

AgieCharmilles

CUT X

350/500



Becoming better every day – since 1802

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 service 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

4 CUT X series: Extreme accuracy, simple and fast

6 Extreme accuracy

- 6 Revolutionary heads
- 7 Easily exchangeable open and closed guides
- 8 Mechanics
- 10 Intelligence-adding IPG-DPS
- 11 X-technologies

12 Simple and fast

- 12 Wire management
- 13 Twin-wire Automatic Wire Changer (AWC)
- 14 Spark Track
- 15 Intelligent Spark Protection System (ISPS)
- 15 Collision protection
- 16 UNIQUA
- 17 Ergonomics
- 18 Ready for Automation

20 Technical specifications

22 About GF Machining Solutions



+GF+

AgieCharmilles
CUT X 350

CUT X series

Extreme accuracy, simple and fast

The latest CUT X series condenses more than 100 years of combined expertise in the best-ever wire EDM machine. With an elegant new design and X-technologies enabling ultrahigh accuracy, this series delivers true value.

Extreme accuracy

This solution's optimized mechanics, revolutionary head design using Additive Manufacturing, and a new thermal management system are the basis for unprecedented accuracy and surface quality.

Simple

Achieving such results has never been easier: Machining the most challenging parts becomes child's play, thanks to functionalities such as the collision protection and wire annealing before threading.

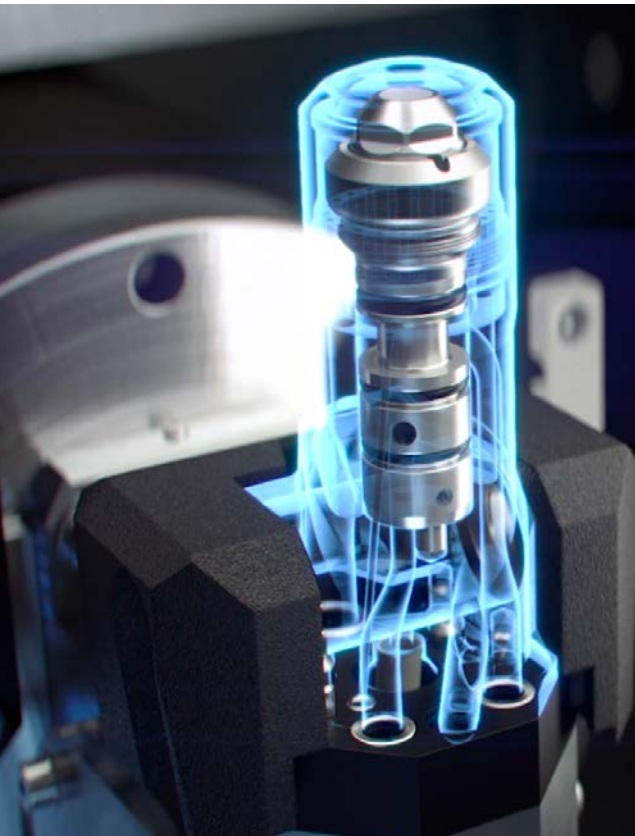
Simple also means flexible. The world premiere exchangeable open and closed guides and the new UNIQUA human-machine interface (HMI) make machine operation as enjoyable for experts as it is for beginners.

Fast

The new CUT X elevates the standards of productivity. Its well-known Intelligent Power Generator with Direct Power Supply (IPG-DPS) and the unique twin-wire technology make the impossible feasible at unbeatable speed. And with its reduced cycle times, the machine is ready for an unmanned automated operation, making your investment easily digestible.

Extreme accuracy

Revolutionary heads



The revolutionary new design of the additively manufactured heads optimizes the flushing channels and reduces the distance between the guides and the part. Both features are key to improving the wire straightness and cleaning conditions during cutting.

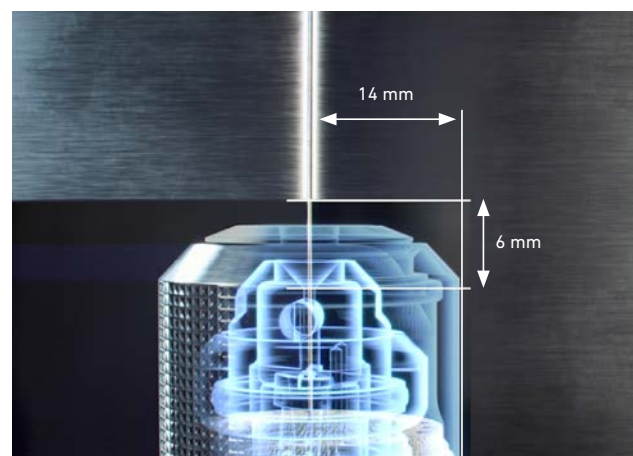
Benefits

- Extreme contour accuracy in complex shapes
- Homogeneous surface quality
- Due to punch and die accuracy and surface homogeneity, the lifetime of stamping tools is increased to unprecedented levels.

The newly designed heads are highly rigid and very compact.

Benefits

- It is now possible to cut shapes close to intricate parts, thanks to the lower head's rigidity and compactness



Easily exchangeable open and closed guides



Closed guide

Open guide

Increased flexibility, reduced idle time

The guides are designed as a cartridge that can easily be exchanged by the operator in less than 15 minutes (five minutes to change the cartridge plus 10 minutes to align the wire circuit), choosing between open or closed guides.

Ultrahigh contour accuracy also in tapered profiles

You can use the open guides for straight or less than 3-degree angle taper cuts (100 mm height) to gain flexibility to use different wire diameters without changing the guides.

If you are looking for unmatched accuracy and surface finish in taper cuts up to 30-degree angle (100 mm height), choose the closed guides, then use dedicated guides matching the diameters of the wire in use, and the TAPER-EXPERT technologies.

Benefits

- The operator can choose the right guides for different applications.
- The operator can use open or closed guides depending on previous experience.
- Very fast maintenance of the guides reduces idle time
- Reach extreme accuracy in a wide range of tapered applications



Thermal compensation

The computer numerical control (CNC) collects data from temperature and humidity sensors strategically located both inside and outside the working area. An artificial intelligence algorithm then predicts thermal deformations and compensates the positioning of the X and Y and U and V axes.

Benefits

- Extreme accuracy even with environment temperature changes up to $\pm 2.5^{\circ}$ Celsius
- $\pm 1 \mu\text{m}$ positioning accuracy during long cutting cycles

Extreme accuracy

Mechanics

Ultrahigh pitch and contour accuracy

Linear scales on all axes

Linear scales on the X, Y, and Z main axes as well as the U, and V tapering axes ensure the best positioning accuracy.

Benefits

- Ultrahigh pitch accuracy
- Ultrahigh contour accuracy even in tapered parts.

Sealed cabinet

Consistent thermal behavior is a given, thanks to the sealed cabinet and doors ensuring a controlled air flow in the working area through the strategically designed openings in the bottom and top of the machine enclosure.

Benefits

- Repeatable accuracy on parts due to the machine's consistent thermal behavior





Extreme accuracy

Intelligence-adding IPG-DPS

The Intelligent Power Generator with Direct Power Supply (IPG-DPS) automatically adapts machining parameters to the profile during roughing and skim cuts. In combination with latest-generation central processing units, the EDM process delivers improved gap control, respect for geometry and surfaces, no wire breakage, and very good speed.

Benefits

- Finest surface finishes, minimal polishing, geometrical accuracy
- Perfect control of the fine details for highest profile accuracy



INTELLIGENT
POWER
GENERATOR

X-technologies

The X-technologies are perfectly optimized for the CUT X design, condensing true value—extreme accuracy, simple and fast—in the best-ever wire EDM machine.

Extreme accuracy

The X-technologies are dedicated to delivering ultrahigh contour accuracy, thanks to the CUT X's minimal distance from guide to workpiece and the revolutionary design of the flushing channels.

Simple

The operator does not need to compromise on accuracy, surface quality or speed: These unique technologies ensure the best results in all three. The operator simply selects the wire, workpiece material, height, open or closed guidance system, and the mono or twin-wire circuit in the UNIQUA HMI. The X-technologies do the rest.

Fast

The X-technologies are also the fastest, ensuring very high productivity and a short CUT X payback. With this machine's speed and minimized wire consumption, you profit from sustainable cost-effectiveness.

Typical high accuracy application with extremely complex shapes performed with twin X-technology

Height
30 mm

Material
Steel

Radii (internal/external)
0.12 mm



Simple and fast

Wire management

Automatic Wire Threading

Automatic Wire Threading (AWT) puts reliable automatic wire threading and rethreading—essential to unattended machine operation and automation—at your fingertips.

Benefits

- Correct rethreading even under the most difficult conditions
- Automatically cuts multiple openings in die blocks and progressive dies in unattended operation
- Smooth implementation of automation.

Wire chopper

The integrated wire chopper cuts the wire into small chips which are collected in a box at the back of the machine.

Benefits

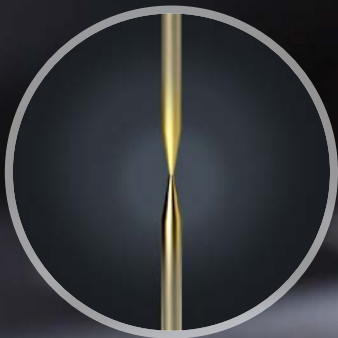
- Extends autonomy and production
- Reduces idle time to collect the used wire

Double wire spool with twin wire

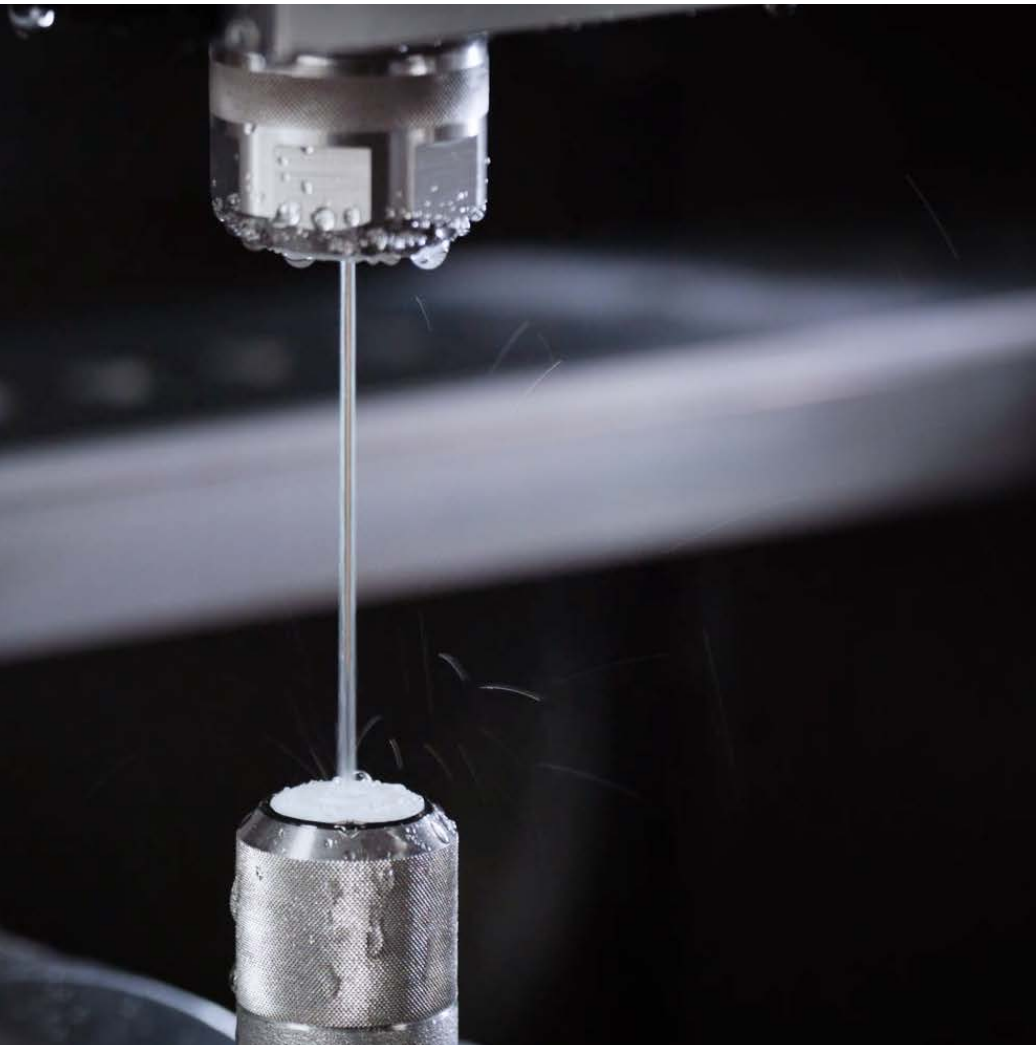
The double wire spool (two 25 kg spools) for twin wire technology increases your autonomy.

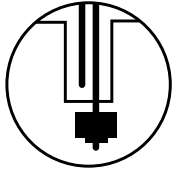
Benefits

- Greater productivity due to longer period of unattended operation
- Enables Automation
- Reduces idle time associated with wire spool changes



AWT's annealing process first heats the wire between the brake and lower working head; then, a jet of air cools down the wire which is stretched over a certain length to reduce its diameter. The result: burr-free thermal cutting and a conical wire end that is easy to insert through the guides and workpieces.





Twin-wire Automatic Wire Changer (AWC)

The machine includes two identical, symmetrical wire circuits. The AWC shifts the wire board so that one or the other points into the guiding head.



Simple, fast roughing and finishing

Use a thicker wire for a faster, more aggressive main cut and a thinner wire to finish small and difficult corner contours during the trim cuts. The twin-wire technology used with open guides makes the impossible feasible, at unbeatable speed.

Optimal cutting speed and accuracy

Use two wires with the same diameter but different coatings to optimize speed during the main cut and the surface finish during the trim cuts. Then use the twin wire with close guides for extreme accuracy—even on big tapered cuts.

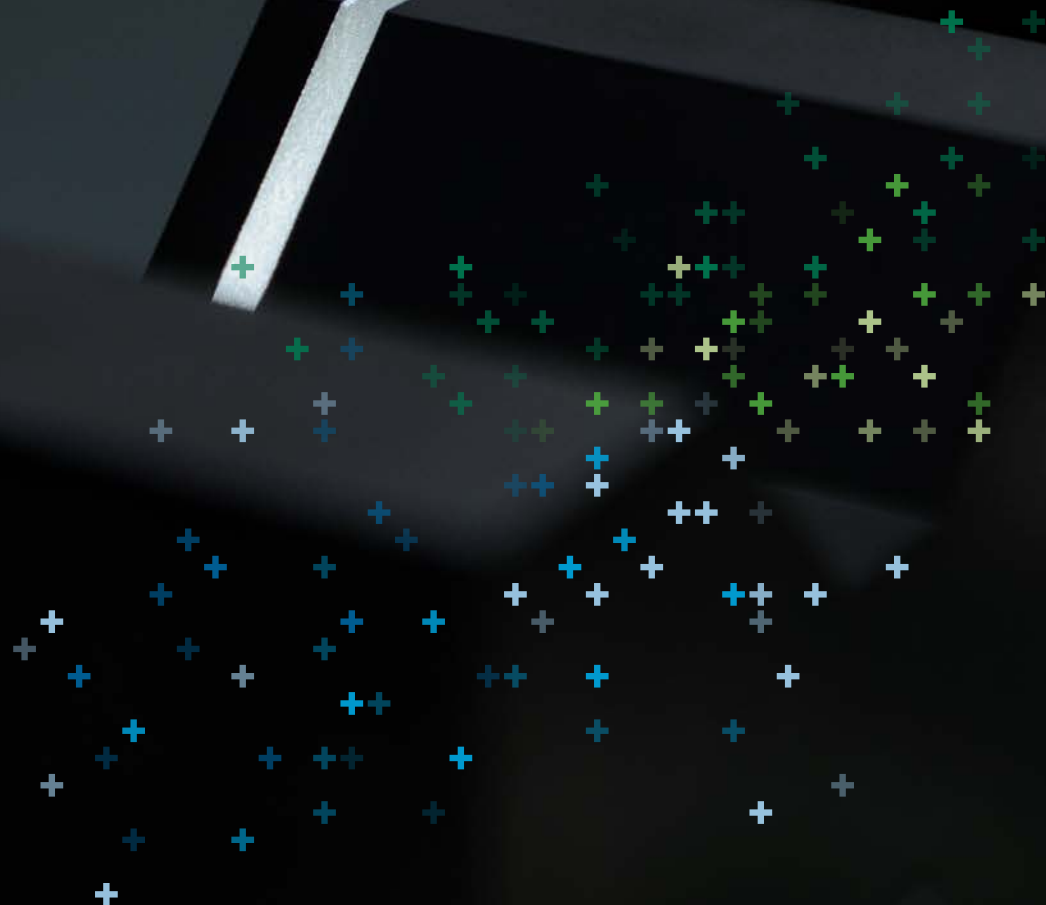
Easily double your wire autonomy

Use both wire circuits to double your wire autonomy with the two identical 25 kg wire spools.

Simple and fast

Spark Track

To determine spark position and monitor spark concentration, Spark Track leverages the fast, accurate signal acquisition and real time data processing from modern sensor electronics. This GF Machining Solutions innovation forms the basis of outstanding features including ISPS.



Intelligent Spark Protection System (ISPS)

To make EDM cutting easier, GF Machining Solutions' Spark Track technology includes the ISPS module. Its intuitive engineering evaluates the position of each discharge between the wire and the part, analyzing the concentration against a set threshold. If the concentration exceeds the threshold, the ISPS module automatically adjusts spark energy in real time to prevent wire breakage and maintain optimal cutting speed.

Benefits

- Automatic real-time parameter adjustments for variable heights, blind holes, poor flushing conditions and other extremes
- No need for an expert operator just to avoid wire breakage
- Eliminates wire breakage to reduce idle time and enable automation
- Increased productivity

ISPS overcomes difficulties

- + Varying part height
- + Blind holes
- + Inclined upper or lower surfaces
- + Poor flushing conditions caused by tooling or part shape



Reduced down time

Collision protection

Eight strain-gauge sensors, strategically located in the upper head and lower head arm, detect any collision and immediately stop the machine axes to avoid any damage.

Benefits

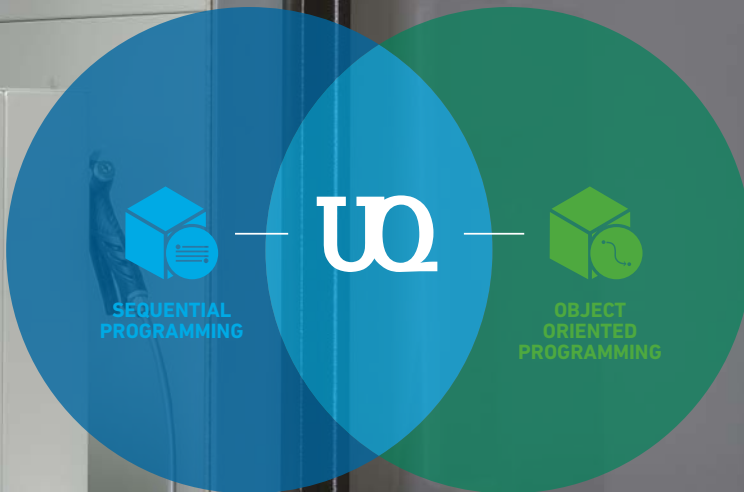
- Protects parts and machine investment
- Saves maintenance costs
- Restarts work immediately, with only a wire alignment needed, after a collision



Simple and fast

UNIQUA

UNIQUA is GF Machining Solutions' new HMI for wire EDM machines. It represents the pinnacle of more than a century of EDM technology and the perfect combination of optimal functionality and usability (ergonomics) from our previous HMIs.



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Every skill level

UNIQUA is ideal for wire EDM experts and beginners alike. While experts use its powerful functionalities, beginners can take advantage of its ease of use and short learning curve.

Every approach

UNIQUA works the way you want to work. Control the details of sequential programming with an updated ISO-based functionality or leverage the flexibility of object-oriented programming.

Every user

Work offline or at the machine. UNIQUA ensures compatibility with major computer-aided design/computer-aided manufacturing (CAD/CAM) programs and provides a powerful graphic tool with integrated CAM.

Ergonomics



Work area accessibility

The 90-degree, corner-opening, motor-driven automatic doors reduce operator fatigue during work preparation. The U-shaped drop tank ensures effortless access to the work table.

Benefits

- Perfect ergonomics for the operator
- Full accessibility to the complete working area

Footprint and maintenance accessibility

The machine's footprint-minimizing design makes all consumables (dielectric filters, wire spools and chopper, etc.) and maintenance systems (electrical cabinet, pneumatic unit, and water pumps) easily accessible from the opposite corner of the work preparation area.

Benefits

- Orderly machine environment
- Best-in-class productivity per square meter



Simple and fast

Ready for Automation

3D Setup

A Z-axis touch probe integrated in the head defines the exact orientation of the workpiece top plane. The wire is then automatically aligned perpendicular to the plane.

Retractable probing

A complete 3D probing system is integrated in the head. It is automatically deployed when part measurement is needed and is retracted during the cutting process.

Benefits

- Unmanned workpiece preparation and in-process workpiece measurement for continuous production with automatic loading and unloading

Automatic Slug Management (ASM)

After the main cut, the ASM device automatically extracts the slug and collects it in a dedicated bin.

Benefits

- Avoids manual intervention to enable a 100 percent automatic process
- No need for day and night strategies

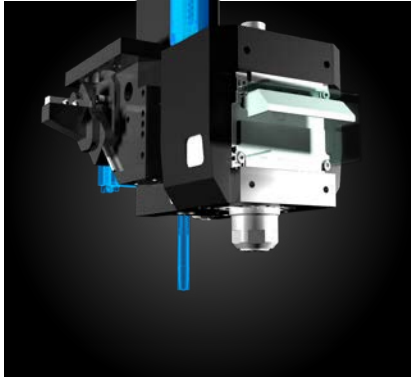
Automatic doors

The 90-degree, corner-opening, motor-driven automatic doors provide access to the robot for automated loading/unloading.

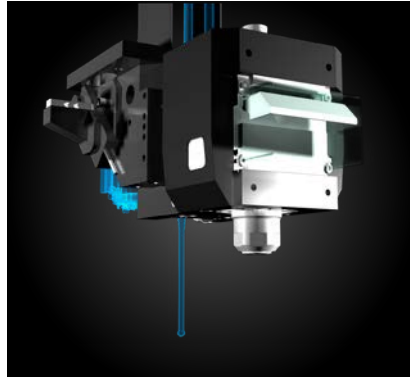
Benefits

- Ready for Automation: seamless integration with robot loading/unloading

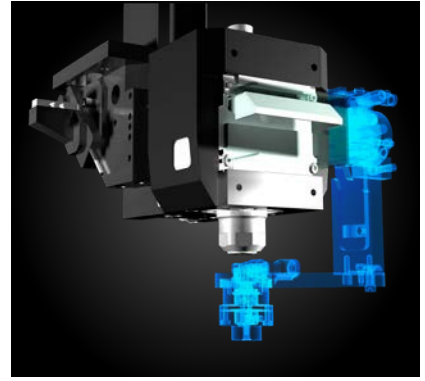




3D Setup



Retractable probing



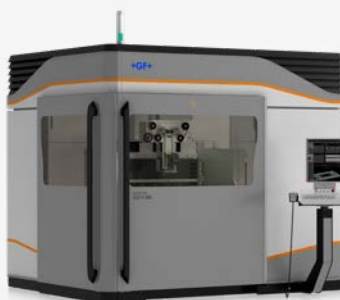
Automatic Slug Management (ASM)



Technical specifications



CUT X 350

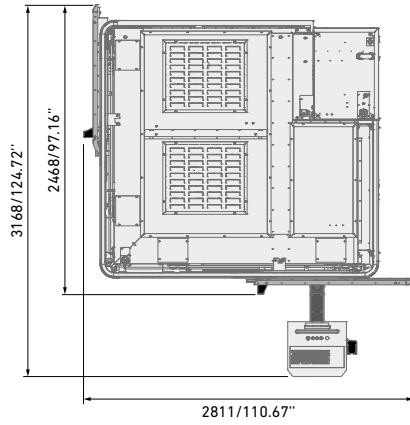
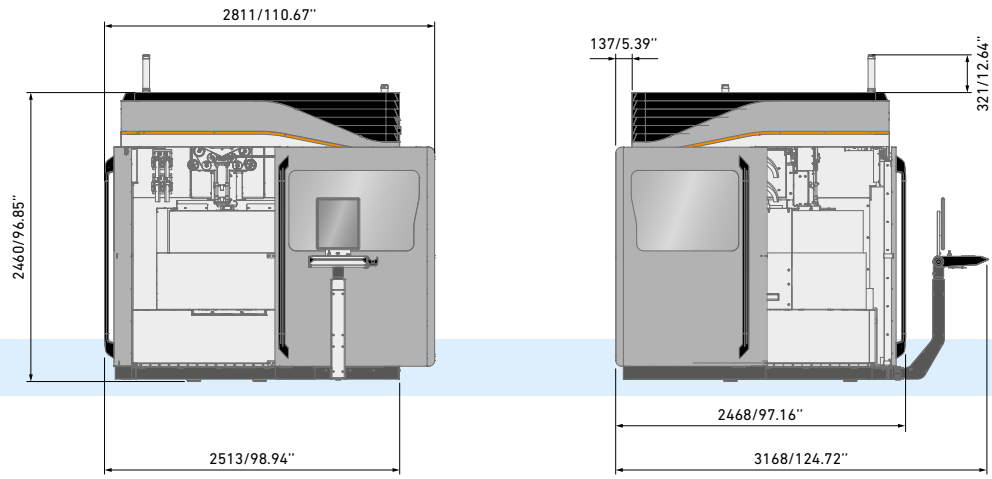


CUT X 500

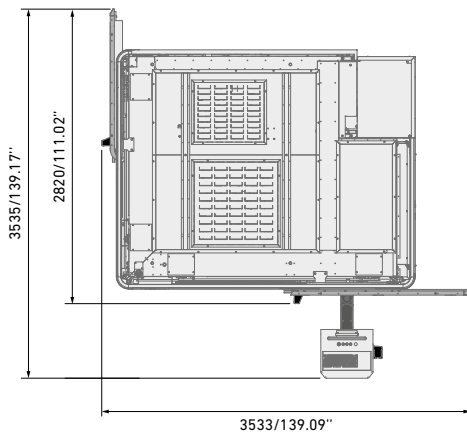
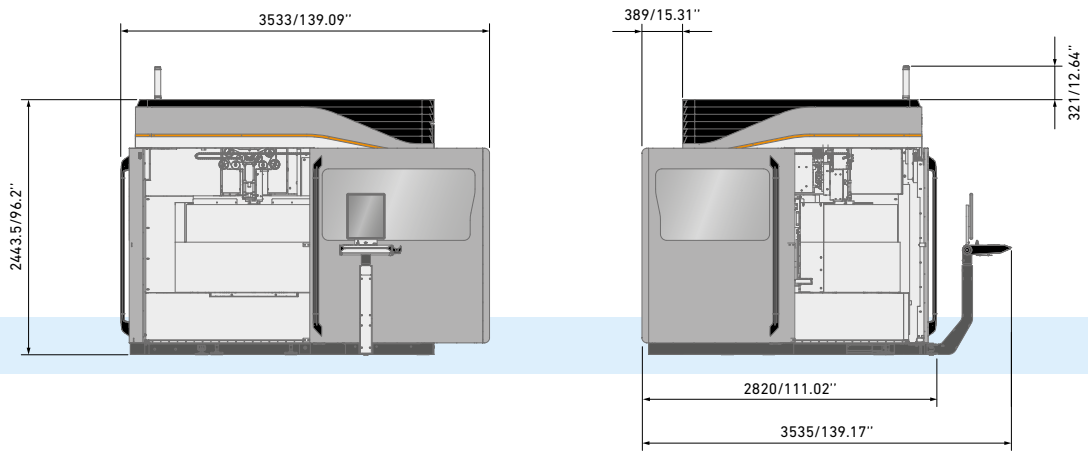
		CUT X 350	CUT X 500
Machine			
Type of machining		Submerged wire cutting	Submerged wire cutting
Dimensions of complete equipment (*)	mm (in)	2520 x 2340 x 2154 (99.21 x 92.12 x 84.8)	2822 x 3533 x 2444 (111.1 x 139.09 x 96.22)
Total weight of the equipment without dielectric	kg (lbs)	3900 (8598)	4700 (10362)
Machining Area			
Work tank		Automatic drop tank	Automatic drop tank
Accessibility		Front + Left sides	Front + Left sides
Max. workpiece dimensions (**)	mm (in)	800 x 550 x 250 (31.49 x 21.65 x 9.84)	1050 x 700 x 250 (41.34 x 27.56 x 9.84)
Max. workpiece weight without bath	kg (lbs)	450 (992)	800 (1764)
Dimensions of table (**)	mm (in)	680 x 450 (26.77 x 17.71)	850 x 450 (33.46 x 17.71)
Floor-to-table distance	mm (in)	1000-1100 (39.37-43.3)	1000-1100 (39.37-43.3)
Total volume of dielectric fluid	l (gal)	700 (175)	950 (251)
Dielectric level adjustment	mm (in)	0 – 250 (0 – 9.84) automatic	0 – 250 (0 – 9.84) automatic
Dielectric type		Deionized water	Deionized water
X, Y, Z and U, V axes			
X, Y, Z travel (*)	mm (in)	350 x 250 x 256 (13.78 x 9.84 x 10.08)	500 x 350 x 256 (19.68 x 13.78 x 10.08)
U, V travel (**)	mm (in)	± 70 (2.75)	± 70 (2.75)
Max. speed (X, Y and U, V axes)	m/min (ft/min)	3 (9.84)	3 (9.84)
Max. manual position speed	m/min (ft/min)	2 (6.56)	2 (6.56)
Linear glass scales		Standard on 4 axis (X,Y,U,V)	Standard all axes (X,Y,U,V)
Integrated Collision Protection (ICP)		Standard on 5 axes (X,Y,Z,U,V)	Standard on 5 axes (X,Y,Z,U,V)
Taper machining			
Max. taper	°/mm (in)	30°/100 (3.94)	30°/100 (3.94)
Electrical supply (machine)			
Three-phase input voltage	V	400	400
Maximum consumption	kVA	12	12
Compressed air connection			
Pressure	MPa (PSI)	0.6 – 0.8 (87-116)	0.6 – 0.8 (87-116)
Maximum consumption	l/min (gal/min)	150 (40)	150 (40)

* Width x depth x height ** Width x depth

CUT X 350



CUT X 500



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.

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.

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.

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.

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.

Service + Success



We take you to new heights

Our Success Packs are designed to maximise your return on investment and empower you in your quest for success across all industrial segments. Our subscription packs feature a comprehensive range of services that guarantee the access and support you need to get the most out of your assets today, while preparing for the challenges of tomorrow. Our trusted experts backed by our latest cutting-edge, intelligent Digital Solutions, provide a full range of services.



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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 services completes our proposition.

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