



# Forming, bending and welding stainless steel half pipe profiles on the tanks

Imcar proposes an automated construction technology of the entire tanks, or parts of them, moreover designs and manufactures the heat exchange system for cooling.

By Clara Biancardi

**A**mong the many machines used in the construction of the entire tank there is the Full Automatic Half Pipe Forming, Bending and Welding Technology, a system designed by Imcar to specifically manufacture the heat exchange system for cooling the tanks. As the name suggests, a steel half pipe profile is applied to the tank obtained by forming a

metal profile, which is positioned helically around the tank and welded. The conventional technology for the realization of this cooling system requires many manual operations and therefore a considerable amount of time and money. Just think that a reasonable estimate to carry out such an activity amounts to about two weeks and the use of two specialized operators. Based on these evidences, Imcar has developed an automatic system implemented in both horizontal and vertical configuration, capable of drastically reducing production costs (approximately one day of work and one operator is required), increasing the quality and repeatability of the result. This technology consists of an automated solution for forming, bending and welding stainless steel half pipe profiles directly

on the body of the tank, or on sections of it. The first section of the plant consists of a forming line that shapes the steel profile carried out by the coil in a half pipe, according to the required size and shape, and, at the same time, it bends it on the tank diameter. The profile is thus placed and welded directly on the external surface of the tank (second section of the machine), avoiding the spot welding operation: all while the tank rotates with its own horizontal axis, in the case of horizontal technology, on motorized and idle positioners (third section of the machine), ensuring the continuity of the process. The automatic management of the process parameters (i.e. tank diameter, profile width and step) is implemented by the CNC control, which guarantees a high



Full Automatic Half Pipe Forming, Bending and Welding Technology, a system designed by Imcar.



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repeatability of the process and therefore a constant quality of the results obtained. The two main strengths of this technology are therefore evident: the reduction of production times compared to the traditional process and the increase in the quality of the work. It is a machine that gives its best in the presence of large productions, which do not require constant plant setup. Therefore, in cases where a specific customer requires the construction of a limited number of tank systems with half pipe profile or a high number of different types / sizes, Imcar is able to direct the production and supply to the customer other semi-automatic technologies. In the same way, however, while previously in some cases the choice of the half pipe profile solution was discarded for reasons of higher construction costs in comparison to the jacket one (less efficient), today the situation is reversed thanks to the availability of the Imcar automated technology.

### **From customer to partner**

In order to develop this

automated solution, Imcar has deployed all its expertise and seriousness. In fact, the project started in the form of a collaboration between Imcar and a customer who decided to invest in this concept. This is how the first technological solution took shape and was installed and started up at the same customer. In the meantime, Imcar has started the construction of a second prototype which already had some technological improvements compared to the first. A third version of the machine was then built, equipped with all those precautions made thanks to the feedback from the other two machines installed and operational. Imcar has retrofitted the first prototype by integrating all the improvements developed also thanks to the work done together with the customer/partner, to highlight how a simple customer/supplier relationship can evolve into an activity capable of bringing great satisfaction for everyone. The channel system is not designed in “one size fits all”,

especially since these machines are generally customized on the basis of market needs. For example, one of the characteristic parameters of customization is the surface tolerance of the tank to be processed: in some situations, very irregular surfaces can be found, which leads to a series of technological problems linked above all to the welding operation, which instead requires processing parameters very stringent, and it must necessarily always be carried out respecting specific processing constraints. Therefore, it may be necessary to install an instrumental equipment on board the machine that makes it so personalized. Not only that, it is evident that there cannot be a single machine size that can be adapted to each tank size, if only because, with the variation of the tank dimensions, the weights of the semi-finished products and consequently the structure of the machine itself also change. This has therefore led Imcar to create different sizes of machines to reach everyone satisfaction. ▶