

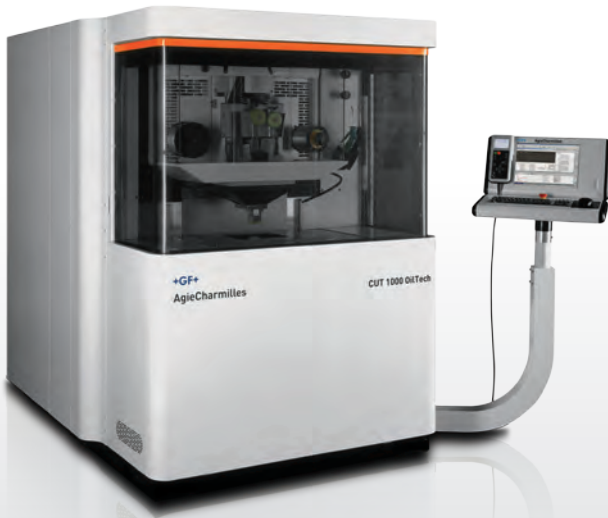
CUT 1000
CUT 1000 OilTech



MICRO WIRE EDM

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CUT 1000



CUT 1000 OilTech

A machine concept fully conceived to suite the highest requirements in producing very fine details and best surface finish

Highlights

The benchmark for ultra accurate results in micro wire EDM applications

The world of micro dimensions

GF AgieCharmilles technology supports the increased miniaturization of industrial components. Production of very small components has become a high priority in many industries: connector technology, medtech, watch making, automotive and aerospace. The production of micro components is linked to higher manufacturing tolerances and the ability to precisely produce geometrical shapes.

In the manufacture of high-precision stamping tools and in the production of micro components, best contour accuracy, finest surface finish and highest repeatability are absolute musts.

GF AgieCharmilles' new CUT 1000, specifically designed to meet these demands, offers unique features in terms of precision and productivity, and perfect predictability and repeatability of machining results. This wire cut machine is a benchmark in micro erosion.



Watch industry

High accuracy in the inner radii.

Exactness in machining the small details with provision for machining inner radii down to 0.02 mm (0.0008 in).

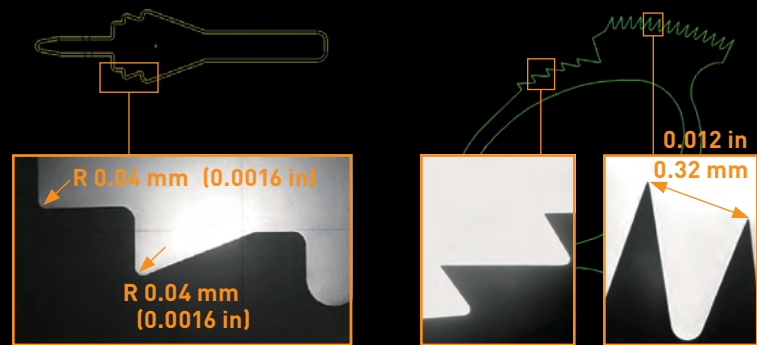




The innovative mechanical structure of the CUT 1000 — with a patented monobloc framework, separately arranged main axes, a dual measurement system on all axes, a consistent separation of the sources of heat from the EDM area, and a working area kept constantly under water as well as an optimal water circuit — creates the prerequisites for outstanding features:

- 1 μm positioning accuracy over whole travel paths
- Ra 0.05 μm best surface quality
- 11 μm (0.44 in) smallest possible inside radii
- 20 μm (0.79 in) smallest possible wire diameter
- 22 μm (0.88 in) smallest possible slit

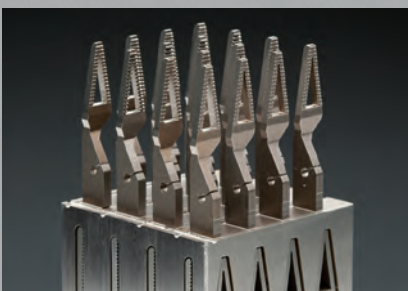
Great accuracy in the fine details



Medical technology

Production of single components or small series of surgical tools like bipolar surgical forceps.

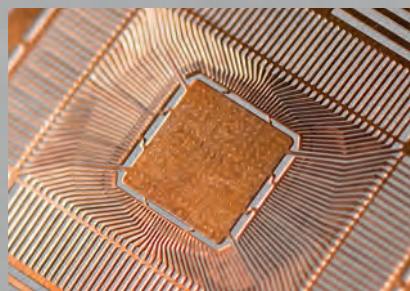
Very good surface finish down to Ra 0.10 μm (4 μm) in stainless steel and titanium with best surface quality.



Microelectronics

Leadframes, high accuracy and perfect surface quality.

Die-punch clearance: 1 μm (40 μm)
 Best surface finish Ra 0.05 μm (2 μm)
 Perfect surface homogeneity, no microcracks and corrosion, very small internal radii down to 22 μm (0.88 in)



Food industry

Positioning accuracy.

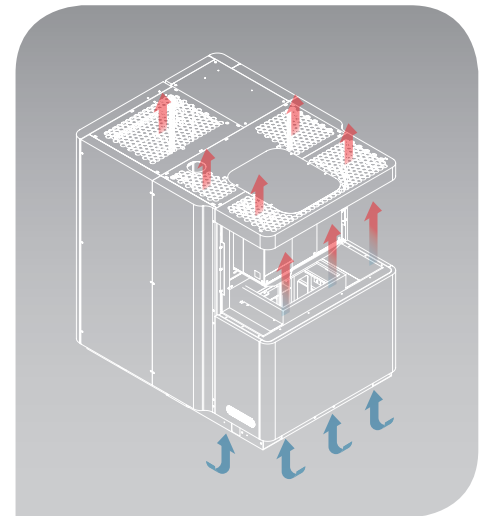
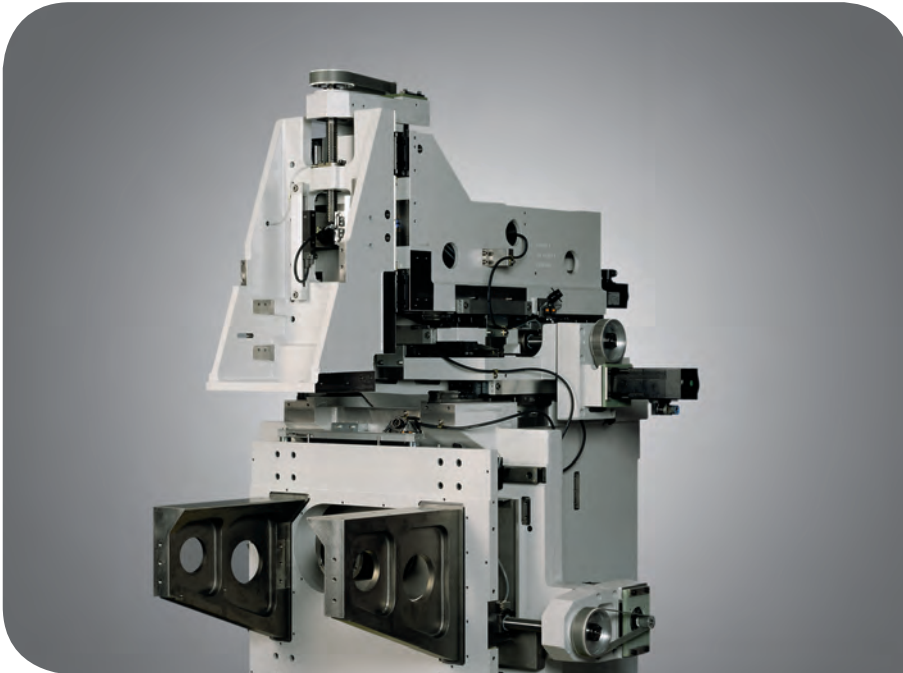
Mass production requires high precision cutting tools, above all for the manufacture of articles just a few hundreds of μm in thickness.

Thickness of the sheet to be blanked: 0.04 mm (0.0016 in)
 Required accuracy: <2 μm (80 μm)



Quality and accuracy

Unique design for highest quality and accuracy



CUT 1000 designed for outstanding accuracy

Due to an exclusive machine design concept, the CUT 1000 meets highly demanding requirements in terms of positioning accuracy, shape and detail accuracy. These results are possible thanks to the development of an innovative machine tool design based on a monoblock framework with separated X and Y axes, and through the static and dynamic analysis of the behavior of the machine tool with the Finite Element Method.

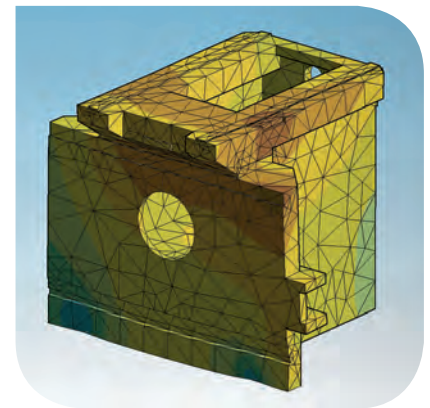
Concept for insulated heat sources

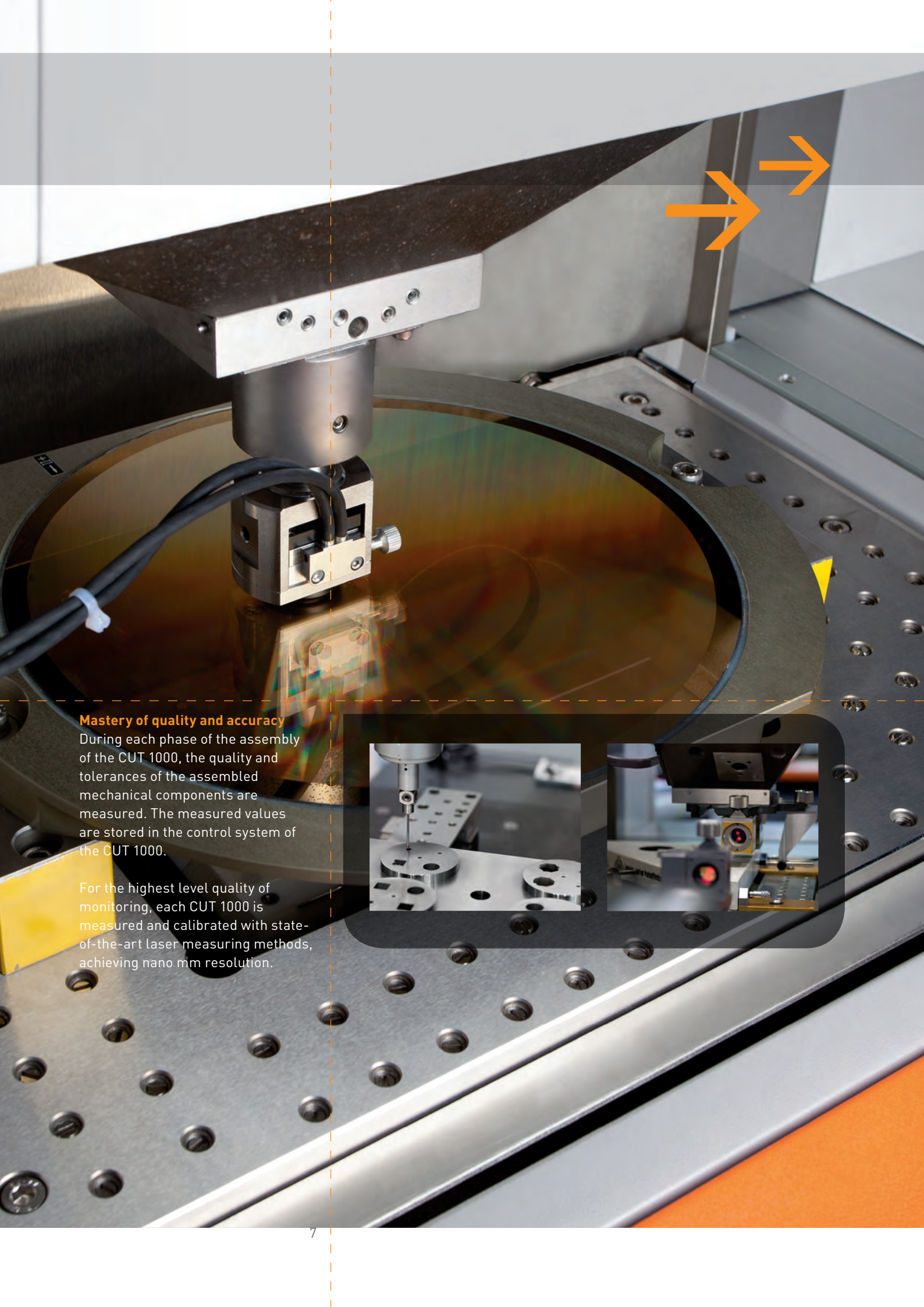
Every heat source of the CUT 1000 has been analyzed and insulated with air, cooling water, and insulation materials, or by locating the heat sources in order to not affect the machine.

Through the particular design of the cabinet, a total thermal insulation concept has been conceived, which includes two stages: first by performing a perfect temperature control between the machine and its surrounding area, and second, by creating a micro climate in the work area ensuring constant temperature.

Thermo controlled water circulation

The work tank has been designed as an overflow tank for constant water circulation in the work area. The water is cooled in the main dielectric tank before recirculation. This ensures an absolutely constant temperature of the water in the work tank. The water level is adjusted automatically to the workpiece height by raising and lowering the filled work tank.





Mastery of quality and accuracy

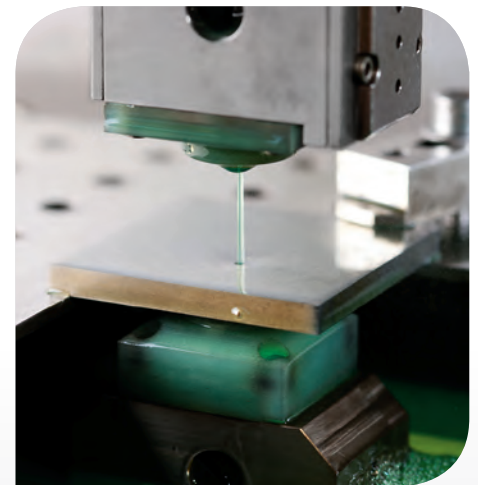
During each phase of the assembly of the CUT 1000, the quality and tolerances of the assembled mechanical components are measured. The measured values are stored in the control system of the CUT 1000.

For the highest level quality of monitoring, each CUT 1000 is measured and calibrated with state-of-the-art laser measuring methods, achieving nano mm resolution.



The exclusive wire system

AWC two-wire spool system for unparalleled productivity in micro wire EDM



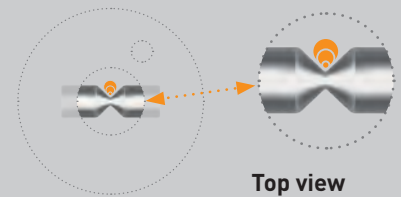
Highest productivity with AWC

The AWC wire system considerably increases productivity by allowing the use of larger diameter wire or premium wires for the main cut and then automatically switching to smaller diameter or more economical wires for the finish cut. The result of this unique GF AgieCharmilles feature is a huge increase in the average cutting speed.

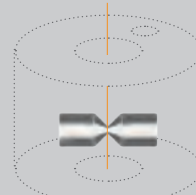
Fast and reliable wire threading

The CUT 1000 can be used to full capacity in reliable night and weekend operation. AC Jet threads reliably with all wire diameters (even wires of 0.02 mm (0.0008 in) diameter) in all cases — such as multiple clampings, multiple openings in one workpiece or in the rare case of a wire break — a prerequisite for truly autonomous, automated ED wire-cutting operation.

A single wire guide permits all wire diameters to be installed



Top view



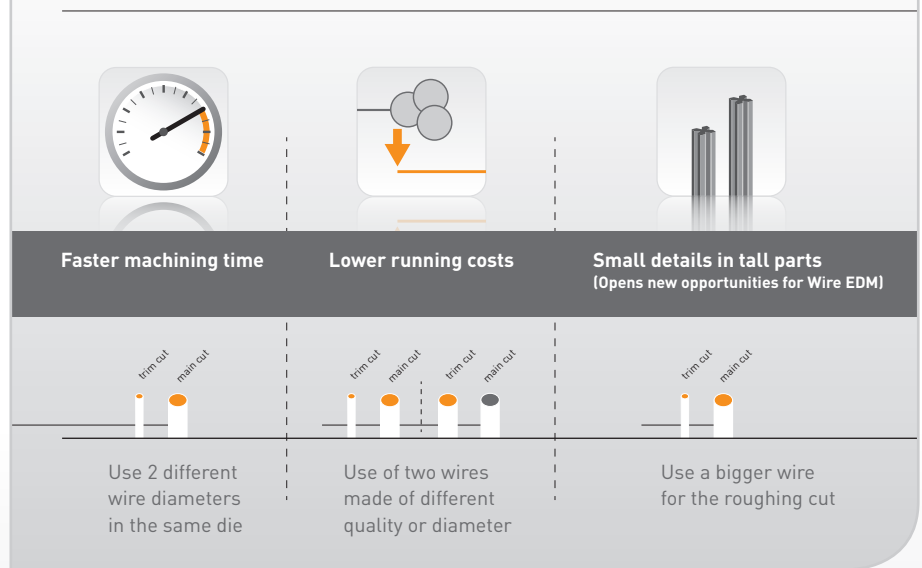
Front view



Efficient wire chopper

Simple and reliable wire disposal with the integrated wire chopper is important to avoid electromagnetic radiation.

AWC for micro erosion: benefits



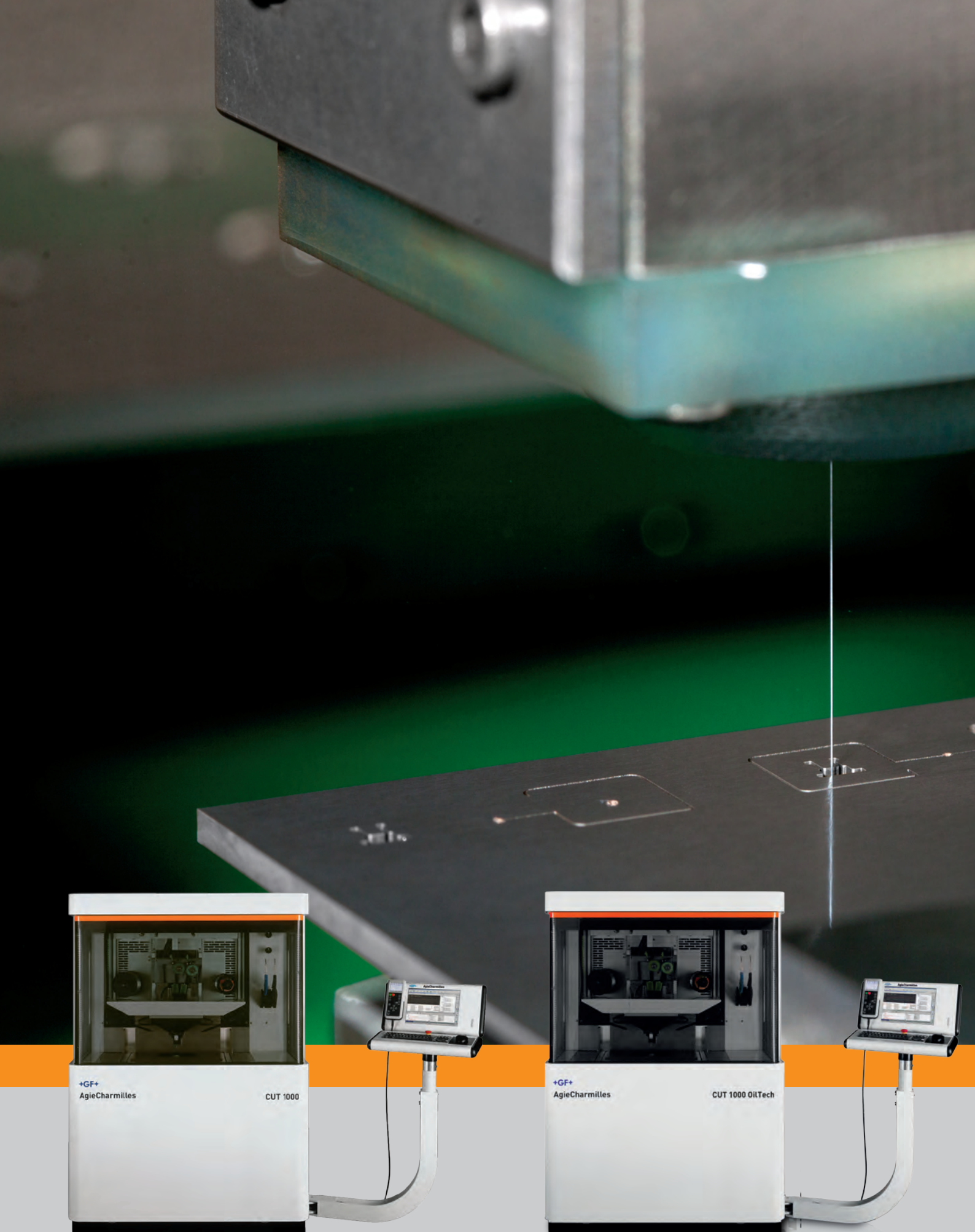
The reliability of single wire and double productivity

The smart and simple design concept of the AWC double wire system and the proven AC Jet wire threading system ensure absolute reliability in automatic wire diameter change during an automatic machining process. This allows unmatched productivity by using a larger diameter wire during the main cut, for important machining time savings, and the fully automatic change to the smaller radius as required by the actual geometry, for the finishing.

Designed for a high level of autonomy

The CUT 1000 also has optimal autonomy available as a prerequisite for automated sequences:

- 2 x 8 kg (17.6 lbs) wire spools
- Long service lives of the filter and deionizing system
- Long working life of the power feeds and wire guides
- Restart after a power failure
- Results on the workpiece achievable with certainty and straight off thanks to mature technologies
- Maintenance and service intervals can be planned.



Achieve more...



CUT 1000
CUT 1000 OilTech

CUT 1000

CUT 1000 OilTech

AC Vision

User friendly and powerful, for highest efficiency,
onboard Job Management System included

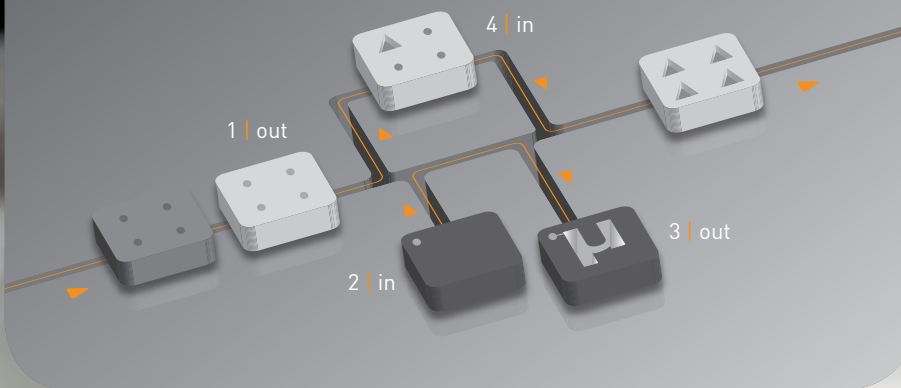


Time-saving work preparation with 3D Setup

Perfect preparation of the work by properly clamping the part on the table is an important operation which will determine the final quality of the job. Reducing time and costs spent on this operation is a permanent goal in all workshops. 3D Setup provides the solution, thanks to a cycle which puts the wire perpendicular to the surface of the workpiece.

This operation can also be performed fully automatically, using palletized workpieces.

Job Management System



Highest flexibility in unexpected situations with the Job Management System

Dealing with changes of priority in the workflow occurs continuously in all workshops. Inserting an urgent machining job when another job is in progress is a requirement which has to be realized in a simple manner, rapidly and with reliability.

The Job Management of the CNC Vision 5 provides the solution, providing a simple and intuitive way to suspend the job in progress, insert the urgent job, and then continue the previous job exactly at the point where it was suspended.



AC Vision

AC Vision is a control system developed especially for EDM machining and shop floor requirements with a high level of operating convenience. A few data inputs are sufficient to generate the EDM program using the Microsoft® Windows® operating system, just like your PC at home.

Highest machining performance

The benchmark in terms of fine surface finish and quality



Fully digitized pulse control

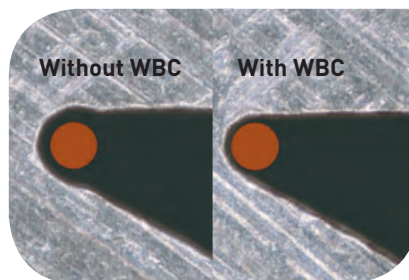
Powerful and modern electronics and smart process control allow the most efficient EDM process. All common conducting materials can be processed to the best results with any type of wire. For best surface finish, the IPG-V generator allows the elimination of the affected layer in steel, and yields perfect surface integrity in carbide.

Variocut: optimal cutting speed under any circumstances

High cutting speed is the basic condition for productivity of the equipment. In case of variable workpiece heights, Variocut constantly optimizes the power of the spark erosion in order to avoid wire breaks and maintain a maximum cutting speed in roughing cutting. With Variocut, the machining is performed to the required accuracy with perfect parallelism and surface homogeneity.

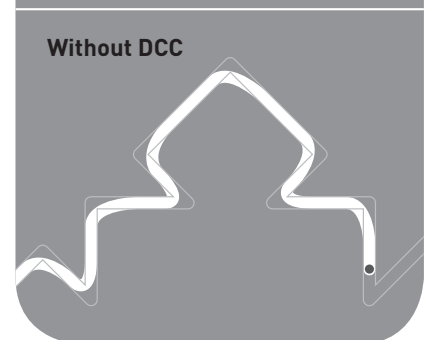
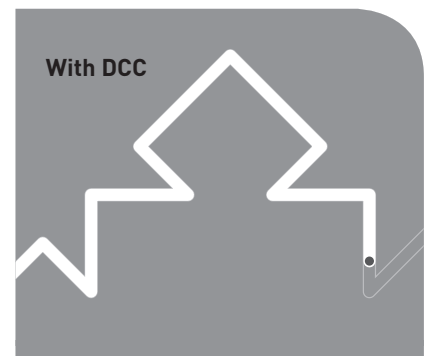
Perfect cutting of contours with AWO and WBC functions

To operate a high performance fine blanking tool, with clearance of a few microns between punch and die, contour accuracy and parallelism of cut shapes must be perfect. The CUT 1000 offers excellent performance due to the automatic setting of wire position and straightness. Wire Bending Control (WBC) automatically compensates for the wire flexion caused by the eroding forces, whereas the Advanced Wire Offset (AWO) function compensates for the wire wear during finishing machining in order to reach perfect parallelism of the cut surfaces.



Constant speed in all contours

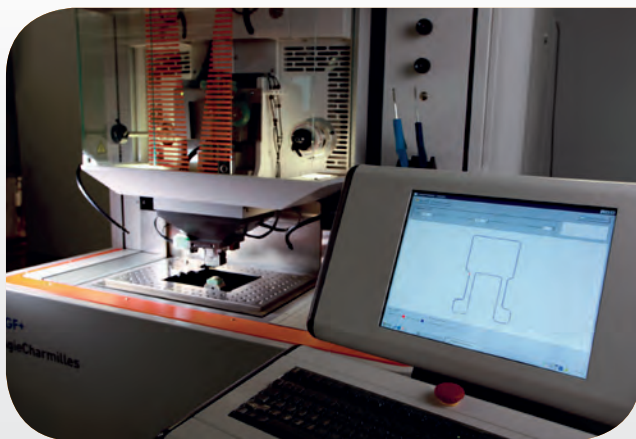
Precise full cuts at maximum speed. Dynamic Corner Control (DCC) continuously corrects physically determined contouring errors. The wire path is dynamically optimized. As a result, the quality of the geometry in full cuts improves so that trim cuts can be carried out faster or even avoided entirely.





Fully integrated optical based system

The exclusive Integrated Vision Unit (IVU) embedded in the CUT 1000 and CUT 1000 OilTech machine is an optical measurement system designed for in-process measurement. Autofocus positions the CCD camera at the right distance and directly measures any shape on the workpiece without removing the piece from the machine. The contrast of the contour is enabled by the backlight installed on the lower arm of the machine.

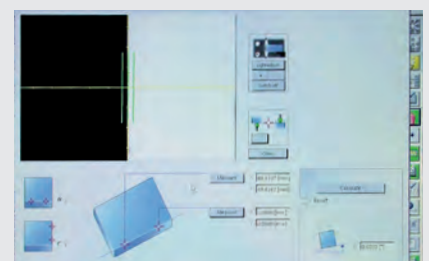


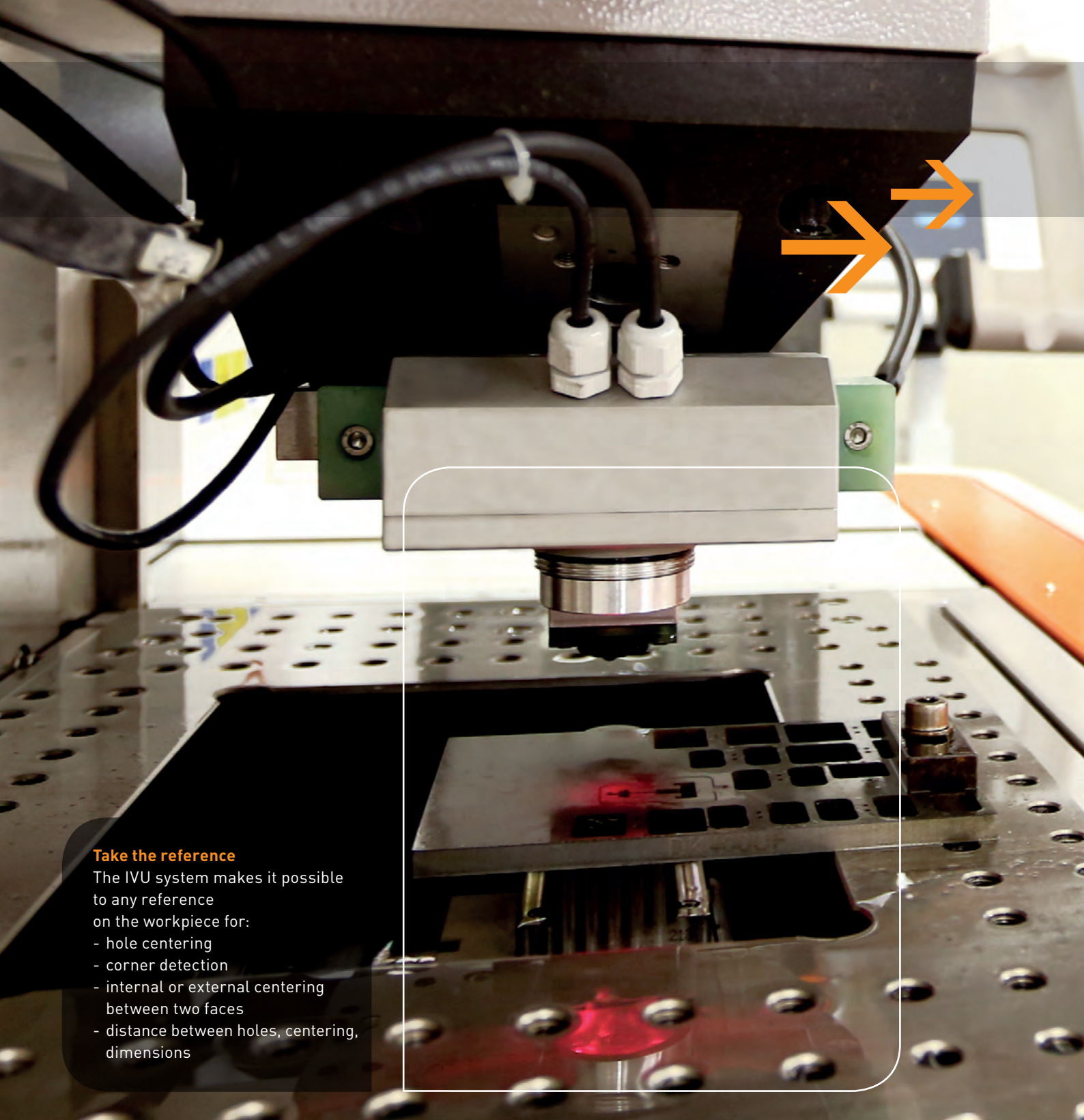
Auto scanning of the form

A complete scan of the contour can be performed anytime. A comparison with a DXF file (theoretical size) can be done and visualized directly on the machine. If done before the end of the machining, a correction can be introduced.

“Get the edge” concept

Special integrated software allows the machine to detect the right position of the edge by analyzing variations in light intensity. The resulting metrological data can be used in various applications.





Take the reference

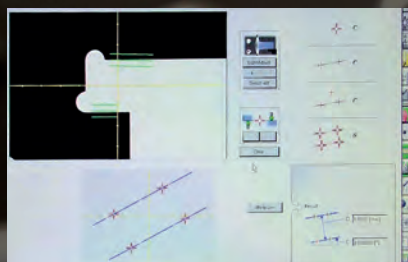
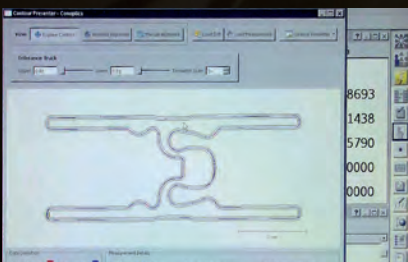
The IVU system makes it possible to any reference on the workpiece for:

- hole centering
- corner detection
- internal or external centering between two faces
- distance between holes, centering, dimensions

Local measurement

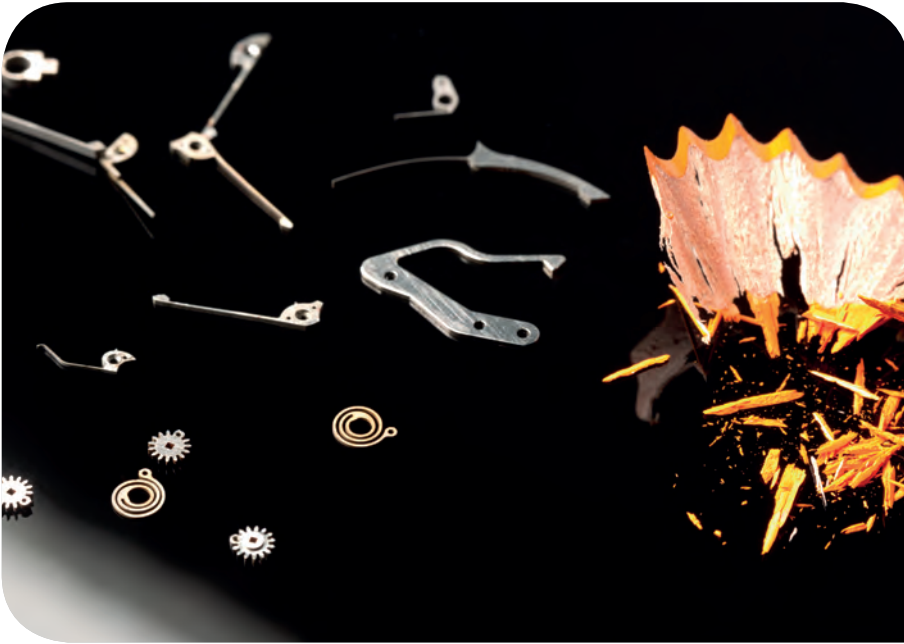
Some parts can present local difficulties. With IVU, it is always possible to locally measure a small detail on the contour (radius, distance).

IVU system: 100 percent reliability of your results.



CUT 1000 OilTech

Surface quality at the highest level



Quality and perfect corner integrity after EDM machining

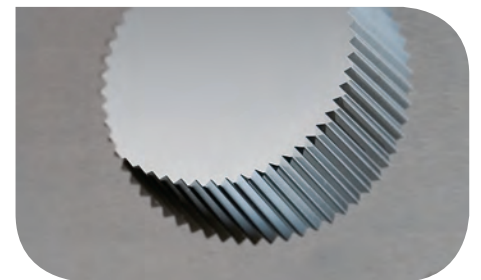
With the CUT 1000 OilTech, GF AgieCharmilles offers a machine with an inert dielectric (oil) that enables machining in tungsten carbide without loss of cobalt, and surface finish down to $Ra\ 0.03\ \mu\text{m}$ ($1.5\ \mu\text{in}$) together with impeccable corner quality.

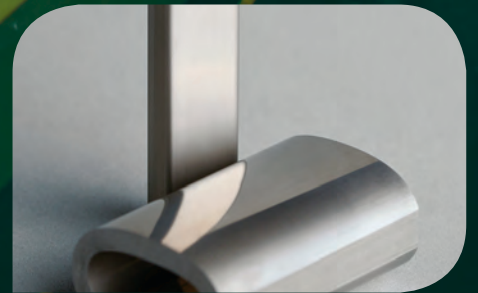
The GF AgieCharmilles generators for wire EDM enable elimination of electrochemical damage to the workpiece during machining in water, but natural corrosion cannot be avoided. The CUT 1000 OilTech uses an inert dielectric (oil), making it possible to produce parts with unsurpassed surface quality, even if this includes long-term immersion in the dielectric.

The use of oil-based dielectric totally eliminates the possible effects of corrosion on the pieces.

This allows:

- Leaving the eroded components in the dielectric for many hours without any risk of oxidation
- Running multiple jobs during the night and the weekend for higher productivity
- No need for an operator to remove and dry completed workpieces
- Significant simplification of the planning of the plant





**Very fine surface finishes
of exceptional quality**

Parts machined on the CUT 1000 OilTech have exceptional surface quality. There is no coloration due to oxidation or redeposit of materials suspended in the dielectric.

Therefore, the machined parts are sound and without defect, ready to be used, aesthetically perfect, and of exceptional quality, meeting the very high demands of the watch making industry.



GF AgieCharmilles

Milling

High-Speed and High-Performance Milling Centers

In terms of cutting speed, HSM centers are 10 times faster than conventional milling machines. Greater accuracy and a better surface finish are also achieved. This means that even tempered materials can be machined to a condition where they are largely ready to use. One essential advantage of HSM is that with systematic integration, the process chain can be significantly shortened. HSM has developed alongside EDM into one of the key technologies in mold and tool making.

EDM

Electric Discharge Machines

EDM can be used to machine conductive materials of any hardness (for example steel or titanium) to an accuracy of up to one-thousandth of a millimeter with no mechanical action. By virtue of these properties, EDM is one of the key technologies in mold and tool making. There are two distinct processes – wire-cutting EDM and die-sinking EDM.

Laser

Laser texturing

Laser texturing supplements and extends the technologies offered by GF AgieCharmilles. With our laser technology we enable you to produce texturizing, engraving, microstructuring, marking and labeling of 2D geometries right through to complex 3D geometries. Laser texturing, compared to conventional surface treatment using manual etching processes, offers economic, ecological and design advantages.

Customer Services

Operations, Machine and Business Support

Customer Services provides with three levels of support all kind of services for GF AgieCharmilles machines.

Operations Support offers the complete range of original wear parts and certified consumables including wires, filters, electrodes, resin and many other materials.

Machine Support contains all services connected with spare parts, technical support and preventive services.

Business Support offers business solutions tailored to the customer's specific needs.

Automation

Tooling, Automation, Software

Tooling for fixing workpieces and tools; automation systems and system software for configuring machine tools and recording and exchanging data with the various system components.

Contact

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