



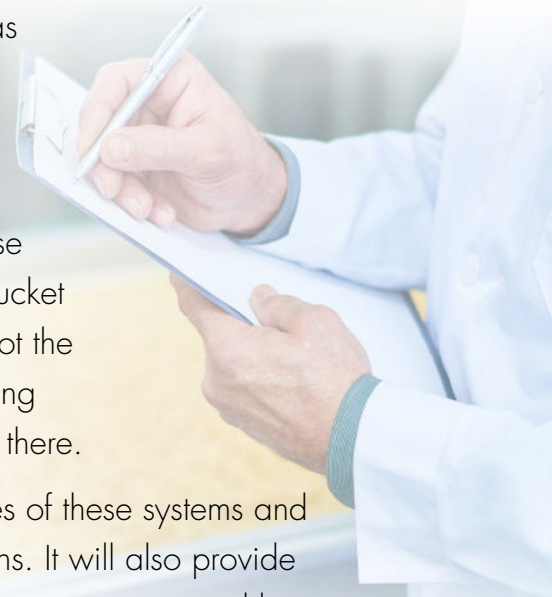
*The
Definitive Guide to*
**SPECIALTY GRAIN
CONVEYOR SYSTEMS**
in Food Processing



The food processing industry is always looking for new ways to make its processes more efficient. Each product type has a conveyor system that works best for that specific food.

The biggest issue with conveying specialty grain is that it's delicate and needs to be gently transported. Some examples of the material handling equipment used for these products are pneumatic conveyors, belt conveyors, and bucket elevators. However, these specialty grain conveyors are not the only options. The equipment used depends on what is being transported, where it's going, and how fast it needs to go there.

The following guide will introduce you to the different types of these systems and common issues that crop up when handling specialty grains. It will also provide suggestions on how to avoid these problems so your process can run smoothly.



COMMON SPECIALTY GRAINS

The most common specialty grains used in the food industry include rye, oats, amaranth, rice, barley, millet, and similar. Let's take a closer look at how each of these is handled.

Rye

Rye is commonly used in flour, bread, beer, whiskey, but it's also a great option for livestock feed. It is an excellent source of dietary fiber and doesn't cause as high of an insulin response as wheat. Therefore, rye is commonly used by those looking for a way to reduce their risk of diabetes.

One of the key properties of rye is its **porous structure**. This allows for higher satiation, which means the person eating it will be full for longer. However, this porous structure is challenging to preserve during processing.

Oats

Oats are one of the most popular cereal grains. The worldwide demand for oats is constantly increasing because of the numerous health benefits they provide (in 2020, this demand exceeded over **25 million metric tons!**). Oats are high in fiber, low in fat, heart-healthy, and can lower cholesterol levels.



Oat processing requires special equipment due to its soft outer layer. Even though oats can be ground into oat flour, not all food processors want to do this. Some would like to preserve the whole oat grain because it contains more fiber (in the form of steel-cut oats or rolled oats). The equipment needed to process oats should be able to gently separate the hull from the kernel itself without damaging either one.

Amaranth

Amaranth has been cultivated for thousands of years in Mexico, Peru, and several other locations worldwide. The protein content in amaranth is considerably higher than in other cereal grains. It also contains more calcium and iron than most grains.

Amaranth grain is usually transported using pneumatic conveyors or conveyor belts. However, these systems are not always the best option. The equipment used to transport amaranth depends on how much damage it can sustain during processing and storage.



Quinoa

Quinoa is a seed, though it is referred to as a whole grain. The seed is grown in South America and has been an essential part of the Andean diet for over 3000 years! The nutritional value of quinoa includes high amounts of fiber, protein, and iron.

The biggest issue with conveying quinoa is that it is a dry, brittle grain. The brittle nature of quinoa means it is highly susceptible to damage, especially if the product will be stored for a long period. The best equipment options for this type of grain are enclosed systems that smoothly transport it without creating too much friction. The equipment should also handle the large size of quinoa seeds compared to traditional grains.



Rice

One of the most versatile grains is rice. It can be used on its own or to make different products like flour, starch, oil, and many more. The majority of the world's population relies on rice as their primary source of food (**over 50%!**).



Rice needs a special type of conveying system, especially if it comes in the form of parboiled rice. Parboiled means rice has been processed under high temperature and pressure. In that case, the grain handling equipment needs to be used for both dry and wet grains while still preserving their shape during the process.

Barley

Another ancient grain, barley, has been farmed for over ten thousand years. Most barley is used to make beer, but it can also be turned into barley flour or barley flakes and grits. It contains high levels of iron and manganese as well as many B vitamins.

If exposed to strong vibrations, barley kernels may shatter. The best way to **transport barley** is through tubular cable conveyors. The key thing to remember when choosing a system for this grain is that it needs careful transportation because it does not handle stress well.



Millet

Like most grains on this list, millet is another excellent gluten-free alternative to wheat, especially for those who have celiac disease.

During conveying, millet should be exposed to environmental factors as little as possible. An enclosed system will be the best choice for this grain, such as one found in tubular conveyors.



*Additionally, grains such as spelt, emmer, and einkorn, each having hulls that require removal before milling, thus exposing the grain to damage during the conveying process, are ideally conveyed in a way that does not damage the grain.



HVH (Horizontal-Vertical-Horizontal)

HVH layouts carry materials from point-to-point and at varying altitudes.



COMMON ISSUES DURING CONVEYING

As outlined above, each specialty grain type requires carefully thought-out grain handling equipment. The main concern when choosing a conveyor system is damage during transit, but there are others to consider.

Common issues that arise during conveying are the following:



Contamination and cross-contamination

In food processing, contamination is defined as the addition of an unwanted substance that is not normally expected to a process or product. The presence of foreign materials can cause problems with taste, consistency, and safety in many cases. Cross-contamination occurs when an ingredient is unintentionally mixed with a different product that may come from the same production line.

Both contamination and cross-contamination are serious concerns in the food industry, and they can be the result of poor conveying equipment. The best way to prevent these issues is by having a conveyor system that does not allow any foreign material inside, such as a fully enclosed system that reduces the risk of (cross-)contamination.



Dust

Grain dust is very fine and can be flammable, which makes it a safety hazard. It can also be a respiratory hazard, especially if the particles are too small and can enter pores in the lungs. The dust from specialty grains is no different—it should be handled with care because it poses health risks for those who come into contact with it. The presence of this dust also interrupts the manufacturing process by clogging filters or machinery components.

The best way to reduce exposure to grain dust and dust accumulation during conveying is by choosing a fully enclosed conveyor system.



Product damage

Specialty grains can take all sorts of damage during transport—they can be crushed, chipped, or broken, for example. The tiny particles are very fragile and can quickly come apart during conveying. This is especially true if the conveyor system uses sharp turns or high speeds to transport the product quickly through production lines.

The main downside to damaged grain is that it becomes unusable because its nutritional value has been reduced. The USDA Federal Grain Inspection Service has a **range of standards** that define the level of damage allowed for each type of grain, measured by kernel size. If the inspection discovers that the product has been damaged, it will downgrade the quality, and the producer will get a lower price for their product. The best way to prevent this is by using specialty grain conveyors with gentle curves that do not break any part of the kernel during transportation.

IMPORTANT CONVEYOR FEATURES

The typical specialty grain conveying issues can be mitigated by **selecting the right conveyor system** for the job. The following features are essential to look for when making your selection:

- **Enclosed system**

We've already established that specialty grains are susceptible to contamination and cross-contamination during conveying, which is why the system must be fully enclosed. This also reduces the levels of dust exposure and the risk of dust explosions. The enclosed system will also keep the heat, humidity, and airflow isolated from the grain to not affect its quality during transport.

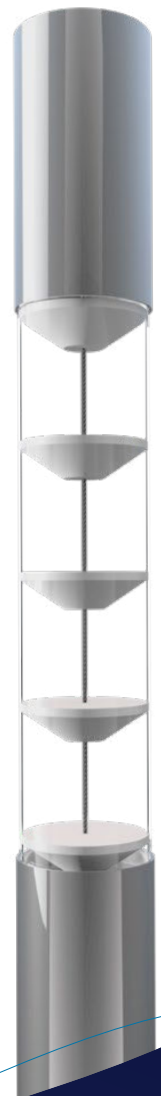
- **Speed control**

The quality of the grain largely depends on the speed of the conveyor system. The faster it moves, the more likely that damage will occur, and there is a bigger chance for cross-contamination to spread among multiple types of grains being processed through production lines at once. Slowing down conveying speeds ensures that particles arrive intact with minimal wear from friction between them, increasing their marketability and nutritional value. The best way to achieve this is by using a variable speed drive system that can adjust speeds depending on demand.



Enclosed Tubular Drag Cable & Disc Conveyors

Gently conveys your friable materials.



- **Modular design**

If your facilities don't have an abundance of floor space, you might need to consider a conveyor system that can be added on at any time. The best way to do this is by opting for an enclosed modular design, like the one offered by [Cablevey](#).

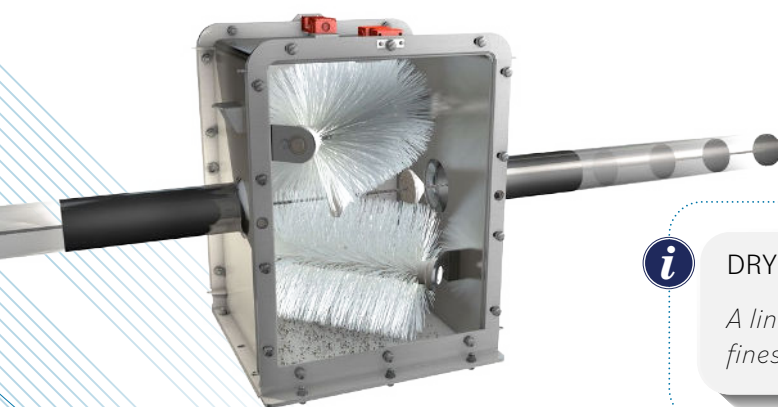
The modular conveyors are built in sections and can easily link together. They also come complete with all of the necessary equipment to make installation quick and easy. The modular design spreads your investment out over time, rather than requiring you to spend all of the money upfront for a single conveyor system that might not even fit into your facility.

- **Temperature and humidity control**

Specialty grains need an optimized environment during transportation to ensure they maintain their quality. The heat and humidity can affect the degree of damage that has occurred and cause other issues like mold growth or contamination. The best way to avoid this is by investing in a specialty grain conveyor system with temperature and humidity controls.

- **Easy cleaning and sanitizing**

The last thing you need is a conveyor system with nooks and crannies where bacteria can hide. At the same time, they grow into larger colonies throughout the day—this increases your chances of having equipment failures or process shutdowns due to food safety issues. Combat this by choosing a specialty grain conveyor system with all of the necessary accessories and equipment to ensure [easy cleaning](#).



DRY CLEANING: Brush Box

A line insert that mechanically brushes accumulating fines off discs.

- **Scheduled maintenance**

A conveyor system that breaks down and shuts you down for hours or days at a time costs your business money if it isn't properly maintained.

Avoiding these costly repairs is by opting for specialty grain conveyors with scheduled maintenance plans as well as proper documentation of all inspections, work orders, and other services that are performed throughout the year. The more proactive you can be with your maintenance, the less likely it is that something will go wrong and cost you time or money in repair work.

BEST SPECIALTY GRAIN CONVEYOR

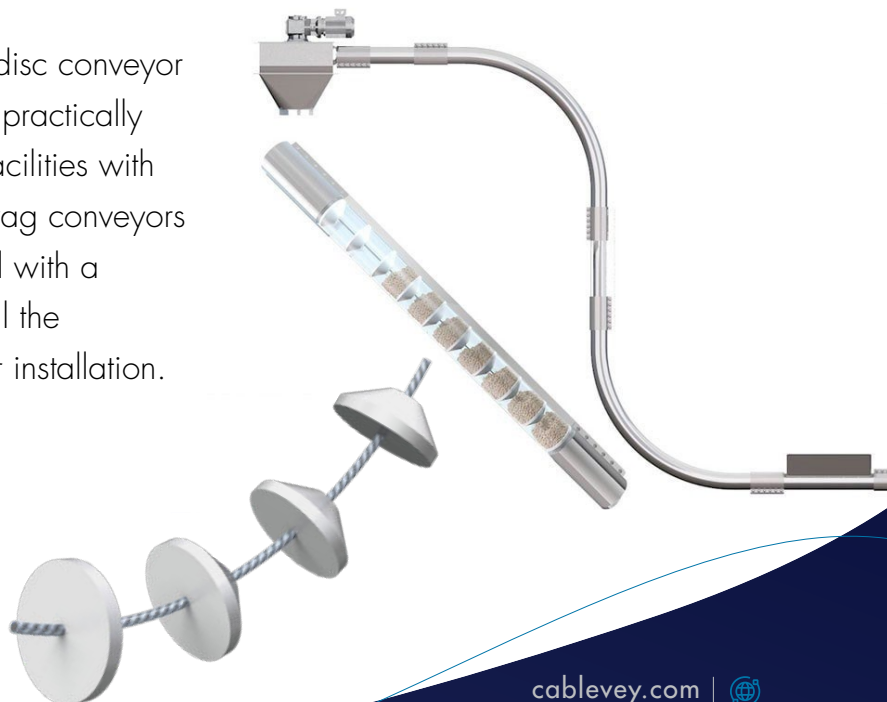
Considering all the features listed above, let's take a look at some of the best specialty grain conveyor systems on the market today.

Tubular Drag Cable Conveyors

The one option that meets all the requirements we've mentioned is the Cablevey [tubular cable drag conveyor](#).

A tubular cable conveyor is an enclosed system that consists of a tube through which a nylon-encased stainless steel cable pulls evenly spaced circular discs. These discs gently push the material along, and the cable ensures that it moves at a constant speed. It is ideal for fragile materials like specialty grains, and it preserves energy for efficient operation.

The Cablevey tubular cable and disc conveyor has a modular design that can fit practically anywhere, making it perfect for facilities with limited floor space. The tubular drag conveyors are easy to clean, come standard with a maintenance plan, and include all the necessary accessories needed for installation.



Belt Conveyors

One of the most frequently used conveyors in any industry is the belt conveyor. The best option for specialty grain is one with an enclosed system to protect it from contaminants.

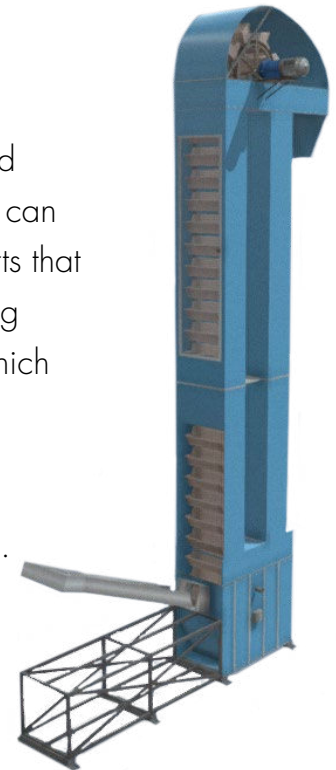


While the belt is ideal for lowering product damage since the transported material doesn't actually move on the belt, it has a few drawbacks. Namely, belt conveyors can function only horizontally or at a slight angle—they cannot be used vertically. This limits their use in spaces that aren't large enough for a belt to fit.

The belts also take up more space than other conveyor systems since they require at least four feet of clearance above the conveyor and below it—this can make them difficult to utilize in tight spaces.

Bucket Elevators

Unlike conveyor belts, bucket elevators can be used vertically and horizontally, and they're not too difficult to install—however, they can be difficult to clean. Bucket elevators consist of many moving parts that need to be regularly serviced and maintained to continue working correctly. Maintenance often involves disassembling the parts, which can be time-consuming.



Pneumatic Conveyors

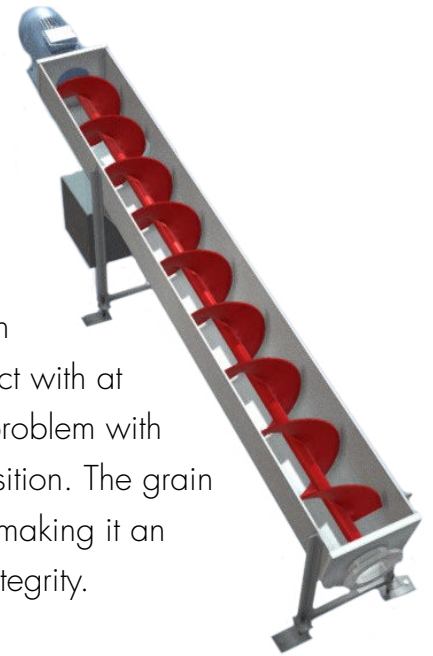
Pneumatic systems are fully enclosed and can fit into tight spaces. However, they function based on positive pressure, which means that they're not ideal for use with fragile materials. Pneumatic conveyors move material at incredibly high speeds, which can cause damage to its integrity.

If you choose to adjust the speed of the conveyor—lower it for fragile materials, for example—it can take quite a bit of electric power to maintain the speed. The power needed to run a pneumatic conveyor can drastically increase your electric bill each month, making it an expensive option for specialty grain processing facilities.

Screw or Auger Conveyors

Even though screw or auger conveyors are low maintenance and relatively inexpensive to repair, they're not the best option for specialty grains.

The material is moved by a screw or auger that moves grain in a rotating fashion—this means that the grain comes into contact with at least two surfaces of the conveyor during transportation. The problem with these types of systems is that they don't allow for a gentle transition. The grain is often jostled and damaged as it moves along the conveyor, making it an undesirable option if you're looking to preserve your grains' integrity.



CONCLUSION

The best conveying option for specialty grains such as rye, barley, millet, rice, quinoa, oats, and similar; is an enclosed system to protect it from contaminants. The belt conveyor, bucket elevator, and pneumatic conveying systems should be considered when dealing with delicate materials like rye or oats. The auger or screw type of system may work in some instances, but the material comes into contact with more surfaces and can cause damage if not carefully watched over.

However, the absolute best would be a tubular drag cable conveyor.

When planning your next conveyor system, consider the type of grain you'll be transporting and choose your conveyor accordingly. Optimized speed is important to ensure the grain is not jostled about during transportation, as well as temperature and humidity control. A modular design and a regular maintenance plan are also good considerations.

If you'd like to know more about the ideal conveyor system for your specialty grain processing plant, contact us at [Cablevey](#) today.



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