

of Antonio Vendramini

Examples of fenders and hoods produced by the company IMPEA of Piadena (Cr). Note the high degree of finish. (Lasertec photo)



PROCESSING SHEET METAL FOR AGRICULTURAL MACHINES

ALMOST ALL GREAT COMPANIES STARTED OUT IN A GARAGE. THIS IS ALSO THE CASE FOR THIS COMPANY THAT WE VISITED IN THE PROVINCE OF CREMONA AND WHICH HAS ALWAYS BELIEVED IN THE IMPORTANCE OF HUMAN RESOURCES AND TECHNOLOGICAL DEVELOPMENTS, CONSTANTLY UPDATING THE MACHINE FLEET IN TERMS OF EFFICIENCY AND QUALITY.

"Sometimes it is truly a pleasure to visit companies that are active and energetically present even in difficult times." This is a phrase that our loyal readers will have heard us say time and again, luckily. This was also the case with the visit to IMPEA, whose premises are located in Piadena (Cr). Here we discussed at length with the owner, the Engineer Emiliano Bosisio, son of the founder Pietro and Maria Maietti, his wife, who for seven long years led the company (after the accidental death of her husband) through the troubled period in the 70's. "My father helped found the company and passed that free entrepreneurial spirit on to me, but it was my mother who provided the current ordered set-up of the company, which is

customer-orientated and technologically innovative in order to constantly make our products more effective". We try to convey in this article the results of a visit of more than four hours spent in an engaging conversation.

HISTORICAL ROOTS

The Engineer Mr. Bosisio explained the origins of the company to us. "It all started in 1963, my father was director of the Industrial Association of Cremona. A friend from Piadena proposed setting up a company together to make stainless steel bumpers for cars. So in a disused gym IMPEA (acronym for Industria Metalmeccanica Paraurti E Accessori (Metalworking Industry Bumper And Accessories)) was born. This was in the midst of a so-called "economic miracle" in

which the automotive industry saw rapid growth and both the production sector (Fiat, Alfa Romeo, Lancia, Lamborghini, Maserati, etc.) and the spare parts industry offered favourable development opportunities to companies equipped to provide moulded components. In a short time the material for bumpers switched to plastic with metal reinforcements, for economic and (in part) aesthetic reasons. They were made of three pieces: front part and side bends, but the quality of our workmanship was so perfect that it was difficult for the lay man to recognize the points of separation. Towards the end of the '60s, the car stopped developing, and my father, who had become the sole owner of the company, considered the fact that some clients (such as Fiat and Lamborghini) were also making tractors, and began producing bumpers for agricultural vehicles. Within a short time, this became our production sector.

In 1972 my father died in a car accident, and the company was run by my mother, who perfected and drove this change in the product sector widening the customer base of the Same Group (1975). It was a difficult choice, but one that was essential for our development. The Italian automotive world tended to be interpreted by a single company and my mother quickly saw the danger and decided to operate in many different small batches, requested by a larger number of companies. However, this meant a change in the corporate structure because you had to change the moulds several times a day. All of this reorganization was thanks to my mother. I started managing the company, with her support, in 1979. Gradually our production area has expanded to its current 30,000 square meters, of which 14,000 are fully covered by the production halls, warehouses, logistics areas and two buildings housing the managers' offices (the company's registered office is in Cremona where I live)." Here we must interrupt the decidedly heart-felt description of Mr. Bosisio, to make a brief comment. Visiting the company and, in particular,

the management buildings, there is great order and a cleanliness that is difficult to achieve in a company that processes sheet metal: "It was my mother's obsession and we always have kept the place clean".

IMPORTANCE TO HUMAN RESOURCES AND INVESTMENT

Before going into the production techniques used by IMPEA, the central question of our visit, we ask our interlocutor: "How have you endured the long current crisis that began in 2009?" His reply: "After changing the business address, which was what my mother wanted, we have to a great extent overcome it by manufacturing hoods and fenders for tractors and we started to move our production towards the use of cold formed sheet metal in the production of tanks, decks and cabins for other construction equipment. After the crisis in 2009 we had a drop in revenue of about 30%, but we did not lose heart. Firstly, we must say that we have not lost any of our 60 employees." We ask him why he uses the word "lost." "To lose one of our staff

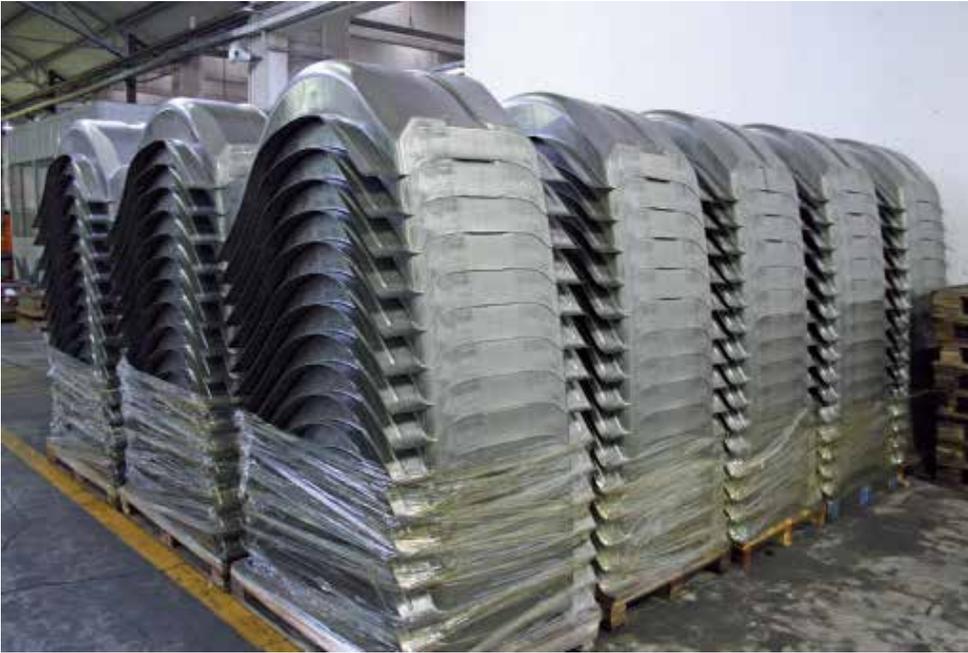
for us means to lose the skills that we have created with hard work and our company is based on the expertise of our staff that we hold dear. Returning to the previous question, I must say that, as we have been doing all these years, we have renewed our production, adding command and control pedals, shelves and other accessories to the products we make to create more added value in the components made: if demand decreases, we try to increase the value of our product. Finally, being able to work with our own money, with the profits being continually reinvested, and therefore being free from pressures from banks, we invested in new technologies in order to make our products better and with lower costs." Let's have a closer look at these investments.

THE PRESSES AND LASER

"IMPEA naturally has a large fleet of mechanical and hydraulic presses with different forming pressures. These presses ensure high quality in cold forming sheet metal, also to achieve constructive details with complex shapes. The high power

Presses for moulding the sheet metal to create the components produced by IMPEA. Normally the corresponding moulds are provided by customers. (Lasertec photo)





Examples of left and right fenders for tractors, pressed simultaneously in IMPEA. (Lasertec photo)

of the presses, which reaches up to 1200 tons, even allows sheet metal with large dimensions to be moulded." Our interlocutor tells us, giving us a thorough tour through the large production area. We note that beside the large moulding presses, there are numerous small presses needed to make small parts. The moulds are usually provided by different customers. At this point, we ask how the printed material is then trimmed. Mr. Bosisio replies: "When we were dealing with large lots, the moulded sheets were trimmed with cutting dies, repeated if there were any

undercuts present. All this was found to be excessively expensive when the number of pieces per lot is reduced. Towards the end of the last century, we switched to using robotic cuts with plasma torches. The quality of the cut was not optimal, but the system was economical and above all very flexible." We ask our interlocutor why he did not immediately turn to laser cutting. The response is: "I said earlier that we work

Chain of small presses for moulding small components. Some of these components are made starting from pieces cut by laser. (Lasertec photo)

with our own money, but of course it must be managed wisely, and the purchase of a laser system for 3D cutting seemed a bit risky, as we believed this technology was still too new. We made in 2006 this step by purchasing a contemporary Rapido (Quick) system for 3D processing and a Platino (Platinum) system for 2D processing. Both systems were equipped with 3000 W CO₂ springs. You see, once we were convinced of the advantages and cost-effectiveness of this new technology, we immediately purchased two machines." Curious, we ask why even purchase one system for cutting flat sheet metal. "First of all, I have to say that we decided to turn to Prima Industrie because it is an Italian company, and because we appreciated the quality of the systems. The machine for 2D laser cutting was purchased for many reasons: the first is the fact that in the structure of a hood, there are many special planes; the second reason comes from our need to make prototype pieces quickly. In both cases, laser cutting allowed us to make big savings on the moulds". We ask Mr. Bosisio if there have been difficulties in introducing laser technology to the company. "When we bought the two systems, laser cutting technology had already become a part of the industrial world. I can say that we did not have great difficulties in integrating them into our production, but rather in finding staff who could work properly with the Rapido





Grinding of components of a tractor cabin. (Lasertec photo)



Vision of the front frame of a tractor with control foot switch. (Lasertec photo)

system, a machine that required the cutting path to be programmed through self-learning. Certainly the experience that we had with robotic plasma cutting units has been helpful in this regard. To largely overcome to this problem and to be able to meet the production requirements in 2011, we purchased a second Evoluzione2 version Rapido unit (still in the "split cabin" configuration with the volume of work

divided into two, so that it is possible to work interchangeably from one part, while in the other the operator loads and unloads the pieces), equipped with the possibility to simply and quickly generate and control the entire cutting path starting from the mathematical models of the workpiece". Mr. Andrea Porta, Area Manager of Prima Power, explains to us: "Of course, the machine continues to grant the possibility

of programming through self-learning. This operation was facilitated with the use of a portable handbox with large screen and graphical interface. It should also be noted that this model has other interesting improvements: predictive trajectory control with speed optimized according to the desired accuracy; the use of direct motors and transducers with high dynamics (1.4 g acceleration and speed of 175 m/min in the trajectory) and great precision, zero backlash and low maintenance. The system has a C axis for adaptive tracking of the workpiece surface with a very high dynamic (4g of acceleration, on a stroke of ± 10 mm)."

IN STEP WITH THE EVOLUTION OF MACHINES

Mr. Bosisio enthusiastically resumes his presentation: "In 2012, we replaced the old system with a next-generation model with Compact Server device for loading/unloading sheet metal starting from pack." Mr. Porta intervenes to outline the improvements compared to the old model: "With the new Platino we decided to adapt the structure to the solutions already in our Zaphiro unit, our flagship model for 2D cutting. The focusing head has also been derived from that used in the Zaphiro unit: with the rapid change of the lens-holder drawers with pre-centred units, with the SIP anti collision magnetic system, with the optional automatic nozzle exchange system, with the Automatic quick calibration device (Optical Precision Control - OPC) and cleaning of the end surface of the nozzle and of course with the assistance of the capacitive sensor for controlling the distance from the surface to be cut". Mr. Bosisio this time is much more concise: "Two machines that are very innovative compared to previous models." We note that these two new models use CO₂ springs produced by the subsidiary Convergent Lasers (belonging to Prima Electro, Prima Industrie group) with a power of 4 kW and we ask why the company, since they mainly operate with thin sheet metal, has not required the use of

On the right side you can see the 2D Platino laser cutting system; in the background the system Rapido Evoluzione2 for trimming 3D components in IMPEA. (Lasertec photo)



new fibre sources that would have required lower operating costs and maintenance with the same performance. The owner of IMPEA responds: "We have examined the possibility that Prima Industrie offered us but we preferred to wait until this solution is better established, normally we are very reluctant to introduce "new" solutions, but when they have proved their worth we have always acted quickly in introducing them to our production environment." At this point, Mr. Porta notes that the new Rapido and Platino models use the same P30L control, developed and manufactured by Prima Electro, a Prima Industrie company. Mr. Bosisio tells us about it: "This condition has been of paramount importance for us as it allows us to easily move a piece from one machine to another, without having to train personnel on different programming languages, to simplify the order of the spare parts". Undoubtedly, this condition seems to be very important to us, especially for the last two points mentioned by our interlocutor. Mr. Porta then integrates what has been said: "Our new innovative control has other general characteristics. First, it is installed on an industrial PC and therefore is easy to use; it allows new work to be prepared, even while the machine is carrying out another task; it possesses a broad base of technological cutting parameters that can be modified continuously to adapt them to new situations or new materials".

Example of processing of an IMPEA component with the Platino system: on the right the incoming component, on the left the component cut with the laser. (Lasertec photo)



AT THE FOREFRONT EVEN IN QUALITY CONTROL

The visit of the company's production section was found to be of great interest since it showed the degree of production and technological innovation. We observe the most interesting thing of all as we return towards the entrance to the production area, in an area just in front of the showroom where some products made by different tractor manufacturers are grouped together. In this department there is a Faro Cam2 measurement system for dimensional control of the machined pieces. Mr. Bosisio tells us about it: "It's

The Engineer Mr. Bosisio, owner of IMPEA, at the Rapido Evoluzione2 cutting station. (Lasertec photo)



FaroCam2Lasersystemformeasurementandcontrol in use at the company IMPEA for examining the accuracy of the components produced. (Lasertec photo)

a system we use to verify the accuracy of our work and it has become an important tool to certify the quality level of our prototypes and have the approval of the customer to make the corresponding product. During production, pieces are chosen at random and further tested to verify that the required accuracy is maintained." Unthinkable that these controls were used for the production of fenders and hoods for tractors. ■