

Conveyor meets manufacturer's need to cleanly move loose food items



GloryBee Foods, founded in 1975 as a one-man operation selling honey, is a Eugene, OR-based manufacturer and distributor of organic food products. The family-run business still sells honey and other liquid sweeteners. It also markets a broad assortment of spices, herbs, trail mixes, flours, grains, baking mixtures, rice, beans, pasta and other dry bulk foods. The diverse product line requires the operation to convey bulk materials having dissimilar particle sizes, bulk densities and flow characteristics to a filling machine, undamaged and with no separation of blended products.

Finding the right conveyor began as a process of elimination that ruled out certain categories of equipment, and ended with a detailed evaluation of available models of flexible screw conveyors.

"We looked at all types of conveyors," says Jim Davis, chief engineer for Glory Bee (since retired). "We quickly decided a flexible screw conveyor was the best type for our operation. It can convey vertically, horizontally, and in just about any configuration we needed throughout the plant."

The company evaluated three types of flexible screw conveyors. "We ranked them, primarily, for their ability to handle free-flowing as well as non-free-flowing products," says Alan Turanski, director of marketing. "These range from delicate nut-meats and sticky dried fruit to lightweight spices and finely ground flours. We also evaluated their ability to convey blended products with no separation of ingredients, regardless of the size or shape of the particles or the bulk density of the material. In our case, this ranges from 23 to 51 lbs. per cu. ft. In addition, the selected conveyor had to supply material without interruption at a rate sufficient for downstream packaging of containers ranging from 13-oz. jars to 50-lb. boxes."

The conveyor also needed to wash down rapidly and thoroughly to prevent cross contamination, and to offer mobility for rolling to a cleaning station and several blenders located throughout the plant. Finally, it needed to offer high-build quality. Ultimately, the company purchased a Model 1350 flexible screw conveyor from Flexicon Corp., based in Bethlehem, PA. Operators position the mobile conveyor's 8-cu.-ft. hopper directly below the discharge port of the blender. The surge hopper of the mobile filling machine, which operates in tandem with the conveyor, is then

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positioned below the conveyor's discharge spout and connected with flexible tubing in similar fashion.

To transfer bulk food products from the blender to the filling machine, an operator manually opens a slide gate valve at the blender's discharge port, allowing the material to descend into the hopper of the flexible screw conveyor. Once the material fill level rises above the hopper's low-level sensor, a controller activates the flexible screw conveyor, causing material to move through its 10-ft. long, 3.5-in. O.D. tube at a 45 degrees incline. Material exiting the discharge housing falls through its flexible connector, loading the filling machine's surge hopper until its high-level sensor signals the controller to stop the conveyor.

Because material exits the conveyor through a port extending from the bottom of the discharge housing, it does not come in contact with seals or bearings of the motor drive located atop the housing, thereby averting product contamination and premature equipment failure. Turanski says the gentle, rolling action of the inner screw moves blends including those comprised of ingredients having dissimilar particle sizes, bulk densities, textures and flow characteristics with no separation throughout the entire length of the conveyor.

The conveyor also handles materials that tend to pack and cake, including the company's blend of shortening, salt, sugar, yeast and other ingredients that are kneaded with flour to make pizza dough. "Despite the non-free-flowing nature of the blend," says Turanski, "the flexible screw conveyor moves it at a consistent rate of 80 cu. ft. per hour."

Rapid, thorough cleaning is required to prevent cross contamination between relatively small batch runs (300 to 6,000 lbs.), especially after conveying flours that leave a residue of fine dust, or dried fruits that smear sticky sugar residue on all product contact surfaces.

GloryBee sanitizes all interior surfaces of the blender, conveyor and filler between production runs with a total system rinse, a wash with cleanser, another rinse, a sanitizing step and a final rinse, after which the equipment is air dried. Turanski says the removable clean-out cap at the bearingless intake end of the conveyor allows reversing of the screw rotation for total material evacuation, and in-place cleaning of the flexible screw and crevice-free interior of the conveyor tube.

Turanski adds that the company uses a vacuum ventilation system to contain dust, but attributes cleanliness of the plant environment to the enclosed conveyor and its sealed, flexible connection to the filler. "If you've ever worked with spices," he says, "you know how quickly they become airborne. Without the enclosed Flexicon system, our air problems would be far worse," he says.

Davis says the company "asks a lot from a conveyor," noting that Glory Bee runs its unit five days per week. And because it's mobile, he says, "they roll it wherever it's needed, eliminating the cost of multiple conveyors."

Flexicon Corporation

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