GF Machining Solutions

AgieCharmilles

CUT 20 P
CUT 30 P

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 Milling, electrical discharge machines (EDM) and Laser texturing machine tools through to first-class Automation, Tooling and software systems — all backed by unrivaled Customer service and support — we, through our Mikron, Liechti, AgieCharmilles and System 3R technologies help you raise your game and increase your competitive edge.

Swiss design and quality

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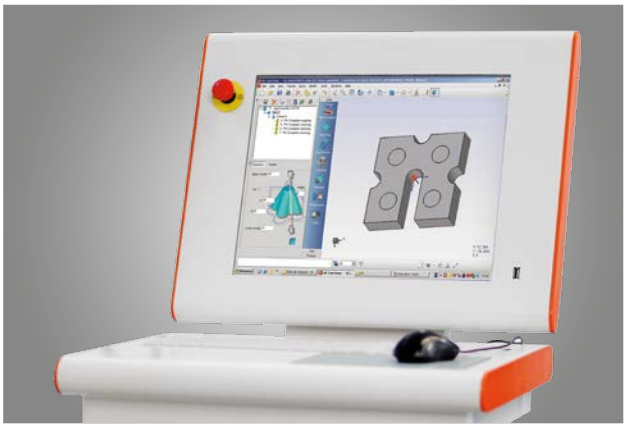
Ready to perform

The practical structural layout yields the shortest possible installation time, and the customer can be productive within a few hours after delivery. The design takes in account good accessibility of the maintenance points, such as the filter cartridges, the wire container, upper and lower heads. This shortens down-time to the minimum and ensures safe, easy maintenance and operation. Equally, the work tank design ensures a comfortable accessibility.

Highlights

The solution for standard parts and general engineering



Simple to use graphics user interface

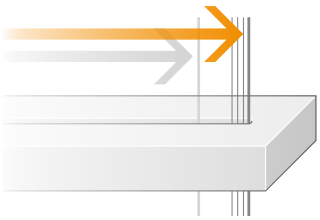
The simple and functional user interface facilitates direct and intuitive dialogue. The input of data takes place in a structured manner with pictures and symbols guiding even inexperienced operators to fast effective results. The Windows operating system allows direct Import/export of ISO files, through:

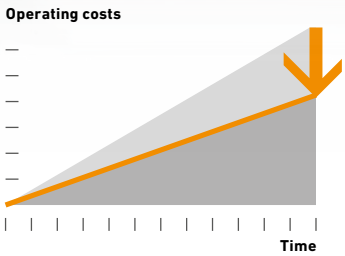
- USB memory key
- LAN network and checking by a 3D graphic mode.

Outstanding price/performance ratio

The CUT 20 P / 30 P, an EDM wire-cutting unit, is a very interesting machine offering outstanding features and excellent cutting performances. Equipped with joint technology from GF Machining Solutions it positions itself as the ultimate in price/performance WEDM machine in the market place. It handles wire diameters from 0.10 to 0.30 mm (0.004 to 0.012 in) with ease and is highly flexible to satisfy most of the requirements in the field of general engineering and standard stamping.

+ Short return of investment
More competitiveness





High cutting rates

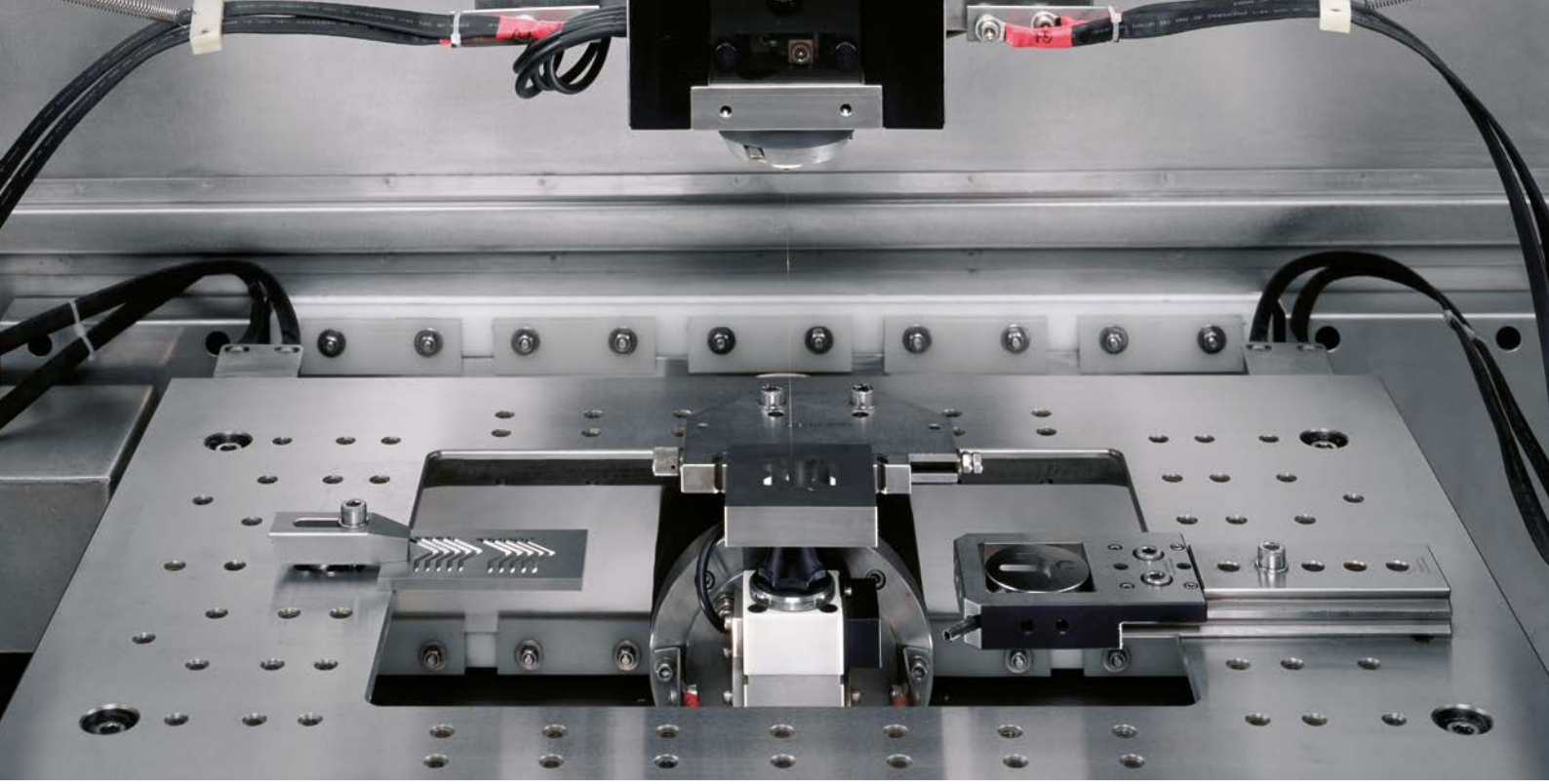
The GF Machining Solutions generator, equipped with the latest technology, assures outstanding performances and highly competitive results.

For example:

- The “Speed” technology package, allow in 2 to 4 cuts to reach competitive results in terms of precision, time and surface roughness.
- Its operating costs are minimised thanks to its sophisticated technology when brass wires are employed.

Low operating costs

- Low energy consumption of its compact and modern generator
- Long life time of the wear parts



Mechanical structure

Solid structure for a reliable and durable operation

Working zone

Easy accessibility to the working area and to the work clamping frame makes the mounting of work pieces a rapid operation. The clamping frame is manufactured out of hardened steel with a thickness of 45 mm and is extraordinarily rigid.

Maximum submmerged cutting:

- CUT 20 P, 250 mm (9.84 in)
- CUT 30 P, 350 mm (13.78 in)

Intermediate water level for thermal stability.

Glass scales for high accuracy

To obtain durable accuracy, direct measurement of positions by linear scales is used. This system enables the actual movement of the slide to be checked directly. It eliminates all the classic errors that arise from the screw, such as backlash on reversal, expansion or wear. Accuracy does not vary over time and no subsequent calibrating is required.

Integrated Collision Protection

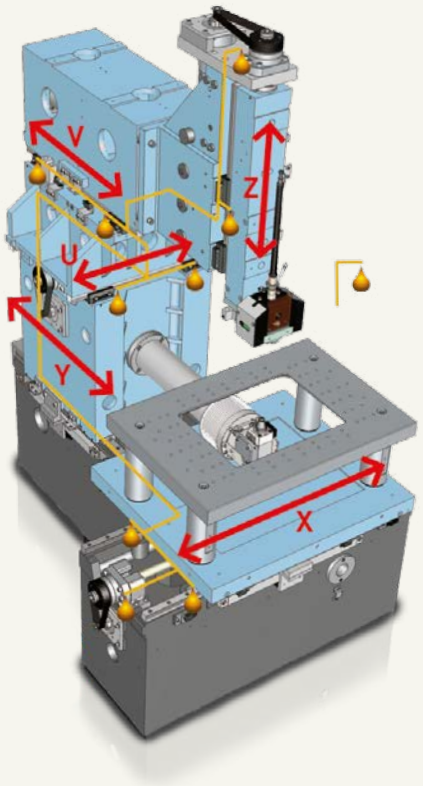
The X, Y, Z axes of CUT 20 P / 30 P are equipped with Collision Protection. The ICP system prevents any breakage of sensitive parts and costly elements allowing the operator to work with more confidence during job preparation and execution.

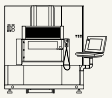
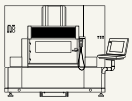
Base structure

The T-shaped base frame permits the loading of larger and heavy work pieces. The compact and rigid machine structure guarantees good positioning accuracy and highly repeatable results.

Lubricating system

The unique design of the centralized lubrification system minimises the machining down time. It lubricates the guides and sliding blocks as well as the ball-screws, simplifying the maintenance tasks.



 **CUT 20 P**	X = 350 Y = 250 Z = 250	X = 820 Y = 680 Z = 250	400 kg
 **CUT 30 P**	X = 600 Y = 400 Z = 350	X = 1030 Y = 800 Z = 350	1000 kg

Machining of large work pieces

Designed to maximise its class leading work area size and travels. Along with its advanced AWT greater productivity is achieved, as extended running during lights out is a reality. If large work pieces are needed to be machined the excellent accessibility allows a hassle free loading and unloading of work pieces of 1000 kg (2204 lb) in weight and maximum size of (L x W x H) 1030 x 800 x 350 mm (40.55 x 31.50 x 13.75 in).

High running hours

A large spool option is available on the CUT 20 P / 30 P. A spool of 25 kg extends running hours and allows continuous production in combination with:

- Deionising bottle with a volume of 20 l (5.3 gal)
- 2 filter cartridges of 450 mm height x 340 mm diameter each (17.71 x 13.38 in)

Wire circuit

Modern reliable wire circuit, GF Machining Solutions design

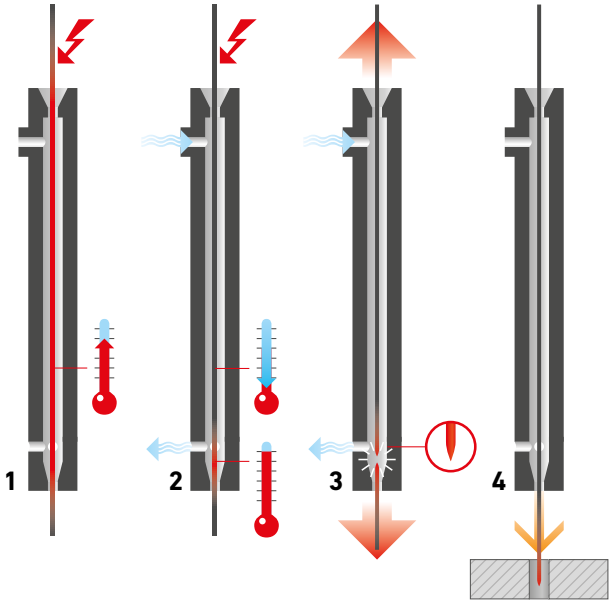
The CUT 20 P / 30 P, handles the following standard wire diameters:
0.15 – 0.20 – 0.25 – 0.30 mm
(0.006 – 0.008 – 0.010 – 0.012 in)

Wire system

The wire system has been designed by GF Machining Solutions and is an optimized version from tried and tested solutions. The wire tension is monitored by an electromagnetic break, CNC programmable. The wire spool storage has been designed to be easily accessible so that the operator can carry out a rapid change of spools.

Simple wire circuit

The concept of wire circuit is composed by very few components and consumable parts. They are: wire guides, wire contacts and pinch rollers. Besides the low running costs, the advantages of this system are a high reliability during threading, rethreading and functioning.

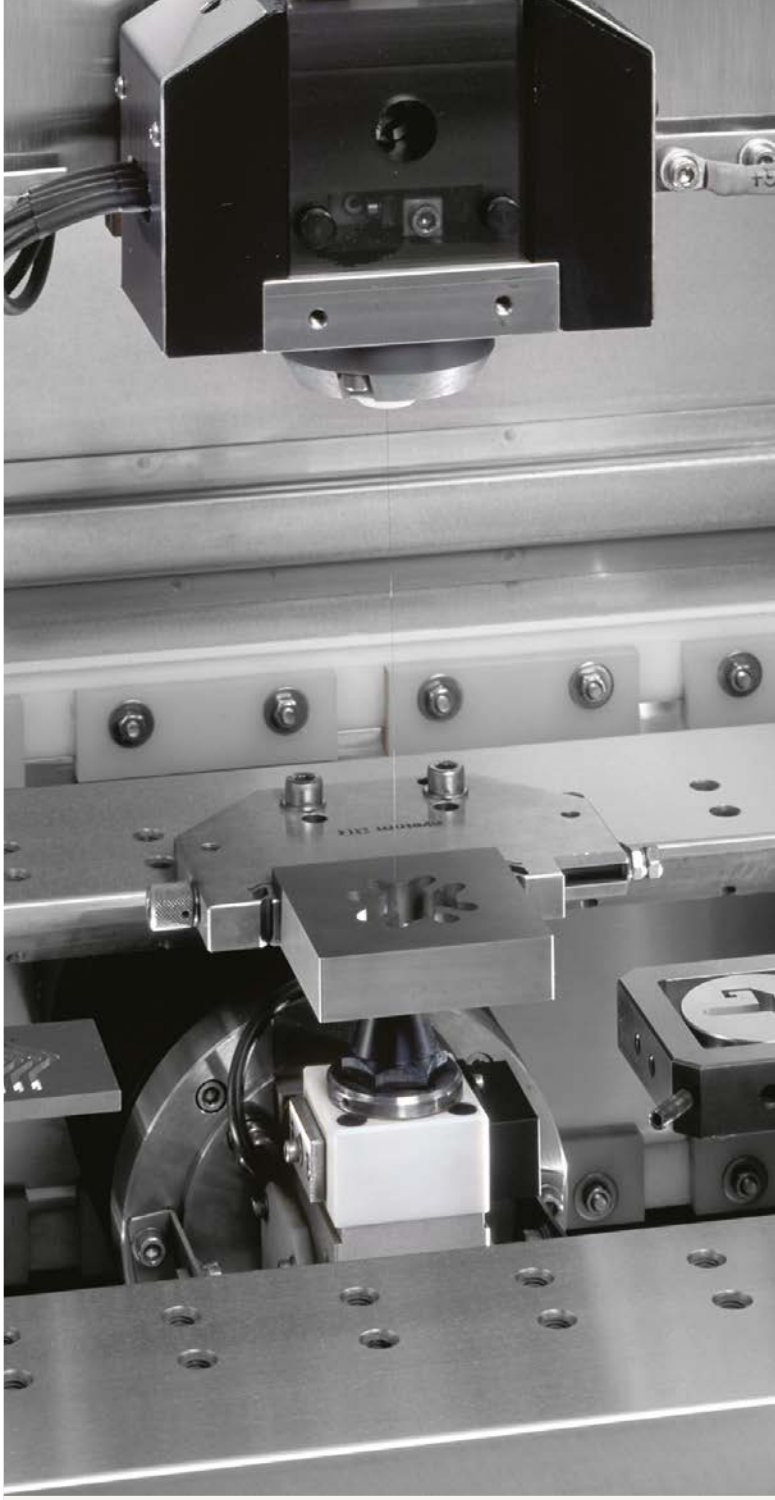


1 Wire heating
The wire is heated between the break and the upper head.

2 Wire cooling
An air jet cools down the wire and in the mean time is stretched in order to reduce its diameter.

3 Wire cut
The wire is annealed and stretched over a certain length. The thermal breakage leaves no burr and tapers the extremity.

4 New threading
The newly prepared wire facilitates its path through the guides and parts.



Automatic threading and rethreading

As standard and to ensure unattended running hours, the equipment includes an automatic wire-threading and re-threading system.

Thermocut system for all types of wire

The automatic threading is rapid and reliable whatever the type of wire used: hard or soft brass, coated or not. The key of success is preparing the wire properly before threading.

0.10 mm (0.004 in) > 0.30 mm (0.012 in)

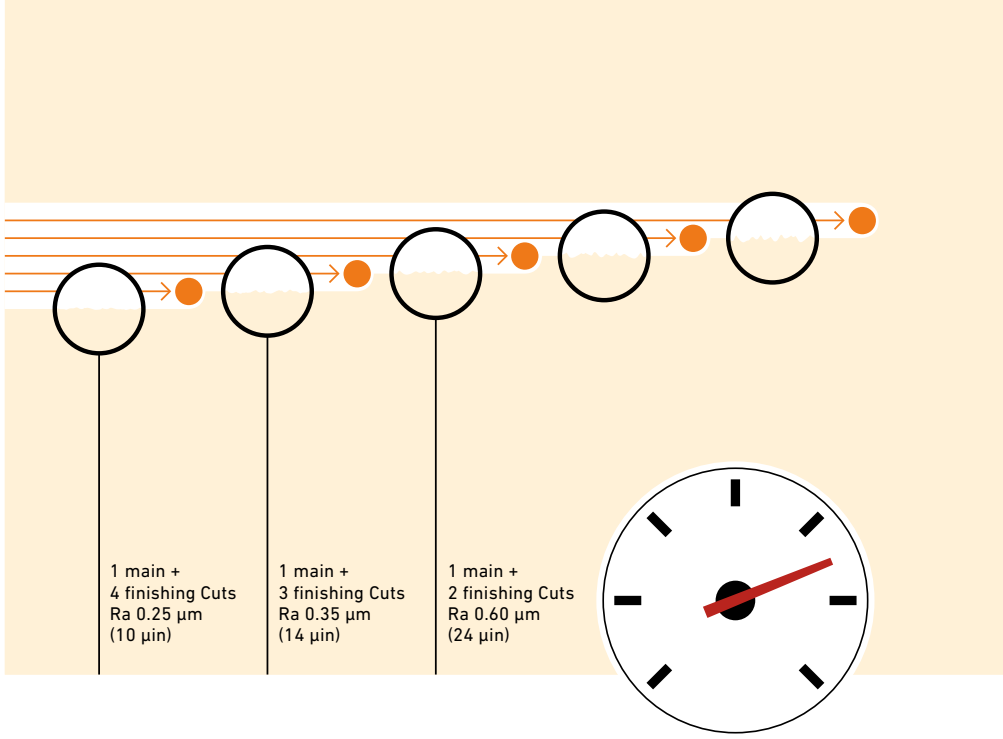
Generator and technology

GF Machining Solutions, Swiss made generator and complete range of technologies

Powerful generator
It integrates a SF (Fine Surface) module with which a surfaces roughness of less than Ra 0.25 µm (10 µin) can be achieved. The generator, completely anti-electrolysis, assures an homogenous and perfect surface finish. Along with the performance, the up-to-date electronics used in manufacturing ensure that the cost of ownership is the lowest possible.

± 25° / 57 mm
± 25° /2.24 in

High cutting speed
The thoroughly tested generator of the CUT 20 P / 30 P with reliable electronics, is based on state-of-the-art technology developed by GF Machining Solutions.
Extremely high removal rates are possible with cheap brass wires, adding low hourly running cost to its unique features.



Strategy for stepped work pieces

The generator can manage and erode stepped work pieces. This function detects the difference of the material thickness in order to adapt automatically the power to the changing conditions.

Technologies

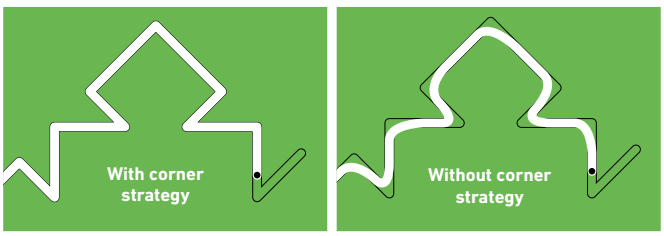
Thanks to the FPGA technology (Field Programmable Gate Arrays – a logic device programmable instantaneously) and the completely digital process monitoring, servo response demonstrates a degree of flexibility that can only be achieved with a system designed specifically for EDM. The technology database package covers all requirements in a workshop. These technologies work with a variety of wires and encompass material ranging from steel to hard metals It also has the flexibility to produce results from rapid cuts to precision finishing cuts.

Speed technologies

The CUT 20 P / 30 P has on board technologies that allow a unique speed cut. These technologies optimise main, 2nd and 3rd finishing cuts, to attain the most common values of surface roughness, like Ra 0.60 µm (24 µin) and Ra 0.35 µm (14 µin) to be achieved in a minimum of time. These high speed technologies, make the CUT 20 P / 30 P a very powerful competitive production unit.

GF Machining Solutions generator

- Highest level of performance
- High cutting speed
- Application oriented technologies
- Complete technology range using wires from Ø 0.10 mm (0.004 in) up to Ø 0.30 mm (0.012 in)

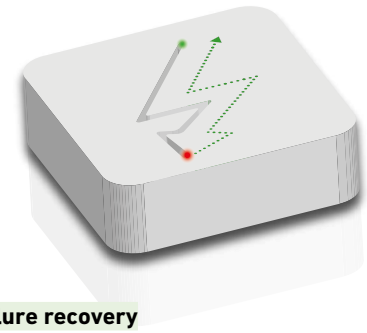


Corner strategy

To ensure accuracy of:

- sharp angles
- small radii

The corner strategies adjust automatically the machining parameters during changes of direction. Even on the smallest details, high geometrical accuracy is obtained.



Power failure recovery

In case of power failure, the point and the job name are memorised, allowing a direct re-start of the job after power restoring.

Control unit

Efficiency through simplicity

The graphics user interface is based on the Windows operating system and allows real time control of the EDM process. The system works with descriptive picture symbols and conversational screen pages following one after another in a logical way. This allows even new users to understand the WEDM principle quickly and means time to production is very short. The unique programming system also gives to the users a large degree of flexibility in a production environment, allowing a simple and fast setup and many hours of labour free running of the machine.

1. Job preparation

a. AC Cam Easy

The operator can easily prepare an ISO file during the machining with an onboard CAM system. This powerful feature is standard and renders this product as a complete solution from the contour creation to the part production.

Data transfer:

- DXF import & export
- ISO export for CUT 20 P / 30 P
- Possibility to import additional NC code

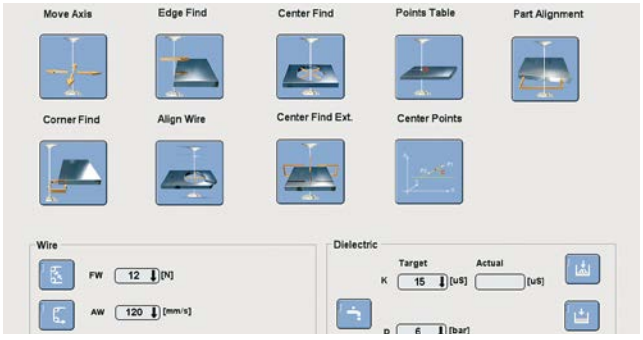
b. Most CAD/CAM programs worldwide are compatible with the CUT 20 P / 30 P giving the operator a large level of integration.

2. Measuring cycles

The intuitive, easy-to-use measuring functions allow the operator to quickly determine work piece references.

Work zone preparation, measuring cycles

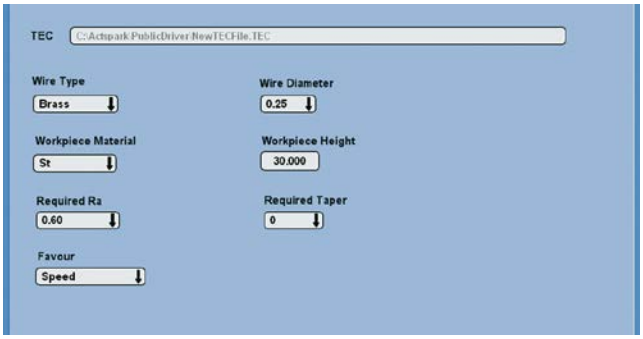
- Edge find
- Corner find
- Center find
- Part alignment
- Center find Ext



3. Technology definition

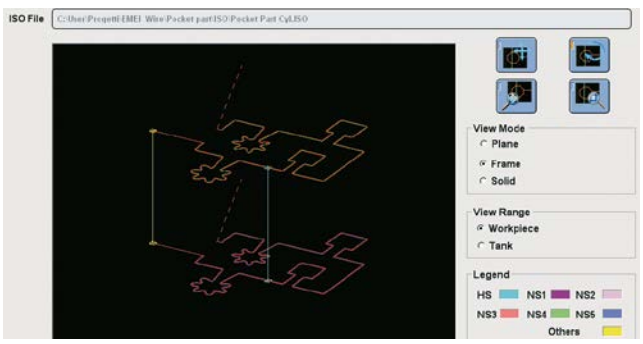
The choice of the right technology is easily done by the operator. The technology database selects the appropriate setting in according to the characteristics of the application.

- Work piece material
- Work piece height
- Required roughness
- Wire type



4. EDM process

The EDM process is monitored by the operator in real time; by means of the “EDM Process” HMI screens he can check and optimise all the important technology parameters.



Technical data

CUT 20 P

CUT 30 P

		CUT 20 P	CUT 30 P
Mechanical body			
Machine dimensions *	mm (in)	2500 x 2500 x 2200 (98.5 x 98.5 x 86.6)	3100 x 2800 x 2325 (122 x 11.2 x 91.5)
Machine weight (Without dielectric)	kg (lbs)	2640 (5820)	4440 (9788)
Work zone			
Max. workpiece size *	mm (in)	820 x 680 x 250 (32.28 x 26.77 x 9.84)	1030 x 800 x 350 (40.55 x 31.50 x 13.75)
Max. workpiece weight	kg (lbs)	400 (882)	1000 (2204)
Table size	mm (in)	700 x 480 (27.55 x 18.89)	950 x 630 (37.4 x 24.80)
Type of tank door		Swing /Drop	Swing /Drop
Distance between table surface and floor	mm (in)	1050 (41.33)	1060 (41.70)
Axis			
Travel X, Y, Z	mm (in)	350 x 250 x 250 (13.78 x 9.84 x 9.84)	600 x 400 x 350 (23.60 x 15.70 x 13.75)
Travel U, V	mm (in)	± 45 (1.77)	± 50 (1.95)
Measurement device		Glass scales (XY) / encoder (UVZ)	Glass scales (XY) / encoder (UVZ)
Measurement resolution	µm (µin)	0.1 (4)	0.1 (4)
Integrated Collision Protection (ICP)		Standard on X, Y, Z axes	Standard on X, Y, Z axes
Taper cutting			
Max. taper angle	°/mm (in)	± 10, 25** / 57 (2.24)	± 10, 25** / 57 (2.24)
Wire drive system			
Wire guide diameter	mm in	0.10**/0.15/0.20/0.25/0.30 0.004**/0.006/0.008/0.010/0.012	0.10**/0.15/0.20/0.25/0.30 0.004**/0.006/0.008/0.010/0.012
Spool weight	kg (lbs)	8, 25** (17.6, 55**)	8, 25** (17.6, 55**)
Wire tension	N	3 ~ 30	3 ~ 30
Wire speed	mm/s (in/s)	30 ~ 330 (1.18 ~ 13)	30 ~ 330 (1.18 ~ 13)
Automatic wire threading diameter	mm	0.15 / 0.20 / 0.25 / 0.30	0.15 / 0.20 / 0.25 / 0.30
Dielectric unit			
Capacity of clean water tank	l (gal)	200 (53)	230 (60.75)
Capacity of dirty water tank	l (gal)	600 (158.5)	970 (256)
Filter cartridge		2	2
Filter cartridge (Height/diameter)	mm (in)	450 x 340 (17.71 x 13.38)	450 x 340 (17.71 x 13.38)
Capacity of deionizing bottle	l (gal)	20 (5.3)	20 (5.3)
Generator			
Best roughness Ra	µm (µin)	< 0.25 (10)	< 0.25 (10)

* Width x depth x height ** Option

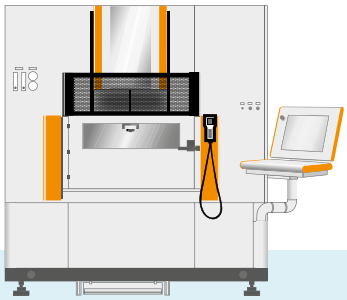
CUT 20 P (Drop door)

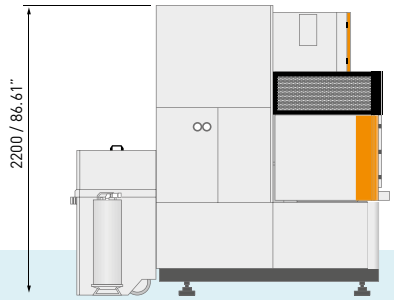
CUT 30 P (Drop door)

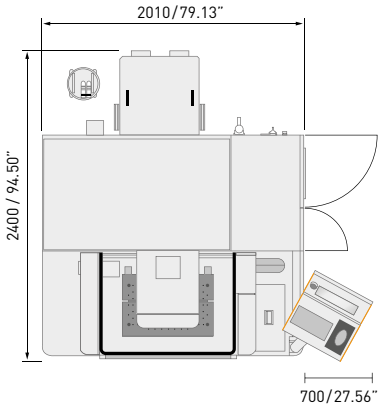
		CUT 20 P	CUT 30 P
CNC			
Control system		Pentium Intel	Pentium Intel
Hard disc	GB	≥ 40	≥ 40
Display, operating system		17" LCD, Windows	17" LCD, Windows
Controlled axes		5, among which 4 simultaneous	5, among which 4 simultaneous
Port		USB, MDI, LAN port	USB, MDI, LAN port
Power failure protection function		Yes	Yes
3D/2D graph check/scale/move function		Yes	Yes
Power supply			
Standard power supply, main frequency	V, Hz	3 x 380 / 3 x 400, 50 or 60	3 x 380 / 3 x 400, 50 or 60
Permissible fluctuation		± 10 %	± 10 %
Power supply consumption	kVA	9	9
Full load current	A	13.5	13.5
Air supply for wire threading			
Air pressure	bar	6 ~ 9	6 ~ 9
Diameter of pipe	mm	6	6
General data			
For guaranteed accuracy	°C	20 ±1	20 ±1
For operation of the equipment	°C	15 ~ 30	15 ~ 30
Permissible relative humidity		40 % ~ 80 %	40 % ~ 80 %
Variants / options			
Automatic drop door		•	•
Wire spool 25 kg		•	•
AC Cam Easy advanced version		•	•
Kit wire 0.10 mm		•	•
Kit taper 10°-25°		•	•
Heat exchanger		•	•
Alarm lamp		•	•
Chiller specifications (included in standard configuration)			
Dimension *	mm (in)	534 x 585 x 1198 (21.02 x 23.03 x 47.17)	
Cooling capacity	kW	5	
Power supply	V	3 x 400 (50/60 Hz)	
Rated power, rated current	kW, A	2.5, 7	
Controlled temperature range	°C	15 ~ 50, Control Accuracy ±1	
Minimum flow rate	l/min (gal/min)	30 (7.92)	
Ambient temperature	°C	10 ~ 45, auto stop if temperature > 48	

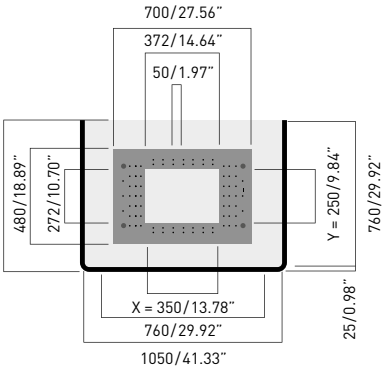
* Width x depth x height • Available

CUT 20 P

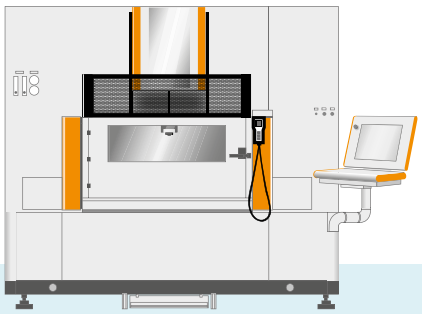


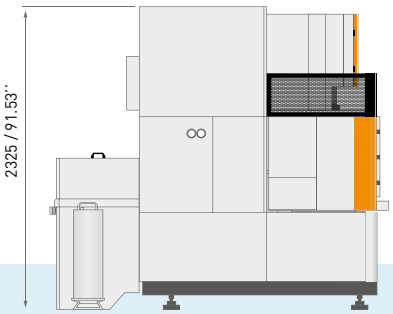


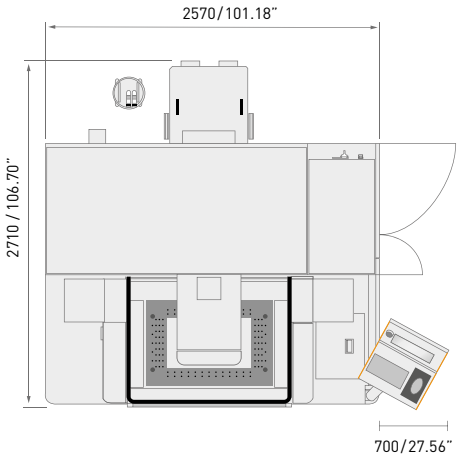


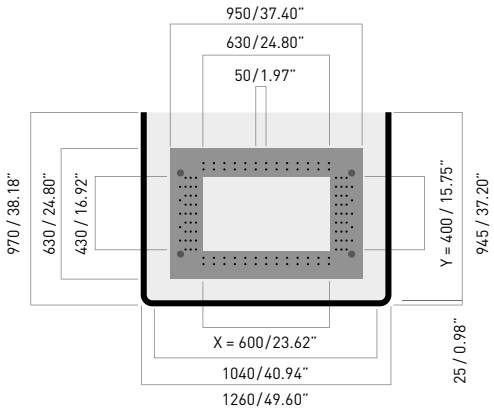


CUT 30 P









GF Machining Solutions

EDM (electrical discharge machining)

AgieCharmilles wire-cutting, die-sinking and hole-drilling machines.

For over 60 years we have been at the forefront of every EDM development: designing and refining the EDM process and building machine tools that deliver peerless part accuracies, surface finishes, cutting speeds and process reliability. Today, our AgieCharmilles wire-cutting, die-sinking and hole-drilling machines are recognized throughout the world as the best in the business. Our continuous research and development in digital generator technology, control systems and integrated Automation systems are evidence of our commitment to keeping your EDM operations on the leading edge of technology.

Laser

AgieCharmilles Laser texturing machines.

Laser texturing is a fully-digitized surface engineering process that has huge potential. The technology enables precise 2D and 3D textures or engravings to be machined accurately and directly onto complex parts or molds to improve and alter their aesthetic appeal, functionality and performance. The process is infinitely repeatable and offers many distinct environmental and economic advantages over conventional texturing processes.

Laser Additive Manufacturing (AM).

GF Machining Solutions has partnered with EOS, the global leader for high-end AM solutions, to integrate this innovative technology and further develop it into its current solutions to fully benefit the mold industry, by focusing on injection efficiency: optimized cooling design to reduce cycle time, lower energy consumption, higher quality of plastic parts.

Automation

System 3R Automation, Tooling and software.

Productivity is the key to manufacturing success, and automating a manufacturing process is a proven method of increasing its efficiency, effectiveness, quality and reliability. System 3R's integrated Automation, Tooling and software solutions — simple workpiece pallet and electrode changers and flexible manufacturing and robot handling systems — increase your competitive advantage.

Milling

Mikron high-speed (HSM), high-performance (HPM) and high-efficiency (HEM) Milling centers.

Customers operating in the mold, tool and die and precision component manufacturing sectors stake their reputations on being able to quickly and cost-competitively meet their customers' demands. That's why they invest in Mikron machines. Incorporating the latest and most advanced technologies and premium-performance components, Mikron HSM, HPM and HEM machines help you increase your production capabilities and improve your productivity. Designed and built for speed, accuracy and reliability, the machines, like you, are proven performers.

Liechti Dedicated Aerospace and Energy machining Centers.

Aerospace and power generation turbine manufacturers increasingly turn to Liechti dedicated five- and six-axis machining centers to machine complex, high-precision airfoils on blades, disks, blings, blisks/IBRs and impellers. It's easy to see why because these machines, with their specific profile machining technology, specialized CAD/CAM software and engineering competence for ultra-dynamic machining in titanium, Inconel, nimonic, titanium-aluminide and high-alloy steels, yield productivity gains as much as 30 percent, thanks to reduced machining times. In the globally competitive aerospace and power generation manufacturing sector, that's definitely worth shouting about.

Step-Tec Spindles.

At the heart of every Mikron machining center is high-performance Step-Tec Spindle. Step-Tec Spindles are essential core components of our machining centers. Highly accurate and thermally stable Step-Tec Spindles ensure that our machines can handle everything from heavy-duty roughing to fine-finishing operations.

Customer Services

Operations Support, Machine Support and Business Support.

To help you get the most and the best from your machine tools and equipment, we offer three levels of support. Operations Support covers our range of original wear parts and certified consumables (EDM wires, filters, resins, electrodes etc.) to ensure that your machines are performing at the highest levels. Machine Support maximizes, through our best-in-class technical support, preventive services and quality spare parts, your machine tool uptime. Business Support is designed to help you make a real step-change in your productivity and performance with solutions tailored to your specific needs.

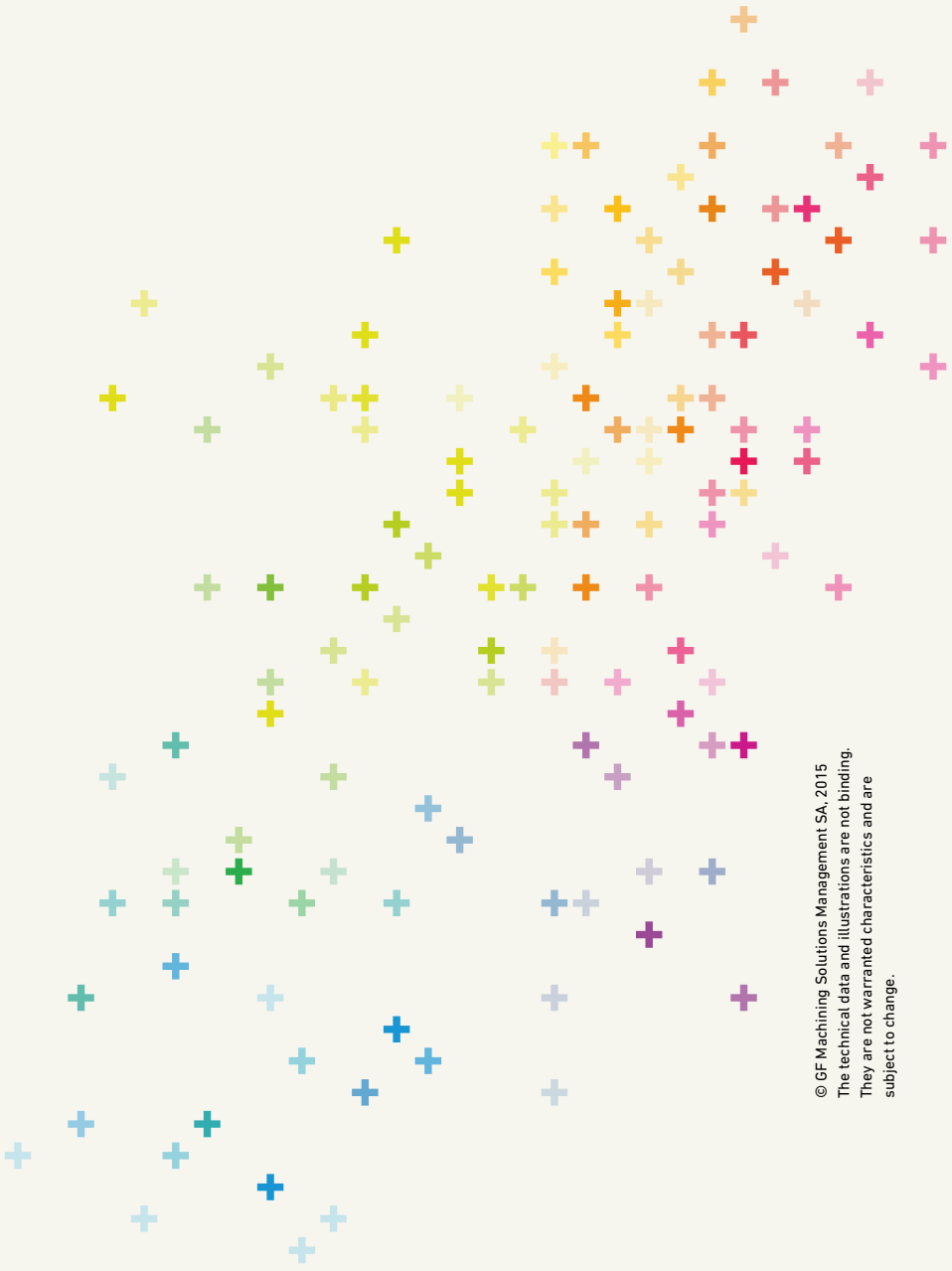
GF Machining Solutions

259.805.642–EN

At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser, Spindle, Automation and Tooling solutions. A comprehensive package of Customer Services completes our proposition.

www.gfms.com



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