, repeatability and surface finish.

The 36,000 rpm HVC150 Spindle is the optimum solution for mold and die machining. It reaches a superb surface finish thanks to its great axial stability. Due to the specially chosen bearing arrangement with two hybrid ball bearings in the rear instead of the common roller bearing system, this Spindle stands out with very low dynamic axial growth. This precision bearing arrangement offers the best in repeatability for machining operations.

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**Step-Tec HPC190**

- Power (S6) 36 kW
- Torque (S6) 120 Nm
- Speed max. 20,000 min⁻¹
- Acceleration 2.5 s
- Lubrication Oil-air
- Tool interface HSK-A63 DIN69063-1

- Direct Lubricating System (DLS) oil-air bearing lubrication through outer race
- Fully digital Spindle equipped with every conceivable sensor to support smart machine integration
- Through-Spindle cooling featuring rotary unions fed by all known liquid and gaseous media
- Machine and Spindle Protection (MSP) crash-proof system to protect your machine and Spindle

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**Step-Tec HVC150**

- Power (S6) 33 kW
- Torque (S6) 21.3 Nm
- Speed max. 36,000 min⁻¹
- Acceleration 2.5 s
- Lubrication Oil-air
- Tool interface HSK-E50 DIN69063-1

- Good thermal stability through OCS
- Excellent weight / performance ratio
- Integrated intelliSTEP functionality
Space for performance
Choice of solutions to meet your needs

Tool magazine for every need

- Disc-type or chain magazine
- Capacity of up to 60 tools with a magazine internal to the machine’s standard footprint
- Touch probe orientation

- Ergonomic and user friendly
- Ensure productivity and process reliability
- Parallel machining and tool loading
- Easy tool loading possibilities thanks to an ergonomic tool loading door

60 tools

30 tools
Chip management

Wet or dry – clean machining

Customer benefits
- Optimum chip flow to steep and smooth cabin walls
- Wash-down nozzles for all corners to prevent chip accumulation
- Large and strong chip augers to transport high volume of chips

Adapted chip management

- Solution for high-volume aluminum Milling chips with slat band lift-up chip conveyor and coolant unit with fine filtration
- Solution for high-volume steel Milling chips with scraper lift-up chip conveyor and coolant filtration unit

Options
- Through-Spindle coolant
- Wash-down system
- Coolant thermal control
- Oil skimmer
Lower your costs, increase productivity with Automation

Take your productivity to new levels while reducing your costs with our superior Automation solution. The Pallet Magazine WPC 10 generously dimensioned door allows optimum pallet access for loading light parts by hand and heavy parts by crane. Larger windows allow a good view into the pallet area, and pallets are managed by using the machine control.

Configuration as System 3R (Dynafix/Delphin)

<table>
<thead>
<tr>
<th>Pallet Automation</th>
<th>5 Delphin 600 x 400</th>
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<tbody>
<tr>
<td>Pallet changing time</td>
<td>30 sec</td>
</tr>
<tr>
<td>Max payload</td>
<td>200 kg</td>
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Ergonomic door design for easy loading of parts up to 200 kg
Automation from the back, full access on the front
Multiple options to drive your success

Options

- Infrared touch probe
- Laser measuring system
- Through-Spindle cooling
- External coolant supply
- Wash-down system
- Band filter system
- Rotary viewing window
- Machine and Spindle Protection (MSP)
- smart machine modules

- OSS
- ITC
- PFP
- MSP
rConnect comprises GF Machining Solutions’ modular digital services. Select the digital service which fits the best to your individual needs. From Live Remote Assistance to ensure maximum machine uptime via process improvement modules to predictive maintenance and monitoring, rConnect keeps you connected, at any time and wherever you are.

**Improve machine availability**
Our Live Remote Assistance (LRA) supports you in keeping your commitments. Our LRA provides you direct access to our expert service engineers with the latest technology.

**Increase your flexibility**
Know the status of your machines in real time at any location. The rConnect Cockpit is the user interface for the machine operator, maintainer or operations manager. It not only enables central access to GF Machining Solutions’ digital services but also provides the operator with support in the daily maintenance of his machine. For example, it provides an overview of all maintenance due on his machine. You can view current status messages and can call up machine performance reports.

With the Messenger module you can even get your machine park data on your mobile device. Features are machine status message, alarm message, programmed messages in the NC program and sending of a service request.
### Technical data

<table>
<thead>
<tr>
<th>Axis travel</th>
<th>Longitudinal X</th>
<th>mm (in)</th>
<th>900 (35.43)</th>
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<tr>
<td>Lateral Y</td>
<td>mm (in)</td>
<td>600 (23.62)</td>
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<tr>
<td>Vertical Z</td>
<td>mm (in)</td>
<td>450 (17.71)</td>
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<table>
<thead>
<tr>
<th>Travel speed</th>
<th>Rapid traverse X</th>
<th>m/min (ipm)</th>
<th>30 (1181)</th>
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<tbody>
<tr>
<td>Rapid traverse Y</td>
<td>m/min (ipm)</td>
<td>30 (1181)</td>
<td></td>
</tr>
<tr>
<td>Rapid traverse Z</td>
<td>m/min (ipm)</td>
<td>30 (1181)</td>
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<table>
<thead>
<tr>
<th>Tool Spindle (40% ED, S6)</th>
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<tbody>
<tr>
<td>20'000 min⁻¹, HSK-A63 S6</td>
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<tr>
<td>36'000 min⁻¹, HSK-E50 S6</td>
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<table>
<thead>
<tr>
<th>Work table</th>
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<tbody>
<tr>
<td>Pallet/clamping surface</td>
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<tr>
<td>Max. table load</td>
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<table>
<thead>
<tr>
<th>Tool magazine</th>
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<tbody>
<tr>
<td>HSK-A63 tool holder</td>
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<tr>
<td>HSK-E50 tool holder</td>
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<table>
<thead>
<tr>
<th>Automation</th>
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<tbody>
<tr>
<td>Pallet size / Number</td>
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<tr>
<td>Maximum additional load</td>
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<table>
<thead>
<tr>
<th>Weight</th>
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<tbody>
<tr>
<td>Machine</td>
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<td>Pallet changer</td>
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<tr>
<th>Control</th>
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<tr>
<td>Fanuc</td>
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GF Machining Solutions

EDM (electrical discharge machining)

AgieCharmilles wire-cutting, die-sinking and hole-drilling machines

For over 60 years we have been at the forefront of every EDM development: designing and refining the EDM process and building machine tools that deliver peerless part accuracies, surface finishes, cutting speeds and process reliability. Today, our AgieCharmilles wire-cutting, die-sinking and hole-drilling machines are recognized throughout the world as the best in the business. Our continuous research and development in digital generator technology, control systems and integrated Automation systems are evidence of our commitment to keeping your EDM operations on the leading edge of technology.

Milling

Mikron high-speed (HSM), high-performance (HPM) and high-efficiency (HEM) Milling centers

Customers operating in the mold, tool and die and precision component manufacturing sectors stake their reputations on being able to quickly and cost-competitively meet their customers’ demands. That’s why they invest in GF Mikron machines. Incorporating the latest and most advanced technologies and premium-performance components, Mikron HSM, HPM and HEM machines help you increase your production capabilities and improve your productivity. Designed and built for speed, accuracy and reliability, the machines, like you, are proven performers.

Liechti dedicated aerospace and energy machining centers

Aerospace and power generation turbine manufacturers increasingly turn to Liechti dedicated five- and six-axis machining centers to machine complex, high-precision airfoils on blades, disks, blings, blisks/IBRs and impellers. It’s easy to see why because these machines, with their specific profile machining technology, specialized CAD/CAM software and engineering competence for ultra-dynamic machining in titanium, Inconel, nimonic, titanium-aluminide and high-alloy steels, yield productivity gains as much as 30 percent, thanks to reduced machining times. In the globally competitive aerospace and power generation manufacturing sector, that’s definitely worth shouting about.

Laser

AgieCharmilles Laser texturing machines

Laser texturing is a fully-digitized surface engineering process that has huge potential. The technology enables precise 2D and 3D textures or engravings to be machined accurately and directly onto complex parts or molds to improve and alter their aesthetic appeal, functionality and performance. The process is infinitely repeatable and offers many distinct environmental and economic advantages over conventional texturing processes.

Laser Additive Manufacturing (AM)

GF Machining Solutions has partnered with EOS, the global leader for high-end AM solutions, to integrate this innovative technology and further develop it into its current solutions to fully benefit the mold industry, by focusing on injection efficiency: optimized cooling design to reduce cycle time, lower energy consumption, higher quality of plastic parts.

Tooling and Automation

System 3R Tooling, Automation and software

Productivity is the key to manufacturing success, and automating a manufacturing process is a proven method of increasing its efficiency, effectiveness, quality and reliability. System 3R’s integrated Tooling, Automation and software solutions ranging from simple workpiece pallet and electrode changers through to flexible manufacturing and robot handling systems are guaranteed to help you increase their competitive advantage.

Customer Services

Operations Support, Machine Support and Business Support

To help you get the most and the best from your machine tools and equipment, we offer three levels of support. Operations Support covers our range of original wear parts and certified consumables (EDM wires, filters, resins, electrodes etc.) to ensure that your machines are performing at the highest levels. Machine Support maximizes, through our best-in-class technical support, preventive services and quality spare parts, your machine tool uptime. Business Support is designed to help you make a real step-change in your productivity and performance with solutions tailored to your specific needs.
At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser, Additive Manufacturing, Spindle, Tooling and Automation solutions. A comprehensive package of Customer Services completes our proposition.

www.gfms.com