

More Bucket Elevator Problems

Bucket elevators are a common sight across many industries. It's no wonder: they are versatile machines. They can be designed for small, batch processes or mill-scale operations, and they boast similar versatility in terms of materials they can handle. Plus, it goes without saying that they excel in elevating material in confined spaces. But familiarity, versatility, and the ability to elevate do not mean, by default, that bucket elevators are the best system for your application, as other solutions are available that may better meet your needs, and there are limitations with bucket elevators of which you should be aware.

Bucket Elevator Advantages

Before digging in, let's cover the obvious: why bucket elevators continue as a popular material handling solution. Bucket elevators have many advantages over other systems. These include:

- **Efficiency.** Energy is mostly used to move material, not air, as with pneumatic systems.
- Use **little ground space.**
- Available for a **wide variety of capacities.**
- Can **gently handle material.**
- Can handle a **variety of materials.**
- Handle **low temperature, free-flowing products well.**

Bucket Elevator Disadvantages

The list of Bucket elevator disadvantages is the same length, however. Disadvantages include:

- **High installation costs** compared to other conveyance systems.
- **Extensive preventative maintenance.**
- **High maintenance expenses** (especially if PM is neglected).
- **Difficult maintenance** due to placement of the motor, elevation of chutes, and common inclusion of a pit at the base of the elevator.
- **Must be overheight** for discharge.
- **Cascading bucket failure** (when one bucket fails, many others become damaged).

We can add to this list difficulty handling certain fibrous materials like biomass: raw cellulosic material including wood chips, veneer waste, shavings, straw, stover, bagasse, and other woody or grassy substances. Bucket elevators do not work well for these materials because the materials do not easily break apart, they do not fill buckets well (e.g. voluminous materials like straw), and their abrasive nature tends to quickly wear buckets (e.g. buckets collecting from a pit of chipped wood).

Fibrous material also proves problematic in that some material inevitably spills over the buckets at the chute and falls to the bottom of the housing. There, buckets going around the tail scoop up this

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material. This isn't a problem with free-flowing grains, but for fibers and strong materials that aren't free flowing, it causes huge stresses on bucket chains.

Perspective on Advantages

Beyond considering the disadvantages, it's good to gain perspective on some of the advantages to bucket elevators. First is their efficiency. Compared to a pneumatic system, bucket elevators are, of course, much more efficient. But when compared belt or advanced drag conveyor systems, their superiority diminishes. Belt conveyors and drag conveyors, especially BE&E's [SMART Conveyors™](#), are much more efficient than pneumatic systems, as well.

It should be noted that the efficiency of individual systems differs dramatically, and our statements about efficiencies are general in nature. Many drag conveyors, for example, are incredibly inefficient. We've encountered systems for which 90 percent of the energy was being used to operate the system while empty. With this in mind, always compare equipment when purchasing a material handling system.

Another advantage worth analyzing is bucket elevators' ability to move material vertically. Belt conveyors are impractical for this due to their limited ability to elevate material. But some drag conveyors can elevate materials at steep inclines like bucket elevators. Certain manufacturers like Biomass Engineering & Equipment offer drag conveyors that can convey at angles of 75° and 90°.

A drag conveyor that can elevate vertically is worth considering as an alternative to a bucket elevator. SMART Conveyors™ from BE&E lack the pulleys, belts, gears, bucket assemblies, and transitional pulleys of bucket elevators and are easier to maintain. And they are extremely efficient. Plus, they are dust tight and will gently handle material without degrading it.

SMART Conveyors™ are also worth considering because they can simplify a system configured with a bucket elevator. Often, by using a SMART Conveyor™, a system will not require the infeed and outfeed conveyors associated with bucket elevators. Thus, a single SMART Conveyor™ can replace three conveyors.

There are other advantages to SMART Conveyors™ that make them an excellent alternative to bucket elevators. Learn more by [contacting us](#). Let's discuss whether SMART Conveyors™ are the right solution for your project.