

ADVANCED TECHNOLOGY SOLUTIONS FOR THE THERMAL TREATMENT OF COIL / SHEET PRODUCTS IN CONTINUOUS

TO PRODUCE HIGHLY CUSTOMIZED SOLUTIONS
PROCESSES FOR CONTINUOUS PRODUCTION
JUST IN TIME FOR PRODUCTION

CATALOG2019





AN EYE FOR INNOVATION

Thanks to the experience and know-how acquired in years of research and production, in 2018 MIT has launched a new line of machines for heating treatments in continuous roll materials. These machines possess a combination of heating technology infrared / hot air with an innovative heat control with array sensors.

WHO IS MICROGLASS GROUP

MICROGLASS GROUP WAS ESTABLISHED IN 2001 WITH THE AIM TO PRODUCE AND SELL MACHINERY THAT USE INNOVATIVE HEATING PROCESSES THROUGH THE APPLICATION OF ELETTRORADIANTE TECHNOLOGY, SUCH AS MICROWAVES, INFRARED AND ULTRAVIOLET TO IMPROVE PRODUCTION PROCESSES, PARTICULARLY THE EFFICIENCY ENERGY.

MICROGLASS GROUP is mainly composed of **MICROGLASS RESEARCH & DEVELOPMENT** (MIUR accredited laboratory for research, studies, development, design and consulting)

MIT INDUSTRIES Technology Made In Italy (for manufacturing and selling machinery and equipment and maintenance services).

CUSTOMER SUPPORT Our dedicated staff is available to our customers to solve any problems with our machines. In addition, our specialized staff provides to all our customers free training sessions on how to use our machines.

WHY INVESTMENT IN MIT TECHNOLOGY

HIGH LEVEL OF EXPERTISE with 20 years of experience in industrial heat treatments, we have developed a specific knowledge constantly supported by Microglass research center.

CORE BUSINESS Among the specific activities of the industry, the MIT is responsible to provide machines and systems for the thermal treatment of materials.

- Mechanical Handling
- Thermal Handling
- chemical Handling

Systems of vacuum environment in multi-technology heating or overpressure, with single or technology combined with other sources such as microwaves, infrared and ultraviolet, hot air, or cold environment.

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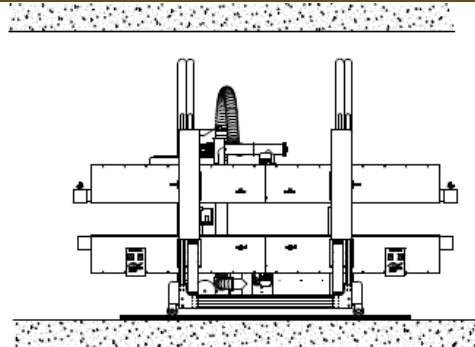
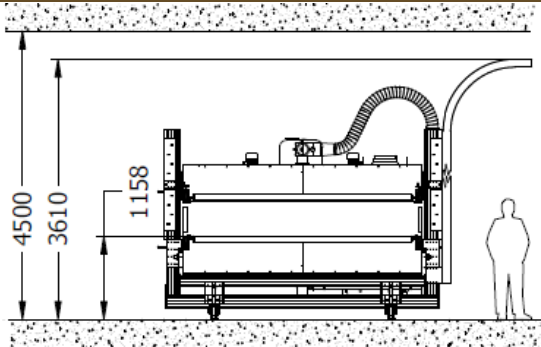


CONFLOW is an oven for infrared Microred® industrial use that processes materials in a continuous manner for drying, heating or detensioning extruded in a continuous or in coil products.

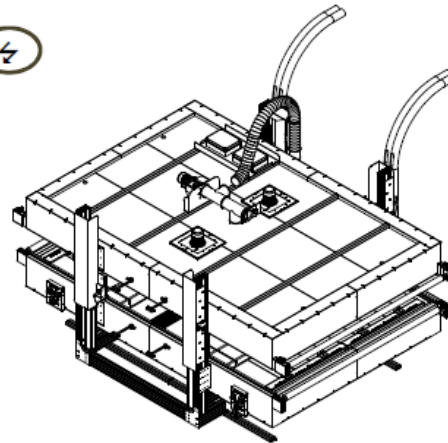
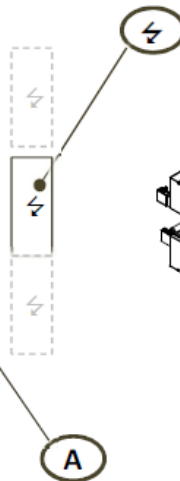
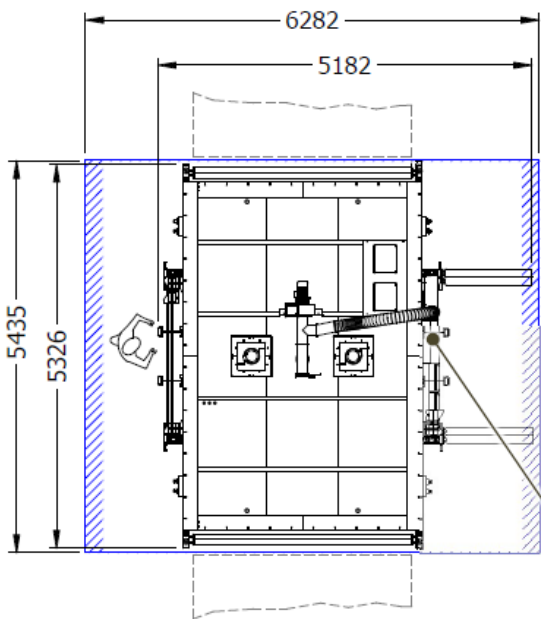
CONFLOW It is a machine that is integrated in a production line and consists of:

- ✓ a stainless steel frame for a higher resistance in time,
- ✓ thermal infrared sources combined Microred® and electrical resistors,
- ✓ ventilation system for energy recovery and thermal homogeneity;
- ✓ system for thermal insulation high efficiency;
- ✓ system for sliding of the film;
- ✓ sensors of highly efficient and innovative temperature (via thermal sensor array);
- ✓ Touch screen control panel with management Industry 4.0.

For sheets of maximum width 2800mm and thickness of 1 ÷ 11 mm

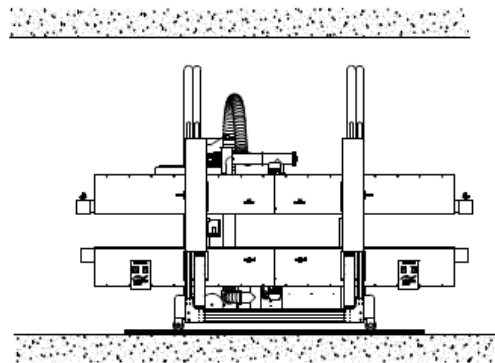
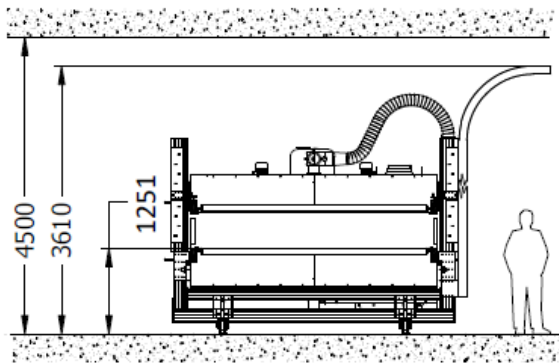



Minimum installation area

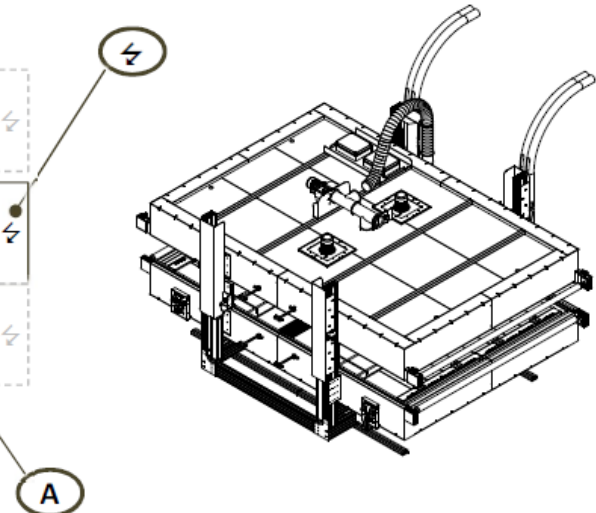
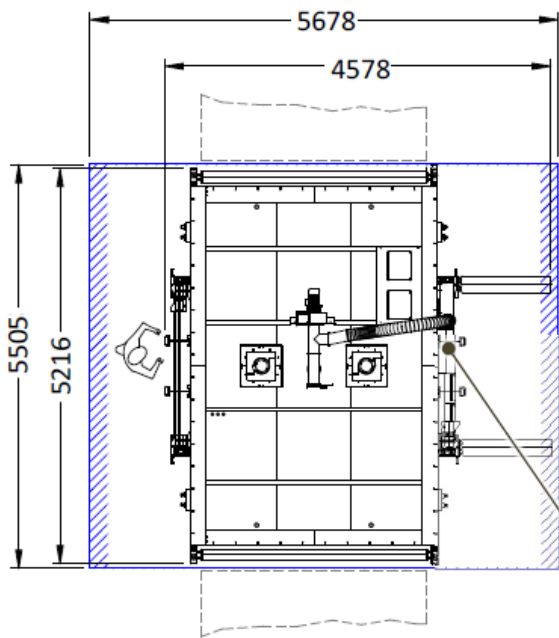


dimensions		Supply		consumption	
Description	measurement	Description	measurement	Description	measurement
Minimum installation area Length	5615 mm	Power supply voltage of electrical equipment	3 / N / PE / 400V 50Hz +/- 4%	Power recirculation fans	4.4 kW
Minimum installation Area Width	6282 mm	Supply frequency	50 Hz	suction Power	1.1 kW
Minimum installation area Height	4500 mm	Type of connection to earth (IEC 60364-3)	TN-S	preheating Power resistors	72 kW
maximum machine length	5326 mm	Supply voltage of the auxiliary circuits	110VAC - 24 VDC +/- 10%	IR Power	96.5 kW
Maximum Machine Width (cabinet)	5182 mm	Supply pressure AIR	0.6 MPa (6 bar)	total installed power	174 kW
Maximum Height of machine	3610 mm			compressed air	20 NL / min
Height transport plan	1158 mm adjustable				
Mass		Performance			
Description	measurement	Description	measurement	Description	measurement
Machine	4500 kg	Speed of the film is moving	1.3 ÷ 17.4 m / min.	Speed of maximum ascent / descent hood	10 mm / s
Electrical cabinet	300 kg	maximum internal oven temperature	130 ° C		

For sheets of maximum width 2200mm and thickness of 1 ÷ 11 mm



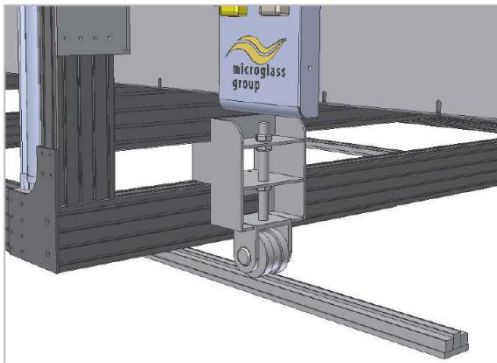
 Minimum installation area



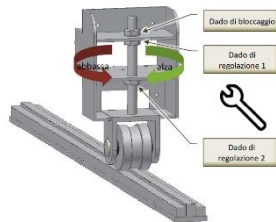
dimensions		Supply		consumption	
Description	measurement	Description	measurement	Description	measurement
Minimum installation area Length	5505 mm	Power supply voltage of electrical equipment	3 / N / PE / 400V 50Hz +/- 4%	Power recirculation fans	4.4 kW
Minimum installation Area Width	5678 mm	Supply frequency	50 Hz	suction Power	1.1 kW
Minimum installation area Height	4500 mm	Type of connection to earth (IEC 60364-3)	TN-S	preheating Power resistors	72 kW
maximum machine length	5216 mm	Supply voltage of the auxiliary circuits	110VAC - 24 VDC +/- 10%	IR Power	93.5 kW
Maximum Machine Width (cabinet)	4578 mm	Supply pressure AIR	0.6 MPa (6 bar)	total installed power	171 kW
Maximum Height of machine	3610 mm			compressed air	20 NL / min
Height transport plan	1251 mm adjustable				
Mass		Performance			
Description	measurement	Description	measurement	Description	measurement
Machine	4500 kg	Speed of the film is moving	1.3 ÷ 17.4 m / min.	Speed of maximum ascent / descent hood	10 mm / s
Electrical cabinet	300 kg	maximum internal oven temperature	130 ° C		

STRUCTURE

The structure of the machine is constituted by a movable carriage, made with cross pieces and uprights in extruded aluminium.



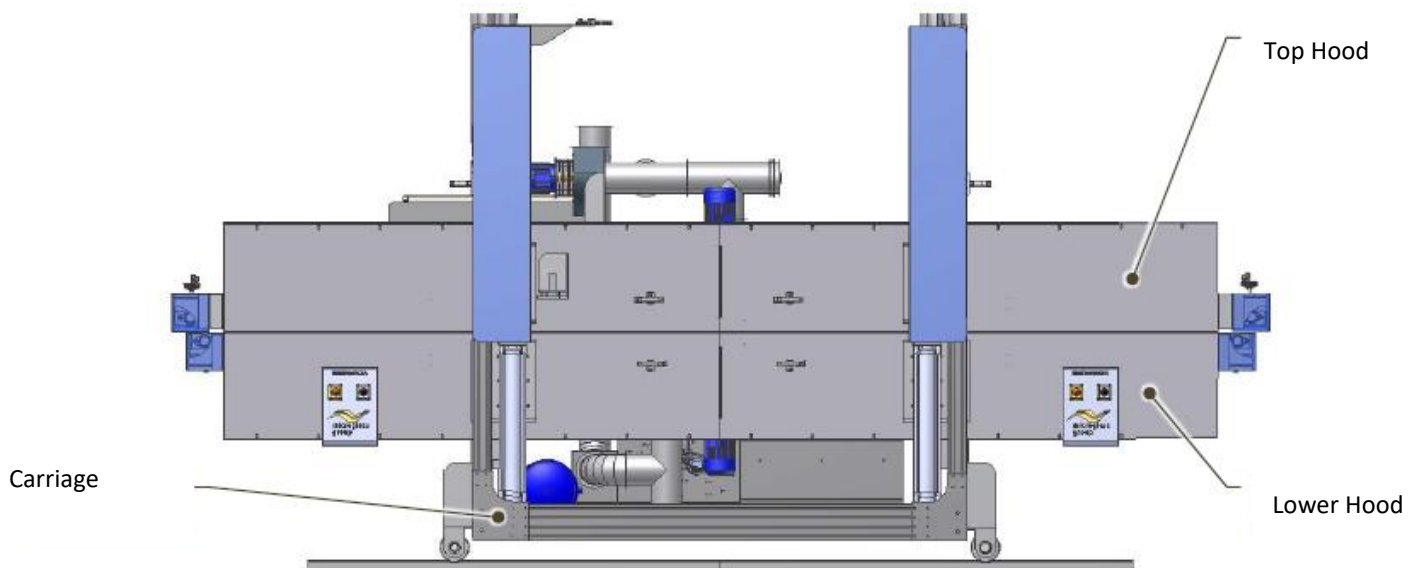
In the lower part of the tank are installed steel wheels which allow the oven displacement on rails.



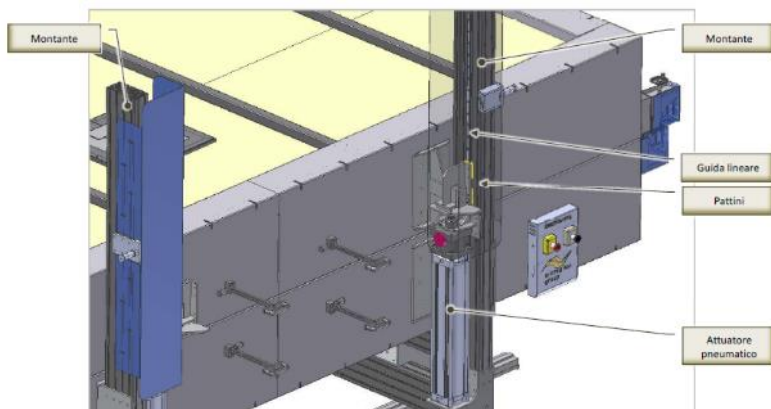
The wheels also implement the control system of the heights of the treatment chamber, and then the sliding of the film plane.

On the wagon is assured a fixed frame, made with profiles and sheets pressopiegate steel. This frame, also called the lower hood, is designed to allow housing IR radiating plates and at the same time the heated air recirculation.

The lower hood is contrasted by another similar one, upper hood call. Unlike the first, this hood has a chance to move vertically, in this way operations are facilitated the passage of the film or maintenance.



The upper hood is mechanically connected to the structural uprights of the oven. The ability to vertical movement is obtained by coupling shoes and linear sliding guides. The movement is obtained through the activation of four pneumatic actuators fixed to the uprights themselves.



For security reasons, the command for the movements of the upper hood is placed at a certain distance from the hood and is made directly from operator by means of a hand control.

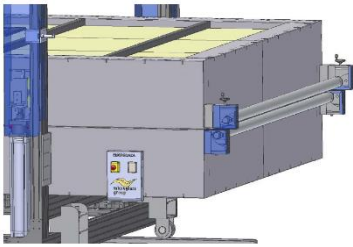
In addition, in order to prevent an unexpected lowering of the upper hood due to failure or lack of energy source specific safety devices have been installed

TRANSPORT SYSTEM

The machine provides that the plastic film to be treated is driven in a constant manner and planar from an external drive source (not included in delivery). They contribute to advancement of the film two pairs of idle rollers partially opposed and placed all input and output of the furnace: a lower fixed and one adjustable upper manually in the vertical position by means of the crank.



Side view with oven hood top down (in work)



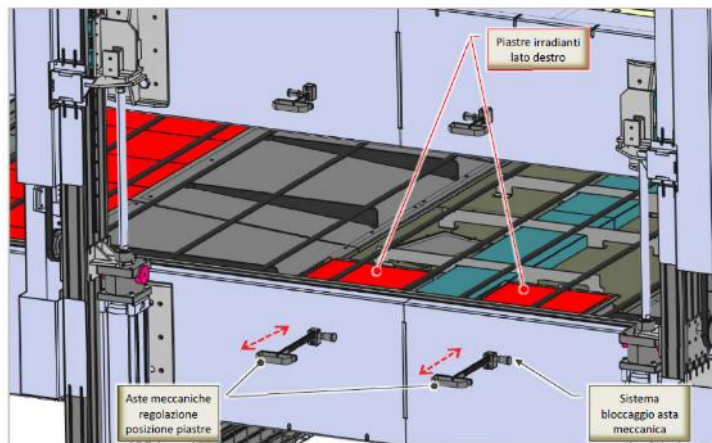
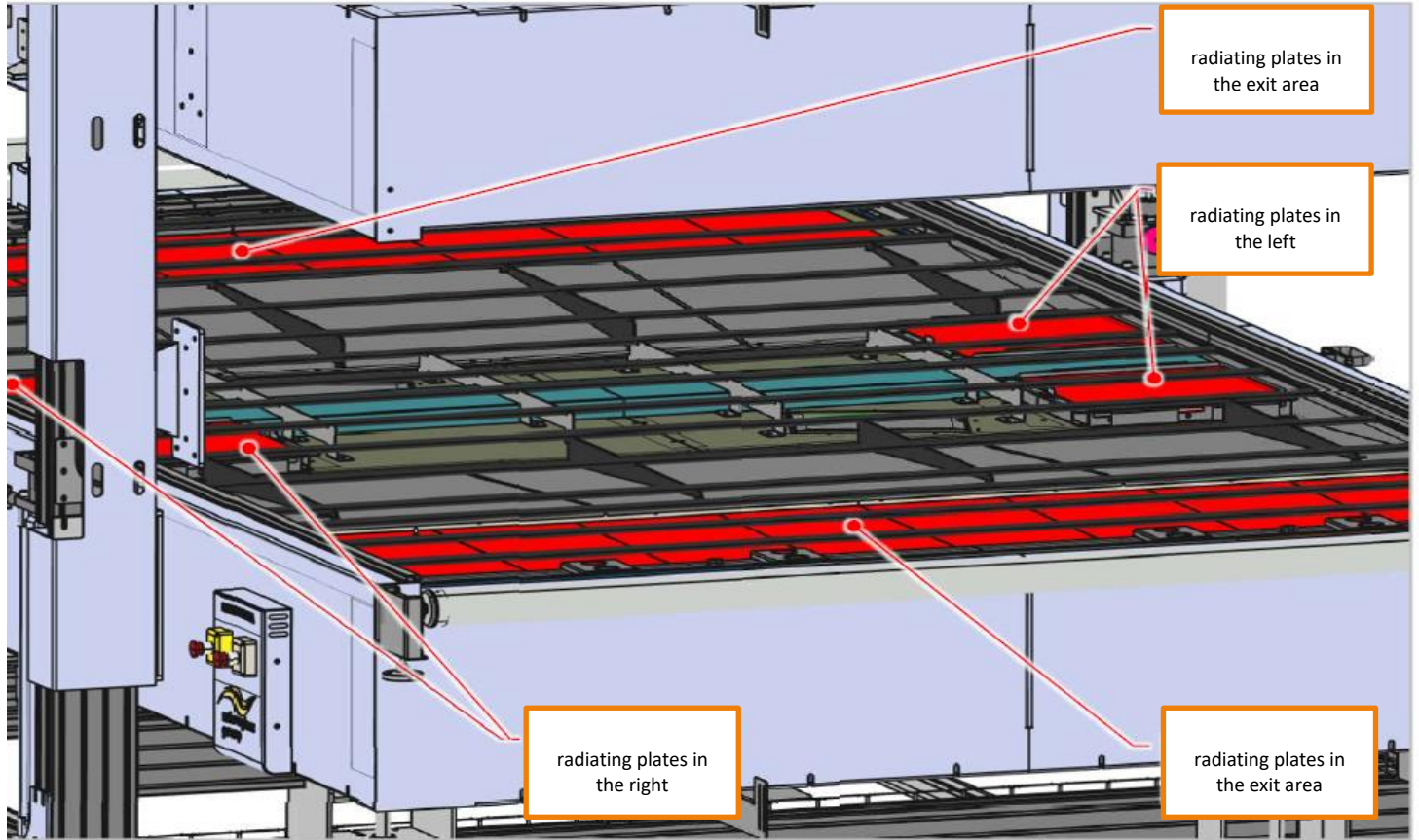
Detail of the exit rollers in a closed furnace zone



INFRARED HEATING SYSTEM

The heating of the film is effected by means of infrared radiating plates Microred[®] located at interior of the oven.

THE irradiation takes place in a specular manner the plates being installed with the same arrangement, both on the lower hood, both on the top one. On each hood the plates are installed on three different zones and independently from the area, each plate is covered by a protective thermal glass.



Detail of the plates radiating infrared Microred[®] furniture placed on the right side of the lower hood. On the side of the structure mechanical rods are visible which allow the displacement of the radiating plates themselves. Each auction is equipped with a series of holes and a position locking system consisting of a knob connected to a spring-loaded pin. To adjust the position of a plate you must pull with one hand the side knob and at the same time with the regular other hand the location of auction.



HOW THE PLATES INFRARED MICRORED®

The Electric line of radiant panels MICRORED® patented devices for the controlled emission of electromagnetic waves that provide multiple possibilities of use thanks to their innovative features.

The panels MICRORED® They serve to complete the drying or polymerization processes or thermal processes in general, with a considerable reduction of time and costs.

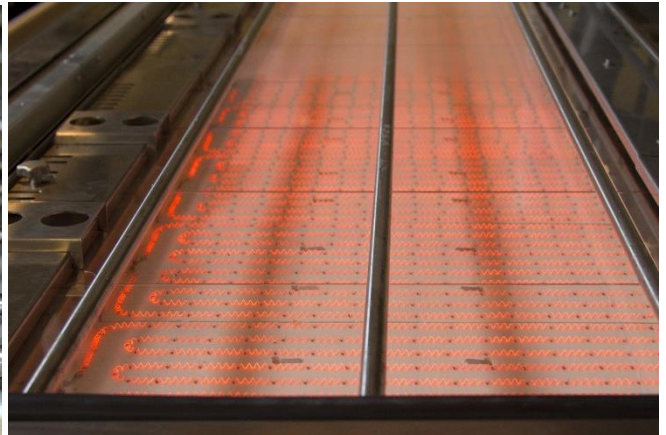
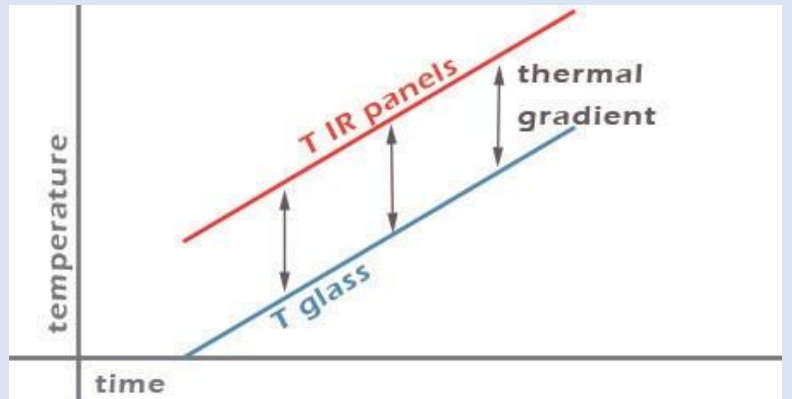
They can be variously sized for mounting on mobile or fixed structures and can be controlled in power for instant, punctual and zone temperature regulation.



INNOVATIVE

Double emission spectrum The emission works at double the frequency spectrum with a peak at 350 ° C at the water absorption peak and the second at 800 ° C in correspondence with the absorption peak of the resin.

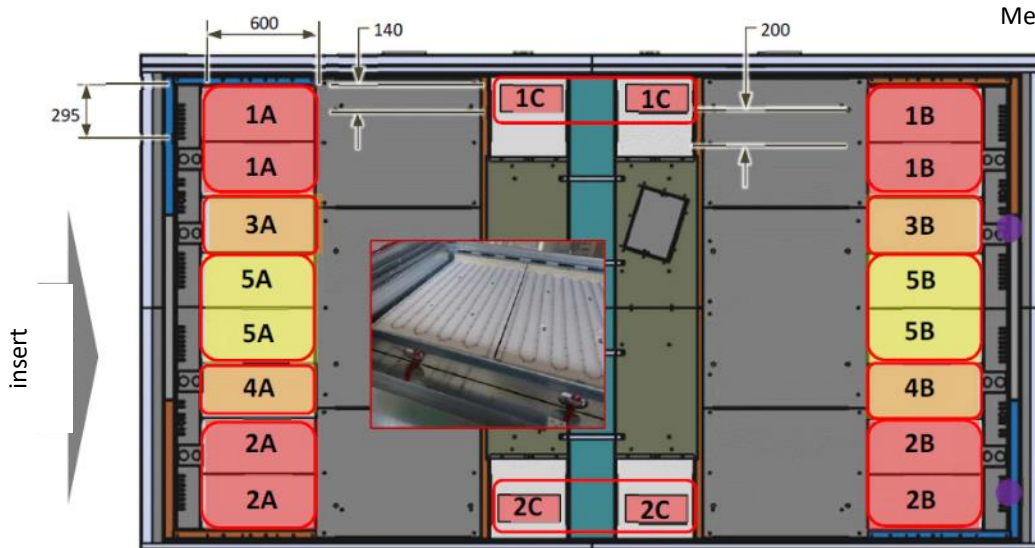
This means optimizing the process time, reducing the exposure time and cost.



ADJUSTMENT OF MICRORED PLATES ®

The radiating infrared Microred ® plates are powered and regulated in pairs, so as to realize the following irradiation zones:

- Zone A for upper hood oven entrance;
- Zone B for the upper hood kiln outlet;
- Zone C for additional lateral upper hood;
- Zone D for lower hood oven entrance;
- Zone E for oven hood lower output;
- Zone F for additional lateral lower hood.



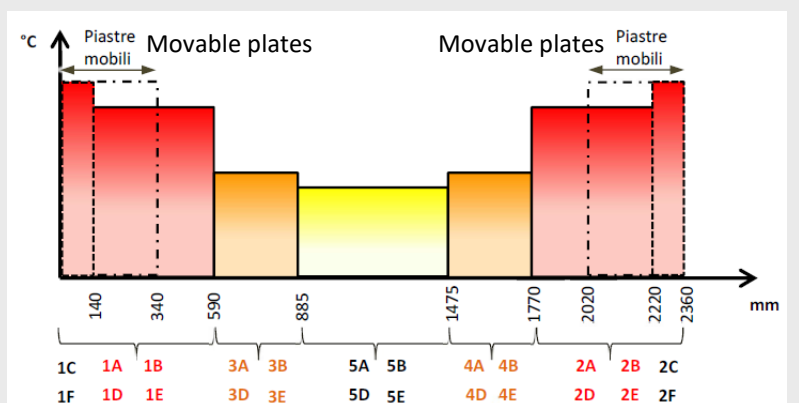
Measurements in mm

Detail plates radiating upper hood



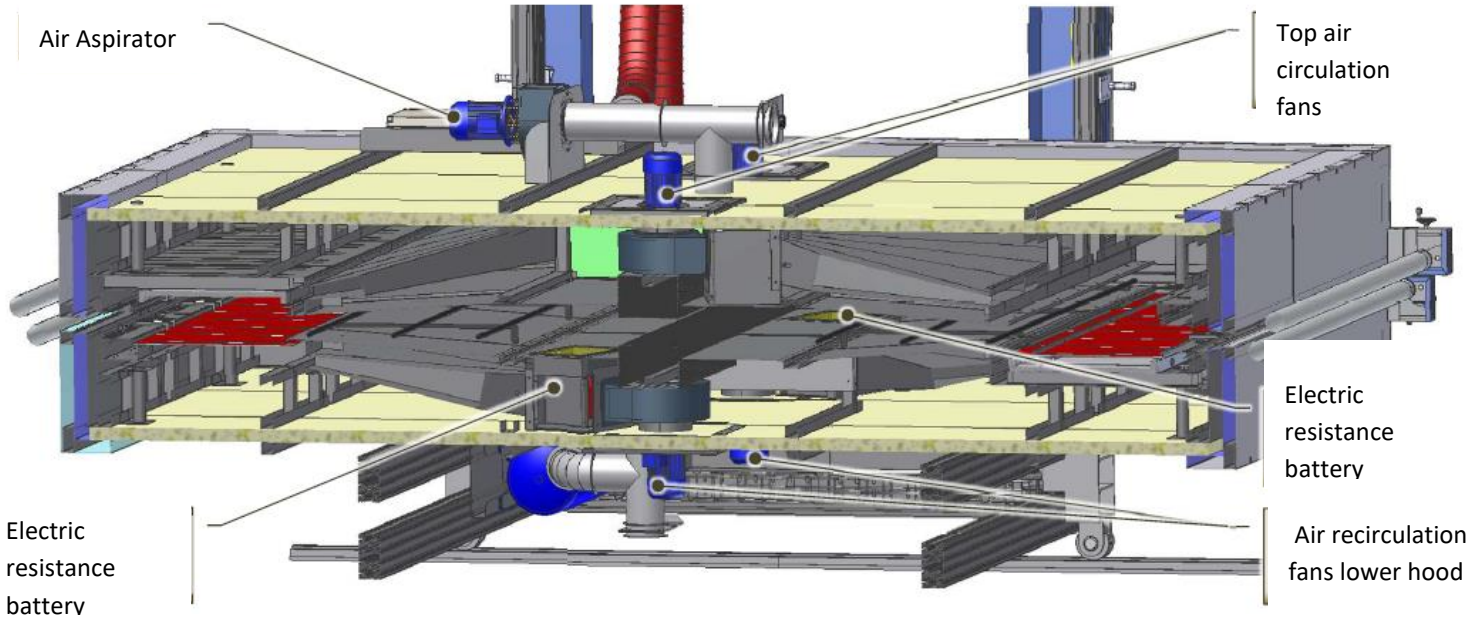
Detail radiating plates hood lower

The graph below represents a hypothetical overall radiation pattern associated with each of the furnace hood, on the model 2200. On the horizontal axis (abscissa) shows bands of radiation emitted from stationary and mobile sources available on the width of the oven (max 2360 mm). On the vertical axis (ordinate) shows temperatures that the various bands can reach all interior of the range of values expected from the machine. Note how the radiation belts of the additional movable plates partially overlap the side fixed plates, contributing to a higher heating of the relative bands.



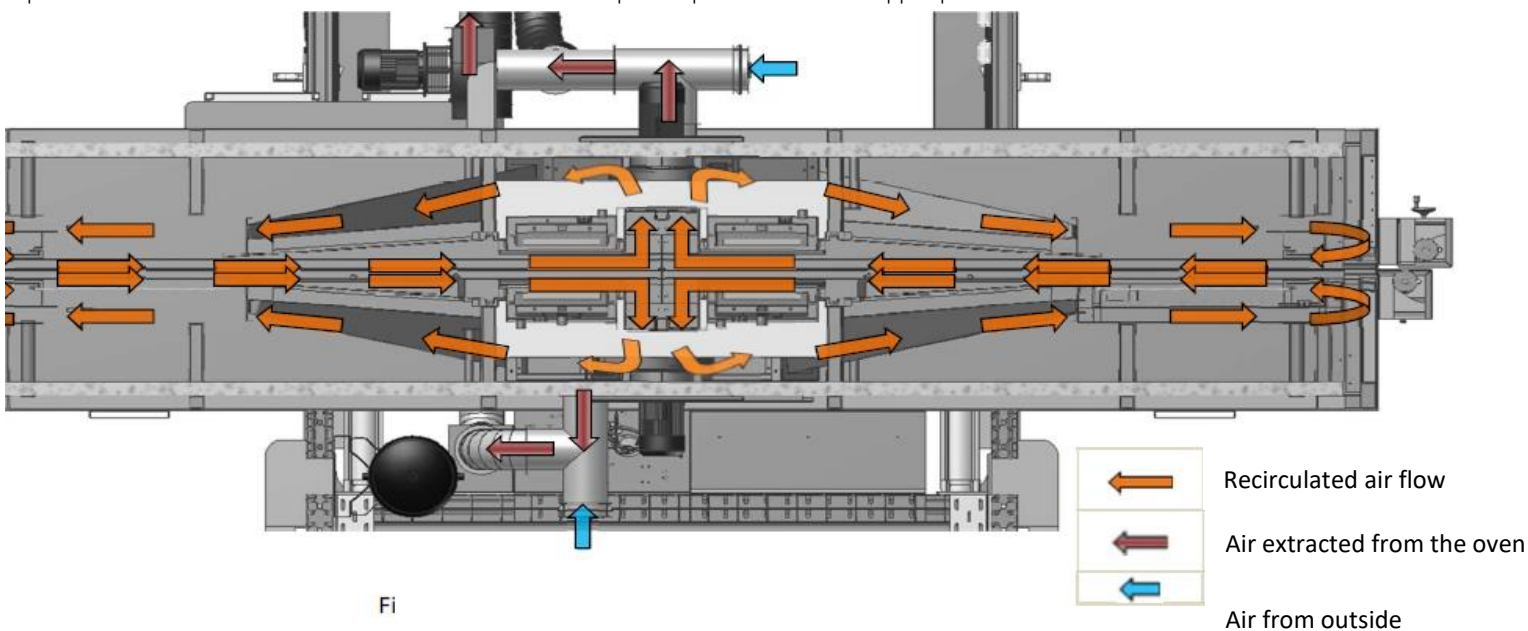
HEATING HOT AIR SYSTEM

As a second source of heating the oven uses four fans to execute hot air: two places at the bottom and two in the upper part, all in a central position. The air moved by the fans is heated by batteries of electric resistances placed inside the oven, in appropriate lateral compartments and on both hoods. To ensure the proper recirculation of air and to create a slight depression at interior of the furnace chamber, in such a way as not to allow the escape of hot air from the entrance slits and oven exits has been installed in the upper part of the oven an aspirator, which allows to convey part of hot air towards the external environment.



RECYCLING

The picture below, shows the longitudinal section of the oven with the flows indicated from the heated air that moves in recirculation. The air passes under the infrared plates and then be channeled to interior of the chamber and be incorporated in the central part. A part of indoor air to the structure is extracted from an aspirator positioned in the upper part of the oven.

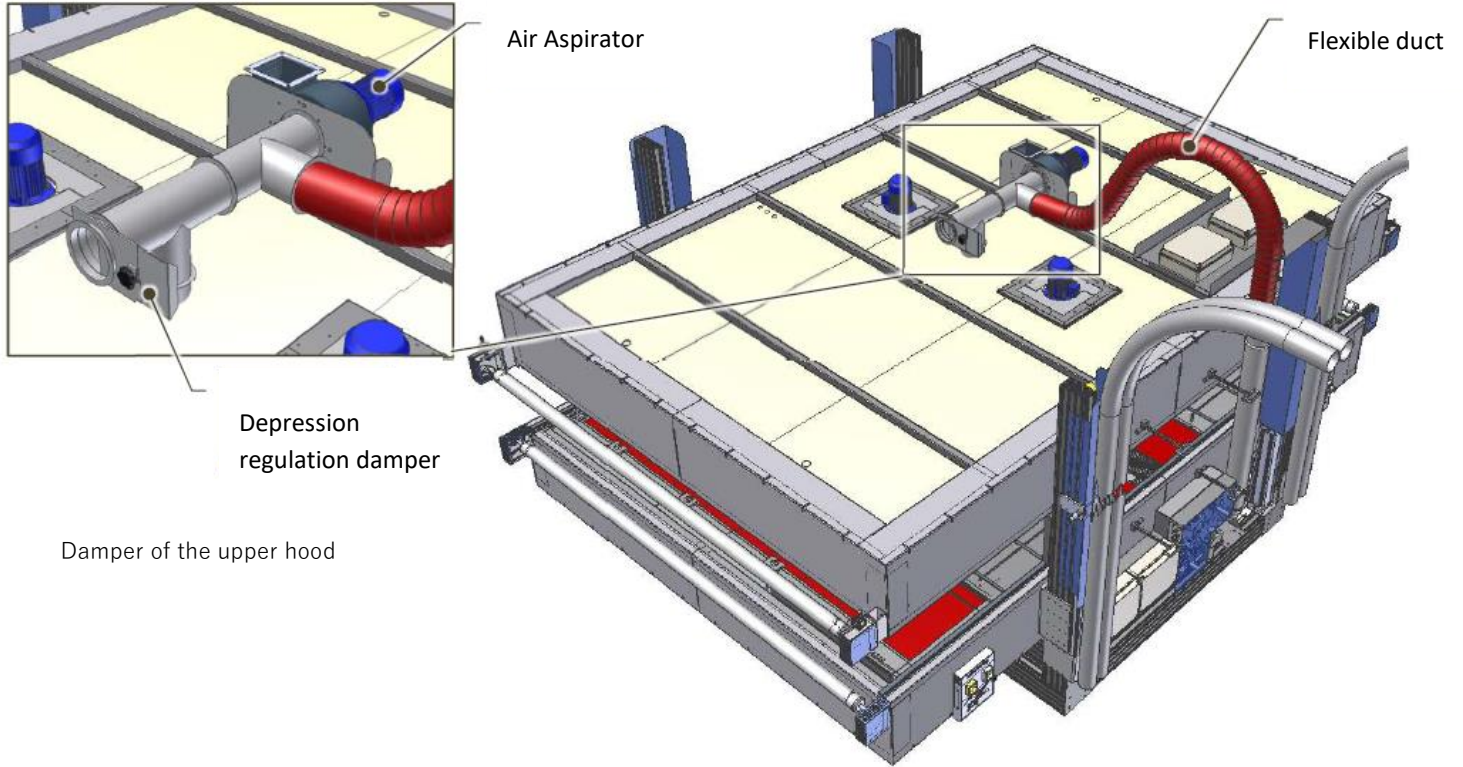


EXPULSION

In the upper part of the oven is installed a vacuum cleaner for extracting part of the heated air from the oven.

The air is taken in the central part of each hood. To convey the hot air from the lower hood is used a conduit partly rigid and partly flexible.

The intake of the air created inside of a vacuum oven, avoiding that the bait hot air from the slots for the input and the output of the product in treatment. On both hoods, to adjust the level of depression at the interior part of the oven, two manual dampers are present, which allow you to adjust the amount to air to be taken from the environment.



PYROMETERS A CAMERA



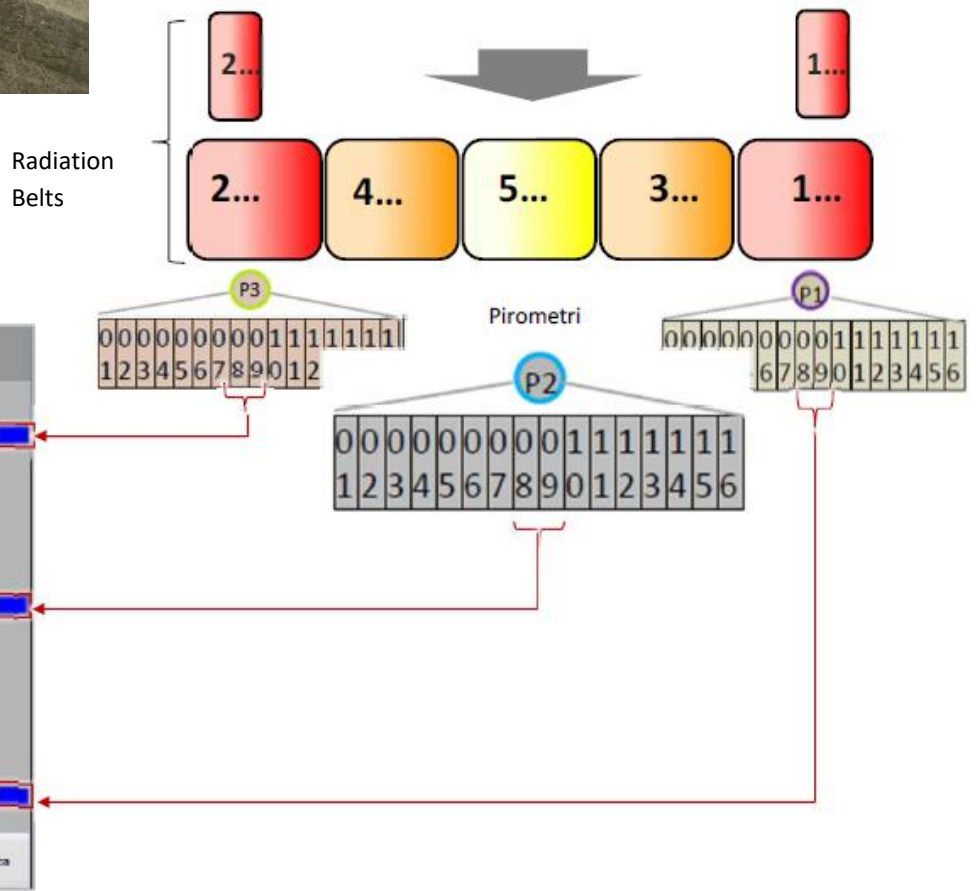
The image that follows illustrates the three bands of radiation associated with the upper hood location of the three pyrometers (P1, P2 and P3) installed in the exit area; in this way it is possible to detect the temperatures over the entire width of the film being treated.

During operation each pyrometer detects the temperature of the plastic film on 16 different points (simultaneously).

The oven control system is necessary then to process them and display on the control panel 3 different temperature values. Each of the three values is the result of the average of the two central reading points provided by the pyrometers, as illustrated in the figure below.

The movable plates are thermoregulated by the pyrometers of the respective band or separately controlled to recipe (command set from the operator panel).

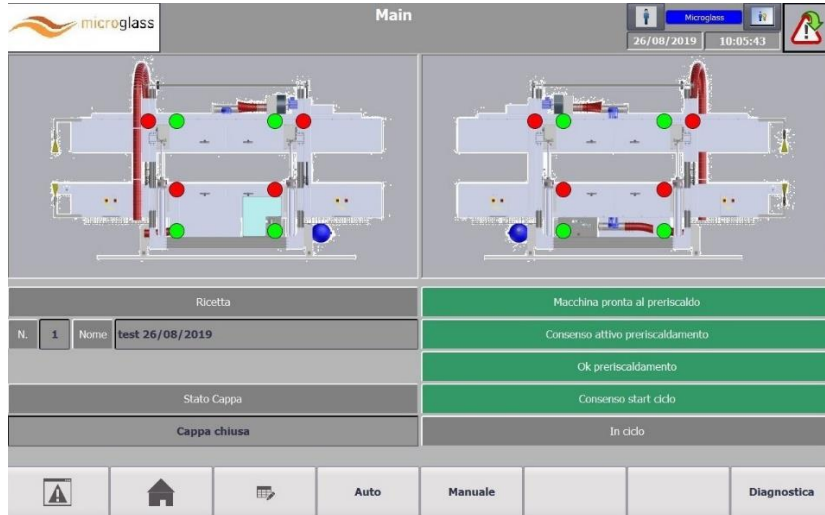
The figure represents the only system of the upper hood, being that for the lower hood entirely analogous.



CONTROL PANEL

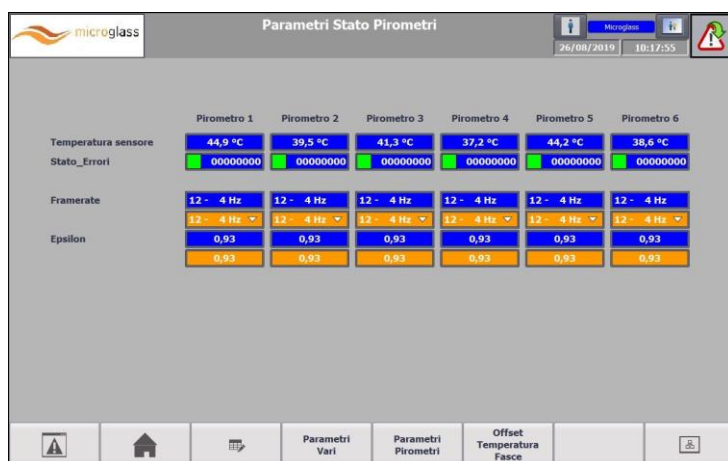
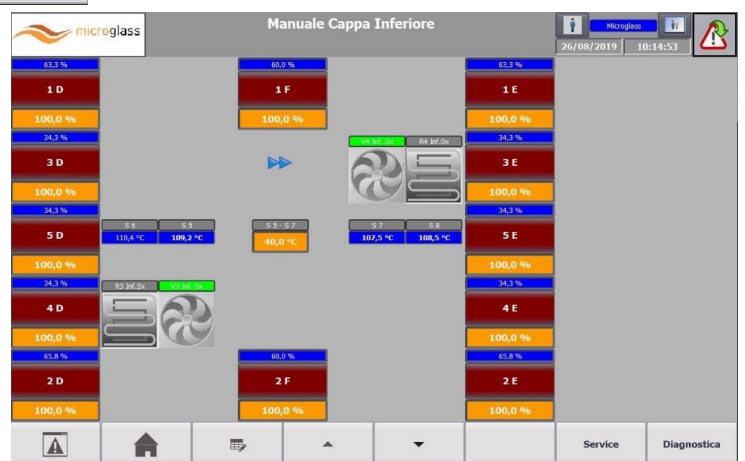
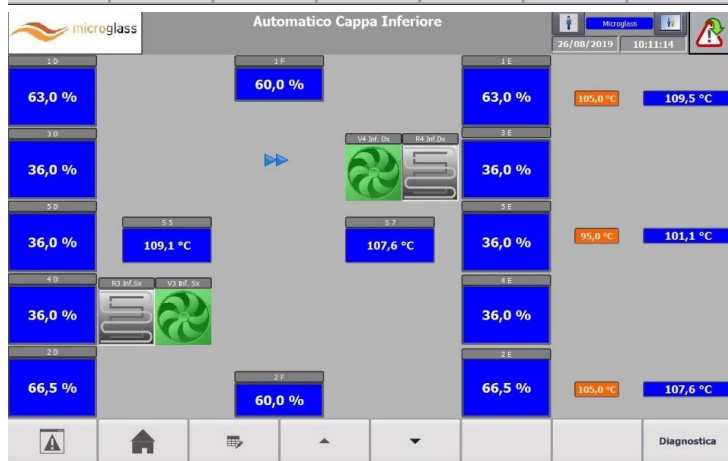
This machine is designed to be integrated in a line facility operated by a central control system (PLC Master).

After performing the sequence of operations for the powering up of the machine and executed the passage of the film to be treated is, you can proceed with the AUTOMATIC start of treatment.



From the operator panel, you can:

- Schedule a treatment recipe
- Save different recipes treatment
- Set the temperature of the different zones of the furnace
- Verify the thermal trend on the lower and upper floor
- MANUAL or AUTOMATIC start the cycle
- View diagnosing different heating systems, security and control



SYSTEM CERTIFICATE INDUSTRY 4.0

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