

What kind of conveyor is best suited to transferring our hot, friable material after it discharges from a dryer?

Selecting a conveyor for transferring a hot friable material will depend on knowing the following information:

- Characteristics of the material being handled.
- Changes in material characteristics at different temperatures.
- Effects of temperature on the conveyor and surrounding environment.
- Desired conveying rate and conveying capacity of the recommended equipment.
- Equipment layout and site constraints.
- Sanitary requirements and cleanability.
- Material of construction and wear properties.
- Hazards posed by material or environment.
- Budget.

Specialist conveying equipment suppliers can supply several conveyor options for conveying hot materials. It's advisable to test your material in the type of conveyor selected to verify the conveying rate and equipment suitability. Given the potential for problems with all but the freest-flowing materials, it's essential to select a specialist supplier that has experience with the materials you want to convey.

Here are several conveyors that may be able to handle your material:

A **screw conveyor** can be designed to operate at elevated temperatures. An indirect drive with secondary shafting can isolate the drive motor and gearbox from the heat source. A shaftless-screw conveyor could be an option for gentler conveying. Typically this is considered a short-distance conveyor.

An **aeromechanical conveyor (AMC)** is often overlooked but is very efficient for conveying materials up to 300°F. This conveyor provides high conveying capacities and total batch transfer. The totally enclosed tubular system, which uses air as a conveying medium, provides a path for the driven rope-and-disc assembly to move around the circuit and results in a gentle conveying action and a reliable means of transporting between processes.

A **cable drag conveyor** is more sophisticated than a screw conveyor or AMC, allows for complex circuits with multiple inlet and discharge points, and is suitable for material temperatures up to 300°F. This conveyor also provides a totally enclosed tubular system. Without using air as a conveying medium, a rope-and-disc assembly moves around the circuit, providing a gentle conveying action. The cable drag conveyor provides total batch transfer but sacrifices conveying rate because it has a lower operating speed than an AMC. The conveyor's operating speed is determined by the circuit's complexity and the distance traveled. The maximum circuit length is typically up to 400 feet.

A **heavy-duty chain drag conveyor** is similar to a standard chain drag conveyor but has a maximum circuit length up to 500 feet. Its equally pitched discs can be made from hard-wearing plastics, such as ultrahigh-molecular-weight polyethylene for temperatures up to 250°F or metal for temperatures up to 450°F.

A **belt conveyor** can be used over long distances and is good for friable materials. Some belt designs can transition to form tubular conveyors as they move along the conveyor path. This conveyor, when fitted with special heat-resistant belts, can operate for limited periods up to 752°F but more commonly up to 392°F.

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For many hot materials, a static screw elevator is a good choice. A static screw elevator is used to vertically convey bulk material at temperatures up to 1,500°F. If the material temperature needs to be maintained during elevation, the elevator's rotating lift tube can be insulated. In addition to efficient bulk material elevation, static screw elevators are noted for the following features:

- Gentle handling,
- Quiet operation,
- Fugitive dust elimination,
- Low maintenance,
- Volumetric flowrate control, and
- High-temperature operation.

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One mechanical conveyor suitable for this application is a horizontal-motion conveyor also known as a differential-motion conveyor. This conveyor uses a shuffle motion that won't agitate, stratify, or damage the material during the transfer from the dryer to the next process point. It's well-suited for adding aspiration as well as conditioned air if the process requires it. The metal troughs can withstand a wide range of temperatures and can be easily cleaned. The conveyor's length typically varies from 4 to 200 feet, and the conveyor requires minimal floor space for support. Multiple drop points can also be incorporated into the unit.

Other potential options, such as using a belt conveyor with a metal belt or slatted-chain-driven belt, require more maintenance, are generally more costly, and can be difficult to clean.

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Equipment suppliers are a valuable source of information about equipment and processes. In light of this, each month we 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 Kayla Carrigan, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (kcarrigan@cscpub.com).