

Academy training

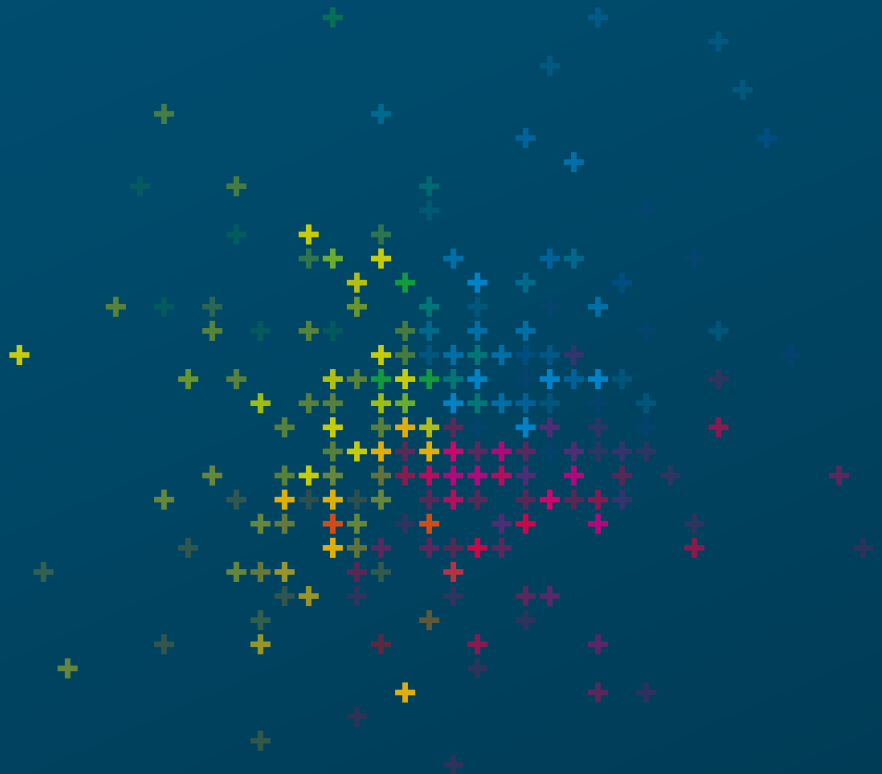
Milling



Passion for Precision

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.



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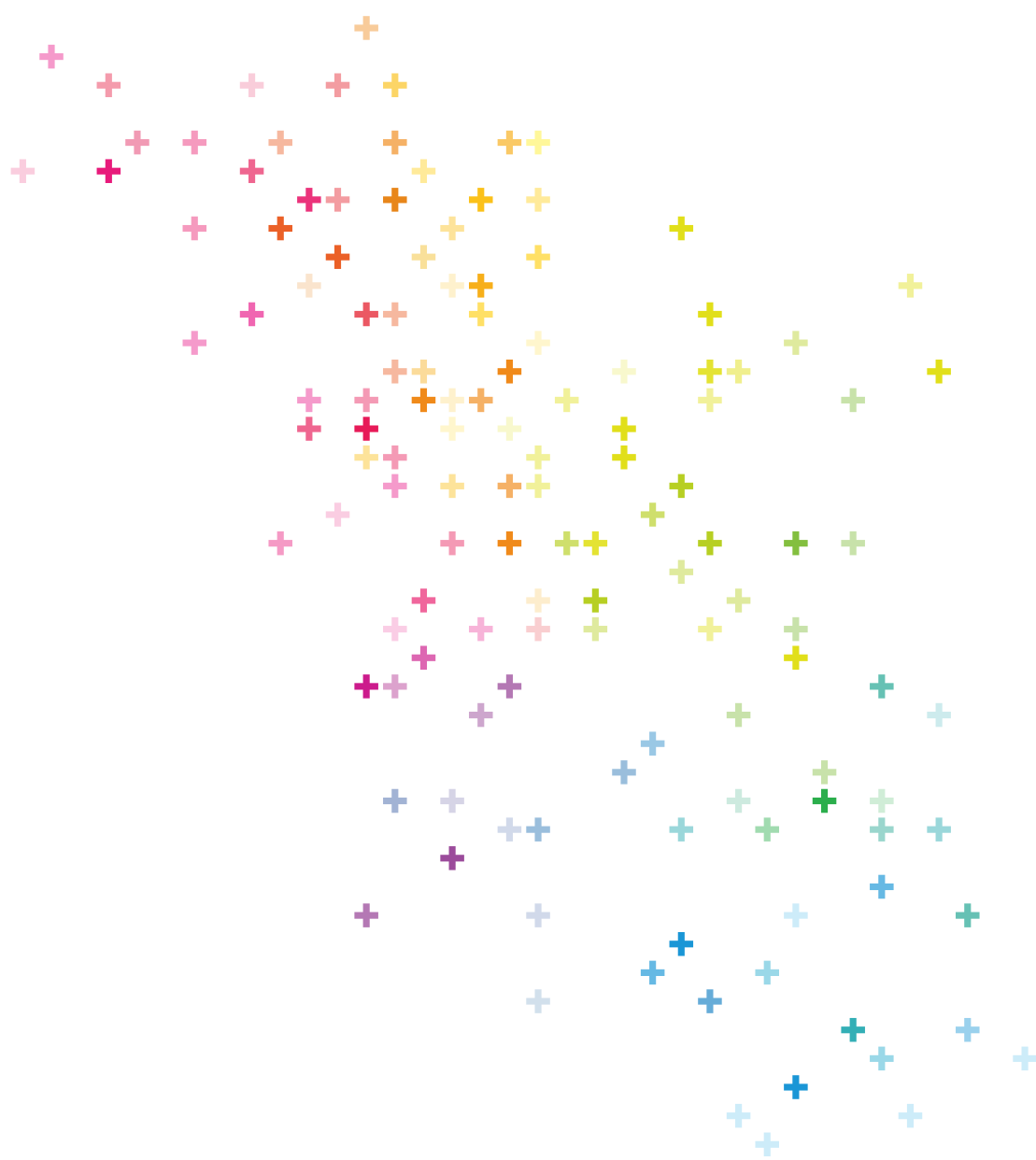
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Learn to operate

We provide you with indepth training to share with you the basic knowledge to use your new machine autonomously/independently.



Milling

- + MILLING–Basic programming
- + MILLING–5-Axis machining
- + MILLING– Machine calibration
- + MILLING–Touch probe
- + MILLING–Tool measuring
- + MILLING–Machine operating



Learn to operate training

MILLING

Basic programming

article n°200010425 (at GF site)

article n°200010426 (at customer site)



Milling

Duration	Number of participants	Experience level	Requirements	Machines
4 days	4	Beginner	Knowledge of Milling and principles of CNC	Programming workstations and any GF Machining Solutions CNC Milling machine

Get familiar with iTNC530/ TNC640 contouring computer numerical controls (CNCs)

What are the course contents?

- + Create and test programs from drawings with HEIDENHAIN iTNC530 conversational programming
- + Understand the structure of Milling machines and their specific functions

What is the course objective?

- + Learn how to program

What are the course benefits?

- + Use iTNC530, TNC640 or TNC620
- + Become autonomous on basic use with the machine
- + Create and test programs in HEIDENHAIN conversational programming based on workpiece drawings

Learn to operate training

MILLING

5-Axis machining

article n°200010429 (at GF site)
article n°200010430 (at customer site)



Duration	Number of participants	Experience level	Requirements	Machines
3.5 days	4	Beginner	Basic programming course	MProgramming workstations and any GF Machining Solutions 5-axis Milling machine

Reduce production costs with your 5-axis Milling machine

What are the course contents?

- + Work with rotary axes and spatial angles
- + Distinguish between the different numerical control (NC) program types of the TNC as well as the different TCPM functions (inclined and simultaneous machining) and use them
- + Use functions to influence the program execution behavior of the CNC control or to adjust NC programs
- + Apply the function for tilting the working plane for swivel heads or tilting tables

What is the course objective?

- + Produce complex five-axis parts with maximum flexibility and minimum tolerances to reduce production costs.

What are the course benefits?

- + Become autonomous on the machine
- + Maximize productivity through basic parameters
- + Optimize your use of consumables
- + Eliminate the risk of collision
- + Apply the function for tilting the working plane for swivel heads or tilting tables
- + Work with rotary axes and spatial angles
- + Distinguish the different NC program types of the TNC

Learn to operate training

MILLING

Machine calibration

article n°200010761 (at GF site)
article n°200010762 (at customer site)



Milling

Duration	Number of participants	Experience level	Requirements	Machines
2 days	4	Intermediate	Basic programming course	MILL E, HEM - MILL S/X, HSM - MILL P, HPM

Reach a higher measuring precision

What are the course contents?

- + iTNC530 or TNC640
- + Why geometry calibration is important
- + Verification of automatic machine calibration (AMC)
- + Definition of AMC and how to operate (3-axis)
- + Definition of intelligent kinematic calibration (IKC) and how to operate (5-axis simultaneous)
- + Alignment and calibration of 5-axis simultaneous machine

What is the course objective?

- + Improving the accuracy of your Milling machine

What are the course benefits?

- + Become autonomous in calibrating a Milling machine
- + Guarantee your machining accuracy
- + Master machining repeatability over time
- + Repeat the process easily to ensure a high-precision quality



Learn to operate training

MILLING

Touch probe

article n°200010769 (at GF site)
article n°200010770 (at customer site)



Milling

Duration	Number of participants	Experience level	Requirements	Machines
1 day	4	Intermediate	Basic programming course	MILL E, HEM - MILL S/X, HSM - MILL P, HPM

Measure with maximum flexibility

What are the course contents?

- + iTNC530 or TNC640
- + Touch probe
- + Manual and automatic presetting
- + Manual and automatic alignment
- + Manual and automatic measurement
- + Rework after measurement

What is the course objective?

- + Learn how to handle the touch probe efficiently

What are the course benefits?

- + Use the touch probe cycles in manual and automatic operation
- + Log the measured values

Learn to operate training

MILLING

Tool measuring



Milling

Duration	Number of participants	Experience level	Requirements	Machines
1 day	4	Intermediate	Basic programming course	MILL P, HPM - MILL S/X, HSM

Maximize use of cutting tool while preserving parts quality with your Milling machine

What are the course contents?

- + Use iTNC530 or TNC640
- + Calibrate a laser measuring system
- + Use measurement cycle tools
- + Manage broken or used tools

What is the course objective?

- + Use the tool measurement cycles in the correct and efficient way

What are the course benefits?

- + Eliminate rejected part
- + Optimize consumption of cutting tools to reduce costs
- + Reduce costs by optimizing consumption of cutting tool
- + Reduce repetitive operator's tasks
- + Increase operating time for other tasks

Learn to operate training

MILLING Machine operating

article n°200010775 (at GF site)
article n°200010776 (at customer site)



Milling

Duration	Number of participants	Experience level	Requirements	Machines
1 day	4	Intermediate	Basic programming course	Related to the purchased machine

Get all of the knowledge necessary to become immediately productive with your machine

What are the course contents?

- + Understand the main system, components and machine
- + Optimize peripheral modules (chip conveyor, cooling unit, tool changer etc..)
- + Perform daily maintenance
- + Manage basic troubleshooting

What is the course objective?

- + Learn to use the main components of your machine, including the different applications and outcome

What are the course benefits?

- + Save time due to the optimization of the peripheral modules
- + Reduce cost by saving consumables
- + Reduce intervention time and cost for basic troubleshooting

ACADEMY

GF Machining Solutions



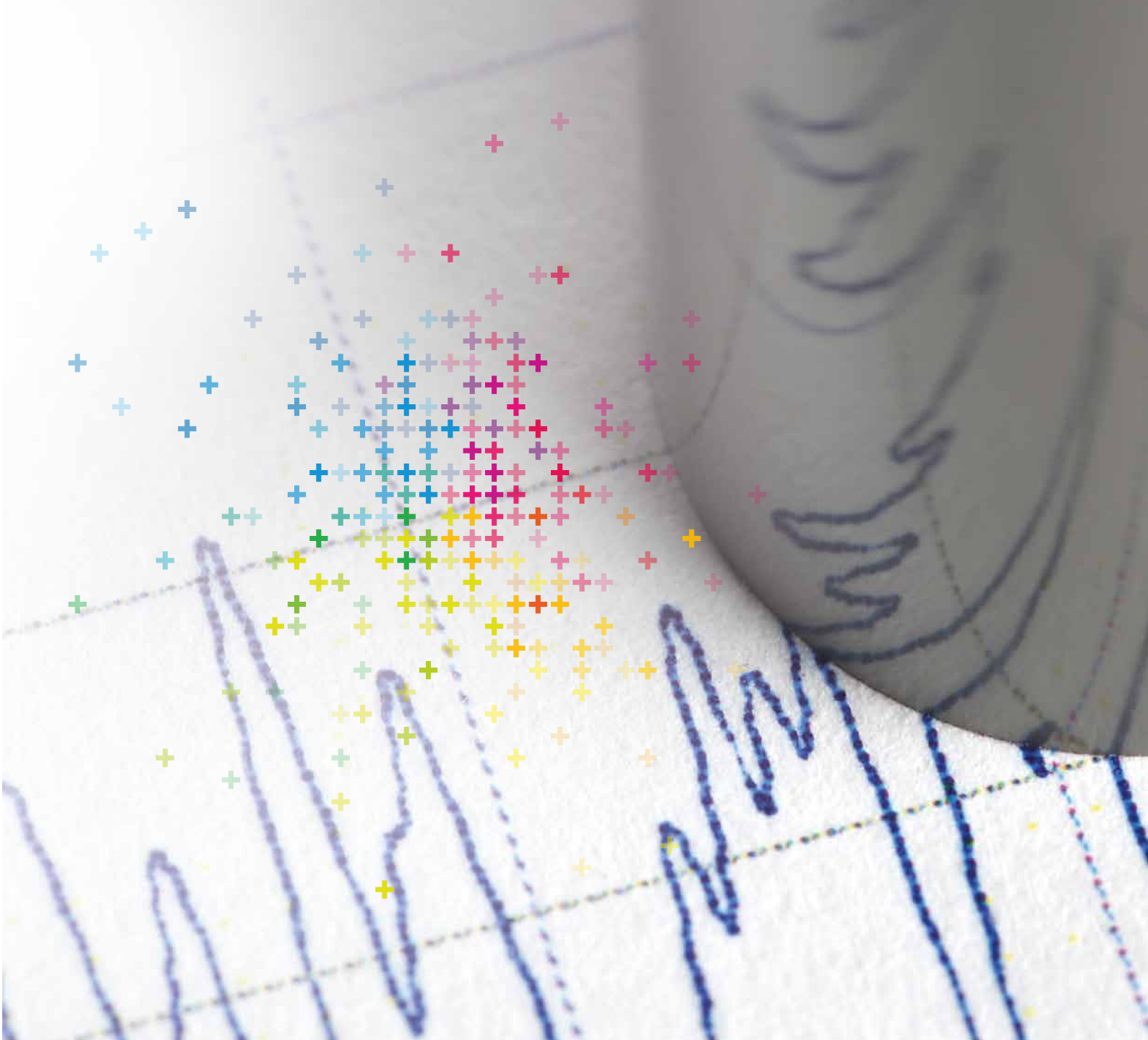
Maximize performance

Developing your knowledge to an expert level, to enhance your machine performances.



Milling

- + Milling– Delta training iTNC530 to TNC640
- + MILLING–Advanced programming



Maximize performance training

MILLING

Delta training iTNC530 to TNC640

article n°200010779 (at GF site)

article n°200010780 (at customer site)



Milling

Duration	Number of participants	Experience level	Requirements	Machines
1 day	4	Intermediate	Basic programming course	Any 5-axis machine with TNC640

Be immediately efficient with your new TNC640

What are the course contents?

- + Basic Knowledge
- + New cycles (Face Milling Cycle 233 and more)
- + New, faster and more powerful simulation of material removal
- + Work with the preset table
- + New probing functions
- + New TNC functions
- + Comparison between iTNC530 and TNC640 controls

What is the course objective?

- + Discover the differences between iTNC530 and TNC640

What are the course benefits?

- + Become familiar with the special features and functions of the TNC640 and be able to use them

Maximize performance training

MILLING

Advanced programming

article n°200010781 (at GF site)

article n°200010782 (at customer site)



Milling



Duration	Number of participants	Experience level	Requirements	Machines
2 days	4	Confirmed	Basic programming 5-axis machining	MILL P, HPM - MILL S/X, HSM

Make yourself a Milling expert

What are the course contents?

- + iTNC530 or TNC640 or TNC620
- + Logical operations (If...then)
- + Conditional and unconditional jumps
- + Branching in programs and outside of the program
- + Program section repeats
- + Nesting techniques
- + Milling cycles for contours and technical curves (e.g., ellipses, spirals)
- + Letter engraving program

What is the course objective?

- + Learn additional and specific knowledge to become a Milling expert

What are the course benefits?

- + Create cycle-type machining sequences
- + Program Milling operations of plane curves with mathematical functions
- + Combination of Q parameters and HEIDENHAIN cycles
- + Use the functions FN 16, 17, 18, etc...
- + Manage and automate complex part measures
- + Save preparation time by automation of complex measurement
- + Allow traceability of machining information

Dedicated training

Customized training based on your specific needs to increase your knowledge and machine performance.



Training for all level

Dedicated training

article n°200011001 (at GF site)

article n°200011002 (at customer site)



Duration	Number of participants	Experience level	Requirements	Machines
Based on your needs	Based on your needs	All levels	Based on your expectations	For all technologies

Realize the full potential of your machine with training customized to your needs

What are the course contents?

- + Adapted to your machine
- + Adapted to your operator's skill level
- + Adapted to your business needs

What is the course objective?

- + Provide your operators with the key knowledge to achieve your business objectives.

What are the course benefits?

- + Acquire the knowledge essential to successful machining.

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 ability 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.



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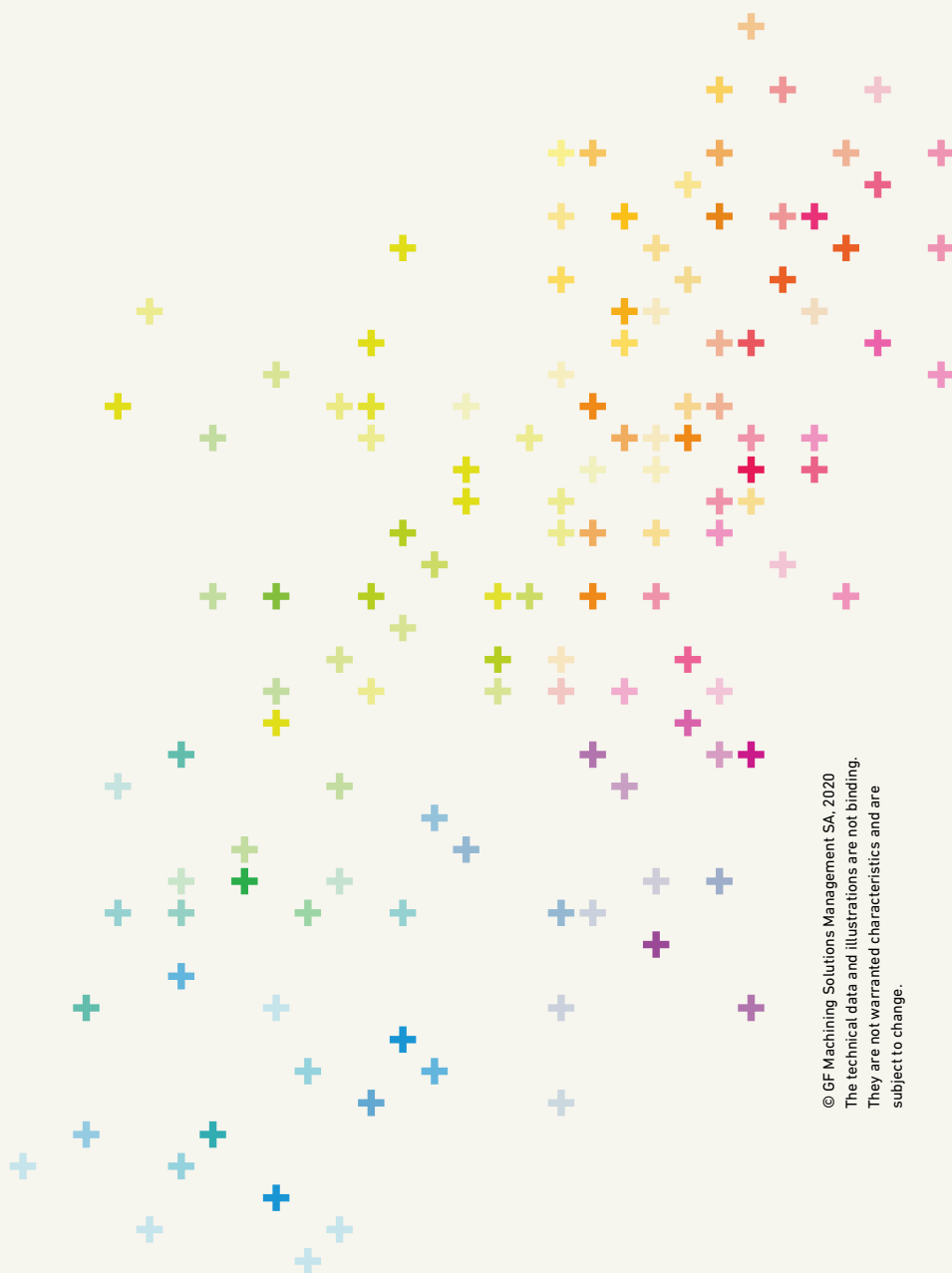
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At a glance

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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