Bakery Process Gets Reinvented

An Equipment Maker Developed a Continuous-Process Dough Machine that Cuts Energy Usage by 30% and Increases Dough Consistency

Solutions

Encompass™ Product Partner

- Hardy Process Solutions worked with a machine builder to develop a continuous-process dough making machine to improve production for large industrial bakers

Allen-Bradley® ControlLogix®

- The machine builder utilized an Allen-Bradley ControlLogix programmable controller rack and Hardy plug-in weigh scale modules to achieve accurate, consistent dough mixtures

Results

Anticipated Results Delivered

- With this continuous process machine, kneading is highly efficient – producing energy saving up to 30%
- There is no difference between the first and last product off the line, achieving desired consistency
- Reduced labor costs are achieved with the continuous dough preparation because the entire process is fully automated, easily saving four operators

Improved Access and Support

- A secure internet link with VPN provides remote support to customers with access to the programmable controller, human-interface (HMI), dosing and drives

Encompass Product Partner

HARDY PROCESS SOLUTIONS
Measurement ▪ Automation ▪ Productivity

When we enjoy a pizza at our favorite restaurant, we don't wonder if the bread's consistency is as good as it could be. But the bread's quality is a huge concern for large industrial bakeries that produce the dough for that pizza crust. Those bakeries look to their equipment makers to help them provide the best-quality dough at the lowest cost.

One of those equipment makers is SoBaTech Bakery Technology, a Netherlands-based machine manufacturer. To help customers produce higher-quality dough products, the company was looking for a dough-making solution that would allow its customers to move from batch processing to continuous. This would reduce the inconsistencies users were experiencing between the first and last product off the line.

Why use continuous instead of batch processing? Conventional machines work in much the same way people bake at home. Operators take a quantity of flour and make a well in it, add yeast, sugar, salt and water, then start mixing. The mixture then is kneaded into dough.

Traditionally, huge mixing vessels perform the kneading. The operator moves constantly from one mixer to another to add ingredients, depending on the quality of the mixture.

As a result, batch production of dough has some disadvantages. The number of mixers one person can operate is limited, which means production capacity quickly reaches its upper limit. Mixers arranged in a carousel do perhaps have greater capacity, but the quality of the dough is less consistent.

Also, differences in quality between batches are unavoidable. This phenomenon occurs because the first dough in a batch is younger than the average, while the last dough is older.

Reinventing the Process

To address these issues, SoBaTech developed the ContinoMiXX machine that produces the continuous flow of evenly kneaded dough that industrial bakeries need for making bread, pizzas and tortillas. The new machine distinguishes itself from conventional dough machines because it makes dough in one continuous process rather than multiple batches. The machine can help bakeries increase dough consistency and save up to 30% in energy usage.

When SoBaTech started developing the machine, it had to make sure that every ingredient in the mixture will be added at the right time and in the correct volumes to minimize costs and keep quality consistent. The machine's process regulation and control allows for accurate kneading and mixing, and raw material dosing, and the company selected Rockwell Automation because of its open architecture.

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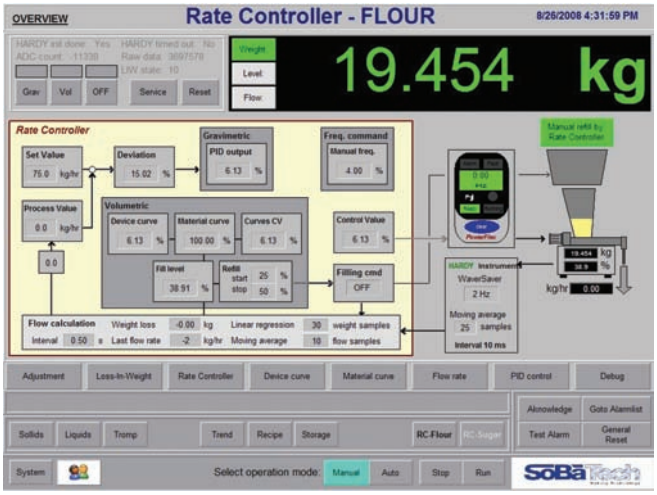
Making the dough requires adding ingredients in the correct ratio by controlling the material feed rate, by weight. To achieve accurate dough mixtures, the company also integrated weighing solutions from Hardy Process Solutions, a participating Rockwell Automation Encompass Program Partner. This is achieved using Hardy's HI 1756-2WS plug-in weigh scale modules, which are installed into an Allen-Bradley ControlLogix programmable controller rack.

The Hardy Process Solutions' weighing card takes care of the initial filtering of the weight signal, and the programmable controller performs the flow calculation and control. The process uses a loss-in-weight (LIW) dosing principle. Raw material weight is reduced in the feed hopper, and as it reaches its low limit, the hopper is refilled from a storage container above it.

During this fill period, the system switches over temporarily from gravimetric dosing to volumetric dosing. SoBaTech developed a programmable controller LIW application with its own LIW algorithm, integrated with Hardy's plug-in scale modules and the CompactLogix programmable controller from Rockwell Automation.



The weighing interface displays accurate weight measurements to help achieve dough consistency.

Benefits of Continuous Production

With the continuous dough machine, there's no difference between the first and last product off the line. Every portion of dough on the line is the same age. The dough has a constant temperature, density and homogeneity (dough structure). Each of these properties is something industrial bakeries have not been able to achieve before now.

With this continuous process machine, kneading is highly efficient – producing energy savings of up to 30%. Energy is also saved because the dough needs to be cooled only briefly or not at all.

In addition to constant quality and increased efficiency, continuous dough preparation has economic benefits because the entire preparation process is fully automated. The operator simply monitors the process, easily saving four operators.

In addition, a secure Internet link with VPN allows SoBaTech to provide remote support to customers for the entire control system with access to the programmable controller, human-machine interface (HMI), dosing and drives.

The results mentioned above are specific to Hardy Process Solutions' use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers.

Automated dosing feeders ensure ingredients are added in the correct ratio by controlling the material feed rate, by weight.

HARDY PROCESS SOLUTIONS
Measurement • Automation • Productivity

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Rockwell Automation and PartnerNetwork companies collaborate to help you develop an ongoing approach to plant-wide optimization, improve your machine performance and achieve your sustainability objectives.

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Hardy Process Solutions has established itself as an industry leader for over 90 years by providing high accuracy and precision measurements, while seamlessly integrating process weight signals into the plant control system. Our solutions include weight controllers, rate controllers and plug-in weigh modules for MicroLogix™ 1500, CompactLogix, ControlLogix, SLC™ 500 and Series 5, load cells, and scales. Hardy's innovative technologies include WAVERSAVER® which ignores surrounding vibration, C2® calibration enabling calibration without test weights, and INTEGRATED TECHNICIAN® which automatically troubleshoots your system.

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Publication FOOVP-AP009A-EN-P – May 2011