THE UNTETHERED PLANT

ROI for leading-edge automation is in the clouds, too
p28

WALMART'S R&D CENTER
p22

FORMULATING FOR MILLENNIALS
p39

NATURAL SHELF LIFE EXTENDERS
p47

4 NEW PROCESSING TECHNOLOGIES
p60
CASE HISTORY

3,000 lbs. of Coffee To Go

Tubular cable conveyors move beans gently at Porto Rico Importing.

Porto Rico Importing Co. has been doing business in New York since 1907. In its new Brooklyn facility, operations include roasting up to 150 lbs. of beans at a time, generating dozens of blends for wholesale and retail purchasers, grinding and degassing some coffee and loading products into 25- and 50-lb. burlap sacks for shipping.

Porto Rico receives green beans in bulk bags that are unloaded from a discharge station and hopper. The beans are manually weighed and transferred in batches up to 150 lbs. by a pneumatic conveyor into a roaster. The real material handling challenge comes after the roaster; the beans must be conveyed gently and efficiently to blending and ultimately packaging operations.

At 5,000 sq. ft., the facility is relatively small. “Since roasting, conveying and packaging areas take up almost half of our space, efficient material handling is critical to maintain production schedules,” explains warehouse manager Mark Kasper. So Porto Rico installed two tubular cable conveying systems, special hoppers, a portable flexible screw conveyor and a half frame bulk bag discharger with an upper frame section that doubles as a filler, all including controls from Flexicon Corp.

At the heart of the system are two Flexi-Disc Tubular Cable Conveyor (TCC) circuits, which are unique in their ability to move fragile coffee without degradation, dust or residual material in the conveyor at the end of a conveying cycle. The conveyors transport coffee beans through 4-in. diameter stainless steel tubes using low friction polymer discs affixed to a stainless steel cable.

After roasting, beans gravity feed into a floor hopper where they are metered into the first tubular cable conveyor circuit, traveling 9 ft. horizontally, then 12 ft. vertically and another 12 ft. horizontally to either a wall-mounted surge hopper for manual bag filling of non-blended batches, or through two inline tubular discharge valves and two wye diverter valves into a special four-compartment hopper mounted on load cells in preparation for blending with other bean varieties.

Once the bean varieties have been delivered to the four-compartment hopper, a PLC weighs batches of up to four varieties by selectively actuating the discharge valves beneath each compartment to deposit the desired amount of each bean into the blender. The PLC also receives signals from high and low level sensors in the compartments to prevent overfilling and to indicate when a compartment is running low on beans.

“We enter the four-bin hopper loadings on the PLC for blends. There might be 100 lbs. of beans in one compartment, 50 lbs. in another, and so on to empty into the blender,” Kasper explains. Once the correct amounts are in place, blending begins.

The second TCC circuit, installed at a right angle to the first, transports blended beans from the hopper beneath the blender 6 ft. horizontally, then vertically 14 ft., and horizontally another 13 ft., where the beans are gravity fed through a hopper and a wye diverter valve. One leg is for filling 50-lb. bags of whole bean blends and the other leg feeds the grinder.

From the grinder, a portable flexible screw conveyor transfers ground coffee at a 45-degree angle into a bulk bag, secured in the upper section of the Bulk-Out BFF-C-X half-frame bulk bag discharger. Since the flexible screw conveyor is portable, it can be easily removed to allow manual filling of these 50 lb. bags at the grinder. The ground coffee degasses overnight in the packaging area. The next morning the bulk bag contents are discharged into a floor hopper within the split frame, from which a flexible screw conveyor transfers the coffee to a packaging machine in the small wholesale packages. The 50-lb. bags are delivered to Porto Rico’s other Brooklyn warehouse for retail packaging.

The Tubular Cable Conveyors replace a large pneumatic conveying system used in a previous warehouse. Kasper says the pneumatic conveyor was powerful and did a good job moving material. However, it broke a percentage of beans in the process, which detracted from product appearance.

No breakage occurs with the TCC systems, he says. The conveyors are dust-free, present no cleaning or material changeover problems and operate simply without blowers or filtration. The lines operate so well, in fact, that minimal manpower is needed for operations. Kasper says only two people work with him in the warehouse.

For more information, see www.flexicon.com.