

High temperature VERTICAL CURING OVEN for sintering SPECIAL CORES, SKIN, SHEATHS AND CABLES





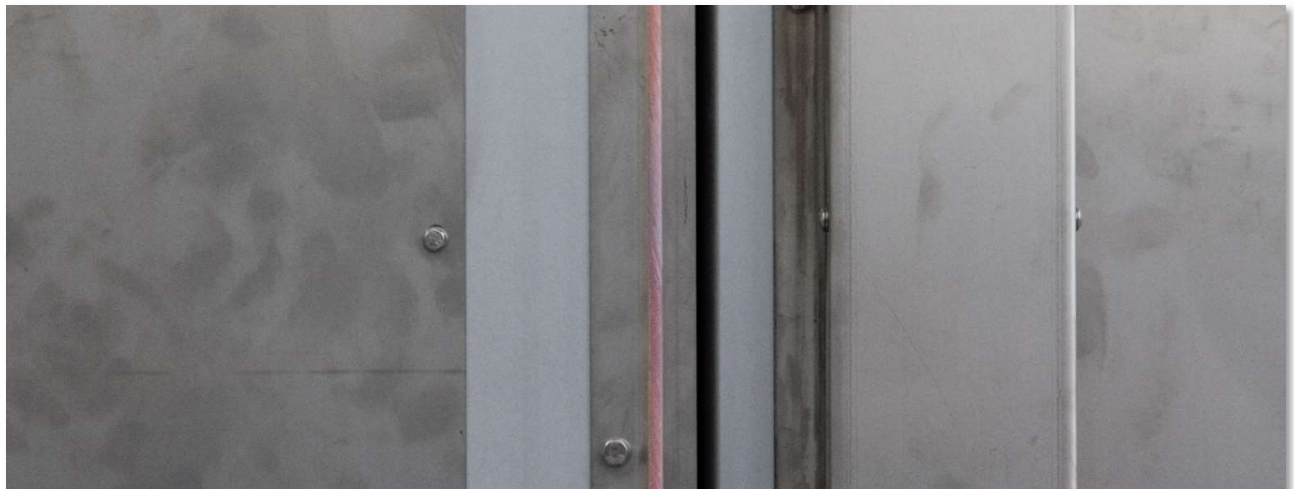
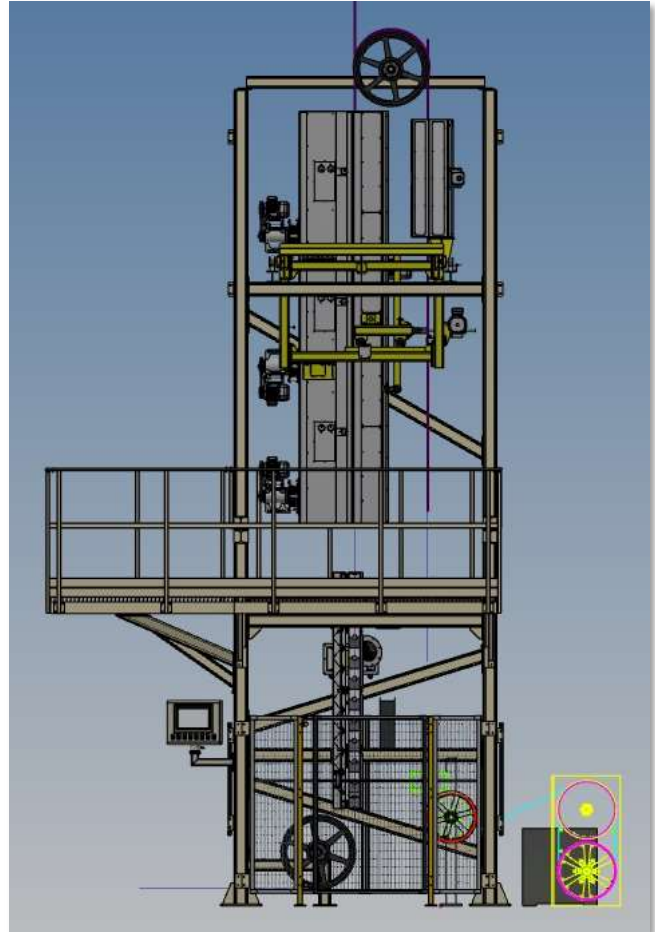
PRODUCTION CHARACTERISTICS

Wire and cable to be treated

- Small and medium section, flexible cores and cables:
- Specifically designed for sintering PTFE and POLYIMIDE coated conductors.

Construction

- VERTICAL design.
- Pre-heating section.
- Heating tunnel in special stainless steel suitable for high temperature (800°C).
- Automatic opening and closing movements during start/stop phases.
- Heating tunnel divided in 3 different and independently controlled heating sections.
- DOUBLE heating technology:
 - CONVECTION EFFECT by forced recirculating hot air.
 - INFRARED EFFECT by low thermal inertia lamps.
- Cooling system by forced RECIRCULATING COLD AIR controlled by a chiller (as option).





PRE-HEATING OVEN WITH INFRARED CERAMIC HEATERS

Heating tunnel

- Positioned on the top part of the main sintering oven, in parallel position.
- Suitable to pre-heat the cable before entering the main oven, to avoid thermal shock.
- Pre-heating tunnel in stainless steel with INFRARED heaters.

Insulation

- Insulation obtained with ceramic and mineral high-density fibre panels.
- Heating tunnel made in specular stainless steel, suitable to reflect internally the radiations for thermal efficiency optimization.
- External surfaces not exceeding 80-100 °C.



Technical specifications

	Min.	Max	Unit
Temperature	150	450	°C
Adjustment	+/- 3		°C
Passage diameter	-	50	mm

VERTICAL COUNTER-CURRENT HOT AIR OVEN, SUPPORTED BY INFRARED LAMPS

Construction

- Vertical and, optionally, horizontal structure.
- The heating tunnel, divided in 3 different sections, is made by special stainless steel suitable for high temperatures, up to 700° C.
- Automatic opening and closing movements during start/stop phases.
- Each section is independently controlled and provided with double technology:
 - CONVECTION EFFECT by forced recirculating hot air.
 - INFRARED EFFECT by low thermal inertia lamps.

NOTE: the percentage of such effects can be combined as desired, depending on the different curing needs.

Recirculation scheme

The heating technology is described as follow:

- The AIR BLOWER collects the recirculating air coming back from the heating tunnel and forces it through the heating battery.
- The HEATING BATTERY, provided with high temperature finned coils resistors, controls the air temperature before the inlet of the heating tunnel.
- In the HEATING TUNNEL, the sintering process takes place, thanks to a combination of forced hot air and IR lamps. The hot air is forced to pass through it and is collected before going out from outlet hole. In the meanwhile, the IR lamp effect acts additionally.

Air blower

- High pressure air blower, provided with centrifugal system.
- Fan movement by means of an external motor, adjustable by inverter.

Heating battery with resistors

- Provided by a battery of high temperature finned coils resistors.
- Heating power controlled by PID regulators, adjusted by SCR controllers and monitored by thermocouples.

Heating tunnel

- Equipped with insulated channel, longitudinally divided in two parts, with possibility to be opened when the line is stopped to avoid cable burning.
- The heating tunnel provides the air flow in counter-current way (the hot air direction is opposite compared to that of the cable).
- Each section of the heating tunnel is equipped with low thermal inertia infrared lamps with reflectors.
- Each section of the heating tunnel, one meter long, is separately controlled by thermocouples.





Sintering temperature control system

The oven can work in THREE different configurations:

1. Only with CONVECTION EFFECT by forced hot air recirculation.
2. Only with INFRARED EFFECT by lamps.
3. Combination of CONVECTION EFFECT + INFRARED EFFECT in different settable percentage.

Insulation

- Insulation by ceramic and mineral high-density fibre panels, positioned in the internal surface of the tunnels.
- In order to reach the maximum thermal efficiency, the internal side of the tunnel is made in specular stainless steel to internally reflect the thermal radiations.
- External surfaces do not exceed 80-100 °C.

Technical Specifications

	Min.	Max	Unit
Temperature	350	700	°C
Adjustment	+/- 1		°C
Passage diameter	-	50	mm

COOLING TUNNEL

- The cooling system consists of a 2-meter long chamber, provided with a feeding/extraction AC fan.
- The cable passes inside the channel, which can be manually opened for the easy stringing.
- The channel is positioned after the heating oven.
- **OPTION:** chiller to stabilize the air temperature in the cooling tunnel.

Technical characteristics

Cooling	By air, feeded by AC fans
Cable pass length	2000 mm



IDLE PULLEY (TOP AND BOTTOM SIDE)

- For cable guiding, on top and bottom side of the oven.
- Made by anodized aluminium, hard coated with superficial $R_a=0,8$ (the pulley can handle a steel lead wire diam. $\approx 1,8$ mm)
- Diameter 400 mm (bottom side) and 600 mm (top side).





MOVABLE SUPPORTING FRAME

- Structure built in electro-welded tubular section steel to support: pre-heater, vertical oven and cooling tunnel.
- Movable trolley operated by gear motors.
- Extractor hood to convey the hot air fumes in the exhausting system (exhausting system and piping for connecting the extractor hood at Customer charge. Hole to be defined).

ELECTRICAL CONTROL CABINET

The electric cut-out box includes the control system with frequency converters, control boards and all the necessary electronics and electro-mechanic equipment for the correct equipment working.

Total power

- Total installed power is approximately 40 Kw, and utilizes a power supply of 3 x 400V, 50Hz.
- The electrical equipment has been designed to be connected to three-phase electrical mains, 400 Volts +6%, -10% with frequency 50Hz \pm 2%, plus Neutral.
- D.C. auxiliary circuits: 24 Volts.

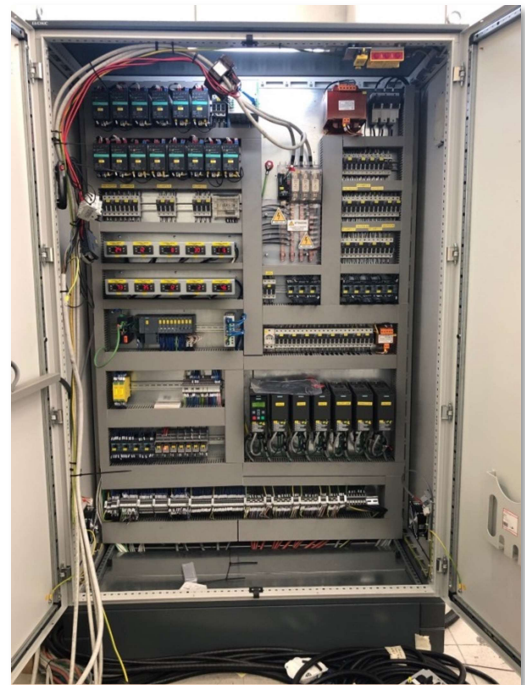
Console board

The console board is a cabinet 800 x 400 x 2000 mm, CE standard wiring compliant.

PID regulators control the different heating zones, via Silicon Controlled Rectifier (SCR), connected in "zero-crossing".

Each PID regulator is connected to a thermocouple.

Different safety alarms are set in the PID regulators, controlling the process in the heating chambers. Analogue regulators, connected to thermocouple in the exhaust manifold, protect the heater from overtemperature.





Operator interface

- One-colour 15" touchscreen Operator Terminal, with recipe management and teleservice connection.

Data exchange

- The PLC of the oven can be the slave of Master PLC of the main rewinding line. PLC of the line can be connected to download recipes into the oven PLC.
- Data exchanges between both PLC (Profinet/Profibus), for example: line speed, temperature, blowing parameters, safety loop etc.
- The way to exchange the data and parameters to be collected will be decided with the Customer.



