

# What kind of mechanical conveyor features should I look for to handle my fragile, friable material?

It has been repeatedly demonstrated that a horizontal-motion oscillating conveyor is the most effective way to convey fragile, free-flowing materials. The conveyor's slow-advance and quick-return motion gently conveys delicate snack foods, agglomerated powders, and other fragile materials over hundreds of feet with no measurable damage. The conveyor applies a differential acceleration to the material's mass working with inertia to provide a gliding motion to the material flow, eliminating the need for mechanical impact.

This conveyor type is suitable for many industrial applications, such as snack food manufacturing. It can handle friable agglomerated powders where mechanical damage to the particles affects solubility or effectiveness. It can preserve the finish of coated materials.

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The easy answer to this question is "a conveyor that's gentle." However, other than gently picking up each particle by hand and carrying it to its destination, every conveyor type, mechanical or pneumatic, can potentially damage the material it's conveying.

Mechanical conveyors can cause material damage at *pinch points*, trapping or crushing particles, such as pellets, granules, or agglomerates, between the conveyor's moving parts, or when the particles abrade against each other as they're conveyed. The least amount of damage occurs when particles are separated by an air cushion or are moved at relatively slow speeds to minimize collisions. For example, aeromechanical conveyors that have appropriate clearances between the moving discs and the con-

veying tube walls entrain the material in an airstream, offering some fragile and friable material protection. Flexible spiral conveyors can also gently handle the materials as long as the conveying speed, spiral type, and running clearances are suitable for the material. Bucket elevators are also an option but generally tend to be a more expensive solution.

There's only one way to determine whether a conveyor will transfer your material without degradation: Test it. Make sure the conveyor test is conducted over longer distances than required and at the appropriate conveying rate.

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To select a mechanical conveyor that doesn't cause material degradation or separation, consider the following three factors:

- The conveyor's speed – The general rule of thumb is that the slower the conveyor speed, the better it will convey material without damage.
- How the material enters the conveyor – Metering the material into the conveyor at a rate slower than the conveyor's capacity allows the material to settle in the system before hitting a shear point.
- The conveyor's discharge needs to be smooth when in the closed position – no edges or sharp sides reduce the possibility of pinching. This eliminates any chance of shearing the product when it bypasses the discharge. Also, managing the distance that the product freefalls will reduce any damage.

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