

Olmar autoclaves have been successfully tested by the main certifying companies, passing through the most demanding tests and quality certifications. Recognized companies of automotive, aeronautical and aerospace industries such as Airbus, Boeing or GE have also tested and approved Olmar equipments according to their internal regulations, making the company a world leader manufacturer and a well-known international reference.

These autoclaves for composites can be manufactured in different materials. Carbon steels and austenitic stainless steels under ASME, AD-MERKBLÄTTER, CODAP or PD 5500 international codes are commonly the most used. The appliance of these regulations is critical to supply the equipment fully certified in any country of the world. In Europe, Olmar autoclaves are CE-certified according to the Directive 2014/68/EU.

Every autoclave designed and manufactured by Olmar is fully adapted to each client's needs, from its dimensions (up to 10 meters in diameter and 50 in length) to its smaller elements. The combination of know-how, experience and passion turn Olmar as a worldwide leading company in autoclaves industry, with more than 1,500 international references, a successful past and a promising future.

GRUPO OLMAR



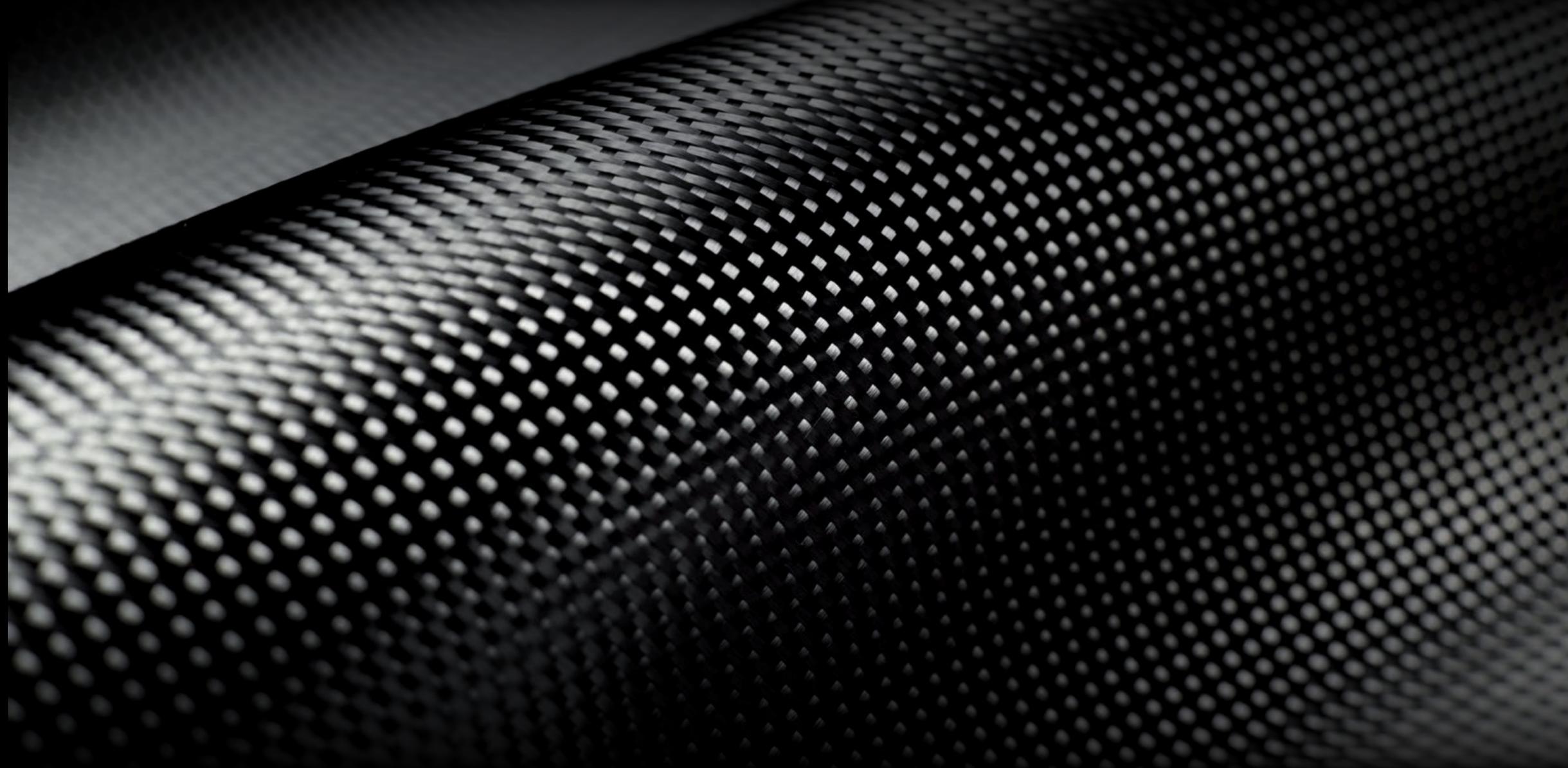
Pol. Industrial de Somonte III
C/ Nicolás Redondo Urbieto
N.º 330. 33393 Gijón (España)
Tel.: +34 985 321 700

PROYECTO COFINANCIADO POR:

- UNION EUROPEA
- PRINCIPADO DE ASTURIAS
- MINISTERIO DE ECONOMÍA Y HACIENDA



Autoclaves COMPOSITES





The fast and constant evolution of the industry together with the recent launch of new materials have led to spectacular advances to any kind of industrial equipments, making them more precise and sophisticated day by day.

Composite materials have experienced a complete upturn in terms of treatment and construction of the equipments related to its manufacturing process. Autoclaves for composites processes are nowadays high-technology machines, able to develop complex cycles that were unthinkable a few years ago.

From automotive to aeronautic and aerospace industries, the main technical sectors are completely involved in the new era of composites materials. Carbon elements, prepreg curing pieces for aeronautic industry or thermoplastic components are now more and more common in several areas, as a clear example of the evolution undergone by these technical sectors in XXI Century.

As a response to these new technical challenges, Olmar offers to its clients the confidence and reliability of a worldwide leading brand with more than 70 years of experience and more than 1,500 international references around the world.

COMPOSITES

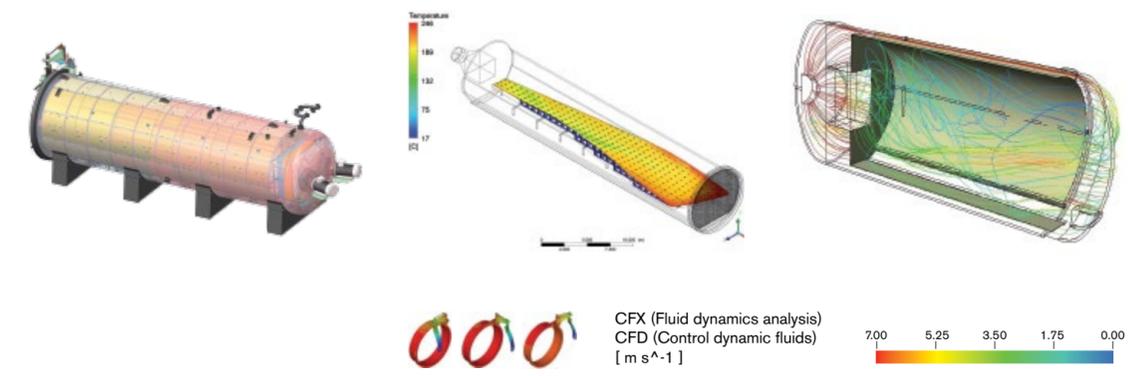
The most advanced technology in Autoclaves Ovens Control systems.



The curing process for composite materials carried out in Olmar autoclaves is totally adapted to each industry. Through the use of Olmar Control System (OCS) it is possible to set all the parameters involved in the cycle (temperature, pressure, vacuum...) and control every single element installed on the autoclave: from the heating system (by means of electrical resistances or thermal oil exchangers) to the cooling exchanger or the electrical fan to move the air into the autoclave. The correct performance of these and other elements is critical to get the homogeneity values requested on each cycle.

The cooling process is performed by the circulation of cold water through an air-water

exchanger. An electrical fan at the rear of the autoclave makes the air pass through this exchanger, causing the fall of the temperature to the established levels. It is also possible to maintain an appropriate level of vacuum on each piece by the use of separate vacuum bags, which are connected to an independent vacuum system. Additionally, the supply of compressed air or Nitrogen by the use of external pressurization systems allows the autoclave to have fully autonomous operation. All the values involved in the process are controlled by thermocouples, pressures sensors and other measuring points connected to the control system, which activates all safety systems in case of failure.



All previously mentioned process is carried out automatically by the use of Olmar's latest version of its control system: Olmar Control System (OCS). This software has been entirely developed by Olmar electrical and software engineers and it is recognized as one of the best control systems on composites sector worldwide, thanks to its exceptional performance, reliability and flexibility.

A modern microprocessor receives the information sent by the picking devices during the cycle, processes it and immediately send the corresponding orders to

the valves and actuators of the autoclave, in order to control the process according to the previously adjusted set-points. It is possible to include inner product sensors to automatically check the temperature and vacuum values during the cycle. These sensors will also notify any possible anomaly in order to correct it and preventing the cycle to be damaged.

Olmar offers to its clients a complete manufacturing service including all kind of accessories for the autoclave: from pressurization to cooling or vacuum systems, hydraulic platforms for loading and un-

loading, adapted trolleys, etc. This flexibility is also applied to the software, which can be adapted to every special requirement of each industry to get the best performance in any situation. Additionally, an experimented after-sales technical team will support any kind of request for spare parts, maintenance or technical problems during the operating life of the equipments, as the final part of the complete service concept that Olmar provides to all of its customers. This full-service philosophy represents a point of differentiation over other competitors and guarantees the excellence of every single project developed by Olmar worldwide.

