

Sports Nutrition and Flexicon bulk handling lines

Bulk bag dischargers and flexible screw conveyors from Flexicon have been chosen for blending and packaging USN's diverse range of 360 different products at the Group's Centurion plant.

With the popularity of sports nutrition products booming in South Africa and beyond, Globepak (PTY) Ltd, a wholly owned subsidiary of the USN Group of Companies, needed to keep pace with growing demand. However, the intermediate bulk containers and rigid auger conveyors at the company's former 4 000 m² facility were unable to transfer mixtures from blenders to packaging machines at the required rates. "They were starving the packaging lines," says Jose Da Costa, head of DC Weighing and

Control, the firm that engineered and built GlobePak's new 14 000 m² plant.

To handle the volume, DaCosta specified a system of bulk bag dischargers and flexible screw conveyors from Flexicon. In addition, DC Weighing designed, manufactured and supplied the electrical control systems and provided integration and production start-up support. The DC Weighing team provided Globepak with a turn-key installation, including mechanical and electrical installation along with integration into the plant production system. Completed in 2021, the facil-

ity employs larger blenders and high-speed packaging machines, which are fed by the new automated bulk transfer system by Flexicon.

Each of the plant's seven lines spans 15 m and relies on a model BFC BULK-OUT® bulk bag discharger with a 250 l capacity hopper and a 4.5 m long flexible screw conveyor to transfer mixed ingredients from bulk bags to packaging machines. "All are under automated control for continuous filling and accurate package weights," says Waldo van der Walt, Globepak general manager.

'No-touch' process faster, easier

To prevent cross contamination, the bulk handling lines, and their dedicated operators are separated from adjacent lines by a curtain. Each BFC bulk bag discharger is equipped with a cantilevered I-beam with electric hoist and trolley that suspends a bag lifting frame above the bag for connecting bag loops to Z-Clip™ strap holders at floor level. The operator then hoists the bag into the discharger frame using a hand-held pendant, eliminating the need for a forklift.

At the bag spout interface, the operator secures the clean side of the bag spout to the clean side of a Spout-Lock® clamp ring positioned at the top of a Tele-Tube® telescoping tube, which applies continual downward tension as the bag empties and elongates, directing material through the bag spout to completely discharge into the floor hopper below.

From the hopper, the 4.5 m Bev-Con™ flexible screw conveyor transfers material to the packaging line at a 45° incline. The conveyor's 90 mm diameter plastic tube houses a self-centering, flexible stainless-steel screw, which is the only moving part contacting the material. The screw is driven beyond the point of discharge, preventing material contact with seals or bearings.

"We now have a no-touch process. The material remains completely sealed during the entire transfer from bulk bag to packaging machine, assuring no contamination up to the filling point," says van der Walt.

Feeding packaging lines without interruption

Low- and high-level sensors on each packaging machine surge hopper signal a PLC when to start and stop its respective flexible screw conveyor, allowing non-stop operation. An alarm sounds when a bulk bag becomes empty, alerting the operator to load a full bag

and press 'restart'. "The flow to the packaging lines is continuous, with consistently accurate package weights," says van der Walt.

The system handles USN's line of 360 different products – mostly whey protein based – whose characteristics range from sticky to free-flowing to fine and dusty. "The Bev-Con spiral design accommodates all the different materials very well," says Da Costa.

15-minute changeovers

Cleaning and product changeovers proceed smoothly. In 15 minutes, an operator can clean the conveyor tube and spiral and load a new bulk bag with a different flavour. "Globepak can run chocolate powder, for example, and then quickly switch to strawberry flavour with no issues," Da Costa says. To clean, the operator opens the conveyor tube end cap, pulls out the spiral, and blows it off with compressed air. "No product sticks to the tubes," he says.

The cleanliness of the bulk handling system and its operation complies with Good Manufacturing Practices, meeting pharmaceutical specifications, since nutritional supplements in South Africa are recognised as pharmaceuticals.

Expanding markets and production capacity

With its diverse range of products and new-found production capacity, USN is eyeing additional European, UK and US markets and looking at launching a plant in Kenya to service

central and west Africa. Da Costa adds that Globepak has seen "massive improvements" with the bulk handling system, while keeping running costs low and conserving floor space

– and with ample capacity to accommodate future growth. "The packaging machines are never hungry," he says.

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An operator attaches bag loops to the lifting frame with Z-Clip™ bag strap holders and hoists the bag into the discharger using a pendant.



Enhanced interchangeability for Technequip knife gate valves

Long regarded as a leading brand in abrasive slurry applications, KREBS® Technequip® knife gate valves now allow less stockholding of spares through the enhanced interchangeability of components. Most of the components are standard across the range, explains Herman Britz, Regional Product Line Manager for Pumps, Cyclones and Valves at FLSmidth.

"While the bodies of the flange-type and the wafer-type valve will differ, other components such as the gate, actuator and wiper blades are standard," says Britz. "This means the components for a 200 mm flange valve, for example, will also fit on the 200 mm wafer-type valve."

This benefits the supply chain and helps customers to reduce their stockholding. With an extensive footprint in mineral processing, the KREBS® Technequip® valves are used across a range of commodities and materials – from phosphates to the platinum group metals.

"The focus of our design was for harsh, abrasive applications – where these valves have proved their worth globally," he says. In sizes from 50 mm up to 1,3 m in diameter, the valves match the pipe sizes in the market and are designed to deal with a wide range of pres-

ures and process conditions. He highlights the 'full port' nature of the valve, reflecting that the valve's inside diameter will be the same as the pipe when the valve is fully open.

"This reduces any pressure loss as the material passes through the valve and ensures that there is no turbulence, which also reduces the wear rate," he explains. "The gate removes itself completely from the flow of material, which is a key differentiating factor."

He also points to the valves' push-through or self-cleaning design. This is essentially a self-flushing function, which eliminates the need for a packing gland. As the gate closes during actuation, material is ejected out of the bottom of the valve, ensuring there is full closure of the gate, and a reliable seal is created.

Another vital contributor to the valves' durability and performance is the internal wear sleeve. "The wear sleeves on our knife gate valves are the only surface in direct contact with the slurry," says Britz. "By protecting the other parts from wear and tear, the sleeves reduce the need for replacement of parts." A bubble-tight seal ensures there is no spillage, whether the valve is open or closed.

Importantly, the sleeves can also be re-

placed in the field. "On our flange-type valve, a technician can simply remove the retainer flange and take out the sleeve, replacing it with a new part and returning the retainer to its position," he says. "This is certainly a stand-out feature when compared to most products on the market, and it helps our customers avoid undue downtime."

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KREBS® Technequip® knife gate valves offer reliable performance in the most demanding applications.



The view from each end of one of Globepak's seven identical new automated packaging lines with the Flexicon bulk bag discharger feeding the packaging machine.