

Manual Unloading Bites the Dust

Automated powder unloading halves batching time and reduces potential harm to operators

By David R. Gill, Flexicon Corp.

POLYMERIC SYSTEMS INC., PHOENIXVILLE, PA., a producer of epoxy mastic, reduced batching time after installing automated bulk-bag dischargers from Flexicon Corp., Bethlehem, Pa. Manual dumping took three hours per batch. After switching to automated weigh-batching directly from bulk-bags, batch time was cut to one-and-a-half hours. The Flexicon system minimizes dust and reduces potential injuries related to manually lifting and emptying bags.

The manual system required operators to dump 50-lb (28 kg) sacks of powder, up to 32 bags per batch, into a 250-gal. (950 L) kneader-extruder, or one of two 100-gal. (380 L) kneader-extruders. Today, three Flexicon bulk-bag dischargers unload powder from 2,500-lb (1,135 kg) bulk-bags as flexible-screw conveyors move the material in pre-selected batch weights to any of three kneader-extruders under loss-of-weight control.

Recipes ready in record time

Operators used to weigh each sack and adjust for variations because sack weights fluctuated by up to 5 lb (2.25 kg). Now, adjusting a batch weight or selecting one of Polymeric's nine epoxy mastic recipes requires a one-minute entry on the control panel. The operator is then available to do other tasks rather than being tied to the batching process.

The small quantities and variety of minor ingredients make complete automation impractical, however. The operators must manually add small amounts of minor fillers from 50-lb (28 kg) bags into the hopper, which is equipped with a bag tray support and hinged cover.

A control panel entry initiates bulk-bag unloading and conveys the dry, inorganic powder in precisely weighed batches to the kneader-extruder. As a bag empties, load cells, which support the discharger frame, transmit weight-loss signals to the controller. This controller steps down the conveyor rate immediately prior to stopping it once the correct batch weight has been unloaded. Batches between 400 and 1,600 lb (180-720 kg) are accurate to ± 2 lb (0.9 kg).



Figure 1. A manual Spout-Lock clamp ring mounted atop a Tele-Tube creates a sealed connection between the bag and the telescoping tube, preventing contamination of the product and environment.

Go with the flow

Flow-promotion devices integral to the bulk-bag discharger frame promote a continuous flow of material. A manual Spout-Lock clamp ring mounted atop a Tele-Tube telescoping tube creates a sealed connection between the clean side of the bag outlet spout and the clean side of the telescoping tube (Figure 1). As the bag empties and elongates, the telescoping tube keeps the spout taut at all times by maintaining constant downward tension. This prevents excess spout material from bulging outward, which creates dead pockets, or from falling inward, which creates flow restrictions.

Flow-Flexer bag activators raise and lower opposite bottom edges of the bulk-bag at timed intervals, which promotes material flow into the bag discharge spout. As the bag becomes lighter, the stroke of the bag activators increases, thereby raising the bag into a steep "V" shape for total evacuation of material.

For leak-proof retying of partially empty bags, a Power-Cincher flow control valve employs a series of curved, articulated stainless steel rods that cinch the spout concentrically on a horizontal axis and vertically in a tight zig-zag pattern, which prevents fine powders from escaping.

Do away with dust

The powder remains fully enclosed as it travels throughout the sealed system of interconnected equipment, which is comprised of the bulk-bag discharger, hopper, flexible-screw conveyor and kneader-extruder (Figure 2). This prevents contamination of the product and plant environment. Previously, dumping bags in the open allowed dust into the surrounding area and paper scraps to enter the batch.

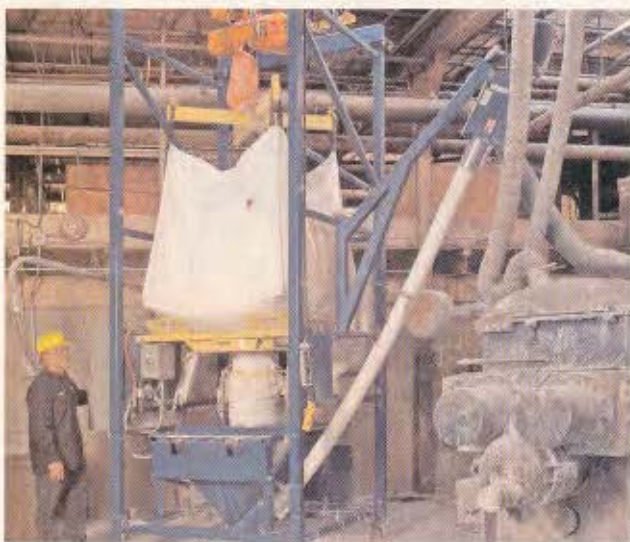


Figure 2. Polymeric Systems' bulk-bag discharger from Flexicon Corp. unloads powder from 2,500-lb (1,135 kg) bulk-bags as flexible-screw conveyors move the material in pre-selected batch weights to any of three kneader-extruders under loss-of-weight control.

Each flexible-screw conveyor consists of a durable, plastic outer tube that encloses a model 1450 conveyor spiral. This conveyor is specially designed to accommodate the inorganic powder, which is highly prone to aeration. Flexicon applications engineers incorporated several other design elements to overcome the challenges associated with handling this powder.

John Kimmich, Polymeric's plant manager, first saw the equipment at a trade show. He then visited Flexicon's test laboratory in Bethlehem, where full-size equipment was configured to simulate Polymeric Systems' installation, and operated using the company's material verifying system performance prior to fabrication.

Kimmich says, "The system enables us to switch to different products rapidly, meeting the needs of customers in the OEM, do-it-yourself and retail markets." He expects the system to pay back in less than two years as a result of the labor savings and productivity gains. **CP**

David Gill is president of Flexicon Corp., Bethlehem, Pa. E-mail him at sales@flexicon.com.

**TIRED OF
REPLACING
COSTLY
SEALS?**

**WORRIED
ABOUT
LEAKS?**

**DRY
RUNNING?**



Searching for the BEST sealless pump? YOU NEED GOULDS!

Reliability—We're sealless experts. Our sealless pumps handle those tough hazardous applications with zero leakage performance. Dry running a problem? It's not. Our SAFEGSLIDE™ bearings allow for dry running while providing optimum protection for your process, plant environment and employees.

Versatility—Goulds makes finding the best sealless pump for your application easy. We offer magnetically-driven, metallic and fluoropolymer-lined models in both ANSI and ISO dimensions that handle pressures up to 275 psig, flows to 1760 gpm, and temperature ranges from -100°F to 530°F. Everything you need to solve your pumping problems.

Availability—Need your sealless pump tomorrow? Order a Goulds sealless pump today—we ship most sealless pumps in 24 hours. Don't wait. Call the sealless experts at **1-800-734-PUMP** or visit www.gouldspumps.com today. *Your search for the BEST sealless pump has ended.*

Goulds Pumps

