GF Machining Solutions

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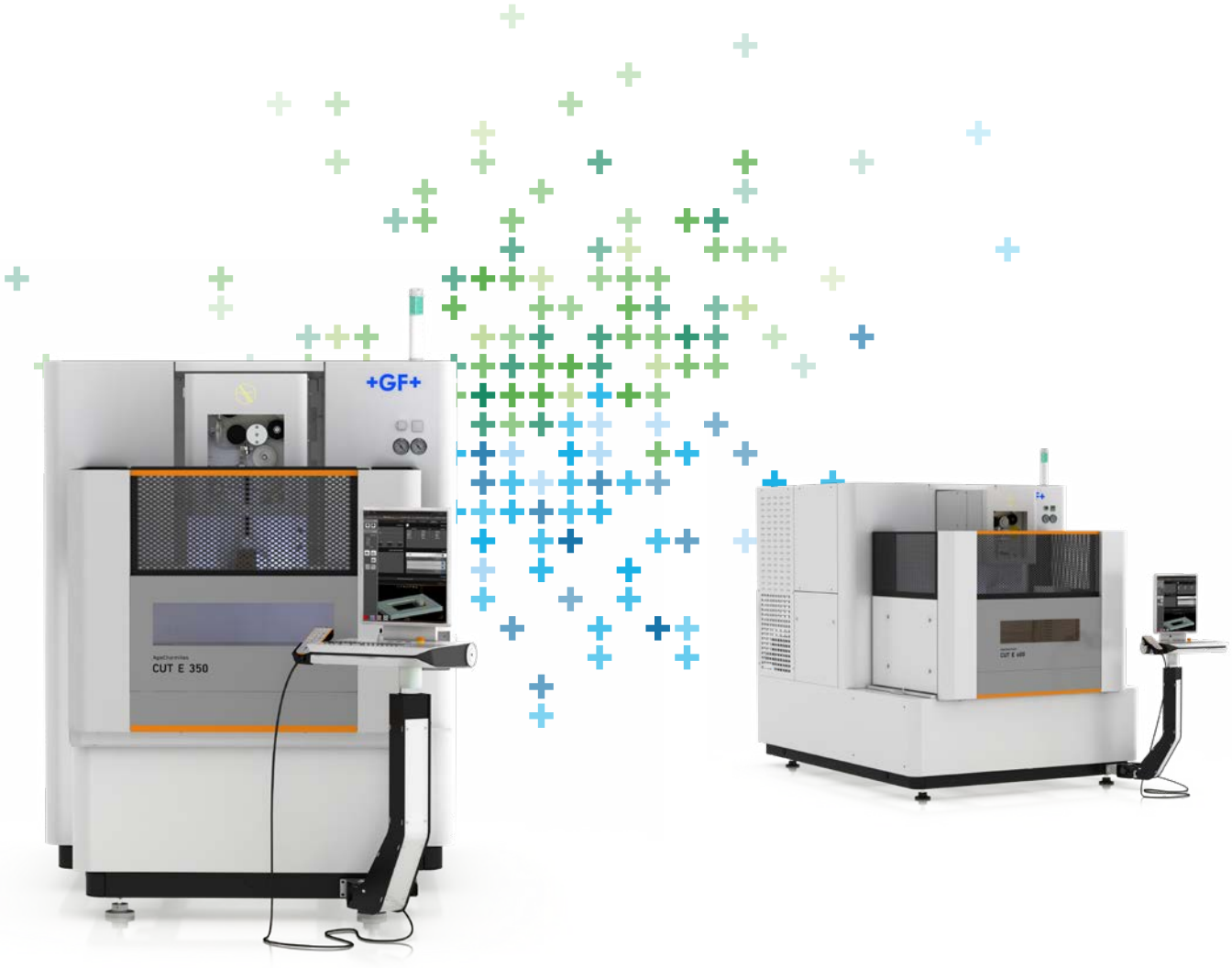
AgieCharmilles

CUT E

350/600



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

Experience flexible, intelligent job management and speed-dedicated processes

The CUT E 350 and CUT E 600 machines put efficiency at the touch of your finger with a smart, easy-to-use human-machine interface and onboard technologies that streamline your job setup, improve your cutting speed and your surface finish, protect your valuable workpieces, and ensure your process robustness.

Key points

Touch your success

Our innovation keeps you ahead

GF Machining Solutions' tradition for constant innovation and strict quality standard push back the boundaries.

Power your performance

Our Intelligent Power Generator (IPG) boasts a wide range of expert technologies helping you achieve the surface quality and precision your customers demand.

Accelerate your productivity

Time saved is money earned. Turbo Tech, the onbaord speed technology, offers an excellent speed-accuracy compromise and puts you on the fast track to provide excellent performance at an affordable price.

Experience ergonomy

You're just one click away from machining perfect punches, dies, molds and parts, thanks to our intelligent and intuitive UNIQUA HMI, providing flexibility for all application types. Included are powerful tools for fast, safe machining preparation to make your machine programmer's life easier. Industry 4.0 at the tip of your finger.

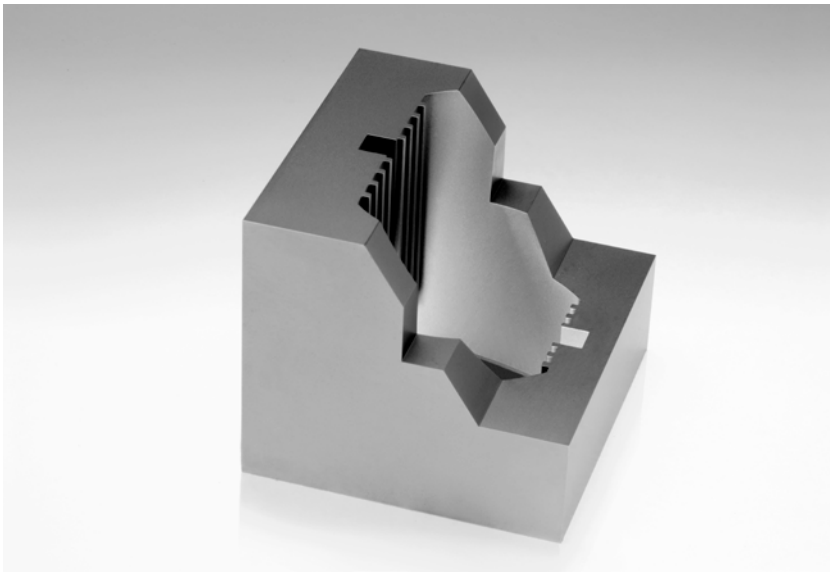
Benefit from our expertise

Benefit from GF Machining Solutions' legacy of more than 60 years of EDM expertise. We make it a poinf of providing highly competent application support, customer services and business support for your specific field.

Intelligence inside

Expert solutions for your success

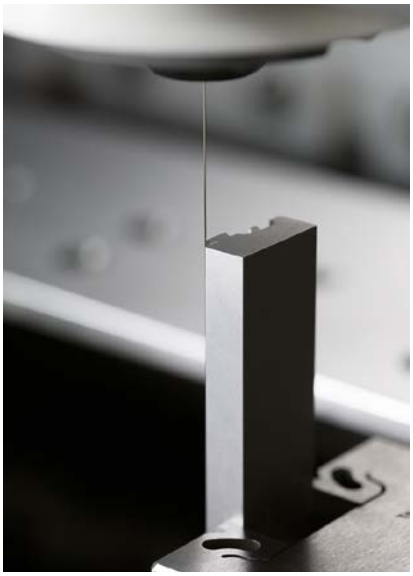
Our legacy of more than 60 years of EDM expertise fuels our solutions and triggers your success.



POWER-EXPERT

Wire breakage prevention on parts with variable heights

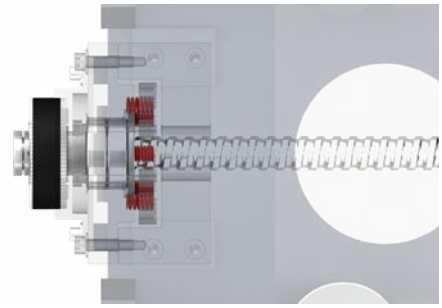
This smart module continually analyzes machining conditions and adapts the power to the geometrical modifications. Critical situations such as when the part is approaching or crossing a blind hole, are fully controlled by POWER-EXPERT.



WIRE-EXPERT

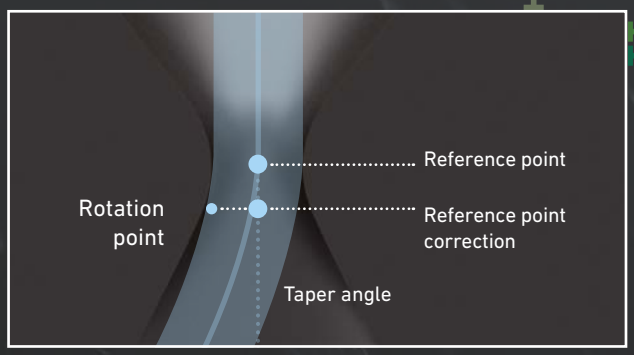
Precision over height

Control of the part conicity compensates for the wire wearing across the height.



Integrated collision protection

Your operator can work with greater confidence during job preparation and execution, because the integrated collision protection on the X, Y and Z axes protects sensitive workpieces from damage.



TAPER-EXPERT allows very precise machining of tapers with angles varying from 0 to 30°. It corrects in real time and during machining the position of the wire depending on the angle. Surface quality is the same as with cylindrical machining.

Benefits

- Unmatched taper accuracy
- Large range of applications
- Accurately-tapered surfaces increase injection mold tooling life

Quality by GF Machining Solutions

Engineered for precision and repeatability

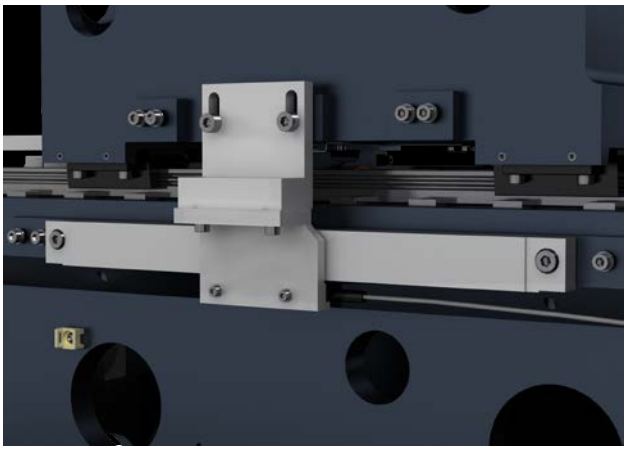
The CUT E series is designed to make it easy for you to accurately machine even large, heavy workpieces. You can count on highly repeatable results.

Compact structure

The T-shaped based frame permits loading of large and heavy work pieces. The compactness and independence of the XY/UV axes guarantee high positioning accuracy and highly repeatable results.

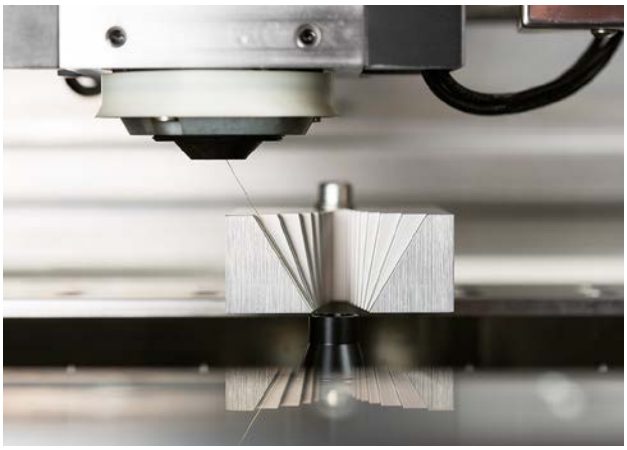
Large/heavy workpieces

Thanks to the standard drop door, large and heavy workpieces up to 1,000 kg can be easily loaded and unloaded.



Glass scales

The glass scales preserve long-term accuracy, require no recalibration, and eliminate classical screw system errors related to backlash and wear.



Taper

Precison cuts up to 30° over 50 mm are enabled by a compact and flexible mechanical concept.

30% less floor space compare to previous model

Filters
Two filters are positioned side by side to make maintenance fast and easy.

Compact layout
The compact layout of about four square meters allows efficient integration of the CUT E series into your workshop.

Drop door
The standard drop door system allows easy and convenient access to the working zone.

Machine concept

New design, new features based on years of legacy

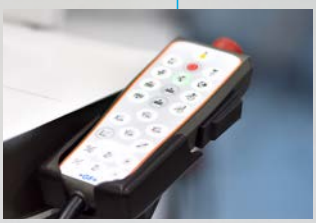
Solutions to advance your performance and productivity, secure your processes, and accelerate your time to market are engineered into the CUT E 350/CUT E 600 Wire-cutting EDM machines.

Thermocut for easy operation
Your key to successful, efficient threading is preparing the wire properly before threading, thanks to the Thermocut module.

Wire circuit
Reliable table wire circuit design ensures a perfect unrolling process that does not disrupt the EDM process during machining.

Automatic threading
The automatic threading and rethreading is quick and useful for all kinds of coated and uncoated, hard and soft brass wires.

Automatic indexing chuck
Autoindexer is an integrated rotary indexing unit with continuous 90° capability intended for submerged use.



Remote control
Designed for one-handed use, the remote control is a standard feature offering ease of use and help in fine-tuning workpiece preparation.

Large spool
A 25 kg spool option is available for both the CUT E 350 and the CUT E 600 to extend running hours and allow continuous production in combination with
– 20-liter deionizing bottle
– Two filter cartridges

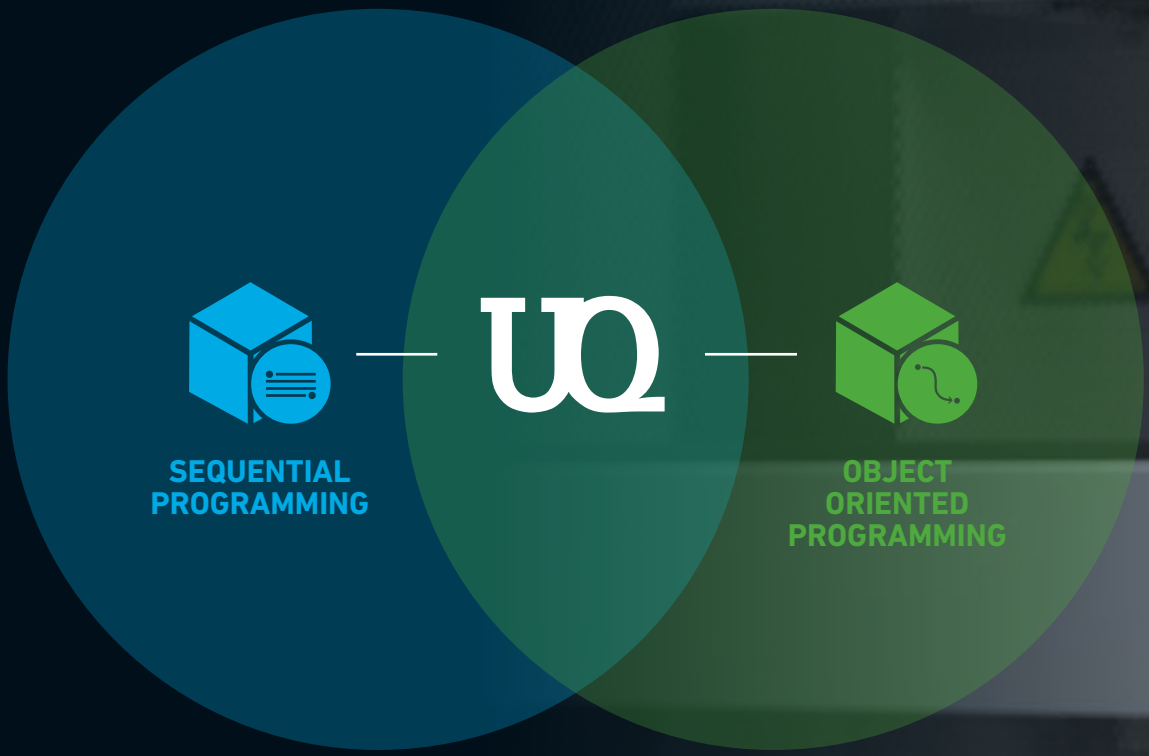
Save energy: an economic and ecological necessity

In order to control production costs, saving energy has become a priority in many workshops. The Econowatt modules manage the machine's electrical power so as to never waste energy when the machine is running unattended. When machining is finished or interrupted, the power supply is reduced to the minimum, lower than 1 kW, or completely disconnected depending on the parameters of the machine. Automatic restart is programmed according to a daily schedule corresponding to the working hours of the workshop. The machine is switched on in sufficient time to be thermostabilized when the workshop opens.

Exceptional human-machine interface

UNIQUA

UNIQUA is the new GF Machining Solutions human-machine interface (HMI) for Wire-cutting EDM machines. It represents the pinnacle of more than a century of EDM technology – and the perfect combination of optimal functionality and usability from our previous HMIs.



Every skill level
UNIQUA is ideal for Wire-cutting 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.

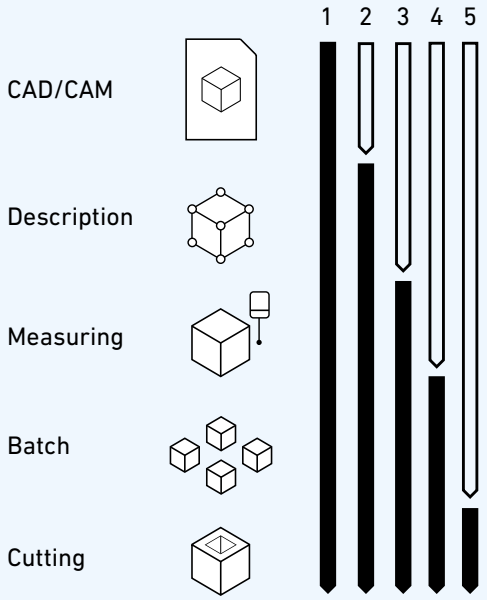
Every user
Work offline or at the machine. UNIQUA ensures compatibility with major CAD/CAM programs and also provides a powerful graphic tool with integrated CAM.


+GF+
MANAGER
PREPARATION
MANUAL
EXECUTION
SERVICES
MANAGER
FOLLOW-UP
TECHNOLOGY
CONFIGURATION
STATUS
H_insert
H_plate
H_Punch
Roughing
PROGRESS
Time left
3D PREVIEWER
+GF+

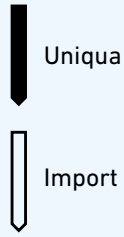
UNIQUA

Where flexibility meets productivity

Flexible data input



1. All data is entered directly at UNIQUA.
2. Only workpiece geometry is imported, remaining data is completed at UNIQUA.
3. Workpiece geometry, workpiece description and machining targets are imported, positioning and measuring data completed at UNIQUA.
4. A complete batch including workpiece, machining, positioning and measuring data are imported. Batches in the case a robot is connected, are managed directly via UNIQUA.
5. All data is imported with direct execution within UNIQUA, including pallets placed in robot magazine.

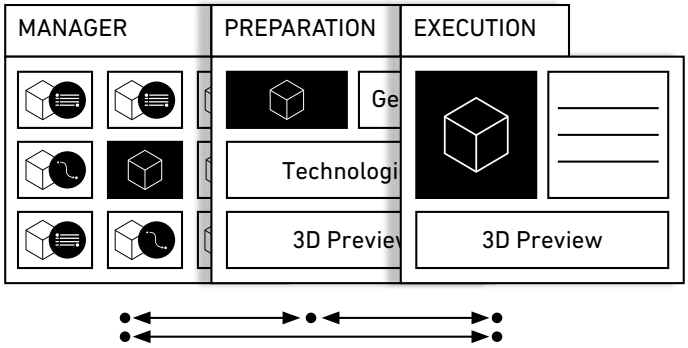


Workflow preparation

MANAGER: Manage folders, files and jobs to streamline preparation and execution.

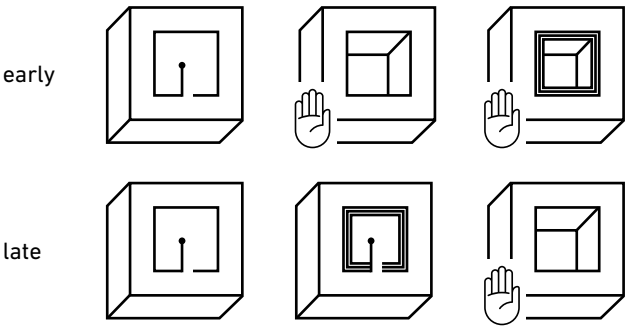
PREPARATION: Import or create geometries, and define machining conditions, technology and sequences. 3D renderings of every job can be previewed and sent directly to execution or back to Management.

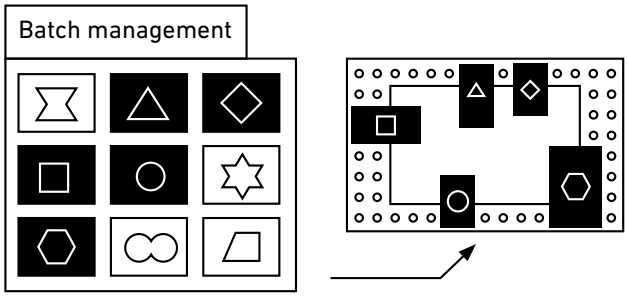
EXECUTION: The execution cockpit allows operators to configure and monitor the job with access to variables and points. The current job's operation can also be monitored graphically throughout the entire execution process.



Change your working strategy at any time
UNIQUA's exclusive functionality offers you the flexibility to adjust cutting strategies anytime during preparation or execution.

Customized Strategy / Priorities
Customized machining sequences minimize unnecessary operator interventions and allow for planned downtime. Priorities can be changed during execution with "one click" directly with UNIQUA without interrupting machining.

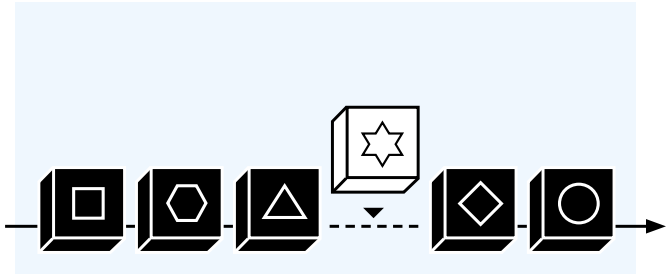




Optimized automation management
UNIQUA effectively manages workpieces by the piece, by the batch or on complete pallets. UNIQUA continuously monitors measuring and cutting processes to produce multiple pallets, which can be stored in the robot magazine. A full sequence of production in different pallets can be programmed directly from your CAD/CAM, avoiding the need of re-managing at the machine HMI.

Dynamic adaptation of batch execution
UNIQUA gives the operator full power to change workpiece and batch-execution priorities, including functions such as piece insert and priority change.

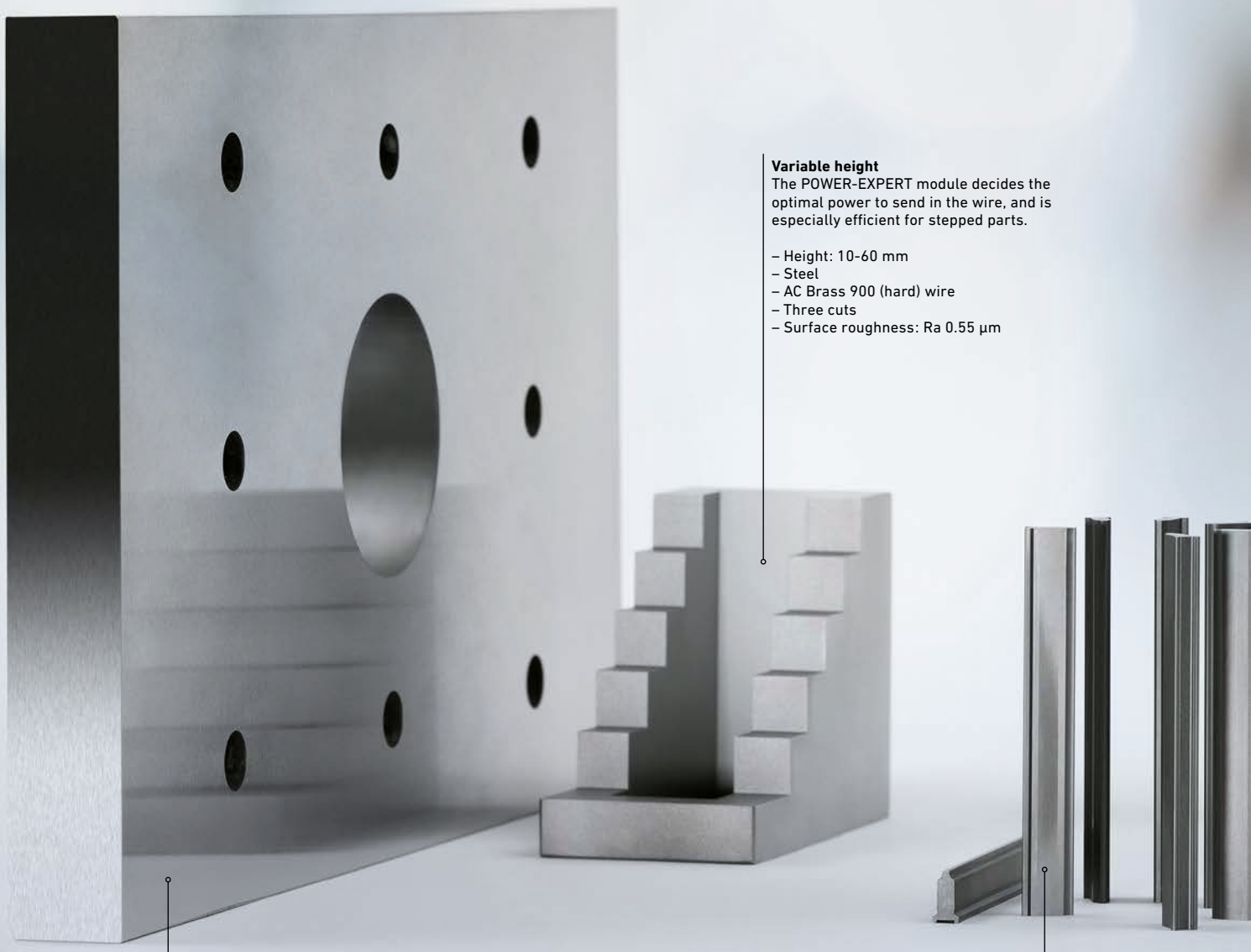
Piece insert
No loss of data or need of reprogramming when interrupting and inserting a job with Piece insert. The interrupted job is resumed exactly where it was stopped, without the need to modify existing data.



Digital IPG

Power your performance

Your efficient production is at the heart of the modern IPG. Its onboard technologies boost cutting speed, precision and surface quality to satisfy your customers and put you ahead of your competitors.



Variable height
The POWER-EXPERT module decides the optimal power to send in the wire, and is especially efficient for stepped parts.

– Height: 10-60 mm
– Steel
– AC Brass 900 (hard) wire
– Three cuts
– Surface roughness: Ra 0.55 µm

Hole plate
– Dimensions: 250 x 150 x 15 mm
– Steel
– AC Cut AH (brass coated) wire
– Five cuts
– Positioning accuracy: ± 3 µm
– Surface roughness: Ra 0.22 µm

Stamping punch
The corner strategy module automatically adjusts the parameters during changes of direction to ensure sharp angles and small radii.

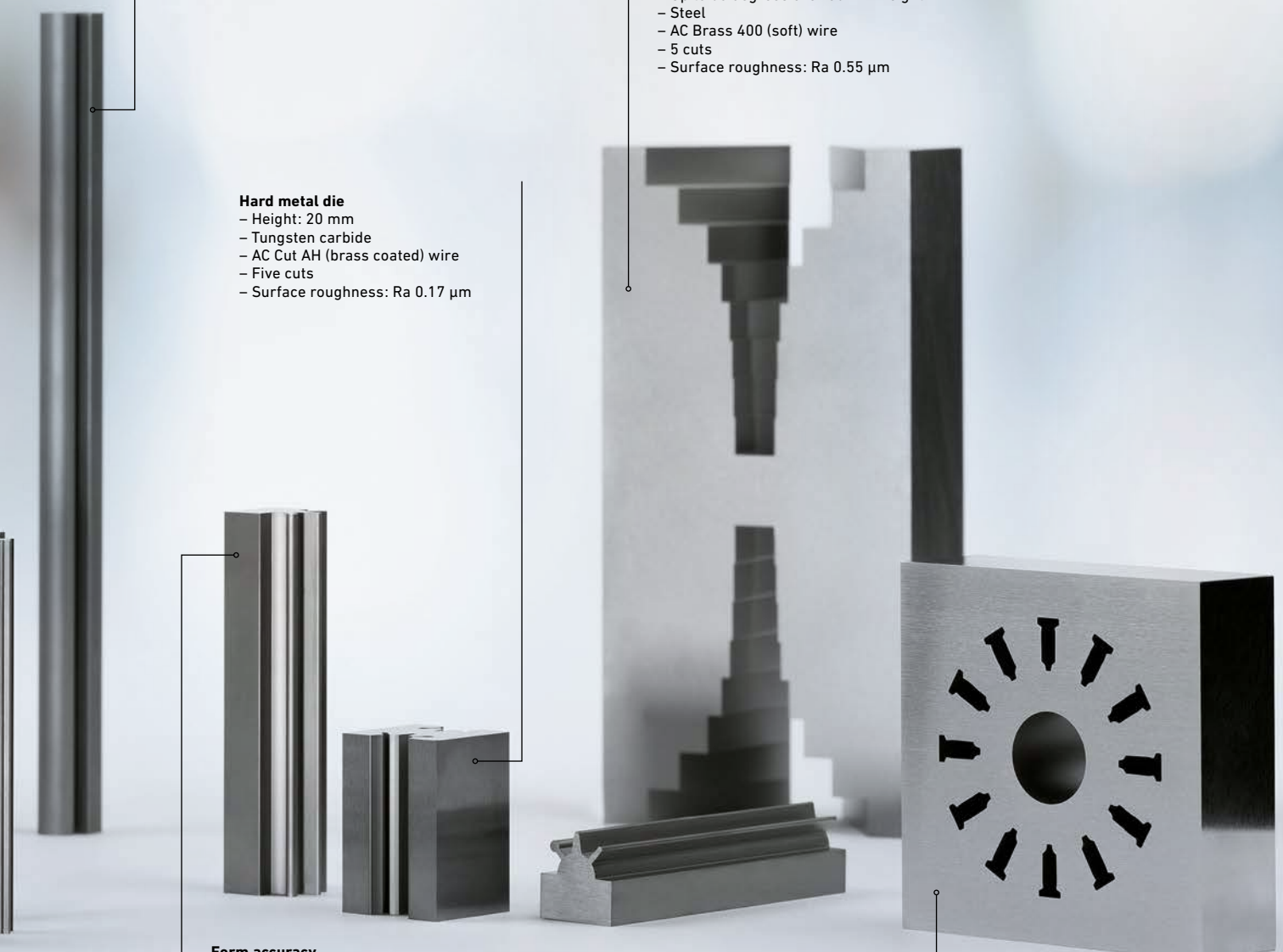
– Height: 60 mm
– Steel
– AC Cut AH (brass coated) wire
– Five cuts
– Contour accuracy: ± 5 µm

High part
– Height: 150 mm
– Steel
– AC Cut AH (brass coated) wire
– Six cuts
– Maximum dimensional error TKM: ± 5 µm

Taper Expert
The CUT E series demonstrates its versatility by offering the capability to cut cones

– Up to 30 degrees over 56 mm height
– Steel
– AC Brass 400 (soft) wire
– 5 cuts
– Surface roughness: Ra 0.55 µm

Hard metal die
– Height: 20 mm
– Tungsten carbide
– AC Cut AH (brass coated) wire
– Five cuts
– Surface roughness: Ra 0.17 µm



Form accuracy
– Height: 60 mm
– Steel
– AC Cut AH (brass coated) wire
– Five cuts
– Maximum dimensional error TKM: ± 2 µm

Stamping die
– Height: 20 mm
– Steel
– AC Cut AH (brass coated)
– Five cuts
– Clearance: 4 µm
– Surface finish: Ra 0.22 µm

Digital IPG

Dedicated to accelerate your productivity

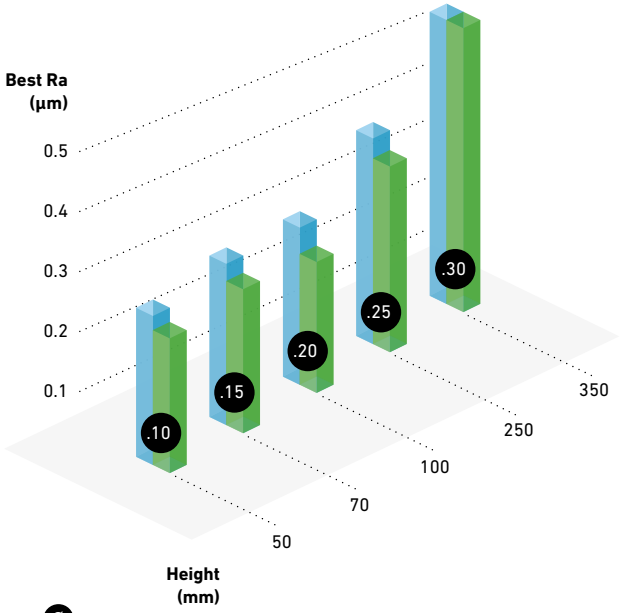
Our latest anti-electrolysis IPG combined with a new state-of-the-art CNC is the new base for the next generation of Wire-cutting EDM machines. The future is here.

Electronic integration
Our latest generation of power generators allows a digital control of each spark bringing precision and very fine surface quality down to an outstanding Ra 0.16 µm.

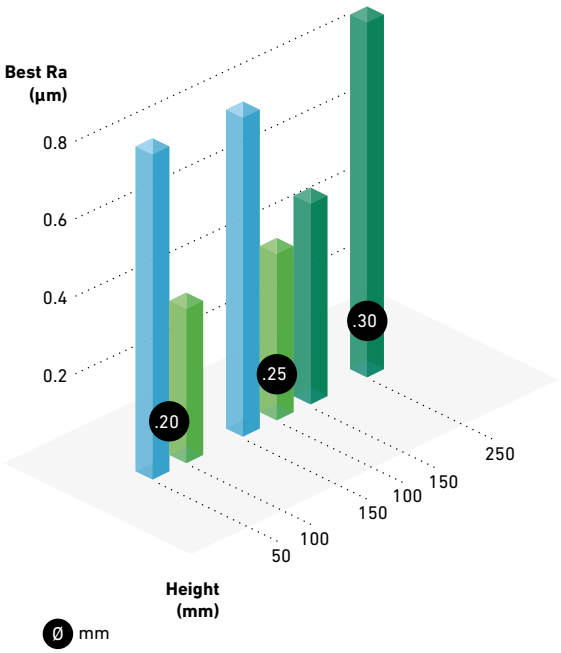
Easy EDM management

The EDM EXPERT module generates the best process according to precision and material needs. A large panel of preconfigured technological parameters enables an optimal choice of settings for your application. Our latest high-performance wires enable excellent execution.

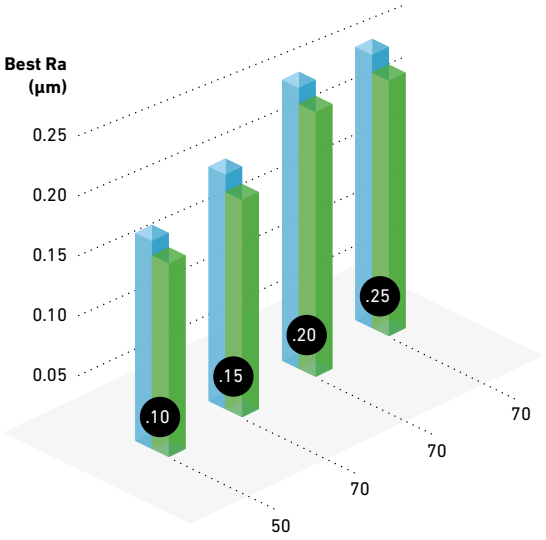
Steel dedicated process range



Ø mm
Brass wire
Coated wire



Ø mm
Graphite
Copper
Aluminium



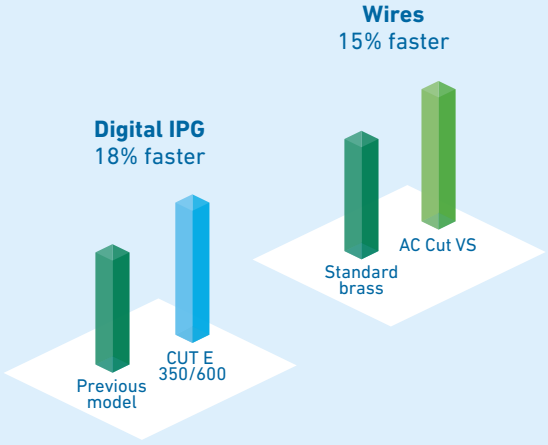
Ø mm
Brass wire
Coated wire

Speed dedicated process

Focusing on productivity, the integrated processes are saving you time and can reduce cutting time by as much as 18% compared to equivalent standard machines.

AC Cut VS

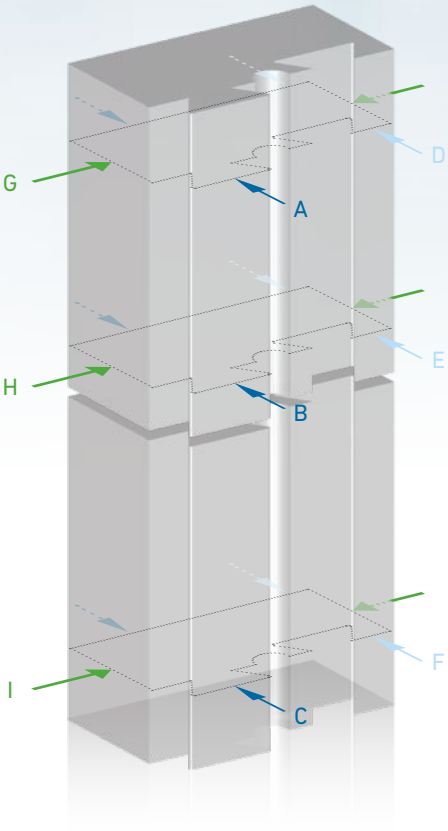
A Wire-cutting EDM machine has a very wide range of applications and wire choice is crucial in order to obtain the best productivity and optimum results in terms of speed, precision and surface finish. The GF Machining Solutions AC Cut VS Certified wire accelerates cutting speed increasing machining speed up to 15%.

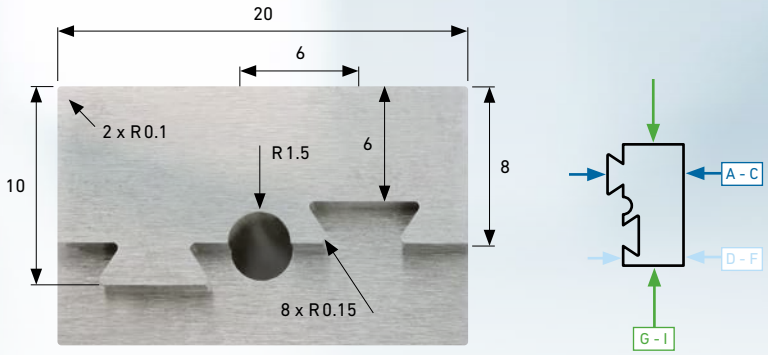


Machine performance

Outstanding precision and repeatability

This part that you see here was machined under the conditions our customers face daily in the stamping industry. It demonstrates the excellent machining capabilities essential for precision parts: remarkable small corner precision and straightness accuracy, excellent contour precision, exemplary surface quality and outstanding production repeatability—four reasons to buy a CUT E series machine.





Technology parameters

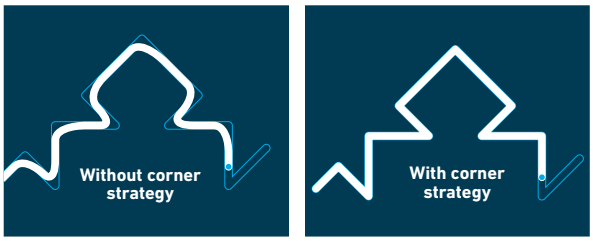
Work piece material: K107/Sk11
Wire: AC Brass 900, Ø 0.2 mm
Height: 60 mm
Production time: 2 h 47' in 5 cuts
Part clearance: 3 µm
Gauge: 88 mm x Ø 3 mm, ± 3 µm

Technology parameters

Max dimensional error TKM: ± 3 µm
Geometrical accuracy / parallelism: 3 µm
Surface roughness: Ra 0.24 µm

Corner strategy

The corner strategies adjust automatically the machining parameters during changes of direction. Even on the smallest details, high geometrical accuracy is obtained. Achieve high accuracy with sharp angles and small radii.



Machine options

Customize your solution

Make your CUT E 350/CUT E 600 solution distinctly yours by customizing it to your specific workshop needs. Find exactly what you need from our wide range of options.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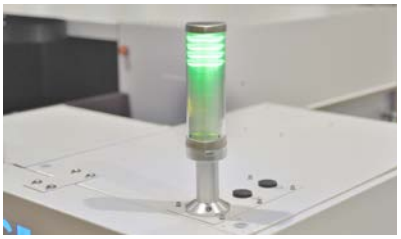
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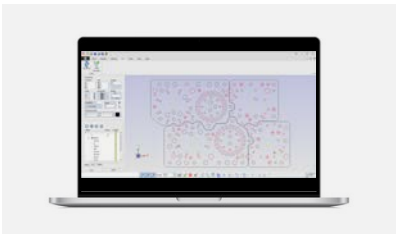
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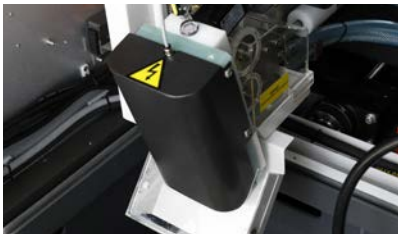
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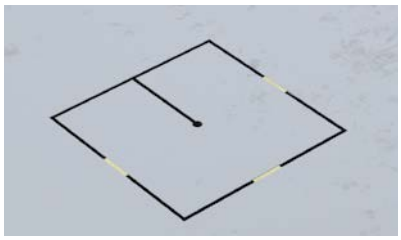
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9

1 // 0.1 mm diameter wire kit
This set includes all the parts that ensure a good machining reliability when using a wire diameter of 0.1 mm.

2 // Taper expert 10°-30° kit
Option for accurate taper cutting
– One set of large radius guides
– One threading nozzle
– One set of nuts
Available for 0.2 and 0.25 mm diameter wires

3 // Automatic Slug Welding
Automatically welds the core to the cavity, leaving a micro-fixture by using a reverse erosion process. This allows you to easily remove the core by a manual tap before the finishing cuts.

4 // Alarm lamp
Stack lamp for the visualization of the equipment status
– Four-color configurable stack light
– Mounting material

5 // AC CAM EASY
– Professional license:
This option is the updated package from the basic version to the professional version.
– Advanced license:
This option is the updated package from the basic version to the advanced version.

6 // Automatic rotary axis chuck
Autoindexer is an integrated rotary indexing unit with continuous 90° capability intended for submerged use in Wire-cutting EDM machines.

7 // 3D setup
Check planarity with a mechanical touch probe. Define wire inclination and the precise position of the part planes.

8 // Wire chopper
Cuts wires into small parts and collects them in a box at the back of the machine.
Maximum box capacity 25 kg

9 // 25 kg wire spool unit
For more running time and less manual intervention

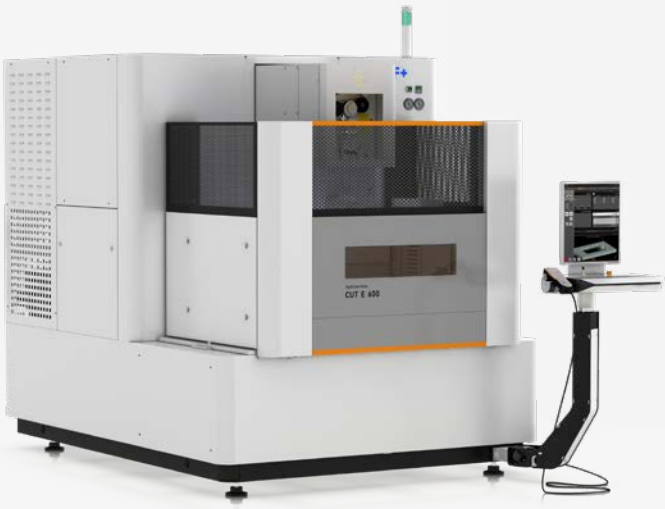
Technical specifications

CUT E 350

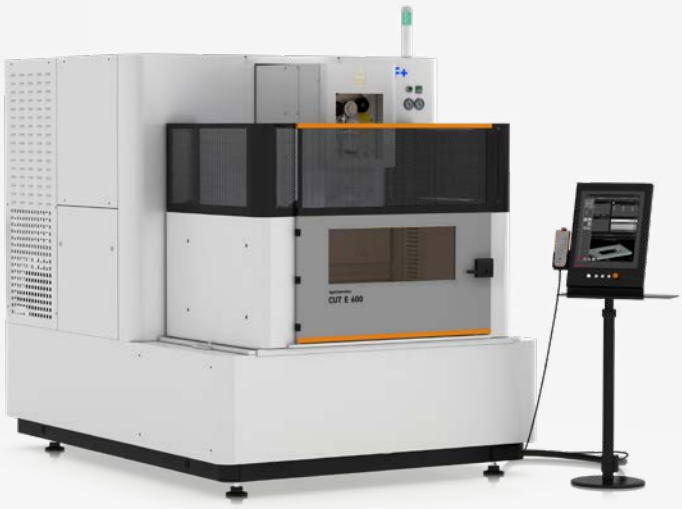
CUT E 350

		CUT E 350	CUT E 600
Machine			
Dimensions of complete equipment *	mm in	1850 x 3050 x 2220 72.83 x 120.07 x 87.40	2160 x 3400 x 2320 85.04 x 133.86 x 91.34
Total weight of equipment without dielectric	kg (lbs)	2845 (6272)	4230 (9325)
Work area			
Part dimensions	mm in	820 x 680 x 250 32.28 x 26.77 x 9.84	1030 x 800 x 350 40.55 x 31.5 x 13.78
Max. part weight	kg (lbs)	400 (882)	1000 (2205)
Level of dielectric min./max.	mm (in)	0/280 (0/11.02)	0/380 (0/14.96)
Air supply			
Pressure	bar	6.5-8	6.5-8
Min. flow	l/min	150 (39.6 gal/min)	150 (39.6 gal/min)
Axes			
X, Y, Z Travel	mm in	350 x 250 x 250 13.78 x 9.84 x 9.84	600 x 400 x 350 23.62 x 15.75 x 13.78
U, V Travel	mm (in)	± 45 (± 1.77)	± 50 (± 1.97)
Taper angle/height	°/mm (°/in)	± 30/50 (± 30/1.97)	± 30/50 (± 30/1.97)
X, Y, U, V, Z movement resolution	µm (µ-inch)	0.1 (3.94)	0.1 (3.94)
Speed of axis movement (XYZ)	m/min (in/min)	0-3 (0-118)	0-3 (0-118)
Anti-collision protection for axes		X, Y, Z	X, Y, Z
Dielectric			
Type		Deionised water	Deionised water
Total volume of dielectric	l	760 (200.77 gal)	1130 (298.51 gal)
Filtering cartridges		2	2
Deionization bottle		1	1
Deionization resin	l	20 (5.3 gal)	20 (5.3 gal)

* Width x depth x height



CUT E 600



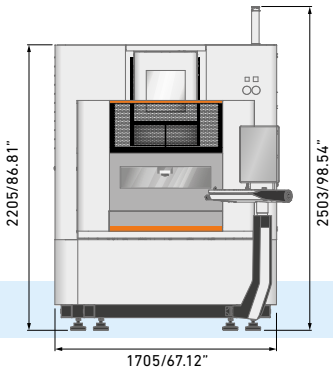
CUT E 600

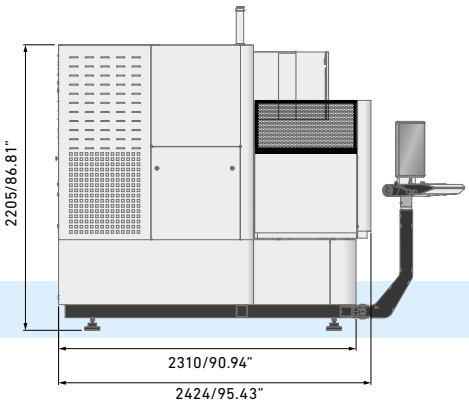
		CUT E 350 / CUT E 600
Wire		
Standard wire guide	mm (in)	Ø 0.20 or Ø 0.25 (Ø 0.008 or Ø 0.010)
Wire diameter (according to configuration equipment)	mm (in)	Ø 0.10-0.30 (Ø 0.004-0.012)
Automatic threading for wires	mm (in)	Ø 0.10-0.30 (Ø 0.004-0.012)
Automatic rethreading for wires	mm (in)	Ø 0.10-0.30 (Ø 0.004-0.012)
Permissible weights and types of reel	kg lbs	8 (JIS P5), 25 (DIN 160) 17.63 (JIS P5), 55.11 (DIN 160)
Best Ra	µm (µ-inch)	0.14 (6)
Max. machine cutting speed	mm^2/min (in^2/min)	300 (0.46)

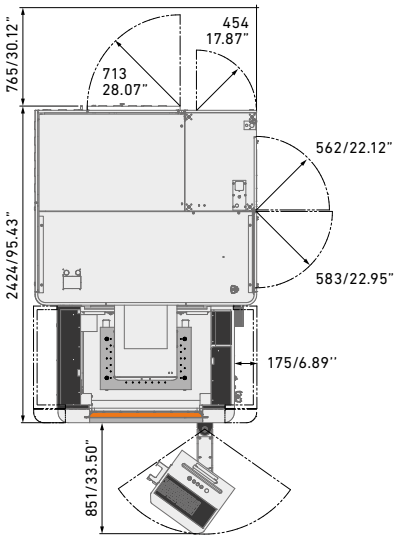
Cabinet (CUT E series)	
Three-phase input voltage (V)	3 x 400
Network frequency (Hz)	50 or 60
Permissible fluctuations	±10%
Total installed power (kVA)	10
Permissible micro-break (ms)	3
Power factor	0.8
Screen/Operating system	19'' / Windows
Keyboard	Yes
Ethernet port USB	Yes
Remote control	Yes

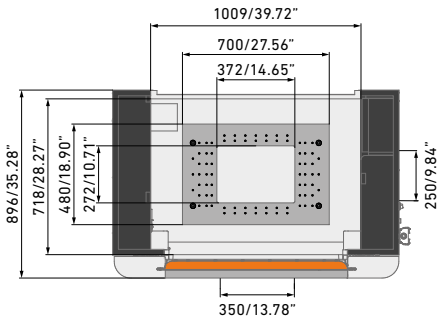
Ambient conditions (CUT E series)	
Temperature for optimum accuracy	20 ±1°C 68 ±33.8°F
Temperature for operation of the equipment	15-30°C 59-86°F
Permissible relative humidity	40-80%
Max. sound emission of the machine (Db(A))	70
Thermal stabilization time (h)	3
Level of protection of electrical equipment (IP)	43

CUT E 350

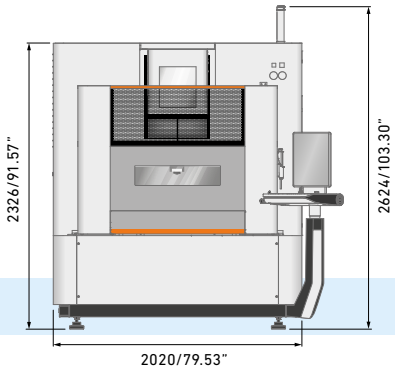


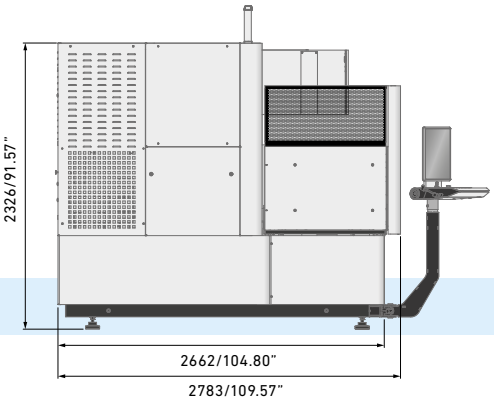


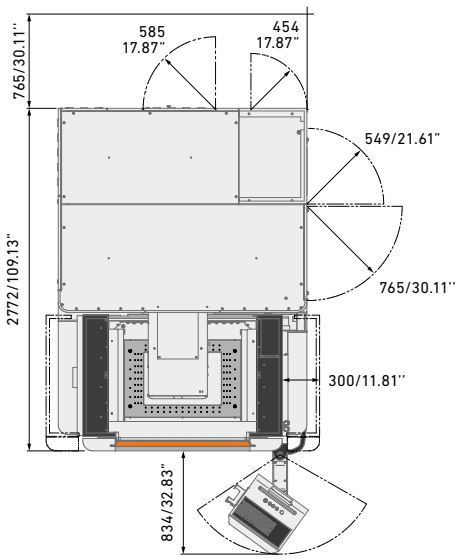


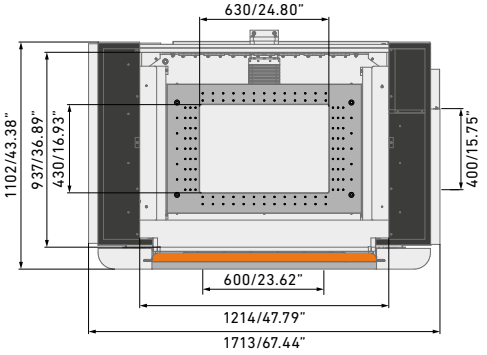


CUT E 600

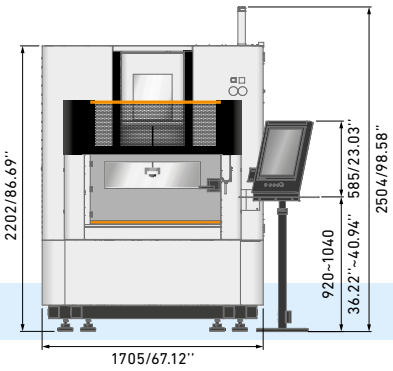


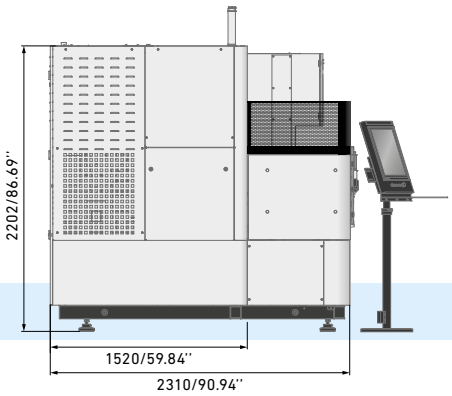


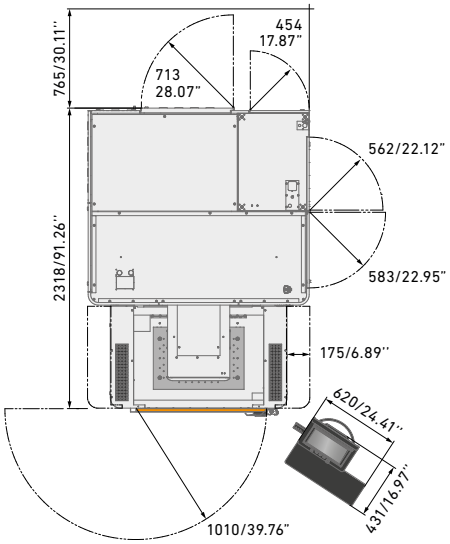


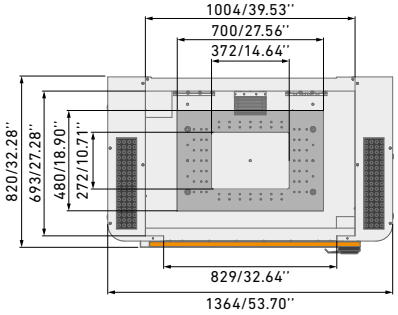


CUT E 350

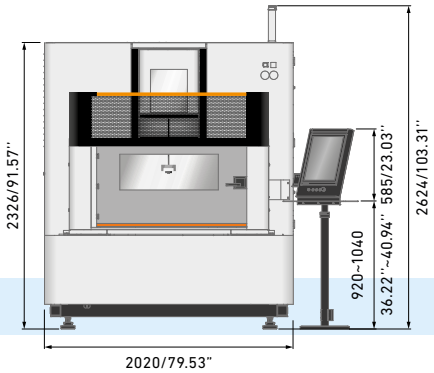


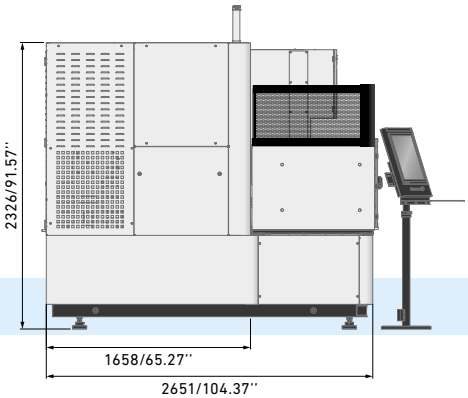


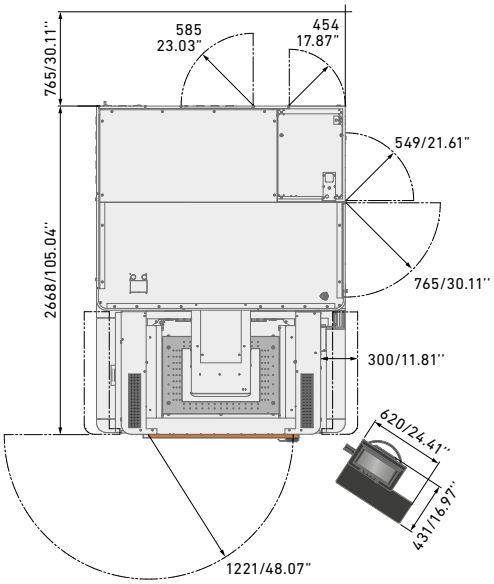


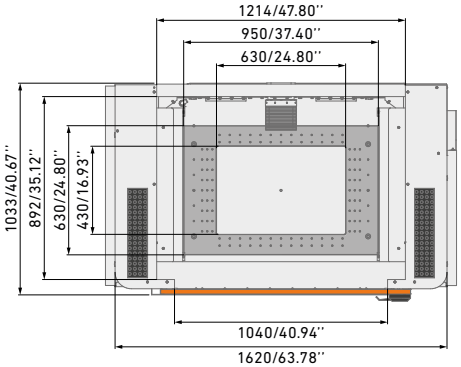


CUT E 600









About GF Machining Solutions

Multi–technology solutions provider

Our commitment to you and your specific applications is proven by the value-adding intelligence, productivity and quality delivered by our multi-technology solutions. Your success is our chief motivator. That's why we are continuously advancing our legendary technical expertise. Wherever you are, whatever your market segment and whatever the size of your operation, we have the complete solutions and the customer-centric commitment to accelerate your success—today.

EDM (Electrical Discharge Machining)

Wire-cutting EDM
GF Machining Solutions' wire-cutting EDM is fast, precise and increasingly energy efficient. From ultraprecise machining of miniaturized components down to 0.02 mm to powerful solutions for demanding high-speed machining with respect to surface accuracy, our wire EDM solutions position you for success.

Die-sinking EDM
GF Machining Solutions is revolutionizing die-sinking EDM with features like iGAP technology to dramatically boost machining speed and reduce electrode wear. All of our die-sinking systems offer fast removal and deliver mirror finishes of Ra 0.1 µm (4 µin).

Hole-drilling EDM
GF Machining Solutions' robust hole-drilling EDM solutions enable you to drill holes in electrically conductive materials at a very high speed—and, with a five-axis configuration, at any angle on a workpiece with an inclined surface.

Milling

Milling
Precision tool and mold manufacturers enjoy a competitive edge with our Mikron MILL S solutions' fast and precise machining. The Mikron MILL P machines achieve above-average productivity thanks to their high performance and Automation. Customers seeking fastest return on investment benefit from the affordable efficiency of our MILL E solutions.

High Performance Airfoil Machining
Our Liechti turnkey solutions enable the highly dynamic manufacturing of precision airfoils. Thanks to the unique performance and our expertise in airfoil machining, you increase productivity by producing at the lowest cost per part.

Spindles
As part of GF Machining Solutions, Step-Tec is engaged in the very first stage of each machining center development project. Compact design combined with excellent thermal and geometric repeatability ensure the perfect integration of this core component into the machine tool.

Advanced manufacturing

Laser texturing
Aesthetic and functional texturing is easy and infinitely repeatable with our digitized Laser technology. Even complex 3D geometries, including precision parts, are textured, engraved, microstructured, marked and labeled.

Laser micromachining
GF Machining Solutions offers the industry's most complete line of Laser micromachining platforms optimized for small, high-precision features to meet the increasing need for smaller, smarter parts to support today's leading-edge products.

Laser Additive Manufacturing (AM)
GF Machining Solutions and 3D Systems, a leading global provider of additive manufacturing solutions and the pioneer of 3D printing, have partnered to introduce new metal 3D printing solutions that enable manufacturers to produce complex metal parts more efficiently.

Tooling and Automation

Tooling
Our customers experience complete autonomy while maintaining extreme accuracy, thanks to our highly accurate System 3R reference systems for holding and positioning electrodes and work pieces. All types of machines can easily be linked, which reduces set-up times and enables a seamless transfer of workpieces between different operations.

Automation
Together with System 3R, we also provide scalable and cost-effective Automation solutions for simple, single machine cells or complex, multi-process cells, tailored to your needs.

Software

Digitalization solutions
To drive its digital transformation, GF Machining Solutions acquired symmedia GmbH, a company specialized in software for machine connectivity. Together, we offer a complete range of Industry 4.0 solutions across all industries. The future requires the agility 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.

Service + Success

We take you to new heights
Our Success Packs are designed to maximise you 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.

eCatalog
Keep your equipment operating at peak precision and performance with our wide range of certified consumables and original wear parts. Our online catalog has it all (ecatalog.gfms.com).

Worldwide for you

Our locations

Switzerland

Headquarters
Biel/Bienne +++

Losone ++
Geneva ++
Langnau ++

Europe

Schorndorf, Germany ++
Coventry, United Kingdom ++
Agrate Brianza (MI), Italy ++
Barcelona, Spain ++
Marinha Grande, Portugal +
Massy, France +
La Roche Blanche, France +
Lomm, Netherlands ++
Altenmarkt, Austria ++
Warsaw, Poland ++
Brno, Czech Republic ++
Budapest, Hungary ++
Vällingby, Sweden +

America

USA
Lincolnshire (IL) ++
Chicago (IL) ++
Huntersville (NC) ++
Irvine (CA) ++

Toronto (Vaughan), Canada ++
Monterrey, Mexico ++
São Paulo, Brazil +
Caxias do Sul, Brazil +

Asia

China
Beijing +++
Changzhou ++
Shanghai ++
Chengdu ++
Dongguan ++
Hong Kong +

Yokohama, Japan ++
Taipei, Taiwan +
Taichung, Taiwan ++
Seoul, Korea ++
Singapore, Singapore ++
Petaling Jaya, Malaysia ++
Bangalore, India ++
Pune, India +
Hanoi, Vietnam ++

+ Plant + Center of Demonstration + Sales company

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GF Machining Solutions

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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