

My material is highly abrasive. How can I select a mechanical conveyor that will handle it?

A horizontal differential-motion vibratory conveyor is one machine that's good for handling abrasive materials because there's no vertical motion to accelerate wear. Abrasion-resistant steel can be used with the nonimpacting motion to provide long wear life and reliability. In addition, thicker abrasion-resistant plating will extend the time between replacement intervals.

Matt Mayo, sales engineer, Triple/S Dynamics, 800-527-2116

Some of the most abrasive materials are those associated with quarrying and mining applications. By far, the most popular method of mechanically conveying such materials is by belt conveyors. These can be smooth for horizontal conveying, modest for incline conveying, or ribbed for steeper angles. Some belts even fold over to eliminate the loss of dusty materials during conveying and are well suited for making tighter curves.

Besides quarry and mining applications where the particle sizes tend more toward lumps than dust, there are numerous applications in the chemical and food industries that can be considered abrasive. Flexible screw conveyors with traditional polyethylene conveying tubes are always an option because their cost-to-life expectancy balance is viable, especially in extreme applications where severe wear will happen no matter what conveyor type is used.

When handling highly abrasive materials, it's most effective to select a conveyor that moves the material slowly. For example, flexible screw conveyors offer high wear value with abrasive materials due to their simple design that only uses one moving part. However, they're subject to frequent auger replacements when conveying abrasive materials. Tubular drag conveyors, on the other hand, can move very high volumes of abrasive material at relatively slow rates. As such, this technology offers excellent efficiency in terms of long-term maintenance to the overall system. In addition, tubular drag conveyors don't mix the material as it's conveyed, minimizing the material segregation and degradation problems that other conveying methods face. Another rule of thumb to follow is to oversize the conveyor and design it with the fewest number of bends. Finally, various construction materials, such as special liners, can be used to combat the effects of moving abrasive material.

Greg Patterson, vice president of sales, Hapman, 269-343-1675

Unlike heavy-duty rigid screw conveyors, flexible screw conveyors have no seals or bearings to be attacked and damaged by fine abrasive particles. Thus, they will not seize-up as a result of abrasive material penetration.

Another conveyor type worthy of consideration is the slow-speed drag conveyor where abrasion-resistant discs, linked together by cables or chains, pull materials at slow speeds through abrasion-resistant tubes. Because the tubes, discs, and disc links can be constructed from various metals, drag conveyors offer a suitable solution for abrasive, hot, or wet materials as well.

As always, when selecting a conveyor and conveyor manufacturer, choose one that can offer references and has a test facility.

Keith Simpson, marketing manager, Spiroflow Systems, 704-291-9595

Choosing the best mechanical conveyor to handle your highly abrasive material will be driven by your application's requirements and material specifications. In many cases, conveyors fail or become troublesome because the application requirements weren't thoroughly considered.

Start your search by reviewing your mechanical requirements for the conveyor. Once this has been evaluated, you'll have some insight on what conveyor styles should be considered. Once you narrow the search based on the physical layout, consider all of the application-driven issues to limit the selection further. After determining what type of conveyors can be used, evaluate the specific material to ensure proper conveyor configuration.

Evaluate your complete process to ensure long-term satisfaction with the conveying system. It's highly recommended that this evaluation be conducted by a manufacturer's experienced process or application engineer.

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