

Augers vs. CONVEYORS

- ✓ Dust-free enclosed system
- ✓ Occupies less space
- ✓ Direct material flow
- ✓ Energy - Efficient
- ✓ Flexible layout
- ✓ Quiet



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Flexible screw conveyors, also known as augers, are used to transport materials vertically, horizontally, or at any angle.

Flexible screw conveyors consist of a stainless steel, or spring steel flexible screw enclosed in a rigid steel tube, or rigid or flexible plastic tube driven by an electric motor usually located at the discharge end of the conveyor. The enclosed tube, or trough, rotates around a central shaft, transporting the material according to the screw design and rotational direction. When the material reaches the end of the tube, it falls into a container or a rotary airlock, depending on the application.

Because the conveyor is enclosed in a tube, it prevents contamination of the materials being transported and also prevents contamination of the plant, while maintaining the temperature and moisture levels of the product.

Screw conveyors, however, can emit dust primarily from the inlet, where the material is received, from leaks in the tube cover as well as from worn-out tubes. Abrasive materials can wear out screw conveyor tubes quickly unless they are treated with a special coating or abrasion-resistant material.

Like other mechanical conveyors, flexible screw conveyors typically don't empty the material completely when they operate in a forward direction, however the removable cleanout cap located at the end of the conveyor tube allows the components to be easily and quickly disassembled and washed down.

Because the flexible, rotating screw fits loosely within the tube filled with the bulk material, it automatically centers itself within the tube and provides enough space between the screw and the wall of the tube so that the materials can usually be conveyed without being damaged – although that depends on the size of the particles being transported and how fragile they are.

Although flexible screw conveyors are not as harmful to materials as other types of conveyors that can grind, crush, or otherwise damage bulk products, not all materials can be conveyed without damage. For example, a percentage of brittle

flakes or large, soft particles being transported through steep inclines in a flexible screw conveyor can break. However, you can minimize the damage with the proper engineering of a flexible screw conveyor.

Flexible screw conveyors can transport materials such as flakes, grains, powders, seeds and granules with a bulk density of 150 lbs./ft³. They can also be used to mix or blend these materials. Typically flexible screw conveyors can convey material to a maximum distance of 60 ft. although you can join multiple conveyors together to transport the materials greater distances.

A flexible screw conveyor is usually used for applications that have capacity requirements of less than 50 tons per hour per conveyor. The drive motors for screw conveyors are based on the materials to be conveyed as well as the length, angle and diameter of the auger. The electric motors can range from 1-horsepower to 10-horsepower. Flexible screw conveyors typically come in diameters of up to 16 inches.

Manufacturers use flexible screw conveyors extensively in agricultural applications including in threshers and balers, to factory-based grain and crop movers. Screw conveyors can also move materials that are difficult to convey like wet, non-flowing and caking materials. Sometimes, however, these sticky, lumpy, or fibrous materials cause problems in screw conveyors.

The flexible screw conveyor is designed to run when it is full of material because running empty will cause it to be noisy and wear out faster and when the outer tube wears out it can mix with the product. To avoid this you should introduce the material when you start up the conveyor and the material should fill the entire length of the tube. You should also make sure you empty the conveyor before you shut it down to avoid overloading it during start-up.

When you have enough space, screw conveyors can be very economical to elevate and convey your materials because they operate with the flow of material inclined upward. In addition, they can cost less than other systems to construct, oper-

ate and maintain because they don't have internal bearings, filters, chains, gears, external compressors, blowers and separators. Installation is also less expensive because you can put the intake and discharge ends wherever you want so you don't have to reconfigure your other process equipment.

A tubular drag conveyor is another enclosed mechanical conveyor that uses a cable-and-disc assembly to convey materials continuously through a tube at high speeds. The speeds, however, can be adjusted on some systems to fit various applications.

The conveying tubes have a diameter of 2, 4, or 6 inches, depending on a company's application. The materials in tubular drag conveyors are moved to discharge points in enclosed conveying tubes, keeping harmful dust, and toxic or flammable materials from escaping into the environment. In addition, the materials are completely sealed within the tube so they are protected from the atmosphere.

A tubular drag conveyor handles material gently, so it's perfect for moving friable and other delicate materials without degrading them. It can also be used to transfer blended materials with very little segregation. A tubular drag conveyor can also transport materials that are hot or highly abrasive as well as move foods and other materials that need to be kept sanitized.

Tubular drag conveyor systems are very flexible – they can have a wide variety of configurations and options. The conveying tubes can be straight or curved, come in a variety of lengths, and can be laid out in various configurations, including vertical, horizontal, or angled parallel lines; a loop; or multiple-corner shapes. The drive unit provides power to move the cable-and-disc assembly through the conveying tubes and the tension turnaround unit maintains the proper cable tension.

A tubular drag conveyor, which operates on a low horsepower motor, can include multiple inlets and outlets and can move material vertically, horizontally, around corners and at an angle. That means you can save money, space and energy by elimi-

nating the need for multiple conveyors.

Tubular drag systems gently convey dry bulk materials including powders, chunks, flakes, pellets, prills, parts, shavings, crumbles, granules, fluff, re-grind and dust through an enclosed tube without the use of air. These systems can convey up to 1,500 cu. ft/hour.

Tubular drag conveyors, like Cablevey conveyors, control dust, so you don't have to spend money on dust collection systems and there are also no filters to clean. And product separation and degradation are practically eliminated as well.

And, like Cablevey conveyors, tubular drag conveyors operate on low horsepower – 1- 5 horsepower single- or variable-speed motors, saving you money on energy. They're quiet so they reduce the noise level in your plant and they're self-cleaning, so they eliminate the build-up inside the tube.

"With a screw conveyor you have a steel helix that spins and moves the product so it's a lot rougher than the Cablevey system and product degradation is much more of an issue," says Patrick Macfarlane, President of Phenix Equipment Inc. "And with an auger, or a screw, usually there's material left in the bottom a little bit, whereby the Cablevey System is kind of self cleaning."

Macfarlane adds, "Augers are pretty much straight shot units and if you wanted to go up and over, you'd have to transfer from one into another so you have another drive and another transfer point, so that's an advantage for the Cablevey."

When it comes to deciding what conveying system best fits your needs there are a number of questions you should ask an expert – a specialist who doesn't have a vested interest in selling any particular system and who can weigh your needs and recommend the best system for you.

In addition to figuring out the best conveyor system to transport the bulk materials you want to transport and at the distances you want to convey them you should ask:

1. Can the system be configured to handle turns and inclines? Make sure the conveyor system you select goes where you need it to go, in the most efficient manner, even if it involves special turns, inclines/declines, and corresponding flights or lifts.

2. How easy is it to repair the conveyor? If something happens to the system you don't want to be waiting days or weeks to get it fixed or replaced so you should try to find systems that can be repaired easily, quickly and relatively inexpensively.

3. How easy is it to change the configuration of the system? If you think your needs are going to change, you should determine if the system you select can change simply and inexpensively to suit your needs. Determine if your plant would benefit from fixed conveyor system a modular system. Fixed conveyor systems may be more reliable but they don't have the flexibility of modular systems. And that's a concern if your operation calls for frequent reconfiguration.

4. What are the standard maintenance requirements for the conveyor system? The easier a system is to maintain, the more time it will be up and running. A system that's down negatively affects productivity and profits.

5. Can the conveyor be used in my clean room? If you're a manufacturer in certain industries like medical equipment, microelectronics, food, and pharmaceuticals then you need to ensure that the system you select meets the cleanliness standards of your industry.

6. What about the warranty? Before you purchase a conveyor system check to see how long the warranty is on the materials and workmanship as well as on the motor and other electric components.

7. How much will the installation cost? The answer, of course, will depend on the system you select and its integration requirements.

In addition you should also consider the following:

- How will the product be placed on conveyor? Will it be placed on the conveyor manually or transferred from another conveyor?
- How many hours per day/days per week will the conveyor be used?
- What is the maximum production rate?
- Will the conveyor be subjected to unusual conditions like extreme heat or cold?
- Is your product likely to change in any way in the future?
- At what rate is the material being moved in pounds per hour or batch size over a given time?
- How important is it to minimize product degradation during conveying?
- Will the system operate in a dusty or hazardous environment?
- Is there enough power available?
- Is there enough clearance for overhead systems?

Remember, just like the materials they convey, conveyor systems come in a variety of shapes and sizes so before you purchase a system take the time to make sure it does everything you need it to do.