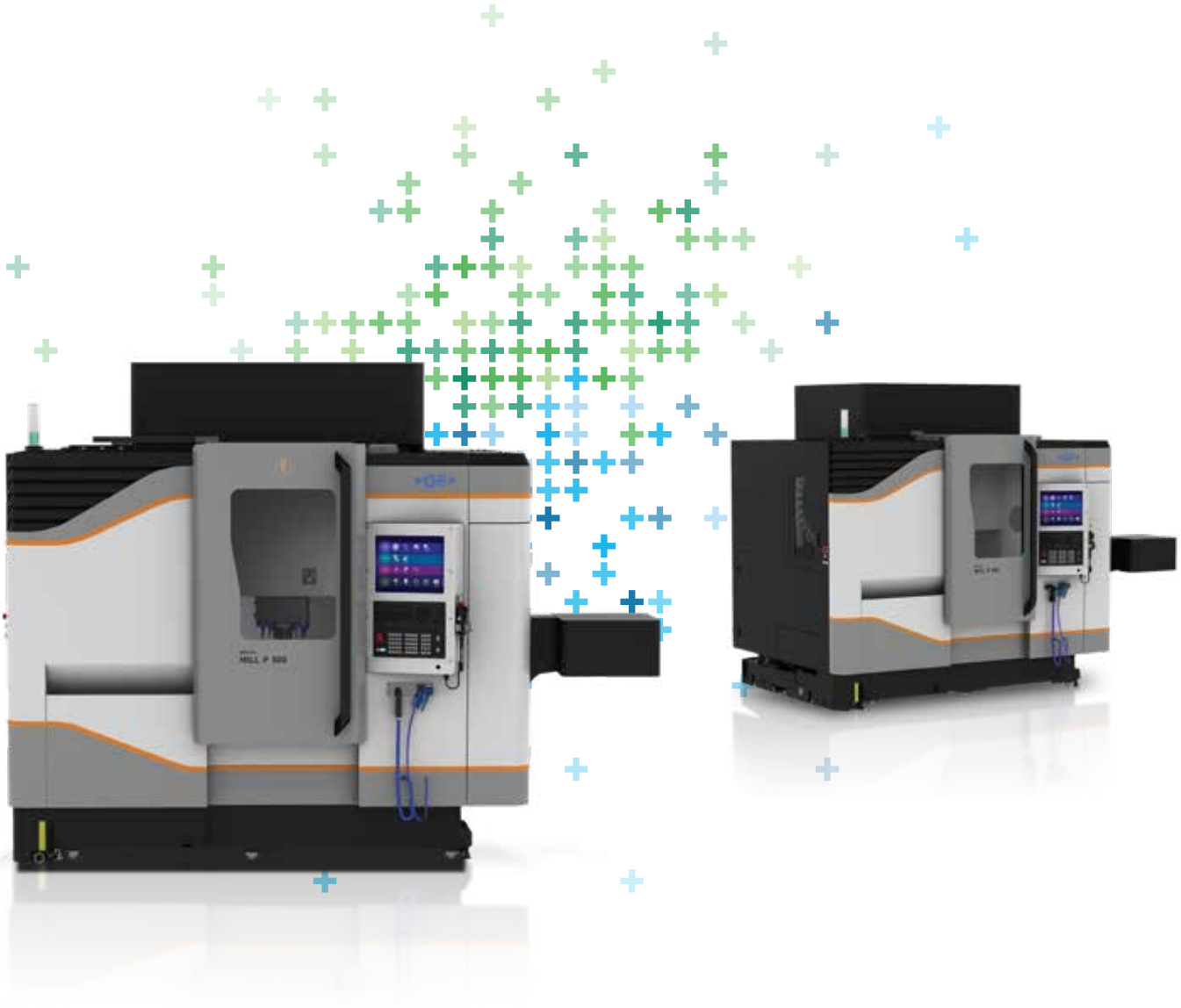
GF Machining Solutions

Mikron

MILL P

500



Passion for Precision

GF Machining Solutions
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 unmatched Electrical Discharge Machining (EDM), Laser texturing, Laser micromachining, Additive Manufacturing and first-class Milling and Spindles to Tooling and Automation, all of our solutions are backed by unrivaled Customer Services and expert GF Machining Solutions training. Our AgieCharmilles, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies help you raise your game—and our digital business solutions for intelligent manufacturing, offering embedded expertise and optimized production processes across all industries, increase your competitive edge.

We are Mikron Mill.
We are GF Machining Solutions.

Contents

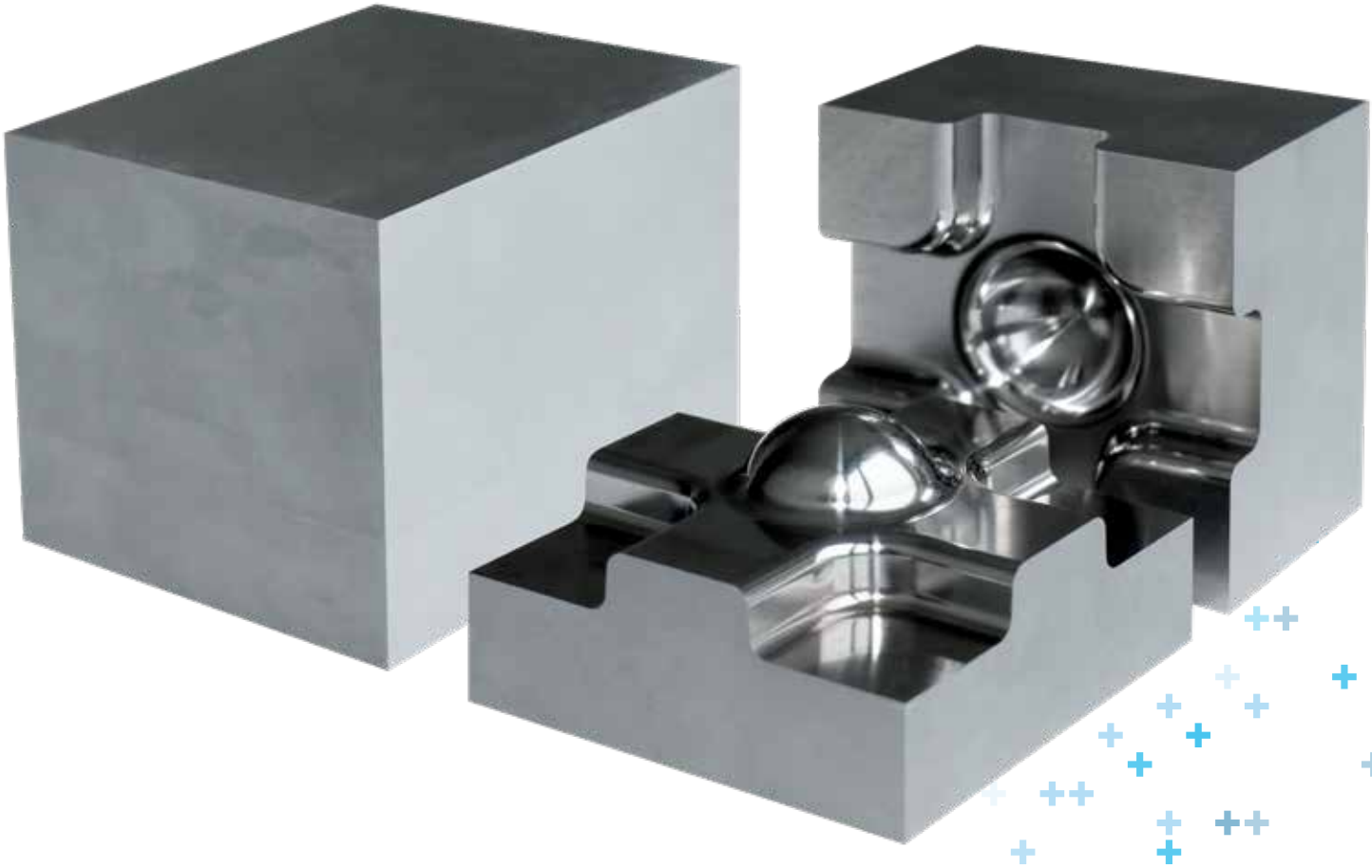
Market segments and applications

Precision and reliability for mold & die applications

The vertical, three-axis Mikron MILL P 500 delivers performance you can count on for every job, every time. It's designed for automation and built around a robust, symmetrical bridge-type structure with an internal cooling system. Its superior dynamics, ideal axis ratio, high accuracy and exceptional stability offer an affordable way to achieve the highest part quality and throughput. The MILL P 500 is particularly well-suited for mold and die applications in the information and communications technology (ICT), electronics, medical packaging and automotive industry sectors.

High performance, uncompromising process security

+ Long-term stability and precision (± 4 µm)
+ Faster finishing operations - Ra 0.02 µm
+ Higher dynamics and greater speeds
+ Automation-ready design for 24/7 unattended machining



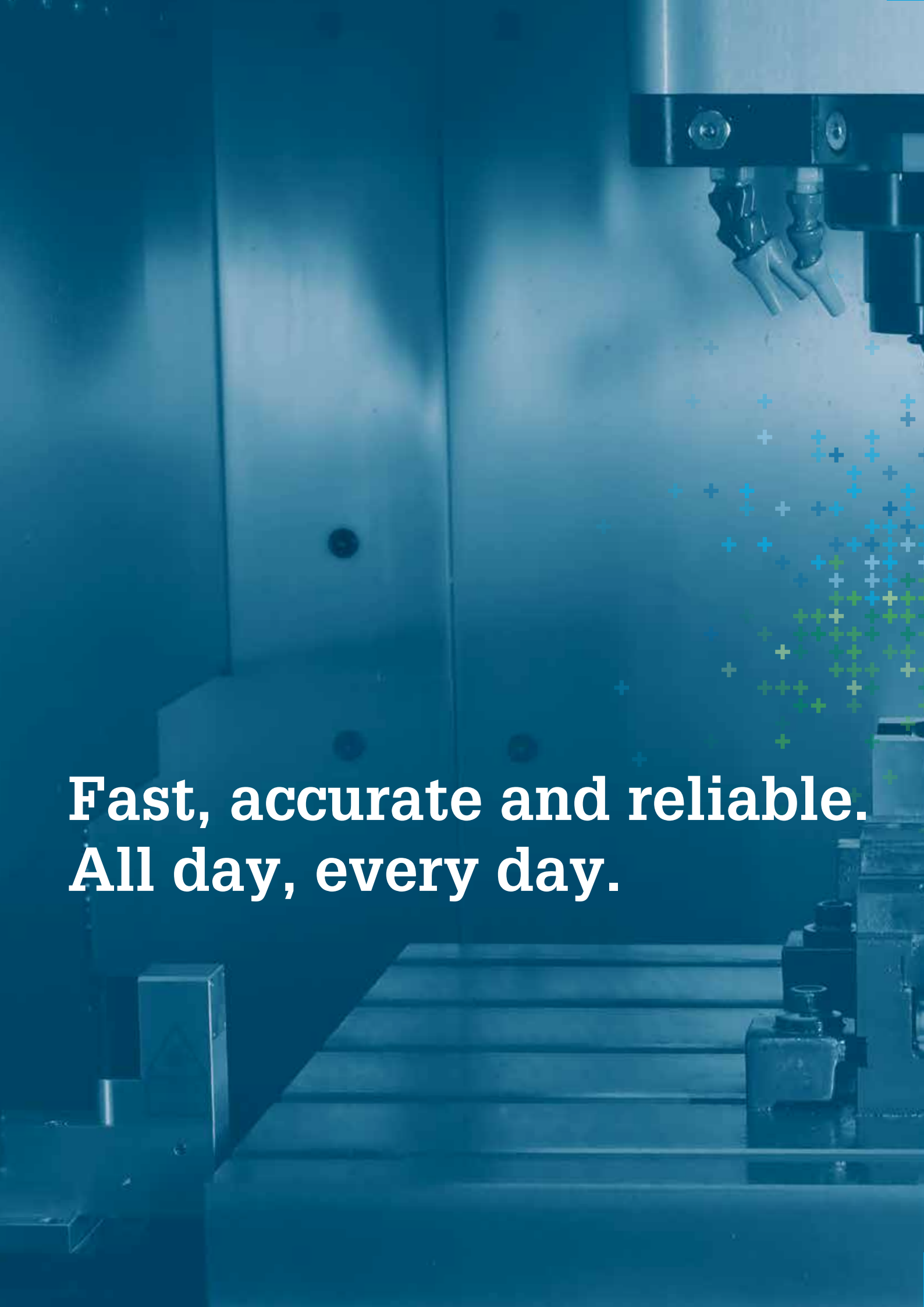
Exceptional productivity, designed to meet your needs

- Thermostabilized machine and components, including all principle heat sources
- Powerful, 42,000 min^{-1} Step-Tec spindle
- Internal magazine accommodates up to 60 tools
- Ergonomic and accessible design
- Automation-ready, including part loading at machine rear
- State-of-the-art FANUC control
- Advanced smart machine modules
- Polymer concrete machine base

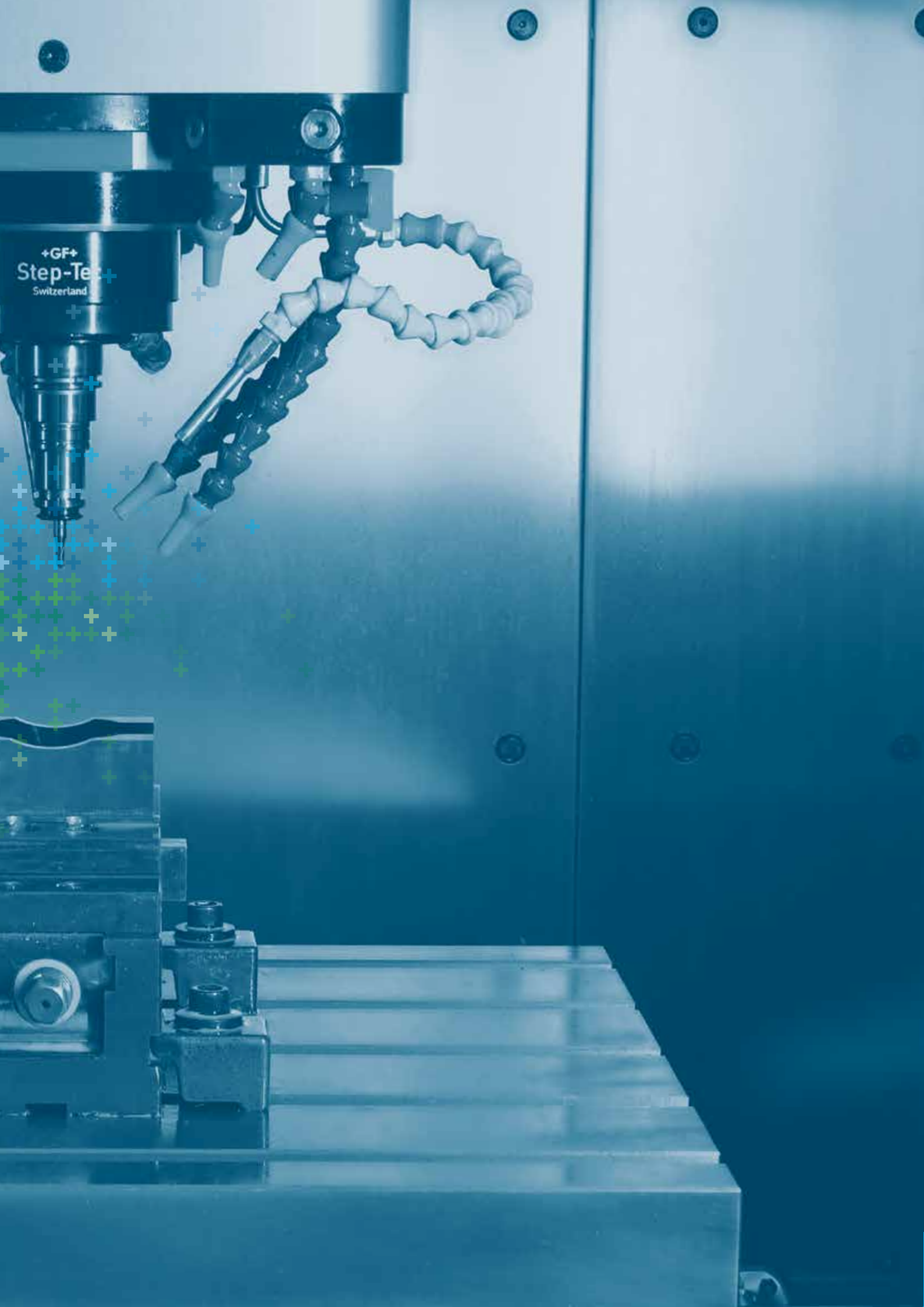
Achieve perfect reproducibility even during extended periods of machining with thermal controls, oversize linear guideways and ball screws.

Shorten time to market by reducing time-consuming, manual polishing operations with outstanding precision and advanced spindle technology.

Maximize ROI with fully integrated workpiece changers, tool magazine expansions and more for extended uninterrupted production.



Fast, accurate and reliable. All day, every day.


+GF+
Switzerland

The solid foundation of the Mikron MILL P 500

+ Durable construction

Designed to meet the needs of mold and die producers, particularly in the ICT/EC sectors, the MILL P 500 features a robust portal structure with exceptional stiffness. This enables shops to achieve outstanding positioning and contour accuracy for high-quality surface finishes.

+ Exceptional precision

With its highly dynamic 42,000 min^{-1} Step-Tec spindle, this machine has the power, speed and performance necessary for the most demanding applications. Shorten time to market, achieve fine surface finishes (finer than Ra 0.02 µm) and reduce the need for post-machining processes.

Z

350 mm

+ Long-term stability

Obtain the highest level of precision with long-term stability, even when milling the toughest materials. The symmetrical design, polymer concrete structure and high thermostability provide a reliable foundation for precision.

- Thermostabilized body
- Axis cooling system
- Internal ball screw nut cooling
- Spindle cooling system
- Thermal-controlled drive motors
- Temperature-controlled coolant
- Internal table cooling loop

Y

450 mm

Reliable accuracy and perfect reproducibility

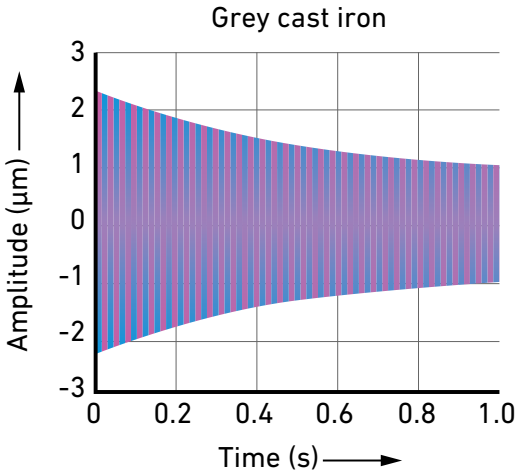
+ Internal cooling system and isolated machine bed
+ Rigid, symmetrical gantry-style design
+ Polymer concrete machine bed

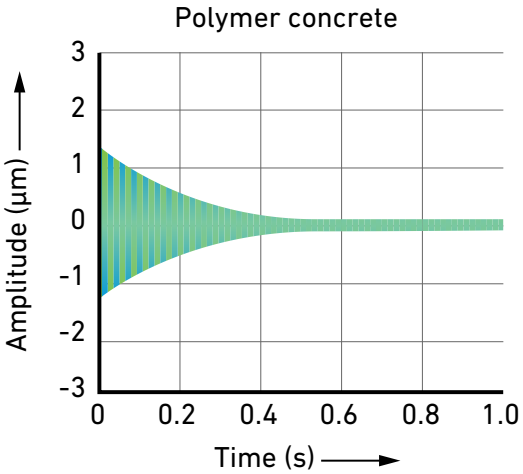
Trustworthy quality

Through extensive testing, the MILL P 500 has been certified to maintain exceptional accuracy over extended machining periods. Our internal protocols for ensuring accuracy throughout the assembly process guarantees machines arrive at your facility ready for highly precise part production.

Polymer concrete performance

For reliable process stability, the MILL P 500 is built around a 4.5 polymer concrete machine bed, which significantly outperforms cast iron in rigidity and damping behavior. This helps manufacturers secure processes, speed up production and reach higher levels of accuracy for the most challenging applications.

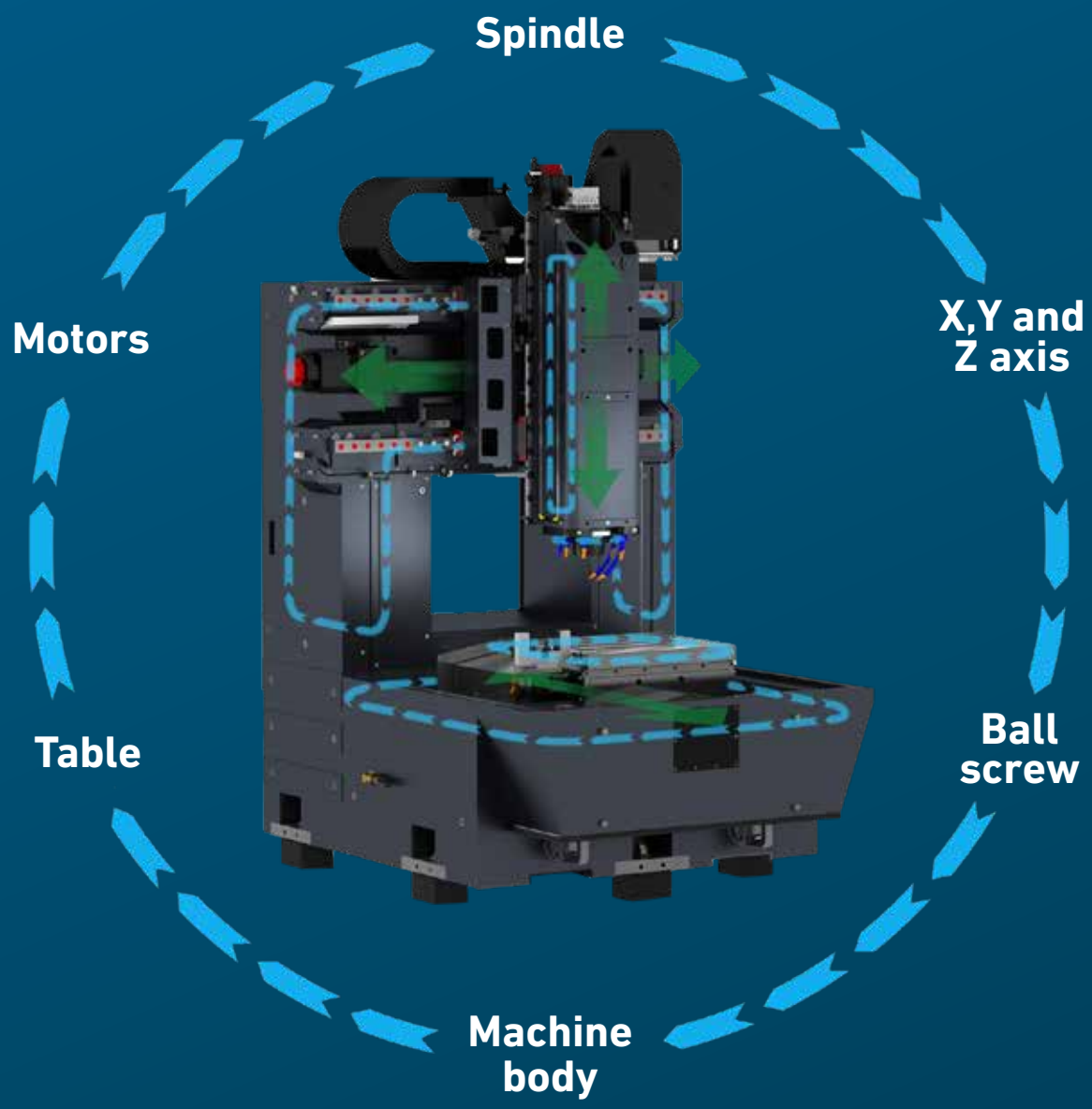




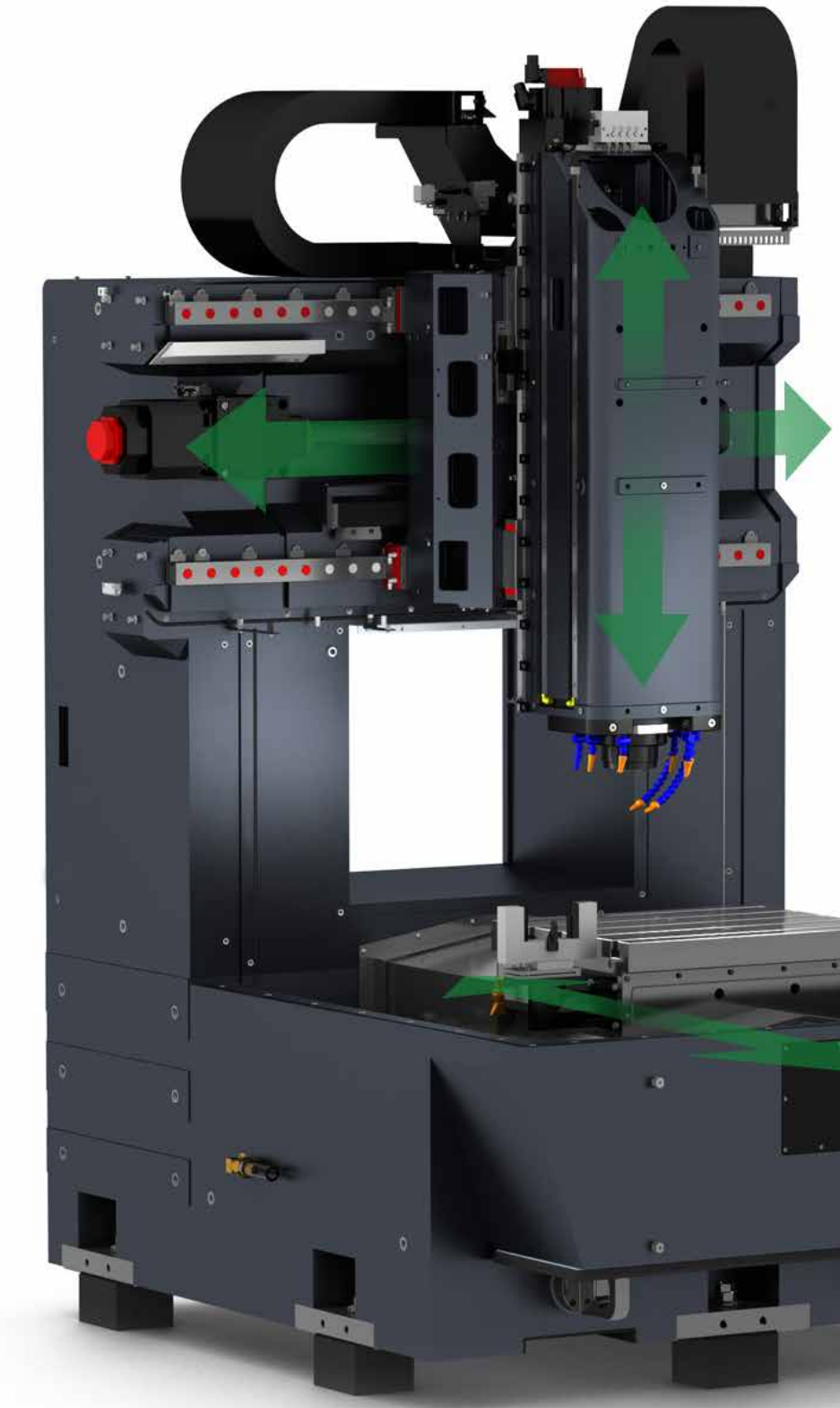
Precision at any temperature

When your milling accuracy must be within fractions of a micron, even the smallest change in temperature can result in a scrapped part. But to achieve the most accurate parts, simply controlling ambient temperatures isn't enough. The heat produced by the machine itself must also be controlled, especially during long production cycles for precision molds and dies.

The advanced thermostability features in the Mikron MILL P 500 creates a stable environment to protect your processes. An advanced internal cooling system is designed to address every heat source and critical element in the machine, from axial movement and spindle rotation to servo motors and table motion.



Reduce production costs, cut down on finishing operations



Achieve higher machine performance with dynamic features:

- Axial rapid traverse speeds of 30 m/min
- Axial acceleration: 6 m/s^2
- 42,000 rpm Step-Tec spindle
- High-precision linear roller guide ways
- Rigid, stiff machine bed
- Optimized force distribution

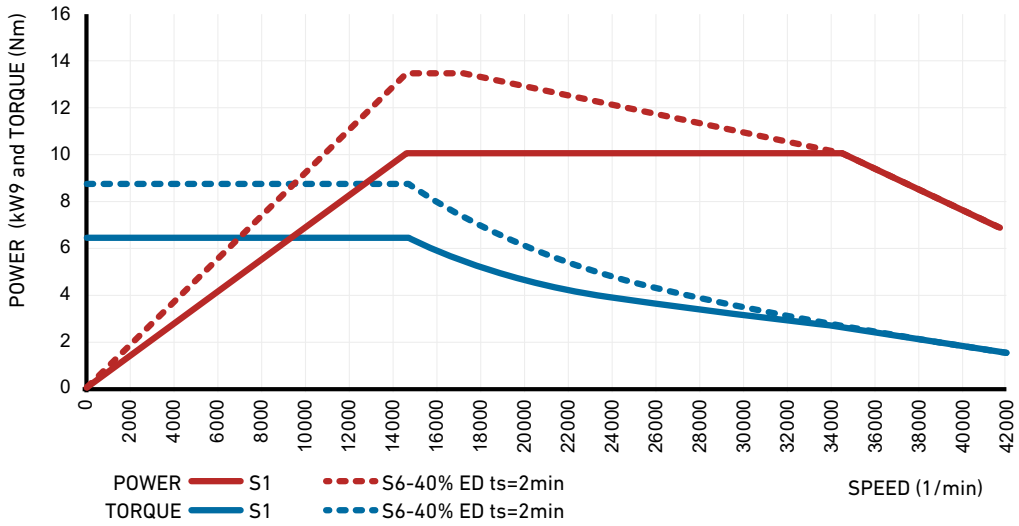
Speed and precision, all day and all night

High-performance Step-Tec Spindles can handle everything from roughing to fine surface finishes. With advanced hybrid ball bearings and thermally robust hybrid cylindrical roller bearings, these super-rigid rotating systems enable milling with extra-long tools, aggressive material removal rates and higher feed rates.

The **MILL P 500** comes equipped with a 42,000 min^{-1} HVC-140 spindle to provide outstanding precision and accuracy for high-speed milling applications in the mold and die industry. With advanced Industry 4.0 features and integrated sensors, your operators can continually monitor vibrations, temperatures, and more to maximize productivity and performance.

Spindle HVC-140	
Power (S1/S6)	10 kW / 13.5 kW
Torque (S1/S6)	6.5 Nm / 8.8 Nm
Speed max.	42,000 min^{-1}
Acceleration	2.5 sec
Lubrication	Oil-air
Tool interface	HSK-E40 DIN69063-1

- Ensures the highest degree of thermal stability with sophisticated design built around OptiCool principle (OCS).
- Includes full range of sensors for relevant machining parameters for smart machine integration.
- Step-Tec's highest ever static/dynamic stiffness enables the least amount of runout for challenging mold and die applications.
- Dust dry spindle nose allows for greater application flexibility and tool life.

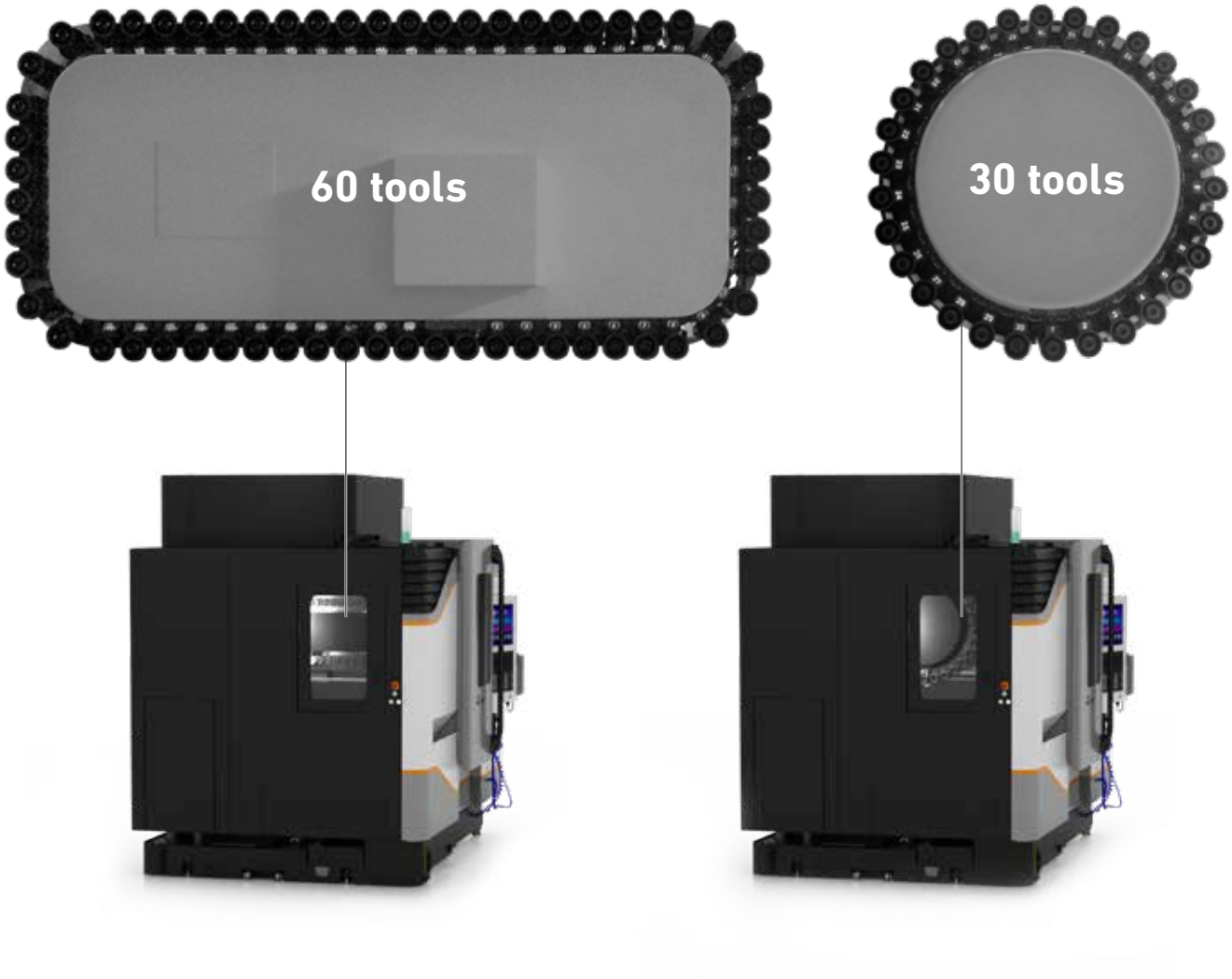


Built-in production flexibility

A tool magazine for every need

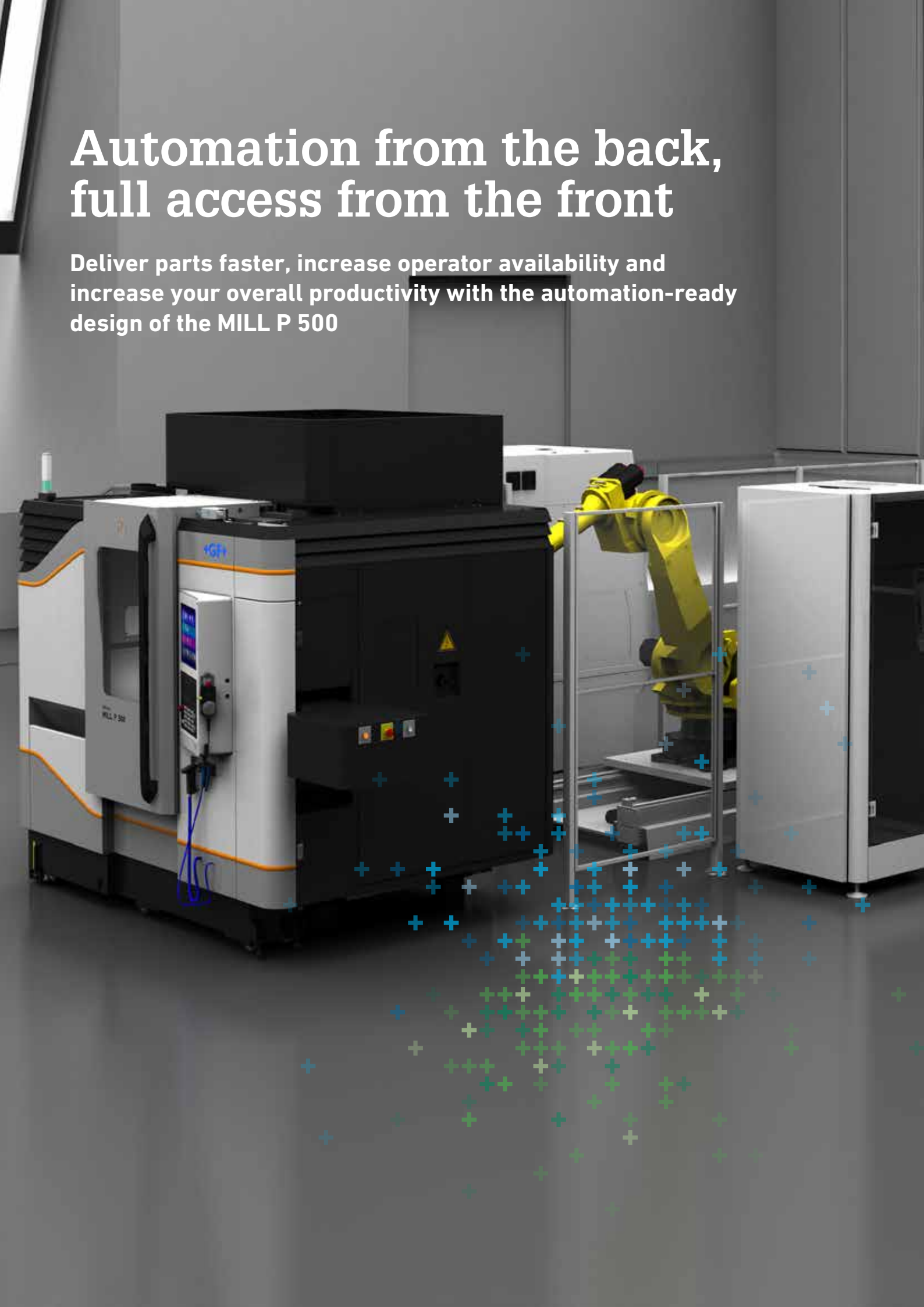
Featuring internal disc-type or chain magazines, the MILL P 500 offers capacities of up to 60 tools.

+ Ergonomic and user-friendly design.
+ Ensures high productivity and process reliability.
+ Parallel machining and tool loading.
+ Provides touch probe orientation flexibility.

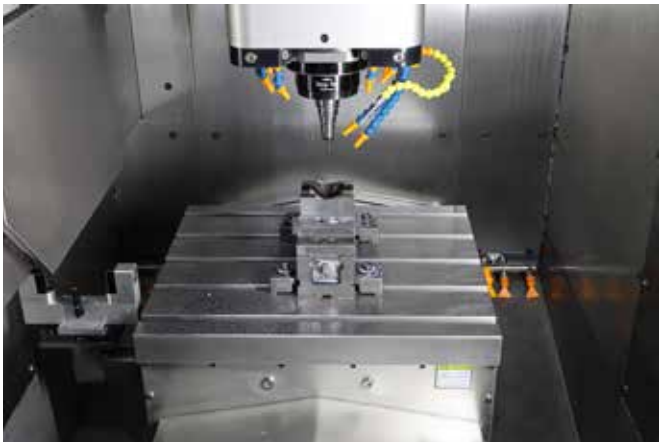


Automation from the back, full access from the front

Deliver parts faster, increase operator availability and increase your overall productivity with the automation-ready design of the MILL P 500



Effective chip control for uninterrupted productivity



Clean machining

- Steep and smooth machine envelope walls optimize chip flow.
- Wash-down nozzles cover all corners and prevent chip accumulation.
- Large and heavy-duty chip augers transport high volumes of chips.

Adapted chip management

The vertical stainless-steel sheet metal enclosure prevents chip accumulation in the working area.

Lift-up chip conveyor

Intelligent milling for modern part production

Achieve optimized part production with powerful smart machine modules.

+ **Produce workpieces with unsurpassed precision and process security**
+ **Increase reliability during unmanned operations**
+ **Automatically optimize various aspects of milling process**
+ **Significantly reduce production costs**

Expert controls

The FANUC 31i-MODEL B control on the MILL P 500 enables world-class part production. The control's intuitive interface offers a wide range of functions designed to ensure greater reliability and performance. State-of-the-art hardware is combined with diverse software packages to give your operators the ability to take on other tasks and add more value.

Saving energy
Econowatt makes it possible to save up to 50% on energy consumption, an ecologically friendly way to realize greater profitability.

Time
Operator Support System (OSS), in combination with software tools such as rConnect, boost your productivity.

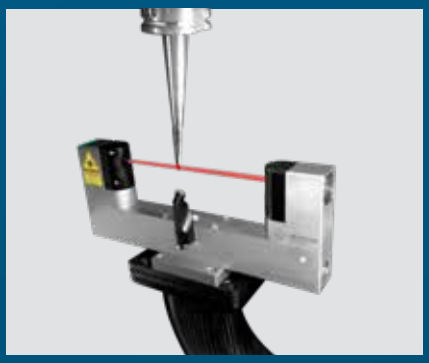
Precision
Intelligent Spindle Monitoring (ISM), ISM extreme and Intelligent Thermal Control (ITC) promote greater stability for the most precise parts, even during unattended operations.

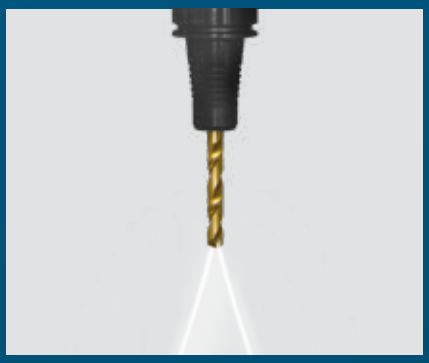
Protection
Power Fail Protection (PFP) and Intelligent Tool Measurement (ITM) protects and extends the lifetime of your machine tools and secures your processes.

Options

A complete range of solutions for your unique application needs

Infrared touch probe


Laser measuring system


Through-Spindle cooling


External coolant supply


Wash-down system


Band filter system


Rotary viewing window


Fanuc iHMI

smart machine modules OSS, ITC, PFP

Service, where you are, when you need it

GF Machining Solutions Customer Services pushes technological boundaries to deliver the future of service to you, today.

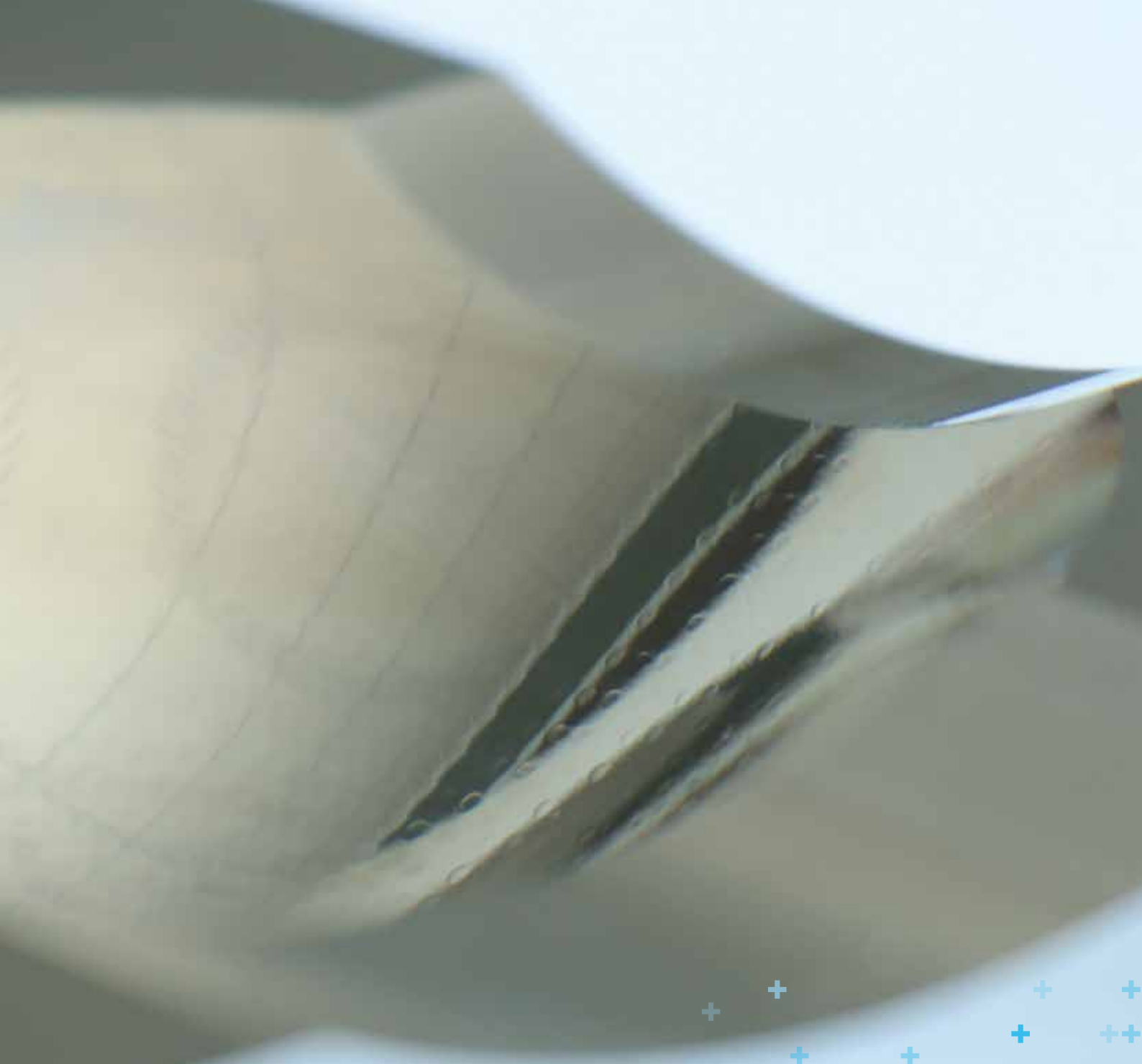
rConnect is a digital services platform available for all GF Machining Solutions technologies. A modular system that includes a range of services, rConnect empowers you to increase your manufacturing productivity, all backed by TÜViT-certified cybersecurity.

rConnect Live Remote Assistance (LRA) makes it easy for you to achieve the highest possible machine uptime by giving our expert engineers the ability to rapidly respond to your service requests with audio, video chat and other tools.

Drive your business forward, rediscover your passion for education

Maximizing the full potential of your machine tools is a key factor for success in today's globally competitive manufacturing industry. In a world where technology and customer demand are constantly changing, the most effective way to stay competitive is to expand your knowledge base and empower your team with the GF Machining Solutions Academy.

Covering the entirety of GF Machining Solutions' broad technology portfolio, the Academy hosts both customers and our own application and service engineers as they learn how to realize the full potential of GF's innovative products. Lessons are taught by GF experts from departments ranging from research and development to sales and application support. The Academy's training modules, as well as on-demand educational services tailored to your specific needs, are designed to help you and your team develop the skills you need for future growth and business success.

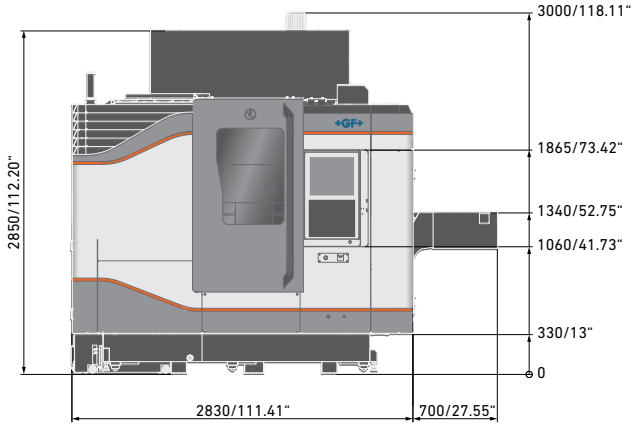


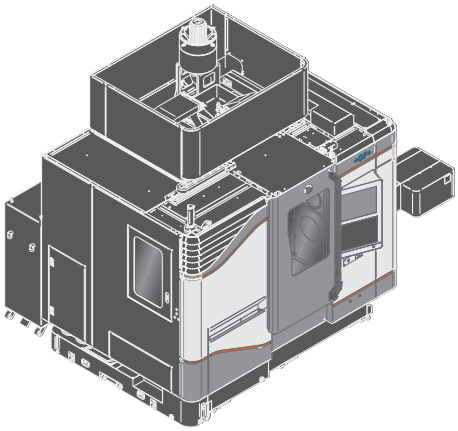
Achieve superior surface finishes and maximum productivity.

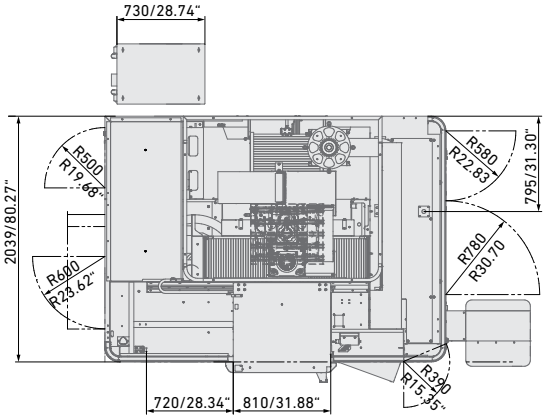
Technical data

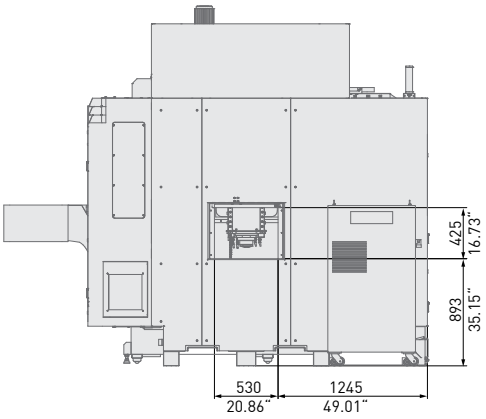
Mikron MILL P 500			
Axis travel			
Longitudinal X	mm (in)	500 (19.69)	
Lateral Y	mm (in)	450 (17.72)	
Vertical Z	mm (in)	350 (13.78)	
Travel speed			
Rapid traverse X	m/min (ipm)	30 (1,181)	
Rapid traverse Y	m/min (ipm)	30 (1,181)	
Rapid traverse Z	m/min (ipm)	30 (1,181)	
Tool spindle (40% ED, S6)			
42,000 min^{-1}, HSK-E40 S6	kW / Nm	13.5 / 8.8	
Work table			
T-slot table	mm (in)	600 x 500 (23.62 x 19.68)	
Max. table load	kg (lbs)	300 (661)	
Distance spindle to table	min mm (in)/max mm (in)	100 (3.93) / 450 (17.71)	
Tool magazine			
HSK-E40 tool holder		DT30	CT 60
Max. tool diameter with adjacent pots occupied	mm (in)	50 (1.96)	50 (1.96)
Max. tool diameter with adjacent pots empty	mm (in)	100 (3.93)	100 (3.93)
Max. tool length	mm (in)	120 (4,72)	120 (4.72)
Max. tool weight	kg (lbs)	3 (6.61)	3 (6.61)
Automation			
Pallet size / Number	mm / piece	Delphin 400 x 400 / 5	
	(in / piece)	(Delphin 15.75 x 15.75 / 5)	
Max. additional load	kg (lbs)	200 (441)	
Weight			
Machine		DT 30	CT 60
	kg (lbs)	8,500 (18,739.2)	9,000 (19,841.6)
Control			
Fanuc		Fanuc 31i-MODEL B / iHMI	

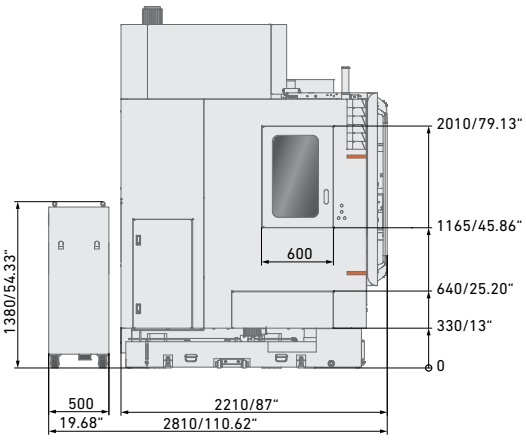
Mikron MILL P 500











A complete portfolio of world-class manufacturing technologies

EDM (electrical discharge machining)

Wire-cutting EDM
GF Machining Solutions' wire-cutting EDM is fast, precise and increasingly energy efficient. From ultraprecise machining of miniaturized components down to 0.02 mm to powerful solutions for demanding high-speed machining with respect to surface accuracy, our wire EDM solutions position you for success.

Die-sinking EDM
GF Machining Solutions is revolutionizing die-sinking EDM with features like iGAP technology to dramatically boost machining speed and reduce electrode wear. All of our die-sinking systems offer fast removal and deliver mirror finishes of Ra 0.1 µm (4 µin).

Hole-drilling EDM
GF Machining Solutions' robust hole-drilling EDM solutions enable you to drill holes in electrically conductive materials at a very high speed—and, with a five-axis configuration, at any angle on a workpiece with an inclined surface.

Milling

Milling
Precision tool and mold manufacturers enjoy a competitive edge with our Mikron MILL S solutions' fast and precise machining. The Mikron MILL P machines achieve above-average productivity thanks to their high performance and Automation. Customers seeking fastest return on investment benefit from the affordable efficiency of our MILL E solutions.

High Performance Airfoil Machining
Our Liechti turnkey solutions enable the highly dynamic manufacturing of precision airfoils. Thanks to their unique performance and our expertise in airfoil machining, you increase productivity by producing at the lowest cost per part.

Spindles
As part of GF Machining Solutions, Step-Tec is engaged in the very first stage of each machining center development project. Compact design combined with excellent thermal and geometric repeatability ensure the perfect integration of this core component into the machine tool.

Advanced manufacturing

Laser texturing
Aesthetic and functional texturing is easy and infinitely repeatable with our digitized Laser technology. Even complex 3D geometries, including precision parts, are textured, engraved, microstructured, marked and labeled.

Laser micromachining
GF Machining Solutions offers the industry's most complete line of Laser micromachining platforms optimized for small, high-precision features to meet the increasing need for smaller, smarter parts to support today's leading-edge products.

Laser Additive Manufacturing (AM)
GF Machining Solutions and 3D Systems, a leading global provider of additive manufacturing solutions and the pioneer of 3D printing, have partnered to introduce new metal 3D printing solutions that enable manufacturers to produce complex metal parts more efficiently.

Tooling and Automation

Tooling
Our customers experience complete autonomy while maintaining extreme accuracy, thanks to our highly accurate System 3R reference systems for holding and positioning electrodes and work pieces. All types of machines can easily be linked, which reduces set-up times and enables a seamless transfer of workpieces between different operations.

Automation
Together with System 3R, we also provide scalable and cost-effective Automation solutions for simple, single machine cells or complex, multi-process cells, tailored to your needs.

Software

Digitalization solutions
To drive its digital transformation, GF Machining Solutions acquired symmedia GmbH, a company specialized in software for machine connectivity. Together, we offer a complete range of Industry 4.0 solutions across all industries. The future requires the agility to adapt quickly to continual digital processes. Our intelligent manufacturing offers embedded expertise, optimized production processes, and workshop Automation: solutions for smart and connected machines.

Customer Services

Worldwide for you
Ensuring the best performance throughout the lifetime of our customers' equipment is the goal of our three levels of support. Operations Support offers the complete range of original wear parts and certified consumables. Machine Support includes spare parts, technical support, and a range of preventive services to maximize machine uptime. Business Support offers customer-specific business solutions.

Worldwide for you

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Biel/Bienne
Losone
Geneva
Flawil
Langnau

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GF Machining Solutions

259.806.542–EN

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

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