

# Stone plates in multi-deck ovens

STONE PLATE OVENS ARE CURRENTLY EXPERIENCING A DISTINCT REVIVAL BECAUSE THEY ARE CONSIDERED TO ENSURE HIGH QUALITY



**++ figure 1**  
Looking into the oven: In front are the rollers, used to move the heavy belt through the ovens; at the back on top the products are reflected; behind that, the heaters are visible

**++ figure 2**  
Stone plate belts consist of small plates, made of natural stones which are anchored on belts to yield a continuous surface while running through the oven

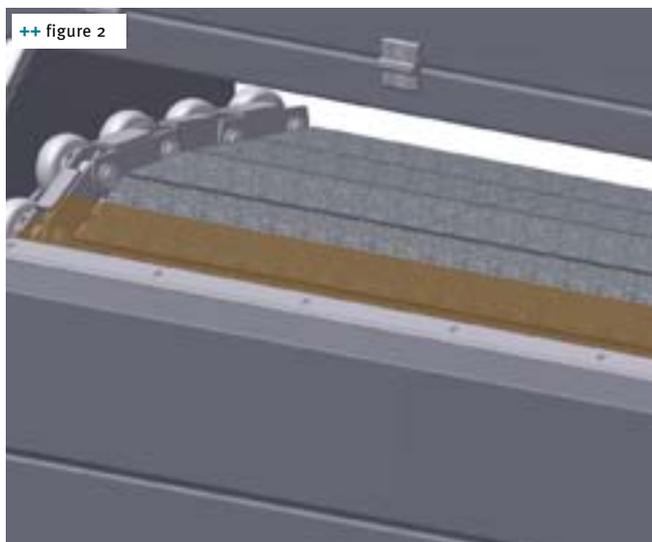
**++ figure 3**  
The high density of the thermo-oil allows the reheating of the stone plate during the 11 minute return path to the required temperature so that they can be used again for baking without the need for further heating

**+** Oven maker Daub, Hamburg, Germany, has equipped many multi-level tunnel ovens with stone plate belts recently. Bakers have known for a long time that par-baked goods bake more gently on stone plates than on steel belts. The bottoms of the baked goods remain fluffier and do not turn too dark. Furthermore, even with high loading density, the sides of the product remain stable, thus preventing the rapid development of creases. The producers of high quality par-baked products agree and the turn to stone plate baking ovens continues not only for artisan bakeries, but in particular for tunnel ovens with large baking areas that are needed for high capacity production.

The oven manufacturer, Daub, with its multi-deck stone plate tunnel ovens is an unchal-

lenged market leader in this field. Dr. Gerd Meyer, managing director of the Kaak subsidiary, says: "Up to now single level tunnel ovens with stone plates were standard. Their feeding and discharge sections could not be closed because of the continuous operation. The advantage of a multi-level stone plate tunnel oven with flaps in front and in the back is the closed climatic chamber on each level. Contrary to conventional tunnel ovens, here a room is formed in which climate and thus product development can be controlled as well as the energy consumption. Added to that, a multi-deck oven needs a smaller footprint when compared to a tunnel oven with the same performance."

Because the stone plate belts on their return path are moved within the oven, they do not



loose too much heat. This contributes to efficient energy consumption. Dr. Meyer: "This feature allows the belt to reach the baking temperature again after 11 minutes, without the use of additional heaters." Eleven minutes baking time is sufficient for most par-baked rolls and artisan products so that a part of the belt can be immediately reloaded when it reaches the feeding section.

The oven is loaded step-wise. The loading and unloading processes are a special challenge to the engineers because the 10 cm long baking plates have to be moved by rollers around the "edge" to the feeding section. During this movement a gap forms in which the product might get stuck. This is now prevented by sensor technology. Most of the ovens built so far have a width of 3 m. Their length is slightly less than 15 m. They accommodate three or four hearths. This results in a maximum baking area of 130 sqm, which according to Dr. Meyer is not the end of the line. Up to 180 sqm on four levels would be realizable without any problems. The performance is limited by the loader, says Dr. Meyer. The loader's cycle time however can be improved by the use of a double table. For the movement of the stone belts, specific mechanical devices are used so that the higher weight does not result in higher strain. The thermal supply needed for heating the stone plate is provided by a thermo-oil oven. The stone plates arranged on the roller-guided rails are either made from granite or from New Serpentino, an amor-

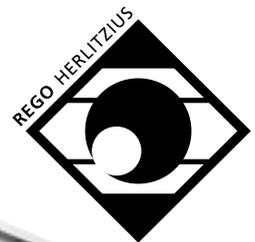


++ figure 4

++ figure 4  
Front view of a three level stone plate tunnel oven: Contrary to conventional tunnel ovens, a controlled climatic chamber is produced on each level, due to the closed flaps

phous stone which is less brittle than granite and therefore less susceptible to damage by impact. Of course all the features have their price. Stone plate belts are more expensive than steel or wire belts. +++

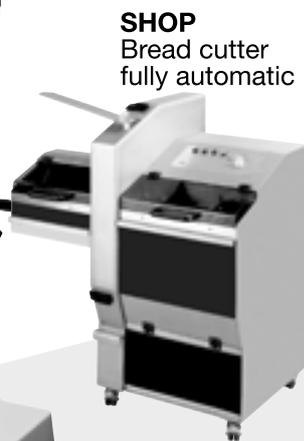
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