



## **POLYMER PRODUCTS PLANT INSTALLS A BULK BAG LIFT, GIVING WORKLOAD AND PROFITS A BOOST.**

Guardsman Products Inc. is a producer of custom industrial paints and coatings and diversified consumer products. Its division in Grand Rapids, Mich., makes polymer products (commonly called resins) such as alkyds, polyesters, epoxies, and acrylics. These products are distributed to other divisions within the company as well as sold nationally to other coatings manufacturers. The polymers division annually produces 13,000,000 pounds of product.

### **A producer streamlines reactor loading by installing a hydraulic lift that can handle 2,250-pound bulk bags.**

Guardsman receives bulk bags of various powdered monomers to make the polymer products. The bags are brought to a third floor mezzanine by freight elevator and carried to hoists by forklift or hand truck. The hoisted bags are discharged to fillports of reactors that span the distance from the mezzanine to the second floor. The plant operates two 1,000-gallon reactors and one 2,500-gallon reactor.

### **Bulk bag size limited by hoist capacity**

Guardsman's material handling requirements have changed several times. In the past, monomer powders were handled in 50- to 100-pound bags or 250-pound drums. "It was backbreaking and time-consuming work to manually cut open and dispense the 45-50 pound bags required for a batch," said technical manager Charles Billstrand. "It took about half an hour to load the reactor for each batch."

### **With a bulk bag lift, reactor loading takes only 4 minutes and needs one fewer workers. The process no longer risks product damage from air exposure and doesn't require borrowing workers from other areas.**

The reactor door stays open during loading, which exposes product batches to air. Polymer products can discolor if exposed too long, and occasionally a batch had to be scrapped. To reduce product exposure time as well as handling time, the plant steadily increased the powdered monomer's container size, changing the bulk bags with 500-, then 1,000-, and eventually 2,250-pound capacities.

The plant used a pneumatic hoist to discharge the 1,000 pound bulk bags to the reactors, but discharging the 2,250-pound bags was limited by the hoist's 1,000-pound capacity. Plant engineers experimented with temporary methods of discharging the heavier bags, but found them inadequate. The discharge operation required three workers, much effort, and was sometimes messy and wasted product at a cost up to \$2 per pound. "The third worker, needed to help load the reactor, had to be taken away from responsibilities in another area of the plant," Billstrand said. "We had to find a permanent solution to incorporate the larger bulk bags into our process." Complicating matters, the reactor fill-port afforded little space for a fixed-position discharge station and limited overhead clearance for a hoist. In addition, the environment was highly volatile, requiring a Class 1 Division 1 explosion-proof electrical rating.

Producer seeks bulk bag lift for volatile environment Guardsmen engineers considered new equipment options, determining the purchase must satisfy concerns about operator productivity, product loss, safety, and space needs. An engineer was sent to a trade show to find a bulk bag discharging method that would suit plant requirements. He saw a discharge lift that required little space or overhead clearance and could be configured for the explosion-proof electrical rating, so he invited the manufacturer to the plant for discussions.



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### **Plant installs single-column rotating lift**

After meeting with manufacturer representatives, plant engineers decided to purchase the bulk bag discharge lift. The lift is hydraulic and requires only one operator to raise, lower, and position bulk bags from a remote operator station. The unit can lift up to 3,000 pounds. It has a single column and a rotating gear, requiring less space than conventional fixed bulk bag discharge stations. The unit also requires less overhead clearance than conventional cranes or hoists.

Because the lift operates hydraulically, its standard configuration has no integral electronic components, which allows it to meet explosion-proof ratings. The lift manufacturer designed the power supply console for mounting outside of the volatile production environment. The power supply console contains the lift's electronics, solenoid valves, and hydraulic pump. The lift's remote operator station (mounted near the lift) contains electrical connections that were easily configured to meet the necessary NEMA ratings.

### **Productivity improves as discharge process is streamlined**

The lift allows the plant to use the 2,250-pound bulk bags, resulting in smoother reactor loading. According to Billstrand, it has helped plant operations as well as morale.

"The workers appreciate that they can now achieve their daily work goal without straining to get it done," he said. The lift has increased productivity by minimizing bag handling time and eliminating messes and lost material. And the lift makes efficient use of floor space in a congested area.

Billstrand says bag discharge and reactor loading operations have come a long way from the days when it took 30 minutes to load 50-pound bags into the reactor or when it took three workers 10 minutes and much effort to unload a bulk bag with the makeshift system.

**"With the bulk bag lift, loading time has been reduced to 4 minutes and requires only two workers," he said. "And we no longer have the risk of product in the reactor becoming discolored, nor do we have to borrow workers from another area every time we load product."**

**"Because of our efforts, we have increased our plant output by over 8 percent in the last year."**

"We use the lift on our large reactor, which can produce 22,000 pounds of polymer product during an 8-hour shift. We have eliminated cost and time in loading so now the production effort can focus on manufacturing as opposed to material handling."

And that focus has resulted in increased output, according to Billstrand. "Our efforts to experiment with the 2,250-pound bulk bags and install a lift to make them part of our operation have increased plant output over 8 percent in the last year."