

An Object In Motion

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Anyone working in manufacturing understands that conveying systems are necessary and, to a lesser extent, a necessary evil that can cause some serious injuries if you, and your operators, aren't careful. Headlines detailing particularly grotesque industrial accidents should be enough to keep conveyor safety top-of-mind, but it never hurts to have your own "cheat sheet."

Pinch Points and More

Will Keast and Steve Kuczkowski, service managers for conveyor systems manufacturer Dorner Manufacturing Corp., broke down some of the most common safety risks that plant personnel tend to take when operating conveying equipment, most notably dealing with pinch points:

- Belt pinch points – When a conveyor belt is moving, whether slow or fast, it doesn't stop moving easily.
- Catenary sag – Pinch points can become a risk when there is a large catenary sag in the conveyor belt underneath the conveyor frame. Fingers, hair, or loose clothing can potentially get caught.
- Cleated belt conveyors – Pinch points can also become a risk when dealing with cleated conveyor belts. Cleats on the conveyor can potentially catch a body part or clothing and can be dangerous if the conveyor doesn't have the proper guiding/guarding to keep these pinch points to a minimum.
- Mechanical parts – Many conveyors have moving parts, such as tip-up tails, adjustable guiding, diverter paddles, end stops. These mechanical parts can

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also potentially become a risk for pinch points.

- Unintentional/unexpected start-up – This can occur after turning a conveyor off for maintenance, if proper Emergency Stops haven't been installed and/or OSHA Lock-out/Tag-out procedures aren't followed properly.
- Top-heavy conveyors – If a conveyor isn't supported properly by support stands, a "tippy" or "unbalanced" conveyor can be a risk. Support stands must be installed evenly throughout the length of the conveyor. The support stands on the ends of the conveyors should be placed as close to the end as possible without interfering with the gearmotor or controls.
- Clear pathway for the conveyor belt travel – Always make sure the pathway for the belt is clear of loose or spare hardware, people, and other obstacles before starting up a conveyor.

It's also important, says Keast, that your conveyor is properly powered down before any maintenance work is performed.

Material Considerations

The presence of static electricity is something that conveyor manufacturers need to consider when designing a system because in certain applications the transfer of electrons due to sliding, rubbing, turning, or separating of a material can create static electricity buildup and – under the right conditions – the induced charge can build to 30,000-40,000 volts. Plastics, fiberglass, rubber, textiles, etc. all have the potential to generate an electrostatic charge, and when this occurs in an insulating material the electrical charge tends to remain in the localized area of contact. Consequently, the electrostatic voltage can discharge in an arc or spark when the material comes in contact with a body at a different potential, such as a person or microcircuit.

If electrostatic discharge occurs to a person, the result can range from a mild to a very painful electrical shock, and in the extreme could result in loss of life. ESD sparks are also dangerous in environments where flammable liquids, solids, gasses, or fine dust particles are present.

For conveyor roller and component manufacturer Ralphs-Pugh, plastic components are designed to safely dissipate static electricity charges to ground. However it is important to note that it is not always possible to dissipate static charge from certain types of conveyor rollers. PVC rollers, for example, will not safely dissipate static electricity. Ultimately it is the conveyor system manufacturer's responsibility to safeguard the equipment by other means of grounding if static electricity buildup is an issue.

Other material considerations, says Kuczkowski, are application-specific for the food industry where the risks may be more applicable to the end users of the product being moved. "For example," he explains, "in a wet or wash-down environment, you need to use stainless steel, UHMW (ultra-high-molecular-weight polyethylene), or another kind of material that won't rust or harbor harmful bacteria and other microorganisms."

Best Practices

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Organizations like CEMA (Conveyor Equipment Manufacturers Association) work tirelessly to help standardize and improve safety for its industry. As an accredited ANSI standards developer, the organization (founded in 1933) offers safety and industry standardization programs to help reduce exposure for its member organizations. (See sidebar, left). From an end-user perspective, the OSHA website features multiple safety standards designed to regulate safety concerns (www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10765&p_table=STANDARDS).

And if you need more advice, don't overlook the parts and expertise available from your conveyor manufacturer. When it comes to replacement, users need to heed a few simple warnings, says Keast. "Use the proper parts," he emphasizes. "Dorner conveyors, as well as other manufacturers', often come with a list of common replacement/wear parts, which are pre-engineered to work properly with the existing conveyor." And most importantly? Don't wait until it's too late. "Don't let parts get so worn out that they can potentially be a hazard to the product carried by the conveyor, or any operators interacting with the conveyor."

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