

Suppliers' Tips

What considerations are often forgotten when selecting the appropriate mechanical conveyor for a project?

In our company's experience, the following considerations are often overlooked by buyers when selecting a mechanical conveyor.

1. Instantaneous-rate versus hourly-rate capacities. Buyers should take care to distinguish between the amount of material that needs to be moved at a moment in time versus the amount that needs to be moved per unit of time. *Instantaneous rate* refers to the rate of material movement noted at a particular moment in time, while *hourly rate* refers to the rate of material movement per hour. Using an instantaneous rate rather than a desired hourly rate to determine capacity can result in buying an incorrectly sized conveyor.

2. Maximum capacities of infeed and discharge equipment. Knowing the rate at which upstream equipment introduces material into a conveyor is important for determining whether accumulation or transport buffers or infeed controls will be needed to control the material feedrate. Overlooking the maximum capacities of infeed and discharge equipment can cause the conveyor to be either starved or overfilled with material.

3. Feeding method. Knowing whether a conveyor will be fed manually or via mechanical means is important for determining how the conveyor will integrate with upstream equipment and whether infeed controls may be required.

4. Material indexing. Some applications require a conveyor to group, count, meter, position, or space materials or products before the next operation.

5. Portability. While many conveyors are stationary, some applications, such as those involving batch production, require a mobile conveyor that can be moved between operations. In these cases, a portable conveyor fitted with a mobile base will be required.

6. Environmental conditions. Environmental factors, such as dust, heat, cold, and moisture may be detrimental to conveyor operation and performance. Identifying these factors before selecting a mechanical conveyor can help you save maintenance and service costs.

7. Total life-cycle costs versus purchase price. The total costs to operate a conveyor include *all* operating costs over the conveyor's life cycle, from acquisition to disposal. Total life-cycle costs include the initial purchase price, as well as installation, energy, operating, maintenance, downtime, environmental, and decommissioning and disposal costs. Because the initial purchase price of a conveyor is only a small part of the total life-cycle costs, don't forget to include these other associated expenses in your cost analysis.

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One of the most overlooked criteria when considering the proper setup of a mechanical conveyor is the rate at which the material will be introduced to the conveyor by upstream equipment. For instance, if a conveyor is set up to move material at 100 t/h but the infeed of the material is at a rate of 200 t/h, the conveyor won't keep up and you'll have issues such as plugging or spillage.

To solve the issue, you'll have to install a metering device to control the infeed flow, or if it's an auger conveyor, you'll have to adjust the flighting to taper the flowrate as material enters the conveyor.

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In most cases, we're approached to quote a belt conveyor to handle a given material capacity, for a given conveying length, at a given incline angle. This information is critical and will generally guide suppliers in determining an appropriate conveyor style along with the components needed to ensure trouble-free performance. However, there are many other details that will impact design decisions which are largely omitted from the request for quote.

First, we need to know specific details related to the material to be conveyed. These include: material name, average weight per cubic foot, particle size and shape, and angle of repose. Some other often overlooked material characteristics that affect conveyor design include: dustiness, explosivity, toxicity, abrasiveness, aeratability, corrosiveness, hygroscopicity, and oiliness. Will the material pack under pressure? Will the particles interlock and resist flow? Will the material's temperature elevate during conveying? Is the material degradable? And finally, is cross-contamination between materials a concern?

When the specific material to be conveyed is known, most suppliers can make knowledgeable inferences to guide their conveyor design, taking into consideration whether the conveyor is to be installed indoors or exposed to environmental conditions, how the material will be fed onto the conveyor, and what the conveyor will discharge into.

Unconfirmed inferences can lead to operational issues, however. A supplier can't base a conveyor design on general statements about the material or its behavior and should ask for very detailed clarification. When you encounter a supplier posing what may seem like unnecessary questions, know that it's because the supplier has everyone's best interest in mind, which every customer should desire.

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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 (kcarriگان@cscpub.com).