GF Machining Solutions

Mikron

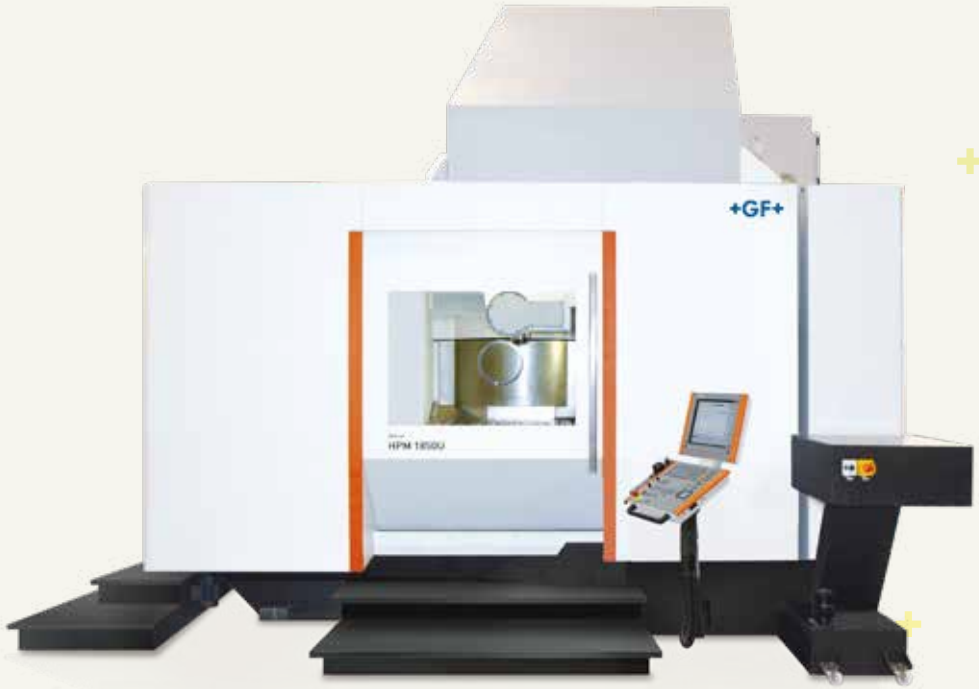
HPM 1850U

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, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies, help you raise your game and increase your competitive edge.

Passion for Precision

Contents



GF Machining Solutions

The Mikron HPM 1850U is designed for universal production of high quality parts.

The very latest Swiss motor driven spindles, directly-driven circular and swivel axes and a stable machine body offer the very best conditions to manufacture modern tools economically and precisely.

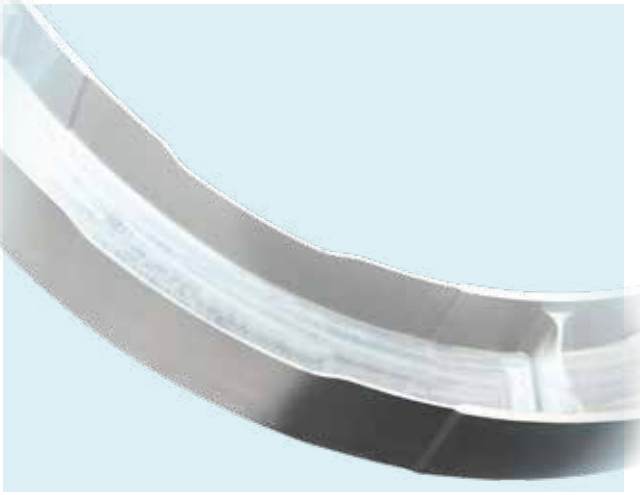
Applications

Mikron HPM 1850U used for a broad spectrum of parts ...

Turbines and compressor discs

Extreme high temperature resistant tough steels
Aerospace

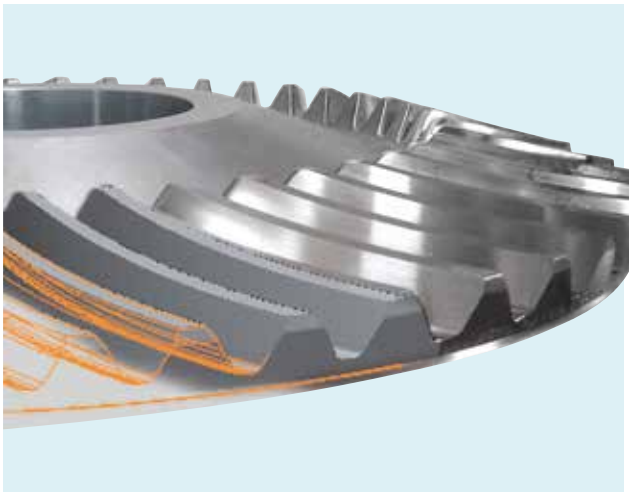
+ High stability and precision
+ Very good surface quality
+ Absolute process security



An aircraft structural part

Aerospace

+ Good surface qualities obtained, also for simultaneous machining
+ High machining performance
+ Machining all around the workpiece thanks to the large swivelling range



Bevel gear wheel

Hard machining
Transmission

+ High stability and precision
+ Very good surface quality
+ Absolute process security
+ Quality achieved: Q3

Compact design, good accessibility, large axial travels: Mikron HPM 1850U

Highlights

Mikron HPM 1850U
Efficient rough as well as precise finish machining

The pallet can be turned manually to offer optimal access to the workpiece

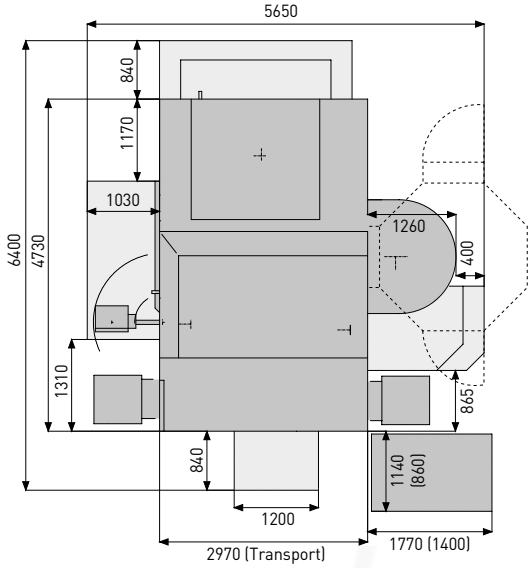
A pallet magazine for workpieces up to 1750 kg in weight

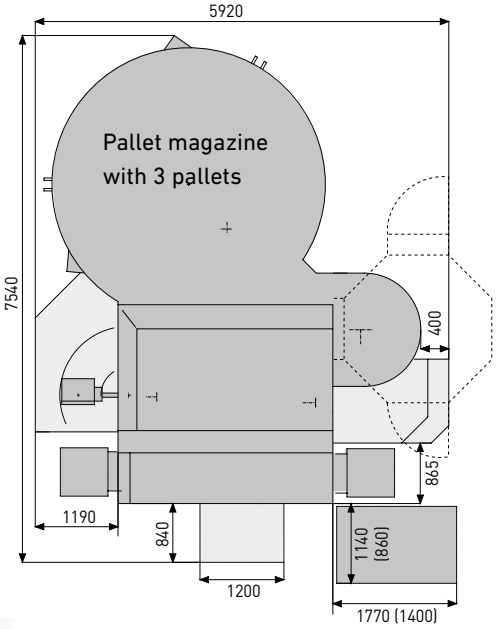
The B and C axes can be clamped together for rough machining.
Increased tool life.

Two loading stations.
The pallets can be lowered hydraulically to a comfortable working height for loading and unloading.
There is no platform.
This means that the machine takes up less floor space.

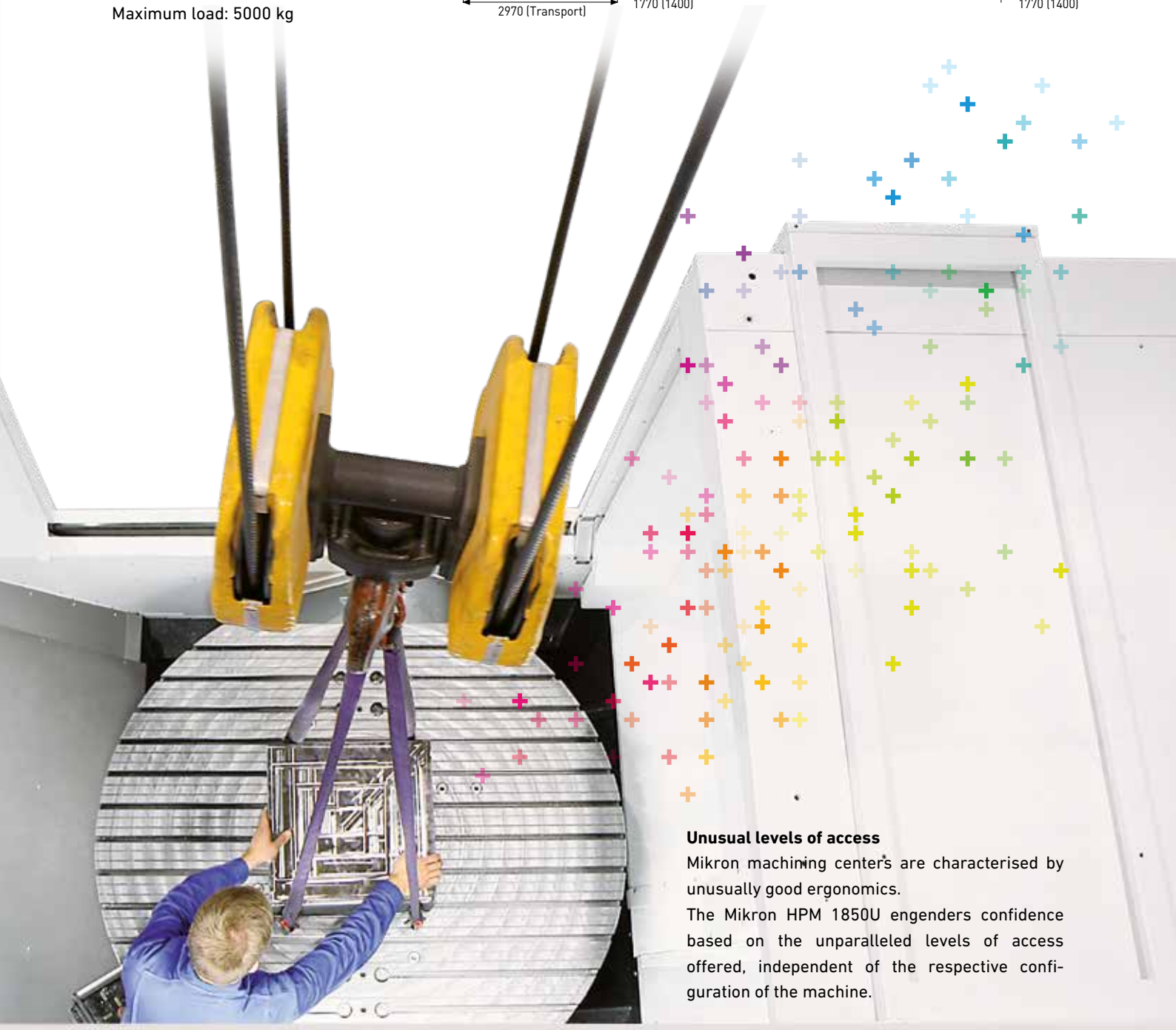
A one-piece machine bed made out of a casting

APS, APS extended, ITC, Adaptive Control.
These and further smart machine modules guarantee even more flexibility and process security for the production of high quality components.





View from above onto the rotary table of the Mikron HPM 1850U.
Maximum load: 5000 kg



Unusual levels of access

Mikron machining centers are characterised by unusually good ergonomics.

The Mikron HPM 1850U engenders confidence based on the unparalleled levels of access offered, independent of the respective configuration of the machine.

Working space

Mikron HPM 1850U without pallet magazine

Mikron HPM 1850U with pallet magazine

With or without pallet magazine:

+ Loading by crane and access to the workpiece are optimal
+ Perfect dropping away of the chips due to the steep smooth cabin walls

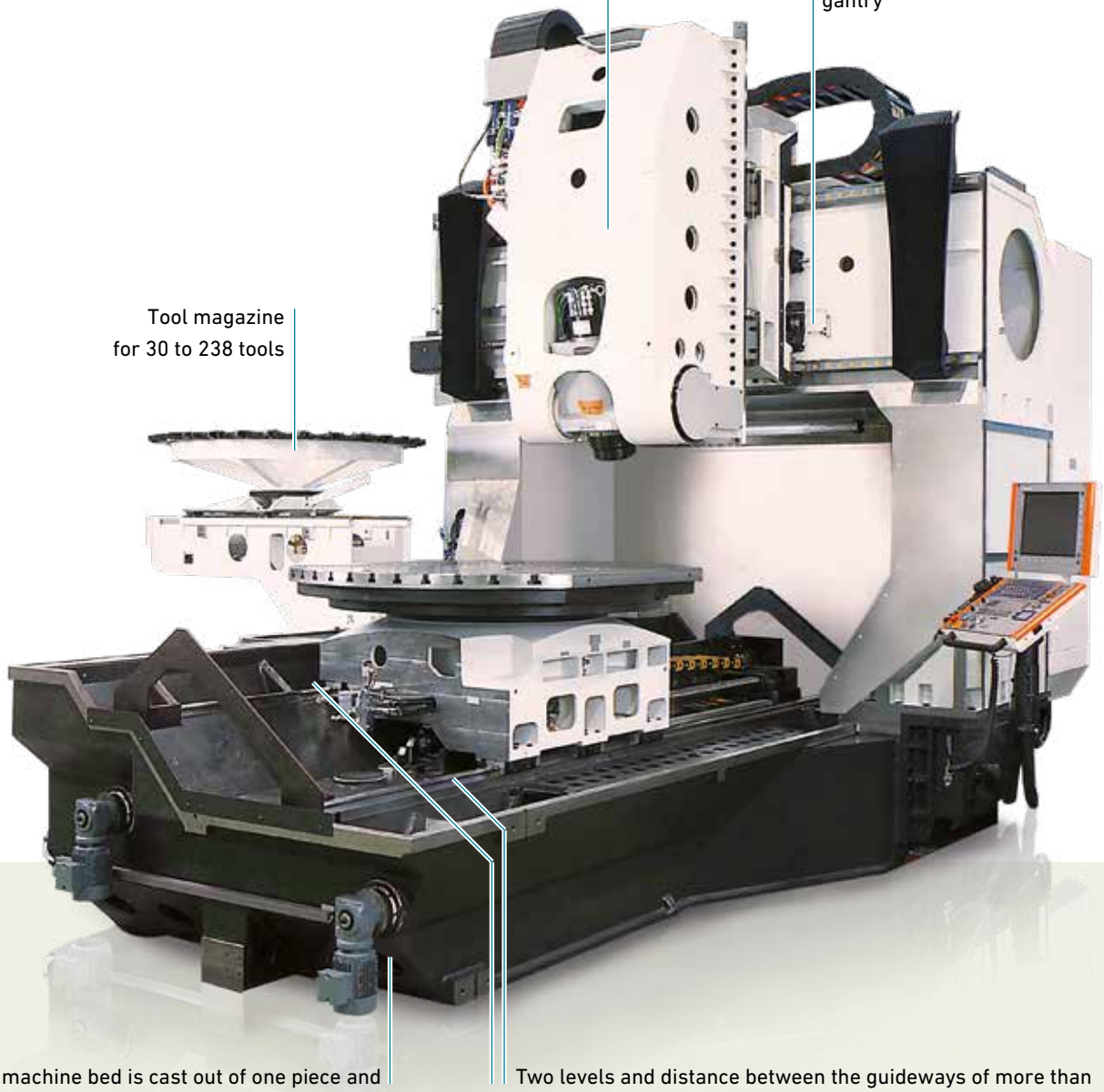
The basic machine

A thought-through basic design for maximum rigidity

A new-type of construction of the Z-axis. 300 kg lighter than a comparable axis made out of a casting for the same stability and even better vibration damping.

Low temperature influences due to the interconnected mechanical gantry

Tool magazine for 30 to 238 tools



The machine bed is cast out of one piece and stands on 3 main feet.
This leads to a shorter start-up time.

Two levels and distance between the guideways of more than 800 mm in the X-axis guarantees absolute torsional rigidity and stability during rough machining.
This particularly plays a role when heavy workpieces cannot be clamped centrally on the rotary table and these are turned.

High tech spindle

Constant machining in the HPC area

Tool spindles for demanding machining operations

Whatever machine configuration you choose you will always obtain the latest tool spindles with your Mikron HPM machine.

+ **A high torque**
  15'000 min^{-1} HSK-A63
  10'000 min^{-1} HSK-A100
  The ideal spindle for universal use
+ **For high spindle speeds**
  24'000 min^{-1} HSK-A63
  An oil-air lubrication system with suction removal of the used oil.
  Optimal for machining materials which should be machined at the highest cutting speeds or for tools with a small diameter.

The facts

+ Vector regulation for the obtaining maximum torque in the lowest rotational speed range
+ A highly stable ceramic-hybrid spindle bearing system
+ Spindle jacket cooling by means of a regulated coolant circuit for constant temperatures during the whole operating period
+ Integrated “smart machine” sensors

Your benefits

+ The highest levels of precision and a high machining performance
+ Shorter acceleration phases
+ A high torque at lower rotational speeds
+ Thread cutting without a compensating chuck

Step-Tec

Since 1995 the Swiss company Step-Tec has developed, manufactured, sold and repaired motor-driven spindles for leading manufacturers of machining centers for milling and drilling applications.
Step-Tec is in a position to manufacture rapidly running and at the same time, very precise high performance spindles with an integrated motor. The machining times for obtaining optimal quality have been drastically reduced using these high quality motor-driven spindles.

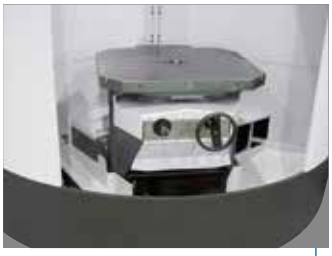
The scope of delivery includes the smart machine module APS (Advanced Processing System) for reliable recording and display of vibrations produced during the milling process.

Universal production of high quality parts

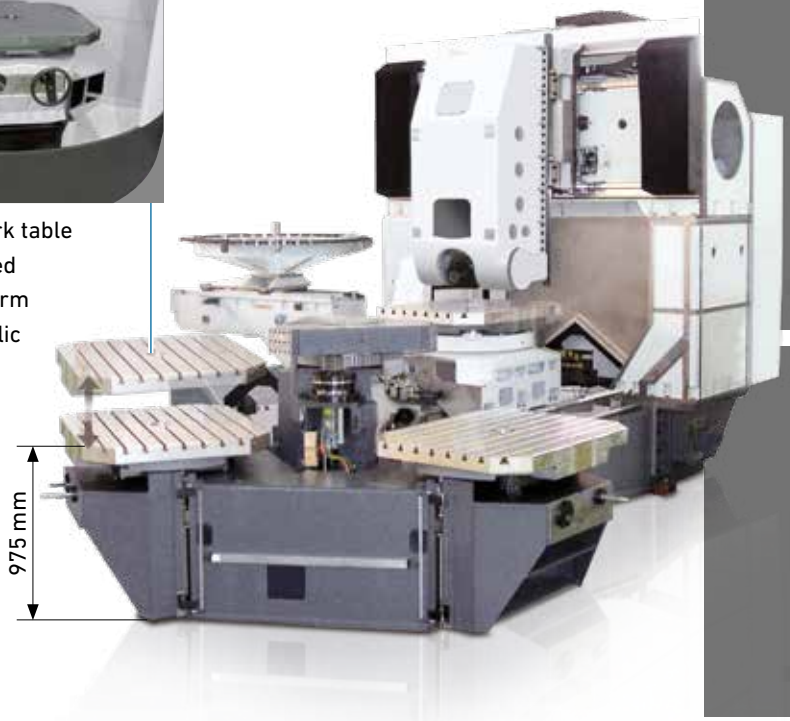
935 mm
750 mm
1400 mm

Pallet magazine

Economic efficiency and flexibility The pallet magazine and the tool m minimum space



The normal work table height is reached without a platform through hydraulic lowering.



Flexibility
Special parts can be clamped on and prepared during the main operating time, also during series production.

Automated machines can be kept in continual use, also when only one shift is being worked in the production area. A significantly longer running time per day is possible in this way compared to a machine without a pallet magazine.

Ergonomics

+ The pallets in the 2 equipping places are lowered hydraulically to a height which is comfortable for the operator
+ The lifting and lowering movements of the pallets are very well absorbed vibrations and do not disturb the milling process
+ The pallets can be turned manually within the two equipping places 360° and locked in position 8x (45°)
+ There is no need for a platform
+ A space-saving design
+ No additional steps or gratings
+ Optimal working conditions for the operator

Tool magazine

through automation:
agazine in various sizes needing

2100 mm

HSK-A100: 170 tools

HSK-A63: 238 tools

Floor space requirements: 3.8 m²

Tailor-made solutions for your production requirements

User-friendly equipping with tools leads to productivity and process security

+ Simultaneous machining and equipping
+ Simple manipulation
+ Ergonomic access

HSK-A100: 30 tools

HSK-A63: 45 tools

HSK-A63: 120 tools

Floor space requirements: 1.5 m²

Options

Our machines are prepared for a large number of options

Touch probe radio RMP 60

Laser tool measurement

Minimum quantity lubrication and cooling

Internal tool cooling

A rotating viewing window

Suction removal of mist

A belt filter plant

Operating modes 3+4

Tool magazine
HSK-A100: 30 tools
HSK-A63: 45 tools

Tool magazine
HSK-A63: 120 tools

Tool magazine
HSK-A100: 170 tools
HSK-A63: 238 tools

APS
CAMplete
Econowatt
SIGMA FMC
ITC
ITC 5X
ITM
OSS
OSS extended
OSS extreme
PFP
RNS

smart machine Module

HEIDENHAIN

Control unit HEIDENHAIN

SIEMENS

Control unit SIEMENS

smart machine

The new dimension in modern production

Saving energy

Protection

Precision

Productivity

The smart machine is constantly being further developed. The currently available modules can be found at www.gfms.com

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.

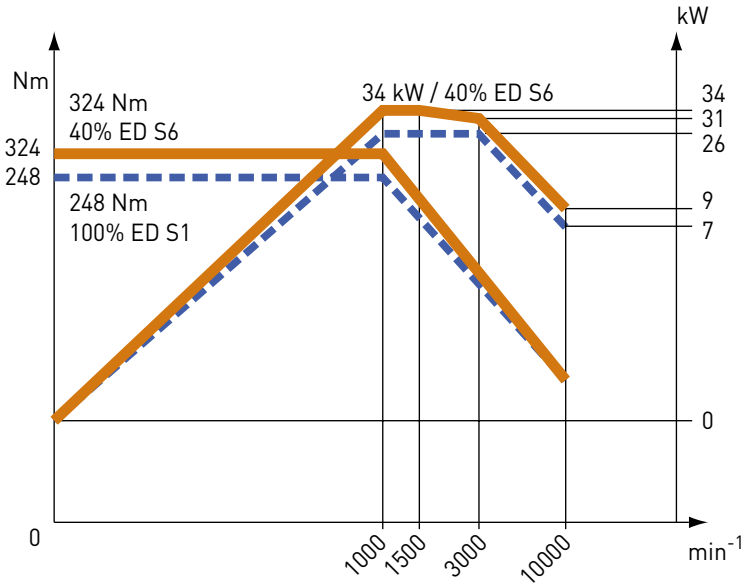
Your benefit

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.

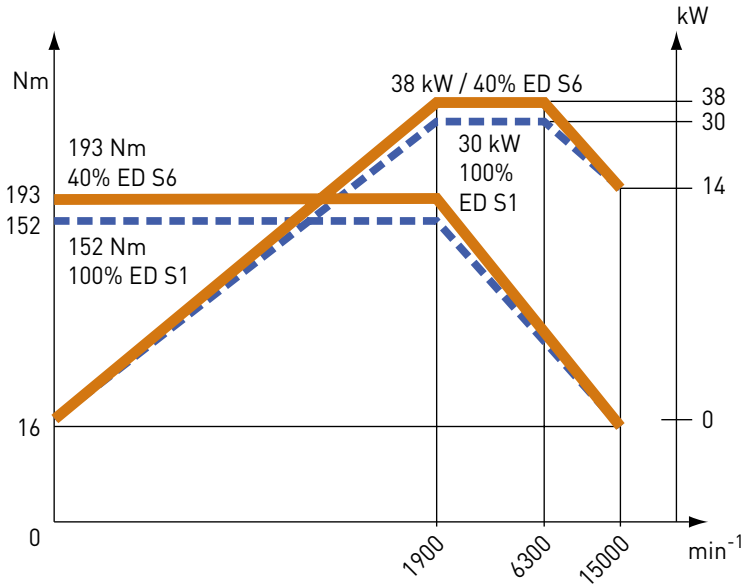
Technical data

			Mikron HPM 1850U
Working range			
Longitudinal	X	mm	1850
Cross	Y	mm	1400
Vertical	Z	mm	720 / 905
A-axis		°	-20 / +120 (110)
C-axis		°	n x 360
Number of simultaneous axis	pce.		5 axis / 5 simultaneous
Feed rate			
Feed rate / Rapid traverse	X, Y	m/min	15 / 40
Feed rate / Rapid traverse	Z	m/min	15 / 40
Feed rate / Rapid traverse	B	min^{-1}	11 / 20
Feed rate / Rapid traverse	C	min^{-1}	30
Working spindle			
Working spindle 10`000	Spindle power 40% ED	kW	34
HSK-A100	Spindle torque 40% ED	Nm	324
Working spindle 15`000	Spindle power 40% ED	kW	38
HSK-A63	Spindle torque 40% ED	Nm	193
Working spindle 24`000	Spindle power 40% ED	kW	30
HSK-A63	Spindle torque 40% ED	Nm	75
Accuracy XYZ ISO 230-2(97)			
Accuracy	A	µm	10 / 8 / 6
Repeatability	R +/-	µm	6 / 5 / 4
Work table			
Clamping surface		Ø mm	1600
Max. workpiece weight		kg	5000
Automation			
Pallet magazine		Positions	3
Pallet size		mm x mm	1000 x 1250
Tool magazine	HSK-A63	Positions	45, 120, 238
	HSK-A100	Positions	30, 170
Control unit			
Heidenhain			iTNC 530
Siemens			840 D
Weight			
Machine weight		kg	25`000 - 31'500
smart machine			
			APS, APS extended, Adaptive control, ITC
Ancillary services			
Programming courses			+
Technology courses			+
Service training courses			+

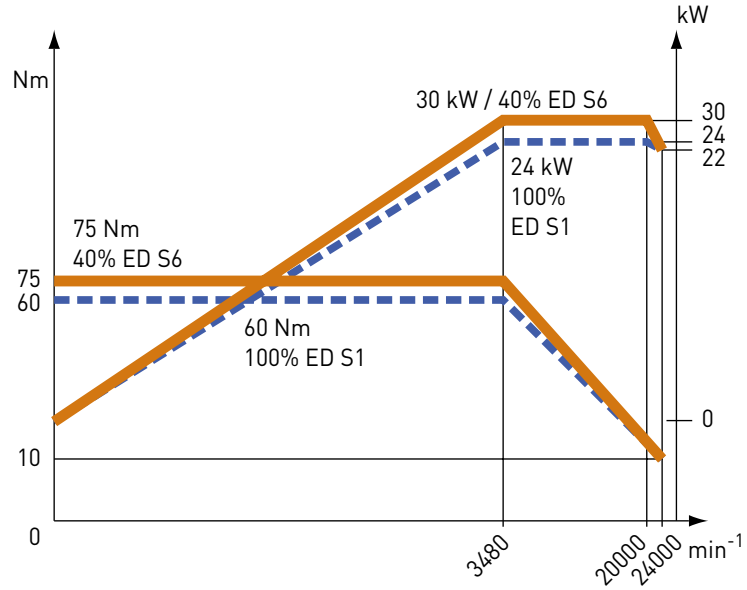
Mikron HPM 1850U



HPM 1850U
HSK-A100 / 10'000 min^{-1}

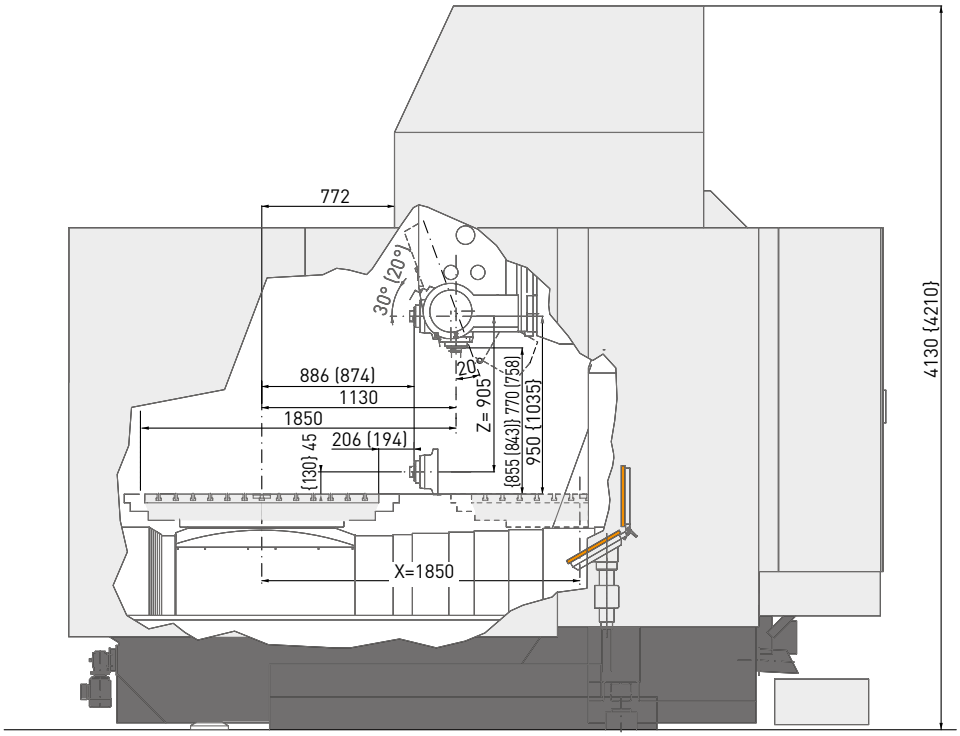


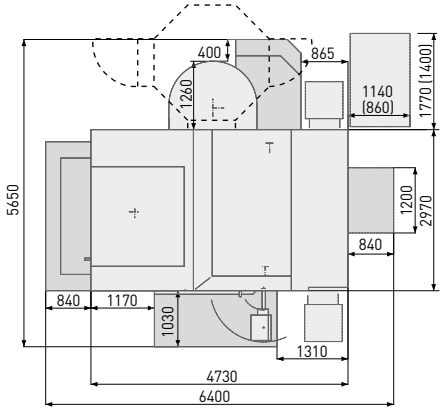
HPM 1850U
HSK-A63 / ISO-B40 / 15'000 min^{-1}

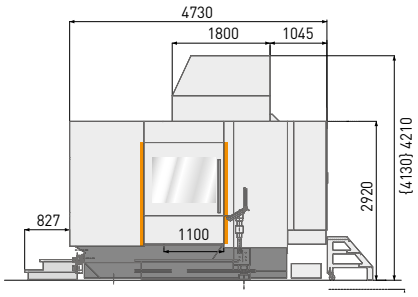


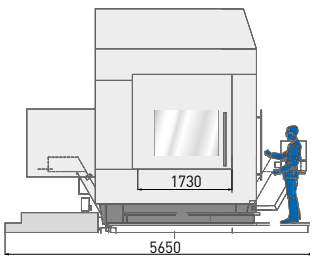
HPM 1850U
HSK-A63 / 24'000 min^{-1}

HPM 1850U without Pallet magazine
HSK-A63 (HSK-A100) {with increased through}

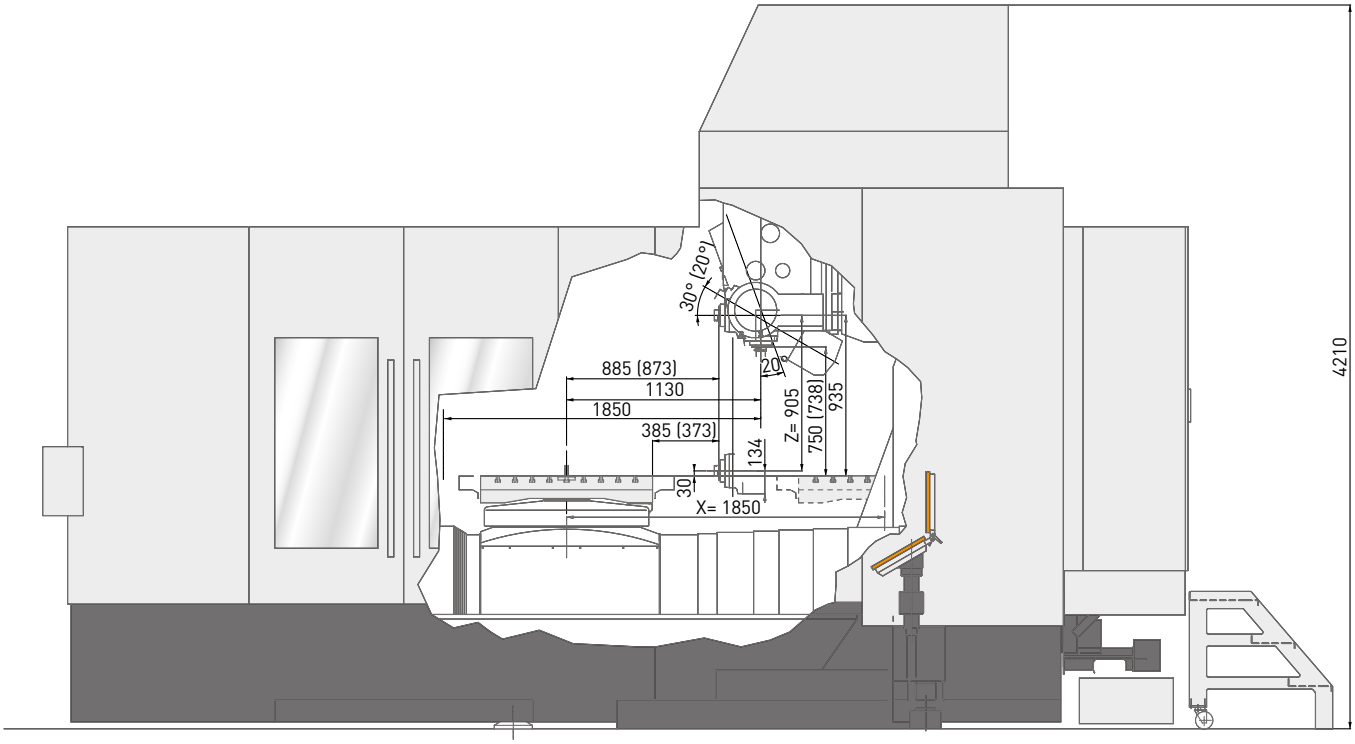


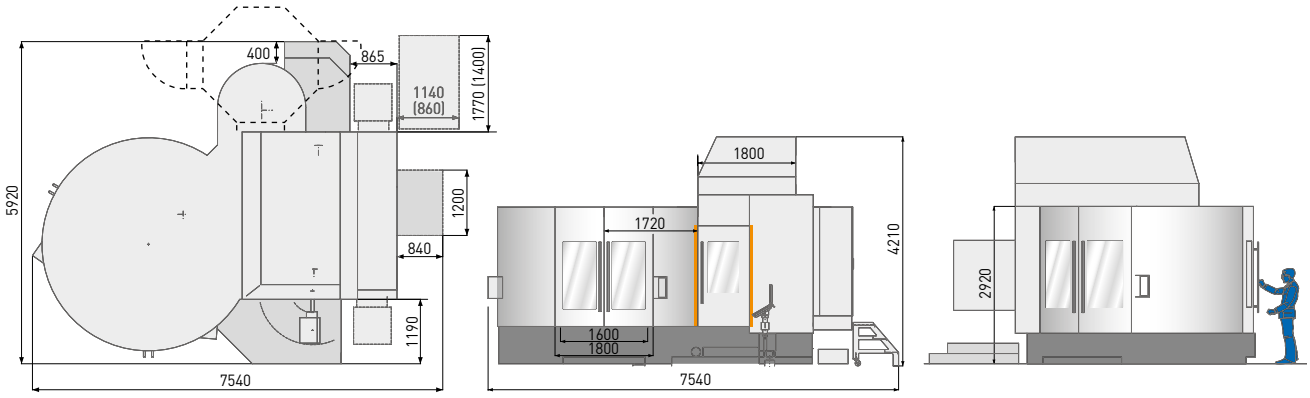






HPM 1850U with Pallet magazine
HSK-A63 (HSK-A100)





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.

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.

Milling

Mikron MILL S (high-speed Milling), Mikron MILL P (high-performance Milling) and Mikron MILL E (high-efficiency Milling)

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 MILL S, Mikron MILL P and Mikron MILL E 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.

Step-Tec Spindles

At the heart of every GF Mikron machining center is high-performance Step-Tec Spindle. Step-Tec Spindles are essential core components of our machining centers. Highly accurate and thermally stable Step-Tec Spindles ensure that our machines can handle everything from heavy-duty roughing to fine-finishing operations.

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.

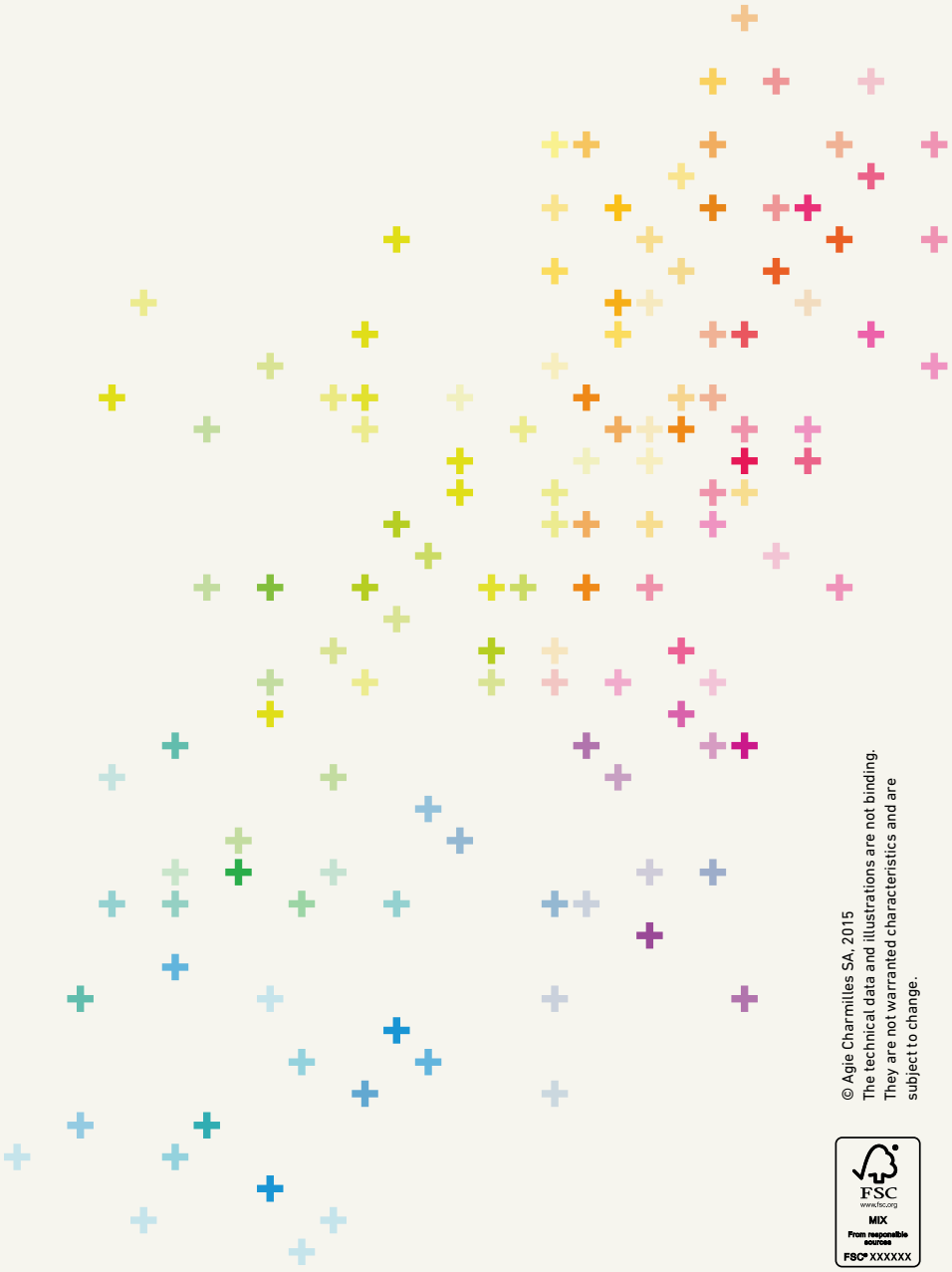
GF Machining Solutions

259.805.852

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



+GF+