

Dry Processing Technology

Focus on Powder & Bulk Operations

Karen Schweizer, Assoc. Managing Editor

Challenged to mix it up

Automated blending system helps to increase production by nearly three-fold.

Your assignment: increase production by 250 percent. You cannot hire any additional staff. You cannot add production hours. And, you can have only a small increase in space on the plant floor. That was the challenge Integrated Bakery Resources' Director of Operations Mike Lengacher faced. Based in Lake Oswego, OR, Integrated Bakery Resources (IBR) develops and blends proprietary mixes for bakery products. It maintains about 70 active formulas, 95 percent of which were developed for customers in its own labs. In fact, the blends can be so complex that many require more than 100 different ingredients.

Last year, the company planned to increase its production from 20,000 lbs. of blended product per day to 50,000 lbs. per day. There would be no change in the company's single, five-day, split-shift operation, which blended and mixed product in the morning and bagged and packaged product in the afternoon. Crew size—three workers on the blend line and three on the packaging line—would stay the same as would the total number of hours worked. And, the 30-day raw materials inventories standard would not change.

"Ingredient Masters had manufactured our existing manual blending system," says Lengacher, "so we consulted with them for a solution." As it turned out, Ingredient Masters had built an automated system for a pharmaceutical company that had a change in plant requirements. "They told us it

IBR's automated blending system features two rows of eight ingredient dispensers. Although only one dispenser is activated at a time, the dual rows are accessed alternately, minimizing processing time and space requirements. Source: Ingredient Masters.



would be available quickly and could be re-engineered and adapted for our purposes," continues Lengacher.

The Ingredient Masters automated blending system features 16 free-standing bulk bag unloaders, 16 bag-lifting frames, 16 receiving hoppers and a robotic cart equipped with a gain-in-weight scale system. The system's modules

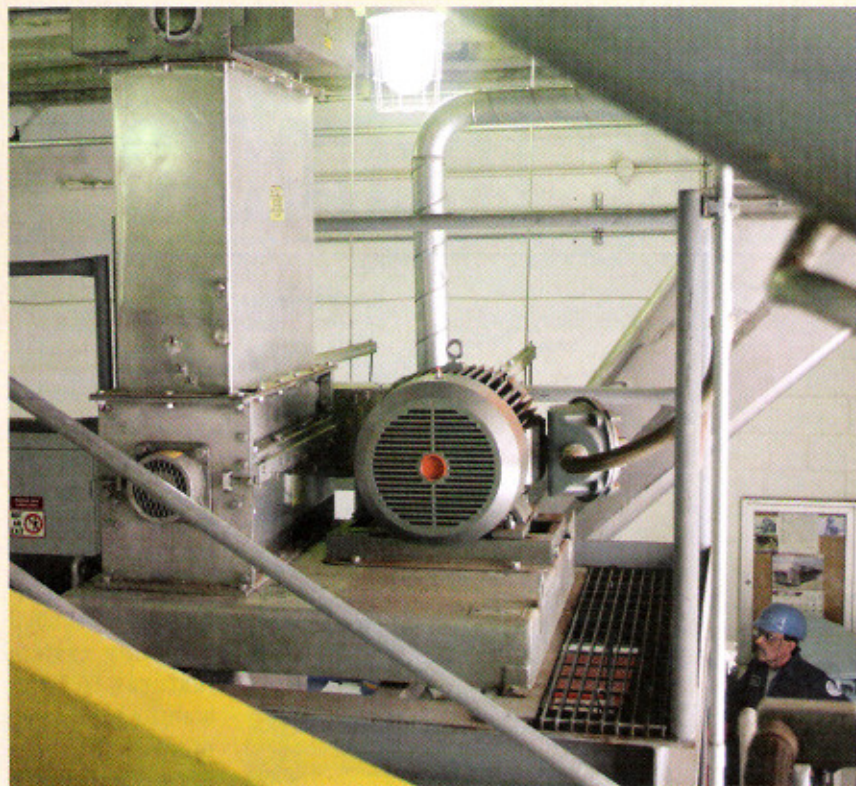
are computer controlled and electric eyes ensure the cart stops where the recipe specifies. In addition, each hopper has an icon indicating the weight of the powder inside and visual alarms activate when replenishment is needed. At the start of the cycle, the system checks the hopper content to ensure there's sufficient raw material.

To further reduce manual operations, instead of 50-lb. palletted bags, 2,000-lb. bulk bags are used to charge the ingredient dispensers. This has enabled the plant to achieve greater efficiency since batches rarely require an ingredient in increments of exactly 50 lbs. Previously, an operator had to manually break the 50-lb. bags and weigh the material to achieve the specified total. "The savings in time between manually breaking the bags, measuring the material and verifying its weight—as opposed to simply suspending the bulk bags in the frame—has been significant," says Lengacher. "There's also a great ergonomic benefit since we've eliminated manual handling."

The switch from a manual blending system to the automated blending system from Ingredient Masters has enabled IBR to increase its efficiency and production—and meet its aggressive 50,000 lbs. per day goal. "Sales are increasing," says Lengacher, "helped in part by our ability to go from product concept to market in 30 days, if the customer circumstances are right." ♦

For more information:

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A new SCC 30 rotary cutter from Munson Machinery helps Givaudan grind vanilla beans at a rate of 3,000 lbs./hr. Source: Munson Machinery.

Vanilla beans from Madagascar, cinnamon bark from Sri Lanka, ginger roots from Nigeria and other natural flavors you enjoy have likely come from East Hanover, NJ-based Givaudan Flavors Corp., which extracts flavor from natural products, concentrates, packages and markets it to food and beverage manufacturers.

Givaudan processes these and other natural ingredients on a mass scale, placing high demands on its size-reduction equipment, grinding upwards of 6,000 lbs./hr. of ginger root, cassia bark or cola nuts and cutting about 3,000 lbs./hr. of vanilla beans to uniformly sized chips, within the relatively tight tolerances required for efficient flavor extraction.

During the process, organic raw materials are forklifted to the second floor of the plant and dumped into any of four dumping stations terminating at size-reduction equipment located below on a first floor mezzanine. To help with this part of the process, Givaudan relies on a rotary cutter, hammermill and roller mill to reduce material to uniform size chips, presenting the best surface area for liquid extraction of flavors.

After a bulk bag is filled with ground material, a chain hoist lifts the bag for emptying into one of several box extractors or 20-ft. high conical extractors. Liquid flavor is derived from vanilla beans, for example, at a 1:10 ratio, says Joe Bush, basic products maintenance supervisor.

Throughput of 6,000 lbs./hr. of tough, hard roots, beans and nuts places high demand on the blades of the rotary knife cutter, which must be very rugged to handle the impact, yet give a precise cut with minimum fines and dust. Givaudan needed to replace its older rotary cutter with one that could handle these tough tasks and keep downtime to a minimum.

Grinding away downtime

A flavor extraction operation installs a new rotary knife cutter and increases uptime.

According to Bush, the Munson SCC 30 rotary knife Givaudan selected does just that thanks to efficient blade replacement, which Givaudan performs every six months. He says blade changing takes four hours now compared to one-and-a-half days with the previous knife cutter. The five rotor knives and four stationary knives fit into slots for easy bolting and unbolting. Additional time saving derives

from a Munson tool for adjusting the clearance between the rotor and stationary knives. The rotary knife cutter this machine replaced required lengthy measurement and adjustment of knife clearance with a feeler gauge.

The former knife cutter attained a throughput rate of 1,990 lbs./hr. with a 60 hp motor, where the Munson unit, driven by a 20 hp variable speed drive at 550 rpm, triples that rate. Also, a wider 270-degree screen permits higher throughput compared to the replaced cutter's 120-degree screen area.

With a second Munson machine, a stainless steel screen classifying cutter, Givaudan chops vanilla beans at a rate of 3,000 lbs./hr. The rotary cutter attains high throughput with a helical rotor assembly of dozens of interconnected parallelogram-shaped cutters, each holding two tungsten carbide cutter inserts. Cutting action occurs as the carbide tips pass within thousandths of an inch of two stationary bed knives. The rotor configuration produces a spiral cutting and feeding effect.

The carbide inserts are replaceable, but Bush replaces the entire rotor assembly every three years, since the tungsten carbide teeth last long even in this abrasive application. "Cleaning of the rotary and knife cutters between batches proceeds rapidly," says Bush. The operator flushes out the cutting chambers with nitrogen and rinses with water. ♦

For more information:
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