

# Screw Conveyors

## Advantages & Limitations



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**Engineered Systems**  
*Systems Engineering and Design*

# Screw Conveyors

## Advantages

Screw Conveyors are very capable of handling a variety of bulk materials from sluggish to free-flowing when designed properly.

Screw Conveyors may be used to mix various products together and/or for breaking up large friable lumps of material utilizing breaker bars or other modifications.

Screw Conveyors can convey in two directions utilizing right and left hand flights as well as be reversed to convey in the opposite direction.

Screw Conveyors work extremely well when you have design requirements for multiple inlet and outlet points. Bulk materials can be “conveyed from” and “distributed to” many different locations along the length of the unit. Slide gates or valves (either manual or automatic) can be added to control the flow into and out of a Screw Conveyor.

Screw Conveyors can be used in congested areas since Screw Conveyors do not require space for a return portion of the conveyor similar to a belt or drag conveyor or a bucket elevator.

Screw Conveyors can be more easily constructed as dust tight with the proper bolt and gasket arrangements. Screw Conveyors are totally enclosed preventing product spillage.

Screw Conveyors can be utilized in all planes of operation including the horizontal, vertical or any inclined position. Material characteristics of the product being conveyed, length of the unit as well as design practices relative to HP and Speed calculations are very important in any application above a horizontal plane. Screw Conveyors can be designed to work efficiently in all of these positions, providing the design is prudent for the application.

Screw Conveyors can also be designed without a center pipe. Shaftless Screw Conveyors are designed for conveying wet, sticky, sluggish products such as industrial sludges, bio solids or even dewatered sewage sludge in a waste water treatment plant.

Screw Conveyors can be furnished with external jackets that may be heated or cooled depending on the application. In this manner, Screw Conveyors may be designed with the ability to cool, heat or dry the product in transit.

Screw Conveyors can be designed to be vapor-tight or hold internal pressure. This is very important when conveying toxic or hazardous products such as those in the chemical industry.

Screw Conveyors can be used to provide an air lock between upstream and downstream equipment when designed properly.

Screw Conveyors can be used as a metering device. When used in this manner they are referred to as Screw Feeders. Screw Feeders are used to initiate a controlled flow of material from static storage such as a bin or hopper.

# Screw Conveyors

## Limitations

**Screw Conveyors tend to grind as they convey resulting in possibly very harsh handling of delicate materials. Therefore, Screw Conveyors may not be suitable for materials such as dry dog food or certain other friable materials.**

**Screw Conveyors may not be the proper selection based on material lump sizes or an application which has a high percentage of larger lumps. Consult TPI for allowable limits.**

**Length is a major factor in Horsepower Calculations and can result in a high power required to operate the conveyor empty becoming a limiting factor for conveyor selection. High calculated HP requirements for longer length units can also increase torsional load on shafts to the point that shafts and bearings are no longer available as standard items.**

**Screw Conveyors are not inherently self-cleaning and will not completely empty without considerable up-front engineering (and added cost). This can result in cross contamination and/or spoilage of certain materials if the conveyor is required to handle more than one material.**

**Many screw conveyors have internal bearings and coupling shafts that are normally the high wear items within the system. These can be very difficult to change in a standard conveyor. Screws are also subject to wear and are also very difficult to change. It is common to have one each of the different screws on hand as well as hangers, hanger bearings, coupling shafts, coupling bolts as well as drive and tail shafts. It is also common to keep a trough of each size and length available. If any of these items fail due to wear, the conveyor in all likelihood can be rendered unusable until replacements are procured and installed.**

**Screw Conveyors are not particularly efficient at conveying material and consequently can have a higher initial cost when compared with some other types of conveyors. Screw Conveyors also handle a relatively small volume (especially when intermediate hanger supports are required) compared to other types of conveyors.**



# Other Equipment By

## TPI Engineered Systems, Inc.

**Bulk Materials Handling Systems**

**Belt Conveyors & Belt Feeders**

**Drag Chain Conveyors**

**Chain Reclaimers**

**Radial Stackers**

**Screw Conveyors & Screw Feeders**

**Live Bottom Storage and Bins**

**Bucket Elevators**

**Apron Conveyors & Apron Feeders**

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