

### Top Equipment Design Considerations for Handling Bulk Chemical Powders

By Steve Grant, Hapman Product Manager

Successful conveying and handling of chemical powders requires much more input than understanding a material's properties, the desired convey rate and distance. Today's manufacturers are faced with tighter margins, leaner operations, shorter lead times and greater environmental concerns. Maintaining plant and worker safety is paramount.

#### Dust Control

Dust is the No. 1 issue most chemical processors face when handling powders. And for good reason, too—dust threatens both plant and worker safety. Explosions are an obvious concern, with ignition resulting from electrostatic discharge, friction, hot surfaces or open flame. Depending upon the level of dust control required by the process, a number of options are available when conveying.

Conveying methods that move material en-masse (such as tubular drag conveyors) can minimize dust. Because the tubular drag conveyor's components come into contact with a smaller percentage of material compared to other conveying methods, it is less likely to create dust. Tubular drag conveyors also create less friction as the chain and

flight mechanism moves the material at a relatively slow velocity.

When handling bags, dust collectors are an effective way to minimize plant and worker exposure to powders. Such systems can be configured to filter material down to 1 micron. And units can include glove box access to further assure worker protection from hazardous materials. Adding a bag compactor to these systems can extend dust control to the bag disposal process, as well as enhance operator efficiency. In addition, dust-tight connectors can be employed with bulk bag handling equipment to minimize dust entering the plant environment.

#### Equipment Design and Material Construction

Other factors to consider when handling chemical powders deal with the design of equipment and materials used in their construction. For example, does the process require sanitation or washdown? Is the chemical powder corrosive or will it react in some way with equipment handling it? Is the powder abrasive?

There is a wide array of options available to effectively meet sanitation standards, which may include various





Hapman offers a number of dust-combating options for its material handling solutions. Bulk bag unloading systems can be equipped with glove box dump stations and integrated bag compactors to provide the greatest worker and plant protection from chemical powders (Left). Hapman's exclusive Helix™ Hi/Lo mobile flexible screw conveyor is easily disassembled for safe cleaning from the floor. An integrated dust collection hood and bag compactor further ensure powders are not dispersed throughout the plant environment (Below).



materials for construction and finishes. Likewise, materials for construction and the design of the conveyor can reduce wear from abrasive materials.

## Easy to Operate

Material handling equipment that is easy to operate supports environmental health and safety in a processing facility. Operators who may have only worked in with one part of a process in the past may now be responsible for multiple pieces of a process as organizations have found ways to increase productivity. Also as the baby boomer generation exits the workforce, they take their knowledge and experience with them. To reduce training required to effectively and safely operate equipment and reduce errors that can result in wasted materials or operator injury, equipment should be intuitive and employ safeguards. One example of this would be the use of programmable logic controls (PLC) to ensure batching consistency. However, depending upon the equipment and process, a number of design elements are available.

## Conclusion

Handling chemical powders is more complex than simply moving product from point A to point B. Use of systems and processes that assure safe and efficient processing of chemical powders are just as important. Many options are available related to dust control, safety and efficiency from manufacturers of bulk powder handling and conveying equipment.

## ABOUT THE AUTHOR

Steve Grant, Product Specialist for Hapman, has an engineering degree and more than 25 years mechanical conveying design and application experience.

For more information, contact Steve Grant, at (269) 382-8223, e-mail [steve-grant@hapman.com](mailto:steve-grant@hapman.com), or visit [hapman.com](http://hapman.com)

## ABOUT HAPMAN

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