Maximizing sanitation efforts in food processing: the importance of conveyor hygiene

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Superior sanitation is a critical component of any successful food-processing operation. Standards for hygienic practices continue to rise with each passing year, and they have never been higher than they are today. Not only is it essential to have proper procedures and equipment for cleaning in place, but installing such products as conveyor belting and components that are designed to facilitate easy and efficient sanitation is critical in successfully maintaining high standards of hygiene.

Concerns for proper hygiene are greatest in food-processing facilities, where poor sanitation practices can lead to food contamination, product recalls, and a loss of consumer confidence. Many incidents of food contamination can be traced to the production stage of food processing, associated with poor plant hygiene.

From the receiving end of a plant where all varieties of fruits, vegetables, dairy products, meats, and fish enter the first stages of processing, to the back door of the plant where food products exit in neat cases and packages, conveyor belts play an important role, linking together the different stages of food production. Because conveyor belts carry valuable product at some of its most vulnerable stages for contamination, maintaining excellent conveyor sanitation is an essential requirement.

To establish a sanitary food-processing operation, it is important to implement a well thought-out food safety program. This program should consist of the following practices, principles, and procedures.

GMP: Good Manufacturing Practices
- Sanitary design guidelines for equipment and facilities
- Employee hygiene practices
- Product handling
- Employee and forklift traffic control
- Airflow and air temperature controls
- Adequate water volume, temperature, and pressure for sanitation

HACCP: Hazard Analysis and Critical Control Points
This is a process control system designed to eliminate or reduce to acceptable levels potential hazards from the production, storage, and transportation of food.

SSOP: Standard Sanitation Operating Procedures
These are detailed, step-by-step instructions for cleaning any given equipment, line, room, department, or plant. Conveyor design and belt selection are included under Good Manufacturing Practices. When applied to conveyors, GMP indicates that choosing the right belt for an application will result in more effective sanitation and elimination of contamination risk. Therefore, it is crucial to select a conveyor belt that not only performs well in a specific application, but that is designed for effective sanitation. Additionally, establishing best practices for cleaning procedures and selecting sanitation-friendly conveyor components and cleaning equipment are necessary to deliver optimum results. Reputable conveyor belting companies will provide customers with a sanitation specialist to help them select the best products and understand how to maximize their effectiveness.

Choosing an appropriate conveyor belt material
Selecting an appropriate conveyor belt material can go a long way in providing more effective sanitation and elimination of contamination risk. Conveyor belting is made of a variety of different materials, designed to deliver particular benefits to certain applications. For sanitation-critical applications, modular plastic belting has proven to be a material of choice.

Modular plastic conveyor belting was first invented in the 1970s by the American company, Intralox, L.L.C. The company exclusively manufactured this type of belting, which is assembled from interlocked, plastic
modules with full-length hinge rods. Over the past 30+ years, the success of modular plastic belting (MPB) in food industries around the world has grown the company into an international provider of innovative conveyance solutions.

Why choose MPB?
Modular plastic provides a non-absorbent, non-porous, easy-to-clean belt material that performs excellently in hygiene-sensitive food-processing conveyance applications. Where other technologies such as flat belts, wire belts, and metal rollers suffer from certain weaknesses in enabling efficient cleaning, modular plastic has proven to improve or entirely eliminate many of those issues.

Flat belts frequently suffer from mistracking, which can lead to sanitation problems. Mistracking can cause belt breakage, presenting the risk of damaged belt pieces contaminating food products. Additionally, flat belts can be deceptive in that they may appear clean to the eye, but can harbor bacteria in surface cracks. The presence of bacteria on the belt surface cannot only increase the risk of product contamination, but it can delay start-up in plant production. Modular plastic belt material, on the other hand, does not support bacteria growth, and when proper sanitation guidelines are followed, it can be cleaned easily and effectively.

As with flat belts, wire belts may appear clean but can yet harbor bacteria, which can delay start-up and increase product waste. Wire belts are also difficult and time-consuming to clean. There are modular plastic belts on the market that are designed specifically to increase sanitation efficiency by reducing the amount of time and water required for sanitation. Features such as wide-opening hinges and smooth, seam-free surfaces prevent debris from accumulating, making cleaning easier and more effective on both sides of the belt. No belt-soaking is required to ensure sufficient cleaning.

Selecting the right belt
When choosing a conveyor belt for a hygienic application, it is critical that food processors research their options, as not all conveyor belts produce the same results. It is important for food processors to involve themselves in the design process, before the installation of a new or retrofitted conveyor system. Taking into account the total cost of ownership and purchasing a conveying system that will provide the best return in terms of cleanliness and food safety rather than focusing on the lowest up-front costs will ultimately improve the bottom line.

Many details about an application, the food product handled, and a production environment can factor into selecting the most effective belt for an application. Working closely with a conveyor belting specialist is the best way to maximize sanitation by selecting the proper sanitation products.

Leading conveyor belt companies conduct testing in the laboratory and in the field to identify the most effective cleaning practices. These studies lead companies to develop conveyor components that meet the specific sanitation challenges that food manufacturers face, such as developing easy-to-clean belts that save companies time, labor, water, and energy costs in cleaning.

Today, processors can choose from an extensive selection of different modular plastic belting styles available to equip their specific applications. Many belts have designed-in features that tackle common sanitation problems such as clearing debris and adequate cleaning access, maximizing the overall cleanability of the belts.

Clearing debris
Modular plastic belts are offered in seam-free designs, which feature larger belt modules that minimize debris-trapping areas on the belt. Clearing debris is an important step in conveyor sanitation. If debris is allowed to build up on a carryway or on the interior components of a conveyor, problems such as production delays, shutdowns, and product recalls may arise. In addition, labor time and water usage can be wasted as a result.

Cleaning access
Conveyor belt hinges should open wide as they rotate around the sprockets to maximize cleaning access to the hinge area, but they should remain closed on the conveyor belt to prevent debris from clogging the belt. Hinge openings should be large enough to allow spray to reach both the bottom and top surfaces of the belt; otherwise, water spray cannot reach all areas where soil or chemical residuals exist. Slotted, open-hinge belt designs leave space for particles and scraps to accumulate.

Conveyor belts that allow catenary sag, as opposed to those that are tensioned tightly against the conveyor surface, also enable better cleaning. The extra space allows more water spray to reach and loosen soils and scraps in the hinge area inside the conveyor frame.
Conveyor components

It is important to consider how each conveyor component contributes to the overall sanitation of a food production process. Clean-in-place systems can maximize the cleanability of certain belts by providing custom-engineered spray patterns to thoroughly clean the belt underside, sprockets, and shafts. These systems employ high-impact nozzles, which save time and water while delivering a more consistent level of sanitation than can be achieved with manual cleaning. Carefully designed sprockets can expedite the cleaning process by allowing access to 100% of the belt underside. While normal inline sprockets block cleaning access to the drive area on the belt underside as they engage the same portion of the belt, Intralox’s patented Angled EZ Clean Sprockets allow the sprocket teeth to engage different portions of the belt underside as the sprocket rotates, revealing the previously inaccessible area of the belt for cleaning.

In addition to providing conveyor hardware that improves hygiene and sanitation, Intralox provides integral conveyor design consultation to deliver improvements in cleaning accessibility and solutions for reducing water usage.

Best practices for conveyor sanitation

Optimal sanitation results from not only selecting the most effective conveyor belting and component materials, but from establishing and following proper sanitation principles and procedures.

Water temperature and water pressure will vary depending on the application, belt selection, and cleaning equipment, but should remain within certain ranges. Ideal water temperature for cleaning is between 47 °C and 54 °C. Water pressure should be sustained at a minimum of 150 psi, 10 bar.

When choosing a detergent for sanitation, keep in mind that more does not equal better. The overuse of chemicals can result in belt degradation and corrosion. All detergents should be used as directed by the chemical supplier. For daily sanitation, chlorinated alkalines work best. When sanitizing, chlorine should be used at 200 ppm or less. Even quaternary ammonium, which is not corrosive, should be used carefully due to environmental concerns.

Conveyor sanitation should be completed through the basic steps outlined below:

- Perform dry pickup
- First rinse
- Apply detergent and let stand for no longer than twenty minutes
- Second rinse
- Inspect
- Apply sanitizer
- Rinse sanitizer if required by law or company policy

Conveyor sanitation dos and don’ts:

- Do clean the belt on the conveyor.
- Do use clean-in-place systems when possible.
- Do use open conveyor frames.
- Don’t soak belts in caustic baths.
- Don’t walk or stand on belts.
About Intralox

Intralox is a global manufacturer that invented modular plastic belting (MPB) almost forty years ago. With a strong commitment to innovation, Intralox delivers complete conveyance solutions that increase throughput efficiency, improve sanitation and reduce costs of belt ownership for food-processing companies across the globe. Company headquarters in the United States, China and the Netherlands, with assembly and warehouse facilities in the United Kingdom, Brazil, Australia and Japan allow Intralox to serve the global industrial community with worldwide expertise and world-class service. For more information about Intralox, visit www.intralox.com.