

A new generation

A Bakery in the German speaking area (DACH Region) invested in a new generation Rademaker Laminator, Croissant line and Pastry line. The Laminator is designed according Rademaker's Sigma hygienic design guidelines.



++ The apple filling is applied onto the dough by a Rademaker depositor. A folding set then folds the filling into the dough lanes, creating a filled dough pocket.

+ The new Sigma® Laminator is designed according to the Rademaker Sigma® design guidelines. These guidelines are directly derived from various high-end requirements for hygiene and clean ability such as the GMA standard and Ehedg recommendations. With excellent machine surface finishing, tilted surfaces, rounded frames, FDA approved materials, minimized hinges and bolts and numerous other items, the line is living up to the highest industrial expectations. Total elimination of recesses, cavities and dead corners is achieved. An open design enables easy cleaning without lowering the operator's safety.

Accessibility for cleaning and inspection is achieved by opening covers on both sides of the machine, belt lifters, retractable belt tensioners and knife transfers. Belt lifters enable good accessibility resulting in fast and thorough drying after wet cleaning processes. Accumulation of dirt and dust is reduced due to the application of standoffs and pollution with dough parts is prevented by using wider conveyor belts. New standard feature is also the application of life-time lubricated bearings in the product zone. Needless to say that also this new Rademaker line is fully designed and approved for wet cleaning.

Functionality

An open design with best possible visibility of the process has been the focus for the system design. Rounded edges and

fully opening covers on both sides of each unit are applied throughout the system. The best possible accessibility of the process is achieved by optimizing the space between the working stations and application of horizontal conveyor belts. Also smaller units are designed with open housing. Lightweight safety covers with extra handles enable ergonomic operation. Overall safety is guaranteed by the application of safety locks.

The new Sigma® Laminator is designed with wider rollers (+50 mm) and belts (+100 mm). Apart from a higher output this is resulting in improved dough support, reduced risk for micro-damage and stress in the outer dough edges. Final result is even less thickness variation and improved consistency of the layers than before.

Efficiency

The overall set-up of the Sigma® Laminator is designed for high production efficiency. Operation is made as easy as possible. This is enabled by easy to remove tools, reduced change parts, exchangeable scrapers and bins and various options to minimize required cleaning efforts and increase uptime. Furthermore, the system is equipped with automatic settings allowing for a "one button" action bringing the total machine in the cleaning or drying status. After the cleaning the operator will be warned if belts are not tensioned properly.



++ The dough batches are deposited into the a Chunker before it is processed by Rademaker's Low Stress Sheeting System

Accessibility of the system is strongly improved in order to allow for easy service and maintenance. The service and maintenance requirements are reduced by optimal material selection. This results in minimal wear and increased lifetime of all sensitive items, in combination with a minimized variance of spare parts. Lifetime lubricated bearings in the product zone and clear, comprehensive lubrication locations for bearings outside product zone are resulting in minimal downtime. Parts that require regular maintenance are located in easily accessible places outside the production zone. All conveyor belts are equipped with quick belt release mechanisms to reduce. Downtime during cleaning and to keep maintenance to a minimum. Cleaning and maintenance require less time and production can go on without interruption. Data gathered by the plc can be used to improve maintenance (fe. motor loadings, running stops, stop causes).

Control

Process control by means of intensive data handling and communication is becoming increasingly more important in industrial production processes. The control platform enables OMAC based data exchange with neighboring (third party) equipment as well as LMS, MES or ERP systems.

Furthermore, advanced data processing enables on-line monitoring and optimization of equipment efficiency. The smart use of the combination of process and recipe information allows easy and fast start-up and reduction of flour usage. The existing cascade system and automatic belt speed adaptation (DDIC/Dough loop) is adapted to fit the increased hygiene level. The advanced control system features fully automatic speed adjustment and enables the different sections to operate independently. While the last dough part of the production run is processed towards the end of the line, the



++ Rademaker's Fat pump processes butter blocks into a consistent butter layer

beginning of the line is ready for cleaning or for the production of another product. The operator will be advised when the next recipe can be started on the machine. Finally, the number of sensors is reduced to guarantee for the optimal control with minimal risk for downtime due to malfunction.

Production process

When the ingredients are mixed, a kneaded dough batch generated. The dough batches are deposited into the a Chunker before it is processed by Rademaker's Low Stress Sheeting (LSS) System. The Chunker cuts the dough batch into process able dough chunks. After the dough sheet is created by the LSS, it undergoes a thickness reduction by the Quick Reductor. Rademaker's Fat pump then processes butter blocks into a consistent butter layer. The fat layer is applied on top of the dough sheet, after with the fat is folded into the dough sheet.

After reducing the dough sheet thickness further, it enters two lapping lamination sections. After several reduction stations, the dough sheet is cut into dough slaps. By means of the cutting and stacking lamination method, the required number of dough-fat layers is created. The cutting and stacking method is applied because of the system's high output capacity. The system achieves an output of 2.000kg laminated pastry per hour. Also with this lamination method, the less as possible tension that is build up in the dough during the production process, is released. So, an optimum relaxed dough is achieved at a high output.

After reducing this final laminated dough sheet, it undergoes a cooling and resting period in Rademaker's Cooling and Resting system. Cooling the dough sheet is done because it makes sure that the integrity of the layers remains intact and it creates an even better consistency of fat and dough. This



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eventually results in a significant improvement for the further processing steps. Because of the resting period, the best possible taste and shape/volume is realized, resulting from a combination of dough relaxation and controlled yeast activity. This eventually results in the development of mono sugars and CO₂. Because, according to the bakery, the Cooling and Resting system masters this process, they choose to integrate the Rademaker system into their production process. Because the system realizes an optimum airflow, energy usage is kept to a minimum. Rademaker applies a unique concept with this system, based on indirect, active air coolant. The system is designed according to the GMA hygienic design standards, this way the system is living up to the highest possible industry standards.

Behind the laminator there are two dough make-up sections; a croissant line and a pastry make-up line, both from Rademaker. Depending on the product, the required make-up section is selected. During the visit, Apple pockets were produced. The croissant line was by-passed by an upper conveyor belt, transporting the cooled and relax dough sheet towards the pastry make-up section. First, a decoration roller creates the decorative cut into the dough sheet. Then the required dough lanes are created, a total of seven rows. When a different decoration is required, the bakery can quickly change the decoration roller for another one. Then the apple filling is applied onto the dough by a Rademaker depositor. During processing, the apple filling is cooled. A folding set then folds the filling into the dough lanes, creating a filled dough pocket. The last and final step in this make-up process is product cutting. Now the dough products are transported towards the proofing system. Before the products are transported towards the freezer, the proofed products are sprayed by Rademaker's egg yolk sprayer. A recirculation system makes sure that no egg yolk is lost.

Wide range

The pastry line can be changed for a wide range of different filled and folded products. It only requires a tool- and operator program change, after that the production run can be started. The baker specifically chooses for the systems of Rademaker because of the quick change-over times. Rademaker's cascade system enables that the production line can switch towards another production run, while the production line continues to keep running. When the last part of the existing production run enters the last section, the other sections can be changed towards another product run, this significantly reduces change-over time, making the system an efficient solution.

As said, with this flexible production system, it is also possible to produce croissants, both filled and unfilled, with open or closed ends. When the dough sheet comes out of the Cooling and Resting system, the dough sheet is cut into the required dough lanes. Out of these lanes, the dough triangles are cut and lined up for the next process step. When filled croissants need to be produced, the Rademaker depositor is set to work. It applies the type of filling that is required and deposits it onto the dough triangles. When unfilled croissants are produced, the depositor is bypassed. After depositing, the dough triangles are transferred toward the vacuum roller where they are rolled into croissants. After this shaping process, the croissants are transferred towards the proofing system. After proofing, the croissants can be topped and/or sprayed with egg yolk. The last production step before packaging, is transferring the croissants towards the freezer.

This European based bakery deliberately chose Rademaker's technology because it was able to meet the conceptual demands placed on production technology, the high availability of the systems, and Rademaker's wide-ranging support program to assist its customers. +++