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Rapid drying in even-flow dryers

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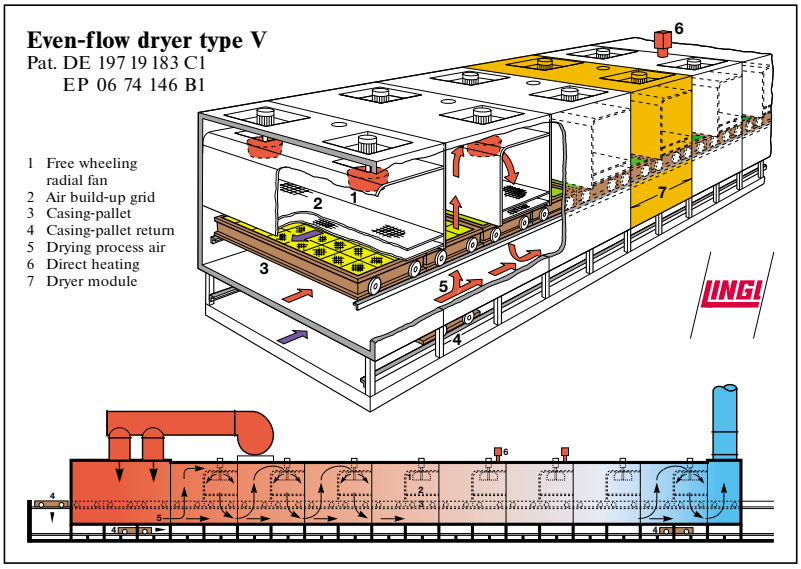
Rapid drying in even-flow dryers

Masonry bricks, facing bricks, roof tiles or ceiling blocks - there are very few products that can't be dried better and faster with an even flow of air around and through the individual brick or tile - the latter of course only when the product is hollow or perforated - than with traditional brick dryers, as was previously the case. It is the stresses resulting from uneven shrinkage of the brick or tile that would lead to cracks if drying is not sufficiently slow. This uneven shrinkage can however be reduced by suitable routing of the air inside the dryer. Dramatic improvements in the drying quality and drying speed are possible as a result.

The first Lingl even-flow dryers Type V for multi-cored hollow bricks were equipped with roller casing pallets in which the masonry bricks, with holes in the vertical direction, were placed upright on two slender rods each (Pat. DE 197 19 183 C1, EP 06 74 146 B1).



The air is routed vertically in this dryer model, alternately upwards and downwards. The casing pallet enclosure served here as a pipe section, and the green brick setting formed a flow grid that achieved a very even air distribution to flow through the setting and its individual bricks.

In the masonry brick industry, however, most plants have a wide production range with a variety of products that cannot all be placed on two slender rods, still less in a grid form.

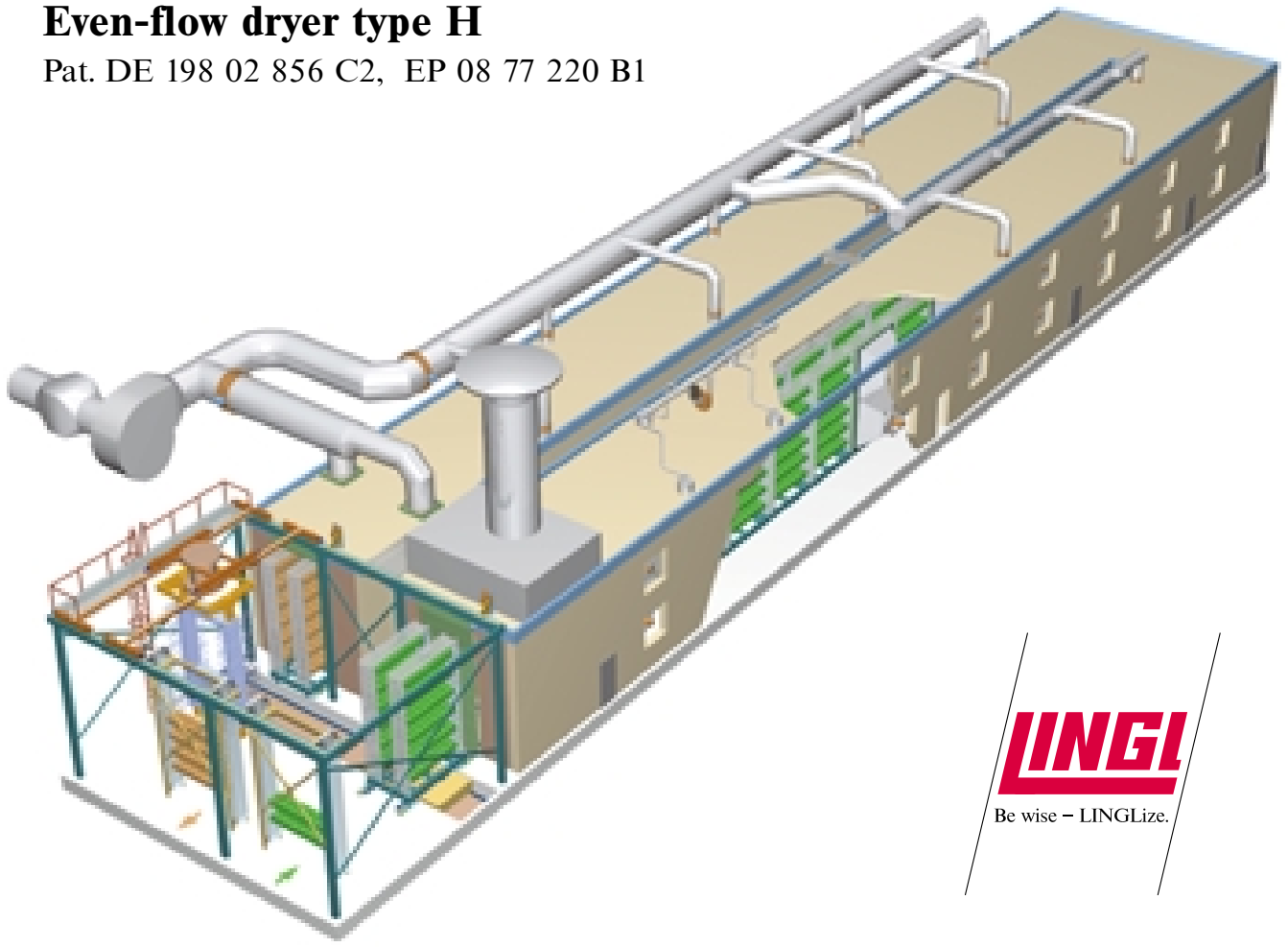
The even-flow dryer therefore underwent further development into the H type (Pat. DE 198 02 856 C2, EP 08 77 220 B1). The latter is equipped with rack cars, which - like the roller casing pallets in Type V dryers - are enclosed in order to achieve precise guidance of the air flow and to avoid disruptions in the edge zones between the alternating-direction air flows. The green bricks are placed on pallets or suitable laths.

Care is taken here that there is also a sufficient air flow around them, for example by using wire pallets or at least pallets with a sufficient proportion of holes.

In this dryer too, the air is alternately forced or drawn through the setting. The time intervals for this direction change are short, since drying from only one side would lead to conically shaped products, drying faster on the incoming air side than on the outgoing air side, where the air holds more moisture due to its absorption of moisture during drying.

Even-flow dryer type H

Pat. DE 198 02 856 C2, EP 08 77 220 B1



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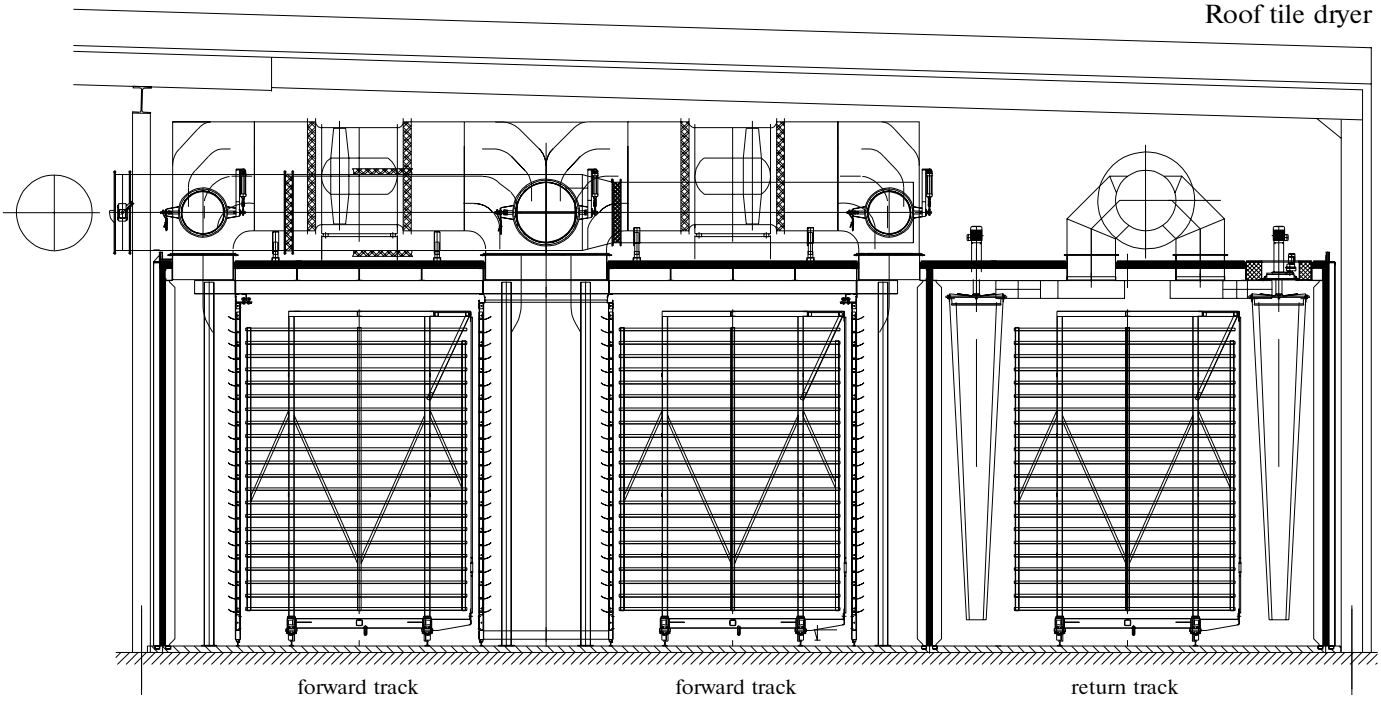
The Lingl rapid dryer for drying roof tiles on pallets also applies the principle of the even-flow dryer, although of course the air can only flow *around* roof tiles. The important thing is that the air flow through the setting is reversed at relatively short intervals, to prevent the tiles drying conically or unevenly. The air flow rate through the setting must be high in order to achieve a high degree of evenness. This is ensured by the overhead-mounted reversing fans. The air is distributed through the cars by movable louvered panels with an air outlet rate that is uniform over the full height of the car. The evenness along the length of the cars is achieved by movement of the louvered panels.

Roof tile dryer



Rapid dryers with longitudinal air flow for thin-walled hollow ware round off Lingl's range of even-flow dryers.

Unlike in conventional dryers, the drying rate in Lingl even-flow dryers is controlled mainly by the heat transmission coefficient α. This results in a very wide control range. The air flow forced through the setting is a partial air flow branched off from the main air flow and routed in the direction of the main air flow. Each loop can be separately controlled. In addition, the air resistance in the system is reduced. The power consumption is therefore - despite high drying rates - considerably lower than in traditional systems.

The relative humidity inside the dryer is lower than in conventional dryers, so that no corrosion problems occur. Nevertheless the even-flow dryer is economical with heat energy: heat consumption is less than 4000 kJ/kg of water, and power consumption is - depending on the layout - between 7 and 15 kWh per tonne of fired material.

Lingl even-flow dryers are now in use for masonry bricks, facing bricks, special products like ceiling blocks and U-shaped shells, and also for roof tiles.

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