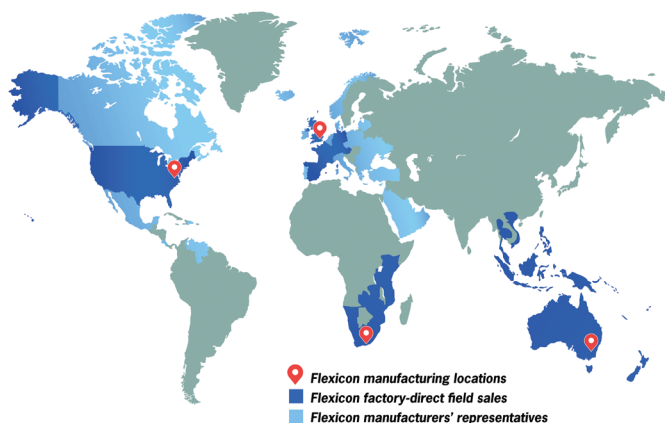




Hemp Processor Improves Product Quality, Reduces Waste

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WINNIPEG, MANITOBA — Manitoba Harvest is a major Canadian producer of hemp hearts, hemp powder, hemp granola, hemp bars and other hemp-based products sold at over 16,000 retail locations in 22 countries. The company prides itself on its seed-to-shelf quality control, advanced packaging processes and sustainability practices.

With growing demand for its products, the company looked to improve the efficiency of its raw hemp seed processing operations, and the packaging of finished products for shipment to retailers. Hulled hemp seeds tend to clump and require gentle handling to avoid product degradation. Existing equipment was proving unsatisfactory. Plant space was limited, and dust needed to be contained to maintain plant hygiene.

“We were experiencing issues with operations,” says Process Engineer Eric Pilor. “We had been using a bucket conveyor to move hulled hemp seeds into the milling process, but it was not designed for handling seeds. As a result, we were losing nearly 9 kg (20 lb) of seeds every eight-hour shift.”

The company improved productivity, product quality, dust control, and overcame space constraints by installing flexible screw conveyors, BFC Bulk-Out® bulk bag dischargers and Twin Centrepost™ bulk bag fillers, all from Flexicon Corporation, Bethlehem, PA.

Processing hemp seeds

Manitoba Harvest acquires hemp seeds from over 125 growers across Canada. The raw seeds arrive at the facility by truck and are stored in silos until ready for processing.

The seeds are conveyed to the processing area, into hulling machines which crack the outer shell. The company previously employed a vacuum conveyor to move the cracked seeds to two screeners that separate the hemp hearts from their outer shells, but replaced it with two flexible screw conveyor systems.

Two 30 ft (9 m) long conveying systems each consist of a 10 ft (3 m) long flexible screw conveyor that connects to the charging adaptor of a 20 ft (6 m) long flexible screw conveyor.

Designed to gently move difficult-to-handle materials, each Bev-Con™ conveyor consists of a rugged, flat steel spiral with a beveled outer edge rotating within a rigid, food-grade polyethylene outer tube. The rotating screw self-centres within the tube, providing clearance between the screw edge and the tube wall, allowing the material to move forward without crushing or grinding.

“The conveyors are gentle on our product,” says Samuel Leung, process engineer. “No crushing occurs or turning the product into butter. We get a consistent product and, compared with previous methods, we get



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Each pair of interconnected flexible screw conveyors discharges processed material into a separator for further processing.



Each pair of interconnected flexible screw conveyors discharges processed material into a separator for further processing.

consistent feed rates. Previously we had issues with clumping and material slippage. All of that stopped when we installed our conveyors.”

The conveyors, as well as bulk bag dischargers and bulk bag fillers, are enclosed, protecting the plant environment from dust contamination.

Mobile flexible screw conveyors boost productivity

The screened hemp hearts proceed to packaging, or to further processing into hemp oil and hemp protein powder. Cold-pressing hemp hearts yields not only the oil, but protein-rich hemp meal that is milled and refined into protein powder.

To better manage the transition to downstream processing, Manitoba Harvest invested in two mobile flexible screw conveyor units with hoppers. Mounted on casters, these units move around the plant as needed to convey finished and semi-finished materials into bulk bags for the next processing step.

“The portable conveyors have made a big difference in our productivity and eliminated almost all of the waste,” says Pilor.



From processing to packaging

Finished hemp hearts enter the packaging area in bulk bags which are loaded into BFC bulk bag dischargers. Each discharger is configured with an electric hoist and trolley that ride on a cantilevered I-beam to lift bulk bags from the floor into the frame without needing a forklift.

Pilor says the plant’s constrained space does not allow room for maneuvering a forklift. He adds that the BFC discharger’s hoist allows rapid and safe loading of bulk bags into the discharger without the use of a forklift.



Overcoming difficult-to-handle powders

In addition to hemp hearts, oil and protein powders, Manitoba Harvest manufactures a variety of hemp-based snacks and nutritional supplements. In support of these products, another BFC discharger and flexible screw conveyor combination feeds a blender that mixes protein powder and other ingredients. This discharger hoists bulk bags from the level below onto a mezzanine where the contents empty into a hopper from which a flexible screw conveyor feeds them into the blender. Since hemp protein powders are difficult to handle, the dischargers are equipped with Flow-Flexer® bag activators that raise and lower the bottom edges of the bag into a steep “V” shape to totally empty the bag.

Also improving flow from the bag and containing dust, the bag spout connects to a Spout-Lock® clamp ring that allows a high-integrity, dust-free sealed connection between the clean side of the bag spout and the clean side of a Tele-Tube® telescoping tube, which lowers, applying continual downward tension to aid flow from the bag.



Caster-mounted hoppers and flexible screw conveyors transport work-in-process and bulk shipment material into each bulk bag.

“The dischargers have eliminated issues we had previously with material bridging and rat-holing,” Pilor says.

The blender gravity discharges into a Twin Centrepost™ bulk bag filler on the level below through a sealed chute. The filler is equipped with an inflatable connector to seal the bag inlet spout to prevent escape of dust, and a feed chute outlet port maintains dust-free air displacement during filling. The bulk bag fillers are totally sealed, eliminating contamination and dusting throughout the process.

Quality control and testing

Manitoba Harvest conducts over 30 safety and quality control processes in its operations, so before purchasing new equipment, the process engineers tested the flow of various hemp materials on full-size equipment at the supplier’s test lab. “That really helped a lot,” Pilor said.

All material contact surfaces of the new systems are constructed of 304 stainless steel and suitable for food-grade operations. Fully contained, the conveyors maintain ambient moisture and prevent against contamination.

“Obviously, quality is very important in the packaging process,” says Leung. “These systems have greatly reduced our manual processing efforts and we are virtually worry-free over dusting or the introduction of foreign objects into our material flow.”

“We’re a pioneer in the hemp processing business,” adds Pilor, “and our updated bulk handling system has helped maintain our leadership position.”

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Final milled muscovite material has gone through size reduction, pneumatic conveying, drying and sieving steps.



Hemp hearts flow from the bulk bag discharger into a scale and to packaging on the level below.

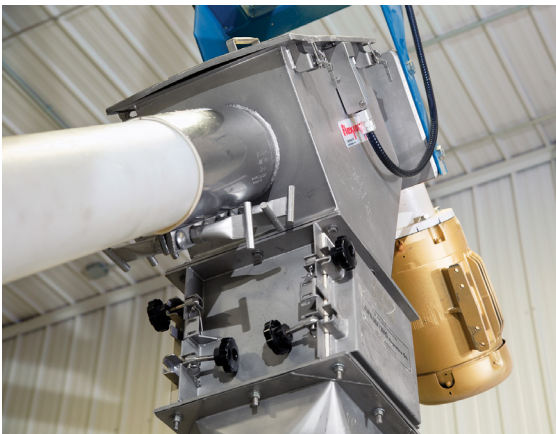


The bag spout interface prevents dusting and promotes flow by virtue of a Spout-Lock® clamp ring and Tele-Tube® telescoping tube. Promoting total evacuation from the bag are Flow-Flexer bag activators.





The BFC model bulk bag discharger, equipped with cantilevered I-beam, hoist and trolley, lifts the bulk bag from the level below.



The bulk bag discharger and flexible screw conveyor gently feed the blender which mixes protein powder and other ingredients.



Twin Centerpost bulk bag filler receives material through a sealed chute from the blender on the level above. The operator attaches the bag spout to the inflatable collar on the fill head. A blower inflates the bag prior to filling, eliminating creases and pre-shaping the bag for stability



Hemp hearts require gentle bulk handling.



Manitoba Harvest says its hemp hearts offer "a simple and delicious ingredient that adds plant protein and nutrients to any recipe or meal."

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