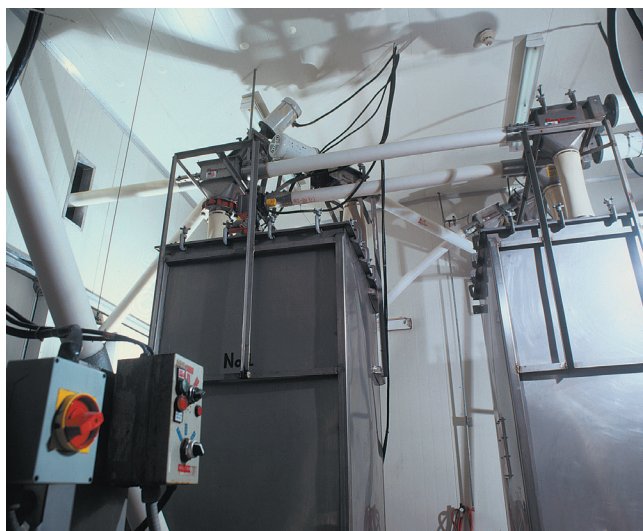
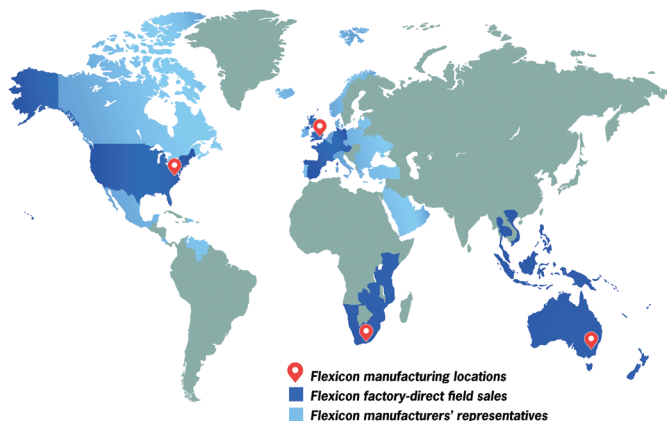




Flexible Screw Conveyors Help Double Output in Confined Bottling and Packaging Area of Milk Powder and Powder Drink Mixes

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Flexible Screw Conveyors Help Double Output in Confined Bottling and Packaging Area of Milk Powder and Powder Drink Mixes

When sales of a product line decrease, expand. That approach paid dividends for Dairy Industries Jamaica with the help of flexible screw conveyors, which allowed the company to expand its product line in limited existing space and double production.

A soft local economy decreased demand for Dairy Industries Jamaica's Horlicks malted milk drink that it bottles and packages. Jamaican consumers have been buying less Horlicks malted milk and more milk powder and milk substitutes. At the same time, Dairy Industries' powder department was not contributing enough to company profits.

The solution was to add a new line of whole milk powder and a soy-based powder drink, EnerPlus. The challenge was to gain flexibility to run packages of all three products at once or one at a time, with Horlicks additionally in bottles.

A heavy stainless steel solid flight auger conveyor system presented the main hurdle to running two more products on the original line. "We would have to start and stop the line, clean, and make adjustments. The conveyors were also far too heavy for us to redesign the department floor layout," says Ryan Peralto, operations manager. "You would need a crane to move them, and the vibration of the augers would have necessitated reinforcing the building's floor."

Gained Flexibility

The department gained the needed flexibility by installing lightweight flexible conveyors by Flexicon Corporation. Dairy Industries installed the conveyors and reconfigured the layout in January 1998. During 1999, the department expanded from one mixer, one sachet packaging machine and manual bag dumping, to two Flexicon automated bag dump stations, two mixers, three surge bins (manufactured by Flexicon) and a second sachet packaging machine. Connecting all together are 11 flexible conveyors, lengths ranging from 15 to 30 feet, with transitions.

Improving over previous manual bag dumping, each Flexicon bag dump station collects dust via a high-velocity vacuum fan as bags are dumped. The outlet is configured to connect with the flexible conveyor.

The new layout operates in original space of 48' x 70', divided into an ambient-temperature and another temperature-controlled room to assure product quality. The surge bins feed ingredients to the packaging and bottling lines for continuous production, cutting downtime by 30-40%.



Multiple Benefits

Results have been dramatic. The new layout doubles production from 6 metric tons/day to 12 metric tons/day, and in the original space. Profits improve as the increased production decreased the cost per case, with the same amount of labor. Consistency of quality has improved. Workers are deployed more efficiently. Safety has improved as workers no longer have to lift the heavy lids of the auger conveyors, which could catch or fall on fingers.

Moreover, the powder department might expand its capacity an additional 50 percent to meet increased demand created by the new products.

Flexible Conveyors

The flexible conveyors transport the material through a 4.5' diameter polyethylene outer tube enclosing a rugged, flexible stainless steel screw. Only the inner screw contacts the product. The gentle rolling action created by the screw prevents any separation of blended products. The enclosed conveyor tube prevents contamination of product and plant environment, and cleans easily and quickly. No cracks, crevices, filters or bearings can trap particles or prevent thorough cleaning. In the powder department, the flexible conveyors move product from station to station in steep, space-saving inclines in a tight area.

The lightweight conveyors make rearranging the floor layout easy. "We can change the layout over a weekend," Peralto boasts. Dairy Industries already expanded the layout once. "With a sketch, we told Flexicon what we wanted. They came back with drawings and a plan."

The conveyors' ease of cleaning and handling help attain high consistency of quality. Previously, when eight or nine extra workers cleaned the auger conveyors monthly over a weekend, the malted milk product stuck like glue in corners and crevices. Now, no sticky, gluey residue remains. Production workers wash the conveyors (instead of the former extra people) by merely removing the clean-out cap, reversing rotation, then flushing with water. Monday morning setups go faster.

Powder line leader, Lloyd Llewellyn, says, "We come in at 7 a.m., and by 8 a.m. we're rolling. Previously the line wouldn't get up until 10 a.m. after a weekend wash-down."

Energy Savings

Another advantage of the flexible conveyors' simplicity, Peralto says their one-half and three horsepower motors are easy to fix or replace at any local motor supply store.

Such energy-sparing components lowered energy costs, as Dairy Industries Jamaica could postpone upgrading the main transformer to the plant for two years. Expanding the department with traditional heavy auger conveyors, Peralto says, would have necessitated the transformer upgrade two years ago. Dairy Industries upgraded the transformer two years earlier.



In reaching the flexible conveyor solution, Peralto and his associates first investigated the conveyors at Pack Expo 1996. He later viewed the success of a local company operating using the machinery. Dairy Industries selected the conveyors for their lightness, ease of cleaning and handling, flexibility, and lower cost than heavy traditional auger conveyors.

The flexible layout has revitalized the powder department to become the fastest growing in the plant at a 10-12% increase per year. (The plant chiefly processes cheese.) Because of increased demand for the new products, Peralto anticipates adding a third sachet-packaging machine with additional conveyors and a bag dump station. "We'll be looking at another 50% increase," he says.



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