

What are the main factors to consider when selecting a mechanical conveyor?

Let's look at one common mechanical conveyor — the belt conveyor. Belt conveyor design begins with understanding your material and how it reacts to being loaded onto, conveyed on, and discharged from the conveyor's belt. You must also consider environmental conditions and your conveying goals. Here are factors to consider:

Material characteristics: Define your material's size, flowability, abrasiveness, and corrosiveness. Is it dusty, easily aerated, hygroscopic, or oily? Does it contain explosive dust?

Material density: Consider your material's weight (typically measured in pounds per cubic foot). Lighter, nonabrasive materials can be most economically transported on a slider bed conveyor while conveying heavier and abrasive materials typically incorporates a roller bed design.

Angle of incline: The belt's angle of incline along with your material's characteristics determines the belt type you need.

Environmental conditions: Temperature, moisture, dust, sunlight, snow, wind, and corrosive atmospheres all impact design considerations. Special belt finishes and components are often required to maximize performance and service life in challenging conditions.

Conveying volume: Consider how much material you need to move in a given time (defined in tons per hour or cubic feet per hour). As a general rule, a narrow belt running at the maximum practical speed for a given material is the most economical design. Select a conveyor that has a capacity greater than your required capacity, preferably 20 to 25 percent more.

Conveying distance: A long conveyor should incorporate belt-tracking devices to help train the belt and gravity take-up assemblies to keep proper belt tension.

Conveying elevation: Aside from the obvious support requirements elevated conveying calls for, elevations dictate whether additional guarding is required to protect personnel from incidental contact with moving parts and whether walkways and service platforms are necessary.

Other options: There are unlimited options that can be added to conveyors: belt scrapers and brushes, inlets and discharges, abrasion-resistant plates and lining materials, skirting, weather covers, motion sensors, PLC controls, tracking devices, concave and convex curves, material trippers, scales, metal detectors, and countless other devices. Discuss with your equipment supplier which options your application requires or will benefit from.

Experience: Finally, when making your conveyor selection, consult with reputable manufacturers that design conveyors as a major component of their business. And keep in mind — quality is remembered long after price is forgotten.

Steve Hartman, project manager, Chantland MHS, 515-332-4045

If you're out in the field talking to a lot of plant managers and engineers about processing, you'll get a lot of opinions on the main factors to consider when selecting a mechanical conveyor. But the best answer is to consider what's best for the materials being conveyed!

As humans we don't like noise or dust. As engineers we want economy and efficiency. As customers we want the best value. But bottom line, what's the best for your materials when conveying them from point A to point B? Does your material want friction? Does your material want to be pounded into a sweep? Does your material care about how fast it gets someplace? Does your material want to be altered from input to output?

I think the answer to all these questions is NO! Materials want to arrive intact unless specified otherwise. So consider your material's characteristics and what kinds of conveying conditions it needs to remain intact while being conveyed.

Karl Seidel, marketing manager, Cablevey Conveyors, 641-673-8451

Many types of mechanical conveyors are available and each one is designed for a specific purpose. Factors to consider when selecting a mechanical conveyor are your process requirements and the desired quality of your material as it's conveyed through your process. For example, if you have material that degrades easily and material integrity is important to you, you need a conveyor that gently conveys the material, reducing degradation. The conveyor will have to keep the material somewhat static as it's being conveyed. A bucket conveyor or tubular drag conveyor would be a good choice for this type of material. If your material is a chemical that emits harmful vapors, you need a conveyor that totally contains the material and is vapor tight. A screw conveyor would be perfect for this type of application. This conveyor can be designed to be vapor tight and even hold internal pressure.

Many qualified mechanical conveyor manufacturers can help. It's important to locate a manufacturer that understands your application and has previous experience with your material. An Internet search is a good starting point. Qualified companies will have a professional website with valuable information on various materials and applications. A phone call to discuss your application with an engineer will also be very valuable in determining the right mechanical conveyor and supplier for your specific application.

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Equipment suppliers are a valuable source of information about equipment and processes. In light of this, each month we ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Kayla Carrigan, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (kcarrigan@cscpub.com).