

# COOKERS FOR DOUGH SHEET

## CUTTING-EDGE TECHNOLOGY FOR THE BEST DOUGH SHEET



required or cleaning the cooker at the end of production. In case of conveyor belts made of stainless steel mesh, the longer-lasting mechanic endurance, compared to thermoplastic belts, causes a high energy consumption due to the need of heating up not only the water in the tank and the entering sheet, but also the great metallic mass of the transportation system. The dough sheet stainless steel transportation system of cookers by Storci, has been designed in such a way that the drive units are out of the cooking water, thus not susceptible to any wear or deterioration. It is longer-lasting, of many years if regularly serviced, in any case definitely not comparable with thermoplastic modular belt conveyor systems. The system has a very reduced metallic mass, the necessary energy consumption is consequently minimum. The footprint is minimum too; this allows for an ample view of each single part of the cooking basin, with no need to lift the transportation belt. This way, the cleaning operations are streamlined and quick, with shorter production stops and much lower management costs.

Cookers are the best solution for continuously cooking the dough sheet in ready-meals lines.

They guarantee a homogeneous cooking, accuracy in transportation and during the entry/exit phase of the product from the machine. This kind of cooker is suitable for treating any dough sheet size and allows several cooking times.

The technological process of pre-cooked lasagna production, involves a pre-cooking phase of the dough sheet submerged in water at 96°-98°C. This stage is one of the most crucial of the whole process. The starch released in the cooking water, the replenishment of water to maintain low and constant the concentration and consequently check the quality of the pre-cooked dough sheet, the sheet conveying mechanic components wear due to starch sediments, the daily cleaning of the cooking tank, the variation of the sheet dimensions when being cooked and the dough transportation to the tank, are all technological and mechanical issues well known to those working in this sector.

Storci CCT series, are state-of-the-art cookers that have solved the above mentioned problems with innovative and original solutions.

### **Starch: mechanical and technological matters in the dough sheet cookers.**

The starch, released by the pasta, is the cause of considerable problems to the drive units immersed in water.

In particular, the most common sheet conveying systems are modular belts made of thermoplastic material that age early because of the temperature and starch sediments laying in the intersection of the mesh of the belt.

This causes protracted production stops to wash out the starch in the intersections and periodically substitute all the transportation system.

The belts require very large basins to be immersed into and a lifting system to be activated whenever either maintenance is

### **Starch: concentration in the cooking water and dough sheet quality**

During the process, the dough continuously releases starch. The quantity released depends on the quality of the raw materials used and duration of immersion of the dough sheet in the cooking water.

The water replenishment, to compensate the water absorbed by the sheet and evaporated, is not enough to maintain a constant concentration of starch in the tank. This leads to modifications of the sheet quality exiting during the production.

To solve this problem, the cookers are equipped with a sensor detecting the starch concentration that is controlled by the machine PLC. If the maximum pre-set value is passed, an extra replenishment is activated - not subject to the absorbed or evaporated water - so that the quantity of starch is kept below the limit.

### **Cooking time and dough sheet quality**

The cooking time is a technological parameter that is based on the characteristics of the raw material used and on the quality outcome the Customer would like to obtain from the final product. However, the timing is conditioned also by the rhythm of production expected on the assembling line and by the size of lasagna to be placed in the trays with different dimensions and weights (i.e. 350g. - 400g. - 600g. - 1000g. etc.). The cutting length of the sheet and the assembling line rhythm require a forward motion speed that usually does not correspond to the ideal cooking time, meant as a technological parameter.

To work this out, fallback solutions are looked for, such as modifying the cooking water level in the tank or tilting the conveyor belt so that the length of the part immersed varies. Otherwise, the Customer should accept the fact that there are different cooking times, maybe adjusting the temperature



of the cooking soak to make up for the different immersion times.

This matter is sorted out by Storci's system, modifying the immersion point of the dough sheet. The cooker length is sized for a maximum value, depending on the shapes and cooking time. Briefer times are possible, simply shifting the entry point of the sheet, so that the submerged part is shorter.

### **Water heating system and dough sheet cooking tank**

The height of the cooking tank of the CCT series by Storci, is only 300mm, much lower than that one of the traditional cookers for the following two main reasons:

- It does not contain the conveyor belt and the lifting system (that is necessary to extract all the transportation system and get nearer the tank for cleaning operations);
- It does not contain elements necessary for heating the cooking water.

This allows the access to the inside of the cooker for the cleaning activities at the end of shift as well as carrying out maintenance operations just after lifting the cooking tank lid.

Water heating is made by the patented system "steam-trap", allowing the injection of steam straight between the bottom walls of the cooking tank.

It is necessary, then, neither the usage of a traditional heat exchanger with a water re-circulation pump nor the direct injection of sanitary steam into the tank water.

Therefore, the sheet can move along the cooker tank without being shifted by the water movements caused by the re-circulation pump of the exchanger or by the steam injection into the tank.

A homogeneous and regular forward motion of the dough sheet simplifies the cutting operations at the end of the line, especially in case of automated plants with a large hourly capacity and cooking tanks longer than 10 meters.