



*JOB SHOP*

## ***THE CHARM OF THE CHALLENGE***

### **SAG TUBI**

Established as a small-size metal fabrication shop specializing in the end forming and welding of tubes intended for FIAT Trattori, SAG Tubi has evolved into an industrial group employing over 1,000 workers and including a dozen companies that operate in several fields (e.g. automotive, ship building). SAG Tubi has, from the very start, closely collaborated with BLM GROUP, from which they have recently purchased a Laser LT-FREE system used for laser cutting curved tubes.

statement about the company established by Mr. Giuseppe Zini as a mere artisan enterprise and converted, in the course of time, into an industrial group by his son Walter Zini: the group, highly renowned both in Italy and abroad, specializes in fabricating tubes intended for the automotive industry.

Mr. Giuseppe Zini established the business in 1969: by that time, he was a qualified welder and had gained extensive technical experience (including a previous stay in Sweden, where he had worked as a welder at shipyards). He started welding hydraulic tubes intended for FIAT Trattori, in Modena (Italy) and soon established, by purchasing a B40 tube bending machine, a business relationship with BLM GROUP, such a relationship having grown until the present day.

Walter Zini (i.e. the company founder's son) joined the business in 1984 and promoted a company expansion policy that led to a number of subsequent acquisitions which enabled the company itself to reach the current size. "Following the global crisis that started 2009, we packed up our bags and left," Mr. Zini explained. This resulted in a great success, since the Group now consists of nine companies with over 1,000 employees and a consolidated turnover equal to € 96 mln in 2015, i.e. the Group has more than doubled its pre-financial crisis (i.e. 2008) turnover and has experienced a steady growth.

The Group's companies include ANSA, the well-known exhaust manufacturer that has been acquired and renovated. "We only manufactured tubes, so we were a minor player in the exhaust system process. If you deal with mufflers, you deal with the entire process, and the people at Ansa are capable of designing any type of muffler," Mr. Zini commented. UNIFER manufactures drilled exhaust baffles for mufflers and supplies them to the main manufacturers of automotive exhaust systems. Sagom Rubber manufactures molded rubber items. SAG Tools manufactures the control gauges and tools needed for all the machines produced by the Group. UNIFER Navale manufactures nautical tubing and has therefore expanded the business opportunities to this sector. Finally, SAG Tubi AIT (Advanced Insulation Technology), a company manufacturing

tube and pipe insulating items, is being acquired, considering that the tube and pipe insulation sector is becoming more and more important worldwide.

“We make 12,000 parts per day of bent, shaped, welded and coated tubes, to be supplied to very demanding customers that operate in many industrial sectors: automotive, trucks, earthmover piping, fork-lift trucks, farming machines (40-45% of the total turnover), sports vehicle, motorcycles and earthmovers. About 50% of our turnover originates in Italy and our customers include FIAT (which accounts for 60% of the turnover), SAME and Caterpillar.

The group’s companies boast extensive know-how and a wide range of tubing products, i.e. from the mixed hydraulic tubes intended for low and high pressures uses to the comple exhaust systems with shields and insulation, mounting hardware, automotive cooling pipes and baffled muffler pipes. “We like to stick our nose in all sectors’ design, from the brake piping to the cooling systems intended for large-sized engines. Thanks to the experience gained in the past, we can propose solutions and provide technological support to companies, if required , for both hydraulics and the exhaust systems. For instance, we have recently visited Rotax, a company that manufactures ultralight aircraft and suggested that they should bend their exhaust tubes instead of welding them”.

As far as production systems are concerned, we have already pointed out that the business relationship with BLM GROUP were established a long time ago. When walking along the corridors of the Novellara plant, we felt as if we were visiting a BLM GROUP showroom, due to the number of bending and end-forming systems installed there. Mr. Giuseppe Zini had started by bending the hydraulic pipes and tubes used tractors (which feature a diameter of up to 30-35 mm) by using a BLM B40 machine; then, he purchased a B90 machine in order to bend the larger tubes and pipes intended for cooling systems. Next, more sophisticated machines became available to Mr. Zini’s company, i.e. the E-BEND90 multiple-radius machine, which



allowed Mr. Zini to bend an item made of aluminium and featuring a diameter of 114 mm, the AST machines used for head end-forming, the E-TURN and ELECT machines. Yet, it would take too much time to evend briefly describe the results achieved by SAG Tubi by making use of the bending and end-forming machines supplied by BLM GROUP.

“We were probably the first company that made use of the ELECT150 machine,” Mr. Zini recalled. “Today we can achieve outstanding results using that model of tube bender: for instance, a few days ago we bent a curve featuring a 123 mm radius on a tube featuring a diameter of 129 mm, the final result was excellent! But you have, as a company, progressed much further and this machine should be replaced today, since the new tube pushing techniques you have implemented make it possible to also reduce the amount of scrap”.

**“Regarding tube bending, the technological landmark was the introduction of electric machines,” Mr. Zini explained. “Hydraulic machines posed some problems especially because they did not make it possible to bend certain radii. When BLM GROUP launched the first fully electric machines, we replaced all our bending systems in just a few years, since the advantages given by the electric machines were huge. Today we can bend tubes with 1D BEND RADIUS, even in case of large diameters, e.g. 139 mm (thickness: 1.5).**





To do this, you will certainly need the ‘right’ machine complete with the latest software and all electric axes control. At the same time, extensive experience is an essential requirement: you have to understand how to bend difficult materials. Then you have to bend ... and the tube breaks in the end. Money cannot buy this know-how: you have to gain extensive experience, you cannot buy it!”.

The latest purchase is, however, different: it refers to a 5-axis laser system used to cut end-formed parts, i.e. the newly-designed LT-FREE model that has drawn Mr. Zini’s attention. “We got the LT-FREE machine in September 2015. An excellent piece of machinery, yet we still have to ‘play’ with it in order to make the best use of it. The 3D laser technology is a recent entry in the marketplace, especially as regards tubes and we mainly cut curved tubes.” As a matter of fact, the LT-FREE is a 5-axis system designed to machine both the conventional hydroformed, drawn components and the curved tubes. The availability of robots to handle the parts ensures a degree of flexibility that could not be conceived of in other systems of this kind.

SAG Tubi did already have a laser machine available to cut the tubes, yet it was quite simple and not very flexible. “That machine posed some limitations: sometimes we had to move a tube from one template to another one, to be able to finish the tube.

**We make about 250 different parts each month, which feature diameters ranging from 4 mm to 150 mm, so we needed an extremely flexible system”.**

“When I first saw the LT-FREE machine three years ago, I quickly realized that it would be the perfect solution for the tubes we machined, i.e. quite complex tubes with complex cut patterns. By combining the five axes of the fiber laser head with the six axes of the robot, the system’s flexibility can be guaranteed. Two work cells are available, which means that you can work in one cell while loading the other cell, in a very efficient way. The fiber laser device takes care of the rest, working at a speed that is nearly twice the speed reached by the CO2-based devices. It follows, as a matter of fact, that we have halved the processing time on some types of tubes,” Mr. Zini stated. “The advantage given by the laser system mainly depends on the operations to be performed on the tube; for example, if you only have to trim, other solutions are available (they are not so fast but they are likely to be cheaper). However, if you have to make several

cuts and drill holes of different size and shape – and if you consider the quality of the part – then the laser technology has no rivals. We started machining the parts from the greatest production volumes; yet, we are now transferring the entire production to the laser system, also because we have found significant advantages from the logistic viewpoint, in addition to the cutting process speed”.

Finally, we asked Mr. Walter Zini what the strength of the SAG Tubi Group was. He replied that he can rely on the workers’ passion and dedication to their job, adding that he can rely on extensive technical experience gained in the workshop during many years. “I inherited my passion for mechanics from my father. When I was a child, I liked to visit the factory, after I had been at school, and learn to weld and machine the metal tubes”. Then Mr. Zini told a story that reveals what is probably the secret of his own success: “I have always been drawn to challenges: some time ago we had to make a very difficult curved tube, everyone said the tube could not be bent and suggested that two welded shells should be used instead. Well, I started working, together with production manager Mr. Italo Deda, on the BLM GROUP’s tube bending machine, and in the end managed to get the finished tube!”.

50%  
reduction  
of production times

## TUBE TECHNOLOGY

The integration of the BLM GROUP’s products (i.e. tube bending machines, tube end-forming machines, laser systems) with one another, resulting in a full manufacturing processes. This marriage helps optimize a production line, by simplifying or eliminating the material handling between manufacturing operations and eliminating work in process inventories and its related floor space. This is the case with the exhaust tip which is bent on an E-TURN52 system, end-formed to expanding one tube end by means of the AST-L system and laser-machined on the LT-FREE 5-axis system.

