GF Machining Solutions

+GF+

We help bring innovation to life

Medical

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 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.

Swiss design and quality

Dedicated Solutions

The heartbeat of your operation

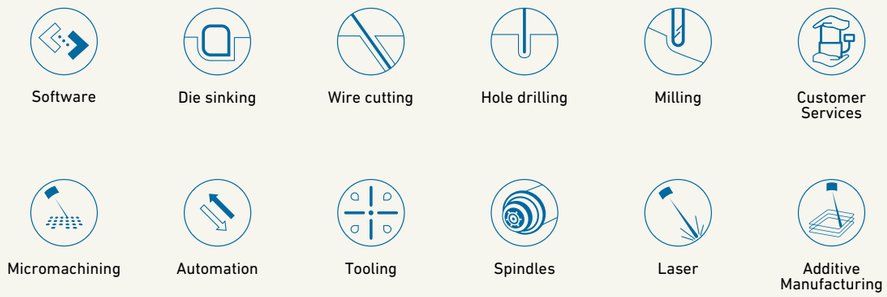
GF Machining Solutions supports your operational health by delivering the innovation, precision, productivity, and support services essential to your production of high-quality medical devices. With our decades of experience and wide range of technologies, we provide complete solutions to your manufacturing challenges. From Milling, Additive Manufacturing (AM), Laser and Electrical Discharge Machining (EDM) to the Automation, data management and connectivity capabilities that allow these technologies to work together seamlessly as part of your operations, GF Machining Solutions ensures your operations run reliably.

We understand your need for traceability of materials and real-time monitoring to secure your processes and keep you on top of stringent regulations, as well as superior process performance in terms of accuracy, flexibility, high productivity and low running cost.

We go a step further by developing our solutions in line with your manufacturing needs, including:

- **Time to market**
- **Repeatability**
- **Efficiency**
- **Digital connectivity**
- **Data tracking**

Backed by our own research and collaboration with specialized universities, our solutions deliver the performance to help your organization innovate with effortless precision. We help bring innovation to life.

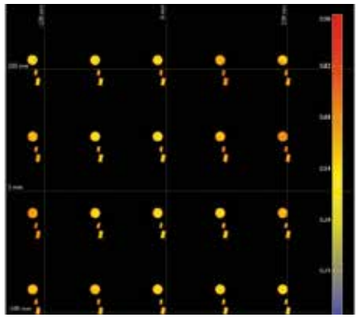


Additive Manufacturing

Revolutionizing manufacturing

Many implant technology advances have been made possible through adoption of Direct Metal Printing. In particular, the development of trabecular titanium structures has revolutionized both hip and spine implants. GF Machining Solutions, together with our partner, 3D Systems, provides an end-to-end solution that takes Additive Manufacturing (AM) out of the research lab and onto the production floor. With industry-leading software and hardware, including 3DXpert for product design and the only wire-cutting EDM system dedicated to the additive technology, our AM solutions bring together the highest product quality, ease of use and unmatched operating efficiency.

DMP Flex 350
metal 3D printing solution designed for your production.



DMP Monitoring
allows real-time process monitoring, synchronized visualization, parameter optimization and post-build process analysis.

3DXpert integrated software
handles the entire AM workflow, from design to post-processing.

AM structure on acetabular hip implants
promotes osseointegration and bone growth.

Post-processing solutions
for patient-specific applications.

Optimized material parameters
for medical applications.

Milling

Technological differentiation

Mikron Mill provide high performance ratios to keep your operation running at full speed. With high-dynamics machine platforms, state-of-the art controls, enhanced chip evacuation systems, tool identification systems, and peerless thermostabilization, our Milling solutions pave the way to success in medical manufacturing.

Our renowned expertise in five-axis Milling with proven reduction of setup and lead time, as well as part cost, is supported by our in-house Step-Tec Spindle manufacturing and technical know-how.

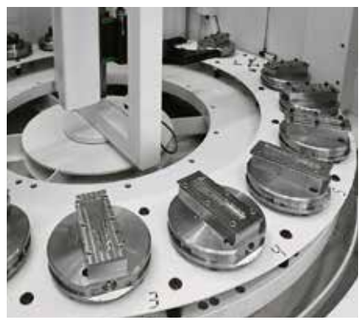
Our compact Milling machines allow you to manufacture injection molds, orthopedic implants, surgical instruments and dental superstructures efficiently even when using hardened materials.

Linear precision guide
reduces machining time and produces better surface finish on orthopedic implants.

High-speed five-axis machining
improves surface finishing and reduces post-processes like polishing or grinding.

Step-Tec CoolCore Spindle
increases tool life and improves machining time.

Chip and dust management
keeps your process clean and in compliance with regulations.



Integrated pallet Automation
optimizes your production and helps you outperform the competition.

Precision

Productivity

Protection

Saving energy

smart modules
are intelligent machine services that increase your productivity.

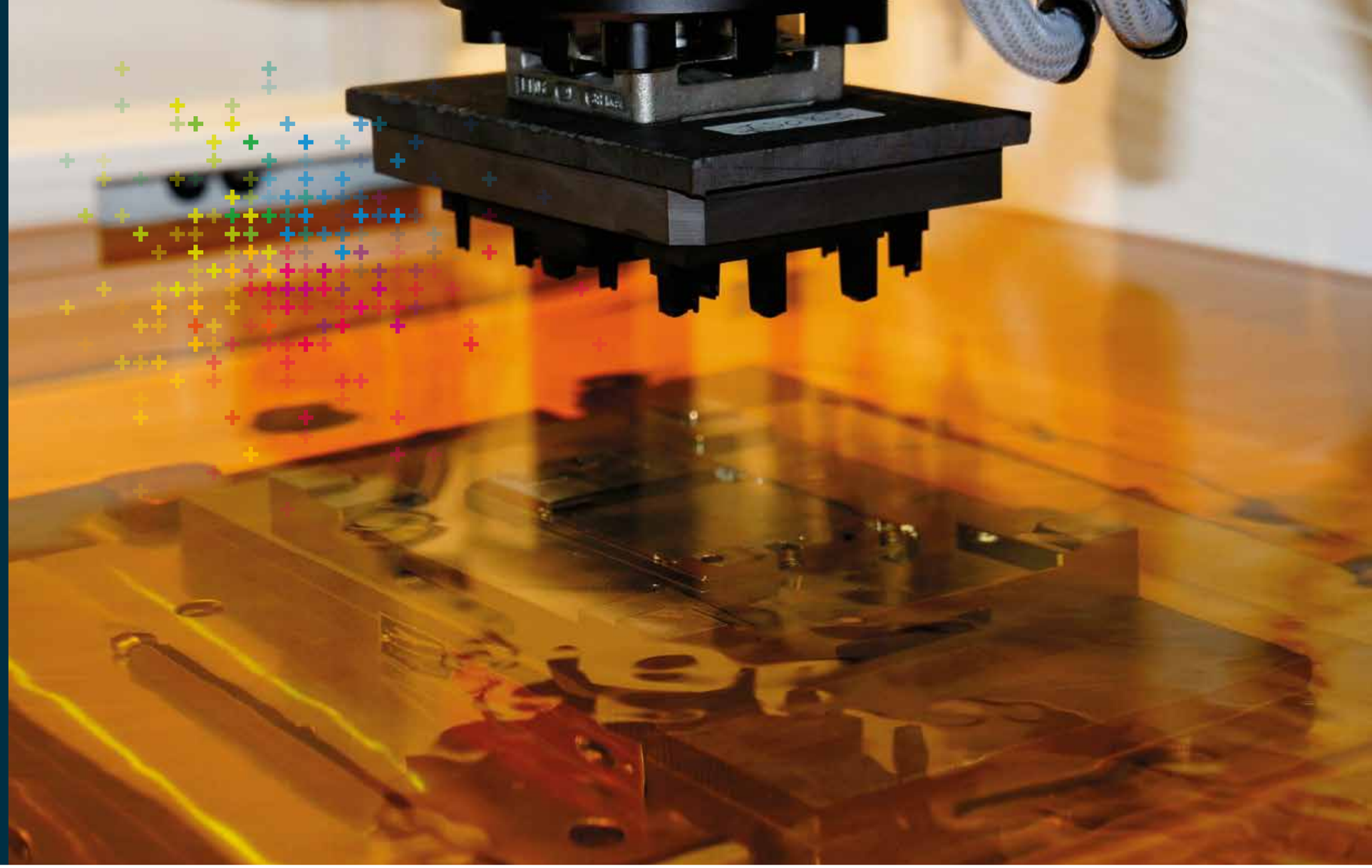
EDM

Pushing the boundaries

Our EDM machines are used to manufacture conductive materials to an accuracy of up to one one-thousandth of a millimeter (1 micron) without mechanical forces.

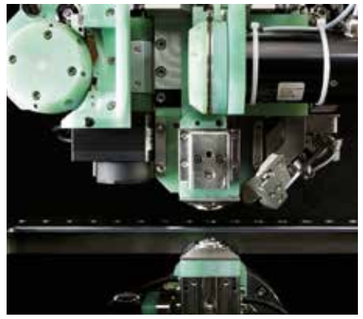
GF Machining Solutions serves medtech customers through a complete range of wire-cutting, die-sinking and hole-drilling EDM solutions. Our latest generation of EDM technologies boosts machining speed while leaving no recast layer, and ensures the perfect geometries essential to medical manufacturing while creating burr-free parts.

These technologies are ideal for a variety of medical manufacturing segments, particularly minimally invasive surgical instruments and complex, nonstandard medical micro molding applications.

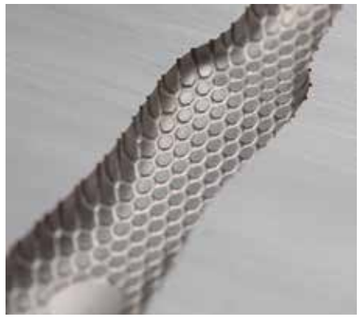


Comply with medical standards
IPG generator avoids material deposition on titanium parts, ensuring biocompatibility.

Limitless geometries for surgical tools
Get force-free machining and profile accuracy with our thin wire capabilities.



High productivity, lower costs
Automatic Wire Changer (AWC) reduces machining time for small and complex geometries.



Perfect surface homogeneity
Generator's complete mastery of surface and spark control allow perfect surface homogeneity with exact desired glossiness.

Advanced thermostabilization
avoids deviations due to temperature fluctuations and ensures unmatched precision under workshop conditions.

A reliable, long-lasting mechanical concept
guarantees geometrical accuracy and positioning results to a high degree of certainty.

Laser

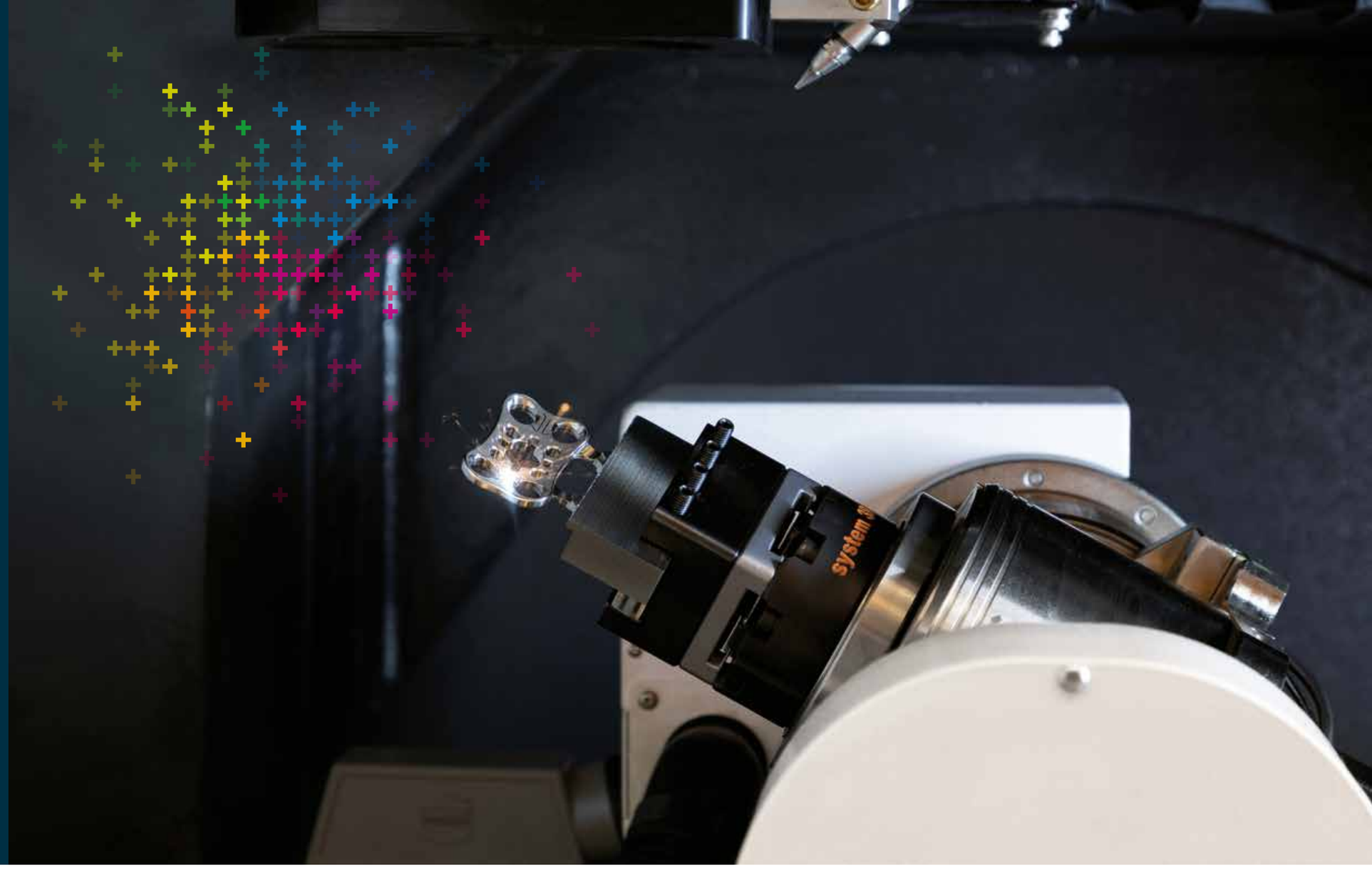
Broadening the spectrum

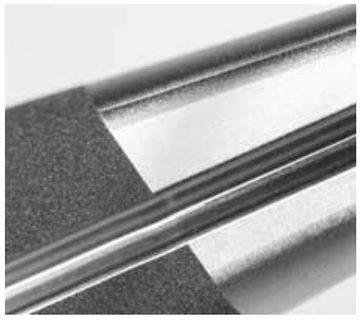
Our fully digital Laser texturing solutions accurately texture, engrave, microstructure, mark and label 2D and complex 3D surfaces with effortless precision. Applications range from injection molding and structuring of surfaces of orthopedic implants to ensure bone and connective tissue growth, to texturing of surgical instruments' surfaces to ensure performance.

Compared to conventional grit blasting and chemical etching surface treatments, Laser texturing can reduce your costs, consumables, and energy use while improving your lead time.

Efficient machining of minimally invasive surgical devices' extremely small features requires the speed and precision afforded by exceptional machine dynamics. GF Machining Solutions' Microlution brand meets the challenge.

Whether your challenge is lot sizes of one or volume production, our micromachining solutions are support your flexibility and cost competitiveness. That's because our solutions are equipped with ultrashort pulse nanosecond or femtosecond Lasers capable of resolutions down to a micron.





Laser texturing
creates multiple functional surfaces and textures, without masking.

All-in-one Laser head
simplifies your working process.

Laser blasting
provides outstanding texture homogeneity.

Minimally invasive surgery
instruments have a variety of critical surfaces that must meet tolerance requirements.

Microlution's ML-5 ultrafast Laser
platform can deliver precision parts in seconds.

Microlution MLTC Laser technology
can machine even the most intricate cutouts on the thinnest catheter marker bands.

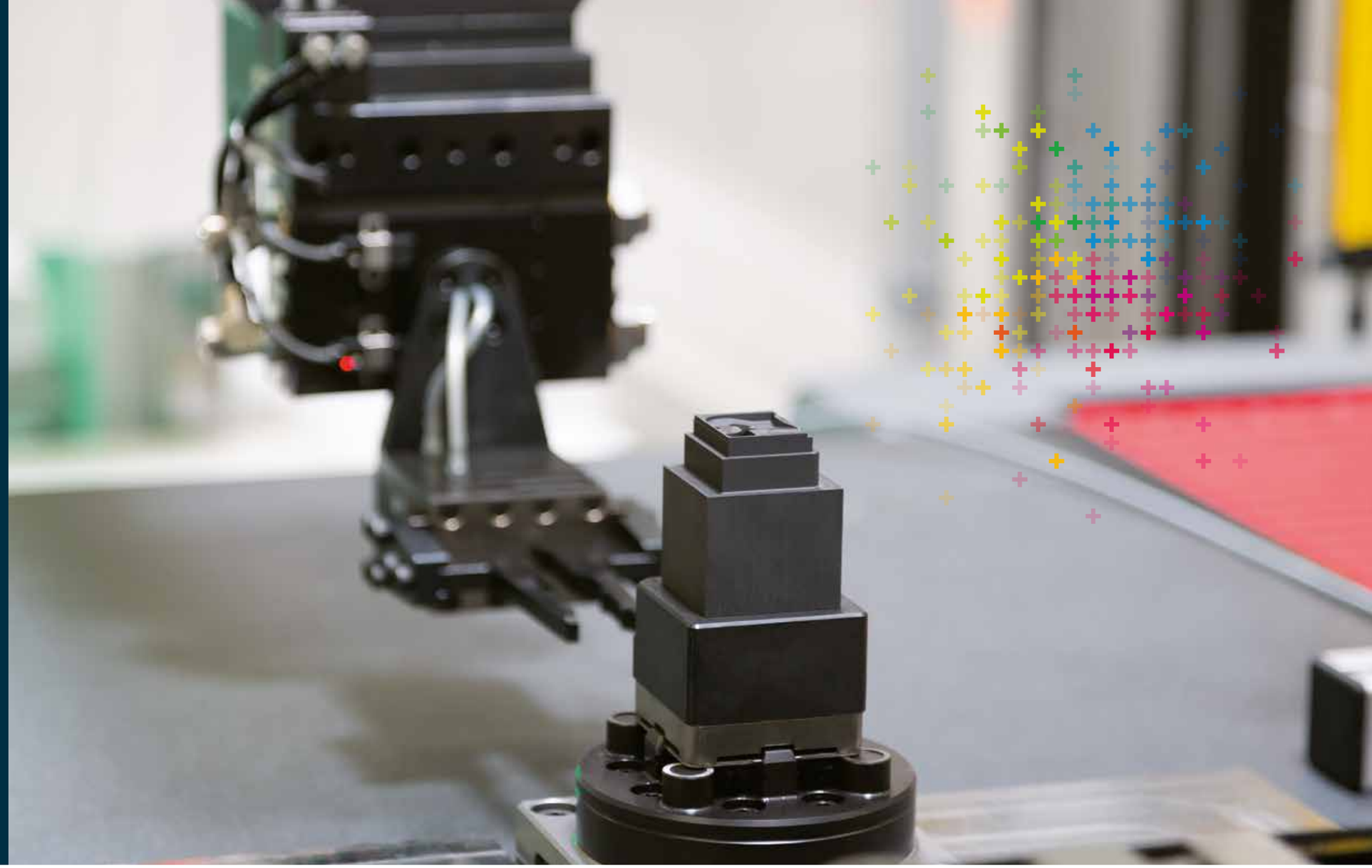
Tooling and Automation

Optimizing production

Our Automation cells and Tooling solutions are adaptable and fully compatible with our entire range of machining solutions. They are superbly integrable in your existing production environment.

GF Machining Solutions' Automation delivers increased process control, greater efficiency and faster time to market. Our vast global experience in developing automated solutions for medical manufacturers positions us to help you standardize your processes and significantly reduce the number of steps required to achieve your production targets.

Our high-quality, integrated Automation cells help you control production quality and costs and keep the work process clean and efficient—all of which are must-have conditions for medtech manufacturing.



Customized clamping for orthopedics
ensures your success with a wide variety of solutions.

Customized clamping for dental
reduces material waste.

Vibration-damped palletization
provides extended tool life, better surface quality, machine Spindle protection and higher material removal rate.

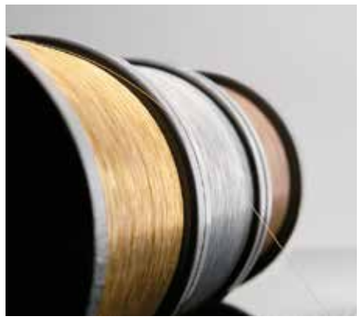
WorkPartner
boosts productivity by housing required tooling and mounts in close proximity to machines.

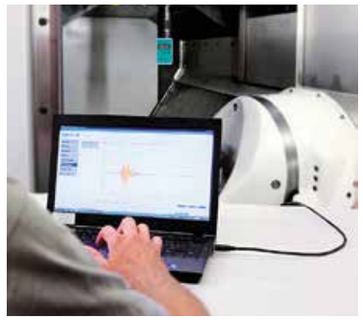
System 3R robot Automation
optimizes your complete process.

Complete Automation cell
keeps the work process clean and efficient.

Solutions for you

Optimizing your productivity is at the heart GF Machining Solutions' broad range of customizable Customer Services solutions. Close to you—wherever you are in the world—our local Customer Services teams speak your language and know your concerns.





Our Customer Services support for the medtech industry is based on three key points

Expertise
Our employees understand the specifics of the medical industry and have mastery of the related technical and technological challenges. We support you in the innovation process and advise you in the development of new devices.

Time to market
With Machine Support, GF Machining Solutions offers you original spare parts, technical support and preventive services to operate your equipment in perfect order and condition and optimize your uptime.

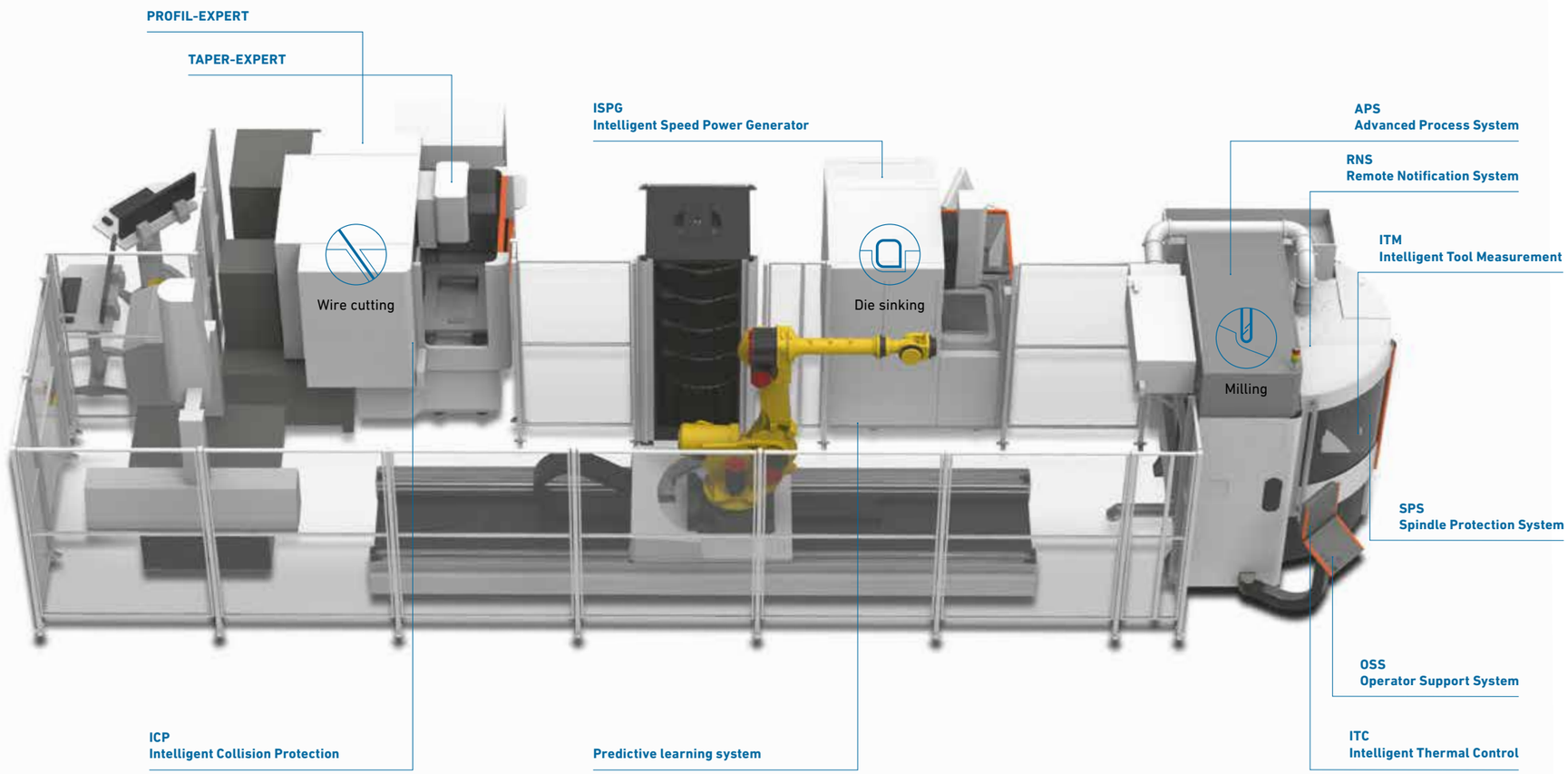
Certification
We assist you with your approval and certification procedures by offering you certified consumables and certification support.

Data management and interconnectivity

Industry 4.0 ready

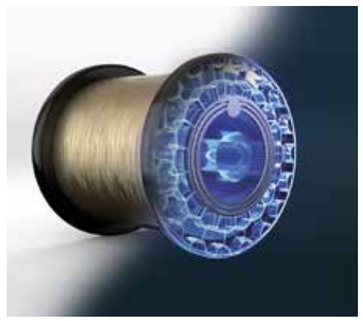
Compliance with documentation and data tracking regulations is a fundamental requirement in medical device manufacturing. GF Machining Solutions supports your compliance by providing a comprehensive set of hardware and software tools that provide real time monitoring of your system, connectivity between your GF Machining Solutions machine and your enterprise resource planning (ERP) system, and many other benefits. Our technology helps you to maximize your productivity and profits via connected solutions that ensure efficiency, uptime, and compliance with the processes that you have defined.

From our rConnect platform allowing secure, wireless access to every GF Machining Solutions machine to eTracking's real-time process monitoring and data recording, we help you gather operation-critical data. Our Live Remote Assistance (LRA) remotely connects a GF Machining Solutions technician with your machine and technician, with video and the ability to securely transfer data and files, as well as a shared whiteboard capability to speed problem resolution and keep your machines running.



Follow the status of your machines wherever you are, and get alerts via rConnect Messenger.

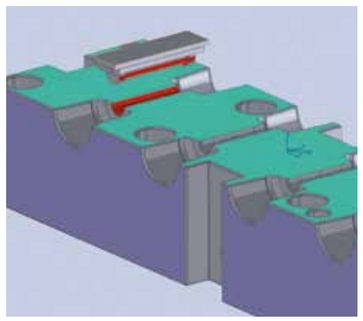
Connections are protected via a 256-bit encryption code and certified by TüViT.



Our SMART consumables communicate with the machine via a radio frequency identification (RFID) chip, ensuring that the right tool is loaded for the job.

Live Remote Assistance brings a GF expert to the side of your machine to maximize your output and efficiency.

Monitor machine performance and efficiency based on Key Performance Indicators (KPIs) based on ISO 22400.

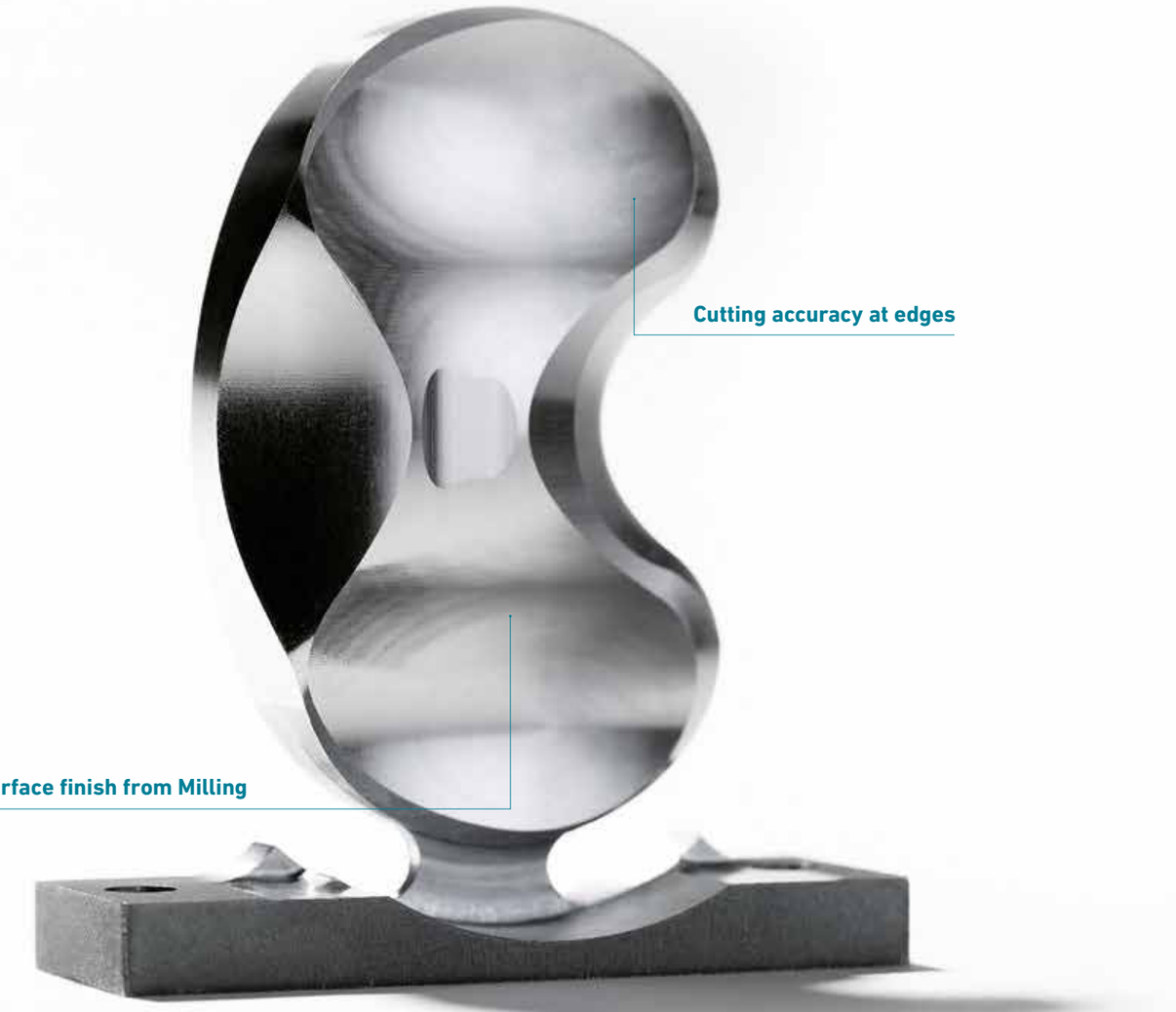


T.R.U.E. PRECISION and MPP softwares automate your EDM operations, increasing precision and efficiency.

Orthopedic implants

GF Machining Solutions is recognized for offering industry-leading solutions for manufacturing implants such as anatomical bone plates, femoral and tibial knee components, as well as hip, shoulder and spine implant components. Whether your product needs trabecular titanium structure made with Additive Manufacturing (AM) or a mirror-smooth finish from high-speed Milling, our complete range of machines drives your success, both for complex customized products and large volume production of standard elements.

With our Milling solutions, you can machine even the toughest materials such as titanium and cobalt-chrome alloys and achieve flawless surface finishes—with fewer post-processing operations such as grinding—bringing improvements in lead time and your bottom line.



Multiple bone plate clamping

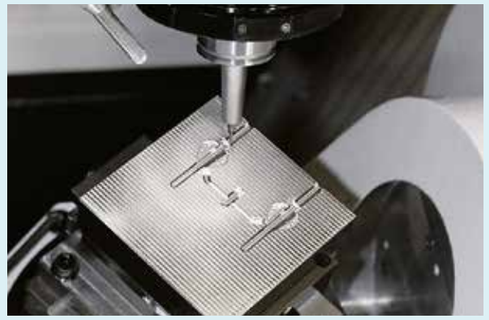
High-speed finish cut

Cervical implants using trabecular titanium structure made with Additive Manufacturing.

Since 1995, Step-Tec has been developing, producing, selling, and repairing precise, high-performance Spindles for leading manufacturers of machining centers for medical devices applications.

Step-Tec Spindles cater to all materials' machining requirements by providing constantly optimized power output and rotations per minute (RPM).

Designed for precision and accuracy, the Spindle rigidity increases machine productivity.



Through-spindle coolant (TSC) technology supports effective machining and greatly reduces tooling cost.

Surgical instruments

Our EDM and Milling machining solutions are unmatched for the realization of precision, complex, nonstandard surgical instruments with machining capability to an accuracy of 1 µm.

We have proven competence in machining of surgery-assisting microprobes, bone saw guides, biopsy needles, LASIK surgery instruments, minimally invasive surgical instruments, high-end tools, endoscopic instruments and much more.

Wire EDM-machined grasper

Milled handle

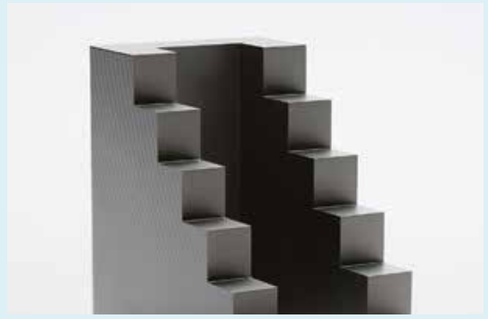
Micro forceps

High-end tool

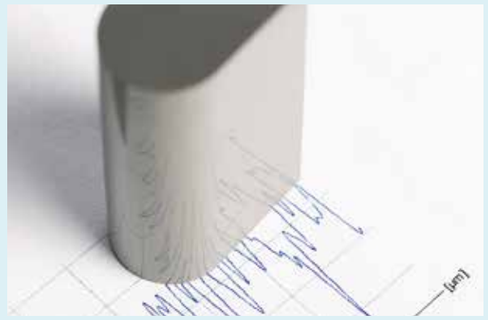
Customized screw for surgical instrument assembly

The manufacture of surgical instruments and complex molds requires high-level technology. Software developed by GF Machining Solutions improves the machining process.

PROFIL-EXPERT automatically adjusts machining parameters during direction change and adjusts cutting speed, consistently delivering perfect geometry.



POWER-EXPERT decides the optimum power and continually optimizes the machining speed.

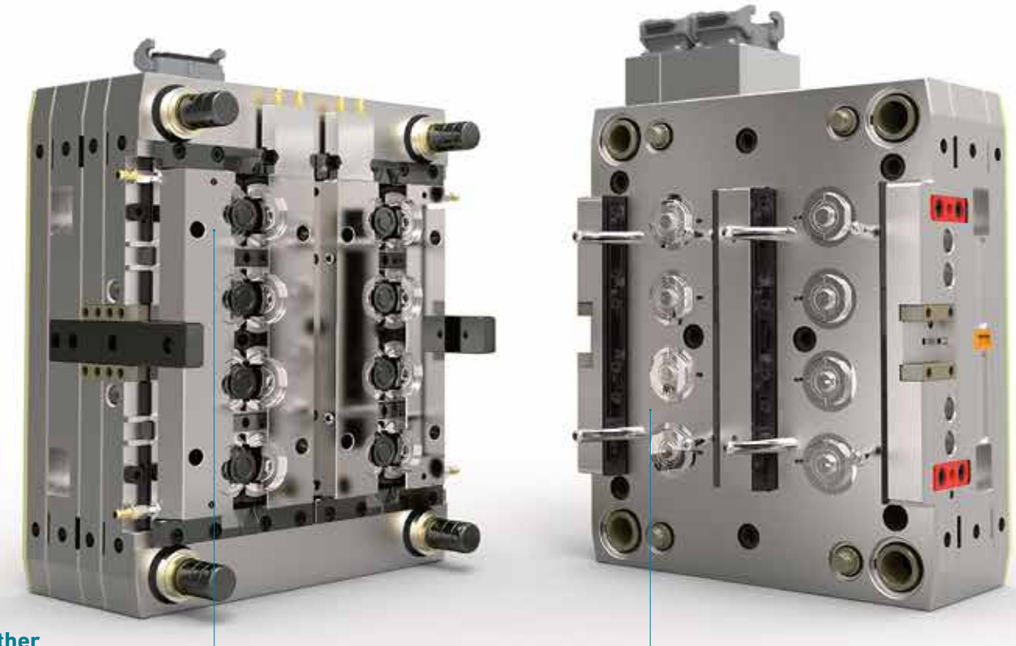


SURFACE-EXPERT controls the sparking parameters during the finishing stage on parts with abrupt changes in height.

Molds for medical devices

GF Machining Solutions is the industry benchmark in mold and die manufacturing. Our technology ensures that your tools are manufactured to the higher tolerances and that you achieve the superior surface finishes so often required of medical devices.

We reduce the time needed to get from first roughing cut to the finished product through a combination of the industry's most precise machines and software that intelligently manages tool offsets and the EDM process.



Greater positional accuracy and smoother cavity surfaces

High repeatability and accuracy of machined features

* Injection molds for packaging Braunform GmbH

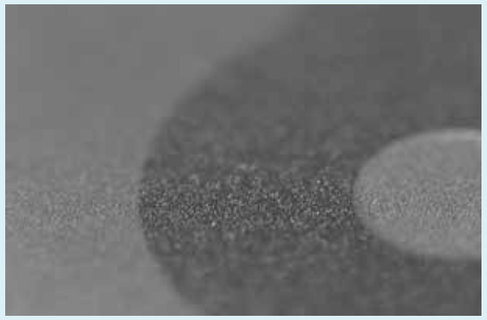
Injection molds for syringes (Schöttli AG)

Graphite electrode and die for eyeglasses

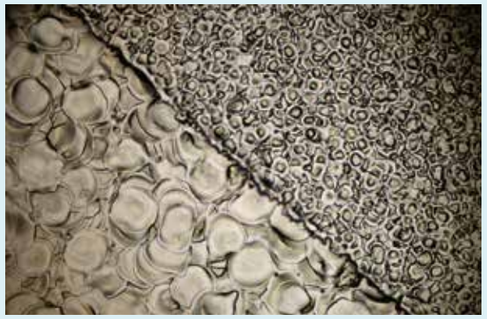
Mold print for plastic toothbrush

Surface homogeneity reaches a new level of perfection, thanks to three-dimensional surface (3DS) structuring technology, integrated in our EDM systems. It allows higher productivity, repeatability, flexibility and greater product quality.

3DS provides a perfectly homogenous surface structure, the exact degree of desired glossiness, and greater scratch resistance for injection molded parts.



With 3DS, surfaces are qualified in both crater height and width and the craters left by EDM are perfectly controlled.

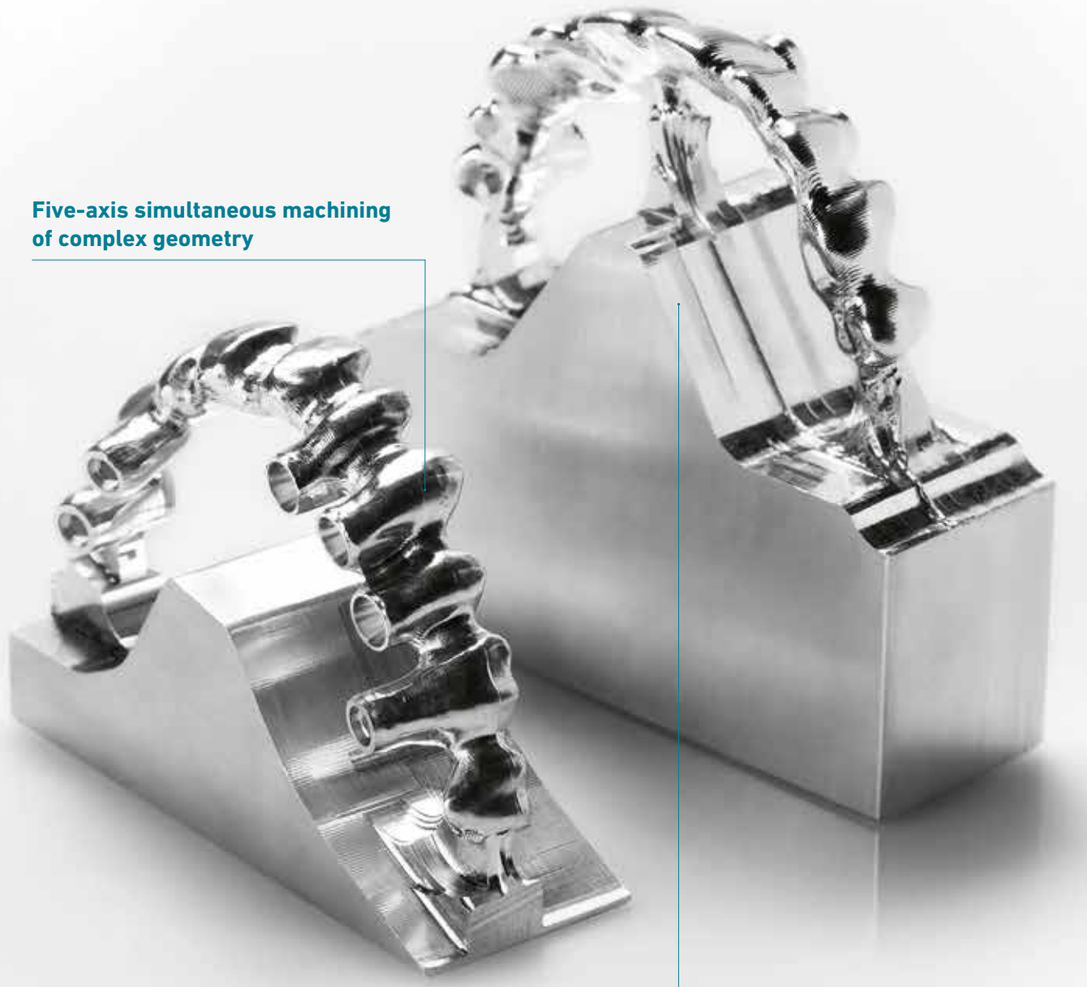


3DS reduces your maintenance costs by limiting residue accumulation.

Dental implants

Complex dental crowns and bridges are made of some of the hardest materials found in manufacturing. Whether your process requires Additive Manufacturing (AM), high-speed Milling or Laser texturing, GF Machining Solutions delivers solutions that are unbeatable in terms of machining time, surface quality and automated production. We have decades of experience in providing leading manufacturers with the right tools and technologies essential to your efficient production of the highest quality products.

Five-axis simultaneous machining of complex geometry



Reduced waste with customized clamping

Titanium bridge and crown

Automated production of dental superstructures

Patient-specific metal AM applications with post-processing solutions

High-speed, five-axis, simultaneous machining provides significant advantages in terms of costs, quality, and time.

By accessing the part from all sides, five-axis machining creates complex features on dental and orthopedic implants in one setup.

High-speed five-axis machining allows use of small tools for high-speed cutting without increasing cutting load. You achieve better surface finish.

Freedom of movement allows manufacturers to tweak their processes and save on tooling costs.

The heartbeat of your operation

GF Machining Solutions is a globally acting Division of the Georg Fischer Group (Switzerland) and maintains a presence at 50 locations worldwide. Its 3,394 employees generated sales of CHF 1,066 million in 2018.

As a preferred partner to leading medical manufacturers, we support our customers worldwide.

259.806.882

Your contact

Business Development and Segmentation
dedicated.solutions@georgfischer.com

GF Machining Solutions Management SA
Rue du Pré-de-la-Fontaine 8
1217 Meyrin 1, Geneva
Switzerland

GF Machining Solutions LLC
560 Bond St.
Lincolnshire IL, 60069
United States of America

www.gfms.com