

INDUSTRIAL OVENS

BISCUITS, CRACKERS AND LAYER CAKES

POLIN
INDUSTRIAL LINE



□ POLIN FROM 1929

Created inside Polin Group with the precise purpose to propose, design, make and install medium and large industrial systems, the Polin Industrial Line guarantees quality and reliability in the mixing, make-up, baking, cooling and packaging of bread, biscuits and pastry products.

Our goal is to be the right partner for the growth and renovation of our Customers. Customers who are worldwide leaders or who often already have Polin equipment and decide to make a further quantum leap, from artisan production to industrial production



A Biscuit Research & Development center, including industrial machines 1.200 mm wide and 20 m Hybrid Oven plus a Bread and Pastry Test centers are at disposal of our Customers to test their products and their processes on our equipment, with total confidentiality, allowing them to anticipate market demands.



TUNNEL OVENS

Polin has been associated with the Baking industry for more than 80 years as a leading company in the design, manufacture and supply of more than 1.000 high quality ovens, delivered in more than 100 countries.

Polin offers a complete range of ovens that fulfills every need within biscuit, cookie and cracker sectors, and also extends to a wide range of baked products including bread, pizza and pastry with or without pans.

Clients can choose between a wide range of ovens:

- Convection
- Cyclothermic
- Direct gas fired
- Electric
- Hybrid

Working width from 600 to 1.600 mm for biscuits and crackers and up to 4.000 mm for bread and pastry.

Depending on different products, the baking conveyor can pass from solid or perforated belt for soft biscuit and cookies, to wire-mesh for hard sweet biscuit, to refractory plates or stones for bread and pizza, to perforated steel plates, wire-mesh with side chains, OGB band for products in trays, to caterpillar plates for cake and muffins.





□ CYCLOTHERMIC

The Cyclothermic is the most flexible oven, suitable to bake many different products, from biscuits and cookies to bread and pastry of any type.

In this indirect oven the combustion products pass inside tube bundles without coming in contact with the product. Heat exchange is basically by radiation (due to the temperature difference between the walls of the tubes and the product) and in a small part by natural convection (air laps against the tubes, heats up and transmit heat to the product). This radiant bake gives gentle texture development and distinctive characteristics on the surface of the product.

A fan conveys gases from the combustion chamber to the intake manifold and then to the tube bundles in top and bottom of the baking chamber (above and below the baking surface) at right and left of the combustion chamber. The tubes air joined in pair so to convey gases from and back to the manifold, where they are flanged to.

Fumes collected by the manifold are partly recycled and partly expelled through the fume stacks.

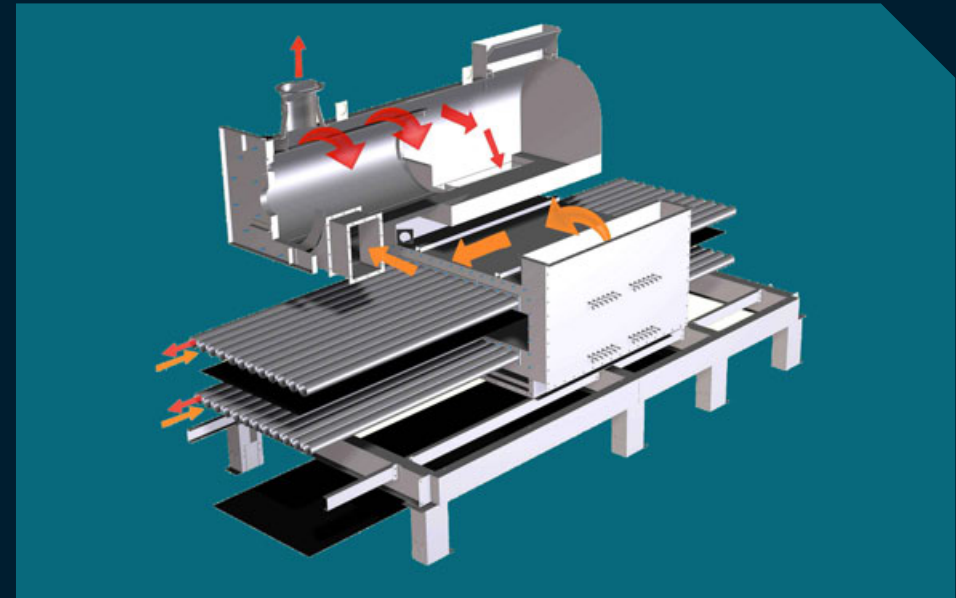
The products of evaporation that are generated in the baking chamber are evacuated through stacks that are independent from the fume stacks.

Features

- Baking chamber divided into zones with independent temperature adjustment
- Independent adjustment of each radiant tube (temperature control across the baking chamber)
- Top and bottom heat adjustment
- Combustion chamber in special steel, high temperature resistant, with safety hatches
- High temperature resistant fan for fume flow
- Adjustable fume exhausting flow rate by inverter
- vapour exhausting ducts with adjustable dampers and forced exhausting fans
- Stainless steel suction hoods on the two oven ends
- Baking conveyor mechanical or pneumatic tensioning system to compensate thermal and mechanical expansion
- Baking conveyor automatic tracking system
- Baking chamber provided with inspection windows on the control side and cleaning hatches on opposite side (both sides on demand)
- Belt cleaning brushes
- Emergency discharge device
- "Touch screen" Operator Panel

Options

- Double radiant tubes in vertical to increase heating exchange
- Turbulence units to increase thermal exchange and to grant uniform baking conditions, improving bake time and efficiency
- Stainless steel cladding
- Support of conveyor belt in baking chamber by rollers with outside bearings
- Steel belt greasing unit and graphiting unit
- Motorized oven regulation damper





□ CONVECTION

Each zone of the Indirect Convection Oven is provided with a heat exchanger and a series of ducts to bake the product by blowing hot air over it. This method is very efficient giving rapid baking and very good moisture removal characteristics. Most products can be baked using this method (biscuits, cookies, layer cakes) and this oven is extremely efficient in the latter zones of a hybrid oven.

In this oven the combustion products pass inside a heat exchanger in order to avoid any contamination of the hot air obtained in this way that comes into contact with the product under baking.

This clean heated air is uniformly distributed throughout the width and the length of each section of the baking chamber by means of two specially designed wide air ducts, provided with a series of nozzles that blown the air directly towards top and bottom of baking band, very effectively ensuring a uniform distribution of the heat applied to the product.

A blower sucks the air from the oven chamber and blow it around the transfers tubes of the heat exchanger and the combustion chamber providing the request air temperature.

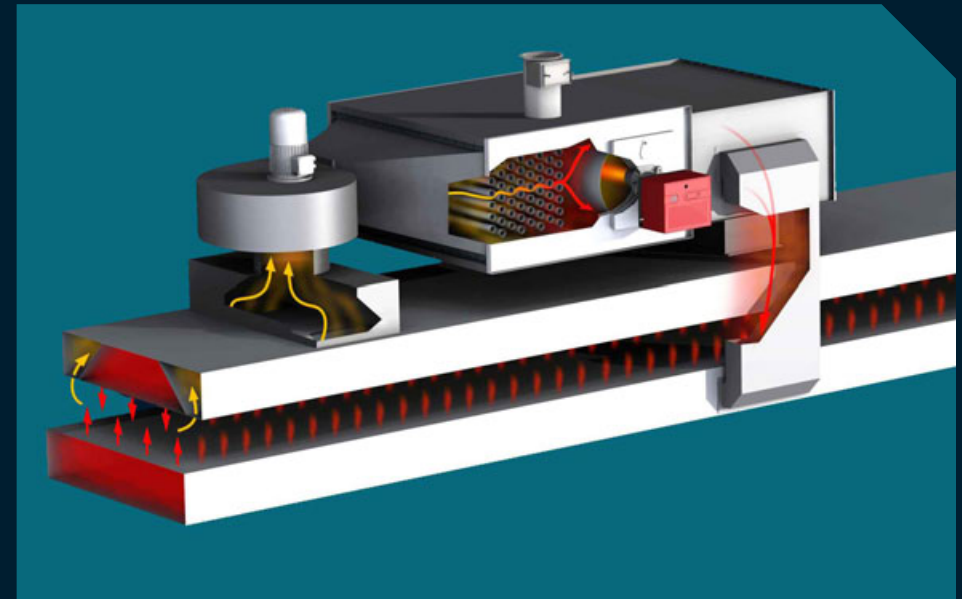
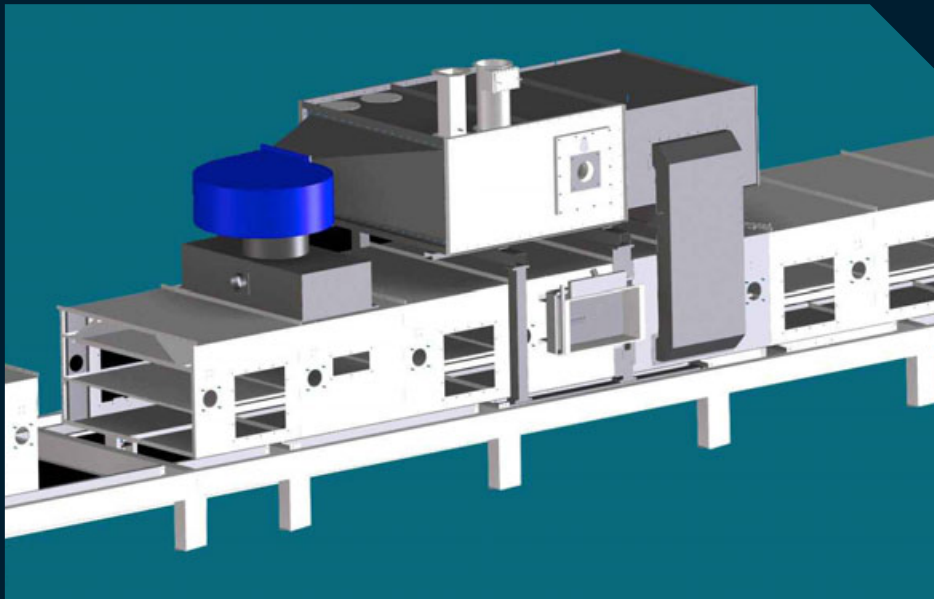
The combustion gas passes directly from the tube system out through the extraction flue, while a double damper balanced system operates on the outlet of the humid air from the baking chamber and the inlet of same amount of dry air.

Features

- Baking chamber divided into zones with independent temperature adjustment
- Baking chamber of carbon steel, outer cladding in rock wool and painted panels
- Top and bottom heat adjustment
- The heat exchanger of heat resistant stainless steel.
- Combustion chamber of special steel, high temperature resistant, provided with safety hatches
- High temperature resistant blowers
- Adjustable fume exhausting flow rate by inverter
- Stainless steel suction hoods on the two oven ends
- Baking conveyor mechanical or pneumatic tensioning system to compensate thermal and mechanical expansion
- Baking conveyor automatic tracking system
- Baking chamber provided with inspection windows on the control side and cleaning hatches on opposite side (both sides on demand)
- Belt cleaning brushes
- Emergency discharge device
- "Touch screen" Operator Panel

Options

- Stainless steel cladding
- Support of conveyor belt in baking chamber by rollers with outside bearings
- Steel belt greasing unit and graphiting unit
- Motorized oven regulation dampers





□ DIRECT GAS FIRED

The powerful Direct Gas Fired Oven combines excellent baking characteristics with the flexibility to bake a wide range of products and has been specifically designed to provide the exact oven requirement for any duty, either for general production requirements or for one specific product, which requires short baking times and high heating supply like cream and soda crackers.

The DGF oven is provided with a series of ribbon burners with flames, placed on top and bottom of the baking chamber with a distribution for each zone of the oven depending on the type of product and the required baking profile. The heating is directly transferred from the burners to the product granting a very high efficiency. A forced extraction channel runs internally along the top of the baking chamber, exhausting the fumes and the vapour generated by the baking process. According to the product requirements the exhaust volume is regulated by means of relevant dampers, applied at the base of each stack.

A certain number of 3-zone burners (adjustable on their length) grant uniform moisture and colouring across the width of the oven).

Features

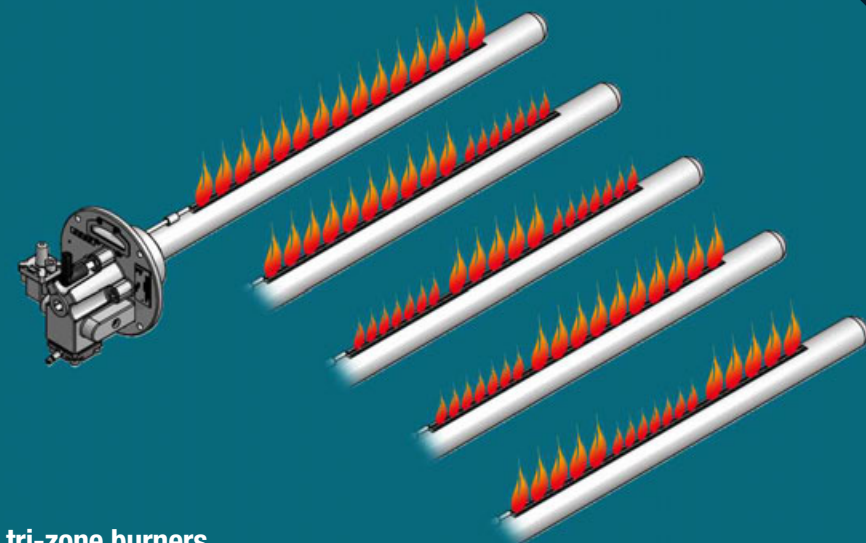
- Baking chamber divided into zones with independent temperature adjustment
- Top and bottom heat adjustment
- Zero gas pressure burner system connected to a self-modulating flow and pressure of the air from the combustion air fan stations placed along the oven
- Electronic control of each burner by dedicated single microprocessor unit
- Stainless steel suction hoods on the two oven ends
- Baking conveyor mechanical or pneumatic tensioning system to compensate thermal and mechanical expansion
- Baking conveyor automatic tracking system
- Baking chamber provided with inspection windows on the control side and cleaning hatches on opposite side (both sides on demand)
- Belt cleaning brushes
- Emergency discharge device
- "Touch screen" Operator Panel

Options

- Stainless steel cladding
- Support of conveyor belt in baking chamber by rollers with outside bearings
- Conveyor band preheating
- Steel belt greasing unit and graphiting unit
- Motorized oven regulation dampers
- Baking chamber of stainless steel for special products



ribbon burner



tri-zone burners



□ ELECTRIC

The powerful Electric Oven combines excellent baking characteristics with the flexibility to bake a wide range of products and has been specifically designed to provide Customers with a special oven in countries / regions where electricity is at low cost. It is quite flexible and suitable to bake any kind of product.

The Electric oven is provided with a series of ribbon heaters of stainless steel armored resistances or of continuous ceramic resistances, placed on top and bottom of the baking chamber with a distribution for each zone of the oven depending on the type of product and the required baking profile.

The heating is directly transferred from the heaters to the product granting a very high efficiency.

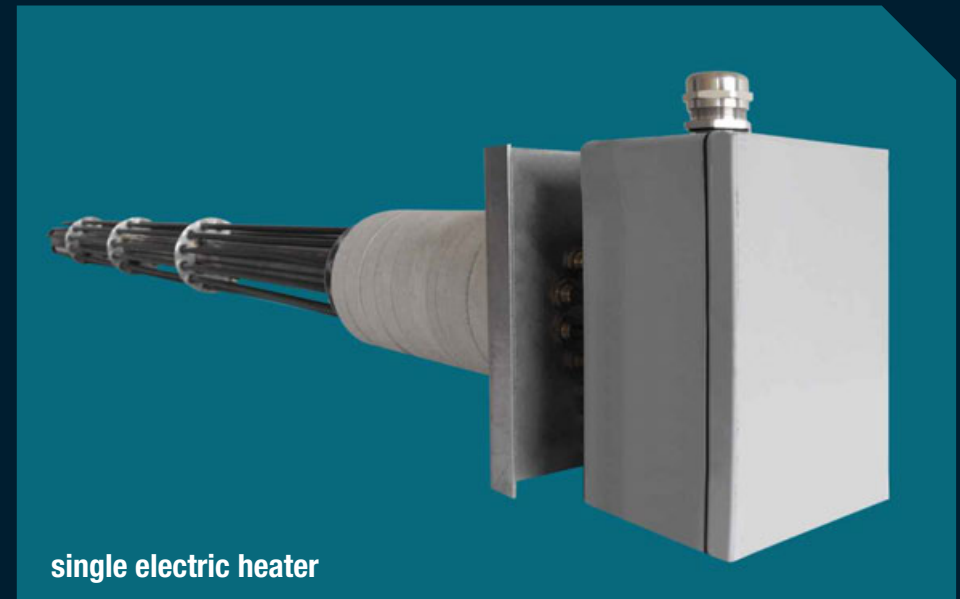
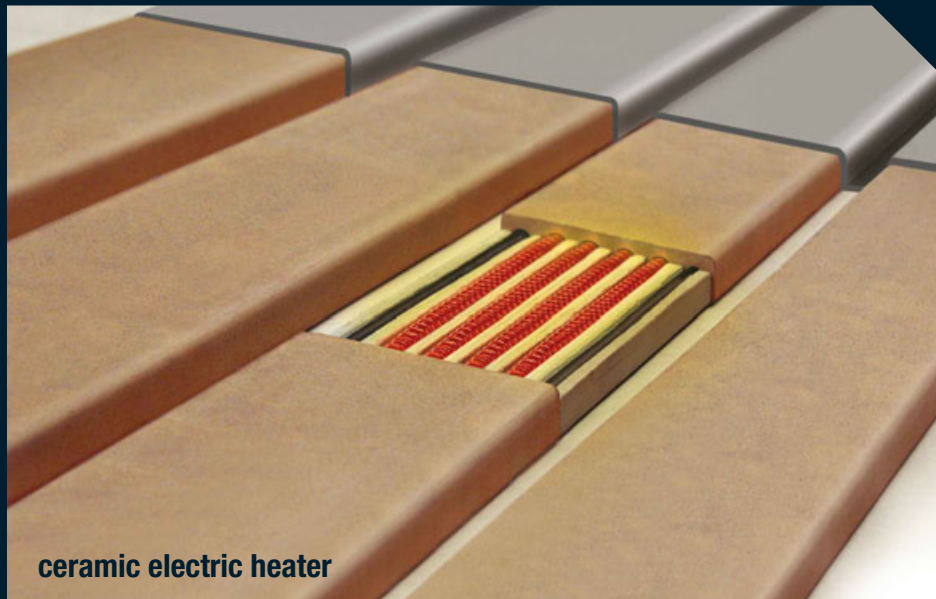
A forced extraction channel runs internally along the top of the baking chamber, exhausting the fumes and the vapour generated by the baking process. According to the product requirements the exhaust volume is regulated by means of relevant dampers, applied at the base of each stack.

Features

- Baking chamber divided into zones with independent temperature adjustment
- Baking chamber of carbon steel, outer cladding in rock-wool and painted cladding
- Top and bottom heat adjustment
- Stainless steel suction hoods on the two oven ends
- Baking conveyor mechanical or pneumatic tensioning system to compensate thermal and mechanical expansion
- Baking conveyor automatic tracking system
- Baking chamber provided with inspection windows on the control side and cleaning hatches on opposite side (both sides on demand)
- Belt cleaning brushes
- Emergency discharge device
- "Touch screen" Operator Panel

Options

- Turbulence units to increase thermal exchange and moisture removal, improving baking time and efficiency
- Stainless steel paneling
- Support of conveyor belt in baking chamber by rollers with outside bearings
- Conveyor belt preheating
- Steel band greasing unit and graphiting unit
- Motorized oven regulation dampers
- Baking chamber of stainless steel for special products





HYBRID

An oven combining the most appropriate heat transfer method for each stage of the baking process is an increasing popular choice. Direct gas fired, Cyclothermic and Convection all have characteristics that are ideal for one part of the process, but not necessary all of it. Combining the benefit of two or three types of ovens creates a unit that exactly matches a specific need.

The most common hybrid ovens have Cyclothermic or DGF for the first phase of baking and indirect Convection oven for the rest. This give maximum versatility at the start of the bake - for every product from soft biscuits to crackers - and maximum efficiency and even baking at the end.

For special configurations, when the products to be baked are various and of different consistency, it is possible to have:
DIRECT GAS FIRED SECTION - CYCLOTHERMIC SECTION - CONVECTION SECTION

The first section is suitable to give great heat to the cold dough, the second to complete basically the relevant baking and the third section to control with care the moisture and the colour of the product.

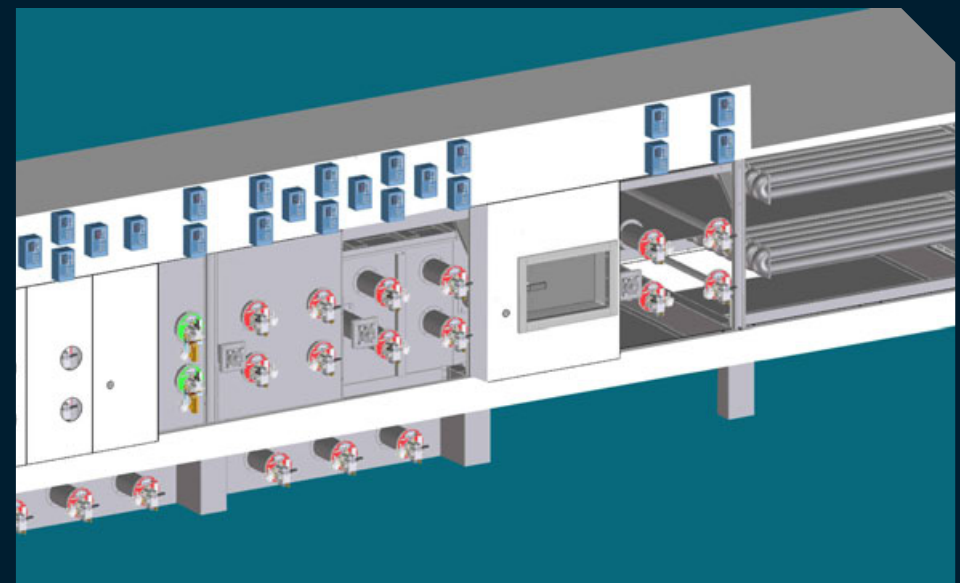
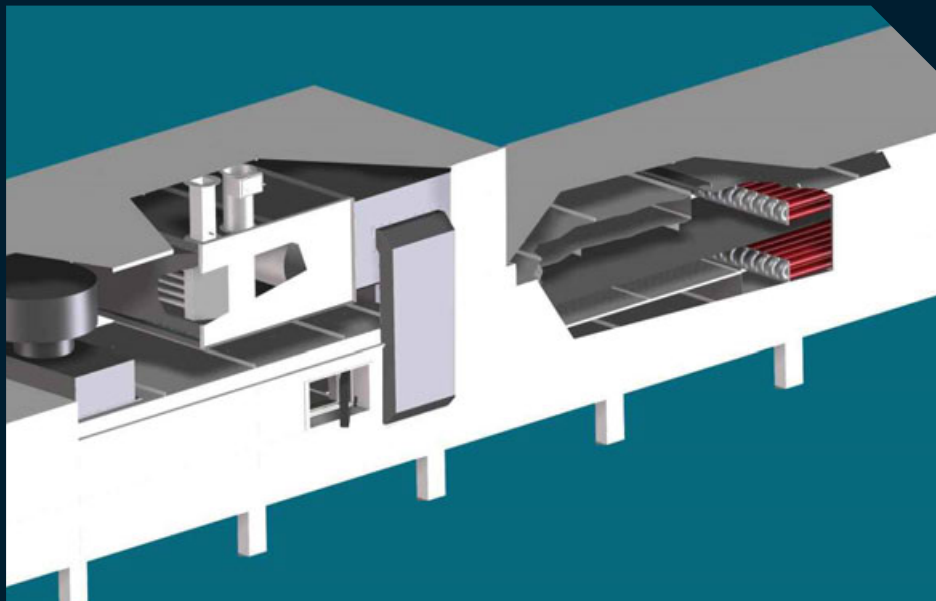
By means of a dedicated control system to each of the three zones it is possible to have a sophisticated temperature and humidity control.

Features

- Baking chamber divided into zones with independent temperature adjustment
- Top and bottom heat adjustment
- Combustion chamber in special steel, high temperature resistant, with safety hatches
- High temperature resistant fan for fume flow
- Adjustable fume exhausting flow rate by inverter
- vapour exhausting ducts with adjustable dampers and forced exhausting fans
- Stainless steel suction hoods on the two oven ends
- Baking conveyor mechanical or pneumatic tensioning system to compensate thermal and mechanical expansion
- Baking conveyor automatic tracking system
- Baking chamber provided with inspection windows on the control side and cleaning hatches on opposite side (both sides on demand)
- "Touch screen" Operator Panel

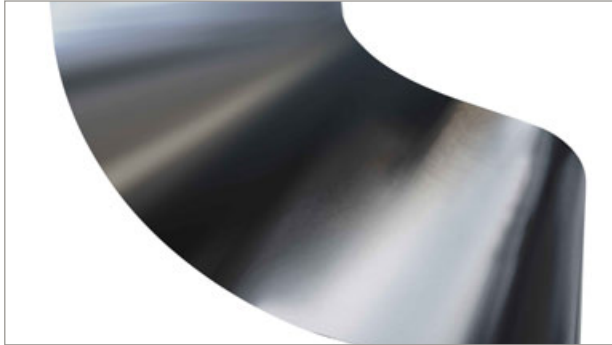
Options

- Stainless steel cladding
- Support of conveyor belt in baking chamber by rollers with outside bearings
- Steel belt greasing unit and graphiting unit
- Conveyor belt preheating
- Motorized oven regulation dampers
- Baking chamber of stainless steel for special products



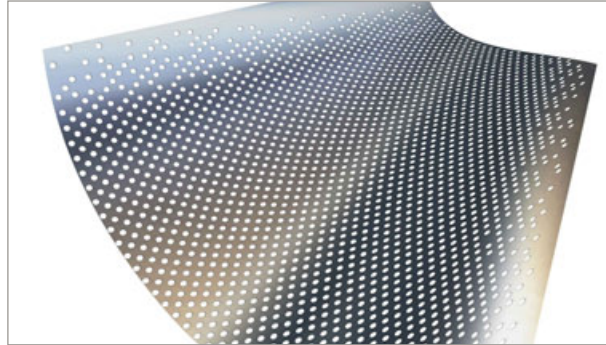
□ Baking conveyors

Solid Steel belt



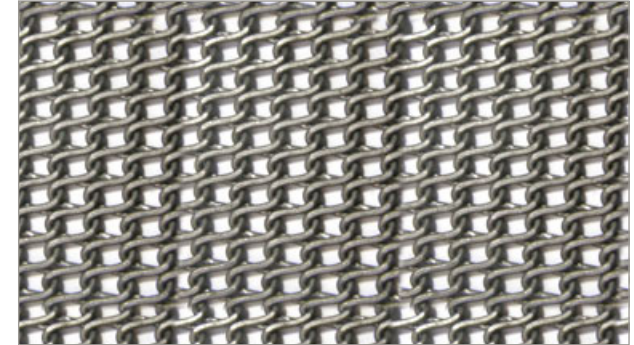
For rotary moulded soft biscuits and deposited – wire-cut cookies, layer cakes.
Up to 1.500 mm width.

Perforated Steel belt



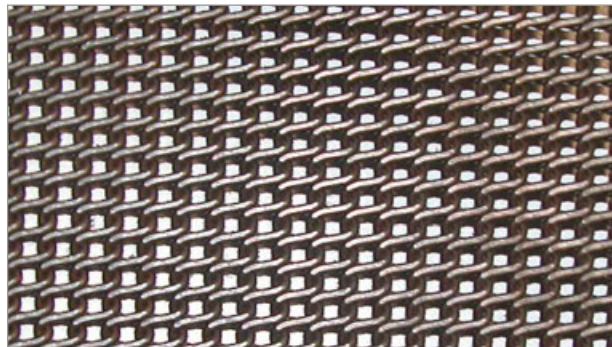
For rotary moulded soft biscuits and deposited – wire-cut cookies, layer cakes.
Up to 1.500 mm width.

Light Wire-Mesh



For soft and hard sweet biscuit.
Up to 1.800 mm width.

Medium Wire-Mesh for biscuits



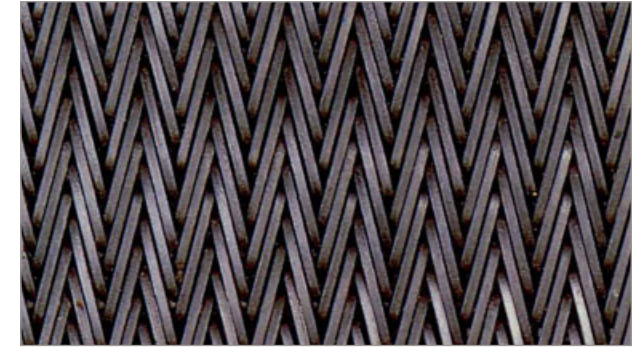
For soft and hard sweet biscuit and for particular snack crackers.
Up to 1.800 mm width.

Medium Wire-Mesh



For soft and hard sweet biscuits and snack cracker.
Up to 1.800 mm width.

Heavy Wire-Mesh



For cream crackers and soda crackers.
Up to 1.800 mm width.

□ Feeding and delivery ends

Feeding end

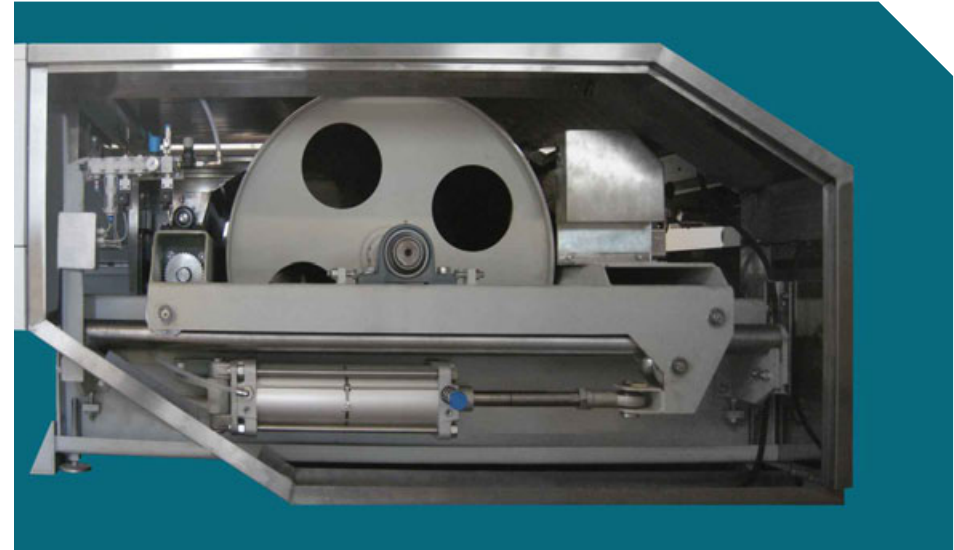
Tensioning station, that provides an even tension to the baking band and ensures troublefree function of the band under varying temperature conditions.

Oven band tension is applied by a couple of pneumatic cylinders or by a set of springs (for oven less than 30 m long) that moves the driven drum on a gear-rack system on both sides, assuring the perfect perpendicularity of the drum axis in respect of the oven axis.

In case of malfunction there is an acoustic alarm and the operator panel will display it.

Driven drum of 1.000 mm diameter for any oven.

Equipped with an automatic built-in greasing system for steel belts.



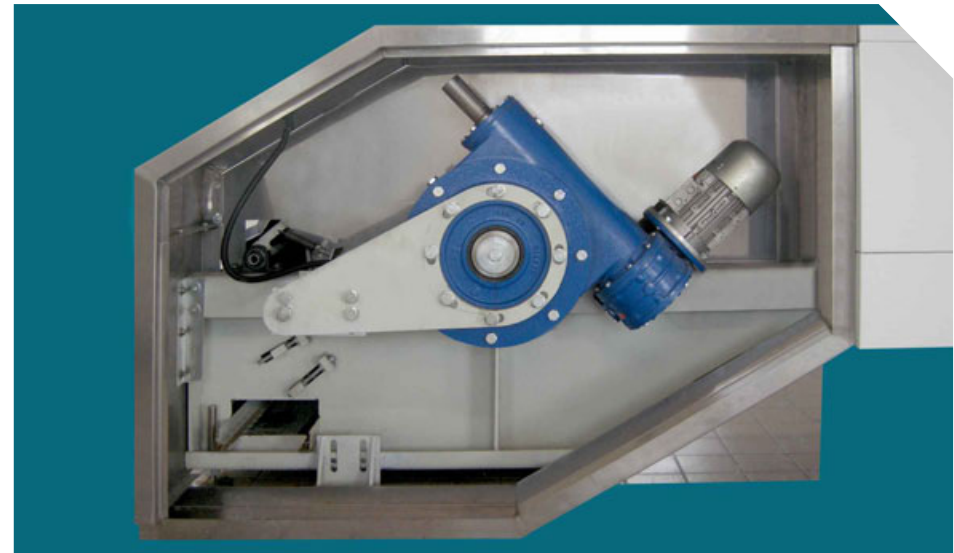
Delivery end

Drive station by means of a frequency-controlled infinitely variable gear motor, with a special driving architecture by direct gear-boxes and chains to achieve a smooth run of the conveyor band in any condition.

Equipped with manual discharge device to move out the product from the baking chamber in case of power failure.

Products are released from the baking band by a scraper and are fed to the Take-off conveyor, that has a reject point of the product not to be processed over, equipped with a container underneath or an orthogonal conveyor to collect the scraps.

Drive drum of 1.000 mm diameter for any oven, to achieve a perfect running of the conveyor bands.



□ General components

Hatches



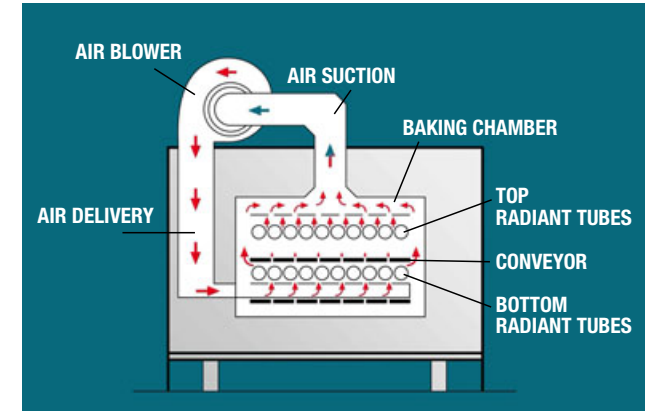
Along the oven at the opposite of control side, for cleaning and maintenance purposes.

Inspection windows



Along the oven at the control side, for checking the baking progress. Provided with mobile lamp for inspection.

Turbulence unit



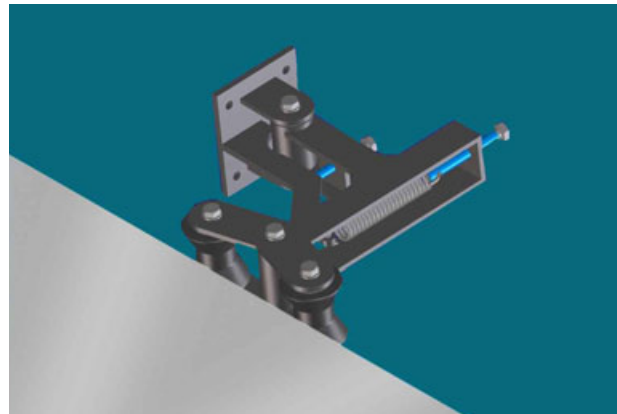
To be used in Cyclothermic and Electric ovens, when a better heating distribution is requested to improve power and product moisture / colour control.

Cleaning brushes



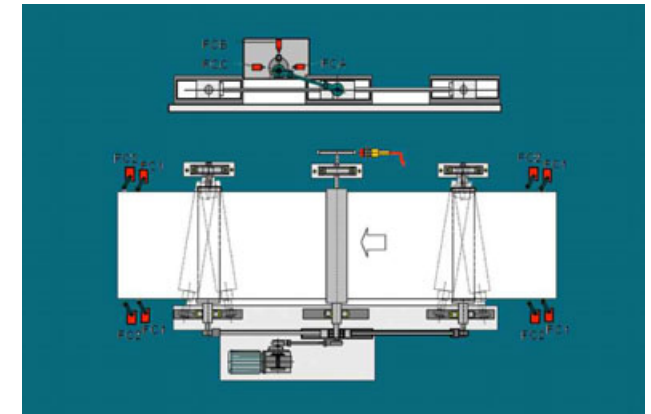
For cleaning of conveyor wire-meshes by means of single or double brush unit provided of relevant debris recovery drawer.

Band guides



Spring loaded rolls for safety of wire-mesh and steel belts, inside the baking chamber and in conveyor return.

Tracking units



Three rolls unit to control automatically the centering of steel belts and wire-meshes. Single or double units in accordance to the length of the ovens.



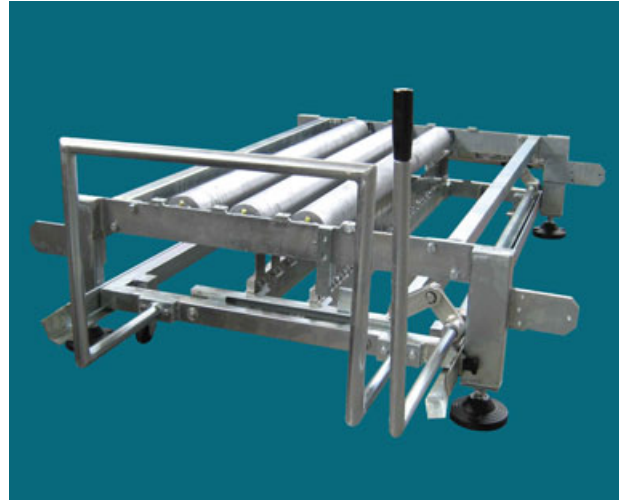
□ Steel belt oven equipment

Belt greaser



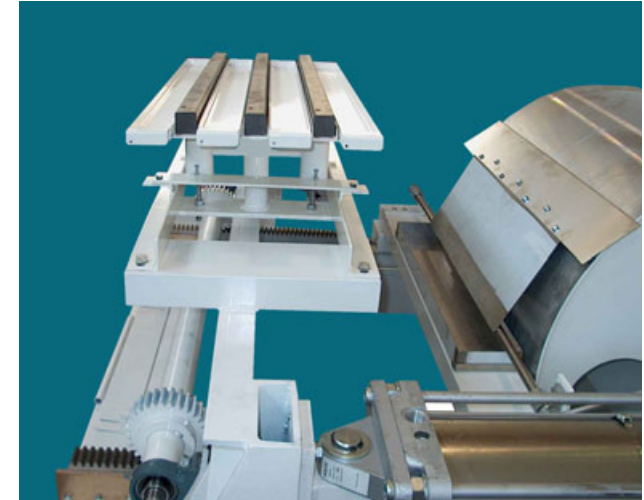
For a continuous distribution of heated oil on the steel belt by a rotating brush at variable speed and an alternating felt for even application.

Belt scraper unit



On mobile trolley for continuous cleaning of steel belts with vertical scrapers underneath on return of belt.

Graphiting unit



To keep a continuous graphite film on the lower surface of the steel belt.



□ Control Systems

Polin provides a range of Control Systems for complete Biscuit, Crackers and Layer cake lines, or individuals units of machinery.

Whether it is semi or fully automatic recipe control, or higher level with SCADA (Supervisory Control and Data Acquisition) coupled to the ERP and MES of the Clients, Polin's control system has a clear, simple "Touch Screen" Operator Panel or PC screen as HMI (Human Machine Interface), to allow the operators to keep quality and easy to operate handling, by visualizing all the oven settings in a single location.

Recipe-driven set-up and clear alarm messages reduce changeover time, downtime and waste.

Full knowledge of internationally recognized propriety PLC, such as Siemens, Allen.Bradley, Omron, Telemecanique, just to mention a few, but in any case at disposal of Clients for any brand request.

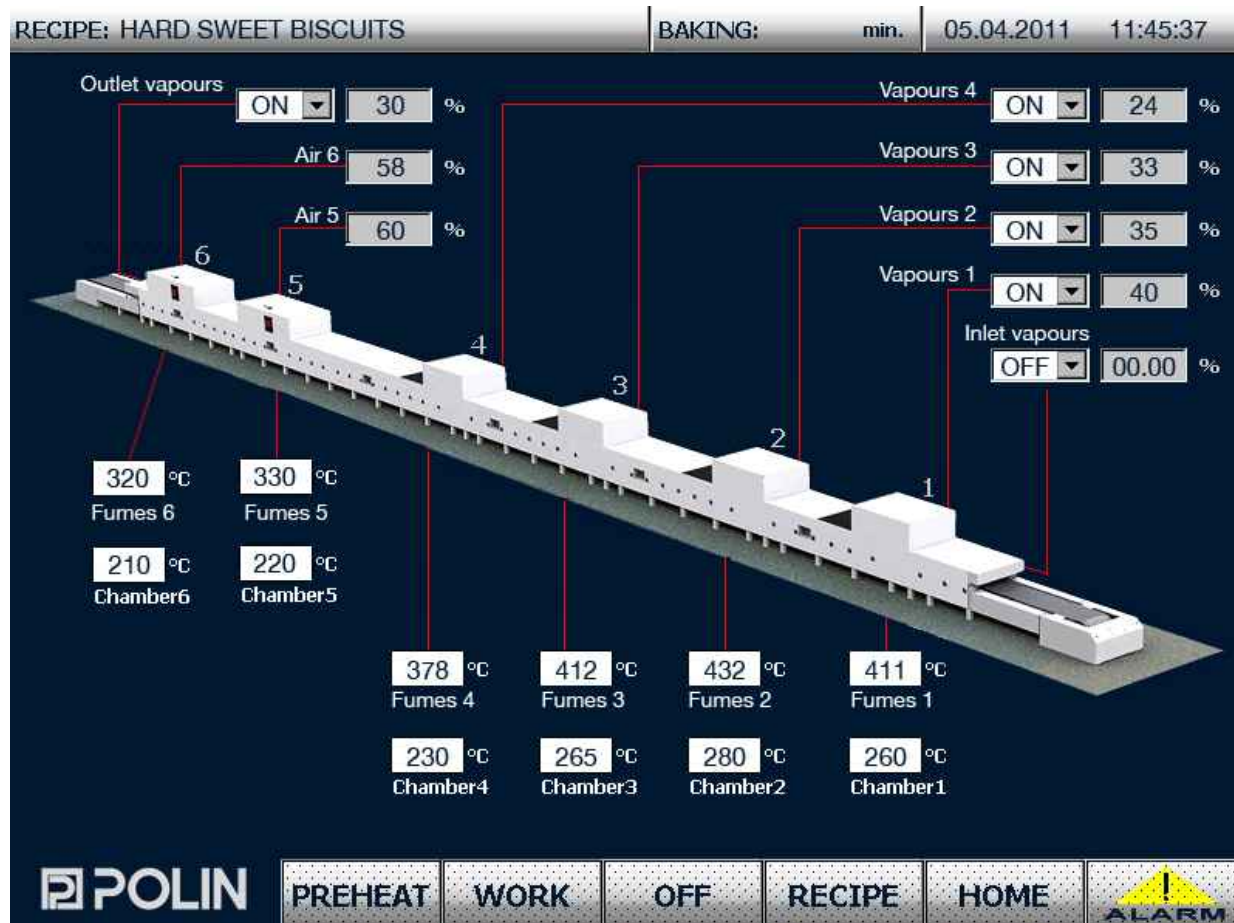
Operator interfaces

Colour "Touch screen" Operator panels or industrial PC.

The HMI display panels set new standards for functionality, open systems and design. Their outstanding features include: state-of-the-art processor technology for maximum data security and handling really complex applications, high-resolution, new ergonomic design, comprehensive communications support and extremely easy connectivity with a full range of interfaces and ports.

Software packaged to suit all customers request, with different level of management and supervisory access, passing from Baking chamber temperature control to Exaust temperature control.

Store and management of any number of recipes.





Main features

- Functioning tests, trials and simulation at our Test bakeries
- Proven Control and Structured Software Systems
- Full Recipe Handling and Management as standard
- Performance historic trends
- Alarm monitoring and handling
- Predictive and routine maintenance management
- Different level of controls to suit clients requirements
- All international brand components
- Control system easy to operate and configure
- Up-to-date links for Teleservice, as remote control, provided via Internet as VPN, direct dial-up or GMS modem to get immediate access and assist with problem solving

Oven controls and monitoring

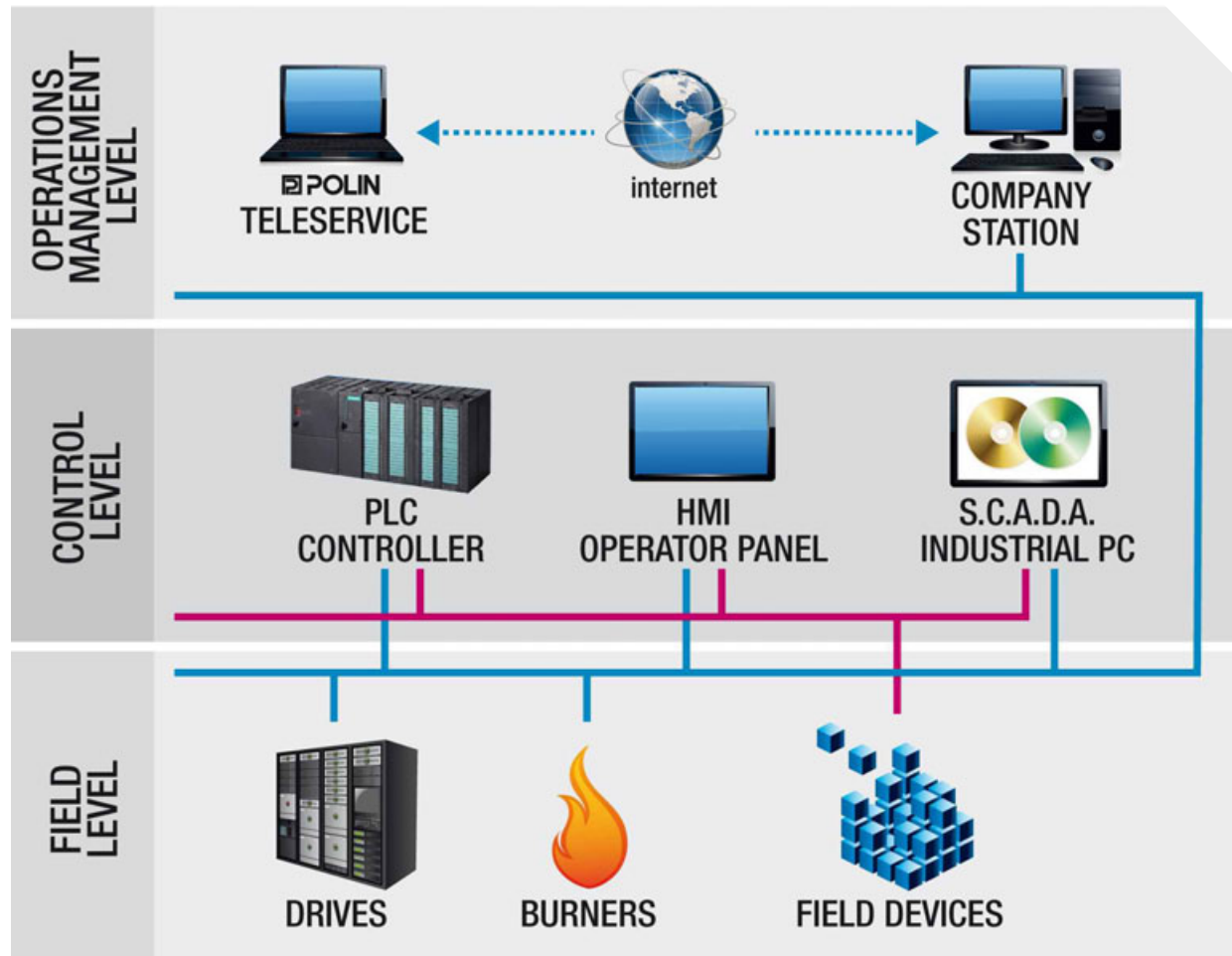
- Automatic start-up and shut off
- Purge cycles
- Burners ignition and control
- Zone top / bottom control
- Product idle and bake mode setting
- Automatic vapour and exhaust damper position
- Automatic tracking system of oven bands

Supervisory pages

- General synoptic of the ovens
- Zone pages
- Recipe managing
- Oven running
- Active alarms
- Previously occurred alarms
- Oven parameters
- Oven variables

Options

- Oven humidity sensors inside bake chamber
- Temperature profile data logged
- Colour trend control





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