

Oven profilers improve quality control

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Oven profilers go by many names in the baking industry, including thermal profilers and data loggers. Despite the name, they all perform similar functions: traversing the lengths and widths of ovens taking constant measurements of temperature and humidity, in addition to internal temperatures of bakery foods.

Oven profilers are designed to take the guesswork out of oven control and provide bakers with added quality control measures. There are several suppliers of these systems in the industry, and they say payback for the tools is less than a year. What follows are examples of how profilers have improved operations at several bakeries.

Example No. 1

In Mexico City, about 35 bakers from a large bakery took a daylong class in profiling. The day was split in two: classroom in the morning and baking applications in the afternoon. The instructor, a representative of an American bakery equipment manufacturer, required a translator to communicate his message in Spanish.

In one day, not only were the bakers sold on the benefits of oven profiling, but so was upper management. "The bakery immediately decided from a corporate standpoint that they were going to roll out oven profile training in 10 bakeries," the equipment manufacturer says. "They now have 20 bakeries between Mexico and South America using oven profilers."

In addition to using oven profilers to monitor oven efficiency, the baking company also has established a weekly reporting system that forces its bakeries to submit reports on oven performance. Detailed oven performance specifications also were created for each bakery, due to the varying environments where the plants are located. Such environments made it impossible to establish a consistent model throughout the bakery's entire plant network.

Example No. 2

A Kaiser roll bakery was running products through its tunnel oven for 16 minutes. After running an oven profiler through the oven and checking internal product temperatures, the bakery discovered that at 10 minutes, its products already had an internal temperature of 200°F. The bakery reduced its baking time for these products to 12 minutes and also significantly increased capacity.

In addition, product quality and shelf life were improved because the oven was no longer over-baking or drying out the products. "This was a brand new oven, too," the equipment manufacturer said. "[The bakery] had the best technology in the world, it just didn't have the operational understanding."

Example No. 3

A large national bakery was running bread through a tunnel oven for 22 minutes. After running an oven profiler through the oven and collecting data, the company realized that it could decrease its bake time to 19 minutes. The bakery calculated the cost savings in natural gas alone and was shocked at the savings: \$4,000 per month per oven.

Example No. 4

A large cracker manufacturer was having staling problems with its products that ran through a 300-ft. tunnel oven. The 3-minute bake cycle sent products through the oven at 100 ft. per minute. After running an oven profiler through the oven, the cracker manufacturer realized it was baking the crackers too long, which took all the moisture out of the products. The cracker manufacturer increased the speed of the oven and boosted throughput by 20%, allowing the company to cut back from two 8-hour shifts to one 10-hour shift.

Example No. 5

A large bread manufacturer was averaging between 500 and 600 complaints per million loaves. The main problem was varying loaf sizes due to oven efficiencies and oven adjustments that actually made things worse. The company purchased an oven profiler, and within 90 days, the complaints fell to three per million.

Example No. 6

A large sandwich-roll bakery was having a problem meeting customer requirements for a brown crust. The bake cycle was nearly 21 minutes, but initial profile runs indicated dough

temperatures were reaching 200°F 11 minutes into the baking cycle due to excess steam and lack of venting. It was determined that all dampers were closed and steam was exiting the end of the oven. By opening dampers, the bakery darkened roll color to a satisfactory level, and the internal temperature was lowered at exit, reducing the staling effect caused by excess heat.

Example No. 7

A large bakery needed to determine proper baking time for a wheat sandwich line baked in an 84-ft. continuous impingement tunnel oven featuring eight zones. By using profilers, the bakery determined internal dough temperatures were reaching 200°F at 74% of the 19:30 baking cycle rather than at the target rate of 85%. To slow internal baking, overall oven temperatures were reduced an average of 15°F. This change has resulted in the bakery saving more than \$3,000 per month on natural gas.

Example No. 8

A bakery was concerned that the actual relative humidity throughout the proofing cycle was different than what the static measurement system was reporting. The static system reported relative humidity in the 90% range, but the product consistently looked underdeveloped and the dough skins appeared too dry. An oven profiler confirmed the relative humidity was only 63% and that a better static system should be installed or existing equipment calibrated. The bakery improved product quality, volume and appearance.

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By using profilers, one large west coast bakery that produces pumpkin pies has reduced cycle times, improved output and cut its natural gas usage.



Several bakers from Grupo Bimbo learn about the benefits of using oven profilers during a daylong class held in Mexico City.