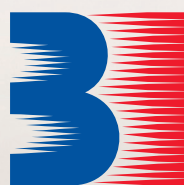


BRICK PLANT WITH ON-WAGON GREEN LOADING DRYER AND SEALED KILN

- relevant model dryer
- presthermic model kiln



**Energy efficiency
taken to the extreme**



Beralmar
Beralmar Tecnologic S.A.

OBJECTIVE

minimum consumption and simple operation

Energy efficiency is one of the great preoccupations of today's ceramics industry. The installation we present here pursues the objective of getting as close as possible to the **minimum theoretical energy consumption** necessary for drying and firing clay, estimated at between **260 and 280 kcal/kg** depending on the moulding moisture and other variables. But its advantages do not stop there. This productive unit concept features:

■ Moderated investment in automation

Using the wagons from the kiln to transport the material in the dryer, only half the number of automated devices are needed as in a conventional plant.

■ Production flexibility, accepting all types of hollow and face bricks

The only limitation in production is that it is not possible to manufacture roof tiles.

■ Great energy efficiency

This is the great advantage of this productive unit. The dryer does not waste the heat recovered from the kiln as it works 24 hours a day, 7 days a week and its rhythm of working and the innovative recirculation system used enable it to be fed almost exclusively by the heat recovered in the kiln.

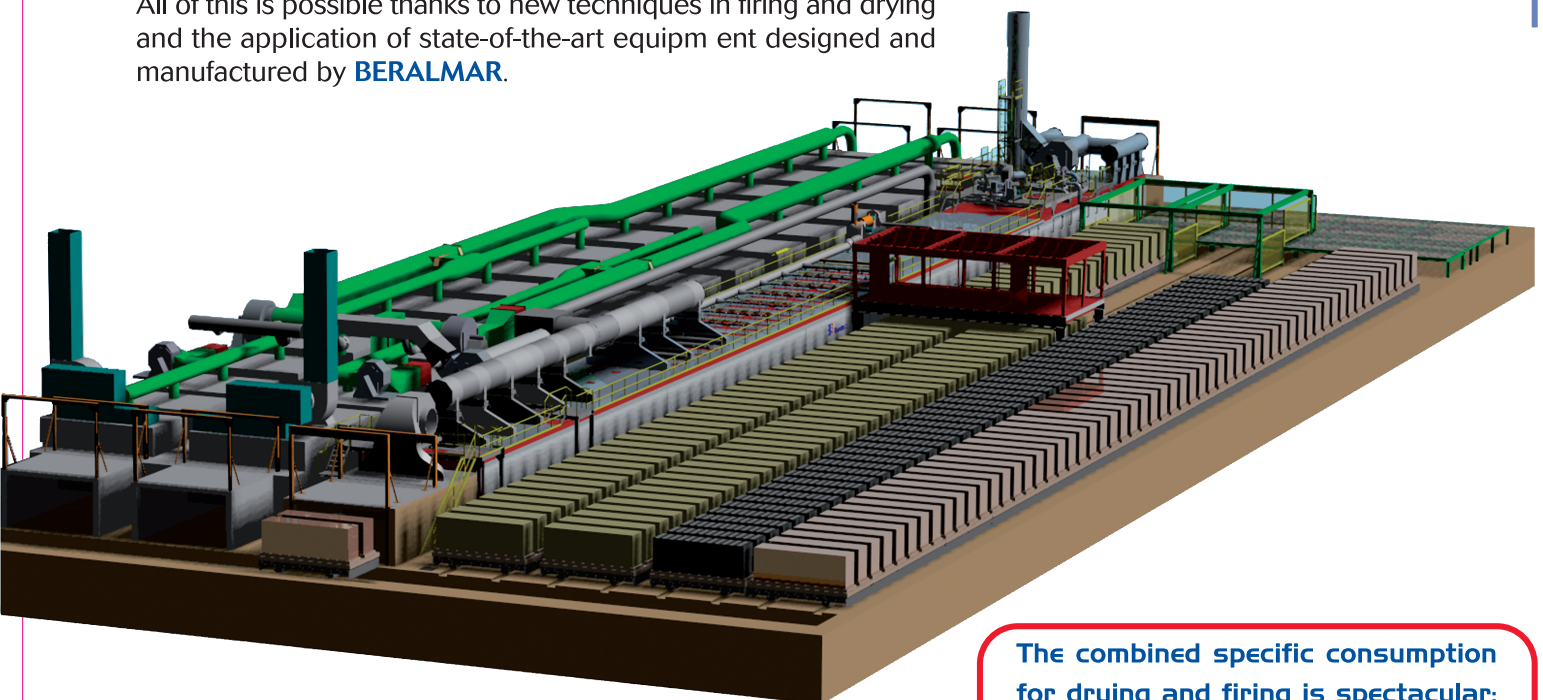
■ Reduction of risk of production stoppage

Automated devices are the main causes of stoppages and incidents in brick plants. Dispensing with half of these reduces these set backs proportionally, and general plant maintenance too.

■ Simplicity in varying production

With the dryer working in line with the kiln and subject to the same mechanisms, increasing or reducing the volume of production from this plant is as simple as speeding up the drive for the wagons and letting the automatic control do the rest.

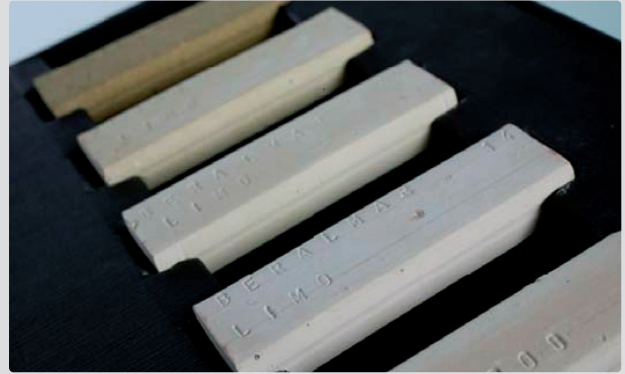
All of this is possible thanks to new techniques in firing and drying and the application of state-of-the-art equipment designed and manufactured by **BERALMAR**.



The combined specific consumption for drying and firing is spectacular: Less than 310 kcal per kilo of material fired, with a clay without combustible additives.

To apply this type of installation, it is essential to have a clay with the appropriate characteristics in terms of drying shrinkage and mechanical strength in the green condition.

In the case of relying on clays which have somewhat different characteristics, a study can be carried out on the additives necessary in each case (sand, etc).

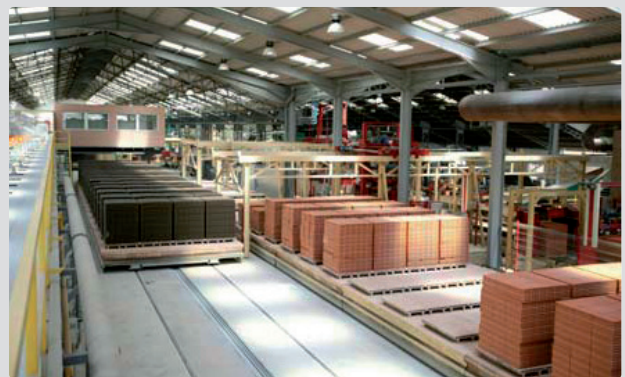


AUTOMATED DEVICES AND MECHANISMS



Investment in automated devices is minimised thanks to the characteristics of the on-wagon green loading dryer which in turn reduces general plant maintenance.

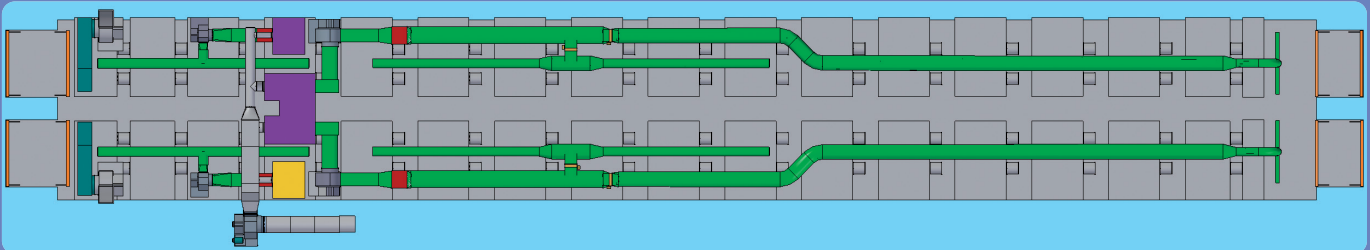
The wagons are loaded before drying and unloaded after firing.



So, the number of automated devices for loading and unloading is half that of conventional plants. Bearing in mind that the majority of stoppages in production recorded in brick plants are due to incidents with this type of equipment, the ability to dispense with half of them considerably reduces the number of incidents in the plant, as well as reducing the number of people dedicated to these and their maintenance.

LLEVANT MODEL DRYER

The **LLEVANT** model on-wagon green loading dryer is a tunnel dryer with one or more channels the same length as the kiln. It works at the same speed as the kiln to take full advantage of the heat recovered from it. The material to be dried is loaded onto the kiln wagon in the green condition, with the consequent simplification of the automated devices for loading and unloading this brings.



The **LLEVANT** model dryer features:

- Energy savings: between 10 and 30% with respect to other types of dryer.
- Ease of use: the **LLEVANT** dryer varies production automatically by always following the rhythm of the kiln.



The energy efficiency of the **LLEVANT** model dryer is based on two points:

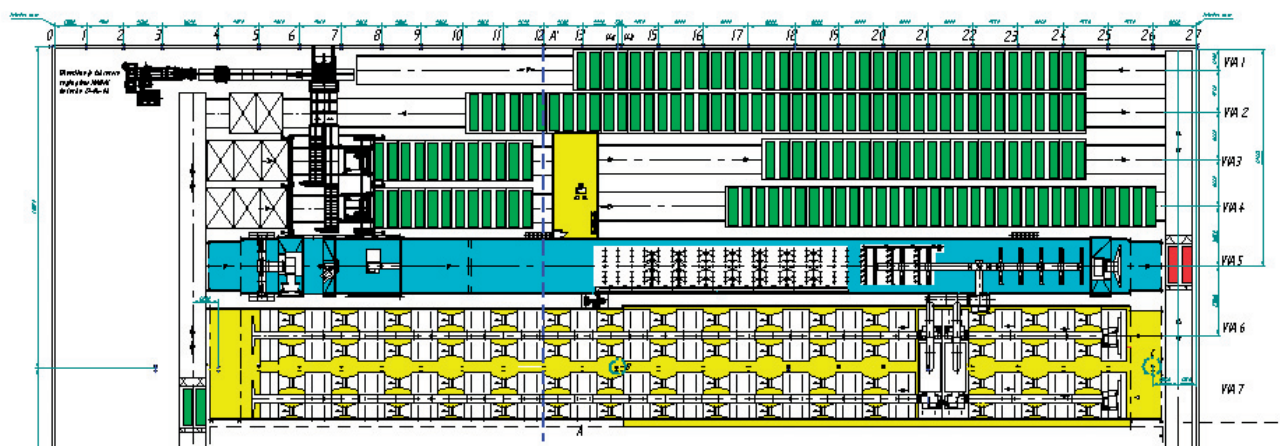
- The dryer works 24 hours a day, 7 days a week so the heat recovered from the kiln is not wasted at weekends, unlike other dryer models.
- An innovative air recirculation system in the dryer which achieves better performance from the hot air injected, making the drying uniform in the whole package section, managed by the **MICROSEC** automatic control.

Another great advantage of the **LLEVANT** dryer is that its production capacity increases automatically when the kiln production speed is accelerated, without the need for structural changes in the installation.



Wagons loaded with damp and dry material.

- The **LLEVANT** dryer is equipped with conical recirculators and an innovative system for injection of heat and extraction of moist air.
- Its efficient design means that the secondary hot air, from a heat generator, is only necessary under exceptionally cold climactic conditions.
- The **MICROSEC** control automatically manages the whole process.



PRESTHERMIC MODEL KILN

The **PRESTHERMIC** model kiln provides significant **energy** saving thanks to the **sealing** achieved by means of:

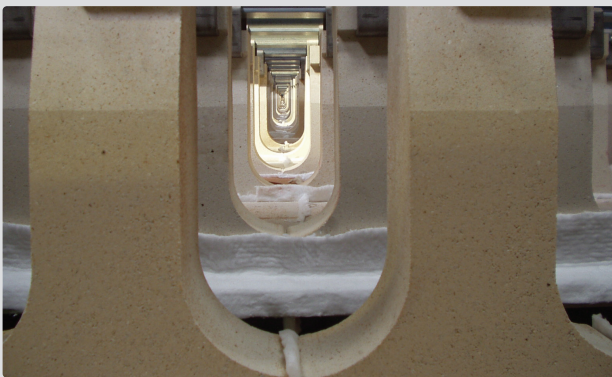
- Metal shroud in welded plate.
- Flat roof in dry pressed refractory supported by the metal shroud.
- All the kiln circuits are prepared to work at high pressure over practically the whole preheating zone.



The kiln can be fitted with firing equipment for **any type of fuel** (natural gas, fuel oil, pet coke) and includes **GERIM** model recirculators and rapid cooling combined with high temperature recovery. This is all managed by the **MICROBER** automatic control.



- The **energy saving** achieved thanks to the sealing of the **PRESTHERMIC** kiln is between 5 and 10% relative to conventional tunnel kilns.



- The hermetic properties of the **PRESTHERMIC** kiln and the materials it is made of enable:
 - The **pressure to be increased** in the pre-heating and firing zones, obtaining a homogeneous firing quality throughout the height and width of the package.
 - **Faster heat transmission in the ceramic material** and hence the possibility of increasing production beyond what is common in conventional kilns of the same dimensions.

PIECES WHICH CAN BE MANUFACTURED

This productive unit concept enables the manufacture of all types of ceramic material, with the notable exception of any type of roof tiles.

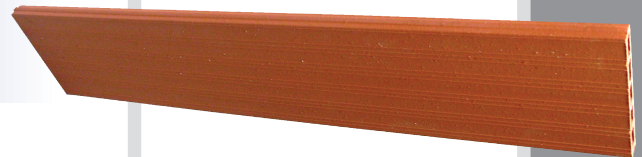
THERMO-CLAY



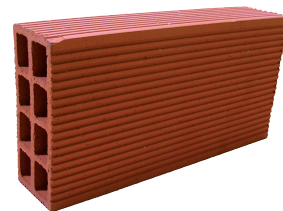
LARGE-SIZED HOLLOW BRICKS



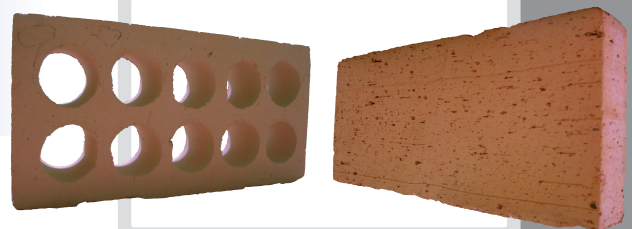
PARTITION WALL BRICKS OR LONG SLENDER SUB-ROOF BRICKS



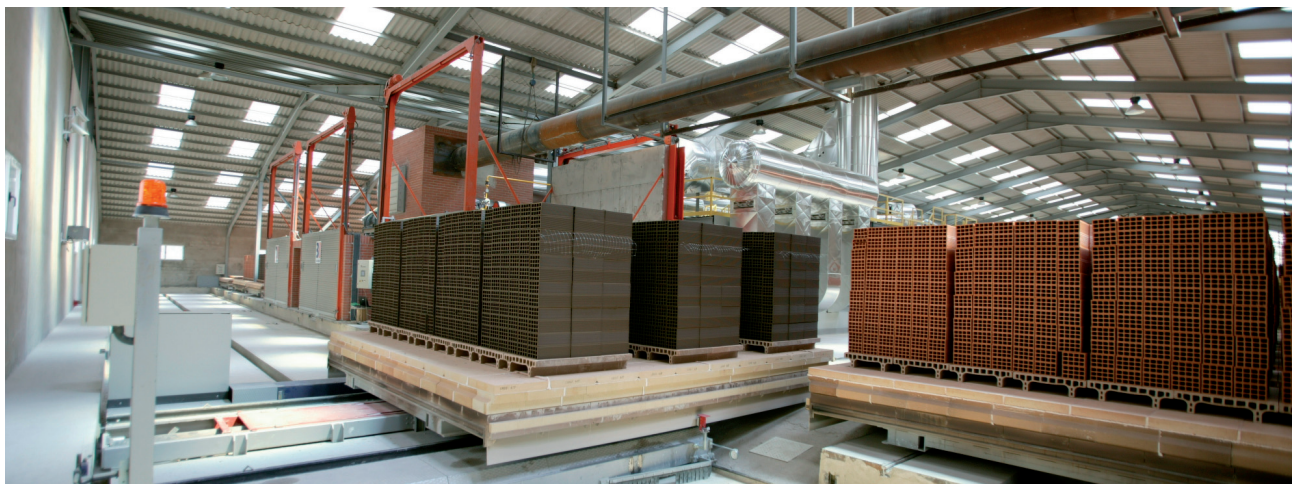
ALL TYPES OF HOLLOW BRICK



SOLID OR PERFORATED FORMS



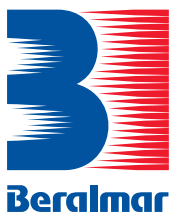
The flexibility and productive quality of the **LLEVANT** dryer has been proven in the manufacture of especially delicate pieces such as long slender sub-roof bricks (Spanish “bardos”) or large format bricks.



References for plants with Ulevant model on kiln wagon green loading dryers and Presthermic model hermetic kilns in Spain

2006 - CERÁMICAS DE MIRA (Cuenca, Spain)
Production: 400 tons/day
Manufacture of hollow and large format bricks

2007 - CERÁMICAS ALONSO (Valencia, Spain)
Production: 350 tons/day
Manufacture of hollow bricks and sub-roof bricks



*Engineering and machinery
for the structural ceramic*

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