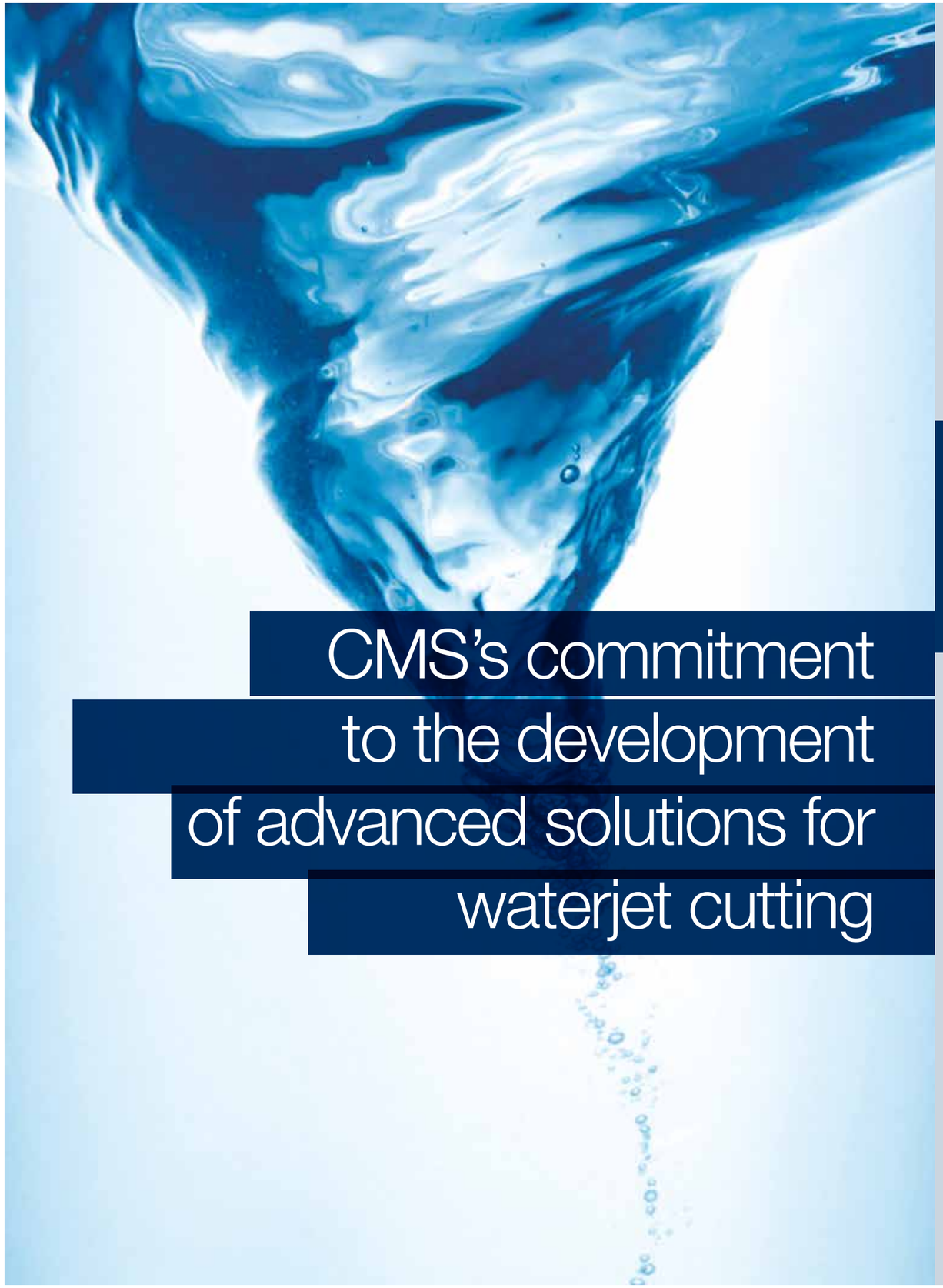
CASE HISTORY

ENOBERG - SACCHI - MAG - CARPIGIANI

TECNOCUT IDROLINE S:
WATERJET CUTTING SYSTEMS
4 TECHNOLOGICAL EVOLUTION CASE STUDIES

Cms
metal technology



CMS's commitment to the development of advanced solutions for waterjet cutting

CMS, which has been producing machines for the global market for over 20 years, designs, manufactures and installs complete systems for waterjet cutting. Over the years it has supplied equipment to a variety of companies in different sectors which all have a range of needs that require their own unique solutions.

tecnocut idroline s

CMS provides state-of-the-art cutting solutions. Waterjet cutting has always been a focus for CMS and they are a fully integrated system manufacturer. The entire product line is built from an engineering perspective with an objective of providing high performance and reliable machines with an emphasis on safety. CMS products provide an efficient waterjet process for a wide range of applications. From small-batch customer parts manufacturing to complex high volume production, the CMS technology provides finished products that are ready for installation. CMS has become a key partner for manufacturers working in the aerospace, automotive, marine, railway, energy, aeronautical industries and, more generally, for engineering companies and job shops. In many cases the CMS cutting machines represent the technological core of their cutting capabilities.

The following four case studies illustrate the versatility of the CMS product line in different sectors. The innovative Tecnocut Idroline S machine is featured throughout these stories and has proven technology that works well in each of these cases. As highlighted by the four reports reported in this booklet, Tecnocut Idroline S can be an important strategic evolution in the engineering industry, employing the waterjet cutting technology to create semi-finished and/or finished products using ferrous and non-ferrous materials, achieving excellent results with steel, stainless steel, iron, copper, medium/high alloys and hardened steel. Another unquestionable advantage with waterjet cutting, reported in all four case studies, is the fact that it performs a cold cut that does not provoke structural alterations that harden the cutting area, with all the benefits that ensue.

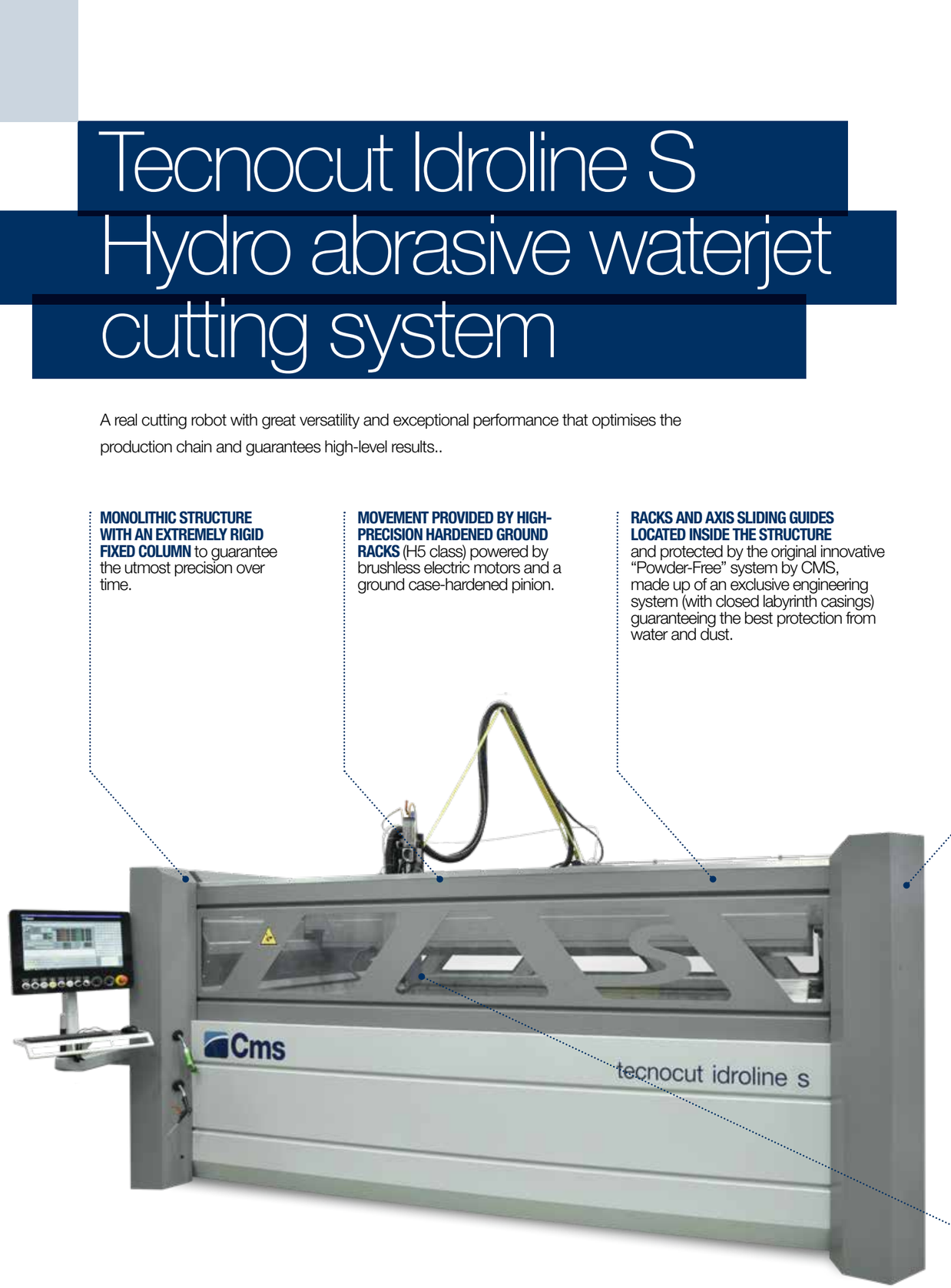
Tecnocut Idroline S Hydro abrasive waterjet cutting system

A real cutting robot with great versatility and exceptional performance that optimises the production chain and guarantees high-level results..

MONOLITHIC STRUCTURE WITH AN EXTREMELY RIGID FIXED COLUMN to guarantee the utmost precision over time.

MOVEMENT PROVIDED BY HIGH-PRECISION HARDENED GROUND RACKS (H5 class) powered by brushless electric motors and a ground case-hardened pinion.

RACKS AND AXIS SLIDING GUIDES LOCATED INSIDE THE STRUCTURE and protected by the original innovative "Powder-Free" system by CMS, made up of an exclusive engineering system (with closed labyrinth casings) guaranteeing the best protection from water and dust.



INCREASED EFFICIENCY: highly intuitive operator/machine interface and a new fixturing system to lock pieces in place.

INCREASED VERSATILITY: new sizes and many accessories.

INCREASED RELIABILITY: numerical control and digital drives for the total control of cutting parameters.

5-AXIS CUTTING HEAD
This head produces complex shapes in 5 axes that reduces the need for any secondary finishing. More than ever before, it is now possible to create finished parts directly from the waterjet without the need for additional machinery or manual labor after the cut is complete. Of course, this all means lower per part cost and shorter delivery times for finished parts. In addition, thanks to CMS's new 5 axis system, the taper typical of waterjet cutting is automatically corrected by the 3D software package called TC2020. This system makes it possible to obtain geometric accuracy to the nearest thousandth of an inch.

CMS High Pressure Intensifier

CMS has developed a new concept of high-pressure intensifiers to meet the needs of the most demanding users. This unique idea utilizes intensifiers equipped with various multipliers that are independent, yet parallel and electronically synchronised. This innovative solution obtains a constant pressure avoiding the drops typical of traditional opposing cylinders intensifiers.

ENOBERG
“tailor-made” filling plants

The Company

Established in Bergamo in 1984, Enoberg designs and manufactures filling plants that can meet the most diversified and demanding needs of a national and international clientele. Specialized in the manufacturing of “tailor-made” machines that can satisfy the operational requirements of the supply chain with a productive capacity between 600 (semi-automatic plants) and 20,000 (completely automatic plants) bottles/hour, Enoberg works mainly for clients in the food, wine, oil, beverage and chemical industry. The structure of the company is agile and flexible, a characteristic that has also been confirmed by its joining the SMI Group, one of the most important companies in the world in the filling technology sector.

ENOBERG

Cutting needs and the dialogue with CMS

Enoberg engineering had been considering waterjet cutting as an alternative to laser cutting for a few years, and had meticulously studied the functional potential of the machinery in this sector and initiated a very positive dialogue with CMS.

“We had two basic needs - improving working processes and intervention times,” explains Francesco Metelli, partner and technical manager at Enoberg. We work almost exclusively with stainless steel, as we manufacture filling plants that are “tailor-made”, so practically every single one is a prototype. That is why we wanted to start using a technology that enabled us to shorten manufacturing times and obtain pieces that are practically finished, ready for assembly. After analysing both the experience and quality level of its machinery, we contacted CMS who, thanks to the excellent advice given by its technical and commercial manager, made us realise how right we were in considering waterjet cutting. In December 2014, we bought an Tecnocut Idroline S. We consider it a fully-equipped machine because it is complete with everything to satisfy our cutting needs.”

> Replacing laser cutting while improving every aspect of the process - versatility, timing, costs and results.

The use of Tecnocut Idroline S at ENOBERG and application results

“After working with Tecnocut Idroline S for a year, I could compare costs and performances with our previous laser-cutting machine,” reports Francesco Metelli. “In particular, I estimated the cost/time ratio that our operator took to intervene on external burring, a procedure which is no longer necessary with waterjet cutting. In addition, there are the advantages: laser cutting just cannot reach the same level in perforation of high thicknesses and small diameters.

Waterjet cutting enables us to cut all the holes we need, not only those of a certain diameter, so operators do not have to intervene with a drill. In this way, manufacturing times are shorter and, when the cut plates come out of Tecnocut Idroline S, they go directly to the structural work department for the next processing operations. Before, with laser cutting, the material being processed came out hardened, causing many problems with the tappers, which broke easily. Thanks to waterjet cutting, we managed to overcome this problem. With this machine, we can cut plates that are 200 mm thick, while laser cutting had its limits above 15 mm. We can now say that, thanks to the experience we gained with the two different systems, laser technology needs at least two working shifts to pay for itself and is very limiting, as it is only effective on certain types of materials and thicknesses. Waterjet cutting is a truly flexible solution that does not bind you to certain thicknesses or materials and, in fact, we work perfectly even with aluminium. In addition, the 5 axes head enables us to cut diagonally, which is impossible with lasers.

This machine offers many advantages but, if I had to name one in particular, I would pick the time we save when processing the pieces. We are very satisfied with Tecnocut Idroline S, which is used in our production line every day without interruption.”

SACCHI
Machine building

The Company

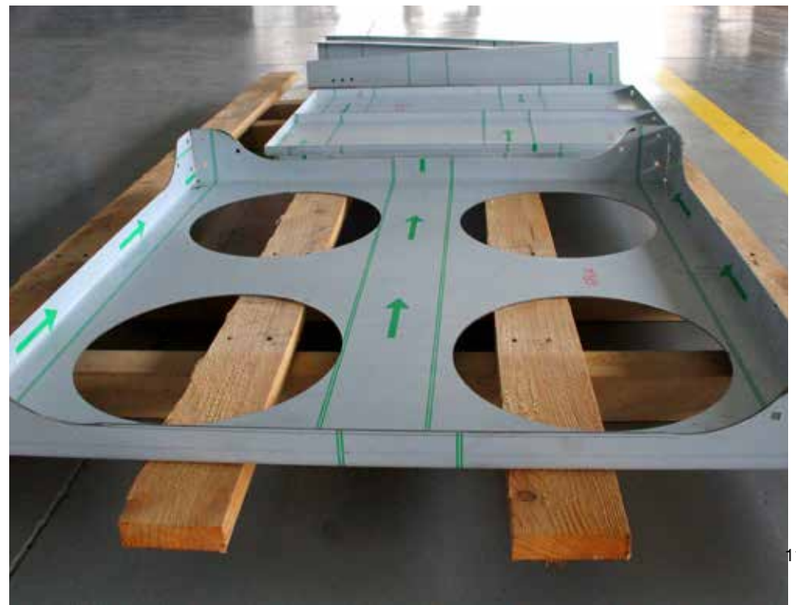
A specialist in the development of technologies for the packaging of powders and granules, Sacchi - a company established in Pavia in 1926 - manufactures bulk product conveying, dosing, storing, bagging and palletising plants for the food industry in particular, which is increasingly in need of evolved plants. In addition, it designs and manufactures cutting and emptying systems for both bags and filling systems for bags, big bags and drums, vibrating screens, dense phase pneumatic conveying, silos and other complementary machinery. In addition, Sacchi specialises in the development of systems for masterbatch and plastic compound production. The company established itself on the market as the sole provider offering a complete service: from the delivery of raw materials to end-of-line production. Among its distinctive benefits recognised on the market, are its innovative efficiency, professionalism, availability and quality of its dialogu with clients both before and after sale.

Powder handling specialists since 1926
SACCHI

Cutting needs and the dialogue with CMS

Cutting very thin plates, e.g. 1 millimetre plates, without ruining or deforming them, ready for assembly.

“At Sacchi, we do not manufacture plants in series, we provide “tailor-made” plants, which have unique characteristics for each single client,” explains Luigi Sacchi, owner and production manager of the company. We therefore needed an evolved cutting machine that could intervene with the utmost precision and above all excellent results with many types of materials - definitely stainless steel, but also aluminium and plastic materials, to name but a few. For over ten years, we had been considering waterjet cutting for use alongside or to replace plasma cutting. We analysed the sector to better understand the potential of the machines and find something that could meet our needs. The technical and sales staff at CMS were professional, helpful and very knowledge able on a technical level - as we are very demanding from a technical point of view... first of all with ourselves! When we compared what Tecnocut Idroline S offers to our needs, we decided to purchase it. Right from the start, we were extremely pleased with the 5axes head and the flexibility it provides as well as with the overall structure of the machine. At Sacchi, we care deeply about cleanliness, tidiness and the organisation of the productive departments in general, as well as the well-being of our workers and Tecnocut Idroline S is perfect for us from all perspectives - it is the ideal machine for our needs thanks also to its closed and safe structure.”



The use of Tecnocut Idroline S at SACCHI and application results

“All our plants are made according to the specific needs of each client and, precisely for this reason, waterjet cutting was the prefect choice for us,” stresses Luigi Sacchi. “A very important aspect is the fact that, unlike hot plasma cutting, this type of technology does not employ flames or high temperatures, so we can cut stainless steel or other laminated materials, even one millimetre thick plates, without ruining or deforming them. Working in the food industry, this was often required, and we finally managed to satisfy the request - in fact, we can now work on pre-metal plates without problems. Sacchi has been employing Tecnocut Idroline S for over a year with an average of nine hours a day. I can say we are very happy with our choice and we have even reduced the processing times for finished products. And I will tell you something more: the work of this machine can be fully appreciated by the finished product, so not only for the short cutting times, as the advantages are considerable - I’m talking about a 30-50% reduction in processing times for finished products ready for assembly.

Let’s make a practical example: thanks to Tecnocut Idroline S, we can

cut a 15 mm-thick 316 stainless steel plate with a precision to the nearest tenth of a millimetre and theplate is practically ready for assembly. It used to take up to four hours to cut, mill and clamp pieces with plasma cutting and now it only takes 50 minutes! By employing waterjet cutting, we believe we have reduced production times by 30%. In addition, waterjet cutting has improved the entire process - for example, we have reduced the need for welding too. All these improvements give us the time to analyse new technologies and start using the newest ones, as happened with bending, for example.

Clearly, such a machine becomes strategic in the production process; that is why we cannot afford downtime. Assistance and maintenance are therefore just as essential. We chose to collaborate with CMS thanks also to this essential factor - a cutting-edge technology combined with an organization to match, i.e. with a well-structured and efficient service.”

Luigi Sacchi (on the right) with Daniel Sansoni, CMS Area manager, and Claudio Tiozzo, CMS agent.

MAG

Subcontractor for mechanical manufacturing

The Company

MAG is a subcontractor specialising in precision mechanical manufacturing and uses evolved numerical control machinery.
Since it was established in 2004, the company grew thanks also to the acquisition of updated technology to satisfy the demands of its reference market. The experience gained and the relationships established in different sectors make it a complete partner that is particularly versatile and able to coordinate various processing phases supplying mechanical pieces ready for assembly. Thanks to its experience and the combination of machine tools and waterjet cutting systems, it can potentially be a “sole supplier” even in the case of particularly demanding work from a project and technical-structural point of view.”.

Cutting needs and the dialogue with CMS

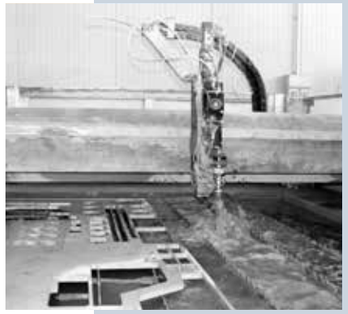
> Using a single technology for a wide range of purposes; providing excellent results in both, precision and surface finish.

“We learned about CMS in 2003, when we needed to cut plates of a certain thickness,” recalls Andrea Mora, founder and owner of MAG. “We work with different kinds of materials and, after seeing CMS machinery at work in some companies in the engineering sector, we realized it could be the perfect technology for us. MAG had just been established and, with a little courage on our part, we decided to choose waterjet cutting, combining this technology with traditional chip removal. My father used to work in the engineering industry. In particular, he used to work in the confectionary machinery sector and, thanks to our experience, we established a company that could also work as a subcontractor especially as regards precision mechanics - we wanted to be a partner rather than a simple supplier. Of course, we did consider laser cutting at the beginning, but we knew its limitations. Waterjet cutting seemed the best choice for us because it is really versatile and less invasive on a large number of materials. For over ten years, we have been working with a CMS three-axis head waterjet cutting machine that has become of strategic importance in our work. Nowadays, though, the market has become increasingly aggressive and the demands we received from our usual clients and new businesses made us look for a new system with evolved performances, versatility and technical-structural characteristics.
In 2015, we therefore purchased Tecnocut Idroline S. It was clearly a considerable investment for a small-medium business like ours, however it was essential to continue being competitive for our customers, i.e. industries producing machinery for the food industry as well as companies working in the automotive sector, shipyards, heavy-equipment and railways. Currently, we work mainly with aluminium, steel and iron.”

The use of Tecnocut Idroline S at MAG

“Passing from a three-axis to a five-axis system with Tecnocut Idroline S enabled usto improve the service offered to our clients,” explains Andrea Mora. “We also decided to keep the first CMS machine we purchased 10 years ago, and we use it for less demanding tasks. In addition to having 5 axes, Tecnocut Idroline S has evolved from all points of view - it performs better, it is safer, sturdier and more versatile when managing processed pieces. Among the more important aspects, there is the quality of the waterjet itself, which we believe has been improved and strengthened. The machine with the 5-axis head can process pieces with increasingly smaller tolerances and a more precise finish - we obtain finished pieces that practically need no further processing. Of course, this has a positive effect on costs in a market that is increasingly dominated by the need to guarantee high quality while remaining competitive.

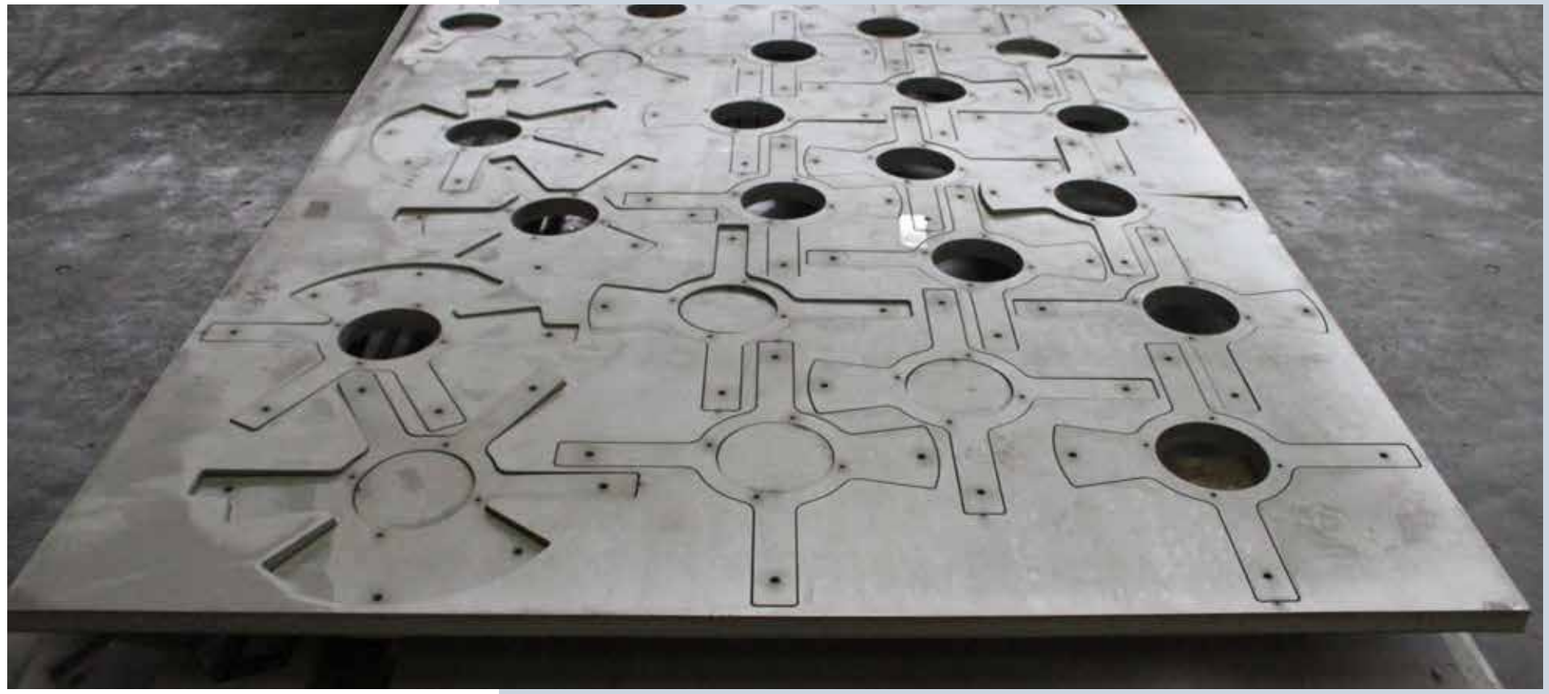
Another positive aspect is the management of the abrasive - fixed dosing in the old machine has been in fact replaced by electronic dosing. The possibility of dosing the abrasive more precisely and, most of all, automatically, has already led to positive results. We have in fact noticed how cutting is more constant. Another positive note concerns the abrasive extraction system, the so-called



The first waterjet machine bought by MAG 10 years ago.

Andrea Mora (in the middle) with Daniel Sansoni, CMS Area manager, and Davide Mimmi, CMS agent.

dredge. From an operational point of view, CMS has obtained amazing results as, in over a year of activity, the dredge in our Tecnocut Idroline S has not required a single maintenance operation. The machine works all day and presents advantages such as, for example, the possibility of inclined cutting. The conicity problem is corrected directly by the 5-axis head, so we can achieve results that were just unthinkable with the previous generation of machines. Even the worktop, now equipped with beams that support the pieces, is a positive improvement, as it enables us to keep pieces straight without a probe. Another positive element is represented by the sensors - Tecnocut Idroline S electronic control indicates exactly when the orifice and focusing nozzle need to be changed as they sometimes have different wear times, thus guaranteeing safety and precision over time.



CARPIGIANI

Manufacturer of ice-cream machines

The Company

Carpigiani established itself on the market in 1946 as a leader in the manufacturing of machinery for the production of the famous italian ice cream. Currently, the company manufactures 11 lines, 300 models and over 2,000 versions - the widest range on an international level of machinery for the production of artisan ice-cream, milk-shakes, frozen yogurt, whipped cream, creams and other equipment for ice-cream, pastry-making, caterers, frozen yogurt stores, soft ice-cream stores and bars. Innovation is at the basis of Carpigiani's technological leadership. A considerable part of the turnover is in fact continually reinvested in research and in the design of new components to provide our worldwide clients with machinery that is adaptable to different production needs, ergonomic and functional, safe, energy saving and, most of all, highly reliable and durable: all these things while complying with the strictest food security regulations. Carpigiani is the pride of the best "made in Italy", both for the machinery it manufactures and for the final products that its technology is able to create.

CARPIGIANI

In order to promote and spread the knowledge regarding high-quality fresh gelato, over ten years ago Carpigiani started training new ice-cream entrepreneurs in its world-famous "ice-cream school" Carpigiani Gelato University.

The "Fondazione Bruto e Poerio Carpigiani" set up an "Ice-cream Museum" inside the company dedicated to the history, culture and technology of artisan ice-cream. Original machinery and equipment is on display which, through a 500 year process, tell visitors the story of ice-cream.

Cutting needs and the dialogue with CMS

Intervene on steel pipes that need complex cuts combining the utmost precision with a non-stop production.

"Over the past few years, we felt the need to upgrade part of our technological resources," explains Luigi Casagrande, engineering manager. "Together with the development of new machinery, Carpigiani has increased its commitment to engineering by identifying and purchasing new plants employing state-of-the-art technology in line with our production needs and with the projects we will be working on. To maintain our position as leaders in the market, we must excel in every sector and keep up with the latest technological developments. We need to do more and do better, which sometimes also means investing and tackling complex yet unique challenges that help us stand out on the global market.

All of this must be done while keeping the characteristics and the peculiarity of the sector in mind, as machine components come into contact with milk and other natural ingredients. We must therefore pay great attention to the materials and shapes that characterise the machinery and handling processes, especially those concerning the mixing of the ingredients, which is carried out at low temperatures without risk of contamination. The recent introduction of the Tecnocut Idroline S waterjet cutting machine is part of this innovation strategy, and represents a new era for our technological equipment - it is in fact the first waterjet cutting machine we have ever used and our expectations are extremely high.

After all, in line with our business style, we only choose the technologies we believe to be the best in that particular sector and we expect the companies we work with to guarantee maximum operating standards. As I said, it is quite a challenge on an engineering level, because we want to use Tecnocut Idroline S to intervene on cylindrical pieces and cut particular shapes. We want to produce special pieces, which are almost impossible to obtain using other cutting technologies. In addition, we want the best results while keeping costs down. We will have to experiment it too."

The use of Tecnocut Idroline S at CARPIGIANI and application results

Luigi Casagrande (in the middle) with Daniel Sansoni, CMS Area manager, and Oriano Baravelli, CMS agent.

“During the first few months we started using Tecnocut Idroline S, our intuitions were confirmed - the prototypes of the piece we want to start producing fully satisfied our expectations,” stresses Luigi Casagrande. “Thanks to its cutting-edge technical characteristics and versatility guaranteed mainly by the 5 axis head and the tube spindle, it is proving to be the perfect machine to satisfy our needs. In particular, the prototypes made enabled us to save a considerable amount of time and are practically finished. In theory, the cylindrical piece we would like to produce, which requires quite complex cutting, could be processed with laser cutting, but the heat would generate significant structural problems (tensions on the consistency of the material but even distortions of a few millimetres which would be unacceptable). Waterjet cutting avoids all this. This piece is not a real shaft and is part of the mixing-shaking system of our ice-cream machines, where stainless steel comes directly into contact with food ingredients - therefore the design is required to integrate perfectly and strategically with the system with a practically perfect functionality. If manufactured this way, the piece does not present critical points such as weldings or sharp edges. Such an advanced engineering element required an equally advanced cutting system.”

tecnocut idroline s
TECHNICAL DATA

TECNOCUT IDROLINE S

TECHNICAL DATA		
MODEL	**1730**	**2040**
X Axis	3000 mm (2 heads) 3300 mm (1 head)	4000 mm (2 heads) 4250 mm (1 head)
Y Axis	1700 mm	2000 mm
Z Axis	350 mm (200 mm with 5-axis cutting head)	350 mm (200 mm with 5-axis cutting head)
B Axis	+/- 60°	+/- 60°
R Axis	Ø Min/Max Tubes 42>400 mm Length 2570 mm Weight 400 kg	Ø Min/Max Tubes 42>400 mm Length 2570 mm Weight 400 kg
Bed Size	3700x2050 mm	4650x2050 mm
Overall dimensions	5700x2700x h 3700 mm	6700x3000x h 3800 mm
Weight (empty)	4000 Kg	4500 Kg

Max. load of support plane: 1000 kg/sqm - Speed: 0->40000 mm/min - 15" TFT color screen, membrane keyboard with built-in mouse
External port for USB stick interface - Connection to computer network - RJ45 10/100 Mb connector.

TCLAMIE-0519E

Cms | your technology partner

CMS SpA manufactures machinery and systems for the machining of composite materials, carbon fibre, aluminium, light alloys, plastic, glass, stone and metals. It was established in 1969 by Mr Pietro Aceti with the aim of offering customized and state-of-the-art solutions, based on the in-depth understanding of the customer's production needs. Significant technological innovations, originating from substantial investments in research and development and take-overs of premium companies, have enabled constant growth in the various sectors of reference.

Cms

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