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GRAND VIEW MEDIA GROUP

Processing

Powder Handling Solutions

**Move
Product
Avoid
Risk**

Bagging balancing act ◀

Pneumatic-conveying ◀
challenges

Valves for dry bulk ◀

Explosion-protection valves ◀

Conveyor system nicely handles hygroscopic-prone cement powder

»Bulk bag discharge inside the warehouse, with product conveyed outside through the roof

A maker of burglary- and fire-resistant safes, vaults and security equipment since 1992, Oakville, Ontario-based Access Security Products (ASP) uses the best technology and unrivaled quality in distribution of its solutions throughout North America and beyond, with clients that include government agencies, financial institutions and security-equipment dealers.

For example, a proprietary cement mixture found in the walls of the company's safes and vaults renders them almost impenetrable to both thieves and fire. This castable material has extremely high compressive strength for maximum burglary resistance.

In the production environment, however, the cement presents some material-handling challenges. It has poor flow characteristics, bridges easily and is extremely hygroscopic, meaning of course that is prone to both absorb and adsorb water.

About once a month, a 20-ton container of the cement arrives from Europe at the ASP facility packaged in twenty 2,000-lb. single-trip, single-loop, lined bulk bags that are emptied into a large outdoor storage silo. At its arrival, the material is quite compacted.

A closed system keeps the material dry and contained.

Given its hygroscopic characteristics, the entire load must be emptied into the silo as quickly as possible to minimize moisture capture. The company's goal was to empty



A conveyor system had to work reliably amidst typical Ontario weather extremes.

a single bulk bag in 30 minutes and all 20 bulk bags within ten hours. They needed a robust and reliable material-handling solution to do so.

Unfortunate episode

In the very recent past, ASP had installed a \$40,000 pneumatic-conveying system that unfortunately did not work as specified. Cement materials accumulated within the conveying tube, plugging it up and rendering the conveyor inoperable.

Following numerous struggles, ASP finally scrapped the equipment and went looking for a conveying solution that could move the cement material successfully. It

was a problem. The company ended up going without a material-handling system for about a year. During the time, it emptied bulk bags directly into the storage silo with a crane, which was both expensive and labor-intensive.

ASP needed a "closed" system that reliably conveyed cement without material build-up or excessive equipment wear. Bulk-bag discharge takes place inside the warehouse, with product conveyed outside the building through the roof and into a large, outdoor storage silo about 40 feet away from the building. This had to happen reliably and consistently amidst weather extremes typical to Ontario.

A dust-free solution would minimize material exposure to moisture and provide employees a clean and safe work environment. The system would successfully discharge a 2,000 lb. single-loop, lined, single-trip bulk bag within 30 minutes or less. Appropriate discharge aids for side massage, bottom massage and agitation were to encourage material flow and minimize product loss.

Trust, but verify

Given the cement's particular material characteristics and ASP's already considerable frustration, Spiroflow Systems experts recommended the cement product be tested in the company's lab.

"Having our cement powder thoroughly tested was a vital step in the process," Peter Gauthier, ASP's president, says. "It gave



Bulk bag discharger empties disposable, single-trip bags without spillage, even for poor-flowing products.

us confidence that the recommended solution would work as specified.”

Spiroflow Systems guarantees any material-handling solution tested in its lab, which “also gave us piece of mind,” adds Gauthier.

The solution included a T4 Single Trip Bulk Bag Discharger in combination with flexible-screw and aero-mechanical-type conveyors.

The unit has a pneumatic-bag piercing knife to cut open the bottom of each single-trip bulk bag. It also has a dust-evacuation frame supplied with a rubber dust-seal membrane located inside the support dish for optimal dust control during discharge.

The discharger has four-corner massage and vibration to encourage material flow. Additionally the pneumatic-bag piercing knife encourages material flow by breaking up compacted material at the bulk bag’s bottom.

Following discharge

Dual flexible-screw conveyors, only two feet in length and positioned at a 45 degree angle, are fitted to the bottom of the bulk-bag discharger. The “screws” moving the material out of the discharge hopper have a beveled profile, ideal for conveying poor-flowing material. Their semi-rigid construction enables steep conveying angles without bends.

The dual flexible-screw conveyors deliver cement material coming out of the bulk bag discharger onto a vertical Spiroflow Aero Mechanical conveyor (AMC). The AMC is four inches in diameter, 21 feet long and positioned vertically. A second AMC, 40 feet long and positioned at a 33 degree incline,



A cement mixture used in the walls of vaults and safes presented material handling challenges.

through the roof, moves the cement material from the vertical AMC and outside the building into the outdoor storage silo.

Controls are included on the flexible-screw conveyors, agitator motors, aero-mechanical conveyors, low-level hopper probe, four-corner massage and vibration.

Spiroflow recommended that ASP completely clean the equipment after each container of material is conveyed into the outdoor storage silo. This prevents any potential material buildup from interfering with equipment operation.

In service, ASP reports that the material-handling system works “beautifully,” based on reliability and an operating rate twice that required — and without material buildup. The closed system keeps the cement material dry and contained, minimizing product waste and ensuring a clean, safe employee environment.

“Spiroflow equipment handles our cement powder quite well and actually empties each bulk bag in only 15 minutes,” concludes Gauthier. “Our goal was to empty each 20-ton container in 10 hours and we have cut that time in half.”

For more than 40 years, Spiroflow Systems has designed, engineered and manufactured its line of powder-handling solutions. Spiroflow has a range of standard and custom options for both small- and large-volume users, including flexible-screw, aero-mechanical, tubular-cable-drag, tubular-chain-drag and pneumatic conveyors; bulk-bag dischargers and fillers; box, sack and drum dumpstations; robotic palletizing, and automatic packing and pick-and-place solutions.

Spiroflow Systems

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