



**MIKRON
HPM 600U
HPM 800U**



Contents

Applications	4-5	High-tech Spindles	17
Highlights	6-7	Tool Magazine	18-19
Automation	8-11	Options	20
Table Variants	14-15	smart machine	21
Chip Management	16	About GF AgieCharmilles	22

The HPM machines are intended for the universal production of high-quality parts with 3, 4 or 5 axes.

State-of-the-art motor spindles, directly driven circular and swivelling axes and stable construction provide the ideal conditions for economical and accurate machining with modern tools.



**MIKRON
HPM 600U**

**MIKRON
HPM 800U**

The machines are designed for use in the field of fully automated and simultaneous HPM (High Performance Machining).

Forging die for crankshaft

Alloyed steel for tools.

Automotive industry

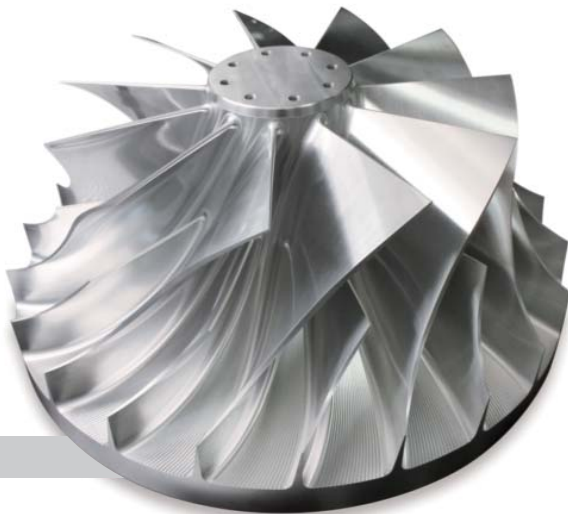
- Material that is difficult to remove
- Heavy tools
- Molding accuracy
- Outstanding machine stability
- High-performance spindles



Bevel gear wheel

**Hard machining
Gear**

- High stability and precision
- Very good surface qualities
- Absolute process consistency
- Achieved quality Q3
- Run out <math><6\mu\text{m}</math>



Impellers

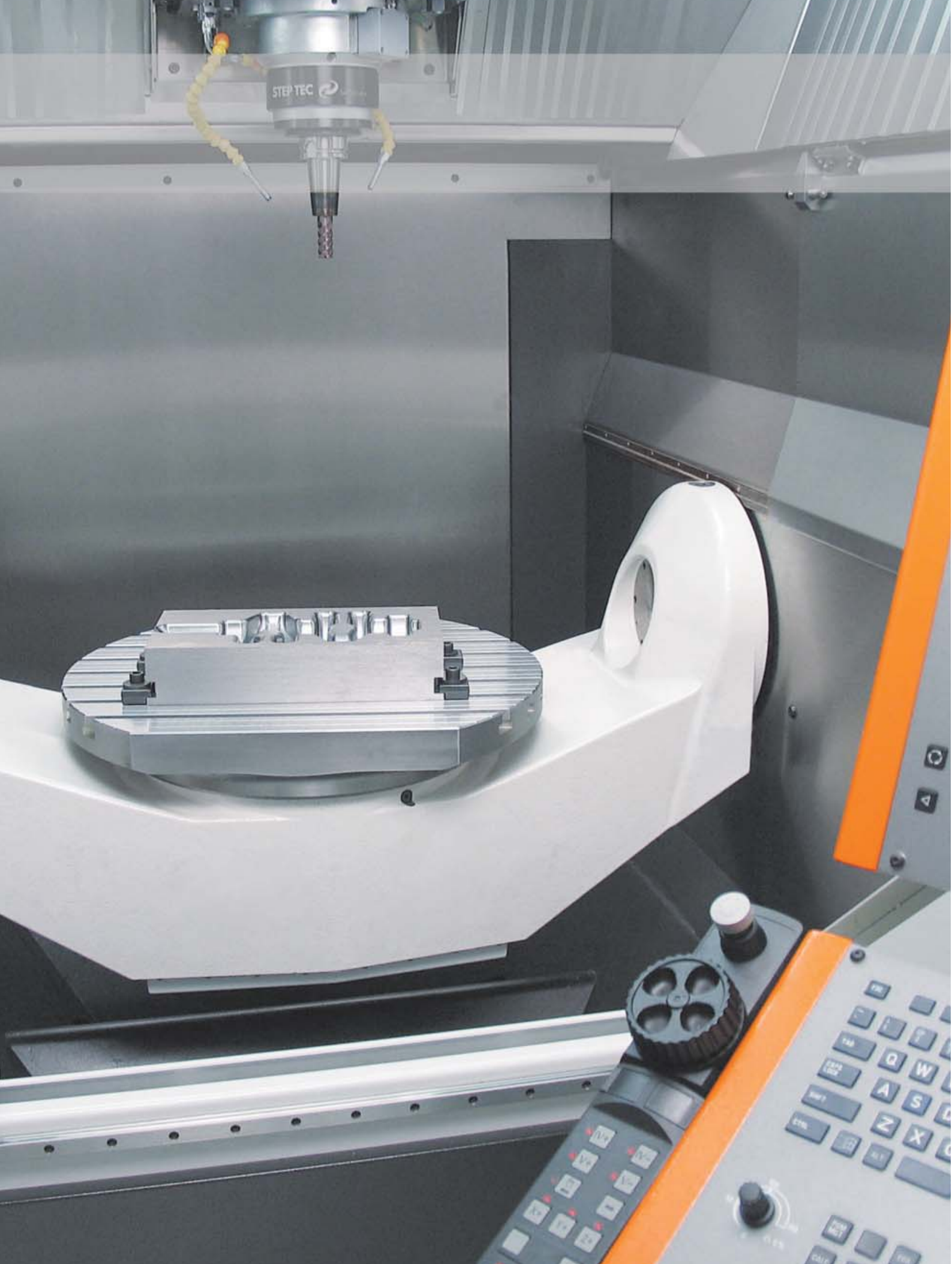
Aluminum

Power generation

- Dynamic 5 axis simultaneous processing
- Quick and efficient control
- Highly efficient at heavy roughing
- Rapid finishing operations
- \varnothing 660mm Machining time 6h20

That direct drives in the 4th and 5th axis ensure the highest possible demands on the circular swivelling axes while getting up to 500 kg are a matter of course.





Highlights

The MIKRON HPM 600U and HPM 800U can be used for anything from heavy roughing to precise finishing operations

Extremely compact construction



Other highlights

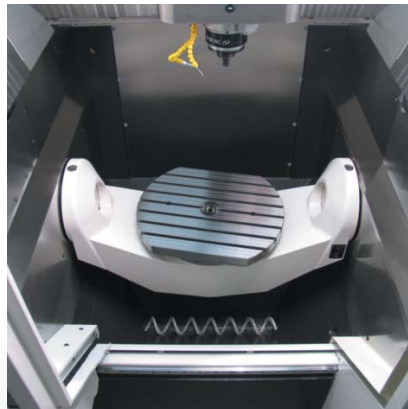
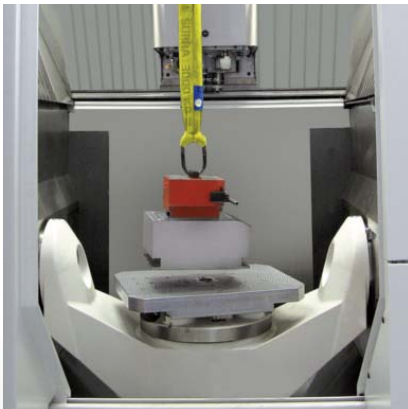
- Optimum service access to all components due to easy-to-open side casings
- Clear distinction between service and user access
- The linear measuring systems are protected against soiling through excess air pressure.



Various modules of the smart machine modular system ensure an optimum process: increased accuracy, enhanced surface quality and molding precision as well as increased safety, which is particularly important for unmanned operations.

Stability and damping

Primary prerequisites for maximum precision and best workpiece surface quality include damping and stability of the components.



Ergonomics

The doors can be opened out wide to enable unrestricted access to the working area. The viewing screen of glass offer a unrestricted view of the machining process. Whatever options the MIKRON HPM is fitted with, maximum accessibility is always ensured. The work table, pallet and tool magazine, and chip removal are easily accessible, as are the maintenance units.

Naturally, the work table can be loaded by crane.

Optimum chip management

Great attention has been paid to the flow of chips in the working area. Sharply inclining side walls direct the chips reliably into the machine bed. The chips are then transported on two spiral chip conveyors to a highly efficient ascending conveyor with a fine filter.

Outstanding accessibility

Popular with users because of their outstanding flexibility and accessibility. Smaller parts can be effortlessly loaded and secured in place by hand on the 100% simultaneously operable, rotary tilting table.



Digital Heidenhain control system

With the latest generation of the Heidenhain iTNC 530 and a clearly laid out operator desk, the MIKRON HPM 600U and HPM 800U are process-consistent and user-friendly machining centers:

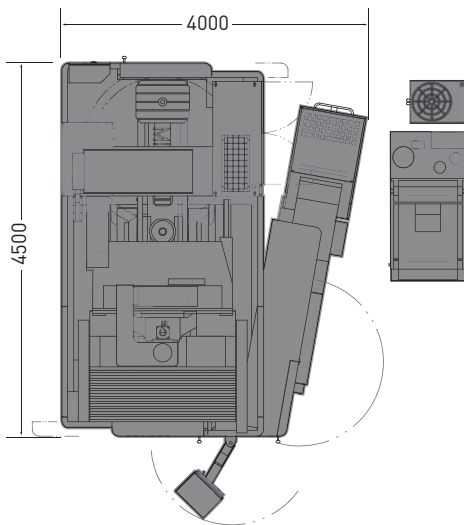
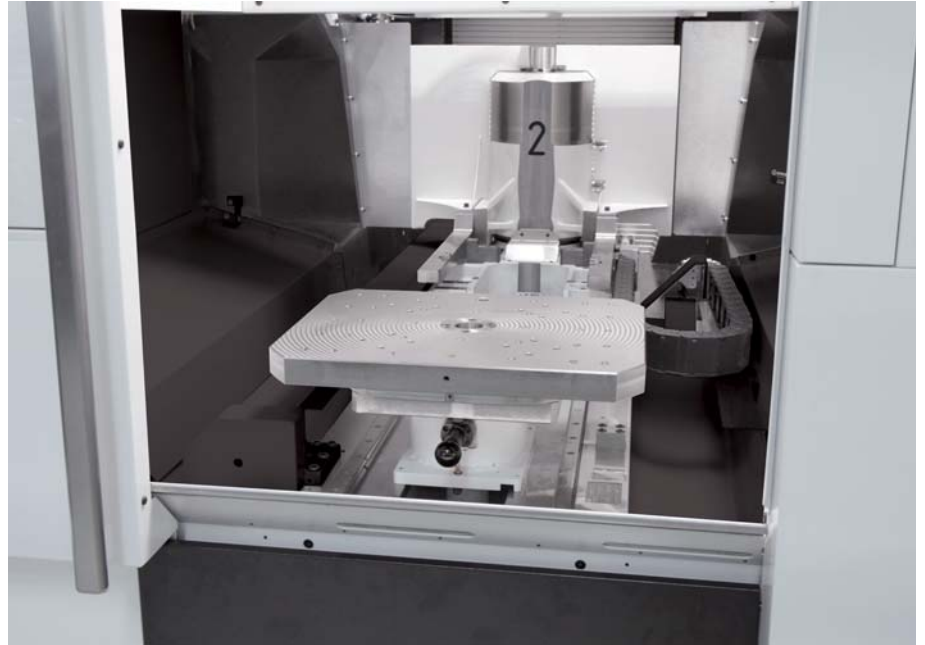
- Process consistency including rapid induction and safe operation of predefined work cycles
- Ethernet connection for rapid CAM data flow
- Easy dialog-controlled programming
- Parallel programming, unrestricted contour programming, freely definable sub-programming



Automation with pallet changer

Automated pallet handling.
The accessibility to the work piece is always ideal.

The MIKRON HPM600U and MIKRON HPM 800U machines have been designed in view of automated pallet handling. As the pallet changing system is integrated in the machine itself, the accessibility to the working room is always perfect, with or without automation.



In the loading station the raw parts will be set up on the pallet, while the machine is machining the work piece on the other pallet. This greatly increases the productivity of the machine.

With the pallet changer the unproductive set-up time will be reduced to a pallet changing time of less than 30 seconds. For overall accessibility to the parts on the pallet, the loading station can be rotated manually.

Technical data

	2 Pallets
MIKRON HPM 600U	•
MIKRON HPM 800U	•
400 x 400 mm	•
500 x 500 mm	•
500 x 630 mm	•
Loading height on pallet	500 mm
Swing circle on pallet	Ø 800 mm
Loading weight	500 kg
Time for pallet change	< 30 sec



Loading station: Very good access to the workpiece.
The pallets in the loading station can be manually rotated 360°.
Dropping coolant flows back into the machine.





Automation with pallet magazine

Automated pallet handling.
The accessibility to the work piece is always ideal.

To increase the autonomy, there are very compact pallet magazines available which can be loaded with up to 12 pallets with optimal ergonomics. With every automation solution the pallets can be loaded up to 500 kg.

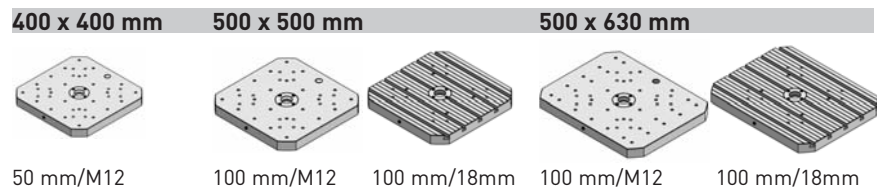
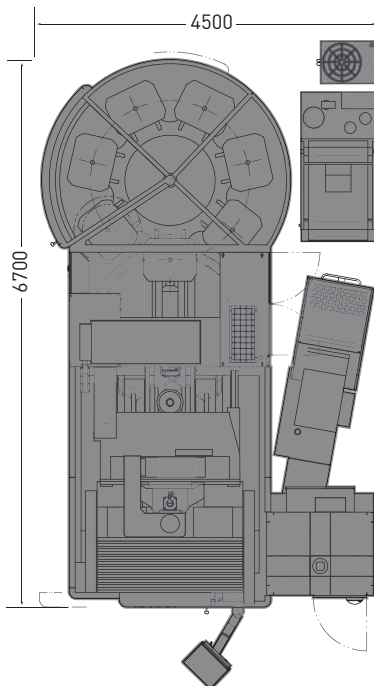
Multiple workpieces in the pallet magazine require multiple tools.

From 30 to 200 tools can be selected in different expansion stages.

The 3 pallet dimensions are available with thread holes. Additionally, the sizes 500 x 630 mm and 500 x 500 mm come with T-slots. Optionally the pallet in the loading station can be hydraulically raised in order to be rotated manually.



Workpieces can be cleaned with a wet vacuum cleaner. (Preparation)

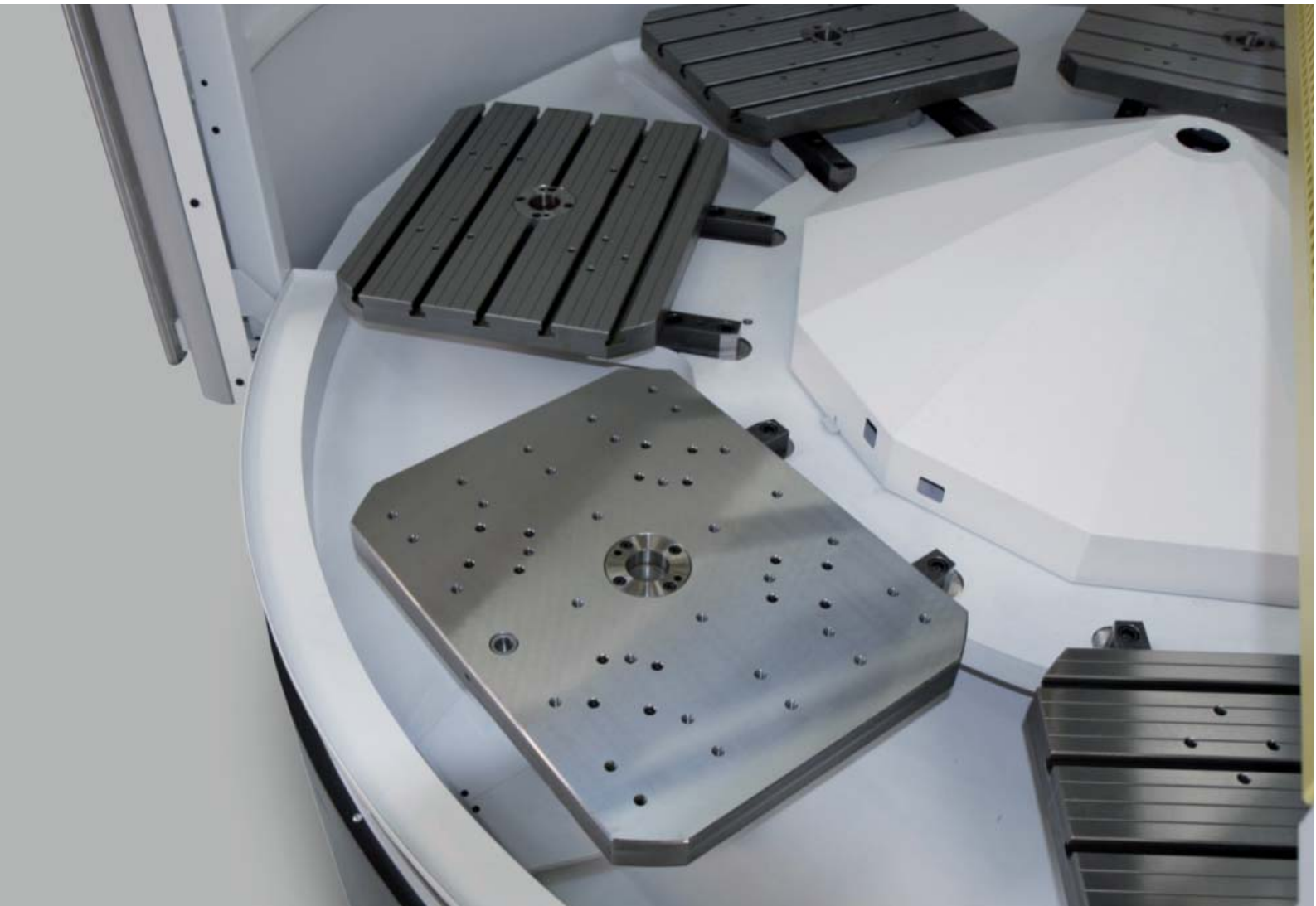
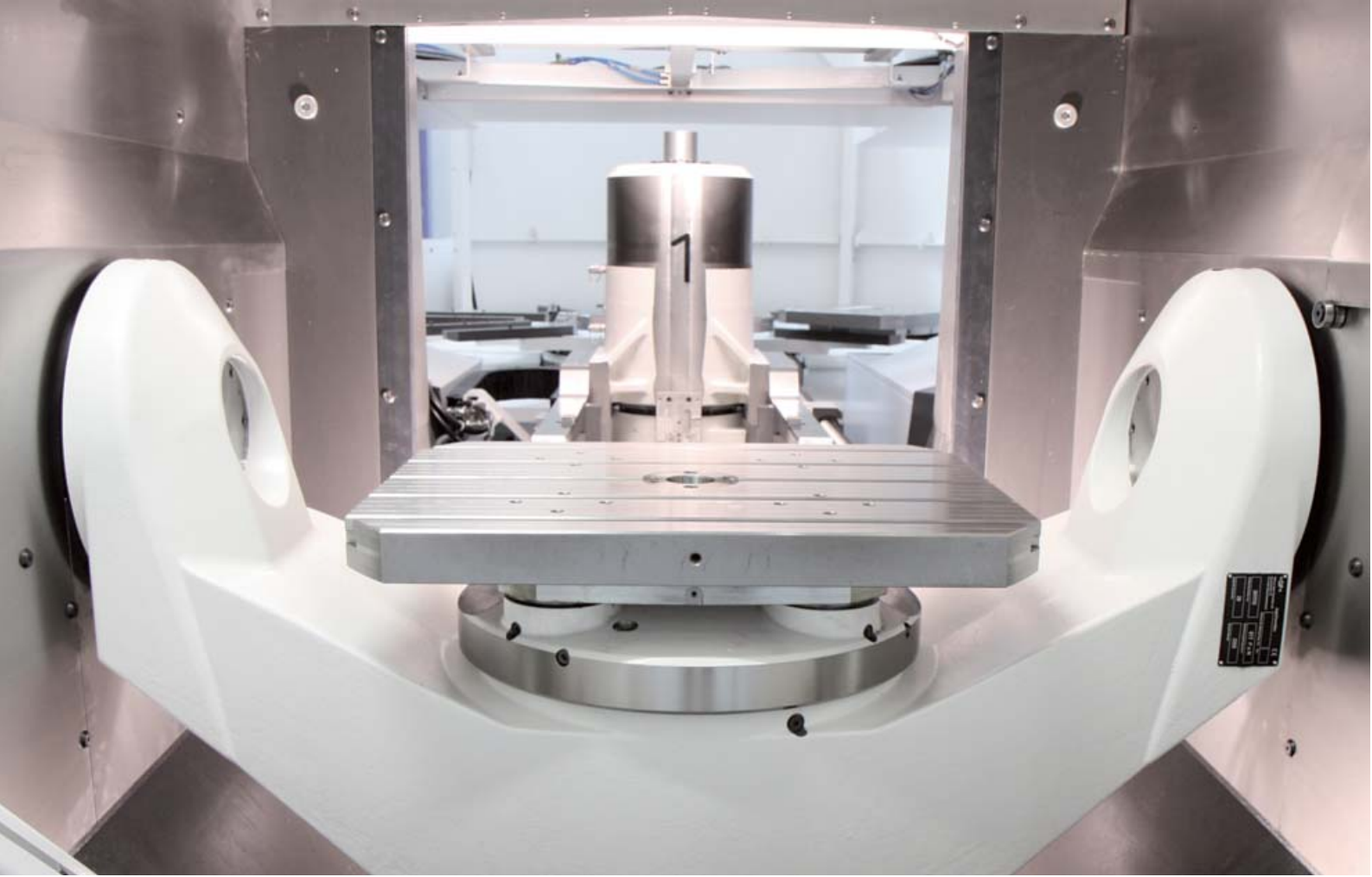


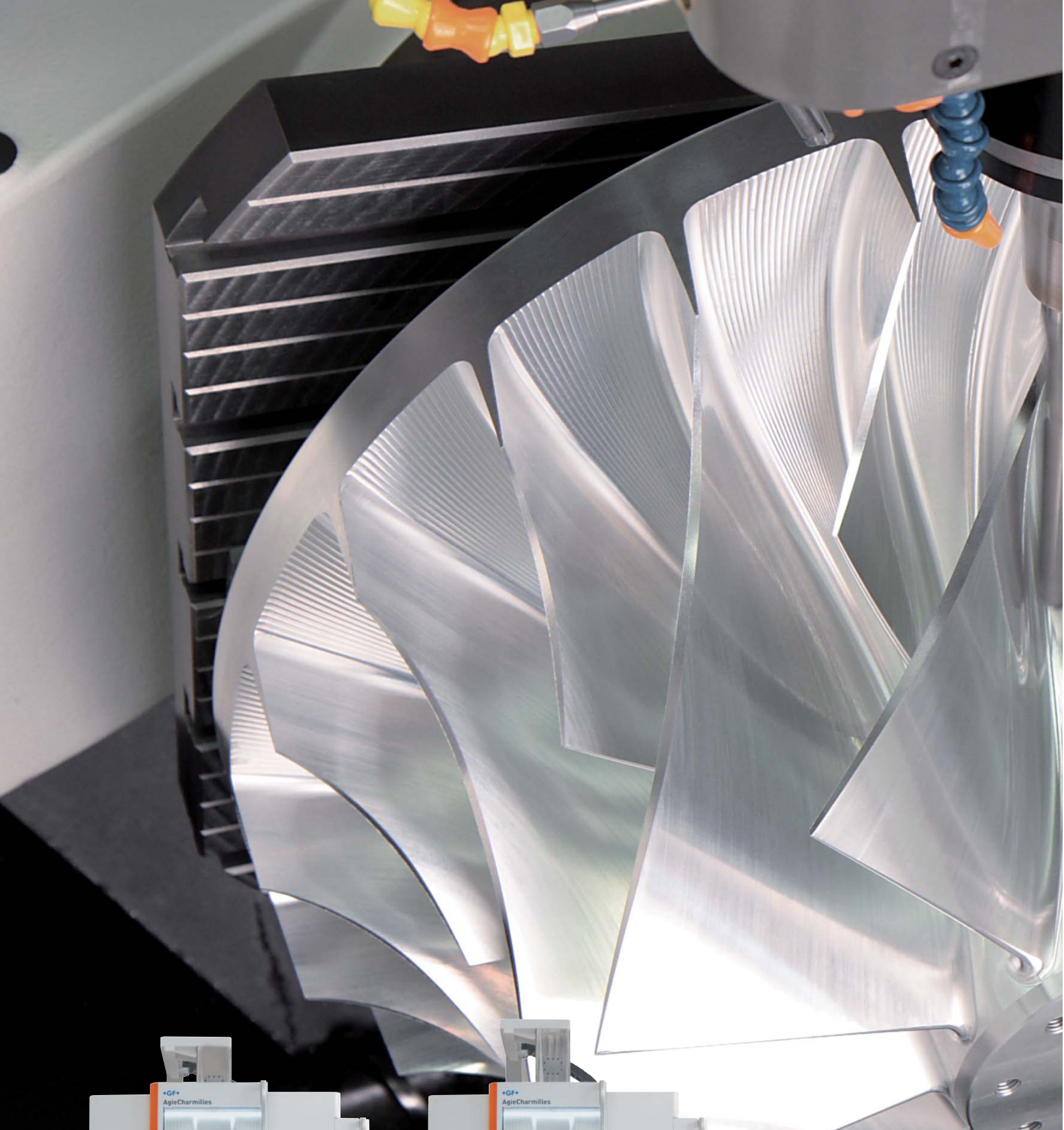
Technical data	7 Pallets	9 Pallets	12 Pallets
MIKRON HPM 600U	•	•	•
MIKRON HPM 800U	•	•	•
400 x 400 mm	•	•	•
500 x 500 mm	•	•	
500 x 630 mm	•		
Loading height on pallet	500 mm	500 mm	500 mm
Swing circle on pallet	Ø 800 mm	Ø 630 mm	Ø 500 mm
Loading weight	500 kg	500 kg	500 kg
Time for pallet change	< 30 sec	< 30 sec	< 30 sec



The Pallet changer moves through the machine.
The 7-fold pallet magazine works for all 3 pallet sizes.







MIKRON HPM 600U **MIKRON HPM 800U**

Achieve more...



**MIKRON
HPM 600U
HPM 800U**

Table variants

Four different work tables

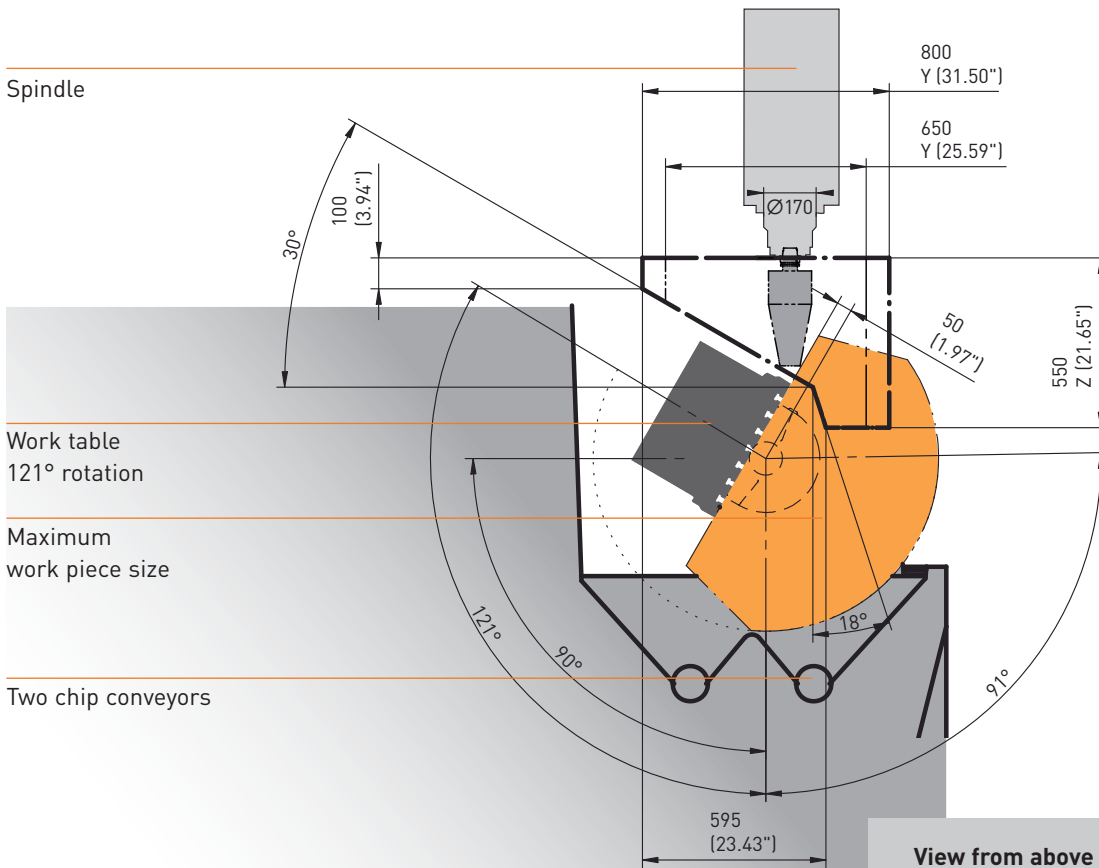
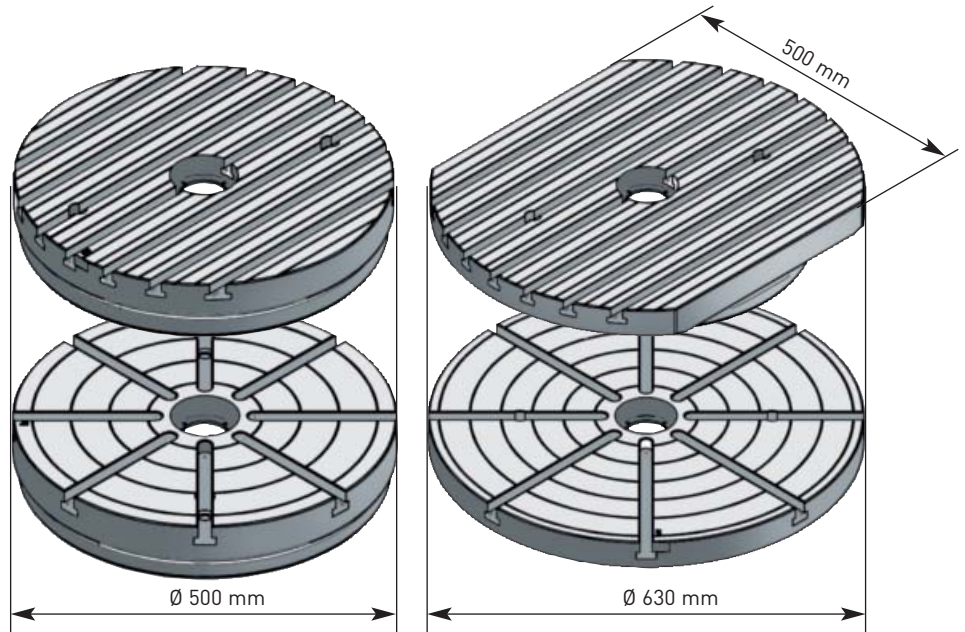
Four different work tables

Popular with users because of their outstanding flexibility and accessibility. Smaller parts can be effortlessly loaded and manually secured in place on the 100% simultaneously operable, circular swivelling table.

Highlights

- Direct and easily accessible measuring systems
- A and C axis with water-cooled direct drives
- A axis has clamps on both sides
- C axis with clamps
- Loads:

Vertical	800 kg (3 axis oper.)
Simultaneous	500 kg (5 axis oper.)



View from above into the working area of the MIKRON HPM 800U.





Chip management

...and unrestricted access to the working area



Optimum chip clearance due to steep, smooth cabin walls

Washer jets in all four corners prevent chip accumulation



Two chip conveyors for large chip volumes

High-performance chip conveyor



Practical chip cart



Machines with chip conveyor and band filter (optional) form a compact unit



Hightech Spindles

Tool spindles for demanding machining

Whichever machine configuration you choose, with a MIKRON HPM you get the most state-of-the-art 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.

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.



smart
machine

smart machine APS (Advanced Processing System) for reliable measuring and display of milling vibrations and ITC (Intelligent Thermal Control) for higher workpiece precision.



20,000 min⁻¹ / HSK-A63

- Precise high performance for use in the HPC field
- Available with or without internal coolant supply
- Compressed air blow through spindle
- Spindle module and motor replaceable separately

28000 min⁻¹ / HSK-A63

This spindle has a water cooled rotor shaft (CoolCore) which stabilizes the temperature and consequently the expansion in the rotor shaft. This feature allows very accurate machining, because it minimizes thermal influences of the spindle.

Through tool coolant is an available option.

All tools visible

Tools are visible through a window on the front of the magazine. Damaged tools can be quickly identified and replaced. If tools are required on other machines, you can see straight away where each tool is.

Smooth and swift

The magazine chain (60 tools) is moved and positioned by a controlled drive. The tools therefore glide swiftly and smoothly to the changing position. This means that tools can be made available much more quickly. Vibrations that could have a negative impact on the milling process are also prevented.



HSK A63

- 80/140 mm diameter
Fully engaged/partially engaged
- Max. length 350 mm

Tools that are placed back in the tool magazine after the machining process are often coated with chips and emulsion. The residues collect on the magazine floor. This can be folded down for easy cleaning.



30 tools



115, 165 or
210 tools



245 tools

Tool magazine for 60 tools.
Simultaneous access to approx. 10 tool bags accelerates the rate at which tools are supplied





Options

The MIKRON HPM 600U and the MIKRON HPM 800U are geared up for a multitude of options. They can be simply and optimally configured



Infrared touch probe



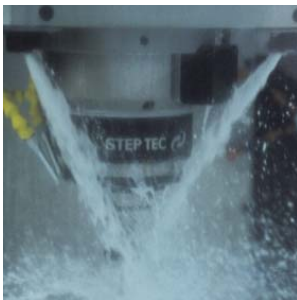
Laser measuring system



Minimum quantity cooling lubrication



Trough-spindle cooling



External coolant supply



Flushing nozzles system



Rinsing pistol



Band filter system



Mist extraction



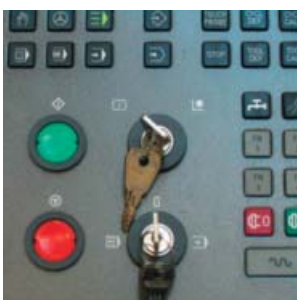
Automatic cabin roof



Rotating viewing window



Signal light



Operating mode 3+4



smart machine

smart machine

The new dimension in modern production

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.



Protection



Precision



Productivity

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.

Laser

Laser ablation

Laser ablation supplements and extends the technologies offered by GF AgieCharmilles. With our laser technology we enable you to produce texturizing, engraving, microstructuring, marking and labeling of 2D geometries right through to complex 3D geometries. Laser ablation, compared to conventional surface treatment using manual etching processes, offers economic, ecological and design advantages.

Customer Services

Operations, Machine and Business Support

Customer Services provides with three levels of support all kind of services for GF AgieCharmilles machines.

Operations Support offers the complete range of original wear parts and certified consumables including wires, filters, electrodes, resin and many other materials.

Machine Support contains all services connected with spare parts, technical support and preventive services.

Business Support offers business solutions tailored to the customer's specific needs.

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.

Contact

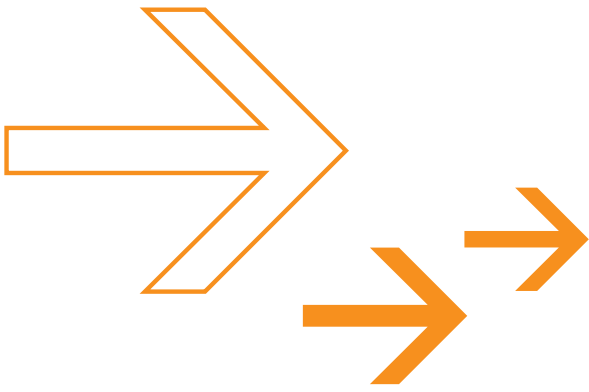
www.gfac.com

+GF+

AgieCharmilles

© Mikron Agie Charmilles AG, 2010
The technical data and illustrations are not binding.
They are not warranted characteristics and are subject to change.

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...