

Bucket Conveyors vs.

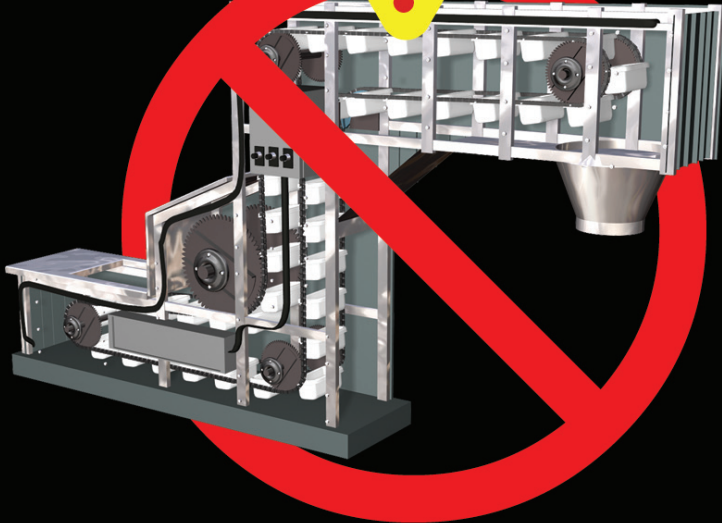


The Gentle Way to Convey

- ❌ **Bulky** - occupies more space
- ❌ **Labor** - intensive maintenance
- ❌ **Heavy** - Big footprint
- ❌ **Material exposed to ambient conditions**



**HOW DO YOU
CLEAN
IT
?**



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



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As the economy continues to falter, only the companies with the most cost-efficient, effective, reliable and flexible plant operations will survive.

Because material transfer is an integral part of the operation for plant managers charged with conveying bulk materials like powders, flakes and granules for packaging, selecting the right conveyor can mean the difference between an efficient and an inefficient operation.

Finding the right conveyor for your plant depends mainly on the materials you want to move. The size, weight, consistency and stability of a product affects the way it should be transported.

To determine the most efficient and economical method to convey your material from point A to point B you also need to factor in space limitation as well the purchase price, maintenance, labor and cleaning costs.

Probably the most common method of mechanically transporting bulk materials vertically – although some can convey materials horizontally – are bucket elevators. This conveyor belt system uses a continuous line of buckets that are either attached to each other on a rubber belt or are attached by pins to two endless chains running over tracks and driven by sprockets.

Any material that spills out of the open buckets is collected in the boot of the elevator. At the end of the conveyor run, the bucket tips and the product is dumped out. The conveyor then carries the bucket to its start position where it is again filled. However, bucket elevators are not self-feeding and must be fed at a controlled rate.

The two main types of bucket elevator systems are the continuous bucket elevator system and the centrifugal bucket elevator system.

The continuous bucket elevator system, which runs at slower speeds (typically 90 to 150 fpm), is designed to transport fragile materials to minimize product damage. The centrifugal bucket elevator system, which runs at higher speeds (typically 190 to 275 fpm), is used to move all free-flowing, powdered bulk solids including animal feed, grains, minerals, sand, chemicals feed, and sugars. Capacities can range from under 1/2 ton per hour to over 6,000 tons per hour and heights of 150 ft.

In the continuous bucket elevator system continuous spacing of the buckets allows gravity to discharge their loads into the inverted front of the adjacent bucket. In the centrifugal bucket elevator system, centrifugal force throws the material out of the buckets into the discharge spout as the buckets pass over the pulley or head sprocket.

But there are a number of problems with a bucket elevator system, not the least of which is the risk of explosion.

An explosion can occur when dust from the material being conveyed mixes with the air that is moved within the bucket elevator housing, forming explosive clouds that can be ignited by even a small spark. And a spark can be generated if a bucket breaks free of its chain and hits the frame of the elevator or the housing.

Explosions, however, are not the only problem associated with a bucket elevator system. For one thing, bucket elevators occupy more space than other types of conveyor systems – al-



though they do occupy less horizontal space — and typical applications require at least a 15-horsepower motor. The larger the motor the more money and energy will be wasted.

And the initial cost of a bucket elevator system as well as its installation costs are usually higher than the costs associated with other systems.

Because bucket elevators have to be fed at a controlled rate, you don't have the option of varying the speed to convey your materials. Bucket elevator systems are also very dusty because dust is generated when the materials are loaded into the system and while the product is being conveyed. Product can also escape through the holes in the elevator for the shafts. So you'll have to spend money on fixes for those problems.

In addition bucket elevators are noisy, as well as costly and time consuming to maintain because they are made up of many moving parts including motors, belts, sprockets and bearings that wear out and need to be replaced. And the centrifugal bucket elevator system will cause product degradation because it shovels the bulk materials in the boot of the elevator into the buckets.

A tubular drag cable conveyor, on the other hand, is an enclosed mechanical conveyor that uses a cable-and-disc assembly to convey materials through the conveyor. The tubular drag conveyor moves materials continuously through the tube at higher speeds than the bucket elevator system. However, the speed 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 transported to discharge points in these

totally enclosed, dust-free conveying tubes, preventing harmful dust, as well as toxic or flammable materials from escaping into the environment. Because these conveyors are completely sealed they also protect the materials from the atmosphere.

Because the tubular drag conveyor handles material gently, 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. Additionally the conveyor can also be used to handle potentially explosive material because of its enclosed design, which allows the conveyor to resist the buildup of internal pressure caused by explosions.

Additionally, a tubular drag conveyor usually costs less to purchase, operate and maintain than bucket elevator systems.

Tubular drag conveyor systems are very flexible — they can have a wide variety of configurations and options. 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 eliminating the need for multiple conveyors.

A Cablevey Tubular Drag Conveyor gently moves dry bulk material through an enclosed tube without the use of air. Systems can convey up to 1,500 cu. ft/hour. Powders, chunks, flakes, pellets, prills, parts, shavings, crumbles, granules, fluff, re-grind and dust can all be handled with ease. Numerous layouts are available using multiple inlets and discharges, making Cablevey conveyors ideal for packaging lines. And they're con-



structed using food-grade sanitary stainless steel.

Cablevey conveyors gently move thru an enclosed tube without the use of air. Cablevey systems can convey up to 1240 Ft³ (35 M³) / 49,420 lbs. per hour. The system's adjustable variable-speed motor provides gentle material handling. A Cablevey conveyor can be configured in many different ways to fit into every plant environment.

"The big advantage with Cablevey is the flexibility," said Carl Teten, Engineering Manager S & D Coffee, Concord, NC. "I've used it where I've had to go around obstacles. Bucket elevators don't do that very well; they don't normally run well in a circle. Bucket elevators are extremely linear whether it's straight up and down or a Z formation or a C formation."

Teten said he uses Cablevey to feed whole bean, ground coffee from a roaster into a group of bins. S&D Coffee continually roasts and processes tons of coffee its plant.

"I have one Cablevey that goes around in a big loop and it hits 16 bins, so what I can do there is feed that Cablevey, in this case from another Cablevey, and it can hit each one of those bins in a great big loop. I can get more throughput with Cablevey," Teten said. "That system is handling whole bean and I also have the same thing over in our ground coffee system."

Ad Verkuylen, Director of Engineering at the NohBell Group LLC, said one big advantage with Cablevey conveyors is that he can make changes in multiple dimensions.

"So with a bucket elevator I can go from A to B, as long as A and B are in the same line and it might be in different elevations," he said. "If I use a bucket elevator I can go from here

straight out and up or from here across and up, but I cannot go from here across up and then go forward. If I do a Cablevey I can from A to B and it doesn't really matter if I make a two- or three- dimensional change from getting to A to B. And with Cablevey I can also use a much smaller footprint," Cablevey systems control dust, eliminating the need to spend money on dust collection systems. In addition there are no filters to clean. And product separation and degradation are practically eliminated as well. Cablevey conveyors operate on low horsepower – 1- 5 horsepower single- or variable-speed motor – that provides material transfer rates of less than 100 to 1240 ft³/h (35 m³) / 49,420 lbs. per hour, so you save money on energy. Because they're quiet, they reduce the noise level in your plant and because they're self-cleaning, there's no build-up inside the tube.

To clean the conveyor, polyurethane wiper discs are attached to the cable and are left on during operation. They keep the tube clean by eliminating any residual material and any chance of material buildup. To change each wiper – wipers need to be replaced about every two months – an operator just has to unbolt the old one and bolt a new one in its place.

Depending on a company's application, each Cablevey conveying tube is 2, 4, or 6 inches in diameter and may have one (or more) transparent polycarbonate inspection sections that let observers see what's happening in the system. The conveying tubes can be straight or curved, are available 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 cable-and-disc assembly consists of an Ultra-Flex stainless steel cable with ultrahigh-molecular weight plastic discs that



fit the conveying tube and are attached at regular intervals, generally 2 or 6 inches, depending on the application. This assembly is an endless loop that runs from the turnaround unit, through the conveying tube and the drive unit, then back through the return tube and to the turnaround again. Along the way, material is picked up at one (or more) inlet and discharged through one (or more) outlet.

The drive unit provides power to move the cable-and-disc assembly through the conveying tubes. The tension turnaround unit maintains the proper cable tension. Each Cablevey Tubular Drag Conveyor may have one (or more) inlet and outlet of various types. The system components are connected with compression couplers and gaskets, making the system totally enclosed and dust-free.

So while a bucket elevator conveyor produces dust, which may cause an explosion, degrades the material, consumes excessive power, takes up a lot of space, and limits the speed of the conveyor, a Cablevey Tubular Drag Conveyor gently and quietly conveys your product in an enclosed, dust-free system, saving money and energy in the process.

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