

## My material tends to segregate. How can I select a mechanical conveyor that will successfully handle it?

Selecting the right mechanical conveyor to handle a material that segregates involves finding one that transfers the least amount of energy into the material during conveying. Infeed and discharge methods and other potential segregation contributors must also be considered. A belt conveyor with a gentle metered feed onto the belt at the infeed end and an angled exit chute at the discharge end provides favorable results over a vibratory conveyor under the same operating parameters. A drag conveyor or cable conveyor will also transfer less energy into the material, although particles are subject to friction within the transfer line. A horizontal-motion differential conveyor is also a potential candidate, depending on your process characteristics.

To select the best conveyor for your material, first determine the conveying rates, transfer distances, and analysis data required for your process. Next, send out samples to potential equipment suppliers. Keep in mind that shipping material samples can change characteristics and cause segregation, so actually witnessing these performance-based tests may be necessary to fully understand and evaluate the value of each option. Last, view the final test results and validate the performance as acceptable prior to making your final decision.

*Clyde Waller, system sales engineer, Powder-Solutions Group, 877-933-2556*

If your material tends to segregate during mechanical conveying, you're probably handling several materials, densities, and size variations simultaneously. There may also be some friable materials that break and disperse as they're fed from the source or transferred within the conveying system. Make sure you're feeding the material from a reasonable height into the mechanical conveyor. Also, try premixing or feeding the various material densities into the inlet at appropriate rates for dispersion while conveying. Material height in the conveyor bed and the number of transfer points are other considerations.

Vertical bucket elevators can be used to convey materials that tend to segregate or otherwise break, crack, or chip. This often happens when conveying products in the agricultural industry, such as peanuts in the shell or edible beans. The rule of thumb is to slow the conveyor speed down by about 10 percent, which allows gentler material handling while reducing breakage.

*Bruce D. Fagala, southern territory manager, Tapco, 800-288-2726*

A continuous bucket conveyor can typically move material from source to discharge without segregation, but be sure to consider the conveying rate and the number and size of the buckets when choosing a conveyor. Bucket size can affect the integrity of the materials in the individual buckets, and proper selection can help ensure the first-in, first-out integrity of the conveyed material.

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Minimizing material segregation in a bulk solid can be a difficult task, especially when handling a mixture of materials that vary greatly in size, density, and shape. Belt conveyors provide one of the gentlest forms of conveying, but beyond that your options are limited. Vibrating or horizontal motion conveyors will disturb the material and promote segregation. In fact, vibratory conveyors are known for segregating material to allow efficient lump and fines removal. Keep in mind that the less you disturb the material, the less the material will segregate.

*Stan Davis, president, Machine and Process Design, 763-427-9991*

One way to convey materials that tend to segregate on traditional belt or screw conveyors is to use *en masse* conveying. This conveying technology moves an entire bed of material in an enclosed casing while minimizing any movement of particles in relation to each other. *En masse* conveyors can typically be built up to 300 feet long and provide rates from 1 to 750 tph for handling material densities up to 50 lb/ft<sup>3</sup>.

*Bruce Robbins, sales manager—standard products, Metso Minerals Industries, 412-269-5000*

*Equipment suppliers are a valuable source of information about equipment and processes. In light of this, we occasionally ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Alicia Tyznik, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (atyznik@cscpub.com).*