STERILIZATION

cGLP Process Equipment for Research
and Microbiological Laboratories

LAB DIVISION

LAST® TECHNOLOGY

Built to last

LAB division

Company

LAST Technology is the worldwide provider for cleaning, decontamination, disinfection and sterilization equipment for the life science & healthcare sectors. **LAST** takes its name from the Italian words "**LA**vaggio" (washing) and "**ST**erilizzazione" (sterilization) combined together with the concept of "**latest**" as the most innovative and newest, and "**lasting**" to describe durability and reliability of its products.

A group of experienced managers incorporated the company in Prata di Pordenone, a town near Venice (Italy). Starting with the idea of a business center of excellence, this young and innovative company is, thanks to the continuous investments in high standards and research, a leader in engineering and manufacturing, designing and developing the most innovative and effective technologies for the improvement of the quality of life of everyone.

STERILIZATION

cGLP Process Equipment for Research and Microbiological Laboratories

LAB division

LAST Technology's LAB Division was developed to provide research and development laboratories of Life Sciences with the highest quality washing, decontamination, disinfection and sterilization equipment. The devices are developed to ensure the safe treatment of contaminated and dirty material to prevent from infections in laboratory environments. Higher performances with lower consumptions and reduced footprint dimensions to fit in every research department. Innovative design and process reliability, user-friendly solutions and many available accessories is what makes the difference in LAST Technology's products.

NEBULA is the Series of LAB steam sterilizers developed by LAST technology. The state of the art of the sterilization machineries is guaranteed by their modular design, high efficiency, high-ended finishing and tailored-made loading accessories.

The perfect sterilization and decontamination process

NEBULA

cGLP Steam Autoclaves

Designed for

The Autoclaves type **NEBULA** are designed for sterilization by saturated steam of heat-resistant and moisture-stable materials such as metal parts, plastic and rubber components, liquids in sealed or vented containers, clothes, etc.

Comply to

- Quality Management **(ISO 9001:2015)**
- Current Good Laboratory Practice **(cGLP)**
- US Food and drug Administration **(FDA)**
- Code of Federal Regulation Title 21 **(FDA 21 CFR part 211 and 212)**
- Code of Federal Regulation Title 21 **(FDA 21 CFR part 11)**
- Sterilization, Steam Sterilizers, Large Capacities **(EN 285:2006+A2:2009)**
- Pressure vessels standards
  (97/23/EC or **ASME code Sec. VIII Div. 1** or **Chinese GB 150)**
- Safety Requirements for Electrical Equipment **(IEC 61010-1:2010)**
- Safety Requirements for Electrical Equipment **(IEC 61010-2-040:2015)**
- EMC Directive **(IEC 61326-1:2013)**
- Governing directives for affixing the **CE** mark – machinery directive **(2006/42/EC)**
- Underwriters Laboratories **(UL)**
- Canadian Standards Association **(CSA)**
- Occupational Safety and Health Administration **(OSHA)**

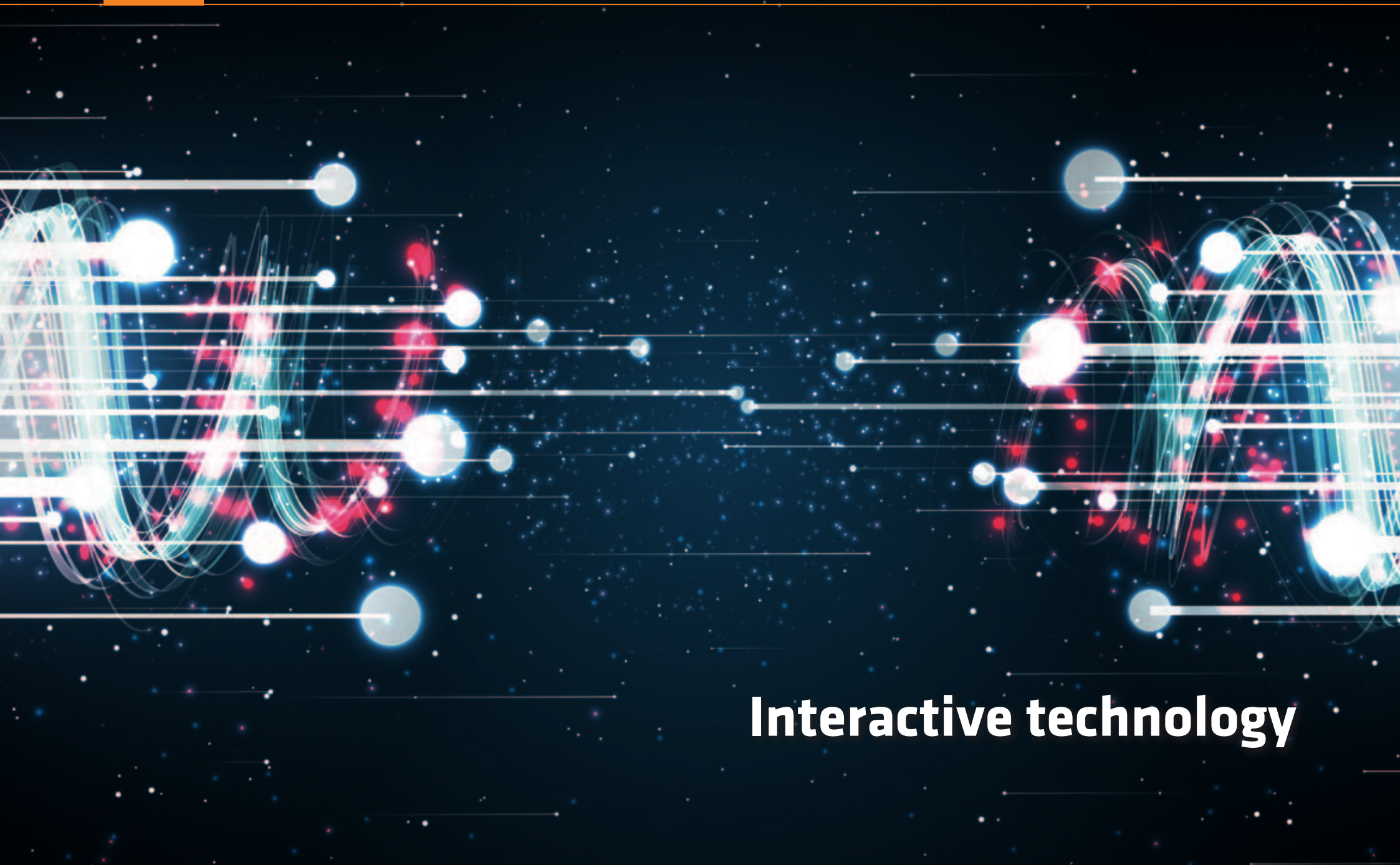
Heavy-duty modular design

NEBULA

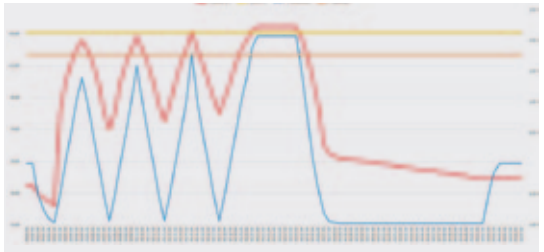
cGLP Steam Autoclaves

Solid Construction

- Rectangular cross section chambers of double-wall type made of 316L or 316Ti stainless steel
- Full-jacket of dimple welded type made of 304 or 316L/316Ti stainless steel
- Piping completely made in 316L and 304 stainless steel
- Product contact surfaces mechanically polished to a degree of roughness below 1 micron (40 micro inches)
- Chamber doors of automatic vertical or side sliding type
- Chamber-door sealing by pneumatically pressurized gasket (by process air)
- Components and instruments made of 316L/316Ti/304 stainless steel and FDA approved elastomer (21 CFR part 177)
- Chamber, doors, piping, components and instruments are properly insulated by an advanced type material
- Areas separation by means of bio-seal frame (BSL 3 and BSL 4) made of 304 or 316L/316Ti stainless steel
- Bio-seal flange for ducting to a VHP isolator
- Ergonomic product loading of manual or full-automatic type
- Floor or above the floor loading solution

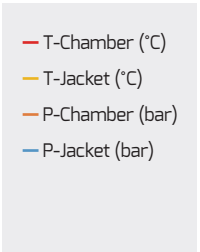


Interactive technology



Bowie & Dick - Helix Test

Liquid Cycle



Process Features

Pre-selected and custom-made programs for any need. The machine process is developed by our Automation Department following the current codes/standards and type of product to be processed. Vacuum or Pressure leak test, Bowie & Dick test, Helix test, Filter sterilization and integrity test, Program for dry goods and porous loads, Program for liquids in vented containers, Program for liquids in sealed containers, Program for high sensitive products (filters), Decontamination cycle following BSL3 and BSL4, etc. The steam is injected into the chamber through a PID controlled valve and the condensate is continuously evacuated through the drain for guaranteeing an excellent distribution of the heat during all sterilization phase (temperature deviation below ± 0.4 °C).

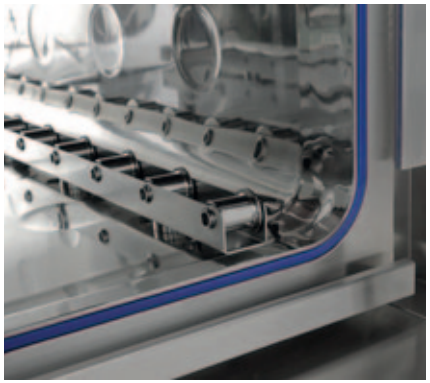
Supervision, Traceability and Control System

Machines automated by a Programmable Logic Controllers (PLC) which guarantee high level reliability. The Human Machine Interface (HMI) is guaranteed by a touch screen Industrial Computer (PC). A PID based control manage all machine parameters, recipes, settings, sequence of operations, and their storage. The brand commonly used for hardware and software are Siemens, Allen Bradley and Asem.

Remote Control

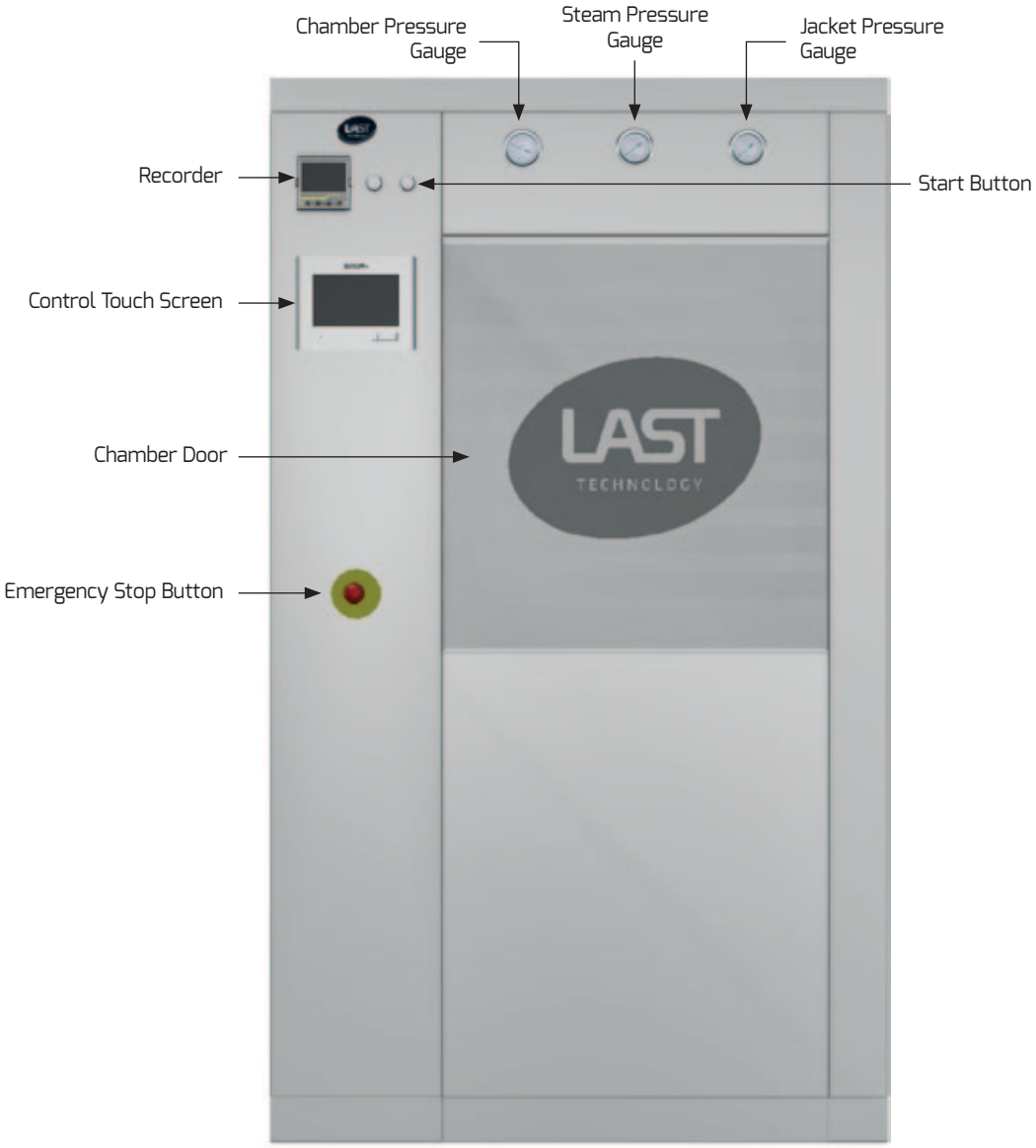
All machines are equipped with a software for a remote control. The application can be installed in any iOS and Android devices. The system allows the remote control of the machines via wireless connection. Operators do not need any longer to be in the same room of the machine to control the progress of the cycle, they will get a notification for any problem with the machine. Multiple number of machines can be controlled through this simple APP from a single source (device).

Fully integrated solutions



Product Handling System

- Possibility to choose between manual or full automatic product loading systems, both developed in order to ensure the highest ergonomic standards considering the height and weight of the loads.
- The cart system is of multi-level type according to products that need to be processed.
- Transport trolleys for the movement of the carts can be of fixed or variable height.
- An automatic feed-in and feed-out system can be provided to make the movement of heavy loads/carts easier.
- Tailored-made solution of lading trolleys to meet any customer demand in term of different products to be loaded.


Chamber Pressure Gauge
Steam Pressure Gauge
Jacket Pressure Gauge
Recorder
Start Button
Control Touch Screen
Chamber Door
Emergency Stop Button
LAST
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a
b
c
d
e
f

Type NEBULA Steam Autoclaves - doors of vertical or side sliding type

Type	Chamber Dimensions (mm - inches)			Capacity (litres / cu. ft.)	Overall Dimensions (mm - inches)		
	Width (a)	Height (b)	Lenght (c)		Width (d)	Height (e)	Lenght (f)
NEBULA 150	350 / 14	700 / 27.5	680 / 27	150 / 5	1040 / 41	1900 / 75	1000 / 39
NEBULA 250	350 / 14	700 / 27.5	980 / 38.5	250 / 9	1040 / 41	1900 / 75	1300 / 51
NEBULA 300	650 / 25.5	700 / 27.5	680 / 27	300 / 10.5	1340 / 53	1900 / 75	1000 / 39
NEBULA 450	650 / 25.5	700 / 27.5	980 / 38.5	450 / 16	1340 / 53	1900 / 75	1300 / 51
NEBULA 550	650 / 25.5	700 / 27.5	1280 / 50.5	550 / 19	1100 / 43	1900 / 75	1600 / 63
NEBULA 650	950 / 37.5	700 / 27.5	980 / 38.5	650 / 23	1640 / 64.5	1900 / 75	1300 / 51
NEBULA 850	950 / 37.5	700 / 27.5	1280 / 50.5	850 / 33.5	1400 / 55	1900 / 75	1600 / 63
NEBULA 1000	950 / 37.5	700 / 27.5	1580 / 62	1000 / 39.5	1400 / 55	1900 / 75	1900 / 75
NEBULA 1250	950 / 37.5	700 / 27.5	1880 / 74	1250 / 49	1400 / 55	1900 / 75	2200 / 86.5
NEBULA 1500	975 / 38	1400 / 55	1280 / 50.5	1500 / 52.5	2800 / 110	2200 / 86.5	1760 / 69.5
NEBULA 2000	975 / 38	1400 / 55	1580 / 62	2000 / 70	2800 / 110	2200 / 86.5	2060 / 81
NEBULA 2500	975 / 38	1400 / 55	2180 / 86	2500 / 87.5	2800 / 110	2200 / 86.5	2660 / 105
NEBULA 2850	975 / 38	1900 / 75	1580 / 62	2850 / 100	2800 / 110	2800 / 110	2060 / 81
NEBULA 3400	975 / 38	1900 / 75	1880 / 74	3400 / 119	2800 / 110	2800 / 110	2360 / 93
NEBULA 4000	975 / 38	1900 / 75	2180 / 86	4000 / 140	2800 / 110	2800 / 110	2660 / 105
NEBULA 5000	1250 / 49	2200 / 86.5	1880 / 74	5000 / 175	3450 / 136	3000 / 118	2360 / 93
NEBULA 6000	1250 / 49	2200 / 86.5	2180 / 86	6000 / 210	3450 / 136	3000 / 118	2660 / 105
NEBULA 6800	1250 / 49	2200 / 86.5	2480 / 98	6800 / 238	3450 / 136	3000 / 118	2960 / 116.5


Be green. Be Smart

Sustainability

Concentrating on environmental sustainability as a differentiation feature of the company is an informed decision of LAST, which is in fact convinced and conscious that the attention towards environmental issues can lead to substantial economic benefits in the medium-long term.
The company's decision to invest in human capital highly qualified in the technical-engineering field, and in research projects to develop new equipment and improve their performance in energy and water consumption terms, embodies LAST's idea of being green and considering the environment as an opportunity to grow.

Activities, Services and Documentation

From the User Requirement Specification (URS) to the machine Qualification, LAST provides extensive documentation and services for supporting all steps of the project as per the internal operating procedures and flow diagram:

- Analysis of URS and reexamination of feasibility
- Project Plan (Gantt)
- Quality Plan (QP)
- Document Qualification (DQ) including P&ID, lay out drawing (GAD), Utility Interface Agreement (UIA), Software Interface Agreement (SIA), Electrical Diagram (ED), Pneumatic Diagram (PD), Bill of materials/ components (BOM), Functional Design Specification (FDS), Software Design Specification (SDS), Hardware Design Specification (HDS), Installation, User and Maintenance Manual (IUMM), Welding Validation Manual (WVM), Machine and software Validation Manual (MSVM).
- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Machine positioning, Installation and Start up
- Installation, operation and performance qualification (IQ, OQ & PQ)
- Training courses
- Program of preventive maintenance
- Spare parts and consumable products

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