GF Machining Solutions

+GF+

AgieCharmilles

FORM P 330 Dedicated

Dedicated Solutions

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 AgieCharmilles.
We are GF Machining Solutions.

Contents

FORM P 330 Dedicated
Manufacturing connector molds requires not only speed and high precision, but also high machining performance. To support mold makers, GF Machining Solutions has developed the new AgieCharmilles FORM P 330 Dedicated—a tailored, ready-to-use die-sinking solution for fast and reliable manufacturing of connector mold inserts.

Focused on your needs

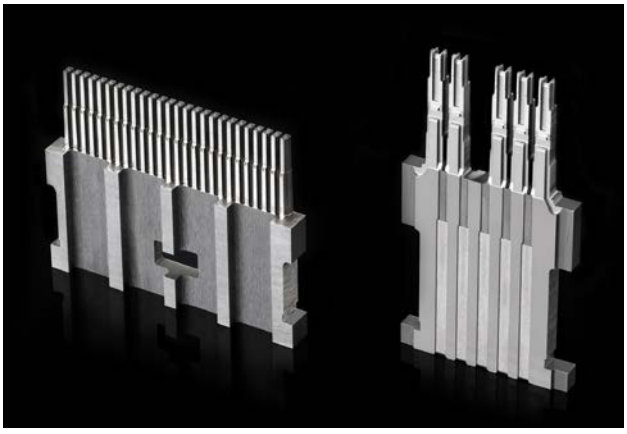
Connecting you to performance

Optimize your manufacturing process

"The mold doesn't work!" This is a familiar complaint in speed-reliant sectors such as Automotive and ICT. GF Machining Solutions' AgieCharmilles FORM P 330 Dedicated helps you solve this issue and forget about mold repairs and scrap. Thanks to the machine's high precision and the dedicated Electrical Discharge Machining (EDM) technology for connector mold inserts, it's easy to quickly achieve a sharp cavity profile, a sharp bottom cavity radius and perfect bottom cavity flatness, with no need to remove unwanted particle deposits from the part. Moreover, the FORM P 330 Dedicated enables perfect repeatability and homogeneity, an unbeatable finish, and stable cavity quality—independent of machining conditions.

Improve your work performance

Connector molds, with their small and complex characteristics, often spend too much time in the mold production workshop for repair or final adjustments. These operations rely considerably on the craftsmanship and personal experiences of individuals. The FORM P 330, designed for the connector industry, optimizes this production process and significantly reduces repeated mold repair and scrapped molds. A guarantee to repeated accuracy and consistency of surface quality and small details.



Designed to assure

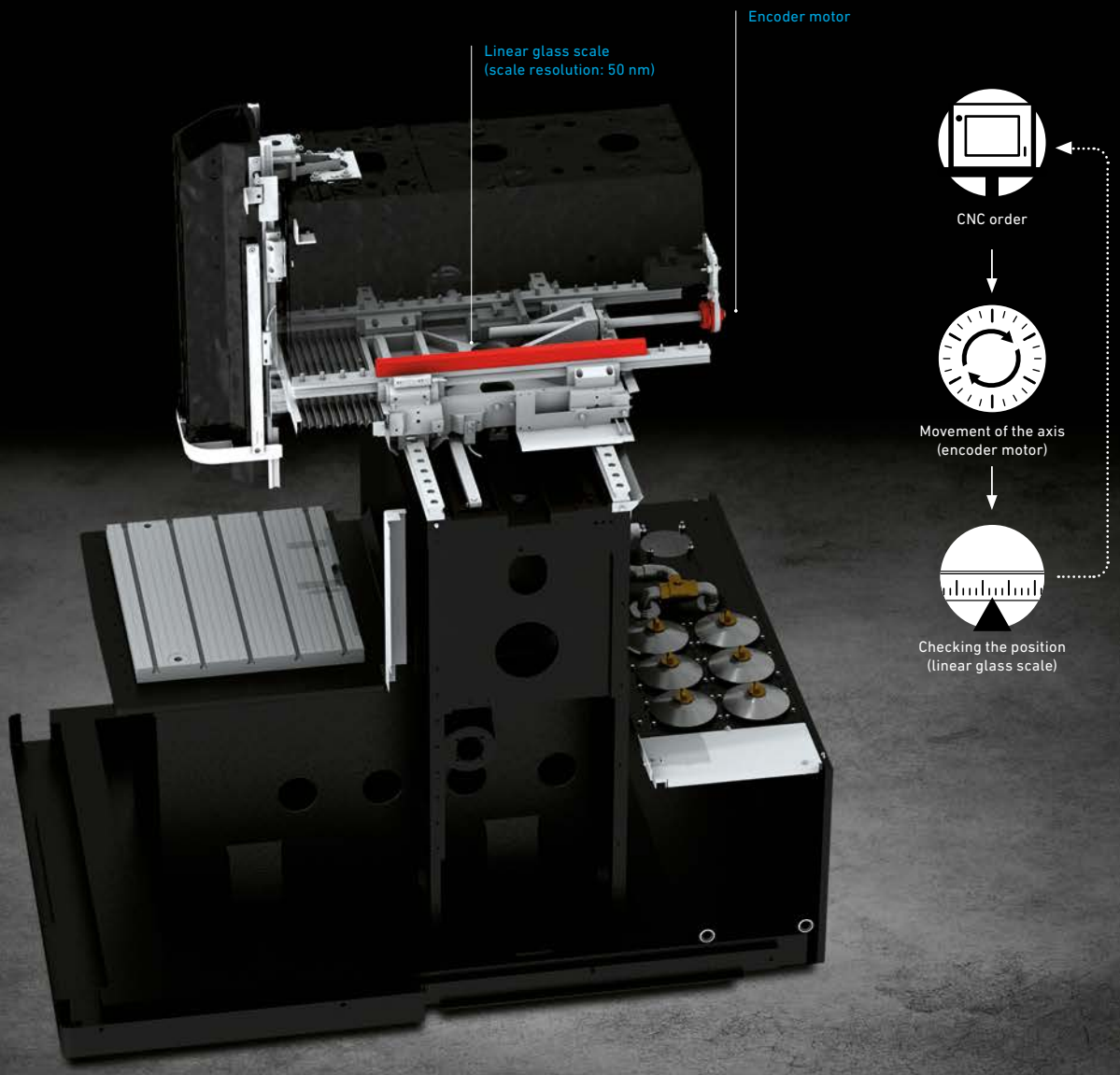
Meet customers' expectations

Compact and rigid mechanical concept

A short C-frame construction and the oversized casting guarantee mechanical stability and precision throughout the life of the machine. In addition, the robustness of the machine absorbs all the machining forces to maintain a precise gap between the part and the electrode.

Linear glass scales: lifetime accuracy

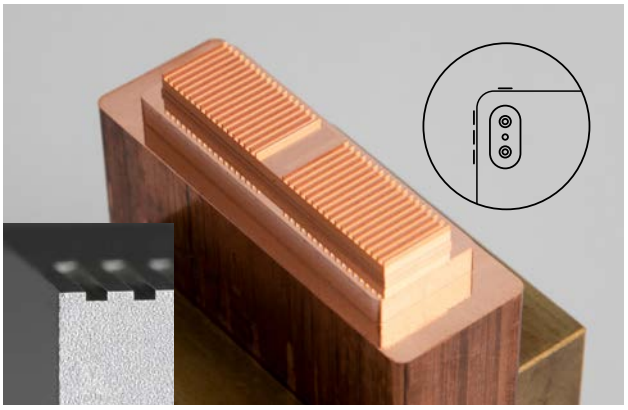
For reliable positioning accuracy to obtain high machining precision, only linear glass scales are effective. They eliminate all the classic errors, such as backlash, expansion and wear effects. The axis servo control system developed by GF Machining Solutions is a closed loop measurement solution designed to provide infallible accuracy, whatever the travel.



Digital ISPG generator

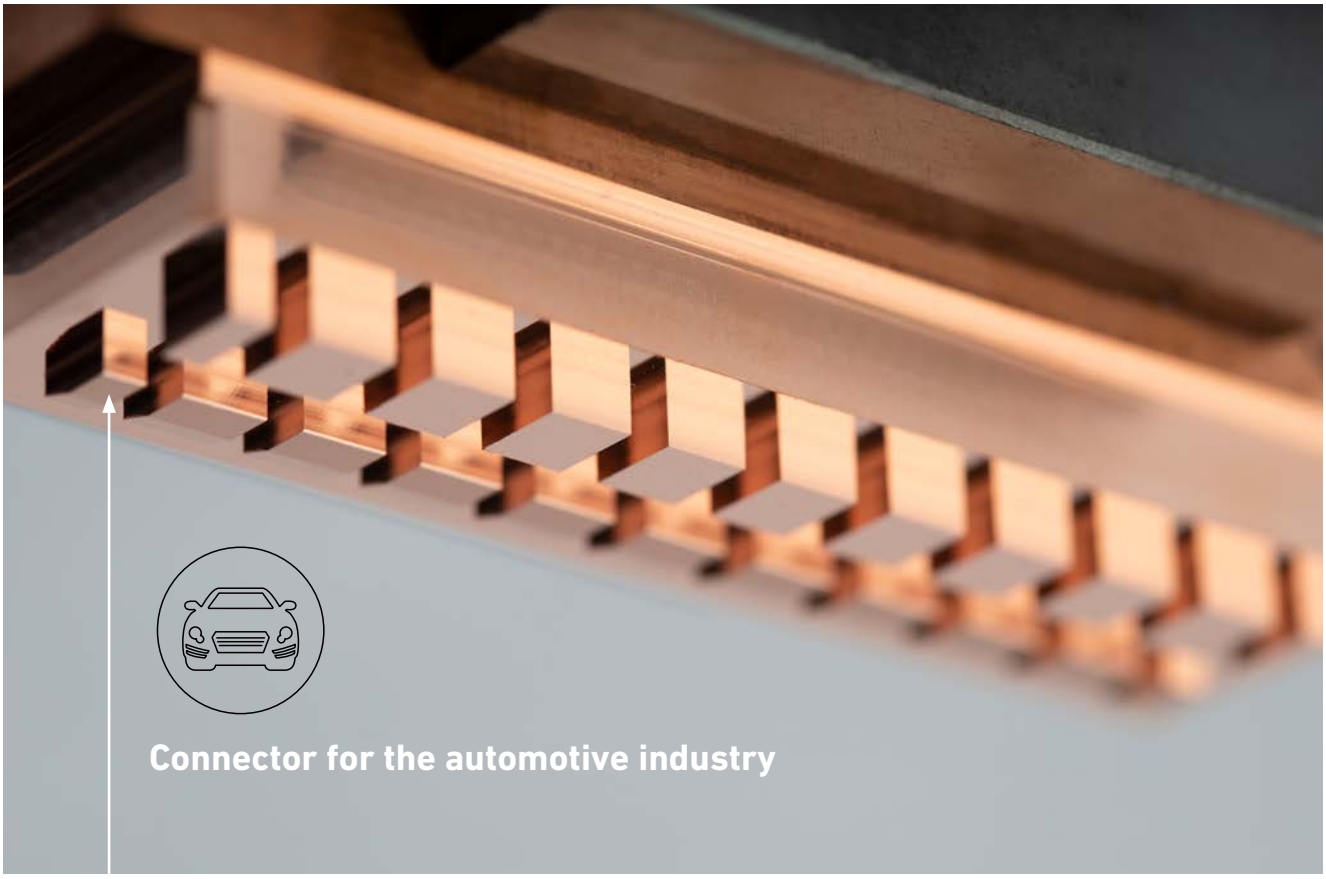
Power your performance

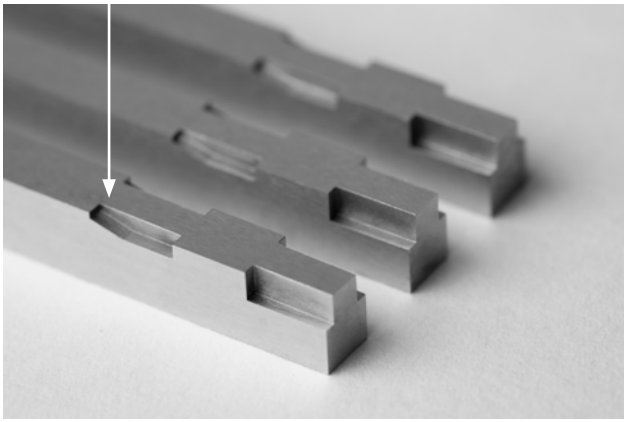
The FORM P 330 Dedicated is Swiss engineered and offers the state-of-the-art Swiss technology, famous for its reliability and and long-term precision. It features the Intelligent Speed Power Generator (ISPG) ensuring performance repeatibility and predictability of the machining results. Every operator can benefit from years of GF's expertise and practical experiences to obtain uniform surface finishes, small radii and sharp top edges.

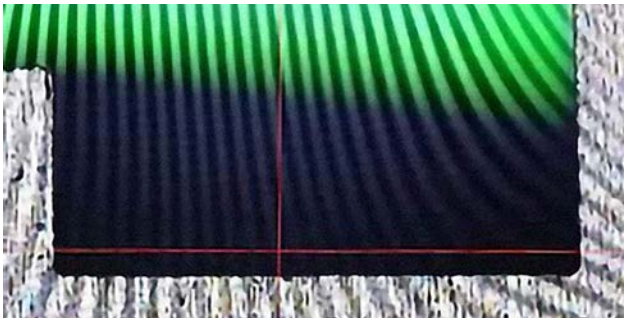


Example of copper comb electrode for micro-connector.

Bottom radius down to 10 µm and top edge corner error below 10 µm. A “first-time-right” result, ready for production.





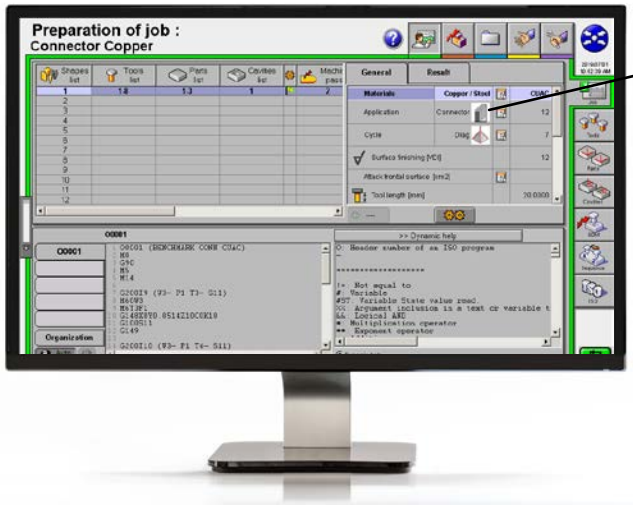


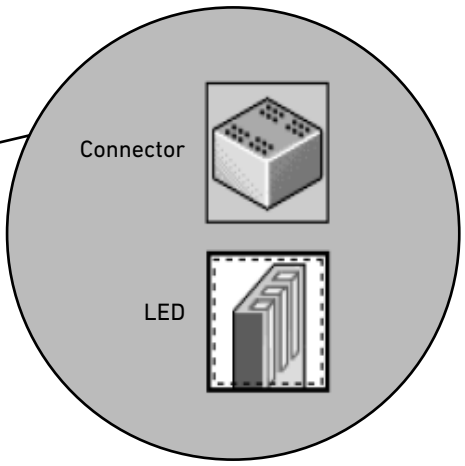
Edge fusion below 20 µm
Bottom radius below 25 µm

Human-machine Interface

Perfect results at your fingertips

The ergonomics of GF Machining Solutions' new AC FORM Human-machine Interface (HMI) put customers in the driver's seat by making die-sinking EDM an intuitive, easy-to-learn and easy-to-use process. That means greater autonomy over your processes, higher efficiency, improved process reliability and accelerated performance. The standardized working environment created by the AC FORM HMI makes it easy to achieve perfect machining results.





Easy set up of processing preparation

The ease of operation is one of the salient features of the FORM P 330: the optimized Smart-page. The module simplifies the programming preparation work that originally required multiple page operations into one display. This has a clear advantage in the processing of small jobs. It minimizes the processing time and increases efficiency.

Trusted expert system

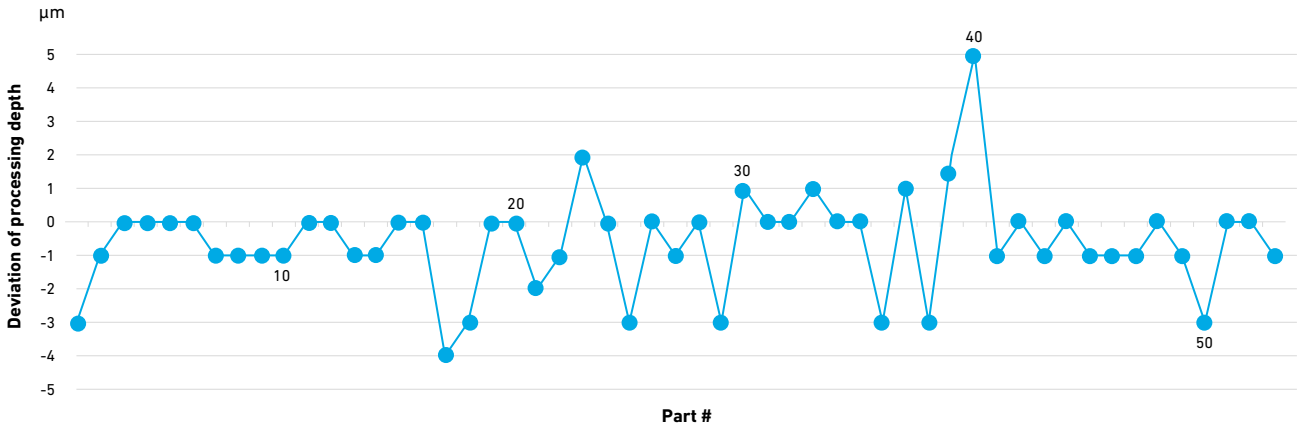
The expert system in the HMI interface provides a comprehensive process parameter database, dedicated to connector mold production. Special processing parameters allow you to easily master the practical machining skills to solve in a couple of clicks the challenges of unsharp edges and small radii.

Process assurance

Stability of batch processing

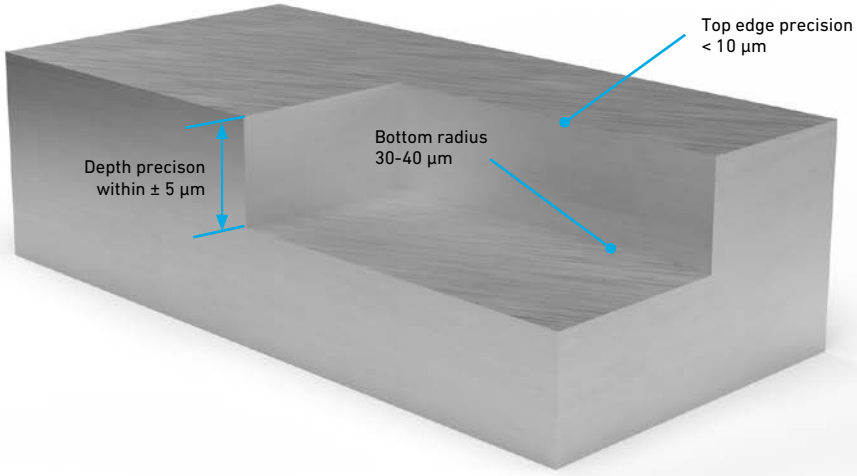
It is well known that multi-cavity, micro-size molds for mass production have extremely strict requirements on accuracy. The biggest challenge in the manufacturing process is to ensure the accuracy and the stability of batch processing.

In order to verify the accuracy and stability of the FORM P 330 Dedicated, a simulation of connector mold production for testing has been carried out. The following is the result of a continuous, multi-day production of more than 50 parts:



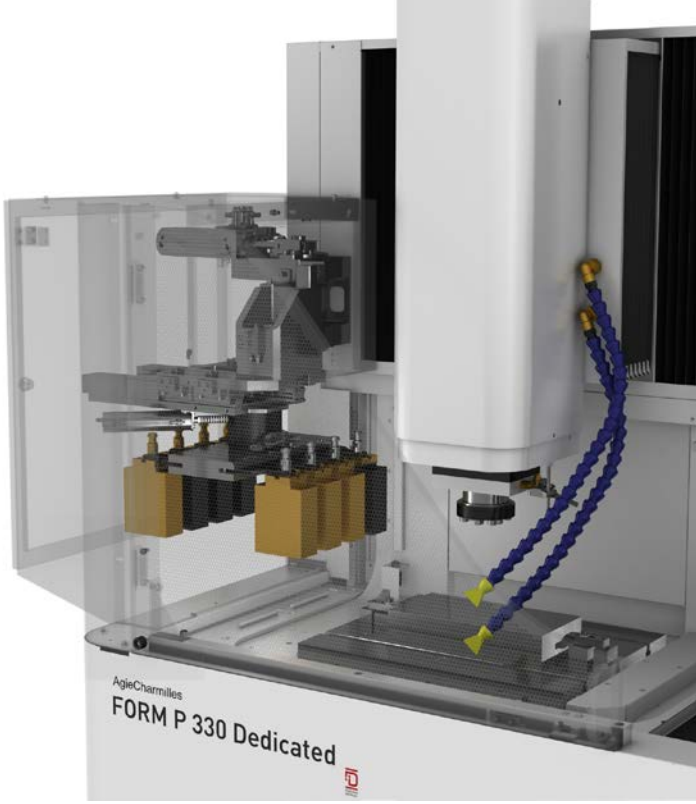
Assurance of production repeatability

A 100% qualified rate of success within ±5µm, in one-time processing! In the above test, the ambient temperature is 23 ±1°C and the temperature of the dielectric, 23 ±0.5°C.
The depth is measured in Z-direction.



Productivity

Unattended machining



Simple, efficient, flexible

A cost-saving, newly designed rotating changer, for up to 8 electrodes, will limit the downtime of the machine. It can match different shapes and sizes, specifically suitable in the field of connector mold machining. Through a very simple work preparation it is easy to ensure a smooth overnight unattended use of the machine, helping you to increase your production efficiency.

Boost your competitiveness

Automation keeps production going whatever the time of day or day of the week. Your results are shorter lead times, higher productivity and quicker payback of capital invested in machines. With automated operations, production can continue running round the clock, seven days a week.

Simple, effective tooling

The FORM P 330 Dedicated can be equipped with both manual and automatic chucks such as System 3R's automatic Macro chuck system, which provides repeatable accuracy within 0.002 mm, or EROWA ITS 50 chucks. Additionally, the solution's rugged C-axis delivers a high positioning accuracy to 0.001°. It is fully computer numerically controlled (CNC) and the four axes can be interpolated simultaneously. The optional optical transmission Renishaw probe ensures perfect positioning while eliminating any electrical contact marks on the workpiece. The possibilities are endless.

Configurations

Dedicated solutions to your needs

Dedicated to reliable, precise and repeatable production of connector mold inserts, you can be sure to find a tailored solution within the range of configurations proposed by GF Machining Solutions.

+ RTC 8 positions:
Production pack

+ RTC 8 positions + C-axis:
Advanced Production pack

+ Automation kit:
Production pack Automation

+ Automation kit + C-axis:
Advanced Production pack Automation

FORM P 330 Dedicated
Basic

Reduce energy consumption

Manage your resources

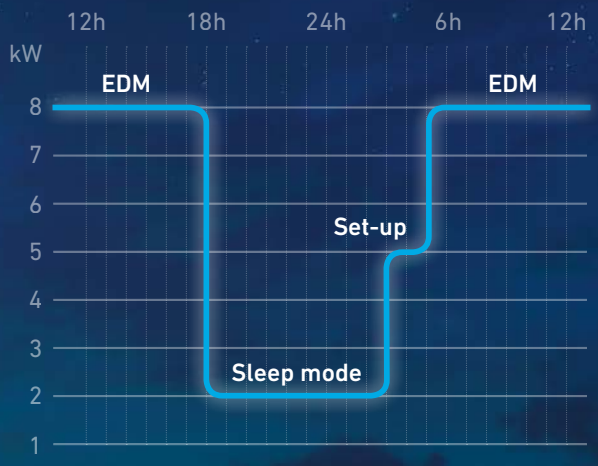
With the Econowatt Smart module you can save, per machine, enough energy to run two houses for a year.

Econowatt Smart module: Take action to save energy

For several years, the cost of energy has been spiraling out of control. For this reason, controlling production costs and saving energy have become priorities for all workshops. The Econowatt Smart module makes GF Machining Solutions the industry leader in energy saving and environmental protection.

Improve competitiveness

- An automatic wake up can be programmed in a weekly calendar
- Before the scheduled time for restarting work, the machine automatically restarts to enable thermostabilization of the dielectric.
- Each morning, the equipment is found in perfect working order, ready to perform precision work.



OPC UA Standard Interface for 3rd party usage

One connectivity solution for all machines

Using OPC UA Standard Interface and its plug-and-play capabilities makes it simpler than ever to connect your GF Machining Solutions machines to existing 3rd parties such as ERP, MES, Dashboard.

Main contents

- Machine identity
- Machine states
- Process and job information
- Machine messages
- Precomputed KPIs

Features

- One interface licensed as GF Machining Solutions “OPC UA Standard”
- 41 data items available on most machines/technology of GF Machining Solutions
- Allow connectivity to 3rd party software such as MES / ERP / PLM
- Time model implementation offers ready-to-use computed KPIs (according to ISO 22400)
- Peace of mind with secure solution thanks to state-of-the-art security standard

+ Shorter engineering time
Ease integration for 3rd party usage and reduce cost of integration.

+ Improved productivity
Ready-to-use pre-computed KPIs in order to rapidly identify potential for productivity improvements.

+ Competitive advantage
Enables seamless data exchange between machines and any software.

+ Ensure data integrity
Safe and secure encrypted communication data due to access granted with username and password.

Customer Services

Accelerate your production to new levels of success

Experience the highest performance of your equipment with GF Machining Solutions Customer Services providing you with unbeatable life cycle support.

Keep pace in a changing environment

As your business evolves, so does its needs, and you can count on GF Machining Solutions for the individually tailored solutions to enhance your operational excellence. We help you keep pace with the continuously changing business and market environments and outperform your competitors.

Operations Support: solutions to boost your applications

Your single-source provider of a vast selection of certified consumables including electrodes and filters to achieve optimum level of performance.

Machine Support: securing your sustainable machining success

Preventive maintenance as well as advanced preventive services such as circularity tests with ball bar or laser calibration will optimize your uptime.

Business Support: realize the full potential of your equipment

Advanced support and consulting—including training, upgrades and dedicated Automation solutions—to improve your performance, productivity and competitive edge.

Technical specifications

FORM P 330 Dedicated

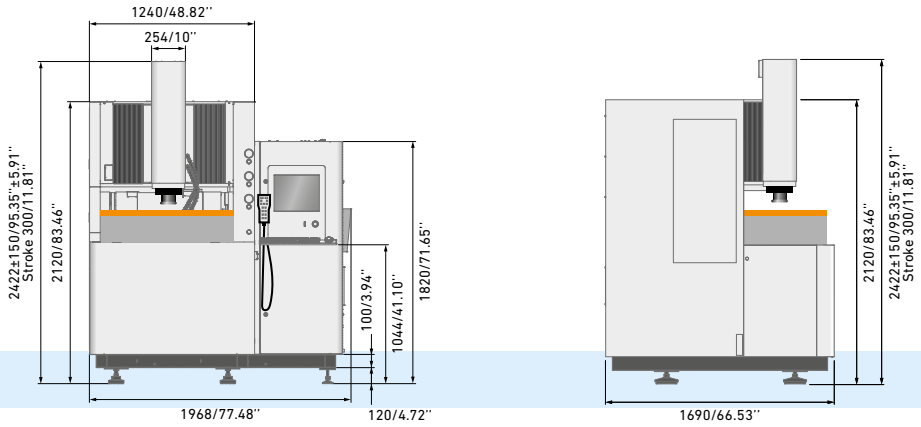
		FORM P 330 Dedicated
Machine		
Architecture		C-frame/Fixed table/Drop tank
Dimensions (*)	mm (in)	1960 x 1690 x 2590 (77.16 x 66.54 x 101.97)
Total weight (without dielectric)	kg (lbs)	2025 (4464)
Floor space (**)	mm (in)	3700 x 3400 (146.6 x 133.8)
X-, Y-, Z-axes		
X, Y, Z travel (*)	mm (in)	330 x 250 x 300 (13 x 9.84 x 11.81)
X-, Y-axes speed	m/min (ft/min)	6 (19.7)
Z-axis speed	m/min (ft/min)	6 (19.7)
Positioning resolution X, Y, Z	µm (in)	0.05 (0.000002)
Work area		
Worktank size (*)	mm (in)	790 x 530 x 350 (31.1 x 20.86 x 13.78)
Worktable size (**)	mm (in)	500 x 400 (19.68 x 15.75)
Distance floor to clamping level	mm (in)	1070 (42.12)
Min./Max. distance between table and chuck (***)	mm (in)	150/450 (5.9/17.7)
Workpiece and electrode		
Max. electrode weight	kg (lbs)	15 (33)
Max. workpiece weight	kg (lbs)	100 (220)
Max. workpiece dimensions (*)	mm (in)	700 x 460 x 200 (27.56 x 18.11 x 7.87)
Bath level (programmable)	mm (in)	0 - 250 (0 - 9.84)

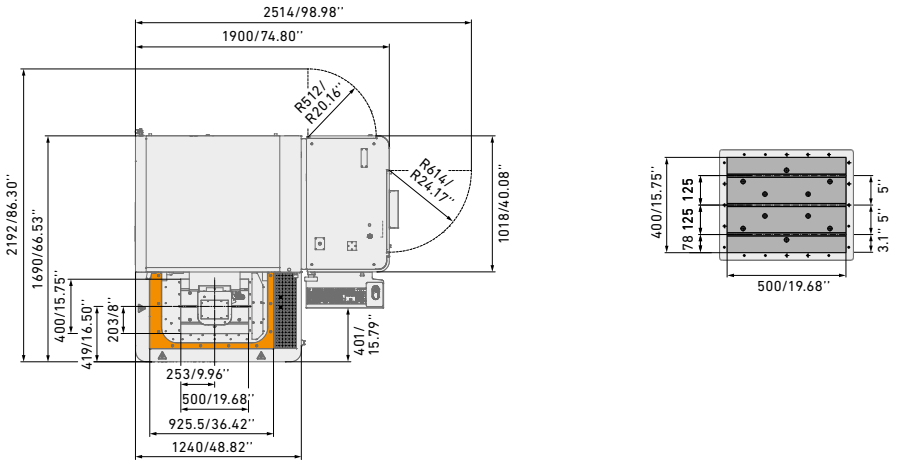
* Width x depth x height ** Width x depth *** With C-axis Eco + System 3R Macro

		FORM P 330 Dedicated
Dielectric unit		
Capacity	l (gal)	200 (52.8)
Number of filter elements and type		2 Paper filter
Heat exchanger for the dielectric		Integrated (Dielectric-Water)
Flushing injections		2 laterals, 1 through the work piece, 1 through the electrode, 1 suction
Generator		
Generator type		ISPG
Max. machining current	A	40
Best surface finish	µm Ra (µin)	0.1 (4)
Electrical supply		
Standard voltage	V	3 x 380/400 ± 10%
Frequency	Hz	50/60 (50 standard)
Control Unit		
Operating system		Windows 10
Data input		17" LCD screen, mouse or touch screen, keyboard and remote control
User interface		AC FORM HMI
Expert system		TECFORM
Rotary Tool Changer (RTC8-LE) *		
Number of electrodes		8
Max. electrode weight	kg (lbs)	5 (11)
Max. electrode dimension	mm (in)	150 x 50 (13 x 1.96) or Ø75 (Ø2.95) Height: 180 (7.08)
C-axis *		
Max. electrode weight on automatic chuck	kg (lbs)	15 (33)
Rotation speed	rpm	0-100
Max. inertia	$kgcm^2$ ($lbsin^2$)	2000 (683)
Measuring system *		
3D probe		System 3R or Erowa
Heat exchanger *		
Air/water for the cabinet		

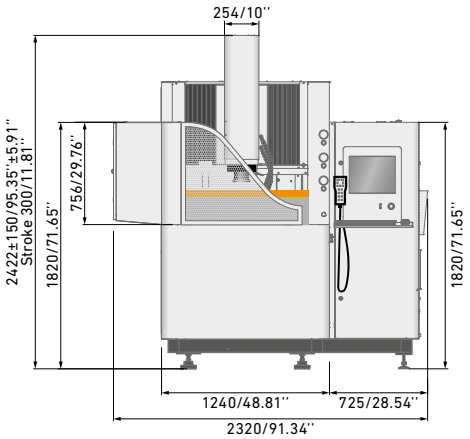
* Option

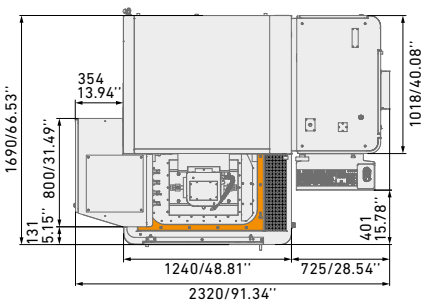
FORM P 330 Dedicated



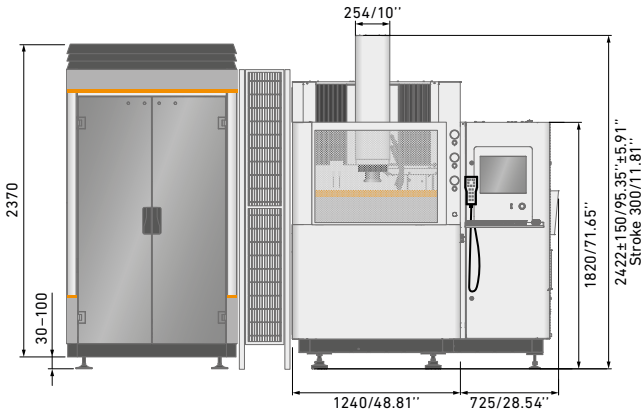


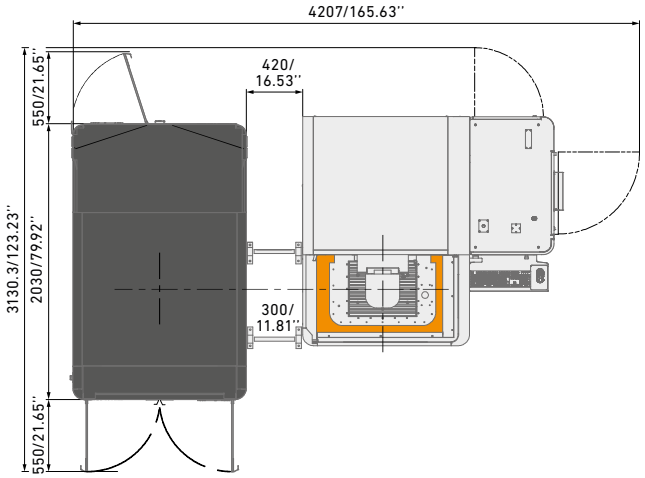
FORM P 330 Dedicated with RTC8-LE

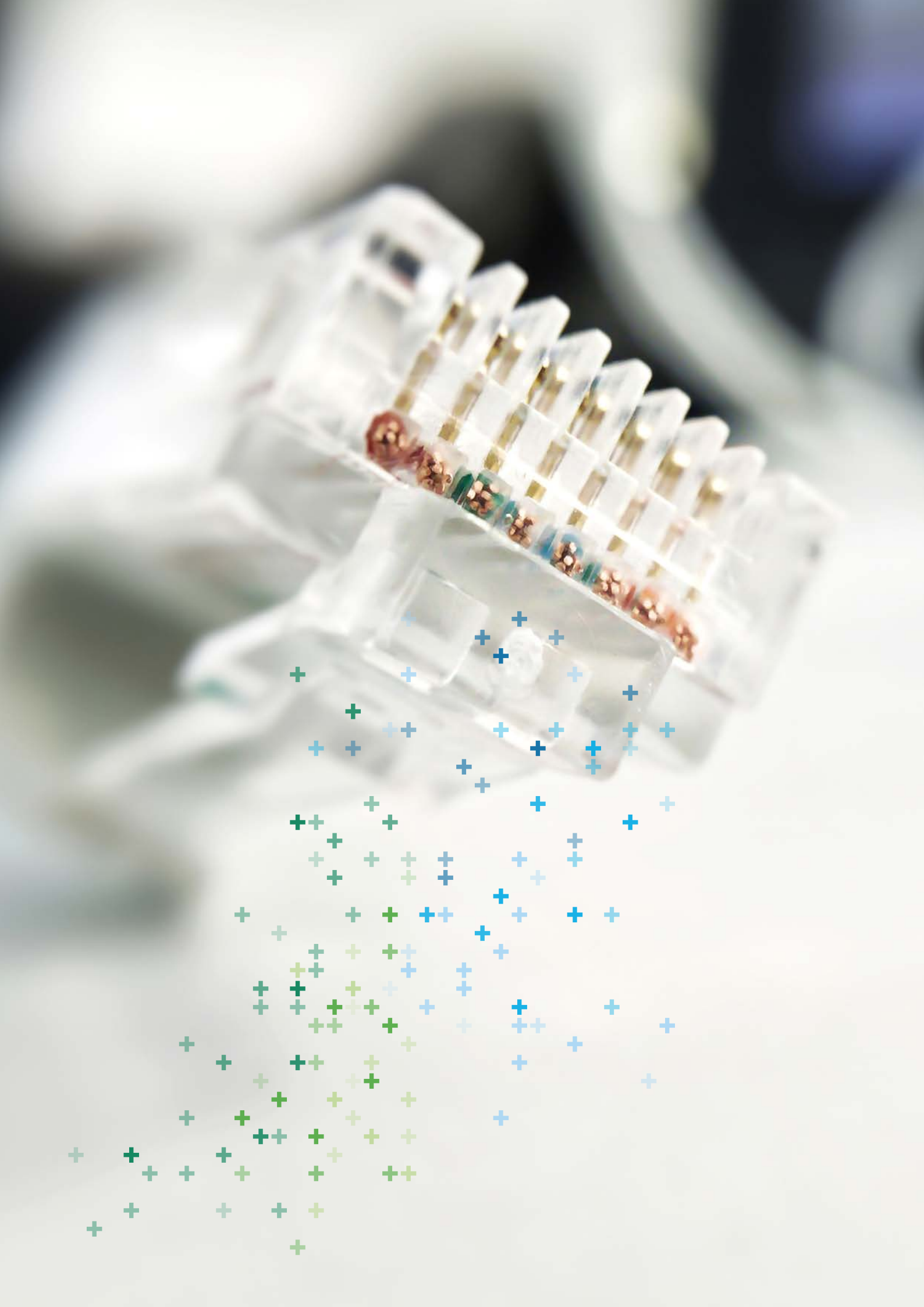




FORM P 330 Dedicated with WPT1+







About GF Machining Solutions

Multi–technology solutions provider

Our commitment to you and your specific applications is proven by the value-adding intelligence, productivity and quality delivered by our multi-technology solutions. Your success is our chief motivator. That's why we are continuously advancing our legendary technical expertise. Wherever you are, whatever your market segment and whatever the size of your operation, we have the complete solutions and the customer-centric commitment to accelerate your success—today.

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 the 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

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.

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