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Trelleborg seals help keep food and beverage industry clean



Typical processing tanks used in food and beverage manufacturing.

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One of the most important aspects for the food and beverage industry is sterility. Preventing cross-contamination on the plant floor is crucial. Any company creating pieces of equipment needs to adhere to the

industry's strict regulations.

"There's more and more guidelines as to how to design equipment for processing. Seals are not exempt from this ... and in recent years, they've become a big part of it because seals are wear items," said David Kaley, Trelleborg Sealing Solutions' segment manager for food and beverage, water and robotics.

"Wear items have a bad habit of leaving trace material in the food, in the content. They are supposed to seal the inside in and the outside out."

With so much food and drink being processed in plants, sanitation is key for the safety of those people consuming the end product. The term "processed food" often has a negative connotation, Kaley said, but that's just a term describing any food packaged in a factory.

"It could be a bag of frozen fruit that's just as fresh as can be, but it's still considered processed," he said.

Easier cleaning

From fresh fruit to salad bags to snack crackers, there is a lot of food and beverage processed in manufacturing plants, and Kaley said now there is an easier process to sterilize equipment.

Cleaning in place and sterilization in place works like a dishwasher—there is a sprinkler system that sprays hot water and chemicals into the vessel to clean and sanitize.

"When the scientists figured out how to do (cleaning in place), it was a big boon for the industry," Kaley said.

Before these processes, he said equipment had to be removed to properly clean and sterilize to avoid cross-contamination to adjacent equipment and processes.

"Which means you have to disassemble the equipment, take it to a

cleaning station, clean all the components and then bring it back to the production area and reassemble the pieces," he said, adding that is "cumbersome and time-consuming under the best of circumstances."



Trelleborg

UltraClean and HiClean seals are designed specifically for hygienic applications.

Any piece inside of the equipment needs to be able to be cleaned and sanitized as well. For instance, Kaley said Trelleborg's Variseal Ultra-Clean is a spring-energized PTFE-based seal. The trigger required to activate the spring is fully enclosed within a Turcon PTFE-based case, ensuring there is no dead space for bacteria to be caught.

"We are designing along with the rest of the industry," Kaley said. "We're continually upping our designs to better meet the demands of the industry."

While the obvious benefit to CIP and SIP is the extended life of the equipment, Kaley said the less obvious perk is reduced downtime. "We've got a saying that unplanned downtime is the most expensive downtime in the world," he said.

It can take a couple of hours to replace a broken part, which creates wasted labor and production costs.

"If you know you're not going to be making food on Saturday and Sunday, you can have maintenance come in and change the seals," Kaley said. "If you know you're making food Monday-Friday and on Tuesday afternoon the vessel sprouts a leak, well not only have you lost the material that's in process, but you've also lost production time."

The easiest way to understand this is thinking about McDonald's ice

cream machine, Kaley said. Customers complain because it always seems to be broken. McDonald's loses money because it's telling customers they can't have their ice cream and losing that business. That's the complex nature of the equipment itself and the cleaning process of all the mechanical elements, he added, including the seals.

"If a seal falls, and you suddenly lose even \$10,000 of production, the cost of the seal isn't really your concern," Kaley said. "It's how reliable it is that becomes your concern."

Multiple materials

Seals for food and beverage are made from many different types of materials.

Silicone has been used in the food and beverage market for decades, but it has transformed itself into a more viable product.

"You go back 30 years ago and your only two choices would have probably been EPDM or silicone," Kaley said. "Very few people at the time would have touched silicone because at the time it hadn't developed yet into the fantastic material it has turned into today."

Now it has different processing techniques, Kaley said. It is not just soft and expensive, but can also be hard and has come down in price a bit.

"Silicone rubber is a magic material because it's generally considered biologically inert and chemically non-reactive to most chemicals at lower temperatures (below 900°C), but it's not impervious to steam," Kaley said. "It doesn't do well in steam much above 150°C."

FKM and EPDM also are used for CIP and SIP.

"We have materials for every application," Kaley said.

Different plastics and rubbers have different resistance to chemicals.



David Kaley

"(I've seen) somebody make a decision to change cleaning chemicals with never really thinking about any of the materials that they're cleaning ... and what that decision to change chemicals might do to the equipment," Kaley said.

"What I would suggest to anybody looking at seal selection for a piece of machinery is engage the application engineers at the company you're interested in working with, just to ensure you've selected the right material and the right seal design for your application."

Inline Play

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