

ONA AF MODULAR



OUR COMPANY: LEADERSHIP, SERVICE AND SUPPORT

Ever since its foundation in 1952, ONA ELECTROEROSION became a pioneer in the development of EDM technologies. As a result, the company is:

- The oldest EDM machines manufacturer in the world.
- The second largest European manufacturer of EDM machines.
- The world leader in large & customized machines.

ONA is located in the Basque Country, the heart of the machine-tool industry in Spain. Still located in Durango, the site of its foundation, are to be found its head office, its principal factory, its R&D facilities, and its technical assistance centre.

Training, technical assistance and maintenance for the customer are given priority No 1 by ONA.



TRAINING

ONA provides the user with a complete training programme at its Training Centers. At these Centers the most up to date instructional systems are used.

COMMERCIAL SERVICE

ONA has established an international subsidiaries and distributors network with the aim to advise and help their customers in order to choose the best solution in each case.

AFTER SALE SERVICE

ONA maintains the commitment to offer to its customers an exceptional service in all the markets in which the company operates. A team of engineers, with a wide experience, are at your disposal in order to assist immediately if necessary.

APPLICATIONS CENTER

ONA has several application centers staffed by real EDM professionals. These specialists are always at your disposal in order to help you and to solve your specific erosion problem.



ONA, WORLD LEADER IN LARGE & CUSTOMIZED EDM MACHINES

At ONA we seek to create partnerships with our clients, while upholding the highest values of behaviour with respect to people and nature.

As a result of ONA's many years of investment in research seeking a cleaner manufacturing process, today we are in a position to offer the most cost-effective, most environment-friendly solutions to be found in the field of EDM.

The philosophy of ONA is based on collaboration with the customer. We want to know precisely what his problems and objectives are. We can then offer him professional solutions most suited to his particular case. This commitment to offering customized solutions has led ONA to become the world leading manufacturer of large & customized EDM machines.



CERTIFICATIONS AND AWARDS



European Award for the Environment, Ecoefficiency category, year 2002.



Spanish Design Prize in Machine Tools in the years: 2000, 2002, 2004 and 2008.



Central production unit certified with the quality standard ISO9001 and environment standard ISO14001.



LARGE WIRE EDM MACHINES WITH MODULAR DESIGN

20 DIFFERENT MODELS OF LARGE WIRE EDM MACHINES

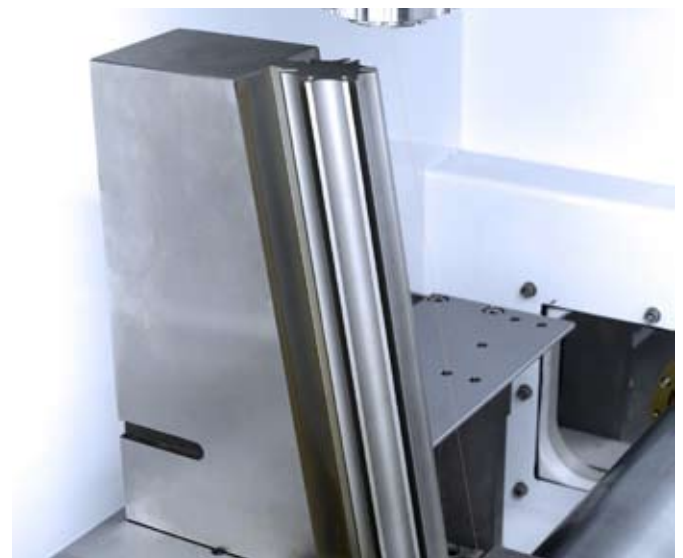
- The large scale ONA AF series, uses a modular design to allow many configurations. Each customer can configure, with a great flexibility, the machine that meets his exact requirements.
- The ONA AF series utilizes pre-built axes modules to drastically reduce machine assembly time.
- Each customer can get a custom system for almost the same price and lead time as a standard one.

MANIFOLD CONFIGURATIONS OF X-Y-Z TRAVELS:

- X travel: 800, 1000, 1500 or 2000 mm.
- Y travel: 600, 800, 1000 or 1300 mm.
- Z travel: 500, 600 or 700 mm.

HIGHLY RIGID MECHANICAL STRUCTURE:

- The structure of the machine is constructed of stabilized fine grained cast iron blended with graphite.
- Fixed-bedframe machines.
- Capacity of workpieces up to 10000 kg.



ONA **AF60**



ONA **AF100**



AF MODULAR



ONA **AF130**

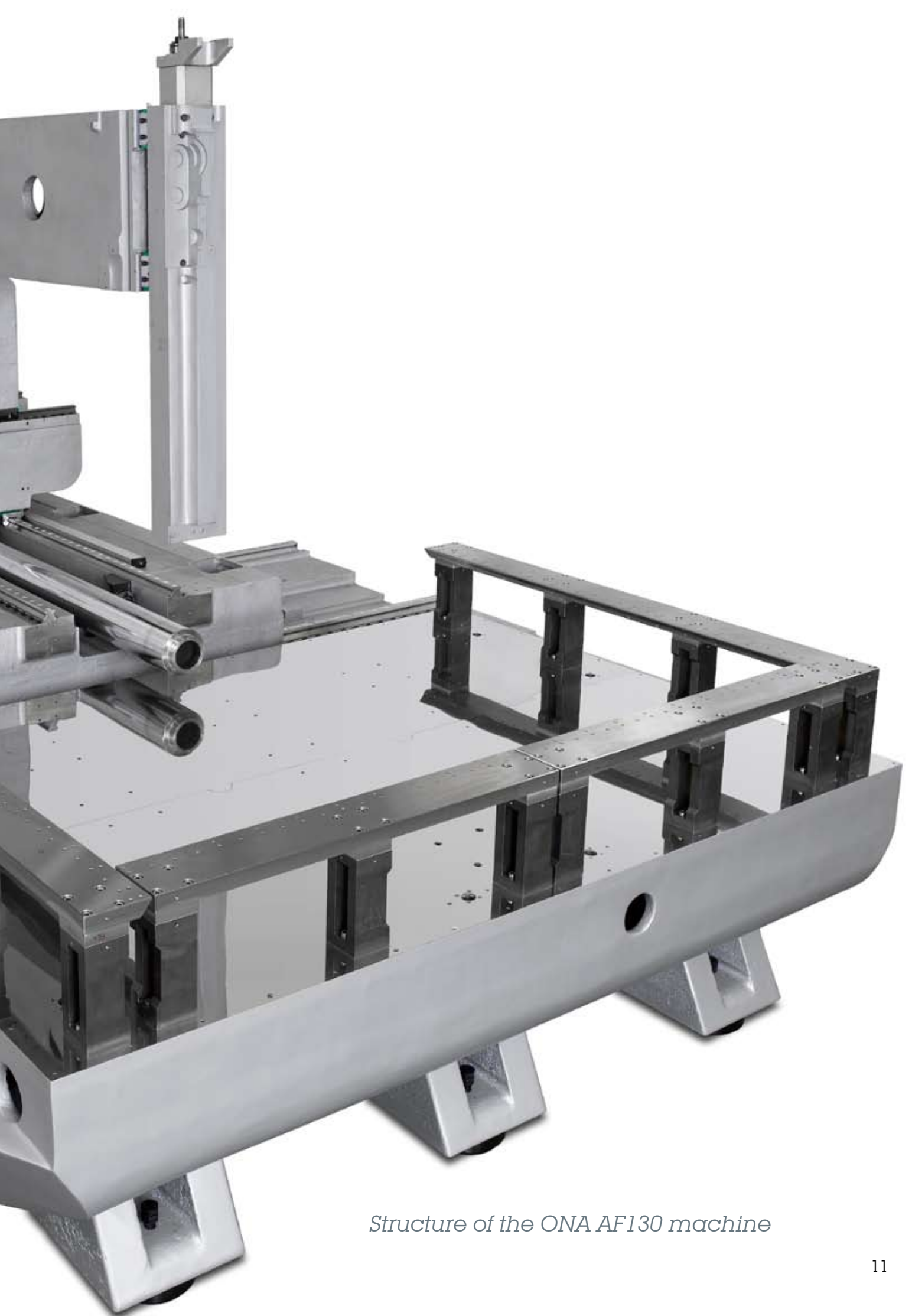




VONA AF130 MODULAR

ONA **AF** MODULAR





Structure of the ONA AF130 machine

ROBUST MECHANICAL STRUCTURE THAT ASSURES A LASTING ACCURACY

ONA: ROBUSTNESS AND RELIABILITY SINCE 1952

The ONA AF modular series feature the traditional robustness and reliability that have been a landmark of all ONA machines since 1952.

TOP QUALITY EUROPEAN COMPONENTS

ONA manufactures all its machines using components supplied by top European manufacturers to assure the best performance and quality.

SYMMETRICAL STRUCTURAL DESIGN

The structure of the machine is constructed of stabilized fine grained cast iron blended with graphite. Structural design is symmetrical so that thermal deformation will be minimal.



Structure of the ONA AF60 machine

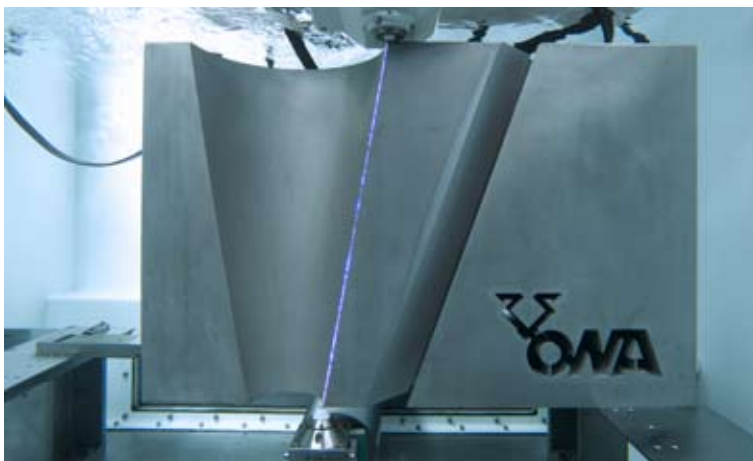
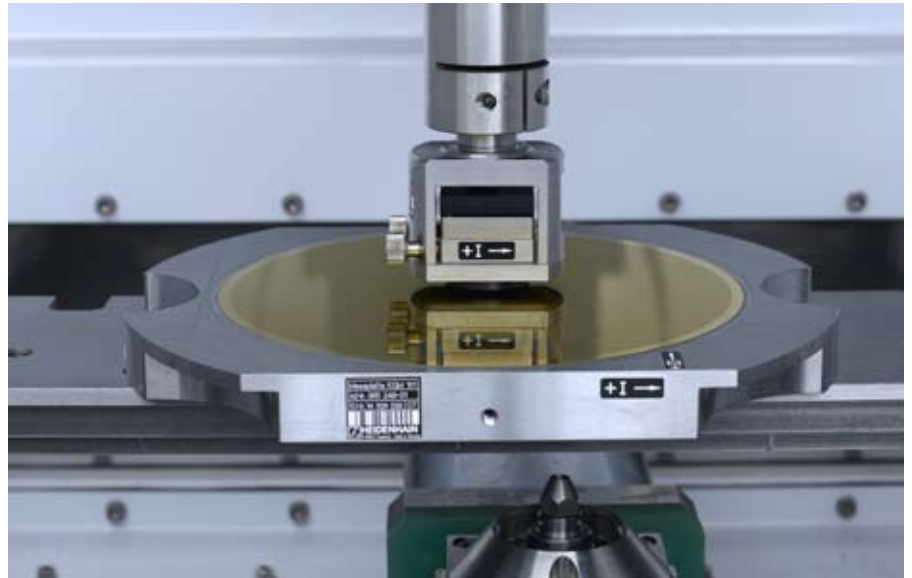


MADE IN EUROPE

Machines manufactured in the ONA central production unit, certified by ISO9001 and ISO14001 standards and complying with EC electromagnetic safety and compatibility standards.

CERTIFIED ACCURACY

Each machine is laser-tested according to the VDI 3441 (axes positioning) and ISO 230-4 (circularity) standards.



EXTREME COLLISION PROTECTION SYSTEM

All machines feature (as standard) an extreme collision protection system with ultra-sensitive load sensors. It protects the machine against collisions or improper forces whilst the axes are moving in machine operations (manual positionings, programmed movements, centring, programme simulations, etc.), in addition to when the machine is eroding.

DIRECT CONTROL POSITIONING OF THE X, Y, U, V, AXES

In all ONA AF modular models positioning control of the X, Y, U, V axes is achieved by highh precision glass scales.



EASYCUT GENERATOR: MAXIMUM PRODUCTIVITY AND EXCELLENT SURFACE FINISH

100% ELECTROLYSIS FREE CUTTING WITHOUT COMPROMISING THE CUTTING SPEED (450 MM²/MINUTE)

The new high power, digital **EASYCUT** generator has been developed in order to achieve the highest cutting rates (450 mm²/minute with Ø 0,33 mm wire) possible in EDM, while being 100% electrolysis free.

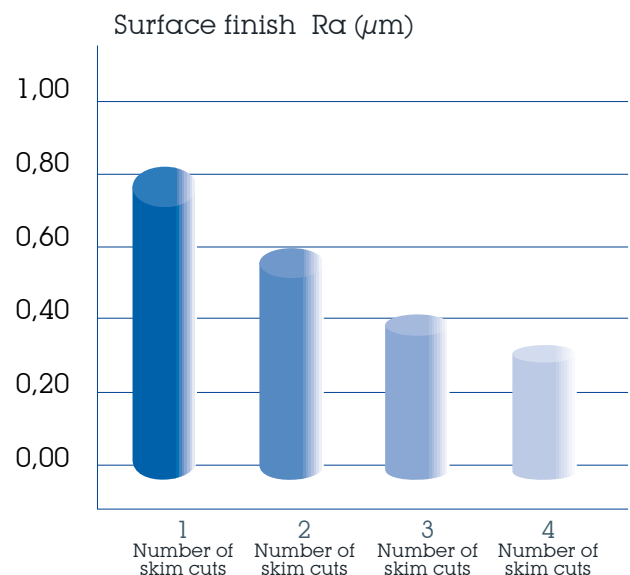
TIME SAVINGS IN ROUGH AND SKIM CUTS

The high cutting rates provided by the **EASYCUT** generator (even in the skim cuts) make it possible to cut high precision parts in a much shorter time.

SURFACE INTEGRITY 100% PRESERVED. BEST SURFACE FINISH: 0.2 µm Ra

The ONA **EASYCUT** generator fully preserves the surface integrity of the workpiece. It avoids completely the electrolytic corrosion even for long machining times while preventing the oxidation, pitting corrosion and deterioration of the workpiece surface.

Material: Steel (X210 CrW12)
Type of wire: brass Ø 0,25 mm.



STEEL AND FERROUS MATERIALS

The recast layer is very thin in the rough cut, disappearing completely after two skim cuts, while preserving the original surface integrity of the workpieces.

NICKEL-BASED ALLOYS

This sort of materials, like inconel, are widely used in the aerospace industry. The **EASYCUT** generator makes it possible to get cutting rates and surface finishes very similar to those achieved with steel parts.

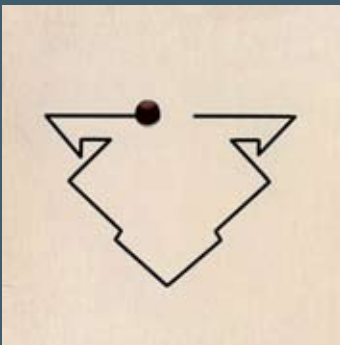
TITANIUM AND ALUMINIUM ALLOYS

The **EASYCUT** generator fully prevents the oxidation and decoloration that might occur in the surface of the workpieces, no matter whether they require several skim cuts or just one rough cut.

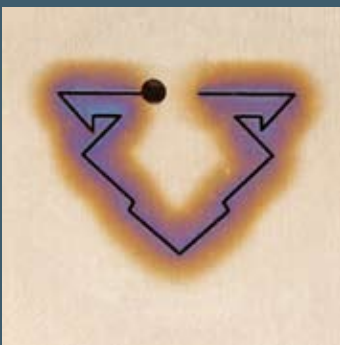


CUTTING OF A TITANIUM ALLOY:

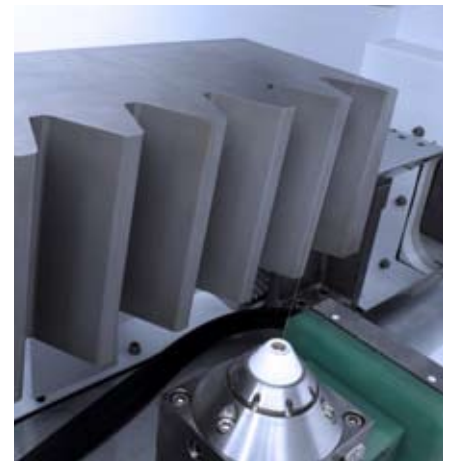
WITH ANTI-ELECTROLYSIS SYSTEM



WITHOUT ANTI-ELECTROLYSIS SYSTEM

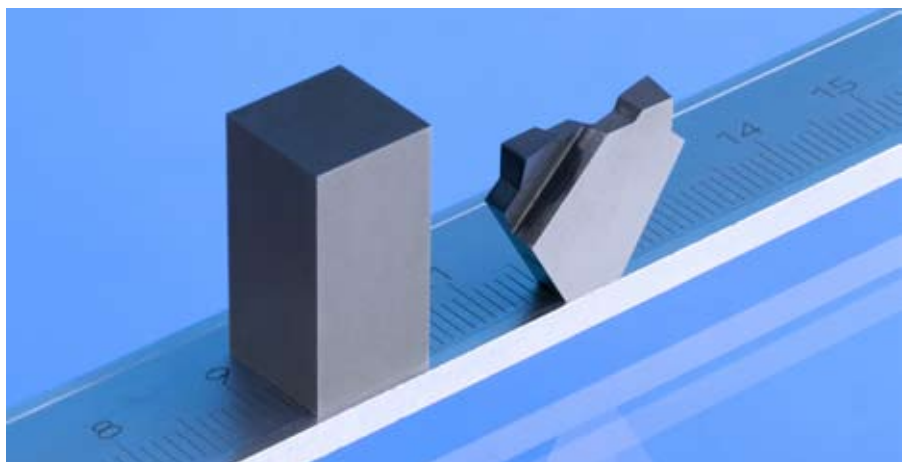


Material: steel (X210 CrW12)
Wire: \varnothing 0,25 mm.
No of cuts: 1 cut and 3 skim cuts
Surface finish: 0.4 μ m Ra.



TUNGSTEN CARBIDE AND PCD

The **EASYCUT** generator reduces the depletion of the workpiece binder, preserving the integrity of the material surface. With Tungsten carbide, a best surface finish of 0.2 μ m Ra (6 VDI) can be achieved.



A LOW- MAINTENANCE SYSTEM FOR THREADING AND FEEDING THE WIRE, WITH NO CONSUMABLES REQUIRED

HIGHLY RELIABLE WITH ALL WIRE TYPES

The built in automatic threading system can handle a large variety of diameters (from \varnothing 0.20 mm to 0.33 mm) and wire types (coated or uncoated). The maximum height for threading is equal to the maximum travel on the Z axis. Minimal maintenance required due to wear-resistant elements and optimized design. Threading is possible in both flushing mode or during immersion, with no need for the work tank to be emptied. Minimum threading hole diameter: 0.5 mm.

WIRE SPOOLS UP TO 45 KG

The spool system of the ONA AF modular machines can handle spools of the following types: DIN 100-125-160-200 and DIN 355 (45 kg maximum), providing considerable autonomy and versatility.

TAPER ANGLE UP TO $\pm 30^\circ$ / 400 mm

All ONA AF modular models have long UV travels (500 x 500 mm), which makes it possible to cut at 30° in 400 mm.



100% ECOLOGICAL FILTER AND WITHOUT MAINTENANCE COSTS (OPTIONAL)

The ONA AF modular machines are equipped with a standard paper cartridge filtering system. As an option the machine can be purchased / equipped with the patented ONA Mineral Filtering System.

MAJOR ADVANTAGES OF ONA FILTRATION SYSTEM (OPTION)

- **100% environmentally friendly.** *This is the first filtration system with no consumable agents to replace or dispose of. The only waste generated is that of the material being machined.*
- **No operating costs ever.** *The precisely ground mineral, used for filtering, never needs to be replaced. Therefore consumable costs are reduced to "zero".*
- **Valid for all types of materials.** *Specially recommended when cutting aluminium parts (cartridge life is very short).*
- **3 µm filtering quality.** *Remains stable throughout the lifetime of the system.*
- **Maximum productivity.** *The filtration system provides a constant supply of clean dielectric. Machining is not interrupted for servicing the filtration system not even for sludge removal.*



ONA mineral filter major savings
Thanks to the ONA filtration system it is possible to obtain a cleaner production process.
No consumable agent has to be replaced or disposed of.
Example related to conventional cartridge filter.*

2 Cartridges	100 €/u.
Hourly EDM fee	25 €/u.
Operator wages	25 €/u.
Cartridges life	150/200 working h.
Cartridges-changing downtime	0,5 h.
Total costs	
2 Cartridges at 100 €	200 €
Downtime 0,5 h. x 25 €	12,5 €
Wages 0,5 h. x 25 €	12,5 €
Total costs in 2 weeks (150/200 h.)	225 €



ONA mineral filter allows to save around 5.625 €/year (50 weeks) cutting steel.

NEW CNC ONA-W64: EASY, AUTOMATED OPERATION

6 AXES CONTROLLED

All AF modular machines feature the latest generation ONA-W64 CNC that can control up to 6 axes, 5 of them (B, X, Y, U, V) simultaneously. The machine can feature a rotary axis fully controlled by the CNC.

CNC ENABLED WITH THE MAXIMUM LEVEL OF REMOTE SUPERVISION AND CONTROL

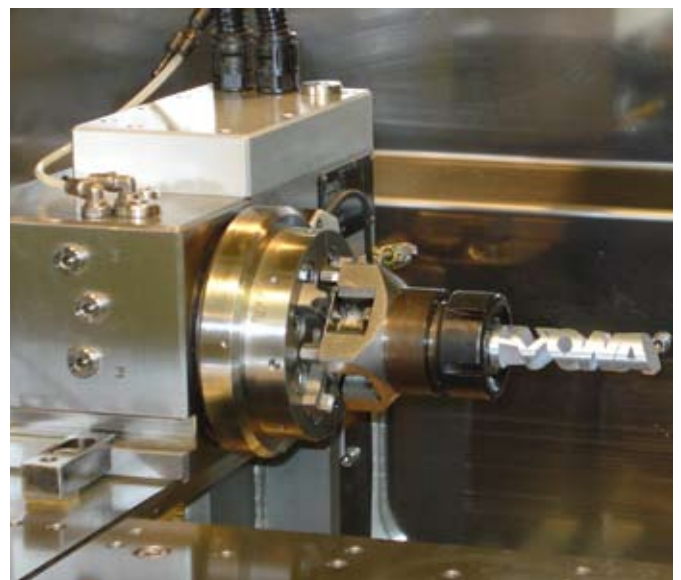
- Network connection.
- Delivery of automatic messages.
- Monitoring and remote control of the machines.
- Open control and supervision protocol.

WINDOWS-LIKE INTERFACE

The Windows-like graphical interface makes life easier for the operator, while providing a higher automation capability.

AUTOMATIC MEASUREMENT CYCLES

The ONA-W64 CNC includes an extensive set of automatic measurements to simplify the tasks of completion the job to be carried out on the machine. As an example, the automatic alignment can take automatic measurements of the deviation of the piece with respect to the main axes. It also automatically corrects the program according to the position of the workpiece on the table.



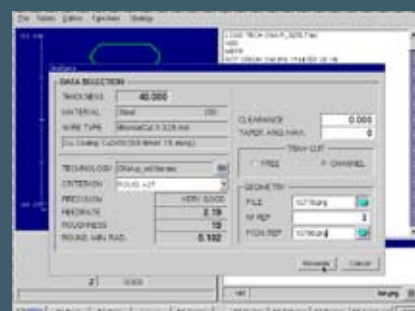
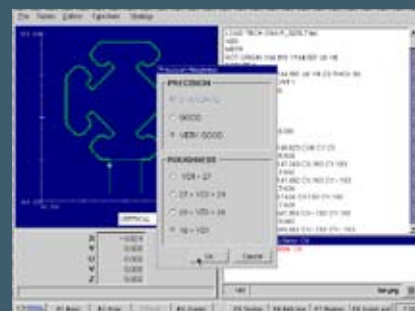
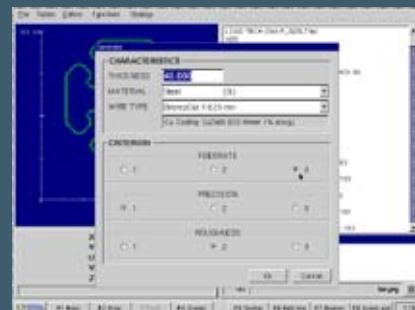
STRATEGIES: AUTOMATIC GENERATION OF MACHINING PROGRAMS

Just by filling in a short questionnaire, the user can easily cut a technologically complex workpiece. A geometry defined by the user is incorporated into the final program, while the program generator chooses the right technology, along with various options that are made available to the operator.



Workpiece thickness: 400 mm
Material: steel (X210 CrW12)
Wire: Ø 0,25 mm
No of cuts: 1 cut and 1 skim cut
Verticality precision: 9µm/side

- Choice of characteristics and priorities.
- Choice of precision and roughness levels.
- Analysis
 - Sample of criterion to be used.
 - Estimate of theoretical velocity.
 - Choice of clearance.
- Program generation

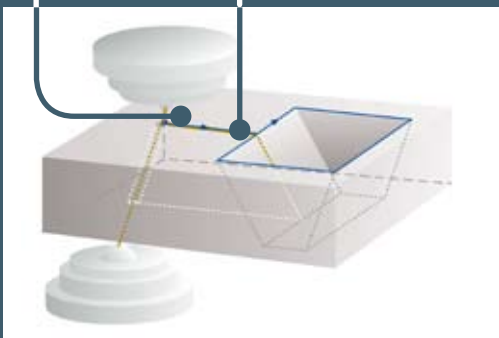


FEATURES OF THE CNC

- **Up to 6 axes controlled, 5 of them (B, X, Y, U, V) simultaneously.**
- **Linear and circular interpolation (XY-UV).**
- **Programming language: ISO standard assisted.**
- **Axes speed:**
Cutting: 0.1 to 600 mm/min
Dry run: 2000 mm/min.
Manual: 0.1 to 2000 mm/min.
- **The value of the generator parameters can be adjusted** or modified from the program.
- **Output signals** activate/deactivate (optional).
- **Alarms and diagnostics** displayed on the screen.
- **Execution**
Manual.
Programmed.
Single block.
Dry run. Machine locked.
- **Short circuit back up.**
- **Auto power cut by:**
End of program.
Alarm.
Programmed stop.
- **Auto switch on after power failure.**
- **Start point return** and go to the previous position
- **Optional stop.** Program can be interrupted.
- **Enhanced corner surface cutting.** The CNC, working through a cutting control system, automatically ensures against inaccuracies when the radius and sharpest corners of the workpiece are being cut.
- **Absolute/incremental modes.**
- **Inches/metric full conversion.**
- **Geometric changes:**
Figure displacement (each 0.001 mm).
Figure rotation (each 0.001°).
Mirror image independent on axes X and Y.
- **Axis exchange XY / YX.**
Scale magnification (from 0.001 up to 99.999).
- **Dwell:** programmed as a time function or as input state function.
- **Allowed working zone definition.**
- **Jumps:** conditional and non-conditional with function repetition.
- **Centering in inner cavities** (slots, holes, etc.).
- **Edge searching** with tolerance.
- **Vertical position search and vertical position return.**
- **Programmed path graphic display,** with current working position.
- **Cutting length and current cutting speed .**
- **Consumable life monitoring** (i.e.: wire, guides, etc.).
- **Types of taper cutting: sharp corner taper cutting , constant corner taper cutting (ISOCONO), constant radius taper cutting (ISORADIUS).**
- **Edge rounding and chanfer functions.**
- **Automatic rounding of negative radii.**
- **User's technological tables and strategies.**
- **Automatic strategy:** generation of programs automatically via a brief questionnaire.
- **External interface:** Ethernet card, RJ45 connector and USB.
- **Off-site transmission of automatic messages** by the CNC to a PC or mobile telephone.
- **Technology tables, programs, offset points, compensations and history are saved in different types of files,** which can be browsed through Windows Explorer.

The Start Point Control Function (SPC) automatically controls the initial and final cutting of the workpiece, with the wire at any position on the U axis or on the V axis. Thus it is possible to start erosion without preliminary calculation of any kind (offset, corner rounding, etc.) whether erosion be vertical, tapered, or programmed on four axes.

State of the machine (incidents, etc.) can be transmitted automatically to a PC or mobile phone. Standard on all ONA AF machines model.



PROGRAMMABLE CONTROL OF THE Z AXIS, OR FIFTH AXIS

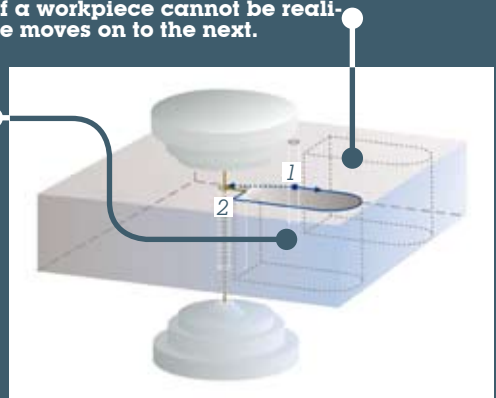
CNC control of the Z axis is standard on all ONA AF machine models. It is very useful in the cutting of workpieces of various heights, since the Z positioning and the correspondent cutting strategy can be programmed.



JUMP function: if a workpiece cannot be realized, the machine moves on to the next.

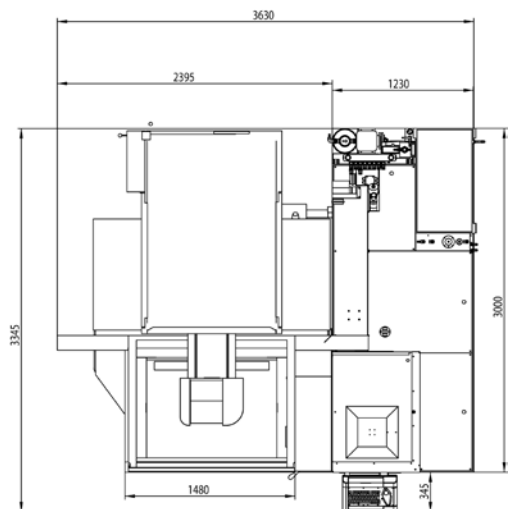
Threading in flushing mode or during immersion

1. Automatic recovery of erosion point following power failure.
2. Control of corners and rounding. Optimized strategies for roughing and finishing Threading in flushing mode or during immersion.

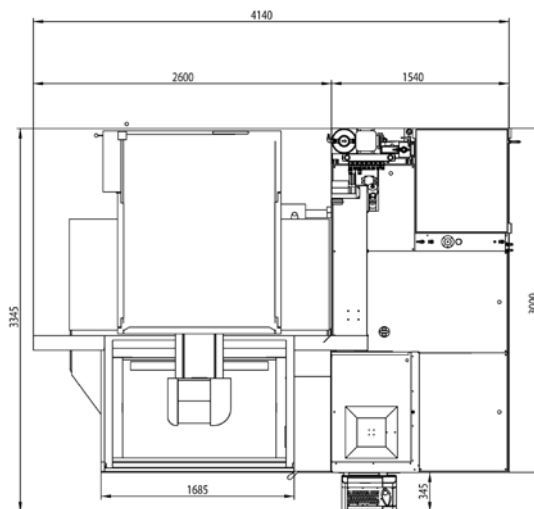


FOOTPRINTS

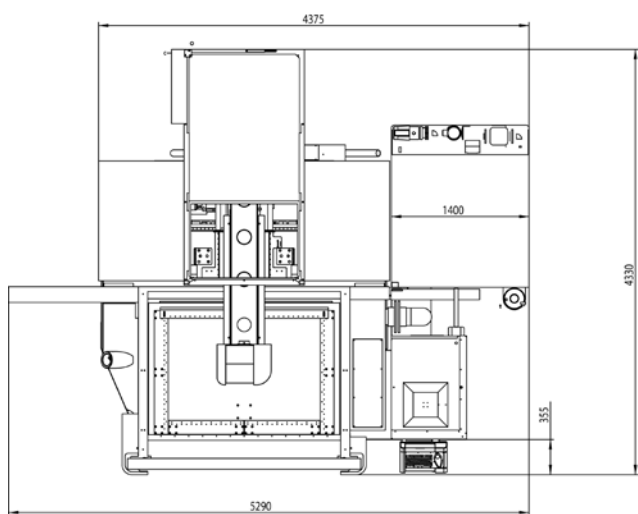
ONA AF60



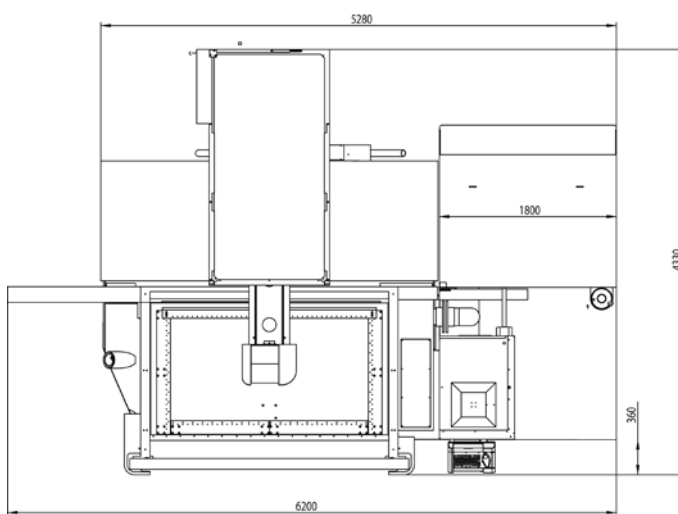
ONA AF80



ONA AF100



ONA AF130



Note: the drawings represent the machines equipped with paper cartridges filter. The dimension of the drawings are in millimeters.



SPECIFICATIONS

MACHINE		AF60	AF80	AF100	AF130
X axis travel	mm	800	1000	1500	2000
Y axis travel	mm	600	600/800/1000	1000/1300	1000/1300
Z axis travel	mm	500/600/700	500/600/700	600/700	600/700
Auxiliary travels U-V	mm	500 x 500	500 x 500	500 x 500	500 x 500
Maximum workpiece size	mm	1300 x 1040 x 500 (*)	1500 x 1040 x 500 (*)	1950 x 1600 x 600 (*)	2450 x 1600 x 600 (*)
Maximum workpiece weight	kg	5000	5000	10000	10000
Maximum axes speed	mm/min	2000	2000	2000	2000
Maximum taper angle		±30°/400mm	±30°/400mm	±30°/400mm	±30°/400mm
Wire diameter	mm	0.20-0.33	0.20-0.30	0.20-0.30	0.20-0.30
Wire guide		Closed, high-precision diamond guides			
Automatic wire threader unit		Standard			
Wire choper		Standard			
Cutting technology		Submerged			
CNC					
Display		15" TFT color			
Minimum increment programmable and controllable		0.001 mm/0.001°			
Max. programmable dimension		+9999.99 mm			
Memory capacity		258 Mb RAM			
Keyboard		Membrane, dust resistant			
Hands controller		Standard			
GENERADOR EASYCUT					
Maximum cutting speed	mm ² /min	370 - wire Ø 0.25 Xcc wire			
Best surface finish	Ra	0,2 µm			
FILTERING UNIT					
Paper cartridge filtering system		2 cartridges			
Tank capacity		1.610 (*)	1980 (*)	3500 (*)	4500 (*)
GENERAL CHARACTERISTICS					
Total weight	kg	7500	9000 (*)	15500 (*)	21000 (*)
Max. height	mm	2920 (*)	2920 (*)	3100 (*)	3280 (*)
Total surface required	mm	3625 x 3345	4140 (*) x 3345 (*)	5490x 4660 (*)	6200 x 4330 (*)

(*) Ask details for the different possible configurations. The indicated data correspond to the smaller machine configuration of each model.

OPTIONS

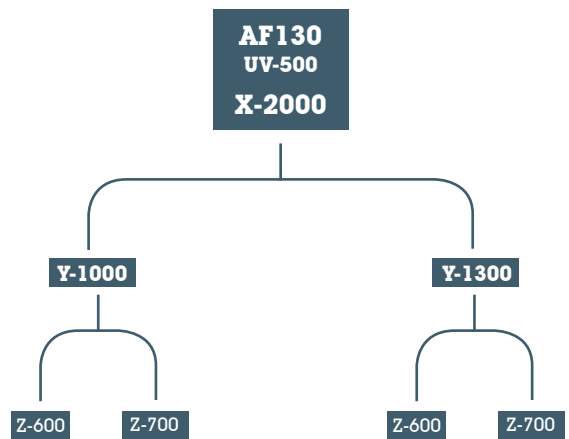
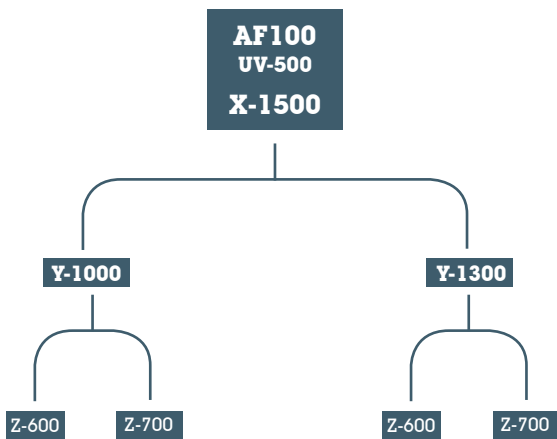
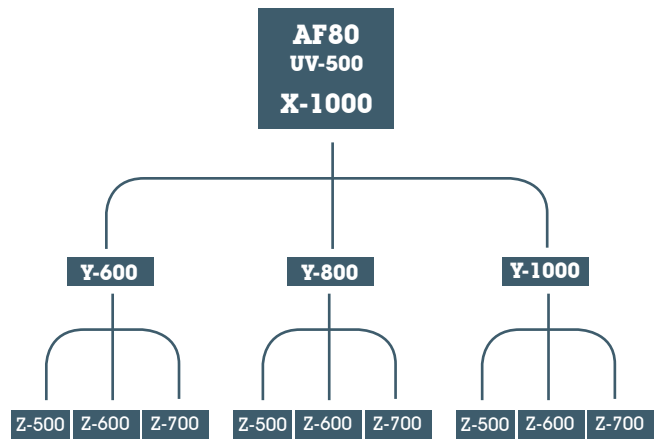
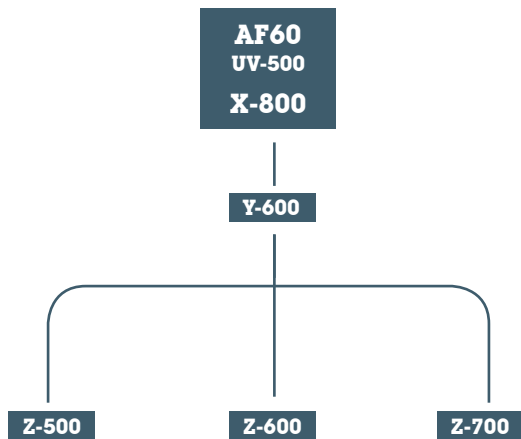
ONA ecological mineral filter (without maintenance costs)
 Work tank door with window.
 CAD CAM software.
 Rotary B-axis
 Wire guides: 0.20, 0.30, 0.33.
 Dielectric temperature control unit
 ONApure / E.KO IONISER® easymetal prozesstechnik GmbH automatic water deionization module.



With our commitment to up-to-date technology and design, ONA Electro-erosión reserves its right to introduce modifications in the specifications printed in this brochure without prior notice.

STANDARD CONFIGURATIONS OF THE ONA AF MODULAR MACHINES

The 20 configurations described in this catalogue are the standard options set by ONA for the AF modular series. Moreover, ONA's Engineering Services department is focused on developing customized machines to meet each customer's particular requirements.



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