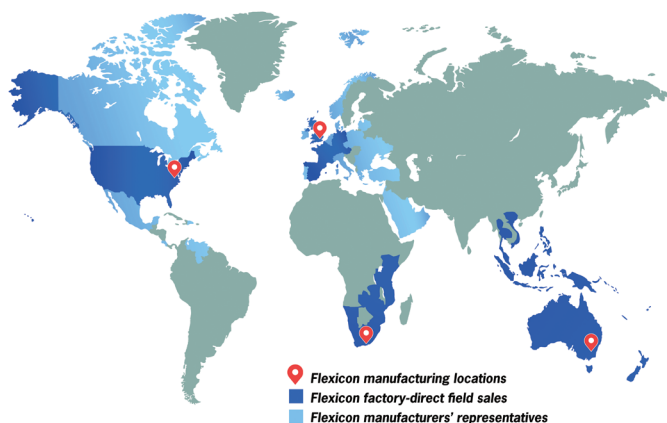




Dutch Compounder Cuts Labor, Improves Productivity with Bulk Bag Dischargers, Flexible Screw Conveyors

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Dutch Compounder Cuts Labor, Improves Productivity with Bulk Bag Dischargers, Flexible Screw Conveyors

HOEK, THE NETHERLANDS — An investment in bulk bag dischargers and flexible screw conveyors by compounder Styron Netherlands BV is increasing productivity, worker safety and plant cleanliness.

The company, which runs eight compounding lines in a 53,820 sq ft (5,000 m²) plant and employs 80, installed two BULK-OUT® BFC-X Bulk Bag Discharging systems with integral flexible screw conveyors from Flexicon (Europe) Ltd. One system unloads and conveys talc used to improve the mechanical properties of polypropylene compounds; the other unloads and transports an impact modifier in polycarbonate/ABS formulations.

The bulk bag dischargers replace manual unloading, says Ron Drabbe, senior improvement specialist at Styron Netherlands, which was known as Dow Benelux prior to its acquisition in 2009 by private equity. The equipment promotes complete evacuation of bulk bags and conveying of material to blending hoppers on compounding extruders.

Bag handling was labor intensive

Each bulk bag weighs 1,320 lb (600 kg). Unloading a bag previously required three workers, says Drabbe. Two would mechanically hoist a bag above a hopper while a third, working from a platform atop the hopper, connected the bag to a discharge unit and dislodged trapped residue by hand. Non-free-flowing talc was especially prone to lodging in corners of the bags.

Apart from the risk of injury in handling bulk bags and climbing up and down platforms, “unloading generated dust, which settled on the plant floor,” says Drabbe.

Each bulk bag discharger frame includes a cantilevered I-beam with an electric hoist and trolley, allowing a single worker to raise and position a bulk bag above the unit's receiving hopper. Because the discharger is automatic and dust-free, Ron Drabbe says, Styron Netherlands can discharge as many bulk bags as are needed, both rapidly and safely.

Bulk bag dischargers ease operation

A cross-shaped bag-lifting frame attaches to the straps on each corner of the bag, and the electric hoist lifts the bag into place on the discharger frame. The operator pulls the bag's outlet spout through a POWER-CINCHER® flow-control valve whose elliptically-contoured bars close concentrically around the spout, preventing product leakage. The clean side of the bag spout attaches to the clean side of the discharger by means of a SPOUT-LOCK® clamp ring, which is mounted atop a TELE-TUBE® telescoping tube that maintains constant downward tension on the bag as it empties and elongates, promoting material flow through the bag spout.



Flexicon bulk bag discharger positions the bag from a cantilevered I-beam with electric hoist and trolley and cross-shaped bag-lifting frame. The discharger provides complete evacuation of the bag, flow and dust control at the bag spout interface, and PLC control for automatic operation. The flexible screw conveyor transports talc to the blending hopper.



Automated, safe, and dust-free, the Flexicon discharger is equipped with an integral flexible screw conveyor that delivers impact modifier to the blending hopper.

Pneumatically-actuated FLOW-FLEXER® flow-promotion devices raise and lower opposite bottom sides of the bag, forming a “V” shape to promote total discharge into the hopper.

The hopper is vented to a BAG-VAC® dust collector that vacuums displaced air and dust from the sealed system as talc or impact modifier discharge from the bag, improving plant cleanliness, Drabbe notes.

Conveyor maintains talc quality

As material enters the hopper, a flexible screw conveyor, 34.4 ft (10.5 m) long and 4.5 in. (114 mm) in diameter, transports talc or GRC at a 45° incline to an inlet hopper for blending with other additives and resins prior to compounding. The conveyor's flexible stainless steel screw has specialized geometry to handle non-free-flowing materials.

One benefit of this particular screw design is its ability to convey talc consistently regardless of its moisture content. Drabbe says the density of talc often decreases when it is conveyed because ambient air reduces its moisture content. “A lower density means more talc volume, reducing the amount that gets added to a formulation and affecting production throughput in a negative way,” he explains. Only one other materials-handling system that he evaluated, a mechanical unit, was unaffected by talc density, but Drabbe says it was unable to handle bulk bags.

A programmable logic controller governs operation of the two dischargers and conveyors. Limit switches stop the conveyors from running when the hoppers under the dischargers become empty, and proximity sensors stop the conveyors when material has been transported to the compounding hoppers.

Styron Netherlands evaluated a number of pneumatic, vacuum and mechanical materials-handling systems. Ron Drabbe says the BULK-OUT® BFC-X Bulk Bag Discharging equipment outperformed them, and Flexicon Europe personnel provided assistance in designing the installations to enhance their operation.

The throughput, dust-free operation and minimal operator involvement of the discharger stations have met expectations. “Styron Netherlands will likely add a third bulk bag discharging station for talc,” Drabbe remarks. “There is no timetable for this as yet, but it is on the list of things to do.”

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Operator pulls the bag's outlet spout through a POWER-CINCHER® flow-control valve, which prevents product leakage. He then connects the spout to a SPOUT-LOCK® clamp ring, which is mounted atop a TELE-TUBE® telescoping tube that promotes material flow and eliminates dust.



The bulk bag dischargers unload and convey talc, used to improve mechanical properties of polypropylene compounds, and an impact modifier in polycarbonate/ABS formulations.

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