

Industrial
Lamination Line
for hard biscuits
and crackers





The **hard biscuit** is one of the first examples of packaged bakery products that can be remembered. The same etymology of the word biscuit comes from the Latin "bis coctus" which means cooked twice, to indicate a dry product, suitable to be preserved for a long time. Sailors' biscuits were the first example of printed biscuits and in some areas the laminated biscuit is also called "biscuit de mer". These products have a fairly well-aerated structure with a rather low specific weight: therefore they are well suited to being soaked in hot drinks. They are fairly crunchy biscuits, just hard on the first bite and then crumbly on the palate, leaving the typical vanilla flavor in the mouth. Within the family of dry biscuits we find the typical French "Marie" and the "Petit Beurre", the English "Oswego", "gem biscuits" and "cabin", but also the families of "cream crackers", the "soda crackers", "snack crackers" and "water crackers". The main ingredient of this family of products is flour and its types, since the dry product is mainly composed of flour and water, with a modest amount of sugar and fat.



In any type of **laminated biscuit** there are the following process phases: the preparation of the dough, its fermentation or stasis (in the case of some crackers or semi-hard biscuits), the formation of the dough, its sheeting (in the case of some recipes), the reduction of the thickness of the final sheet and subsequent cutting, baking and cooling before packaging. Laser provides an integrated solution of the whole process from the beginning to the end with the experience of more than 500 lines installed in the world in the last 20 years. This allows to obtain an optimal result, constant over time and efficient in all steps.



3
FEEDING
SOLUTIONS

50+
MIXERS MANUFACTURED
EVERY YEAR

4
TYPES
OF TUNNEL
OVEN

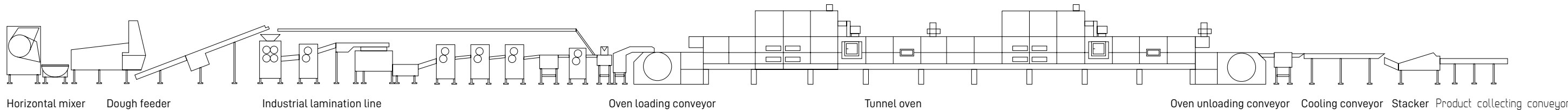
3.5+
KM OF COOLING CONVEYORS
MANUFACTURED
EVERY YEAR

30+
PRODUCTION LINES
INSTALLED EVERY
YEAR

20
DOUGH SHEETS
ON CRACKER
PRODUCTS

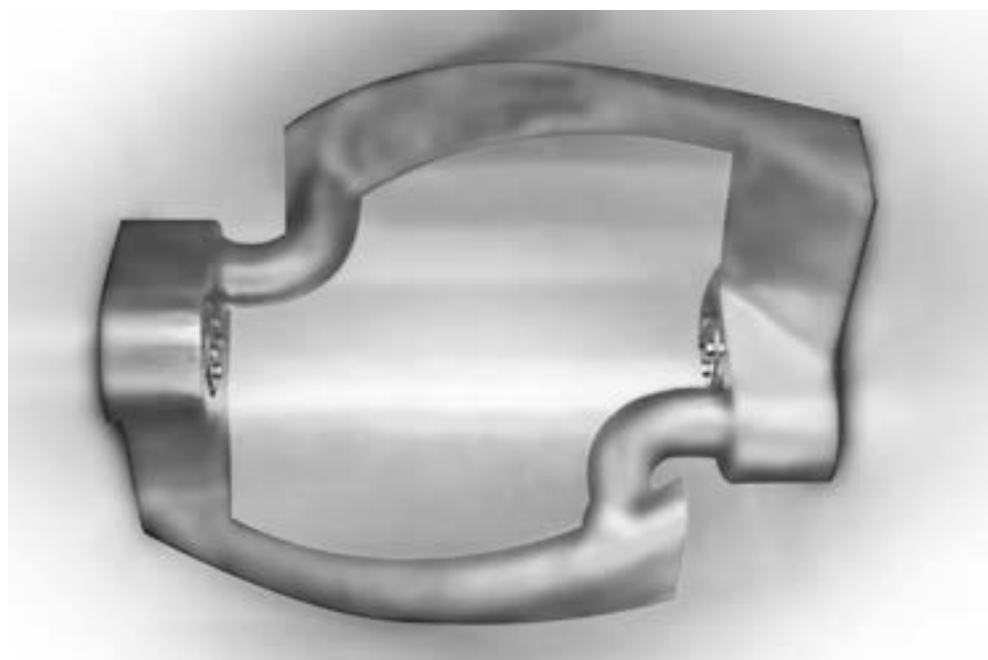
50+
SOLUTIONS FOR
CUSTOMIZING THE
FINAL PRODUCT

99
RECIPES
STORED



Horizontal mixer Dough feeder Industrial lamination line Oven loading conveyor Tunnel oven Oven unloading conveyor Cooling conveyor Stacker Product collecting conveyor

50 MIXERS MANUFACTURED
EVERY YEAR



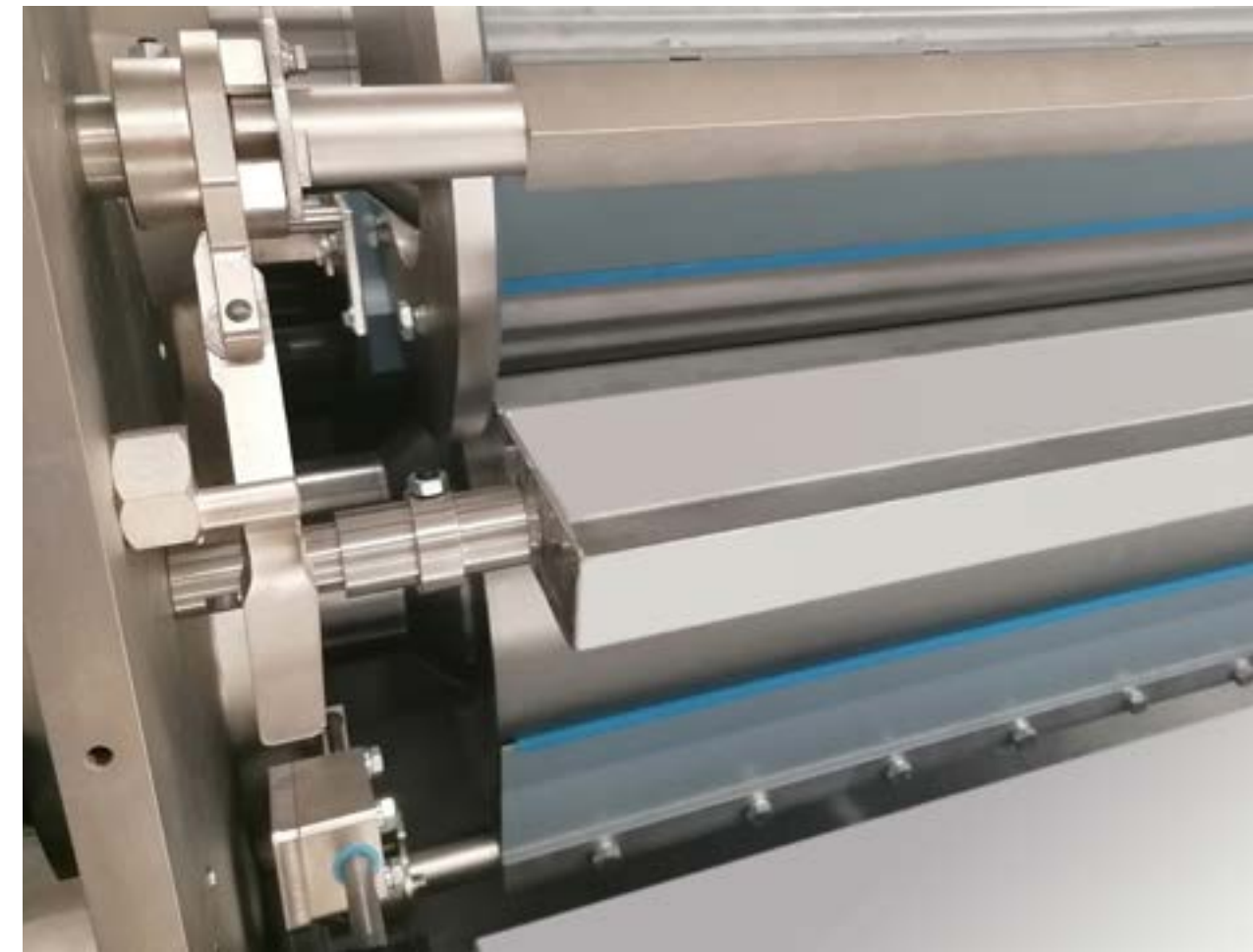
The **dough** is the first phase of the process and one of the most critical: great importance is given to the homogeneity of the dough and its characteristics. How the ingredients are dosed, blended and incorporated, producing the correct amount of gluten during mixing and developing the correct temperature is essential to have a constant and machinable product in the subsequent phases. Laser can count on different types of mixers produced internally through years of experience gained in contact with its customers all over the world.

3

3 FEEDING SOLUTIONS: DIRECT FEEDING, INTERMEDIATE SHORT REST, LONG FERMENTATION ON BOWLS

Once the dough is created it must be transferred to the **lamination line**. It could be a direct process, with resting period of a few minutes, or require a fermentation of several hours. The mixing room could be near the process area, or on a separate floor. In any case Laser has various technical solutions to automate this phase. Often the dough is also checked to avoid the presence of contaminating materials that could damage the following stations.





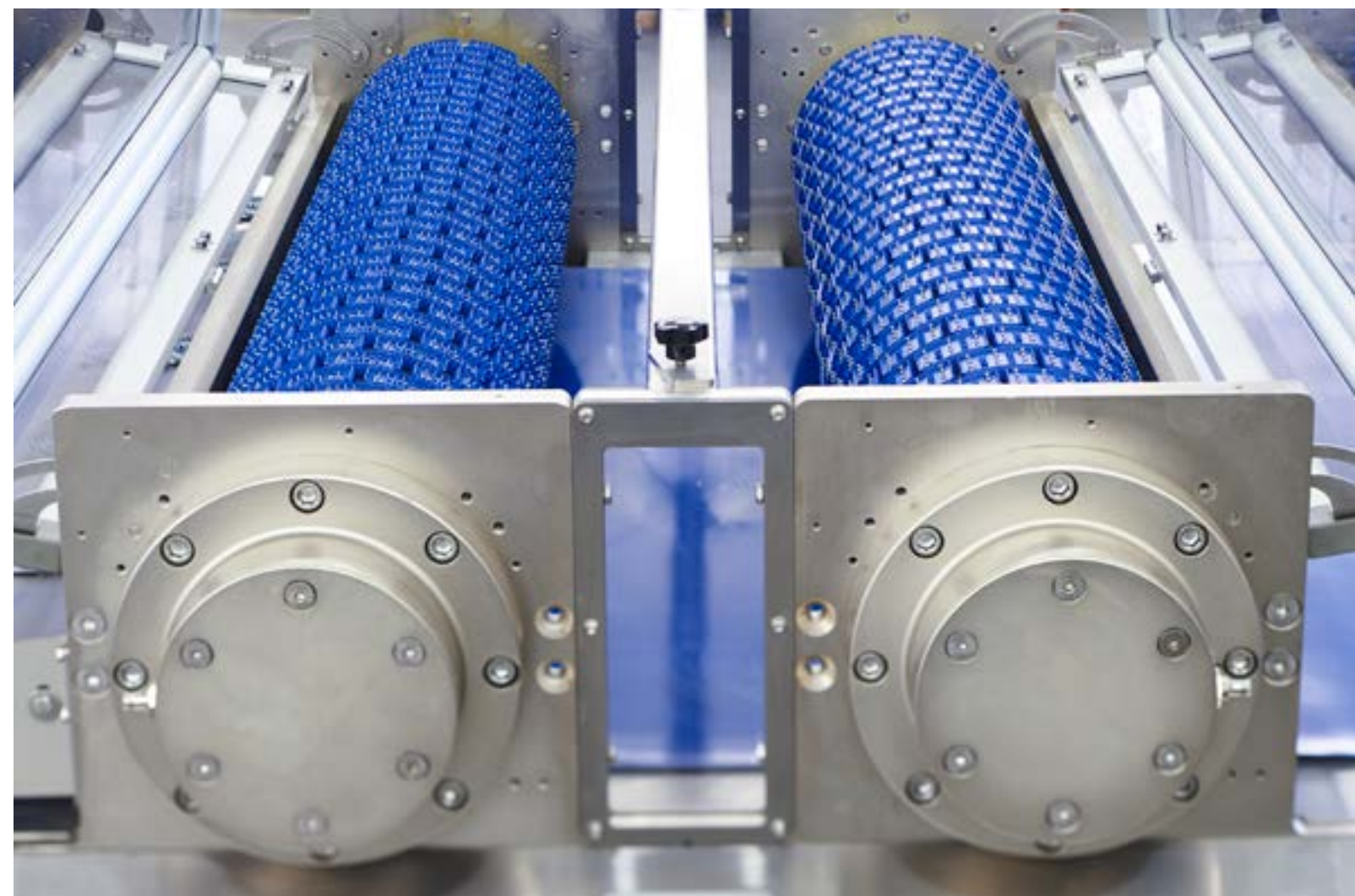
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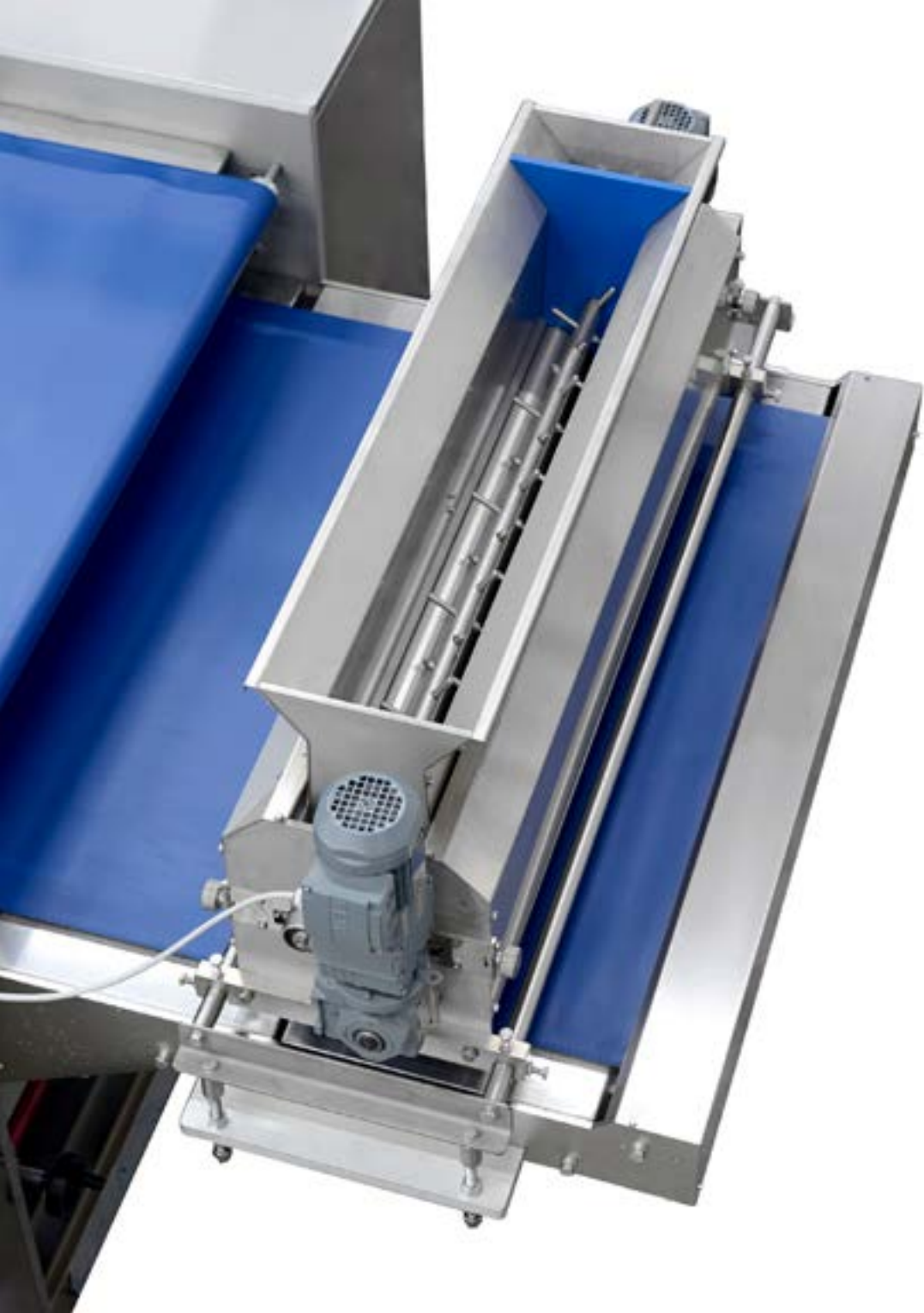
30 PRODUCTION LINES
INSTALLED EVERY YEAR

The **lamination phase** is the heart of the creation of the biscuit: from a coarse sheet created by a 3 or 4-roll extruder, a continuous sheet of dough, even a few tenths of a millimeter thick, is obtained through continuous calibration. It is here that the weight of the biscuit is decided and very high precision is indispensable in order to obtain constant and equal products. Sophisticated electronic control systems analyze and correct the density of the dough to form the sheet, and then automatically adjust the speed of gauge rolls and the belts. The energy transferred from the lamination to the dough generates a further formation of gluten and this allows the dough to remain elastic until the end of the process.



Once the desired thickness is reached, the sheet is engraved and cut by a **rotary cutting machine** and thousands of biscuits are formed every minute. The scraps are automatically recovered and taken back to the hopper of the initial extruder to be reused together with the fresh mixture. Once cut, the biscuits can be decorated with sugar, seeds or glazes before entering the baking phase. All this takes place automatically and without the need for direct intervention by operators.





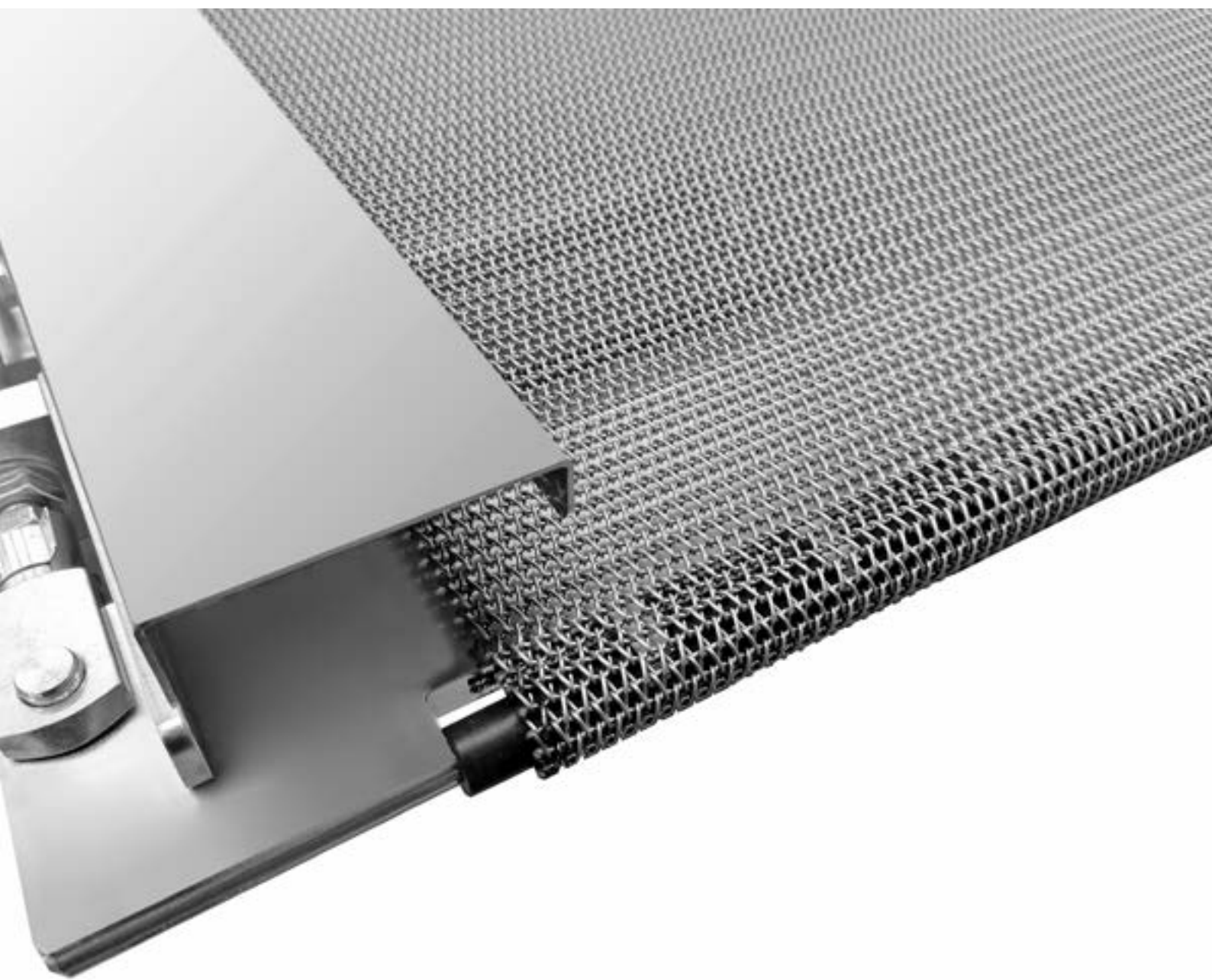
Crackers are a particular family of laminated biscuits: essentially salty, they have a much more aerated structure than the classic dry biscuits and have a longer and more complex fermentation phase (except in some cases). It is also necessary to sheet the dough to make the product fragrant and crunchy and this operation must be carried out with meticulous precision: a badly laid or non-constant sheet will give a remarkable product diversity, sometimes not packable.

Their baking temperature is also much higher because they need to generate internal chemical reactions to create the classic bubbles and their aerated structure. Precisely for this reason Laser has developed a series of innovations suitable for the standardization of these processes to obtain constant products, perfect in every situation

20 DOUGH SHEETS
ON CRACKER PRODUCTS
FOR THE BEST DEVELOPMENT
OF INTERNAL STRUCTURE



50⁺ MORE THAN 50 WAYS TO
CUSTOMIZE THE PRODUCT



Each production line can be customized with various **accessories** to make the final product unique or make the same line more flexible and able to respond to market demands. It is possible to insert more dough sheeters, for two-colored or "Sultana" type products, as well as rotary moulding machines to also produce shortbread biscuits. Distribution systems for granulates, wetting and glazing can be easily integrated into the layout of the line to ensure that each product is unique in the market



4

DIFFERENT TYPES OF TUNNEL OVEN

The **oven** is the master of reference for the entire line and determines its production capacity. Proper baking and correct profiling of the parameters of each zone is the secret to obtain a constant and efficient production. Whether the oven is powered by gas, diesel or electric, which it bakes by radiation or convection, Laser has a solution for every need. Different types of baking and fuel can be combined to give an optimal and at the same time flexible result for modern industry.



CYCLOTHERMIC OVEN



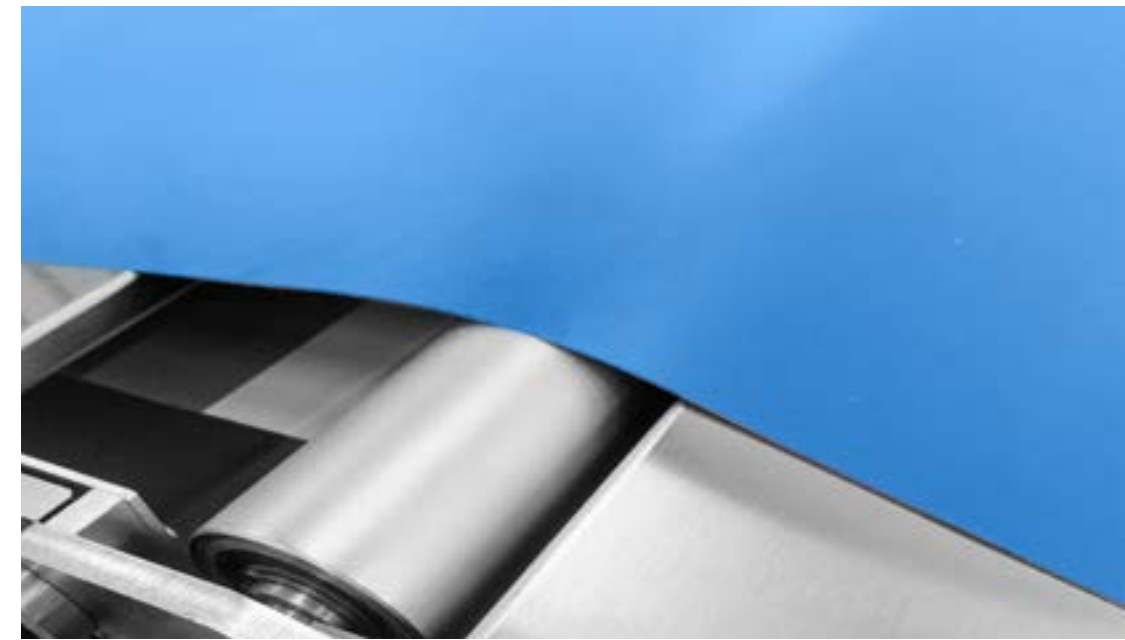
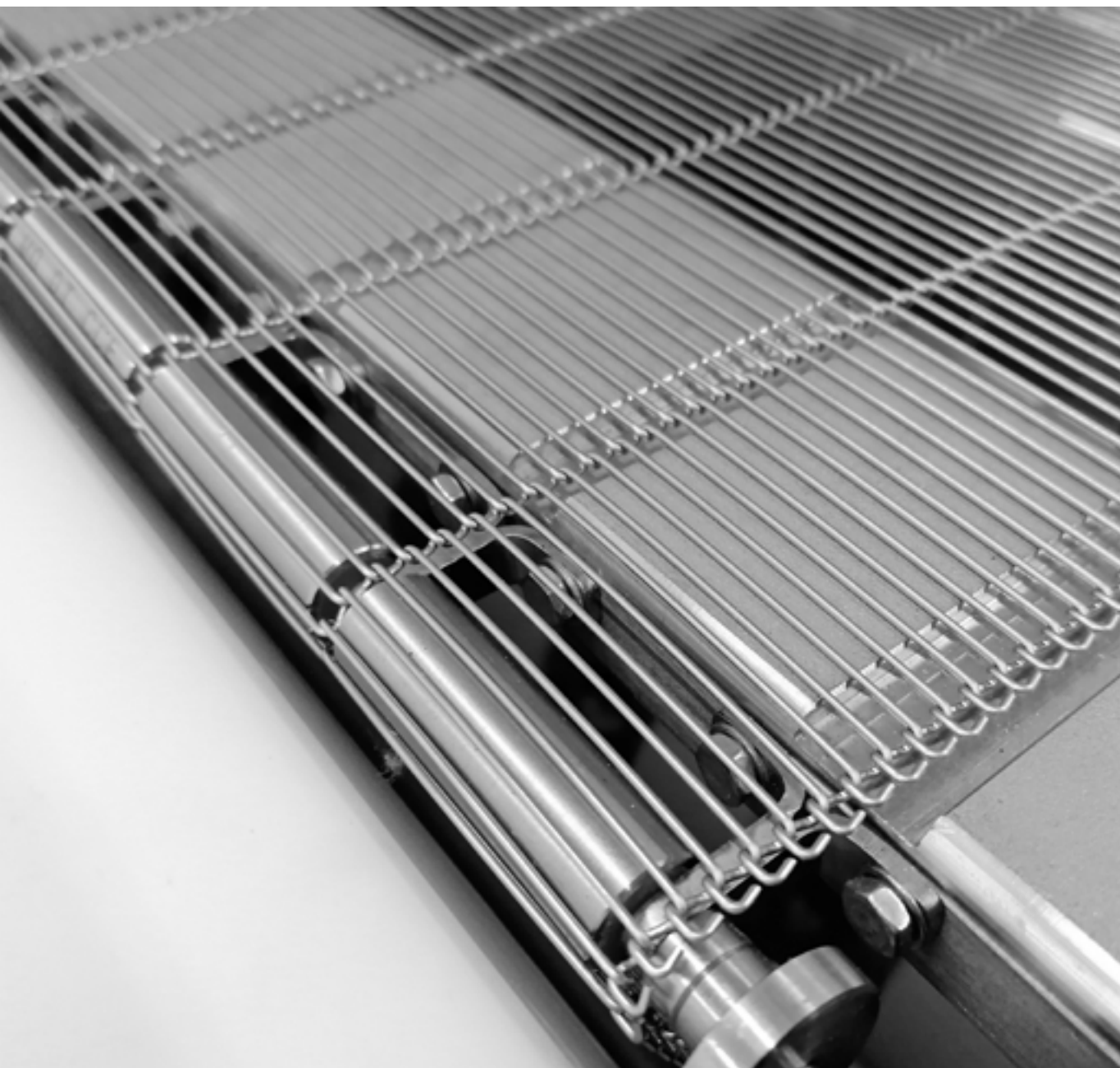
INDIRECT OR DIRECT
OR ELECTRIC
CONVECTION OVEN



ELECTRIC RADIANT
OVEN



DIRECT GAS
FIRED OVEN



3.5

KM OF COOLING CONVEYORS MANUFACTURED EVERY YEAR

Once baking is over, the biscuit must be cooled and transported to the packaging areas, which may be in various positions in the factory. Maintaining a constant alignment and non-aggressive **cooling** are essential for obtaining a whole product that does not break, can be easily stacked and packed. Nobody wants a box of crumbs! More than 3,500 meters of cooling conveyors are carried out each year, transporting each cookie to stacking stations. Subsequently, the biscuit can be conveyed to the packaging machines automatically or manually depending on the system and the speeds. There could be several packaging areas, or several production lines, in this case an integrated system allows a production flexibility necessary for the modern industry.



99

RECIPES STORED
IN OUR SOFTWARE
MANAGEMENT SYSTEM
FOR A FLEXIBLE AUTOMATION

The entire system is managed **completely automatically** by one or more PLCs. The software allows to manage the recipe and production parameters and also be connected to the customer's company networks if necessary. Extensive customization and on-line assistance give the customer a support according to his production needs (Siemens, Rockwell/Allen Bradley, Omron).



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