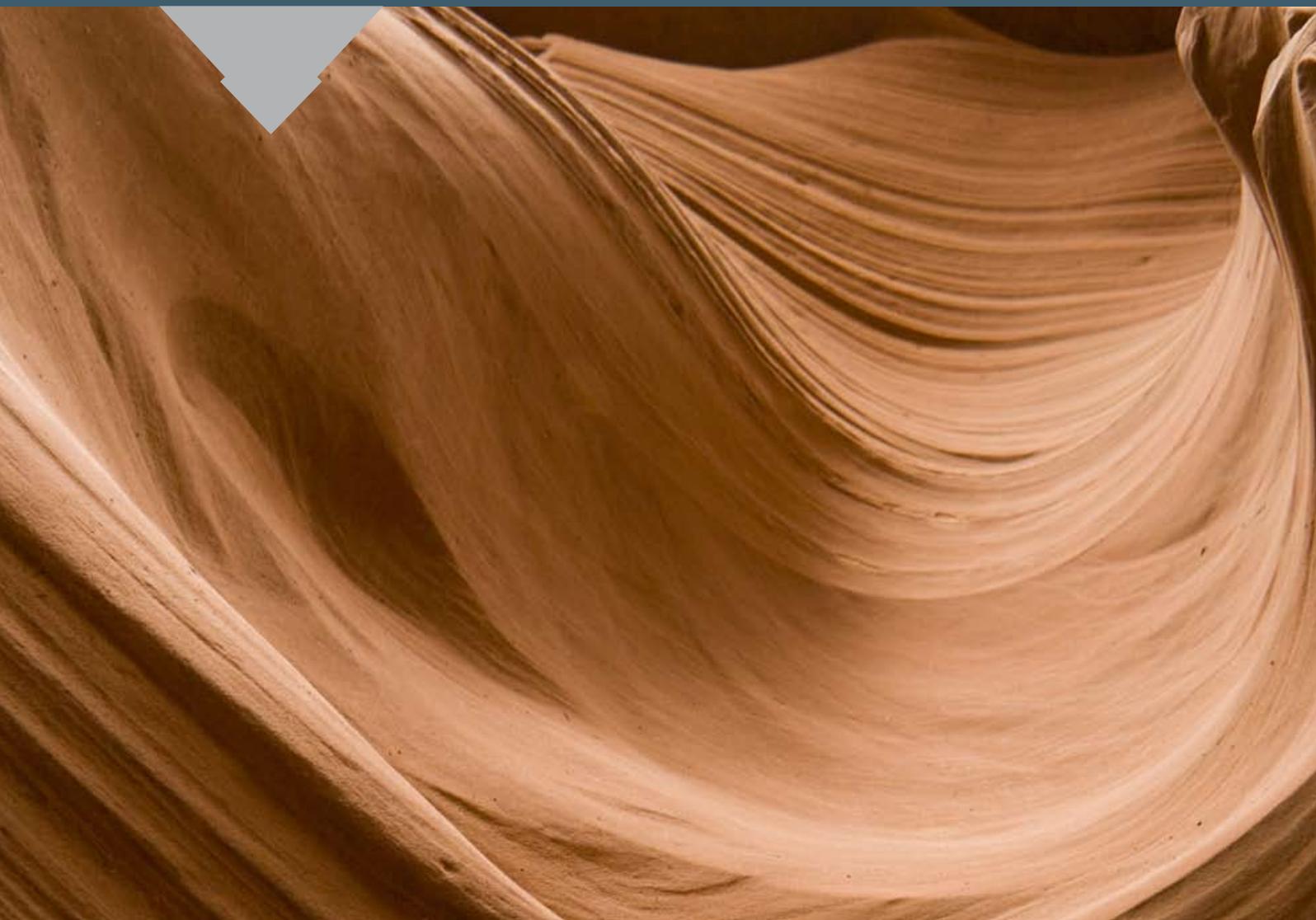


# ONA NX MODULAR



## 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 DIE SINKING EDM MACHINES WITH MODULAR DESIGN**



### **40 DIFFERENT MODELS OF LARGE DIE SINKING EDM MACHINES:**

- The large scale ONA NX 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 NX series utilizes pre-built axes modules to drastically reduce machine assembly time.
- Each customer can get a custom system for the same price and lead time as a standard one.

### **MANIFOLD CONFIGURATIONS OF X-Y-Z TRAVELS:**

- X travel: 1500, 2000 or 3000 mm.
- Y travel: 750, 1000 or 1500 mm.
- Z travel: 650, 800 or 1000 mm.

### **ONE OR TWO HEADS:**

- Commanded by two independent CNC generators.
- This allows the possibility of eroding two cavities simultaneously and independently in a big workpiece.
- Optionally, the working tank can be divided in two parts so it can perform the work of two machines completely independents.



# ONA **NX7**



# ONA **NX8**



# ONA **NX** MODULAR



# ONA **TX10**





# **ROBUST MECHANICAL STRUCTURE THAT ASSURES A LASTING ACCURACY**

## **ONA: ROBUSTNESS AND RELIABILITY SINCE 1952**

The **ONA NX 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**

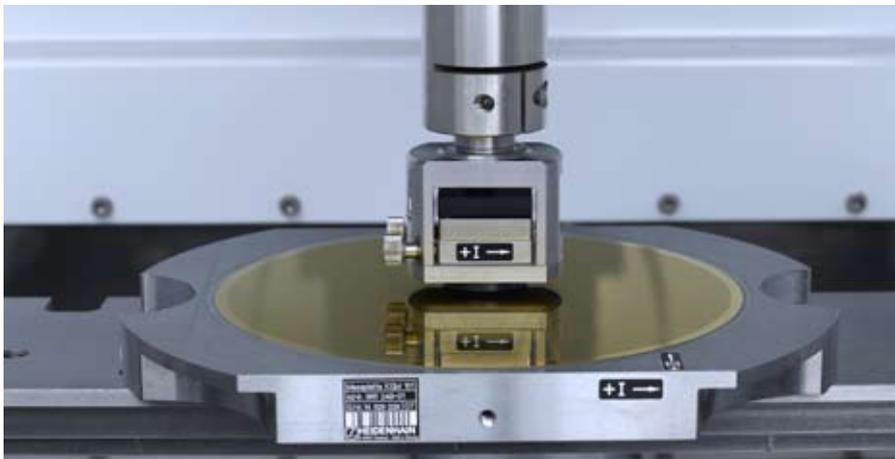
The structure of the machine is constructed of stabilized fine grained cast iron blended with graphite. Structural design is symmetrical so that thermal deformation will be minimal. Fixed-bedframe machines that allows work pieces up to 20.000 kg in the NX10 / TX10 models, 15.000 kg in the NX8 / TX8 models and 10.000 kg in the NX7 models.





## 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.

## DIRECT CONTROL POSITIONING OF THE X, Y, Z, AXES

In all ONA NX MODULAR models positioning control of the X, Y, Z axes is by high resolution glass scales.



ONA

**NX MODULAR**

# GENERATOR WITH SAAC SYSTEM

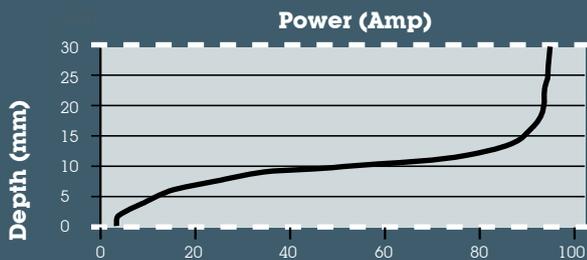
## FULL AUTOMATION WITH TAPERED SURFACE ELECTRODES

The SA AC (Surface Automatic Adaptive Control) system, forming part of the new generator in the NX MODULAR machines, maximizes generator performance in erosion work involving tapered surface electrodes.

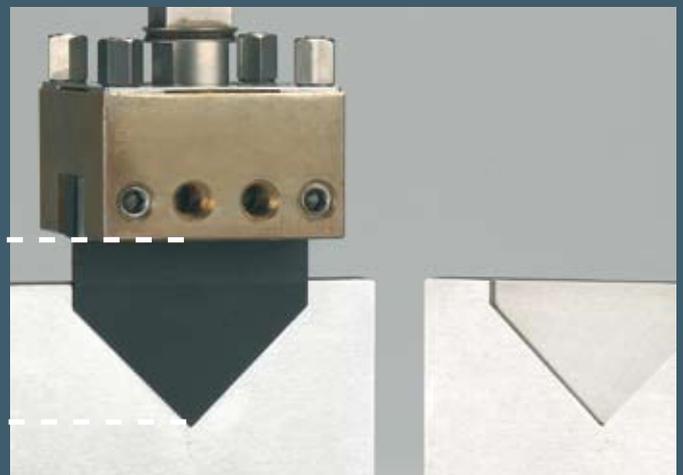
It adjusts the erosion intensity to suit the area being eroded, and is particularly adept where the workpieces have changes on the erosion surface during machining. It operates without special programming or any other initiative on the part of the operator because of the Expert Erosion System in the CNC.

## TOP PERFORMANCE

The ONA NX MODULAR generator provides operation's reliability and a greater performance in both erosion operations: roughing and fine-finish mode.



Technology used:  
**Technology for graphite/steel ribs**  
Depth: **30 mm**  
Surface finish: **20 VDI-Ra 1.00  $\mu$ m**



# BES: BURNING EXPERT SYSTEM

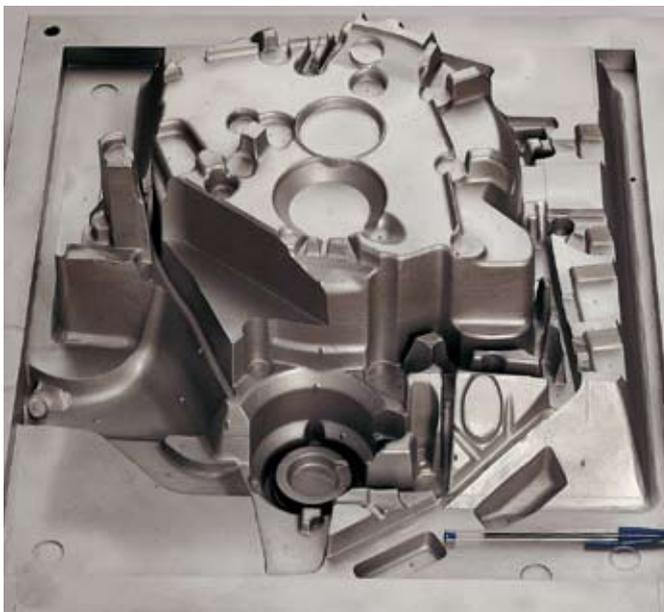
## 100% OF UNATTENDED OPERATION IN DIFFICULT JOBS

On the basis of the years of experience of ONA in developing generators with a high level of automatic control of the erosion process, ONA has created the new Expert Erosion System called BES.

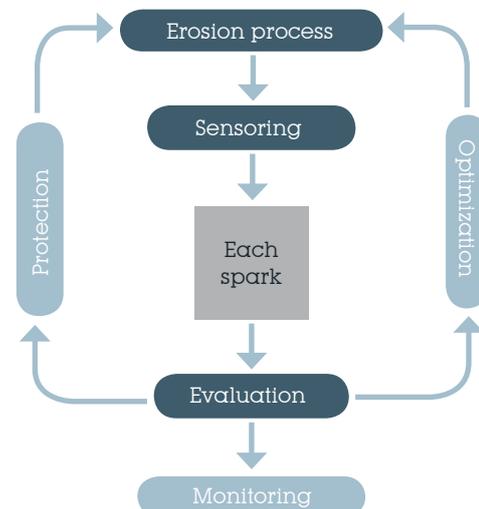
This new module represents a new advance of ONA in the improvement of the yield of unattended operation. This new system is complex and demanding, yet works in the grooves of great depth without cleaning, surfaces, etc. It can automatically be made with the maximum quality assurances and accuracy, with the certainty that the generator will give the maximum in each phase of machining.

Analysis of the BES System:

- **Control by spark.** *Measurement of all the characteristics of each sparks, time of ionization, level of unloading, etc. Detection of the conditions of erosion in each spark and case specific protection of workpiece.*
- **Control of spark.** *It evaluates groups of sparks and it acts case specific when it is necessary.*
- **Control of timings.** *Evaluation of timing, analyzing previous values and modifying the regime with the objective to increase the yield of the erosion.*



## BURNING EXPERT SYSTEM (BES)



# PROVEN ADVANCES IN PERFORMANCE, ACCURACY AND SURFACE QUALITY

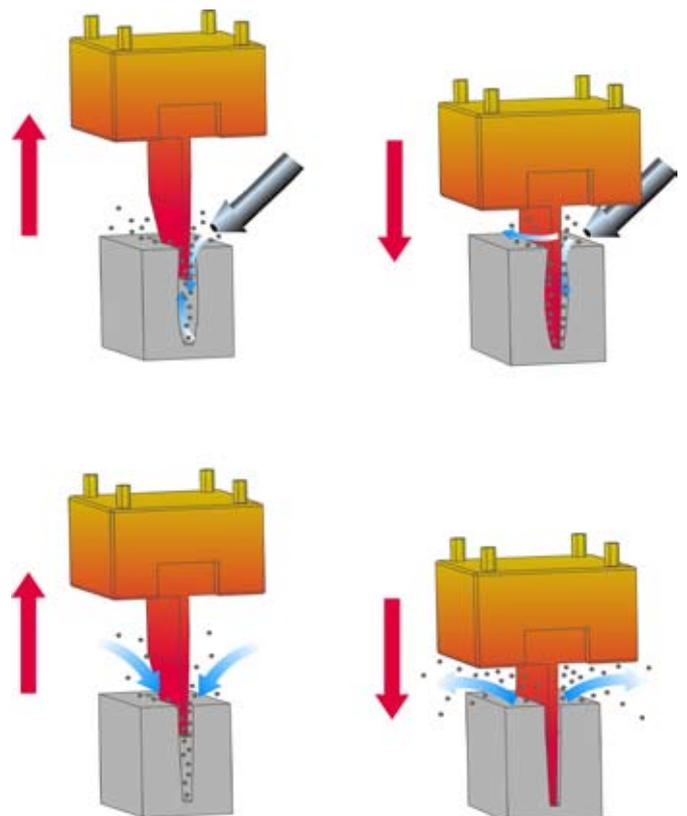
## HIGHER ACCURACY

The high-speed pulse technology that incorporate the ONA NX models, makes it possible to machine cavities faster and more precisely. It is no longer necessary to use side flushing lances and malformations in the eroded cavity can be avoided.

These malformations are often produced by the dielectric flow and can reducing the electrode's undersize and the technology of the NX eliminates this.

## DEEPER MACHINING IN WORK WITH GROOVES

Very deep cavities can be machined, with the highest quality and precision guaranteed.

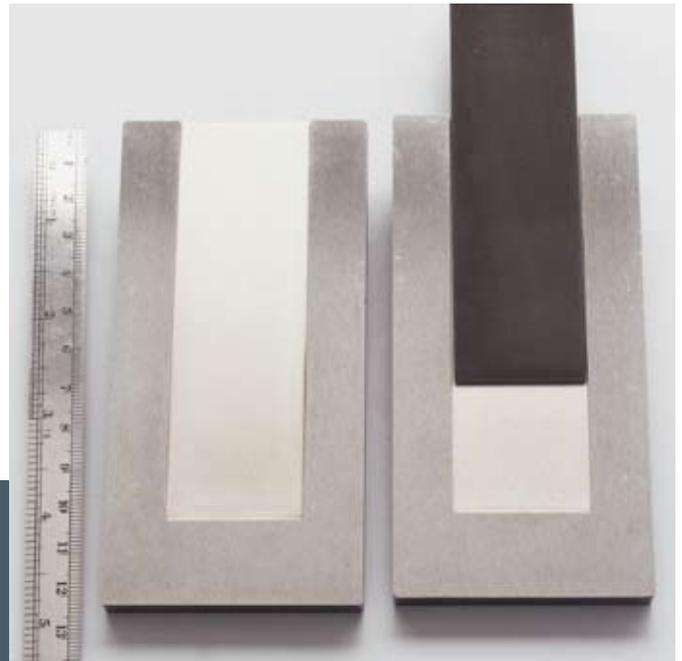


## TECHNOLOGY TABLES AND SPECIFIC STRATEGIES FOR GROOVES

The ONA-S64 CNC incorporates technology tables specifically for the machining of grooves.

The Strategy Generating Wizard for automatic program generation incorporates the information that the operator needs so that he can quickly and automatically generate the most suitable program for the type of groove being machined.

Electrode: **graphite**  
 Workpiece: **steel**  
 Technology used: **Ribs technology**  
 Depth: **100 mm**  
 Surface finish: **22 VDI-Ra 1,26  $\mu\text{m}$**



## MORE HOMOGENEOUS FINISH ON LARGE SURFACE AREAS

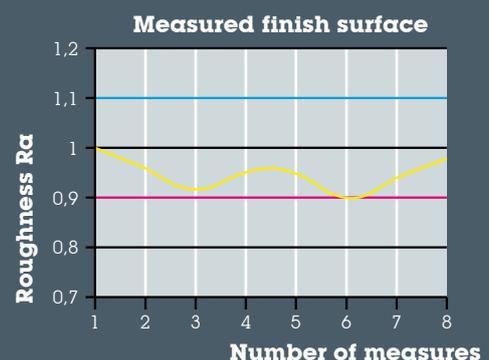
Another advantage of high-speed pulse technology is more homogeneous finish on surfaces of large area.

The ONA-S64 CNC belongs to all NX models and incorporates technology tables specifically intended for an excellent, homogeneous surface finish where the working area is large.



Electrode: **copper**  
 Workpiece: **steel**  
 Surface area: **225 cm<sup>2</sup>**  
 Technology applied: **Technology for copper/steel surfaces**  
 Surface finish required: **20 VDI-Ra 1,00  $\mu\text{m}$**

— Ra needed +10%  
 — Ra measured  
 — Ra needed -10%



## **CNC ENABLED WITH ETHERNET CONNECTION, USB, MESSAGES TO A MOBILE PHONE...**

### **ETHERNET CONNECTION, USB AND AUTOMATIC MESSAGES**

The RJ45 connector and the Ethernet connection that is standard with ONA NX units are a major breakthrough in control and automation, so that the machine can be added to the any Local Area Network (LAN).

ONA-S64 CNC also allows the delivery of remote automatic e-mail messages to several locations of the operator, with possibility of enclosing files of technology, compensations, and the history the current workpiece.

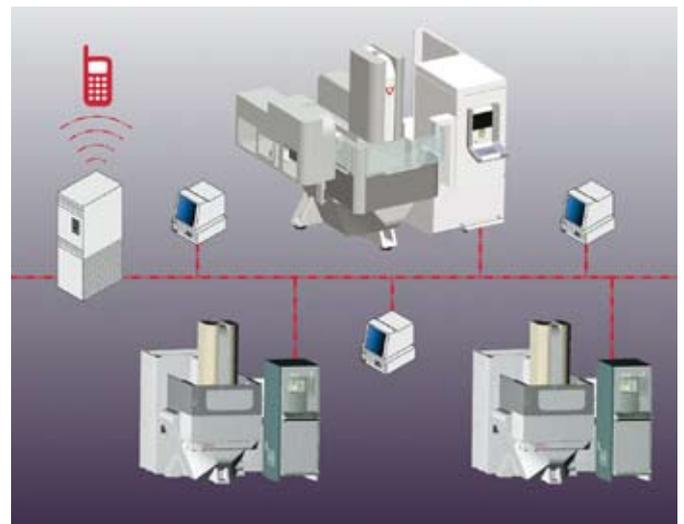
In addition, it allows warning messages to be sent during the execution of a program, so that the operator is aware at the very moment of the current state the job.

### **MONITORING AND REMOTE CONTROL OF THE MACHINES**

Thanks to the ONA Plant Manager communications programme, the users can supervise and control at a distance (from a PC, PDA or mobile telephone), in real time, the work process being carried out by the machines.

### **OPEN CONTROL AND SUPERVISION PROTOCOL**

The ONA-W64 CNC has an open architecture allowing for the integration of ONA NX MODULAR machines in advanced systems for management and control, in real time, of production costs.



# PROJECT GENERATING WIZARD & STRATEGY GENERATING WIZARD

## PROJECT GENERATING WIZARD

The works that demand the use of multiple electrodes require long and complicated programs. With the purpose of simplifying the programming and management of this type of work, the new ONA-S64 CNC incorporates a tool of programming called the Project Generating Wizard.

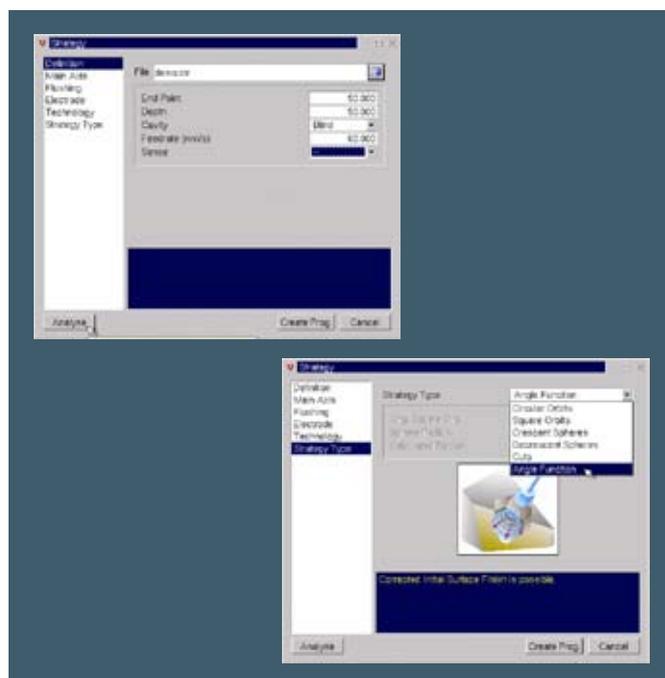
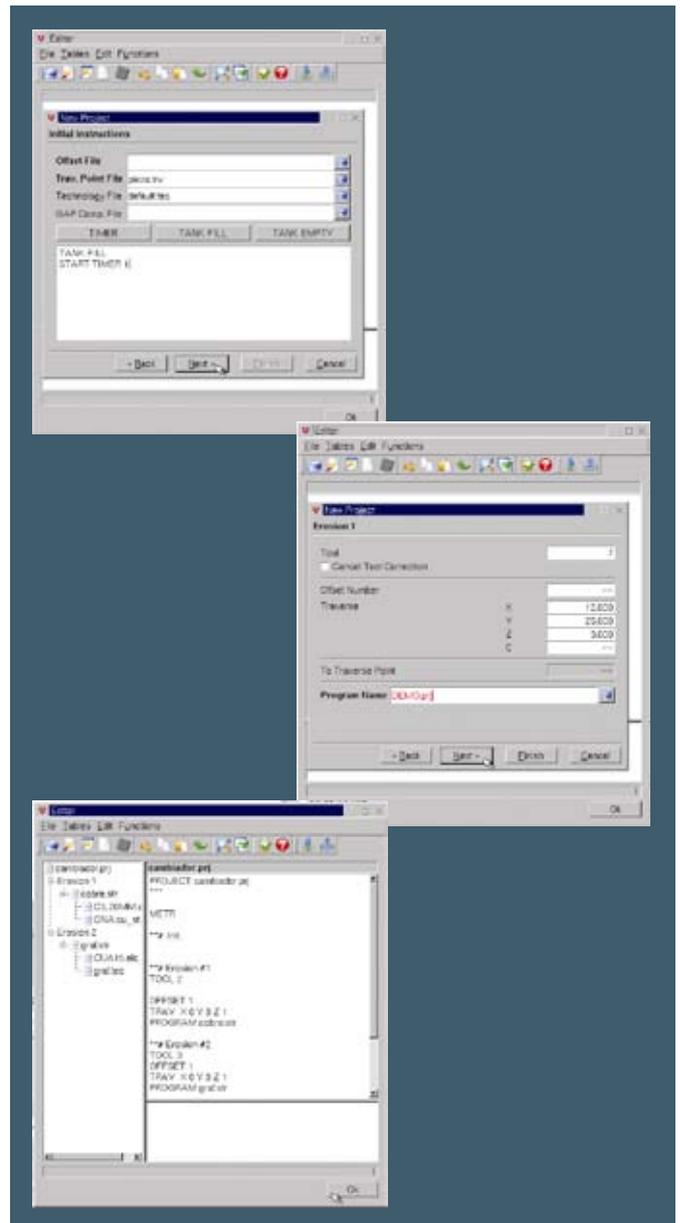
The Project Generating Wizard is a manager of strategies and electrodes and will help indicate:

- **Files of characteristics of electrodes.**
- **Electrodes to use.**
- **Erosions to use with each electrode.**

The Project Generating Wizard visualizes with a tree-like structure, a summary of the generated work, allowing the operator to quickly file any project.

Also it presents/displays a summary of the work to make, publishing strategies, programs, files of staggers, technologies, etc. of the attended form.

The worker also can interchange programs, strategies, instructions, etc. between different projects. Thanks to this tool it is possible to manage the complex works in a very fast and flexible format.



## STRATEGY GENERATING WIZARD

The Strategy Generating Wizard analyzes the optimal erosion process, showing the roughing and finishing regimes, the electrode's undersize and generates the program automatically.

The machine operator must fill out a simple questionnaire specifying:

1. **Characteristics of the work.**
2. **Technology.**
3. **Finished strategies.**
4. **Specifics of the erosion.**

With the automatic strategies, ONA's decades of experience is in the hands of the operator.

## CNC THAT ALLOWS 3D WORK WITHOUT LIMITATIONS

### A-SPACE FUNCTION

The ONA-S64 CNC incorporates the new function A-SPACE (Axis for erosion in SPACE). With this, any programmable CNC erosion function (spheres, taper machining, orbital machining, vectors, etc.) can be carried out in any spatial direction.

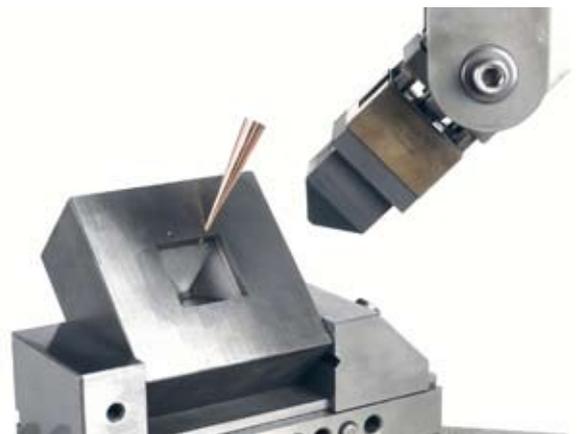
Programmable fixed cycles:

- **Circular orbital.**
- **Circular orbital at 45°.**
- **Square orbital.**
- **Square orbital at 45°.**
- **Vectorial erosion**
- **Decrescent / Crescent square cone type erosion.**
- **Decrescent / Crescent circular cone type erosion.**
- **Orbital erosion with ANGLE function.**
- **Decrescent / Crescent spherical erosion.**

### 3D SETUP: SIMPLIFICATION AND TIME REDUCTION IN THE COMPLETION OF WORK PIECE

The module 3D SETUP that incorporates ONA-S64 CNC includes an extensive set of automatic measurement cycles that serve to simplify the tasks of completion of the workpiece and electrode in the machine. The module 3D SETUP allows to make:

- **Manual Movements:** from the remote control movements in the machine can be executed according to a defined axis of erosion and the main axes. This makes it possible to execute all type of balances in the space with associated manual movements.
- **Automatic balances in any direction of the space:** It is possible to automatically make balances in interiors, exteriors, corners, faces and midpoint of each workpiece in any plane defined in any direction of the space.
- **Automatic alignment of the axis-machine to the axis-piece:** The automatic alignment can take automatic measurements of the deviation of the piece with respect to the main axes. 3D SETUP also makes the automatic correction of the program, the orbits and axis C.



# FULLY AUTOMATED ECOLOGICAL FILTER

## MAXIMUM PRODUCTION

This totally automated filter allows work to go uninterrupted in the machine. It does not need to shutdown the machine for removal of sludge.

## FILTERING ELEMENT: SPECIAL PAPER FILTER TUBES

The problem of dielectric filtration was solved by ONA many years ago and is still thought to be a considerable advancement in development over the commonly used filters in EDM.

Important competitive advantages of buying an ONA:

- **Filtration without cartridges**
- **Long duration (average life of more than 10,000 working hours)**
- **Reliability**
- **Ecologically friendly**
- **Excellent filtering quality (1 micron)**
- **Automatic cleaning and automatic sludge extraction.**

## 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.

Filter costs: 6 elements.....	30 €/ea.
Hourly EDM rate.....	25 €/ea.
Labor costs.....	25 €/h.
Frequency of change.....	150/200 working hours
Time required.....	0,5 hr.

### Total filter expense

Filter costs.....	180 €
Lost productivity.....	12,5 €
Labor cost.....	12,5 €

**Total costs in 2 weeks (150 / 200 hr.)..... 205 €**



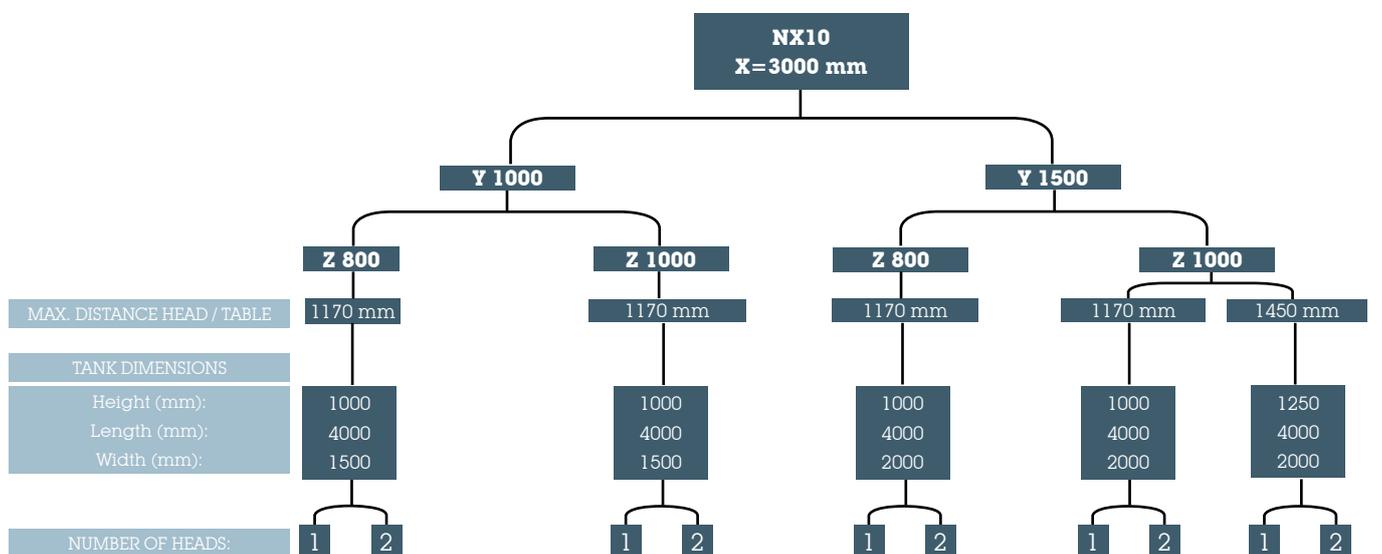
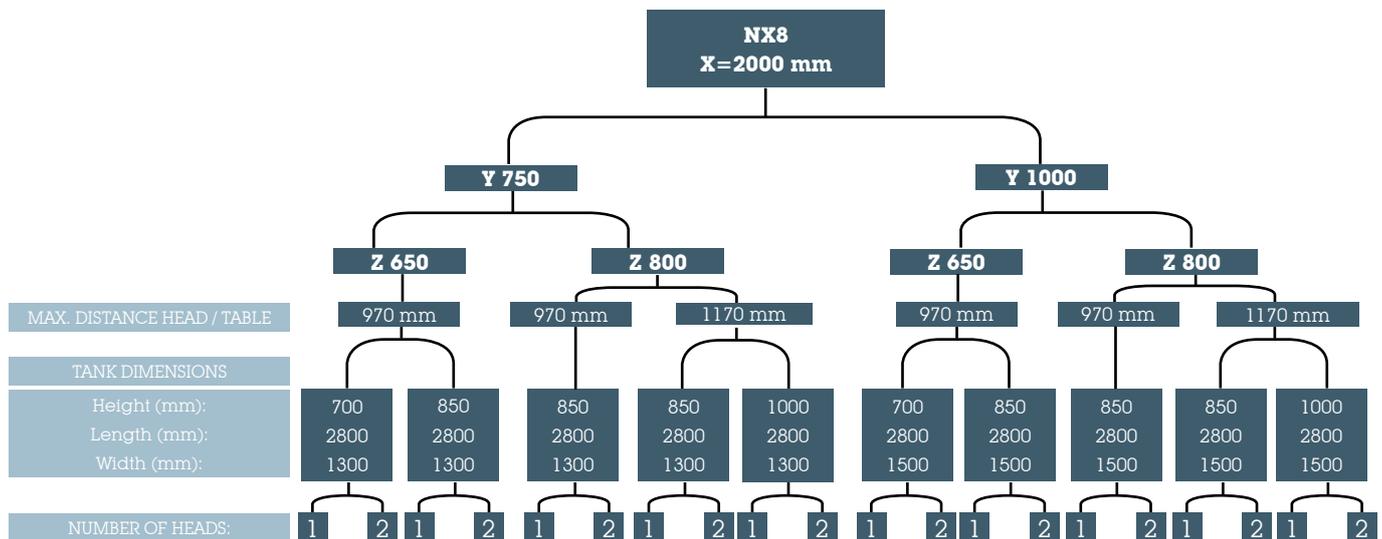
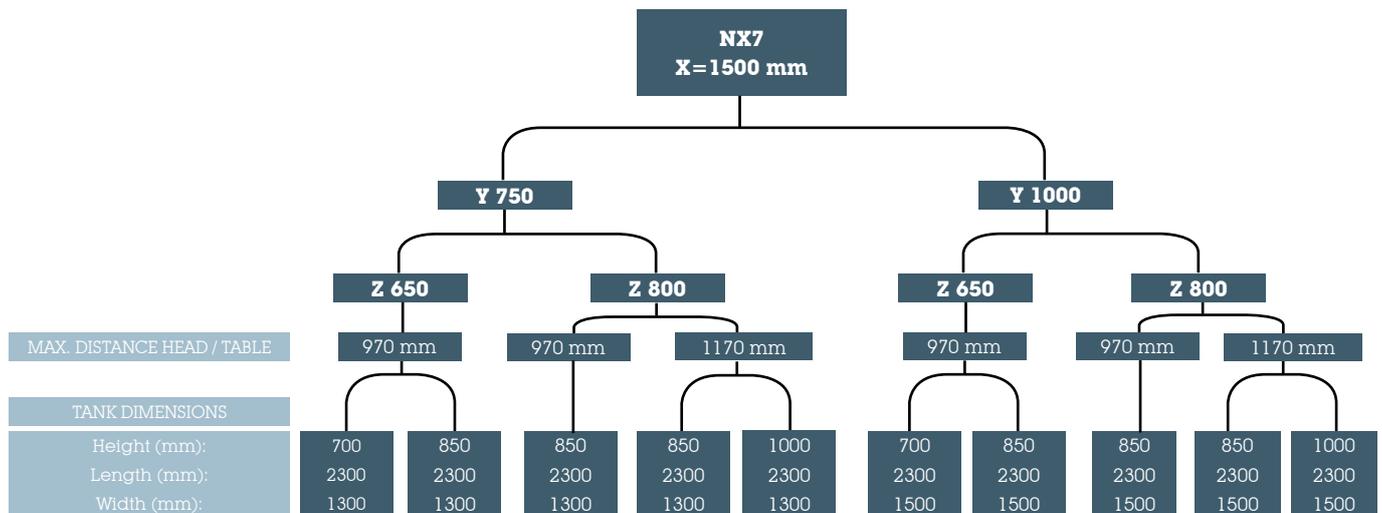
**The ONA filter system will yield annual savings (50 weeks) of at least 5,125 €.**

# SPECIFICATIONS

MACHINE		NX7	NX8/TX8	NX10/TX10
Total X axis travel (individual in TX models)	mm	1.500	2.000 (1.200)	3.000 (2.200)
Y axis travel	mm	750 / 1.000	750 / 1.000	1.000 / 1.500
Z axis travel	mm	650 / 800	650 / 800	800 / 1.000
C axis travel	°	360	360	360
XYZ Positioning resolution	mm	0,001	0,001	0,001
C Positioning resolution	°	0,001	0,001	0,001
WORK TANK				
Door		rise and fall	rise and fall	rise and fall
Tank dimensions (*)	mm	2.300 x 1.500 x 1.000	2.800 x 1.500 x 1.000	4.000 x 2.000 x 1.250
Work table dimensions (*)	mm	1.700 x 1.000	2.200 x 1.000	3.200 x 1.600
Max. distance between head and table				
- (without C axis)	mm	1.200	1.200	1.500
- (with C axis)	mm	1.170	1.170	1.470
Max. dielectric height (*)	mm	950	950	1.180
Max. workpiece height (*)	mm	900	900	1.130
Allowable weight on table	kg	10.000	15.000	20.000
Maximum electrode weight (**)	kg	200	200	200
Maximum electrode weight with C axis (***)	kg	50/12	50/12	50/12
Allowable weight on electrode changer (****)	kg	70/10	70/10	70/10
GENERATOR				
Maximum power (Medium / Peak)	A	60/100	60/100	60/100
Programmable intensities	N°	12	12	12
Ignition voltage	N°	80-100-120-160-200		
On-time	µsec.	1 to 6500 programmables		
Off-time	µsec.	1 to 6500 programmables		
Max. stock removal rate with copper	mm3/min	500	500	500
Max. stock removal rate with graphite	mm3/min	600	600	600
Electrode wear with copper	%	0,2	0,2	0,2
Electrode wear with graphite	%	0,1	0,1	0,1
CNC				
Display		15" TFT color		
Minimum increment programmable and controllable		0.001 mm/0.001°		
Max. programmable dimension		±9999.999 mm		
Memory capacity		256 Mb RAM		
Keyboard		Membrane, dust resistant		
Hand controller		standard		
FILTERING UNIT				
Filtering system		Long life ecological filter		
Filtering quality	µm	1	1	1
Change of filter elements	hours	>10.000	>10.000	>10.000
Flushing method		Automatic	Automatic	Automatic
Flushing:		1 to 31 programmables		
- Head (pressure, intermittent)		1 to 31 programmables		
- Tank (pressure, suction, intermittent)		1 to 31 programmables		
GENERAL CHARACTERISTICS				
Total weight (*)	kg	11.800	15.000	20.500
Max. height (*)	mm	3.585	3.585	4.120
Total surface required (*)	mm	3.860 X 4.525	5.440 X 4.980	6.640 X 5.800
Max. power requirement (****)	KVA	13,5 / 17	13,5 / 17	15,5 / 19,5
OPTIONS				
<ul style="list-style-type: none"> <li>- "C" axis.</li> <li>- Linear electrode changer with 10 to 40 stations.</li> <li>- Linear electrode changer for large electrodes up to 50 kg.</li> <li>- Dielectric cooling device.</li> <li>- Current voltage stabilizer.</li> </ul>		<ul style="list-style-type: none"> <li>- Generator of 120 Amp of medium intensity-200 Amp of peak intensity.</li> <li>- Generator of 240 Amp of medium intensity-400 Amp of peak intensity.</li> <li>- Rotary A-axis.</li> <li>- Rotary B-axis.</li> </ul>		
<p>(*) Ask details for the different possible configurations. The indicated data correspond to the largest machine configuration of each model.  (**) On electrode holder plate.  (***) Static / Dynamic depending on geometry.  (****) Total weight / Unit max. on linear electrode changer.  (*****) 60 / 120 Amp. of medium intensity.</p>				

In our continuous effort and commitment to up-to-date technology and design, ONA ELECTRO-EROSION reserves its right to introduce modifications in the specifications in printed in this catalogue without prior notice.

# STANDARD CONFIGURATIONS OF THE ONA NX MODULAR MACHINES

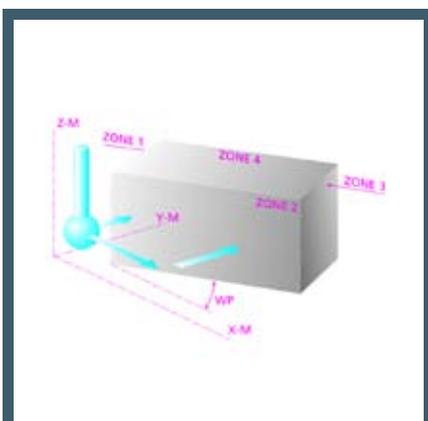


Note: the maximum distance between head and table indicated is with C axis.

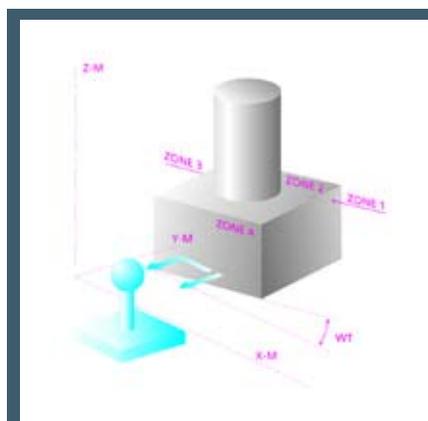
Note: the maximum distance between head and table indicated is 30 mm longer when the machine has not C axis.

# FEATURES OF THE CNC

- **6 axes simultaneously controlled by CNC (X, Y, Z, C, A, B)**
- **Interpolation**  
Linear, Circular, Helicoidal.
- **Capacity of memory (optionally expandable up to)**  
64 MB RAM up to 6 GB.
- **Off-site transmission of automatic messages (e-mail)**  
Via PC or mobile phone.
- **Programming language:**  
ISO standard assisted or ASCII.
- **Lenguaje programación**  
Via PC or mobile phone.
- **A-SPACE function (Axis for erosion in SPACE)**  
With this function, any programmable CNC function (spheres, taper machining, orbital machining, vectors, etc.) can be carried out in any spatial direction.
- **Type of execution**
  - Normal
  - Automatic
  - Single block
  - Dry run
  - Return by profile
- **Graphic representation**  
Display in real time of the orbit that is being executed  
Contouring. Multicavities. Efficiency of the Burning Expert System.
- **Languages**  
English. Spanish. French. Italian. German. Portuguese. Chinese. Hungarian. Polish.
- **Alarms and diagnostics**  
Displayed with text explaining alarms and diagnostics on the TFT monitor (program registers, time of the orbits, time of the regimes, etc.).
- **Coordinate System**  
Vectors: Coordinates of workpiece, machine, and representation of space coordinates.
- **Strategy Generating Wizard**  
Automatic program generation.
- **User's technological tables and strategies**  
The operator can create his own technological tables and use them in drawing automatic strategies.
- **Technology tables and specific strategies intended**
  - For grooves
  - For large surface areas
- **Project Generating Wizard**  
Automatic Project Generation
- **3D SETUP: Automatic cycles of measurement in any direction of work space**
  - Automatic balances in interiors, exteriors, angles, faces and midpoint of a piece in any direction of the space.
  - Automatic alignment of the axes machine to the axes piece and automatic correction of the program, the orbits and axis C.
  - Manual movements according to mainaxes and axis of erosion.
- **Configuration of the work area**  
The usable workspace can be defined by the machine operator.
- **Anti-collision**  
It avoids the possibility of breaking the electrode in the event of a collision with the workpiece.
- **Jumps**  
Conditional and Non-Conditional with function repetition.
- **Electrode correction**  
Electrode center errors correction.
- **File system of several program types**  
Archive technologies, tables, programs, passes, compensations, and history. Use the Window's Based Explorer (browser) to access archives.
- **Compensations**
  - Gap compensation
  - Electrode radius compensation
  - Error Positioning in X, Y and X-axis compensation.
- **External automatics**  
Controlled by program.
- **Canned cycles**
  - Orbital machining (circular and square).
  - 45° orbital machining (circular and square).
  - Taper machining (circular and square, increasing or decreasing).
  - Spherical machining (increasing or decreasing).
  - Helical machining (internal or external).
  - Vectoral machining.
  - Orbital machining with ANGUL function.
- **Automatic switching off**  
Machine will power down at conclusion of the work or if a situation alarm happens.
- **Automatic switching on**  
Machine will power back up after power failure.



Alineamiento automático de los ejes-máquina a los ejes-pieza.



Sincronización automática de los ángulos en que se encuentran girados el electrodo y la pieza.



Centrajes automáticos en cualquier dirección del espacio.

# SPECIAL EXECUTIONS

The 40 configurations described in this catalogue are the standard options set by ONA for the NX MODULAR Series. Moreover, ONA's Engineering Services department is focused on developing customized machines to meet each customer's particular requirements.

## ONA TX10

TX10 with a worktank divider of three positions. Activity field: mould making.

Country: Germany



The machine without having being placed the divider.

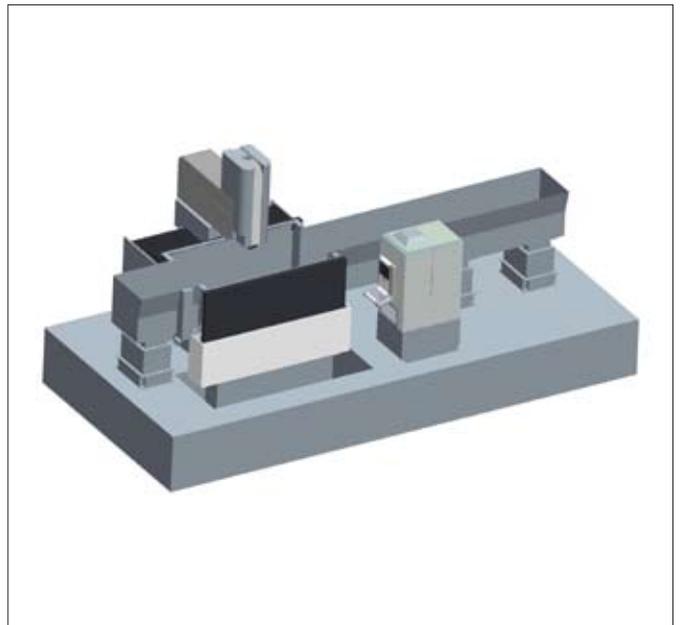


The machine with the divider already placed.

## ONA NX7



NX7 with 1.000 mm Z-axis travel. Activity field: machining of large heat-treated components for heavy-duty industrial applications.  
Country: USA.



ONA NX7 model with a special 8 meters long worktank. Activity field: machining of bimetallic cylinders for plastic injection machines.  
Country: Switzerland.

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