Bread with a homemade taste – using the right processes

Dosing processes with SIWAREX

It comes in so many shapes and forms as almost no other staple: Bread is consumed worldwide – in very different shapes and varieties. There are two aspects that always play an important role in maintaining high quality: the type of dough processing and reliable weighing. This is also the goal of the largest manufacturer for industrial bakeries when introducing new plants to the market: Bread that tastes like homemade thanks to careful processes and integrated weighing technology.

The French company Mécatherm makes bread baking production lines exclusively for industrial bakeries. With the exception of dough kneading machines, the company offers automated plants for the entire production process – from the preparation system, via the cutting equipment all the way to the oven. Mécatherm production lines are making bread in more than 40 countries worldwide – an estimated 20,000 tons of products each day!

The Mécatherm headquarters are located in Paris. Development, production, sales and marketing, however, are located in Barembach, a city in the Alsace-Lorraine region of France. The ovens are manufactured in the neighboring village of Wisches. In addition, mechanical components as well as containers, lifting equipment and freezers are manufactured in another location in Angers.

The task: Products as made by hand – by automation

To guarantee excellent quality for customers, the focus is mainly on the type of dough processing, the baking process as well as the proofing of the dough. Different types of bread need different production lines. Mécatherm offers production lines for standard breads, such as white bread and baguette, toast and soft bread, yeast dough pastries, pizza and quiche as well as rustic breads. Especially for the last variety, the company has developed a dough separation unit that offers particularly careful dough processing and bakes breads that look and taste like homemade.

This unit is referred to as Tradivider, a dough separator that was developed especially for the separation of very wet bread doughs with a long fermentation time prior to separation.
In the ongoing production process, the dough is fed into the dough separator over a funnel and into the dough chambers that cover the entire width of the production line. The fill capacity of the funnel is about 400 kg. The special feature of the Tradivider is the way in which the dough is now separated into portions. To maintain the properties that determine its quality, the dough is to be separated without stress, more or less flowing. The separation therefore takes place in two steps.

While the dough flows into the chambers, it is initially separated from the dough flow horizontally but without tearing it apart or compressing it. This is the only way to prevent the escape of fermentation gases that are crucial for the consistency of the completely baked product later. In a second step, vertical knives that are guided across the filled dough vat, cut the dough into pieces weighing between 300 and 400 grams. These pieces are then formed into the required shapes of bread, such as baguettes, rolls or loaves. Once shaped, the loaves undergo their final fermentation, are cut on the top, baked, cooled and possibly frozen to deliver them to the bakeries without any complications.

For the dough to be continuously processed in the Tradivider, dough is constantly fed into the funnel in units of 25 kilograms. The funnel is mounted directly on the weighing cells here. The most important requirement is precise and reliable dough delivery to the dough chambers because the production line works at an hourly rate of up to 2500 pieces of dough weighing between 200 and 500 grams. This means the measurement of the dough in the funnel must also be very precise and fast.

In addition to the hardware it was also the software that convinced the company to use the weighing module from Siemens. This made installation and commissioning very easy thanks to the ready-for-use application for SIMATIC. It also made it possible to implement customer-specific and industry-specific solutions rather quickly. All scale parameters can be conveniently read and edited from the CPU. „Another important advantage for Mécatherm is the fact that all functions and parameters can be transferred to other production lines with very little effort,” states Dominique Bucher, head of development at Mécatherm.

„The user friendliness of the SIWAREX WP321 is apparent even in case of possible maintenance or repair work because it can be commissioned without any SIMATIC knowledge.“

The machine is equipped with additional components from Siemens. The motors for the drive of the vertically and horizontally cutting knives are permanent-magnet synchronous motors SIMOTICS S-1FK7. The connection of the motors over rotatable connectors and pre-fabricated cables results in a flexible, fast and secure connection to the frequency converters of the SINAMICS series.
Just as with the automation system, the compact design is also evident in the power supply unit being used: a SITOP PSU 200M power supply unit from Siemens.

**The benefit: service and support from one source**

For its Tradivider system, Mécatherm therefore benefited from concept development, over installation and all the way to commissioning from the service and support from one source, represented by Jean-Paul Grosjean, the technical project manager at Siemens SA in Strasbourg.

This is also confirmed by Dominique Bucher: „We are very happy with the excellent technical support we are receiving from Mr. Grosjean – not only as part of this project but also for the ongoing operation.

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**SIWAREX WP321**

The SIWAREX WP321 electronic weighing system is a technology module for SIMATIC ET 200SP. The compact design of the distributed I/O system fits optically into the control cabinet and communicates via Profinet. Its high speed and data transfer rate result in a significantly higher performance than conventional field buses.

With the SIWAREX WP321 electronic weighing system, filling level measurements in silos and bunkers, as well as platform scales can be seamlessly and conveniently integrated into the automation environment directly. Due to the internal updating time of 10 ms, fast and precise force measurement is also possible. Scales can also be set up in hazardous areas with this module.