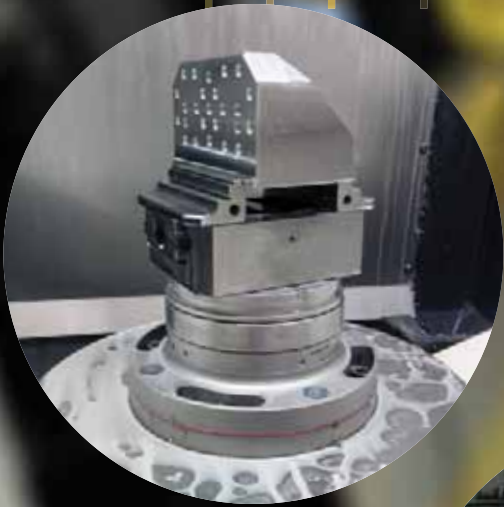


System 3R – At a glance



Swedish design and quality

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

 We are System 3R.
We are GF Machining Solutions.

CO₂ NEUTRAL

Care for the environment and protection of natural resources are key elements in System 3R's operations

- + We take all necessary precautions to prevent contamination of soil, air and water.
- + In our production processes, we continually improve the efficiency of our energy use.
- + The products and methodologies we offer the market improve the efficiency of our customers' use of existing resources.
- + We are CO₂ Neutral

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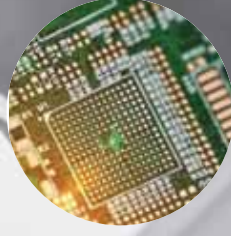
Our technologies

- Milling
- EDMing
- Tooling and automation
- Additive manufacturing
- Laser
- Micro machining
- Powder compacting
- Digital transformation



Customer segments

- Aerospace
- Electronics
- Medical
- Home appliances
- Energy
- Automotive
- ICT



GF Machining Solutions is one of the world's leading providers of complete production solutions. Besides the tool and mould making industry, the company's customers also include manufacturers of precision components. The company's portfolio covers milling, wire-cutting and die-sinking EDM machines. This is further complemented by spindles, laser texturing, additive manufacturing, tooling, automation, digitisation solutions and customer services.

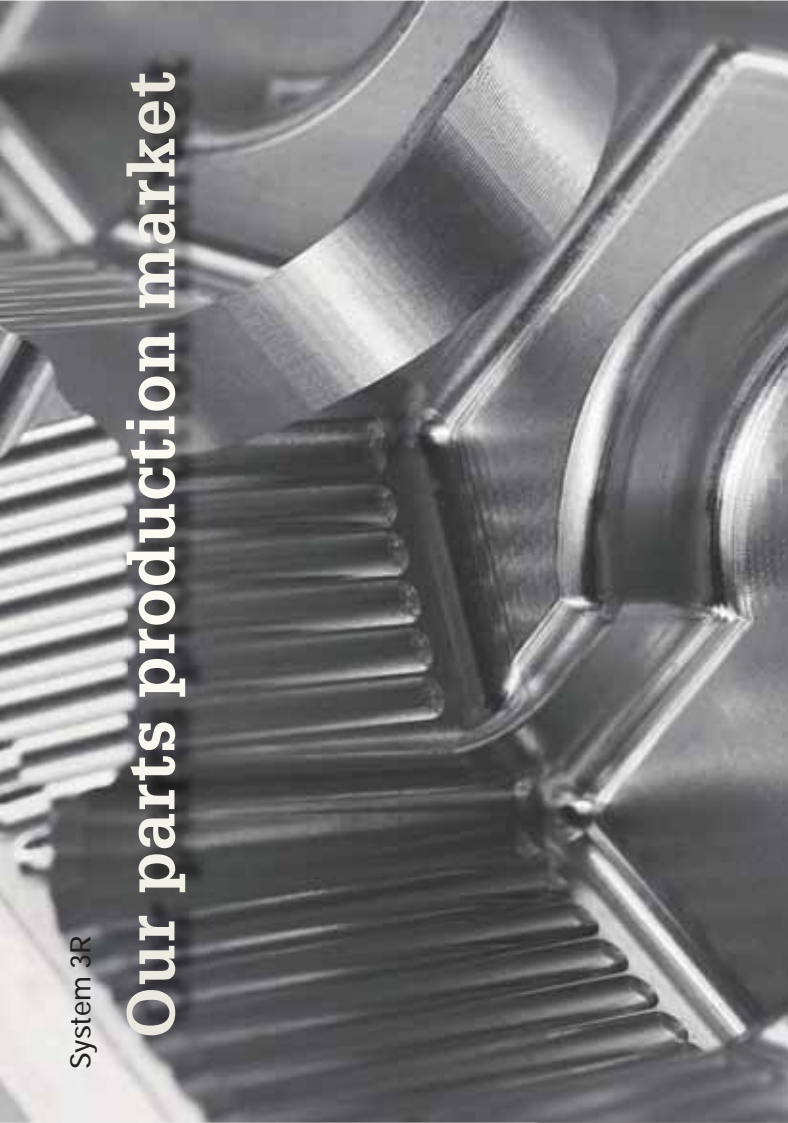
Part of GF Machining Solutions, System 3R is known as a global supplier of high-quality tooling systems, tools and software for palletisation and automation. Serving the precision production industry, the company has customers all over the world.

- + Established 1967 - the Pioneer
- + Headquarter in Stockholm, Sweden
- + Sales offices worldwide
- + A member of the Georg Fischer Group
- + 180 employees
- + More than 20,000 customers worldwide
- + 2,700 installed automation cells.

Our die and mold market



Our parts production market



Die and Mold (D & M)

Production of devices that are then used to manufacture parts.

Typical customers

Mold manufacturers, tool-makers and OEMs (as part of machine sale).

Europe

SECO, Sandvik (carbide goods), Tetra Pak (packaging), Swarovski (glassware manufacturing).

America

Gillette (consumer goods), General Electric (aerospace, medical and consumer), Stihl (chainsaws and strimmers), Shimano (bicycle and fishing equipment).

Asia

Canon (digital cameras and colour printers), Haier (household appliances), Goertek Inc. (acoustic components), Indo-Mim (precision metal injection), YKK (fasteners, machinery and engineering products), TE (connectors industries), Nolato (mobile phone molds, Nikon (digital cameras, lenses, LCD scanners and measuring instruments), Mitsubishi (precision metals, automotive, electronics, construction and engineering products).



Parts production (PP)

Processing of raw materials to produce finished parts and workpieces.

Typical customers

Manufacturers of high-value parts who require extreme accuracy and precision. Also OEMs (as part of machine sale).

Europe

Rolex and Patek Philippe (watches), LUK (automobile parts), Kongsberg (aviation goods), Rolls-Royce (aerospace products), Swarovski (crystalware).

America

General Electric (aerospace, medical and consumer products), Stihl (chainsaw and strimmers), Turbocam (turbine blades and impellers), Williams International (aerospace and defence equipment), Meyer (turbine components).

Asia

YKK (fasteners, machinery and engineering products), Nikon (digital cameras, lenses, LCD scanners and measuring instruments), Mitsubishi (precision metals, automotive, electronics, construction and engineering products), THK (linear motion and screw-feed systems).



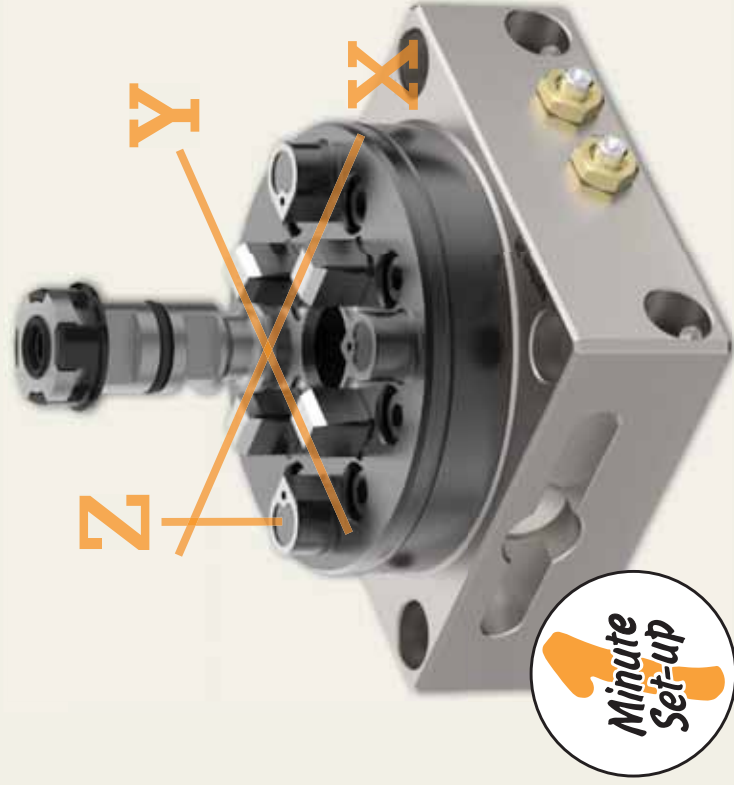
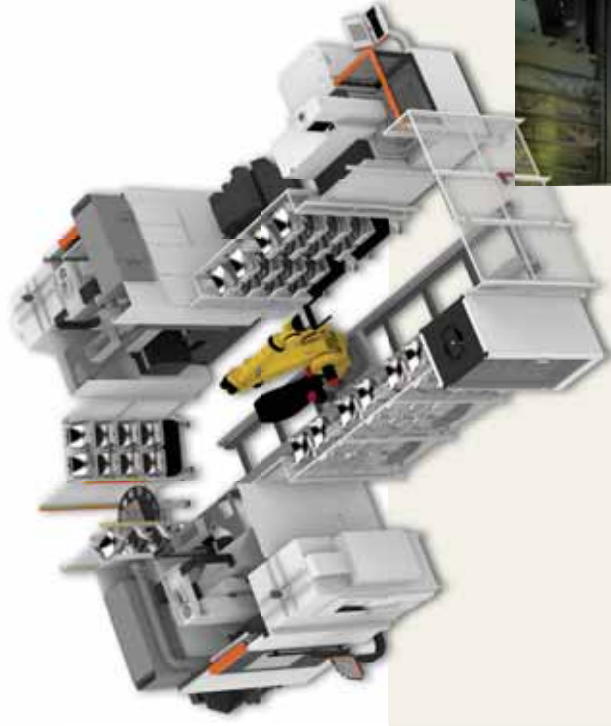
What is the secret?



Automation for increased competitiveness

There are no holidays in today's production calendar. Manufacturing takes place all year round, all around the clock and in all parts of the world.

To stay competitive, our customers must be able to keep up. Palletisation is a major element in success; automation is essential for competitiveness. With System 3R, taking the step to automating and streamlining production is far easier than is often imagined.



Vision and concept

GF Machining Solutions and System 3R share a business concept. In turn, this is founded on a shared vision. We shall be the leading supplier of productivity-enhancing tools and knowledge for the manufacturing industry.

Your machines do not need to stand still for long while you set-up and prepare different jobs. Everything goes faster with fixed references. We call this concept **One Minute Set-up!**

By working with fixed references, System 3R converts internal set-up time to external set-up time. Our concept centres on defining each machine's zero point once and once only. Fixed references for all machines and a common system for the entire workshop are then possible. Just like pit stops in Formula One, set-up times are reduced dramatically.

Palletisation is the first step towards automation. Combined with a reference system, this gives unbeatable accuracy. System 3R minimises downtime and connects production flows. The ultimate goal of reducing lead times is achieved!

ROI – Return on investment

Automation is a way of creating long-term security for survival. Currently, many expensive machines are not being used to more than a limited part of their real capacity. By helping you to increase this use, System 3R also improves your ROI. We help you organize and structure your production from a holistic, process perspective.



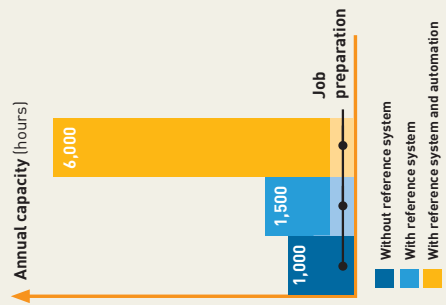
System 3R offers you great potential

By using System 3R equipment and software, you can almost immediately start reaping greater benefit from your investments. We are convinced that once you have started with automation you will continue on that path. We help you reach the future faster and better equipped. Furthermore, with our newly developed ROI App we can help you with the figures.

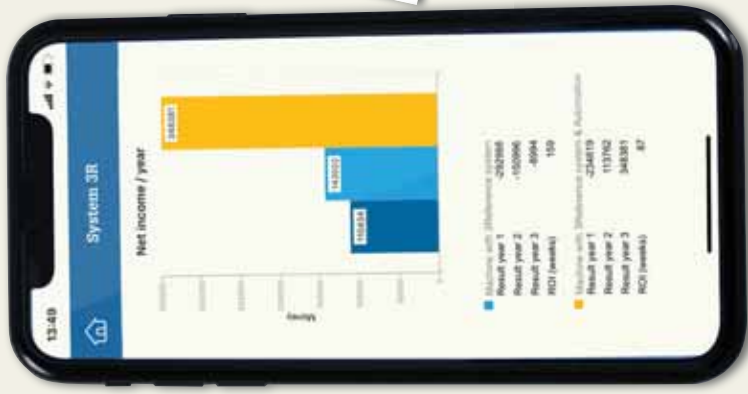
Capacity



Productivity



Reduce set-up times
 + Reduce set-up time by more than 85% per operation.
 + Add automation (e.g. workpiece transfer) and work 24/7.



Easy calculation of costs and returns:

- + Machine investment.
- + Machine + tooling investment.
- + Machine + tooling + automation investment.



Automation

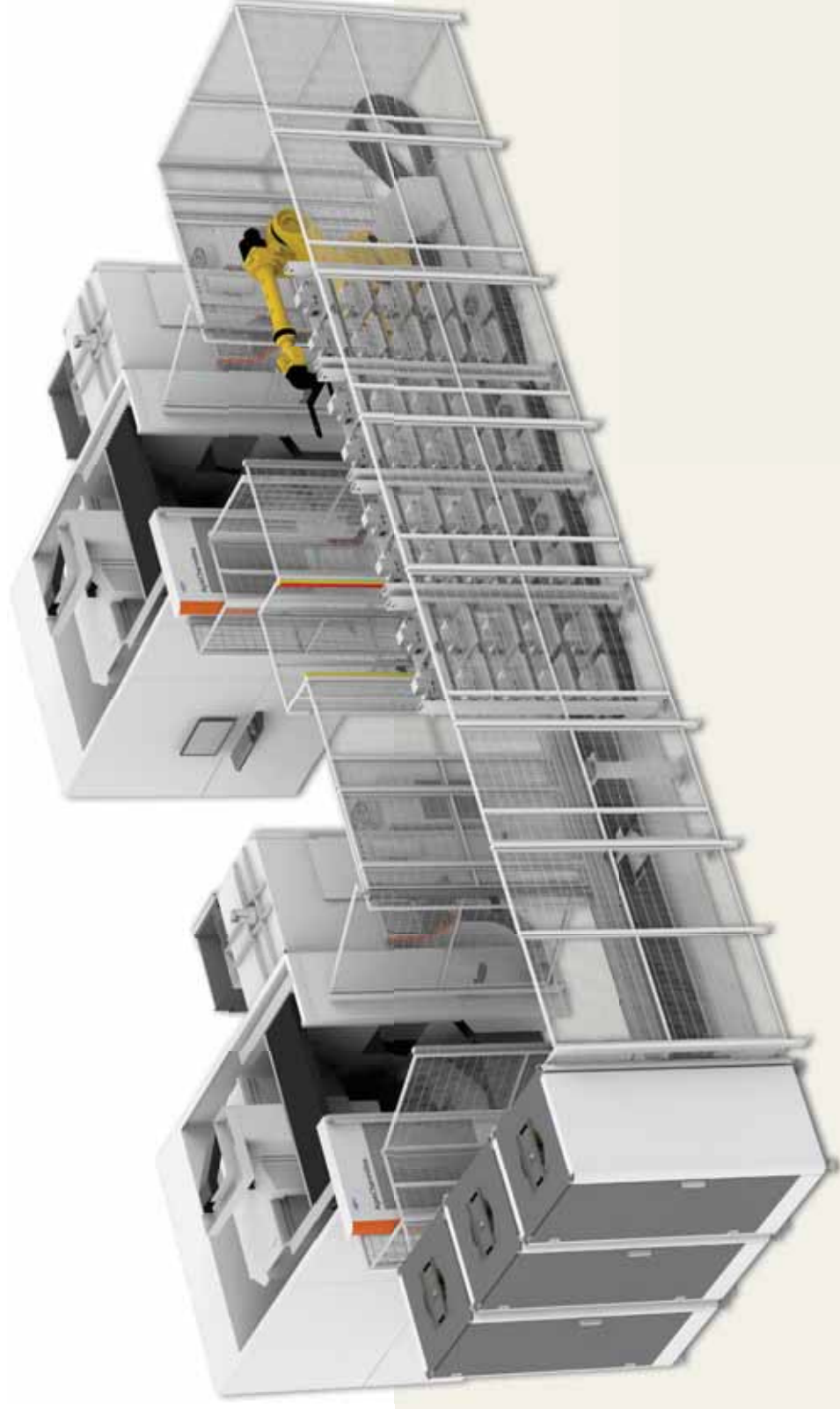
Deliver just in time

Using System 3R robots and software, you can have automated, streamlined production. The focus is on shorter lead times, flexibility and minimum inventory.

System 3R helps you produce the right article at the right time. The first step is palletisation. Next comes robotisation. With this help, production is so certain that you know exactly what to manufacture, which machines to use and how the process will run.

For the greatest possible production efficiency and flexibility, you need central control of your processes. This is where our WorkShopManager pays for itself. It enables ever shorter series in ever shorter times with a greater number of product variants.

Our software is the helper that keeps track of all production steps, resources and technologies. Management, monitoring, coordination and quality control are all simplified. This creates flexibility in the production chain. It also increases the ability to standardise processes and achieve the right quality and unsurpassed repeatability.



System 3R – ONE SOURCE



When you choose System 3R you get more than just our products and services. You also have the opportunity to enter into a productivity-increasing journey. We can be your long-term total supplier and partner. To ensure high quality and reliability, we too like to have long-term relationships and reliable suppliers.

System 3R has manufacturing and other facilities in Stockholm (Sweden) and Flawil (Switzerland). From these bases, we offer support agreements for software and hardware; carry out installations and repairs; and, if desired, provide priority service.

You yourself choose the right service level for your company. Our strength is that we are always close to each customer. Our knowledge, resources and ideas are constantly available. After all, our future is based on the success of our customers and being the ONE SOURCE for all your productivity solutions.



System 3R – makes the future present

Time is important. While getting things right can take time, it also saves time. Similarly, planning right saves planning later. Sooner or later, all producers have to think about how to best equip themselves for the future. To help with this, we have a few basic questions.

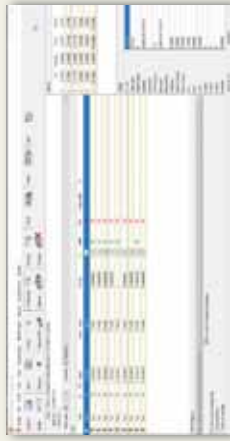
- What skills does your workforce have?
- How do you use your machine park today?
- Can parts of your operations be changed to use resources more efficiently?

We can help you exploit your potential today. Believe us, we know! Asking these questions led us to invest heavily in our own production. With very good results. We are happy to share our experience.

Contacting System 3R can be an important step towards enhancing your competitiveness. Dare to invest in your future. **We feel we can make it your present!**



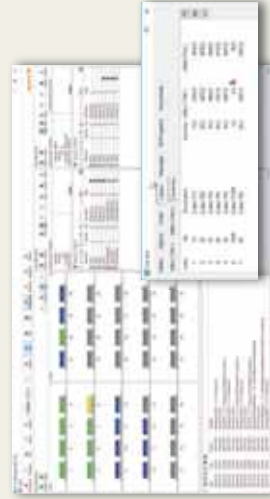
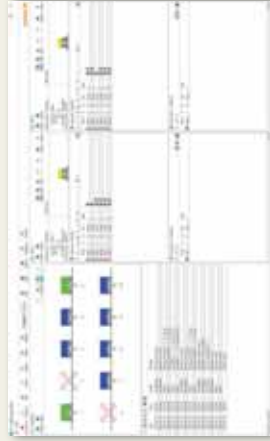
Software highlights



Preparation – WorkCenter



Statistics



ECM – easy cell manager

- + For Milling and laser machines
- + With System 3R robots, support 1 to 4 machines
- + Supports loading station

Options:

- + CTM – cutter tool monitoring
- + Alarm server.



Execution – CellManager

CTM – CutterToolManager

Software summary

WSM module	Process support	Robot type	Machines	Rail	Supported options
CellManager	EDM, wire EDM, mill, laser, CMM & clean	WP1, WP1+ & Fanuc	1 - 12	■	CTM, AES, Alarm Server, pallet/hybrid station, statistics, monitor and MPS2WSM
CellManager Light	EDM, wire EDM, mill, Laser & CMM	No robot	1	-	CTM, AES, Alarm Server, statistics, monitor and MPS2WSM
BatchBuilder (without ID)	EDM, wire EDM, mill, CMM	Pallet/electrode changer, WP1 & WP1+	1	-	MPS2WSM
BatchBuilder (with ID)	EDM, wire EDM, mill, CMM	Pallet/electrode changer, WP1 & WP1+	1	-	Alarmserver, statistics, monitor and MPS2WSM
EasyCellManager	mill	WP1, WP1+ & Fanuc	1 - 4	■	CTM, Alarm Server, statistics and monitor
JobToolManager	mill	Mikron WPC	1	-	CTM, Alarm Server, statistics and monitor

WSM options	Technology	CellManager	CellManager Light	BatchBuilder	EasyCellManager	Job Tool Manager
CTM – cutter tool monitoring	Mill	■	■	-	■	■
Alarm Server	All	■	■	-	■	-
AES – automatic electrode selection	EDM	■	■	-	-	-
Hybrid station (pallets & raw mtrl)	Mill	■	-	-	-	-
Pallet station (re-fixturing)	Mill	■	-	-	-	-
Cell statistics	All	■	■	-	■	■
Cell monitor	All	■	■	-	■	■
MPS2WSM	All	■	■	■	-	-



JTM – job tool manager

- + For milling machines
- + Supports One Mikron Mill with WPC
- + CTM – cutter tool monitoring

Options:

- + Alarm server.



Easy, step-by-step

- + For mixed pallet automation combined with workpiece handling.
- + Fully automatic change from workpiece A to workpiece B in the machine.
- + The system keeps track of NC program, cassette, gripper, chuck adapters, quantity, etc.

The workpiece handling concept is ideal for workpiece families. Thus, grippers and fixtures can possibly be used for more than a single, unique workpiece.



Prepare

Prepare cassettes and jobs.
Load cassettes into magazine.
Execute the jobs via CellManager

Choose

Choose specific chuck adapter/vice needed for the material

Bring

Bring the cassette with materials to the Intermediate station

Load

Using predefined raw material gripper, load each material into the chuck adapter/vice and start first job in the queue.



Highlights

Begin

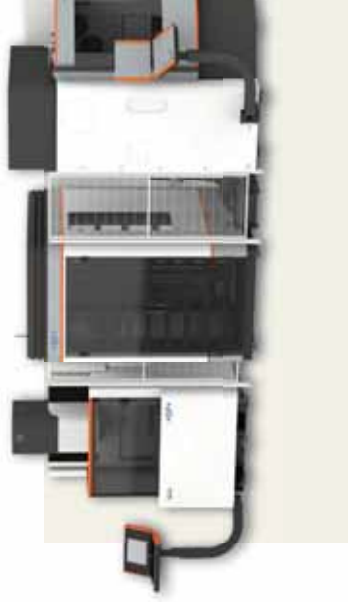


WorkPal 1

connected with one machine .

WorkPartner 1+

connected with two machines.



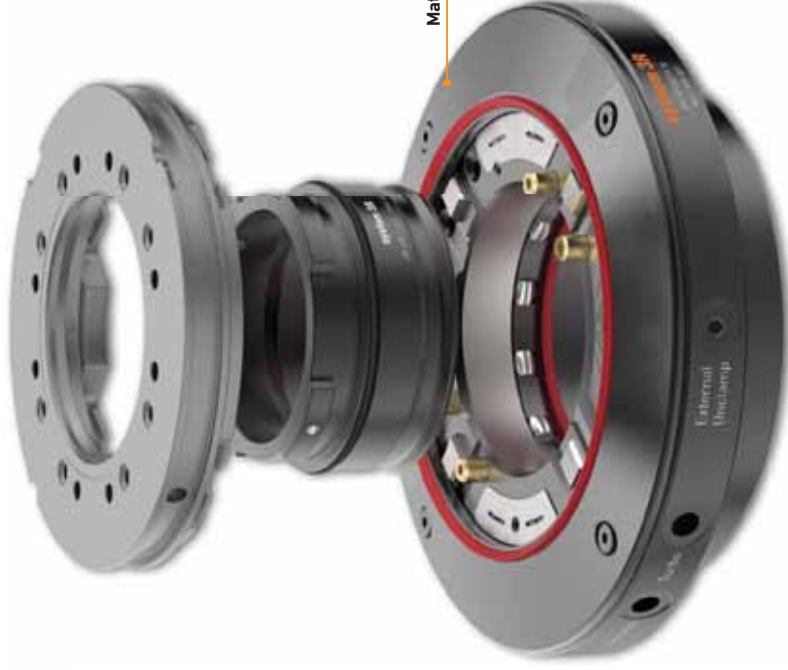
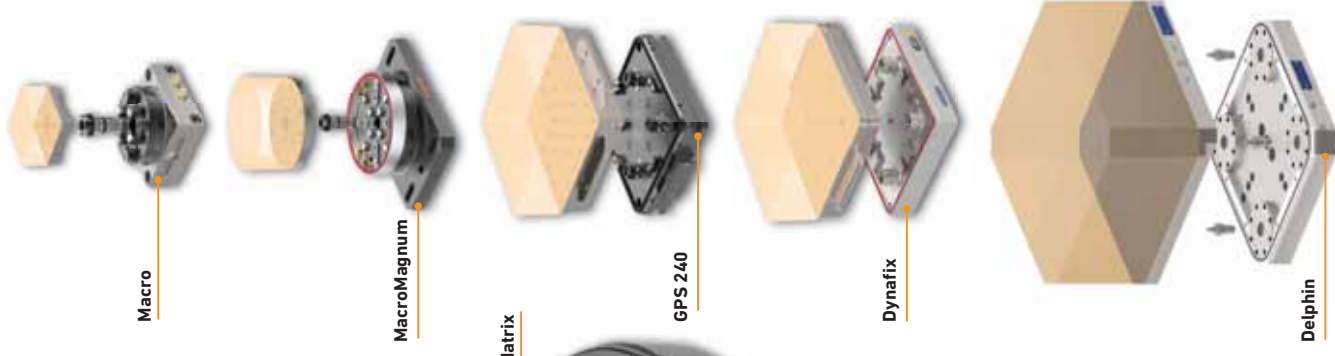
Add

Automation with Fanuc,

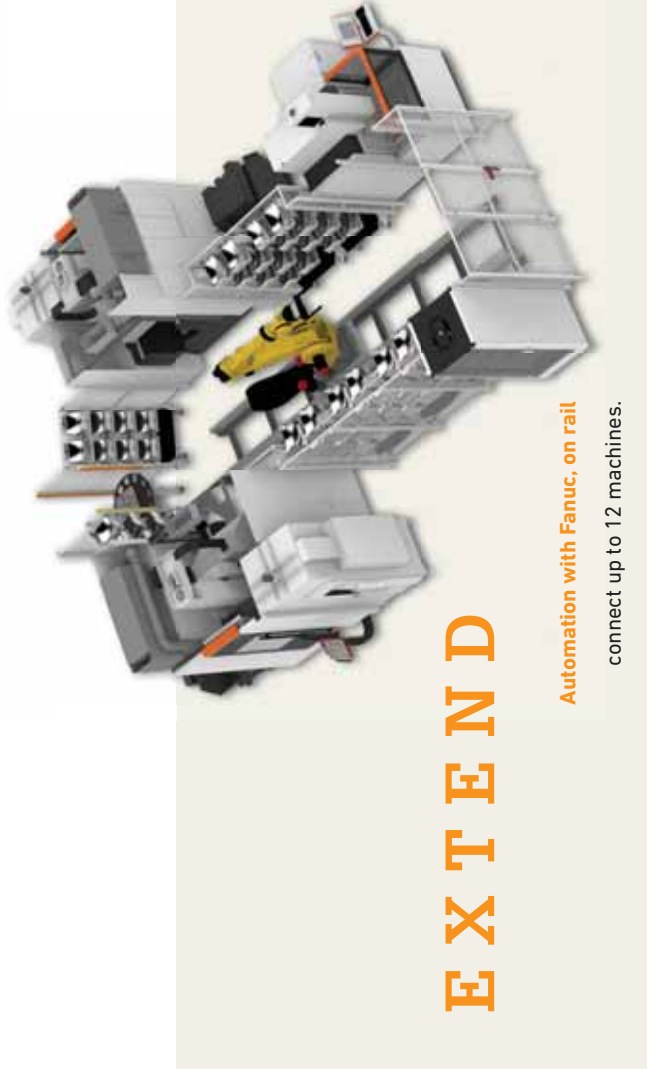
connect up to 3 machines.



Tooling highlights



System 3R can provide an exceptionally wide range of tooling from very small (25 mm pallets) to very large (Delphin BIG, up to several meters). No matter what customers require, the materials they work with and the machines they have, our solutions deliver the best possible accuracy. We can help each customer find the right chuck system and pallets for the application in question. Our tooling systems can work in all environments encountered in modern production. We can equip wire EDM, EDM, milling, laser, grinding, additive manufacturing and CMM machines of all brands. We have also developed tooling for extreme use in environments e.g. ECM, AM, water, oils, etc. This has been achieved by using materials such as cemented carbide, Inconel, ceramic, diabase, etc.



Automation with Fanuc, on rail connect up to 12 machines.

EXTEND

Robot type/model	WorkPal 1	WorkPartner 1+	Fanuc T6-70	Fanuc T6-165	Fanuc T6-210	Fanuc T6-360	Fanuc T6-700
Maximum weight handled (including gripper, pallet, etc.)	50 kg	80 kg	70 kg	165 kg	210 kg	360 kg	700 kg
Maximum number of machines served	1	2	1 - 12	1 - 12	1 - 12	1 - 12	1 - 12
Maximum number of tooling types	1	1 - 2	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5
Chuck adapter support	-	■	■	■	■	■	■
Technology/application	Milling, EDMing, wire EDMing, Grinding, laser, CMM and washing machine*						
Linear rail for manual movement	■	■	-	-	-	-	-
Aluminium linear rail, maximum length	-	-	20 m	20 m	20 m	-	-
Steel linear rail, maximum length	-	-	30 m	30 m	30 m	30 m	30 m
Loading station support	-	■	■	■	■	■	■
Tilting and draining station support	-	■	■	■	■	■	■
Drying station support (wire EDMing)	■	■	■	■	■	■	■
BatchBuilder	■	■	-	-	-	-	-
CellManager	■	■	■	■	■	■	■
EasyCellManager (milling)	■	■	■	■	■	■	■
Hybrid station support (milling)	-	-	-	■	■	-	-
Pallet station support (milling)	-	-	■	■	■	■	■

* WorkPal 1 cannot connect with EDMing. Fanuc can only connect with washing machine.

Sub micron accuracy – a Reality today

Submicron is achievable with Nano. Our Macro and the Matrix systems are outstanding for submicron accuracy. System 3R was the market's first supplier of Nano tooling.

- + Consistent accuracy < 1 µm.

<1 µm proven



Vibration Dampening Pallet (VDP)

Our VDP system offers increased removal rate, better surface finish and reduced tool wear. One obvious advantage of our VDP products is that they allow machining with more complex cutting data – in other words, better exploitation of machine capacity. A further plus is better surface quality than when machining with conventional mountings. VDP also reduces tool wear and consequently, tool costs. Similarly, reduced vibration extends the life of the machine spindle. Last but not least, the lower noise level may, in some case, improve the workshop environment.



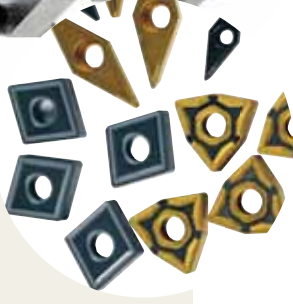
Matrix

System 3R is constantly working to develop its product ranges – not least with a view to entering new fields of application. Mainly for powder pressing in the production of indexable inserts, we have, for several years, been supplying pallet systems to the cemented carbide industry. This is an industry in which flexibility and quick deliveries are an essential for competitiveness and where demands for accuracy are strict. Consequently, System 3R has adapted its powder-pressing pallet system so that it can be used in a significantly wider field of application, i.e. metal-cutting machining. Here, it is being launched under the product name Matrix.



Powder compacting technology

System 3R offers world-leading tooling for powder compacting technologies. Press forces of up to 100 tonnes. Products for both single-level (4 – 50 ton) and multi-level (20 – 100 tonne) set-ups. In the carbide tooling inserts industry, System 3R's customers include Sandvik, SECO, Iscar and Kennametal.



High temperatures in additive manufacturing

System 3R has developed chucks and pallets to withstand high temperatures. This is essential in additive manufacturing (AM). AM is a multi-step process. It includes preparation, printing, heat treatment and post processing. With a System 3R reference system, you can optimise set up time and minimize downtime. Speed and precision are guaranteed!

Procedure:

- + Prepare the pallet.
- + Print the desired 3D part.
- + Heat treat for stress release (and optional hardening).
- + Machine.
- + Cut.



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 (G)P speed and to dramatically boost machining 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

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 Leicht turnkey solutions enable the highly efficient machining of airfoil surfaces. 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 intricate patterns, are precisely 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 indexing and positioning electrodes 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 control. Together, we offer a complete set of digital solutions across all industries. The future requires the ability to adapt quickly to continual digital changes. 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 Machine Support. 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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Flawil
Langnau
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Optimize the uptime of your equipment with our Customer Services

- + Ensuring productivity.
- + Reducing running costs and wasted parts.
- + Maximizing the return on your System 3R investments.
- + Extending the product lifetime of your System 3R equipment while maintaining optimum precision.
- + Ensuring robot cell safety satisfies present machine directives.

System 3R's Customer Services is uniquely positioned to help you maximize the availability, value, precision and productivity of your System 3R equipment. Our cost-effective, customer-centric and expert services put your success at the center, ramp up your productivity and ensure predictable, uninterrupted uptime. System 3R's service engineers are your expert partners for a wide range of success-triggering services.

For more info ask your local System 3R dealer.

For contact details, please refer to:
www.system3r.com.

