

How Do Belt Conveyors Work?

By Billy Dougherty

Belt-conveyor systems have been used to transport bulk materials since at least the 18th century. Today they are still appreciated as a uniquely economical and reliable way to move materials over both short and long distances and can effectively transport a wide variety of materials, ranging from those that are very fine such as dusty chemicals to those that are as large and heavy as lump ore or coal.

How Belt Conveyors Work

Belt conveyors are essentially composed of a textured belt supported by rotating idlers that are powered by a motor or drive. As the idlers turn, the belt moves forward, conveying the material riding on it with a smooth, continuous motion. The belt itself has two functions: It transports the conveyed material, and it transmits the force, in the form of tension, which is necessary to move the load.

Conventional troughed belt conveyors are capable of following existing terrain on grades of as much as 35 percent. Specially designed conveyors and belts are available for steep angle conveying of up to 90 degrees. It's also possible to convey material downhill, a process that can generate electricity to power other equipment.

Typical conveyor belts move at a relatively constant speed, commonly between 50 and 2000 feet per minute. (Speeds vary based on the application's listing facts such as material degradation, dust generation, wear, and noise.)

The Many Advantages of Belt Conveyors

There are many advantages to moving bulk materials via belt conveyors:

- They have relatively low energy and labor requirements.
- They can transport materials for distances ranging from 10 ft to dozens of miles.
- The paths traveled can be altered and the routes can be extended or shortened as required.
- They can run continuously without losing any time for loading or unloading.



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- They can be loaded at multiple points and anywhere along their length.
- Required maintenance is minimal as most belts can be repaired or replaced in one shift, and many have been known to convey more than 100 million tons before wearing out.
- They eliminate all hazards and concerns associated with rail and motor transport and traffic.

Because of their ability to operate reliably for long periods of time, belt conveyors serve well in environments where continuous operation is desired and downtime is costly, as in moving fuel within a power plant. When built to be protected from the elements, they can also function in situations where trucks and other means of transport might fail.

Finally, belt conveyors also provide environmental advantages: For example, dust emissions from conveyors have been found to be less than 5% of the levels generated by trucking, and belt conveyors work quietly.

In summary, belt conveyors represent an economical, safe, and environmentally friendly haulage solution that is likely to be valuable to many industries for many, many years to come.

Billy Dougherty is Vice President of Operations at AIRMATIC and has over 23 years of experience in the storage, transport, and processing of bulk solids.

Thanks for reading our post. If you'd like to learn more about belt conveyor components and accessories, please contact one of our experts at [+215-333-5600](tel:+215-333-5600) or at infocenter@airmatic.com.