Coffee to go

Coffee processor ships large volumes on time with tubular cable conveyors from Flexicon

Coffee to go at Porto Rico Importing Company means shipping 1,300 kg of coffee per day to its four retail stores, mail order customers and wholesale accounts.

"Porto Rico has been doing business in New York since 1907. The company's headquarters and one of its stores are located in Manhattan's Greenwich Village. Three other stores are in the East Village, the Lower East Side of Manhattan, and Williamsburg, Brooklyn, along with two warehouses. Peter Longo, Porto Rico's president, is the third generation of his family to run the company.

Porto Rico roasts, blends, grinds and packages beans in its new Brooklyn roasting facility. Operations follow a strict schedule. This includes roasting up to 68 kg of beans at a time, generating dozens of blends for wholesale and retail purchasers, grinding and de-gassing some coffee, and loading products into 11 and 22 kg burlap sacks for shipping.

EFFICIENT MATERIAL HANDLING IS KEY

At 465 sq.m., 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.

To accomplish this, 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 filter, all including controls from Flexicon.

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 in all of its forms without degradation, dust or residual material in the conveyor at the end of a conveying cycle.

The conveyors transport coffee beans through 10 cm diameter stainless steel tubes using low-friction polymer discs affixed to a stainless steel cable. The cable-disc assembly is driven at the discharge end by a motorised drive wheel, and kept taut by a tensioning wheel at the intake end.

A 914 mm section of stainless tubing

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June 2016 Solid & Bulk Handling
immediately downstream of the material intake is substituted with a transparent section of plastic tubing, allowing operators to visually monitor performance of the system, including fill levels of the "pockets" between discs.

Immediately following discharge, the cable-disc assembly is turned 180 degrees by the drive wheel, and passes an air knife for cleaning of any residual material, before travelling through the return circuit. At the intake end it is again turned 180 degrees, this time by the tensioning device, before passing through a pickup adapter where coffee is metered into the system.

FROM MULTI-BIN HOPPER TO BLENDER

Porto Rico receives green beans in bulk bags that are unloaded from a discharge station and hopper (both supplied by a different vendor). The beans are manually weighed and transferred in batches up to 68 kg by a pneumatic conveyer into a roaster.

After roasting, beans gravity feed into a floor hopper where they are metered into the first tubular cable conveyor circuit, travelling 2.7 m horizontally, then 3.6 m vertically, and another 3.6 m horizontally to either a wall mounted 368 l capacity surge hopper for manual bag filling of non-blended batches, or through two inline tubular discharge valves and two vye diverter valves into a special four-compartment hopper mounted on load cells in preparation for blending with other bean varieties.

"We need to convey the coffee quickly so we don't slow down the blender," says Kasper.

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 according to weight gain information transmitted by load cells underneath the hopper. 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 45 kg of beans in one compartment, 23 kg in another, and so on to empty into the blender," Kasper explains. Once the correct amounts are in place, blending begins.

SECOND TCC CIRCUIT FROM BLENDER TO GRINDER

The second TCC circuit, installed at a right angle to the first, transports blended beans from the hopper beneath the blender 1.8 m horizontally, then vertically 4 m, and horizontally another 3.9 m where the beans are gravity fed through a hopper and a vye diverter valve. One leg is for filling 23 kg bags of whole bean blends, and the other leg feeds the grinder.

From the grinder, a portable flexible screw conveyor, 3m long, transports ground coffee at a 45 degree angle into a bulk bag, secured in the upper section of the Bulk-Out BFF-CX half-frame bulk bag discharger. Since the flexible screw conveyor is portable, it can be easily removed to allow manual filling of 23 kg bags at the grinder. The ground coffee degasses overnight in the packaging area. The next morning the bulk bag contents are discharged into a 113 l capacity floor hopper within the split frame, from which a flexible screw conveyor transfers the coffee to a packaging machine for small wholesale packages. The 23 kg bags are delivered to Porto Rico's other Brooklyn warehouse for retail packaging.

CONVEYORS DELIVER UNDAMAGED PRODUCT

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.

Longo and Kasper learned about the Tubular Cable Conveyor at a coffee trade show, and observed full-scale systems in operation at a Flexicon test laboratory before placing the order.

For more information contact Flexicon (Europe) on tel: 01227 374710 or visit: www.flexicon.co.uk

For more information about Porto Rico Importing Company visit: www.portorico.com

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