What to Consider when Handling Chemical Powders

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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 flames. 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 compared to other conveying methods. As expected, pneumatic conveyors offer the least amount of dust control given their use of air to move the material.

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 ensure 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.

Furthermore, nitrogen can be added to the conveying line as a means of depriving a process of the oxygen required for an explosion.

Equipment Design & 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 would it react in some way with equipment handling it? Is the powder abrasive?

There are a number of options available to effectively meet sanitation standards, which may include various materials for construction and finishes. Likewise, materials for construction and the design of the conveyor can reduce wear from abrasive materials. If explosions are a concern, stainless steel components should be used to eliminate the potential for sparks resulting from metal-on-metal contact.

Easy to Operate

Operators who may have only dealt with one aspect of a process in the past may now be responsible for multiple pieces of a process as organizations have found ways to increase productivity. And as the baby boomer generation begins to exit the workforce, they take their knowledge and experience with them. To reduce training required 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.

Handling chemical powders is a lot more complex than simply moving product from point A to point B. Use of systems and processes that ensure safe and efficient processing of chemical powders are just as important. A wealth of options related to dust control, safety and efficiency are offered by today’s manufacturers of bulk powder-handling and conveying equipment.

For more information, please visit www.hapman.com *[1].*

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