



**MIKRON
HPM 600**

GB

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AgieCharmilles



The MIKRON HPM 600 three-axis machining center from GF AgieCharmilles is, due to its strong and robust construction, particularly well suited to machining in the HPM (High Performance Milling) field.



The MIKRON HPM 600 is designed, due to its modular construction, for all application areas from prototyping, to tool and mold making, to fully automated production; this is due to the large number of options and their compatibility.



A choice of several automation options is available, as well as various swarf removal and coolant processing systems, and high-performance tool spindles. All machine components are logically synchronized with each other and enable very efficient machine use around the clock.

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**MIKRON
HPM 600**

For efficient High Performance Milling



Forging die for crankshaft

Alloyed tool steel

Automotive industry

- Difficult to cut material
- Heavy workpieces
- Contouring accuracy
- High machine stability
- High spindle performance

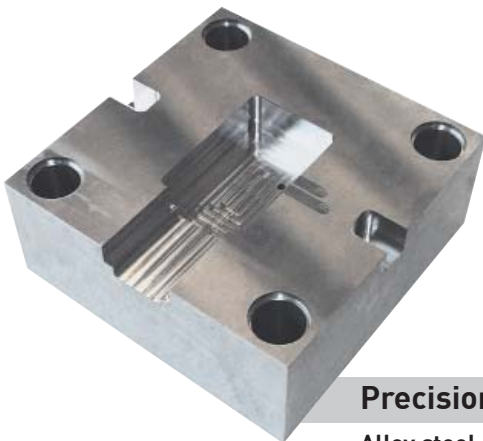


Light alloy component

Aluminum

Aircraft industry

- Large chip volume
- High spindle performance
- High spindle speed
- Shape and position accuracy
- Reproducibility



Precision mold making part

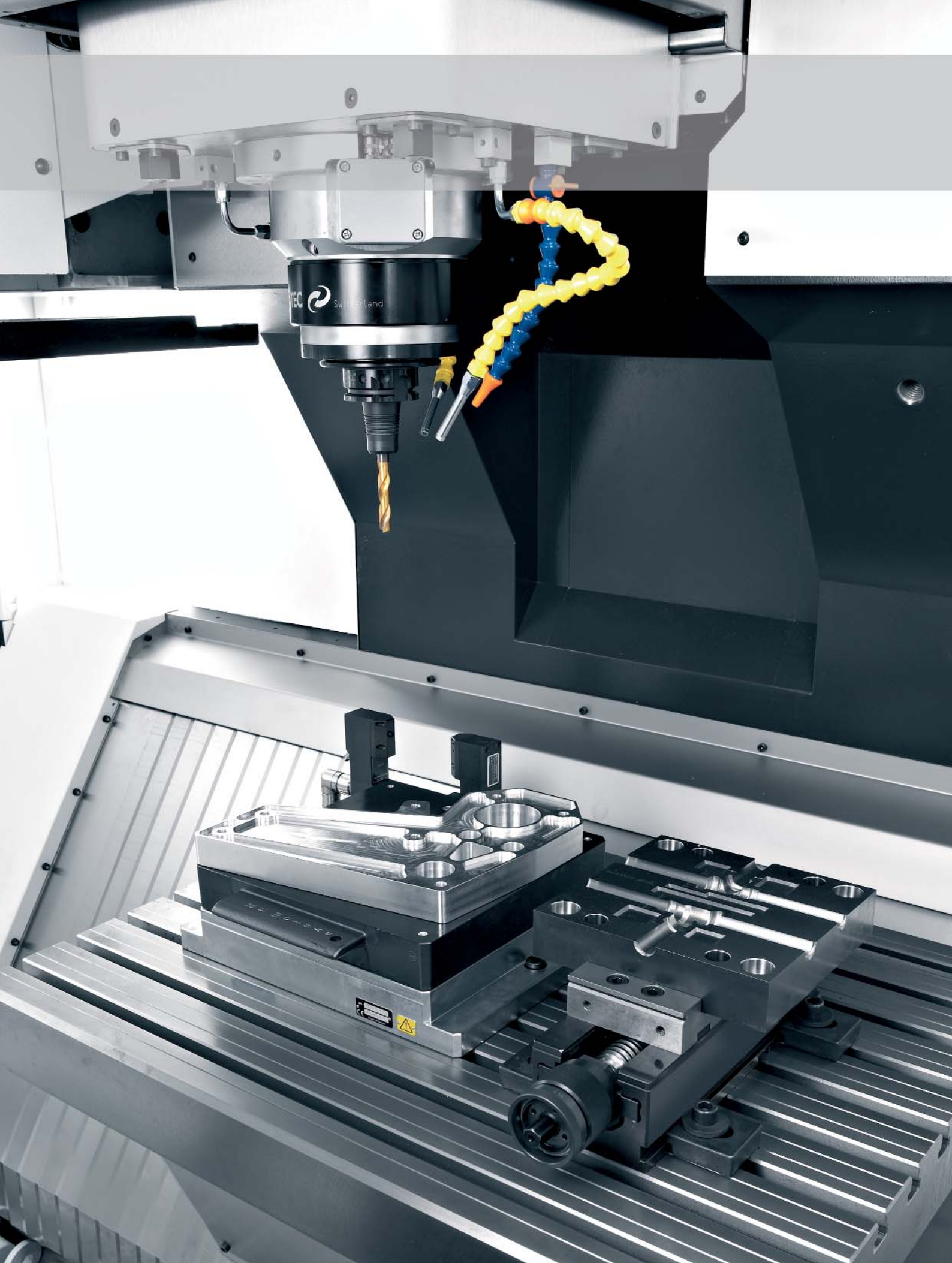
Alloy steel

Plastics industry

- High material removal rate
- Workpiece accuracy
- High surface quality
- High positioning accuracy
- Short processing time
- High spindle performance
- Reproducibility

The stable and robust construction of the MIKRON HPM enables unlimited HPC machining (High Performance Cutting). Due to the tremendous spindle performance, a high material removal rate is guaranteed.





Highlights

The MIKRON HPM 600 can be turned optimally to the customer's requirements



Integrated magazine for up to 60 tools

High-performance tool spindle

Effortless crane loading

Effortless crane loading

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MIKRON HPM 600

Flexible workpiece automation

Large panes of glass give a clear view

Raised machine tray



The outstanding feature of MIKRON machining centers is their exceptional ergonomics. What is impressive about the HPM series is its unrivalled accessibility, which is not dependent on the machine's configuration.

Stable, robust, powerful

The polymer concrete cube-shaped machine base of the MIKRON HPM is designed for high-performance and precision. Two linear movements are carried out with the tool and one with the workpiece. The optimally dimensioned two-axis unit on the machine base ensures high geometry precision and stability. The one-piece polymer base is the first prerequisite for high surface quality and low tool wear.

- No special foundation required, ready for use immediately
- Solid construction and high rigidity
- Raised machine tray for complete leak tightness



Heidenhain digital control system

The latest generation Heidenhain iTNC 530 digital control system and a clearly structured operating panel make the MIKRON HPM 600 a reliable and user-friendly machining center:

- Process reliability including quick installation and secure operation of predefined operating cycles
- Ethernet connection for fast CAM data flow
- Simple dialog-controlled programming
- Parallel programming, free contour programming, freely definable sub-programming
- The optional mobile hand wheel brings you close to the cutting point if required

Ergonomics

The two light, waist-high doors that close above the corner, can be opened at a distance by the operator and enable free access to the working area. Large panes of glass give a clear view of the machining process. Regardless of which options the MIKRON HPM is equipped with, perfect accessibility can always be taken for granted. The work table, pallet and tool magazine, as well as the swarf removal system can be reached just as easily as the maintenance units.

The work table and pallet magazine can of course be loaded using the crane.

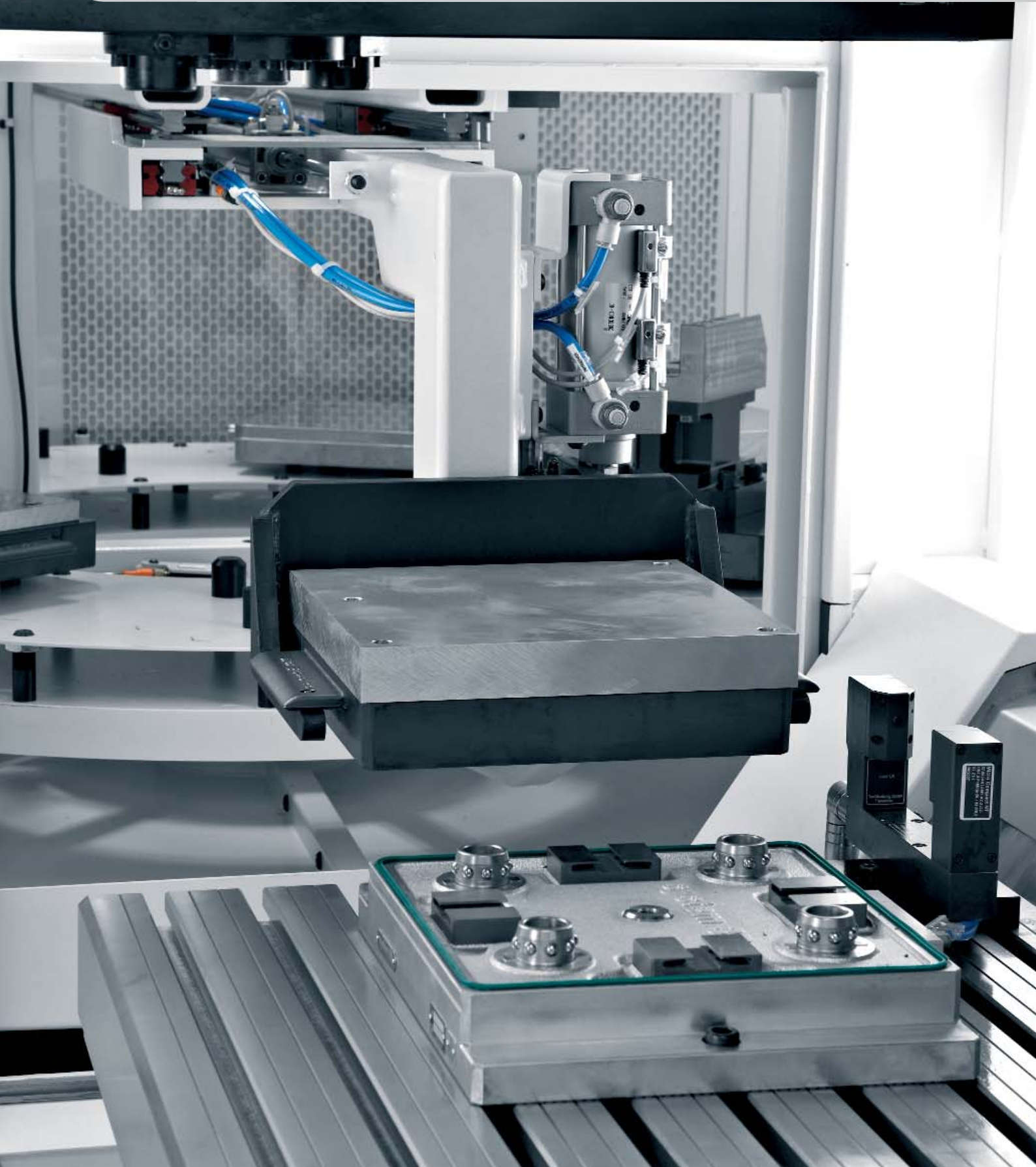


Different modules of the smart machine modular design guarantee an optimum process: more precision, increased surface quality and contouring accuracy as well as improved safety, which is especially appreciated for unmanned machining.



Automation

Automatic workpiece change unit enables unmanned production



The pallet changer shows its superiority

Automatic production is ensured by the cost-effective integration of the pallet changer on the three-axis MIKRON HPM series. Retrofitted with the new modular tool changer, the compact milling center becomes a highly productive and flexible manufacturing cell.

- Repetitive machining is executed without interruption in multi-shift operation.
- The machine's efficiency is increased with subsequent higher profit
- The pallet magazine can be loaded during operation, and easily be operated using the CNC control.



Magazine for 4 large pallets



HPM 600 with magazine for 7 to 10 pallets.

The average daily operation time of the machine is increased through use of the pallet changer. Flexibility increases considerably, since special parts can be clamped and prepared at the same time as continuous series production.

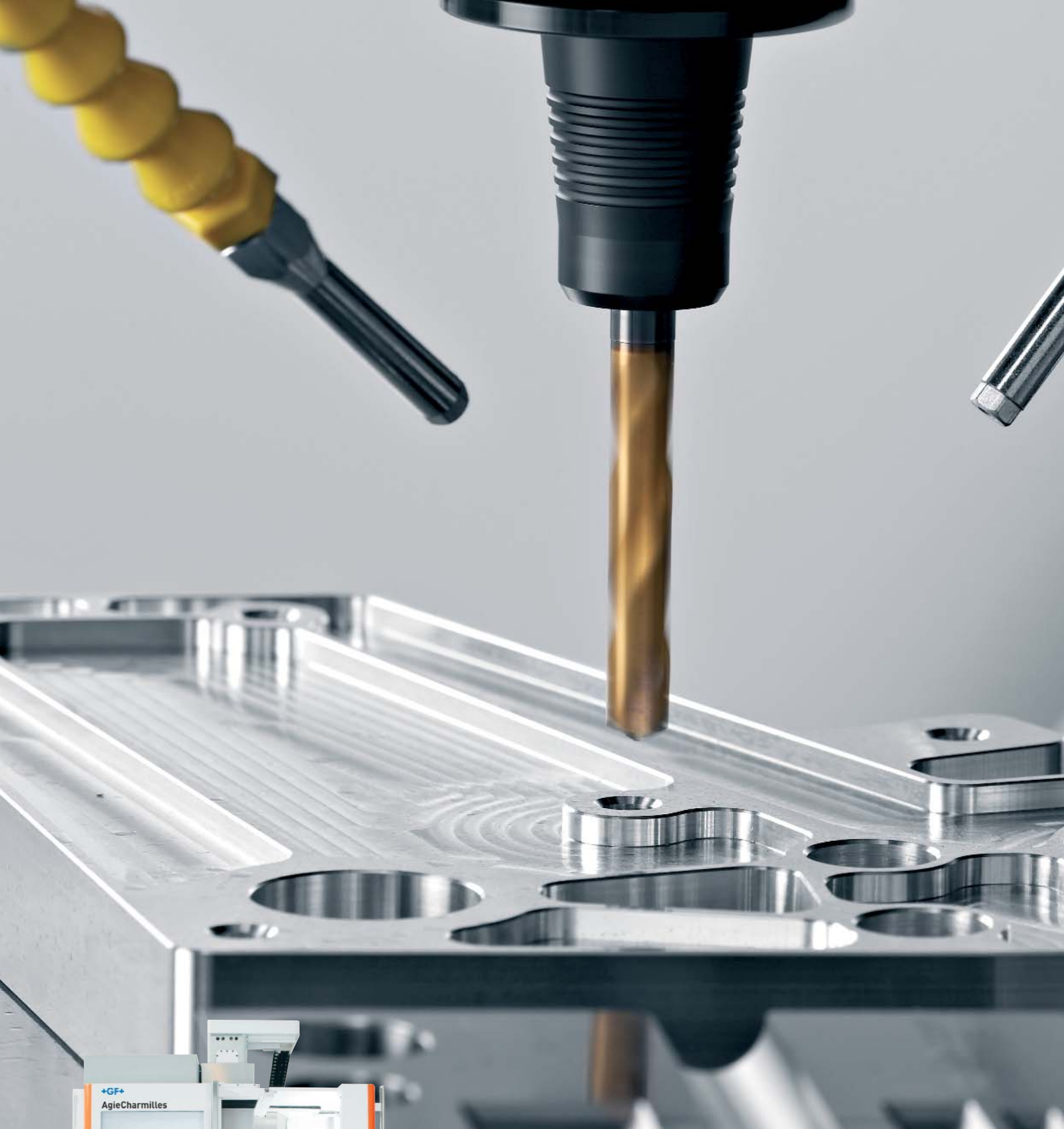
Automated machines tend to be operated 24 hours per day, even when only one shift is worked in production. Compared to a machine without an automated pallet magazine, this essentially enables a longer operating period per day.



We recommend: SIGMA FMC (Flexible Manufacturing Cell) and RNS (Remote Notification System). These and other smart machine modules ensure still more flexibility and process reliability in the production of high-quality components.



Through automatic workpiece changes, the immobilization time of the machine is considerably reduced, and, at the same time, flexibility and efficiency are increased.



**MIKRON
HPM 600**

Achieve more...



**MIKRON
HPM 600**

Table variations

3-axis machining at its best

Work table with T-slots

On the MIKRON HPM there is an ideal division of torque between the workpiece and the tool. Simple loading and set-up of workpieces is ensured.

The heavily ribbed cast iron work table offers robust and universal clamping solutions. The axial (axially parallel to X) arranged T-slots enable diverse workpieces to be mounted.



For simple manual loading of workpieces, a table with parallel T-slots is available.



The generously sized table enables an additional workpiece to be manually loaded in addition to the automatically changed pallet.

Clamping systems

Systems for the slot table:
System 3R Dynafix 280 x 280 mm
Erowa UPC 320 x 320 mm
System 3R GPS 240 x 240 mm

Work table with integrated clamping system:
Pallet 600 x 600 mm
Pallet 800 x 600 mm



Dividing head

The optional dividing head performs rotary movements. This 4th axis can be rotated in both directions.

Chip management

Versatile solutions for many different sorts of applications

The accumulation of chips in the working area can consistently be avoided. With sophisticated detailed engineering of the raised machine tray, chip build-ups are avoided and the accrued chips are reliably and economically separated from the cooling lubricant and disposed of. There are various construction variations available for this.

- Chip chute for dry processing and manual chip removal
- Spiral chip conveyor
- Reservoir with 2 chip drawers
- Lift-up chip conveyor for unmanned production
- Oil separator
- Various belt filter units
- Internal and external cooling lubricant supply
- Washing device



A reliable spiral chip conveyor combined with a lift-up chip conveyor takes care of automatic swarf removal, in automated mode amongst others



Cooling lubricant container with 2 chip baskets

The accrued chips are removed from the machine and conveyed into the chip baskets. The cooling lubricant runs through the basket into the cooling lubricant container. The filled basket is pushed up onto a slope, so that all the cooling lubricant can drain. At the same time, the second basket is laid under the chip ejection again.

In the container, the cooling lubricant is passed through sieves to separate it from further chips and is then pumped from the container through a filtering sieve to the belt filter unit or directly back to the cooling lubricant nozzles of the tool spindle. The cooling lubricant container stands on rollers and can be removed without being dismantled.

High-tech spindles

Tool spindles for demanding machining

Whichever machine configuration you choose, with a MIKRON HPM you get the most up-to-date tool spindle technology: vector control for full torque in the lower speed range, highly stable ceramic hybrid spindle bearing, and spindle casing cooling using a controlled coolant system for consistent temperatures for the entire duration of the work.

The complexly developed inline tool spindles from StepTec, are designed with high torques for the removal of large chip volumes. This spindle particularly stands out due to its easy-to-maintain construction and automatically oil/air lubricated ceramic hybrid bearing system.

15,000 min⁻¹ or 20,000 min⁻¹

- Precise high performance for use in the HPC field
- Available with or without internal coolant supply
- ISO-40, BT-40, CAT-40 spindle taper (15,000 min⁻¹)
- HSK-A63 spindle taper (20,000 min⁻¹)
- Spindle module and motor replaceable separately



The tool spindles built into the MIKRON HPM series have been purposefully designed to meet high performance expectations. The result is performance and torque even at high speeds.

30,000 min⁻¹ or 42,000 min⁻¹

- Precise high performance - from the conventional, to the universal, to HSC machining
- Infinitely variable speed range - no slump in performance
- With or without internal coolant supply for use in production
- High retention powers axial run-out of the tool taper - better run-out
- Finely balanced 3-phase motors
- HSK-A63 spindle taper (30,000 min⁻¹)
- HSK-E40 spindle taper (30,000 min⁻¹ or 42,000 min⁻¹)



The scope of supply includes: MIKRON Smart Machine APS (Advanced Processing System) module for reliable measuring and display of milling vibrations, and ITC (Intelligent Thermal Control) for higher workpiece precision.

Tool magazine

Compact storage for tools

The new HPM series also wants for nothing with regard to tool quantities. The customer can choose between the two solutions integrated into the machine for either 30 or 60 tools.

The side-mounted magazines optimally protect the tools from pollution, and can be equipped at the same time.

CT 60 tool magazine



Tool changer with double arm gripper for still shorter non-productive time

Due to the double arm gripper, short tool change times of 2 seconds can be achieved. The double arm gripper can be used both with the 60-position, and with the 30-position tool magazine.



DT 30 tool magazine



Options

The machines are geared up for a multitude of options. In this way, they can be simply and optimally configured



Minimum quantity of cooling lubricant



Lift-up chip conveyor



Tool measuring probe system



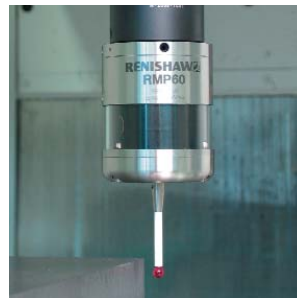
High performance belt filter unit



Basic belt filter unit



Laser tool measurement



Infrared touch probe



Mobile hand wheel



smart machine module



Spray gun



Rotating clear screen



Indicating lamp



3+4 operating mode



Scratch-resistant viewing glass

Further options:

- Cooling lubricant container with 2 chip baskets
- Spiral chip conveyor
- TSC production device
- Oil separator
- Mist extraction system
- Washing device
- Programmable cooling lubricant nozzles
- Direct position measuring system
- Dividing head
- Tool air blowing unit
- Ground protection tray
- Dividing head preparation
- Increased precision
- Pallets



Bringing intelligence into the milling process is the intended aim of "smart machine".

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

First of all, establishing comprehensive communication between man and machine, which makes precise information that the operator requires to assess the milling process available to him. Secondly, supporting the operator in the optimisation of the process, which considerably improves the performance. Thirdly, the machine optimises the milling process, which improves the process safety and the quality of the workpiece - above all 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
- Improvement in the process safety
- Reduction of the machine set due to longer service life
- Higher availability
- Better operating comfort
- Considerable increase in reliability in unmanned operation

smart machine construction kit system

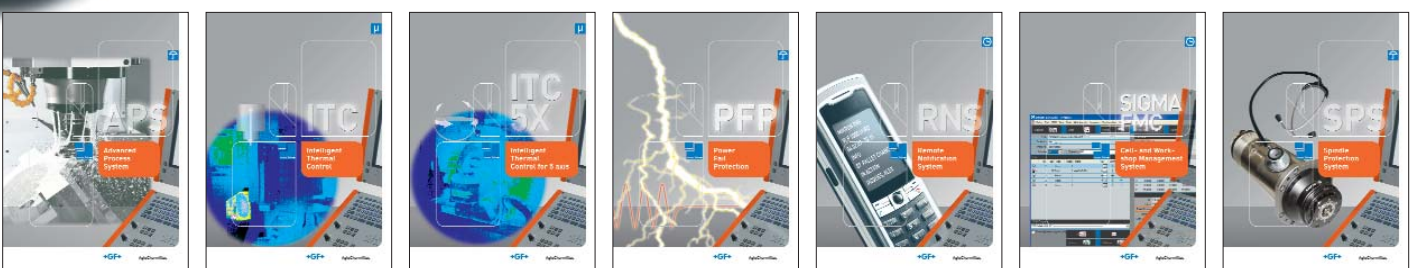
Each of the modules fulfils a specific task. Just like in a construction kit, the user can select the modules that seem to him to be the best option for improving his process.

Your benefit

Producing the workpieces in a process-secure and precise manner, increasing the reliability in unmanned operation, increasing the service life of the machine and significantly reducing production costs.

The smart machine is constantly being further developed.

The currently available modules can be found at www.gfac.com



About GF AgieCharmilles

Milling High-Speed and High-Performance Milling Centers

In terms of cutting speed, HSM centers are 10 times faster than conventional milling machines. Greater accuracy and a better surface finish are also achieved. This means that even tempered materials can be machined to a condition where they are largely ready to use. One essential advantage of HSM is that with systematic integration, the process chain can be significantly shortened. HSM has developed alongside EDM into one of the key technologies in mold and tool making.

EDM Electric Discharge Machines

EDM can be used to machine conductive materials of any hardness (for example steel or titanium) to an accuracy of up to one-thousandth of a millimeter with no mechanical action. By virtue of these properties, EDM is one of the key technologies in mold and tool making. There are two distinct processes – wire-cutting EDM and die-sinking EDM

Automation Tooling, Automation, Software

Tooling for fixing workpieces and tools; automation systems and system software for configuring machine tools and recording and exchanging data with the various system components.

Spindle HSM Spindle Technology

Development, production and sale of the motor spindles that form the core components of modern HSM centers. The spindles rotate at speeds between 10 000 and 60 000 rpm.

Service Services and Consumables

Service, maintenance, spare parts and consumables for EDM, milling and HSM systems as well as for other machine tools; consumables include filters, wire, graphite, copper electrodes and special resin.

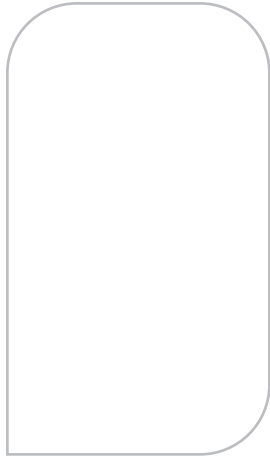
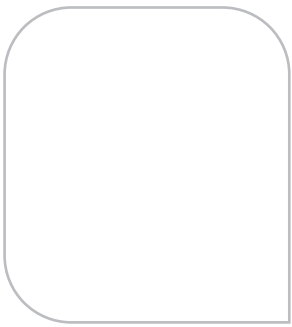
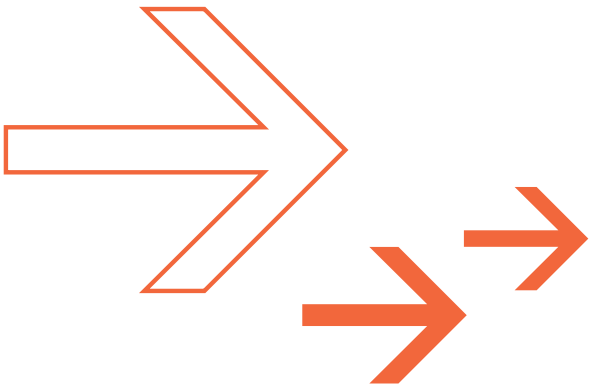
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Achieve more...



We commit ourselves to a promise. That promise is "Achieve more." It's a commitment to create the right conditions for our customers to obtain competitive results. When our customers win, we win.

**Achieve
more...**