

Processing Q&A: Vertical mixer sealing with Trelleborg's Caio Beraldo

Trelleborg's Technical Manager for Food, Beverage and Water, recently connected with Processing to discuss the uses and critical sealing components for vertical mixers.

[Caio Beraldo](#)

The kinds of equipment and machinery used in the food, beverage and water industries are diverse and each has its own set of sealing needs. From mixers and pumps to valves, fillers and more, having the correct seals for the corresponding applications requires the insights of a knowledgeable components partner. Caio Beraldo, Trelleborg's Technical Manager for Food, Beverage and Water, recently connected with *Processing* to discuss the uses and critical sealing components for vertical mixers.

Q: What are vertical mixers?

A: A vertical mixer consists of a bowl and a vertical mixing mechanism that reaches into the bowl. It is an industrial version of the stand mixer that many people have in their homes. The mixers range in size from that of a home countertop mixer to a 10-quart mixer for small catering or a massive 80-quart mixer for large-scale baked goods manufacturing.

Q: More specifically, what are they used for?

A: Uses include coating, mixing and homogenizing bulk materials or for evaporating suspensions for all kinds of products, such as dense doughs, batters, buttercream frostings, whipped cream and mashed potatoes.

Q: What kind of critical sealing components are needed in vertical mixers?

A: In short, seals must prevent splash and thermal overload, withstand speed shifts (sealing under low and high speeds) and offer robust construction (extended life, limited downtime).

Specifically, seals stop particles in the mixing bowl from “splashing up” and entering the motor gearbox, as well as preventing motor grease or lubricant from dripping into the mixture.

Vertical mixers usually have several speeds, and the shifting mechanisms need seals to operate at both high and low velocities. Once a mixture becomes viscous, the motor uses significantly more power and its internal temperature may increase. This requires special sealing compounds that can withstand high temperatures.

Q: You just told us what needs protecting and why. What types of seals help protect these components of vertical mixers? A: I would like to take a step back and say that sealing solutions in the

food and beverage processing industry face a range of challenges. Seals must meet regulatory requirements while improving productivity. They must also be compatible with different food types and ingredients, such as fats, oils and acids. In addition, hygienic design and resistance to cleaning media are top priorities.

When talking about vertical mixers, a radial oil seal is an ideal solution. The oil lip keeps lubrication from the beater shaft and motor spindle contained, while the dust lip works as an exclusion device to protect the motor against mixture splash and ingress of contaminants.

For high-speed mixers and those with regular speed shifts, Polytetrafluoroethylene (PTFE)-based rotary seals offer low friction with no stick-slip, minimized break out force and high wear resistance. There are also PTFE-based rotary seals available in Hi-Clean and Ultra-Clean versions.

Q: And what do you mean by hi-clean and ultraclean?

A: Hi-Clean seals are made from food-grade silicone and have spring-filled cavities, meaning no food contact with the spring. Ultra-Clean seals are ones in which a PTFE-based jacket fully encapsulates the spring, so the only thing touching food products is the PTFE-based material. Both eliminate dead space where bacteria could potentially build up.

Q: Is there anything that makes Trelleborg's sealing solutions for these applications unique in the industry?

A: Our FoodPro material range covers all the main elastomer types, PTFE-based compounds and engineered plastics, and are fully compliant to global regulations. Therefore, it does not matter where customers are manufacturing or shipping their final product to — we have them all covered. That makes us a one-stop-shop for sealing elements. We have dedicated manufacturing lines for our FoodPro materials-based products, have unique and flexible solutions due to our tooling capabilities and are in full control of the supply chain.