APPLICATION REVIEW
Bulk Chemical Processor

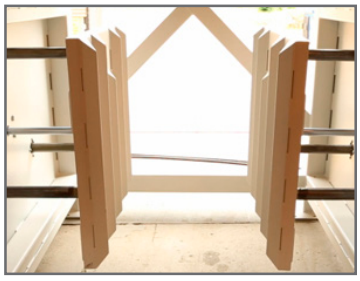
Bulk Bag Unloading Stations with Integral Pneumatic Conveying System Accurately Delivers Metered Materials

The Challenge

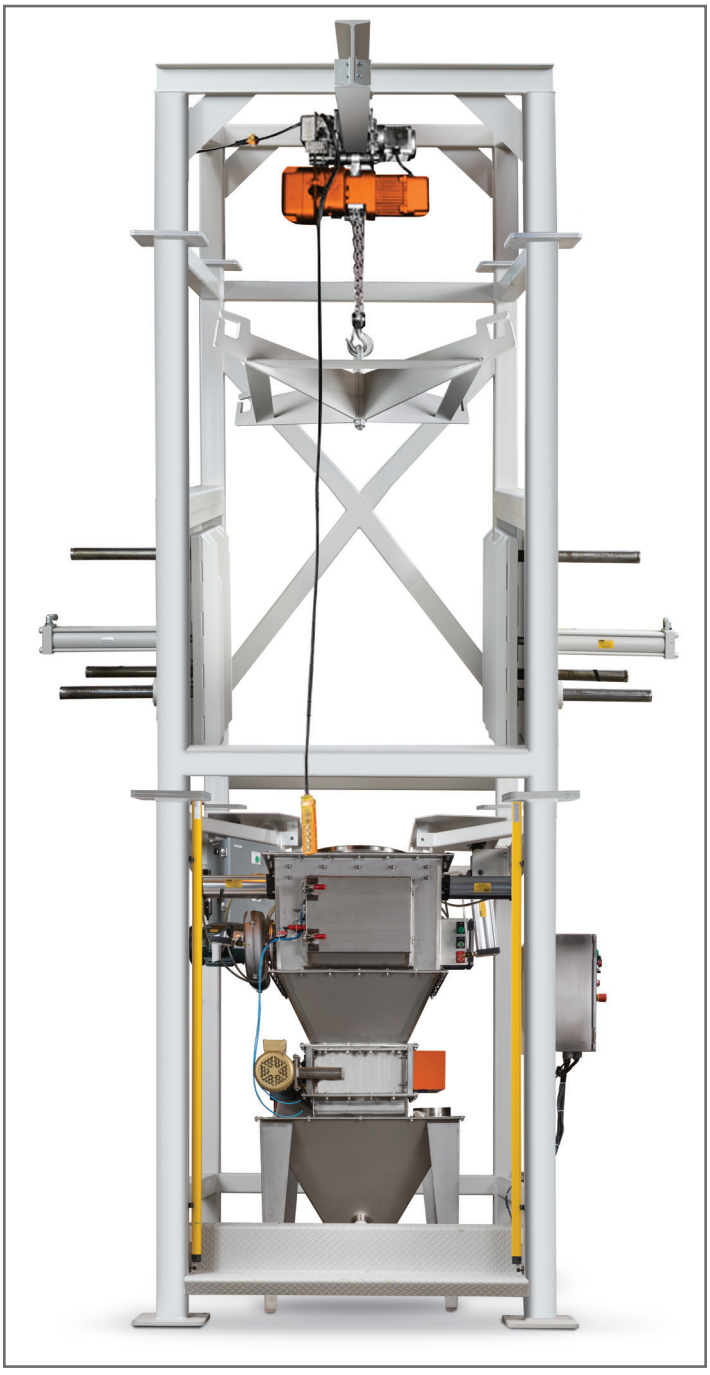
Deliver measured amounts of four powdered ingredients, received in bulk bags to slurry tanks. Some materials are hygroscopic, flow poorly in humid environments and may contain small agglomerations. Whereas some materials do not mix readily into solution, the delivery must be metered so as not to exceed the mixers ability to force it into suspension. System must be automatic and fit into an existing manufacturing space with a very limited footprint. Housekeeping is a concern- provision to minimize the escape of airborne product is essential. Control system must be open architecture and comprised of commonly available, highly dependable components to minimize downtime.

Improvements with an Automated Approach

The Hapman solution involved four extended height bulk bag unloaders which allowed vertical integration of various components, each aimed at addressing a specific need while making the most efficient use of available space. The hoist and trolley mechanism first moves the bags into position. The access chamber (untie box) includes an integrally filtered dust collector which maintains ambient air quality while enabling the captured particulate to remain within the system so as to avoid generation of a separate waste stream and lost product. Pneumatically actuated bag agitators fluidize the material and cause it to flow freely from the bulk bag and through a lump breaker which continuously breaks up incidental agglomerations. The free flowing, conditioned material



(Left) The integral dust collector maintains ambient air quality while enabling the material to remain in process. (Right) Pneumatic bag agitators pulse the bulk bag to keep material flowing into the process.



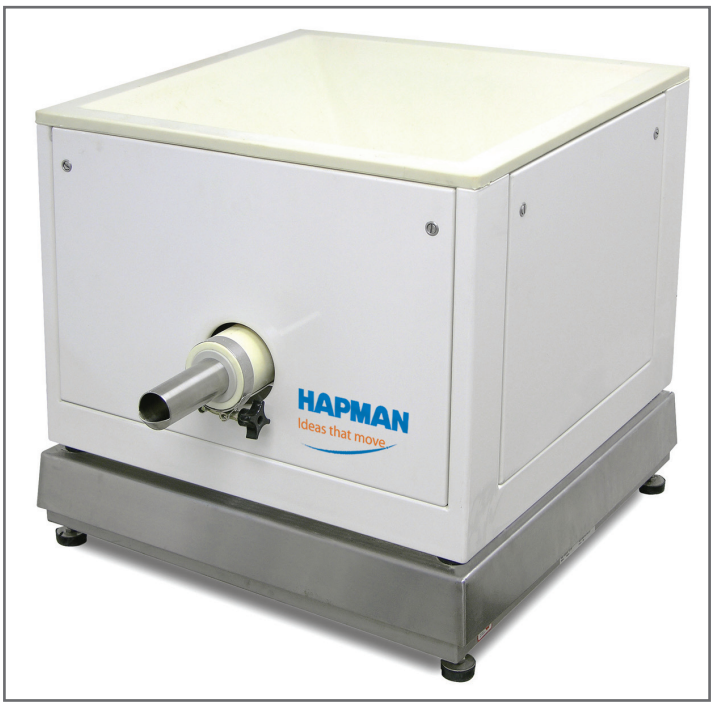
Hapman's Bulk Bag Unloader with Hoist and Trolley moves bags into place for discharge. Pneumatic bag agitators break down lumps to keep material flowing into an integral dust collector.

is then delivered to a PosiPortion™ loss-in-weight screw feeder to precisely measure the amount of product and regulate the rate at which it is delivered. Finally, a vacuum pneumatic conveyor was used to transfer the rate controlled batches and a system of diverters directed the batch to the appropriate slurry tank.

The control system features an Allen Bradley ControLogix PLC with one of industries highest MTBF ratings for maximum reliability. The PanelView Plus 1250 color touchscreen HMI, provides at-a-glance status indication of the entire system, easy to navigate screens to simplify calibration, recipe management, fault recognition and mitigation. The control panel also includes a provision to permit remote Ethernet access so as to permit troubleshooting, program & recipes changes via the Internet from virtually anywhere.

Positive Returns

Hapman provided a system that addresses all material handling challenges, while consuming the least amount of available floor space. Metered delivery of powders assures efficient downstream mixing to optimize overall process performance. User friendly controls and monitoring equipment minimizes operator interface time, freeing plant personnel to address other process concerns.



A PosiPortion™ loss-in-weight screw feeder to precisely measure the amount of product and regulate the rate at which it is delivered.

ABOUT HAPMAN

For 70 years, Hapman has provided manufacturing plants around the world with the most technologically advanced powder and bulk handling equipment and systems, offering custom engineered equipment and systems for chemical, food, pharmaceutical, plastics, building, minerals, and other industries. For more information on Hapman, visit hapman.com

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