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Erosion time saving thanks to double head machines.

TECHNOLOGICAL LEADERSHIP · 12
Automation solutions that optimize manufacturing processes.

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ONA has worked over many years with the most important companies around the world.

A LOOK TO THE PAST · 40
In 1955, ONA manufactured the first EDM machine.
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Down through its over 65 years of activity, EDM has been a perfect combination of passion and tradition for ONA. Setting extraordinary goals is the starting point of our projects and we share the path towards these goals, along with creation and development, with our clients. The ONA Open House 2018, which is to be held during the BIEMH exhibition, will provide us with the opportunity to likewise share a trip through the latest advances in EDM.

Understanding, optimizing and improving the production processes of our clients is fundamental reason for our position as leader in customized, personalized solutions along with special and large machines. ONA engages with each client from the initial stage of in-depth analysis of their needs and continues to do so during the entire sales process to guarantee the best rate of return on the manufacturing processes.

Both highly complex as well as apparently simple projects may call for visionary responses. At ONA, we work on automation solutions that ensure excellent finishes with highly intuitive machine operation. Canadian company Concours, leader in the mold sector and a ONA client for over 20 years, has once again placed its trust in our capacity for automation, and purchased an innovative solution based on the ONA TQX10 double head model. This model is the focal point of a manufacturing cell, integrating two robotized, highly autonomous systems for changing electrodes, together with advanced management and process control to meet the challenge of maximum productivity with 2 heads. Similarly, Russian company Nelidov, a reference in the energy sector, opted for ONA in its search for a technological partner capable of delivering a solution for a highly specialized application. This called for the development of a fully customized and automated wire EDM machine for the autonomous cutting of turbine rings. Two examples that endorse ONA’s experience and knowledge and its capacity to design projects fully adapted to each client.

Digital transformation is a reality, and we continue to innovate to optimize production processes by offering advanced services using connected machines, integrated in the ONA Smart Connect strategy. The latest advances in our ONA Industrial Cloud platform will be presented at the Open House and the BIEMH and include a concept of individual traceability for each piece, specially tested in collaboration with our clients in the aeronautical sector.

Our leadership in technology is certified by a philosophy of continuous improvement and research. We provide financial support to future professionals with the ONA grants awarded in the ISEM XIX congress, we have worked together with Addilan on the development of the first prototype for a high-input additive manufacturing machine based on WAAM technology and we continue to work for the turbine component sector developing alternative processes to conventional machining. A case in point is the manufacture of firtrees using wire EDM or the die-sinking EDM of complex cavities which are difficult to reach in integrated components for the new generation of high speed turbines.

A complete corporate strategy aimed at innovation and research, which, together with the excellence of a customer service based on personalization and proximity, has made ONA a reference in this sector, with a long history and a significant contribution to EDM.

We shall be delighted to welcome you from 28th May to 1st June to our stand (Hall 1 - F03) at the BIEMH and on May 29th or 31st, at the ONA Open House event at our headquarters in Durango where you will be able to live the ONA EDM experience.
FOCUSED ON INNOVATION.

Innovation is the basis to guarantee the future of EDM.

The possibility of including a second head in our larger machines, controlled by an independent CNC, makes the ONA models highly profitable solutions. Erosion time is reduced by up to 50% and there is an increase in productivity of up to 200%. Half the time for the same results.

Innovation and performance are combined in our double head machines. Two machines sharing the working tank, which means less space and a greater optimization of the work process. Enhanced profitability by manufacturing the same in half the time.

These models can work as two independent machines, by separating the tank with a moveable door, or remove it to make a single machine with a double head specifically designed for the manufacture of large pieces and different cavities. This separation of the tanks implies that both can work independently with different dielectric levels, different tool changers, different CNC controls. Provides lots of flexibility to work on the same mold at both ends simultaneously or turn the large machine into two independent machines sharing one machine base.

A significant competitive edge for our clients. They can cut the delivery time for their workpieces in half, and obtain great profitability, particularly with jobs requiring many hours of erosion.

Within the framework of constant innovation and continuous improvement, ONA’s R&D department works daily to include technological improvements in its double head models. >>

DOUBLE HEAD.

Savings of 50% in erosion time and up to 200% in productivity.

IT REDUCES LEAD TIME

50%
ONA is launching its new ONA modular QX9 die sinking EDM machine, combining all the exciting QX technology with new machine dimensions of 2000 x 1200 x 800 mm. A new machine conceived in line with ONA’s commitment to satisfying its clients’ needs. A perfect solution for large workpieces manufacturers requiring a large-sized machine with a Y axis travel of up to 1,200 mm.

ONA once again stands out as the technological leader in EDM by bringing to the market this QX9 model, designed for those seeking profitability and perfection for their workpieces. With a tank capacity of over 1,100 US gallons, it can hold bigger workpieces than the ONA QX8 model.

Reduced wear of electrodes in the large-sized machines

Especially designed for the manufacture of large workpieces, the ONA QX9 machine is an example of innovation, making ONA the world leader in the manufacture of large-sized machines in its sector. In addition, this model includes the new intelligent generator developed by ONA. This new 100% digital generator, integrated in all QX series machines, optimizes the erosion process and adapts immediately to the conditions at any given time. This results in significant improvements in productivity, reducing electrode wear by 80% and contributing to perfect machining.

New model of die-sinking EDM machine.

Die-sinking EDM machine designed for manufacturing large-sized workpieces thanks to its Y axis travel of up to 1,200 mm.

ONA manufactures double head machines for 24 years.

Constantly striving to adapt to the client’s needs, ONA has been manufacturing double head equipment with its current structure for 24 years. Six years prior to that, ONA had already produced machines with a double head gantry structure and was one of the first manufacturers to develop this technology. Years of proven experience perfecting the technology of its equipment to become world leaders in the manufacture of this type of machines.

In this past year, the double head models have incorporated the following improvements:

• Automatic adjustment of the dielectric level constantly maintained at head level. The machine knows the exact location of the head at all times and adjusts the dielectric level to said position. The electrode is always covered by the dielectric, thus preventing programming errors.
• It integrates a especially designed software for double head machines, thus helping to manage the work of the two machines.
• New automatic chuck for large electrodes. Heavy weight electrodes can be interchanged while maintaining the C axis.
Much more than a machine, a complete solution.

The ONA QX9 machine stands out for its autonomy and efficiency. It was developed to achieve a high degree of machine autonomy without manual intervention. The model can be fitted with various sized tool changers. The fact of the matter offers a lot more and can be combined with two 40-position rotary changers. As a result, it can house a large number of electrodes and automate the erosion work.

The ONA QX9 model likewise offers the possibility of its integration, together with robots, in a production process with EDM machines or even with a combination of different pieces of machining equipment. Similarly, ONA offers integral solutions for the development of manufacturing cells that limit human intervention in the production process. The process is consequently automated, thus avoiding errors and optimizing the machine’s performance.

Knowledge at the client’s service.

Over 65 years’ experience in the sector make ONA a benchmark as the most specialized manufacturer of EDM in the world. ONA places a highly qualified team, one that is an expert in the manufacture of EDM machines and precision assemblies, at the client’s disposal.

In its commitment to customization, ONA accompanies each client throughout the entire process involving the purchase and setting up of each piece of equipment. Each machine is individually configured including the necessary improvements to ensure the flawless execution of the workpieces.

Machines are custom-designed to each client with an aim to achieve optimum performance. All machine models include a large number of technical tables, developed by ONA, thanks to its broad knowledge of erosion, which helps the client to produce the workpieces.

In short, the ONA QX9 model is yet another of ONA’s great successes as world leader in the EDM sector. A machine that combines the power of erosion with absolute control of the entire process to guarantee maximum quality and precision in each workpiece. All these technological advantages, together with its experience in the sector and an integral personalised service, make ONA a reliable partner.
TECHNOLOGICAL LEADERSHIP

EXPERTS IN AUTOMATED SOLUTIONS:

Great competitive edge.

As leader in EDM technology, ONA is referenced worldwide for the development of customized projects to suit the particular requirements of each client. It analyzes what the client needs and offers state-of-the-art automation solutions to optimize production processes in each case and makes the best possible use of the machine for its entire useful life. Workpieces with a perfect finish in less time at a lower cost.

Its 65 years as experts in EDM have helped ONA to develop a great capacity for undertaking automation projects. It carries out a preliminary in-depth study of each client’s requirements in order to subsequently design the customized automated machine. All this allows for a more intuitive handling of the machine with automated applications, electrode changing without machine downtime, complete processes for the manufacturing of molds without interruption. ONA can thus guarantee the maximum number of machine working hours without breaks, and get the best out of each production process.

A wide range of automated processes. Great added value.

As part of its policy of delivering great differentiating added value as a competitive edge, ONA offers a wide range of automation solutions integrated in the machine:

An extensive array of automatic changers developed by ONA that guarantee maximum performance according to each client’s needs.
- Linear changers integrated in the machine.
- 20-position automatic changer integrated in the machine.
- 40-position automatic changer ready for its adaptation to any model of machine.

In addition, it makes special changers for large or heavy electrodes.

Multi-electrode robots, which can work with a single machine or integrate several EDM machines, or machining and EDM machines. The robot affords the machine great autonomy and ensures a more efficient use of time.

Integration of two multi-electrode robots in double head machines. ONA offers the possibility of including a second head in its catalogue of machines. This technological improvement shortens erosion time by 50% and it raises productivity by up to 200%. Half the time to get the same results in an automated process with the possibility of integrating two robots. For example, ONA is presenting its TQX10 model with double head and two multi-electrode robots and management software.
ONA offers a complete manufacturing solution for all kinds of users.

**Development of personalized software.**
As part of its philosophy of personalization, ONA develops applications and control software adapted to each client’s needs. Its machines include process control software to manage the plant’s manufacturing status at any given time. Each integrated software accesses different programs for them to be run easily. The entire flow of information relating to the machining of workpieces is stored digitally, to avoid the loss of data as well as errors.

**Manufacturing cells.** ONA offers an integral automation service to all its clients to assist them in improving their working process, with the option to integrate flexible manufacturing cells. As a result, the entire electrode charge process can be automated, as can the manufacturing process, from the palletized pieces to the accessories. Additionally, manufacturing priorities can be modified halfway through the process.

**25 years’ experience in automation.**
ONA experience in process automation is backed up by its 25 years researching and developing increased autonomous models which are constantly adapted to meet the increasingly competitive demands of the EDM sector. Since 1992, ONA has invested technology in projects designed to be automated as well as fully integrable in production cells. In addition, it has developed different product integration projects.

ONA offers a complete manufacturing solution for all kinds of users, with top quality results without the need for an expert. It allows for remote control from another room away from the factory floor, thus avoiding having to work near the machine or the human errors in the production of the workpieces. Its machines are designed to get the best performance, to optimize processes and times and to guarantee a perfect result from start to finish. In addition, it generates a flow of precise information in real time on how each piece is made and the time it takes to make it.

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![Die-sinking EDM machine with automation tool-changer](image1)

**Die-sinking EDM machine with automation tool-changer.**

![Die-sinking EDM machine with multielectrode robot](image2)

**Die-sinking EDM machine with multielectrode robot.**

![Two die-sinking EDM machines with a multielectrode robot](image3)

**Two die-sinking EDM machines with a multielectrode robot.**

![Mono-process manufacturing cell with electrodes rack magazine and linear robot](image4)

**Mono-process manufacturing cell with electrodes rack magazine and linear robot.**

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65 years dedicated to EDM, and all its experience as expert in personalized projects at the service of each of its clients, make ONA a reference in the sector.

Consistent with this philosophy of personalization and automation, we design custom-made machines, work on projects to deliver turnkey solutions and develop applications and software to suit the needs of each client. An integral personalization service adapted to each client with an aim to improve their production process and profitability.

ONA’s capacity to undertake automation projects allows the client to have greater autonomy in their applications, electrode changing without machine downtime and the completion of the entire mould manufacture process without interruption.
CASE STUDY EDM TURBINE DISK MANUFACTURING.

Wire EDM as a future alternative to firtree profile machining.

Being a leader in the EDM sector is only possible through continuous research work on new technologies and applications to provide advanced solutions adapted to clients' needs. ONA is a clear example of an innovation-oriented company which is certified by its 65 years spent delivering technological improvements in electro-erosion. In keeping with this approach, the Basque company has carried out a study to analyze a wire electro-erosion process (WEDM) as an alternative to the conventional machining (broaching) of firtree profiles in discs for the aeronautical sector. In fact, firtree slot WEDM could become a viable industrial option and replace broaching in the future.

Assumption and method.

In its research, ONA compared the EDM process with more conventional machining like broaching and milling. As key points in the research, ONA compared parameters like surface integrity requirements, precision and processing time of the machining of firtrees. The test involved cutting a turbine disc with the following characteristics:

- Material: Inconel 718.
- Outside diameter: 350 mm.
- 28 firtree slot profiles.
- Slot profiles at an angle of 30 degrees.
- 82 mm thick.
- Profile tolerance 0.01 mm.
- Firtree radial and angular positioning tolerance 0.08 mm.

The aim of the research was to cut the turbine firtree teeth using WEDM while complying with tolerance requirements in order to analyze the following information:

- Roughing time of the entire profile.
- Finishing time of the entire profile.
- Total erosion time of an entire profile.
- Total roughing time of the turbine disc (including preparation time).
- Total finishing time of the turbine disc (including preparation time).
- Total machining time (including configuration time).
- Material Removal Rate MRR (mm²/min).
- Recast layer thickness.

Firtree slot WEDM could become a viable industrial option and replace broaching in the future.
EDM configuration and machining conditions.

To carry out the analysis, standard ONA technology was used for nickel alloy, a 2-axis rotary table and two different flushing conditions. On the one hand, good flushing conditions (closed nozzles) and, on the other, worse flushing conditions (open nozzles). In addition, 0.25 coated wire was used for roughing cut. These two different scenarios chosen for the study (open and closed nozzles) enabled us to carry out different tests to properly evaluate erosion time, as this depends to a great extent on the flushing conditions. It is often the case that, due to the geometrical characteristics of turbine discs, cannot be used closed nozzles.

Research results.

On completion of the tests, the results showed that you can obtain a recast layer thickness in the necessary micron range (around 5 μm) and with sufficient precision in the fritree profile within a tolerance of 0.01 mm, using WEDM technology. These results were obtained following one roughing pass and two finishing passes (3-cut strategy).

In worse flushing conditions (open nozzles), the material removal rate for roughing was 110 mm²/min. In fact, for the strategy used in the research (one pass for roughing and two passes for finishing), the material removal rate was 60 mm²/min.

On the other hand, in good flushing conditions (closed nozzles), a slight improvement in the material removal rate was observed. In the roughing process alone, it reached over 400 mm²/min.

Comments based on the results obtained.

Most of turbine discs have fritree profiles at an angle of between 5 and 30 degrees. The taper cutting function of ONA’s WEDM machine obtains good results regarding the geometrical precision for profiles of under 10 degrees. For greater angles, a 2-axis rotary table is recommended.

To remove the required material and improve machining times, the dielectric must be cleaned in the reheating area. It is essential that most of the nozzles are closed in the profile. For turbines discs with a smaller diameter (when the nozzles interfere with the fastening device), special nozzles are recommended.

Lastly, the use of coated wires is recommended to reduce the processing of WEDM, especially in the roughing cut process.

Conclusions

Following the research, we can conclude that WEDM machining of turbine disc fritree profiles is an extremely valid alternative to compete with broaching as an industrial solution in the aeronautical sector. State-of-the-art and increasingly powerful generators and more advanced numerical controls allow for the optimization of machining time and the reduction of the white layer thickness. In addition, they achieve very good geometrical precision.

In the study carried out by ONA (3-cut strategy), the machining of turbine disc fritrees meets geometrical tolerances and obtains a white layer of below 5 μm. Additionally, very valuable information is obtained on the material removal rate and machining time.

It is true that the certification of the complete machining process using EDM to standard aerospace standards may be a long and costly process. For this reason, ONA concludes that a better option would be to combine WEDM for roughing, as it is cheaper and quicker, together with broaching for final finishing. Consequently, the process would not need to be re-certified.
ONA played an important role at the International Congress on Electro-machining, ISEM XIX, in Bilbao.

As leader in the EDM sector, ONA took centre stage at the 19th edition of the ISEM conference, held in Bilbao, from 23 to 27 April 2018. This year, the event focused on technologies based on EDM (electro-erosion), ECM (electrochemical machining) and other “non-conventional” technologies like Additive Manufacturing, Electron Beam, Electroplating, etc. The Basque company was an official sponsor of the conference and contributed with 10 awards in grants for the best research projects in doctoral theses presented at the event. ONA was likewise represented by Xabier Maidagan, former director of the company’s R&D department and President of the ISEM Organizing Committee.

ONA contribute with financial support with 10 grants for the best research work.

ISEM XIX (19th CIRP Conference on Electro Physical and Chemical Machining) was held in Bilbao in the Assembly Hall of the University of the Basque Country (BIZKAIA ARTEOA) with the clear objective to create the ideal atmosphere for a scientific discussion on the most significant advances in the field of electro-machining technology. Attendance at this encounter was obligatory for ONA due to its continuous research work in the field of electro-erosion technology.

This year, the organizing committee was sponsored by ONA, with financial aid in the shape of 10 grants for the best research work by postgraduate students from their respective doctoral theses, which they presented at the ISEM. The company has always been committed to the training of young researchers in order to ensure a future of excellence in research associated with the EDM process. President of ONA, Mr. Joseba Onandia, was in charge of delivering the awards at the conference, following a tradition started by Karmel Onandia in 2001, on the occasion of the first edition of the congress held in Bilbao.

With respect to science, ONA was represented by Olatz Flaño, a prominent researcher in the EDM process technology team at ONA. She outlined the latest research on die-sinking EDM (SEDM), which focused on analysing the effect of geometry and the path of the electrode on the wear pattern of the former. Her work demonstrates that the multi-axis SEDM process is a viable solution for the manufacture of integrated turbine components in the aerospace and energy sectors. Specifically, her study proposes reliable, easy-to-apply indicators for defining wear and gap in cases in which the classical definition of average wear is insufficient.

Availing of his presence in Bilbao to attend the conference, ONA was delighted to welcome at its facility Professor Kunieda, associate member of the International Academy for Production Engineering (CIRP) and a world reference in the science of advanced manufacturing technology, obviously, including electro-erosion.

The current edition is the first time a venue has been repeated for the ISEM. 17 years ago, in 2001, it was held in Bilbao too. Since the 17th edition, held in 2013, ISEM has been organized under the auspices of the prestigious CIRP (International Academy for Production Engineering). This edition of the conference, just like in 2001, was jointly organized by the University of the Basque Country (UPV / EHU) and the research centre, IK4-TEKNIKER. The event was preceded by a highly successful ISEM XVIII in Tokyo.
HAIER, no. 1 manufacturer in the world of large household appliances relies on ONA as trusted supplier of EDM machines.

Precisely because of this strategy based on research and innovation, the Chinese group has chosen to rely on ONA as its trusted supplier of EDM machines for manufacturing the molds for its own-brand household appliances. ONA is now its trusted partner in the EDM sector.

The four machines purchased are the new QX6+ models. Haier opted for ONA following a series of erosion tests that certified that the ONA models complied with their productivity and quality standards. These machines are the first ONA acquisitions made by the Chinese company and can be seen in operation at an event organized by Haier in its own plant during the first week of June.

ONA QX6+

The ONAQX6+ die-sinking EDM machine, acquired by Haier, is fitted with a microfine generator, filtering unit and CNC control.

- 100% configurable and digital generator. All the generator parameters can be adjusted and/or modified from the program.
- Powerful CNC that can control up to 8 axes simultaneously
- 3D manufacturing without limitations.
- Fully automated eco-friendly filter.
- Expert erosion system: 100 % unsupervised operation.
- Graphical representation of the orbit path, multi-cavities, contouring and the efficiency of the Expert Erosion System (BES).
Customized machines for cutting turbine rings.

**Flexibility and customization: Wire EDM for cutting rings.**

NELIDOV, a Russian company whose main activity is the manufacture of gas turbines for power generation and aircraft engines, has chosen ONA for the development of a personalised project with highly specific needs. Nelidov was on the lookout for a supplier who would satisfy the highly demanding precision and quality standards for the production of very specific parts.

ONA, leader in EDM, stands out within the sector for its personalisation philosophy and for the development of turnkey projects. The ideal partner to undertake the design of a special machine adapted to what was required by the Russian company. It was precisely ONA’s capacity to design a fully customized wire EDM machine that led Nelidov to choose the Basque EDM company.

### Special solutions: customized wire EDM machine.

ONA has developed a customized machine with an aim to improving Nelidov’s production process. The new model was designed to cut turbine rings for the energy and aeronautical sectors.

The cut required by the workpiece is mainly the housing of the blades (curved blade of a turbomachine or rotodynamic fluid machine) which are subsequently coupled to the ring. The model incorporates a CNC that can control up to 8 axes simultaneously. A B-axis is controlled by the CNC and allows the turbine ring to rotate. An additional axis positions the turbine ring, depending on the diameter of the ring, on a level with the machine’s lower head.

The customised model can cut rings with a diameter of 250 mm and a maximum diameter of 1,200 mm. The minimum thickness of the rings can be 0.8 mm and the maximum thickness of 100 mm. The minimum width of the ring can be 20 mm and the maximum width of 250 mm. Additionally, the model especially designed for the Russian company has a vertical rotary plate.

This is a further example of ONA’s flexibility to adapt to each client’s needs and offer customised solutions which guarantee an optimum production process and maximum profitability.

### Technical specifications of the machine
- The machine has a vertical rotary plate.
- The machine can cut rings with a minimum diameter of 250 mm and a maximum diameter of 1,200 mm.
- The minimum thickness of the rings can be 0.8 mm and the maximum thickness of 100 mm.
- The minimum width of the ring can be 20 mm and the maximum width of 250 mm.
- Maximum weight of the ring with tooling: 300 kg.
- Wire Diameter: 0.10 - 0.30 mm.
- Travels: X axis: 600 mm | Y axis: 400 mm | Z axis: 400 mm | U-V axes: 120 x 120 mm.
ONA EDM MAGAZINE

ONA WE ARE EDM

2018 N°2

TQX10: DEVELOPMENTS IN THE CONCOURS DOUBLE HEAD MACHINE

- Mechanics: The distance between the heads has been reduced by half. Distance between heads = 500 mm.
- Vertical extension with double chuck.
- Automatic interference management: two heads sharing the space. The two heads are communicated so there can be coordination in common erosion zones.
- Offline programming with Cimatron and JMS.
- The dielectric level is automatically adjusted to the head level depending on the erosion position.
- Software specially developed for double head machines.

With over 20 years’ experience in the industry of mold manufacturing, the North American company Concours Mold, specializes in the design and manufacture of injection molds, compression and RIM (reaction injection) molds, providing service to a variety of industries, including the automotive industry, and the heavy trucks and consumer goods sector.

With leading-edge facilities in Canada, the United States and Mexico, its maximum priority is to guarantee the quality, precision and profitability of its products, which is why it has a team of highly qualified professionals who share the common objective of being the best in their industry.

Concours Mold has strived to ensure that its equipment uses state-of-the-art technology. Only with the most advanced machinery can it reach its quality and lead time objectives and maintain its leadership in the sector. Always up to date with market trends, it invests time and money in order to stay at the forefront of its industry.

In keeping with this philosophy, Concours Mold has purchased the ONA TQX10 double head model to replace a previous ONA model that it bought in 2004. The Canadian company carried out different erosion tests with ONA and two competing manufacturers, and finally decided on the ONA model, thanks to its better results in both productivity as well as in final quality.

ONATQX10 + 2 multielectrode robots and process control software

At the forefront in technology: double head, top quality workpieces in half the time.

The combination of the two heads working simultaneously means that large moulds can be finished in half the time. This leads to a reduction in delivery time, while the quality and precision of the final result is ensured.

The machine integrates two 132-position robotic electrode tool changers.

It is fitted with a radio-frequency identification system (RFID) for the electrodes for a better and more precise management of the production processes.

It has a fully automated eco-friendly filter.

It integrates a powerful CNC that can control up to 8 axes at the same time and does 3D machining without limitations.

The two heads can work independently, meaning two cavities can be eroded at the same time and separately in a large workpiece.

ONATQX10

The combination of the two heads working simultaneously means that large moulds can be finished in half the time. This leads to a reduction in delivery time, while the quality and precision of the final result is ensured.

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W
The excellence of a customer service based on personalization and proximity.

As the most specialized manufacturer of EDM in the world, ONA bases its long and successful history on client-orientation. Its differential value resides in personalization and proximity to each client. The Basque company is very much aware of the importance of getting to know each business in depth so as to be able to offer the most profitable and effective solution. It offers ONA Smart Service as an integral service with all the advantages of Industry 4.0. Its aim is to become a trusted partner in the present as well as in the future.

JOSE MARI RIAÑO
Service Manager

What does ONA Smart Service mean for ONA?
Customer service. Our aim is to be always close to the client, to advise them throughout the entire process and retain their loyalty with an aim to obtaining new business opportunities. A satisfied customer is the best publicity you can have. They are consumer motivators for the future.

As head of ONA Smart Service in Spain, which values do you think represent ONA?
ONA bases its differential value on its capacity to offer each client customized solutions. I would sum it up in the following: proximity, flexibility and the ability to adapt to its clients’ needs.

What are ONA Smart Service’s strategic lines?
ONA Smart Service is an integral service whose objective is to raise machine autonomy and thus optimise performance. Our main goal is to achieve excellence with 100% satisfied customers. To this end, we follow a number of lines:

- Client orientation, analyzing their needs in order to raise competitiveness by improving the availability and productivity of each machine installed.
- Training for the client. Knowledge and performance are directly proportional. We provide our clients with the necessary knowledge to get the best from their machine: CNC, technology, kinematics,…
- World-wide service network. There is a network of local service points at the disposal of the client, with highly qualified local personnel, and, at the same time, we promote our own service. We understand that it is fundamental that the control of the service be managed directly by the manufacturer.
- Proximity to the client. Decentralizing the location of the service in order to be closer to the client. We can then offer a high-quality, quick response.

ONA integral service
Original replacement parts in 24 h.
• Reinforcing the Call centre/Hot line. The client calling ONA will be assisted by experts who assess each incident to find the best solution.

• Smart Connect: A service providing full information on the machine, workpiece and manufacturing process. With all this information, decisions can be made to improve productivity.

Which services does ONA offer as a competitive edge?

To complement the traditional replacement and repair service, we offer an integral advisory and maintenance service including:

1. Hot line/Call center.
2. Teleservice.
3. Personalized service throughout the entire process.
4. Basic and advanced training to handle the machine and maintenance, and advanced training that includes CNC, technology options, script programming (parametric programming).
5. Application engineering: Pre- and post-order. Production and process support.
6. Preventive maintenance.
7. Extension of guarantee period.
8. Original replacement parts with delivery in 24 hours.
9. Replacement C-axis service.
10. Approved consumables with ONA guarantee.
11. Post-machine delivery accessories. Electrode changer, C-axis, B-axis, etc.
12. Retrofitting.
13. Movement and reinstallation of machines
14. ONA Smart Connect. Continuous information with an aim to optimising machine performance.

How important is training for ONA?

Training is fundamental to get the best performance from each machine. We want to make EDM more accessible to our clients so that they can get in-depth knowledge of how to operate their equipment and take the right decisions to optimize its efficiency.

We offer a training course on delivery of the machine. Customized advanced training to complete this course is recommended. This includes deeper knowledge of CNC, programming, process, technological possibilities and script programming (parametrical programming). ONA has also designed a customized training service that can be delivered at the ONA facility or on the client’s premises.

What type of maintenance do you recommend for your machines?

The maintenance of each machine is outlined in the manual provided with the machine and, in addition, it is explained during the installation and start-up of the machine. With an aim to optimizing performance and ensuring a longer useful life of the machine, ONA recommends the use of original replacement parts and consumables approved by ONA. Also included in our services is the possibility for maintenance to be carried out by ONA.
Normally, when we speak of the LEAN model, we think of Toyota, the automotive sector and the long series. However, if we take a look at the two best-known graphics of the model (“House of Toyota” and Jeffrey Liker’s 4P Pyramid), we can see that what it really transmits is the search for a sustainable model on a permanent basis.

This approach is entirely in line with the philosophy endorsed by ONA, a company which has become the leader in the EDM sector for special and large-dimensioned machines in its over 65 years of business.

The Lean model works with concepts like visual management, standardization, JIT, etc, which are references for decision-making and must be adapted to the peculiarities of each sector. In fact, the concept of standardization differs in the automotive sector from that in a short series company.

If we focus on the short and special series, recent years have seen a rise in a management system (compatible with Lean) that proposes something that is clearly radical, the QRM (Rajan Suri’s Quick Response Manufacturing).

The QRM model uses the MCT (Manufacturing Critical – Path Time) as its main metrics, as opposed to other more widespread metrics in classic management, such as resource efficiency and cost. It has chosen this type of metrics because it believes a quick response in short and special series is a winning factor with respect to long-series production in low-cost countries (Terry Hill’s Theory of winning factors and qualifiers).

The argument goes that classic cost metrics only measure production costs and fail to measure those deriving from the lengthy process times until delivery to the client (stocks, rescheduling, emergency management, low flexibility, etc.), usually concealed behind general costs. It is precisely the reduction in lead times (although production costs do rise) that has an impact on increased profitability as there is a rise in market share and general costs are reduced.

The QRM system is based on four fundamental concepts:

**The power of time when reducing lead times.**

**Structure of the organization.** It opts for polyvalent machines and process owners or owners of part of the process (QRM cells, which can be in the plant in any of the organisation’s areas).

**Application throughout the company.** The quick response seen by the client corresponds to the entire organization. We tend to forget that, in many short and special series companies, the lead times (costs too) do not only depend on the production.

**System dynamics** with an aim to understanding the possible negative effects of a high saturation of resources, or variability in the system’s results. QRM recommends having a reserve of strategic capabilities in order to have, on the one hand, response capacity and, on the other, time to invest in improvement projects. Business management errors need to be reduced to a minimum and there must be a commitment to strategic variability, which is what makes a difference in the market.
ONA has built its new Operating system (ONA OS) on the basis of the Lean philosophy, adapted to the short and special series and including elements of the QRM system.

Based on a growth strategy and a commitment to large, special machines, five stages were defined as a road map to prioritize resources. They were used in a flexible manner as a guide with the result that, for example, Industry 4.0 microprojects were sped up.

STAGE 1. Development of the iantegi concept (mini-factory similar to QRM cells), the driving force behind the system, and capacity building strategy.
- Cells defined according to product ranges, with overlapping of cells for maximum response capacity.
- Training of teams and investment in versatility.
- Definition of management system of the cell sustained by visual management.
- Development of a local subcontracting chain to support the cells within a rapid-growth and flexible-response strategy.

STAGE 2. Changing from a functional layout to one with cells, with an aim to adapting it to the teams (improved visual management and an enhanced sense of ownership on the part of the team). The change has also led to increased capacity in large machines.

STAGE 3. Improvements in warehouses, internal and external logistics (use of the QRM POLCA system) and purchase management. Greater integration of suppliers in the cells, particularly subcontract suppliers.

STAGE 4. Industry 4.0 to provide support for logistic movements, data collection and the availability of information-documentation in the factory (zero paper), and for communication with suppliers, etc. As recommended by Lean philosophy, technology follows on from a definition of the system and processes.

STAGE 5. Questioning and continuous improvement of the system with focus on the client.

Though still at the end of stage 2, worthy of mention is how certain indicators have evolved:

- IMPROVED GLOBAL OPERATION ROTATION: +15%
- INCREASE % (LARGE AND SPECIAL MACHINES): +23%
- REDUCTION OF LT ASSEMBLY: -36%
- IMPROVED WIP ROTATION: +29%
- INCREASE IN THE NUMBER OF INTERNAL JOB POSITIONS: +17%

In conclusion, it is safe to say that both the Lean system and the QRM provide a guide to help each business adjust to its sector and strategy, and that they can be applied in the short and special series environment, quite common in the machine-tool sector.
Addilan to attend the ADDIT3D, in the BIEMH 2018, with its prototype of additive machine with WAAM technology.

Addilan has chosen ADDIT3D, the only professional fair in Additive Manufacturing and 3D Impression in Spain, in order to present its prototype of an additive machine with WAAM (Wire Arc Additive Manufacturing) technology. Visitors to the fair have the opportunity to see this machine for the first time at Pavilion no. 4, stand B30.

Addilan is to launch its own metal additive manufacturing machines. The Biscayan company is focussing on WAAM (Wire Arc Additive Manufacturing) technology that uses metallic wire arc welding. Addilan was founded in 2017 as a result of the collaboration of two machine tool manufacturers: Ona Electroerosión and the Maherholding Group. As part of their efforts to innovate and diversify, both companies decided to explore the possibility offered by metal additive manufacturing in 2014. Three years later, the sum of this knowledge was presented to the market as a new company called Addilan. 

WAAM technology.

Anybody visiting stand B30 from 28th May to 1st June will have the chance to become more familiar with this technology. This additive manufacturing method allows for pieces to be manufactured using arc welding with wirefeed. WAAM technology is especially aimed at the high value component and middle to large-scale component market. It means you can work with all the materials used in welding: steel, titanium alloys, superalloys and aluminium alloys.

Collaboration.

Addilan and the Centre for Technological Research and Development, TECNALIA, have joined forces to work together on the development of the new concept of a 3D machine designed by the Basque company. Once on the market, this machine, unique in the world, will be capable of producing medium to large-sized components for sectors like aeronautics, energy or shipbuilding... This collaboration agreement is helping to bring this technology to the market more quickly and it is fast becoming one of the focal points of Industry 4.0.

**How WAAM Technology Works**

1. Wire is melted using an arc welding process to create a bead.
2. Beads are overlapped to create layers.
3. The piece is created layer by layer.

**Key Points of the Addilan Prototype**

- Based on arc welding + wire.
- Size of the piece: max. 1200 x 900 x 500 mm y 300 kg.
- Possibility to work in an inert atmosphere for working with reactive materials like titanium.
- High input rate (up to 2.5 kg/h in titanium Gr 5 and 6 kg/h in steel).
- Repeatability, reliability and traceability:
  - Own CNC.
  - Monitoring system in process.
  - Control system in process.
  - Traceability system.

**ADDIT3D 2018**

from 28th May to 1st June 2018

The Additive Manufacturing and 3D Printing Fair will take place from 28 May to 1 June 2018 with the back-up, and within the context, of the BIEMH 2018, a trade show closely associated with manufacturers and distributors of the major industrial sectors, and which brings together the largest number of businesses in industry 4.0. in Spain. The Machine-Tool Biennial welcomes over 40,000 professionals from the main sectors driving the world economy.
ONA’s vast technological potential was on display at our 2018 Technology Talks workshops

ONA held its 2018 Technology Talks event May 29-31st. The goal was to show our customers our capability to enhance the profitability of their businesses with accurate, reliable machines. The workshops were extremely comprehensive and the attendees enjoyed an exciting trip through EDM on the company’s own premises.

ONA’s expert team was consistently available for all the attendees’ disposal for consultation on the best technological solutions for the needs of their businesses.

By demonstrating a transparent production process that displays our value as a leader in customized solutions and large machines, ONA is developing into a trusted partner in the sector.

This event shows ONA’s commitment to the customer

More than 300 attendees at the 2018 Technology Talks learned first-hand about real examples of technological solutions provided by ONA to its most demanding customers. Projects for the energy, aeronautics, automotive, moulding, micromachining and other sectors were demonstrated.

The R&D team presented the most advanced recent solutions developed by ONA.

The customers were able to verify ONA’s commitment to research and development. They discovered the latest technological improvements developed by the company with the aim of optimizing its customers’ productivity.

- New configurations of de-sinking electro-erodion machines. These are very large automated models with dual heads and electrode-changing robots. These configurations are designed for manufacture of large-dimension moulds. The ONA TQX10 is an example of this technology and was acquired by Concours Mold, Inc., a Canadian company with headquarters in Windsor, Ontario.

- Another example is a special solution for an automated manufacture of vertical rings for the aerospace industry using wire electro-erosion.

- The latest innovations in the development and manufacturing of aerospace applications. At the technology’s cutting edge it is worth highlighting the die-sinking electro-erosion machines with generators up to 400 Amps used among other applications for machining jet engine housings. Wire electro-erosion machines with 7 simultaneously-controlled axes intended, among other applications, for manufacturing of turbine components.

- The new ONA QX6+ model die-sinking electro-erosion machine for manufactures of large injection moulds for square shapes for either home appliance or general manufacturing.

- The ONA AV130 model, the biggest wire electro-erosion machine on the market, with capacity to make cuts up to 800 mm in height.
THE FUTURE IS CLOSER THAN EVER BEFORE

ONA celebrated with great success its OPEN HOUSE days on 29th and 31th of May. ONA shared his extensive experience in the sector and showed the widest range of wire EDM solutions and market penetration.

Automation and Leadership in Large Scale Electrical Discharge Machines at BIEMH 2018

ONA chose BIEMH 2018 to present its capacity for taking on custom automation projects. The company provides personalized solutions that optimize manufacturing times and maximize profitability in production processes.

The company develops complete automation systems for machine options (automatic changers, multi electrode robots, etc). It also has broad experience with complex solutions like multi electrode robots with two machines, milling packs with electrical discharge machining or flexible manufacturing cells.

The 30th edition of BIEMH was a true success for ONA. At the fair, which drew more than 42,000 visitors, they netted more than 200 contacts with potential clients and a number of sales.

Between May 28 – June 1, all the visitors to the show got the chance to see two electrical discharge machines at the company’s booth.

Wire EDM: The ONA AV60, with a mineral filter making fir tree turbine disks for the aerospace industry.

Sinker EDM: The ONA QX8 with 40 electrode changer showing a mold for the auto industry.

The Center for Advanced Aerospace Manufacturing (CFAA) and ONA also shared a space at the fair where a large-scale turbine from ITP (a 100% Rolls Royce group company), was exhibited alongside pieces made with different models of ONA machines.

ONA’s Open Day workshops have become an unbeatable opportunity to learn about the most significant innovations made in the industry, directly from the manufacturer with the most extensive experience in the electro-erosion market.
It all began in an electro-mechanical workshop.

Undoubtedly, it was the visionary and entrepreneurial nature of its founders, brothers Karmel, José and Jesús Onandia, who led ONA Electroerosión to become the greatest manufacturer of electro-erosion machines in the European Union and one of the world leaders in this sector. Nowadays, ONA holds its leadership in a highly competitive international sector with its products among the most highly considered by its clients. In addition, ONA is currently the oldest company in the world in this technological field where the business remains within the founding family.

ONA’s first die-sinking EDM machine.

In 1954, the Onandia family began to show an interest in a new technology that originated in the USA and had been developed less than 10 years before: electro-erosion. With this new technology, the material was removed by the exclusive action of electrical discharges between an electrode and a workpiece which is being processed, with the work area constantly kept in an insulating medium. In this way, the machinability capacity of a workpiece was “restricted” to an electrical conductive material, no matter its hardness.

The Onandia family understood from the start the great potential of this much more advanced and powerful technology and began to produce its first electro-erosion machines under American licence. 1955 saw the launch of its first die-sinking electro-erosion machine: the ONA WSM-4.5 model.

Turning an electro-mechanical workshop into a world leader in the EDM sector is only possible if you have one of the most visionary and entrepreneurial families in the industrial sector at the time pulling the strings. It is a success story ahead of its time with people who, from the start, were able to appreciate the great worth of a more powerful and advanced technology: electro-erosion.

The Onandia’s visionary nature.

In 1952, the Onandia family set up ONA as an electro-mechanical workshop. Its main activity at that time focused on the manufacture of different types of machines, which were still not produced in Spain or there were relatively few manufacturers who did so (grinding machines, drills, or threading machines). This was a difficult period for business, with Europe just out of the Second World War and Spain locked in a policy of state ownership and international isolation.

In 1958, 6 units were produced per month.

The first steps towards technological leadership.

During those first years, ONA Electroerosión manufactured different types of machine tools, but always with a clear strategy aimed at manufacturing its star technology. The Onandia family was aware of the difficulty posed by introducing a new technology based on electronics in such a purely mechanical world as the machine tool industry in the nineteen fifties. However, it soon became a success and was producing up to 6 units of EDM machines a month by 1958. By then, ONA had grown to such an extent that it was obliged to build a new factory in Durango. The new plant had a surface area of 700m².

Growth has been a constant in its history, and in 1992, ONA moved to its new, more modern and high-performance plant. This new facility housed the central offices, the main production unit and the R&D and SAT centres.