Conveyor Belting

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The *Food Manufacturing* Brainstorm features industry experts sharing their perspectives on issues critical to the overall food industry marketplace. *Food Manufacturing* asks: What factors should food manufacturers consider when choosing belting materials for conveying operations?

Jessica Jacobson, Marketing Manager, Nercon Eng. & Mfg., Inc.

In addition to product handling requirements, food manufacturers must consider the operating environment when choosing the appropriate belting for conveying applications. Possible operating environments include:

General: An environment that does not have significant product or manufacturing related effects during production. Allows for the widest variety of chain choices.

Cold: Temperatures from 0–32°F. Acetal chain material and pins are rated for cold temperatures.

Chemical: When products have chemical spillage or when chemicals are used in the cleaning process. Stainless steel chain and pins are preferred.

Washdown: High pressure water and chemical cleaning procedures creating a wet and caustic environment. Polypropylene material is able to withstand a washdown environment. Nylon pins absorb water, causing functional problems and overall weakening of the pins, so other pin materials should be considered.

Freezer: Temperatures from -20–0°F. Acetal chain material is preferred. Nylon is an effective choice for the pin material. Proper chain selection is especially critical in freezer rooms to prevent manual intervention and to reduce maintenance.

Warm: Temperatures from 70–200°F. A variety of metal chains including wire mesh chains are available in this temperature range. There are also some heat resistant nylon chains available for use in warm environments, depending on the exposure to heat.

Elevated Temperature: Temperatures over 220°F. Metal chains are required. The conveyor components, such as brass wear-strips, should also be specified for extreme heat.

Electro-static: Static build-up can occur on production lines running a plastic container on plastic chain. Anti-static (electrically conductive) chain material allows the static to safely discharge through the conveyor to the floor. Also lubricating or adding moisture to the conveyor running surfaces can reduce static.

Explosive: Product fumes in an electro-static environment could lead to explosive situations. In addition to chemical fumes, particles like sugar or flour dust can also provide an accelerant for static arcs. Steel chain is preferred along with a different metal material in the wear-strips such as brass. Explosion-proof components like motors, for example, are also part of an explosion-proof system.

Abrasive: Cardboard build-up, baking flours, cocoa powder and cereals are also examples of abrasive materials. This matter will wear away any chain material, but stainless steel sprockets and abrasion resistant rods will help to increase belt life.

Jill Batka, President, Dynamic Conveyor

There are three factors to consider when choosing belting materials for conveying operations:

Application: Understanding the application is very important, as there are hygienic food grade belts designed for different applications. Depending on where the belt will run, there are trade-offs between modular plastic belts and positive drive flat belts.

For example, modular belting is an excellent alternative for abusive applications, such as cutting on the belt or when handling sharp bone-in product. In contrast, zero-tension flat belts excel in applications with extremely high sanitation requirements (such as ready-to-eat), a great deal of abrasion, those that require troughing or a 100 percent closed surface for containment, and situations where preventing allergen cross-contamination is essential.

Direct Food Contact: For direct food contact applications, it is preferable to use homogenous food grade plastic belts rather than those containing reinforcing fibers. When belts with reinforcing cords or fabric are damaged or worn, the reinforcements become exposed and can absorb fluids and harbor bacteria.

What results is a source of contamination that is often difficult to detect and impossible to clean. Belts made from layers of different materials like fabric and plastic may have the layers come apart, exposing the fabric and causing sanitation problems. Using a belt that is made from only one material eliminates these risks.

Pre-Tension: For best cleaning access to the frame of a conveyor, choose a belt that does not require any pre-tension. Because even limited amounts of pre-tension restrict access to the conveyor, the poorly cleaned areas that can result are at risk for harboring harmful bacteria.

Zero-tension and modular plastic belting can most often be cleaned in place by simply lifting the belt off the frame of the conveyor, eliminating many of the performance issues associated with traditional flat belts.

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