SIMMERRING® RADIAMATIC® HTS II EWS

BEST SEALING QUALITIES UNDER SEVERE STRESSES – PTFE SHAFT SEAL FOR DEMANDING APPLICATIONS IN THE FOOD INDUSTRY

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PTFE SHAFT SEAL FOR DEMANDING APPLICATIONS IN THE FOOD INDUSTRY

Initial Situation
One mechanical process used very frequently in the food industry is the mixing, stirring and kneading of batters and doughs with different consistencies. Strong forces act on the stirrer and severe runout can occur. The results are leakage and seal malfunctions.

Shaft seals made of PTFE (polytetrafluoroethylene) have already been used successfully for many years in the processing industry. They offer very good chemical resistance to a variety of process liquids and gases as well as cleaning agents, and withstand high temperatures. But PTFE's poor recovery behavior alone can lead to lift in the lip seal and leakage in operations with increased shaft runout even at low rotary speeds.

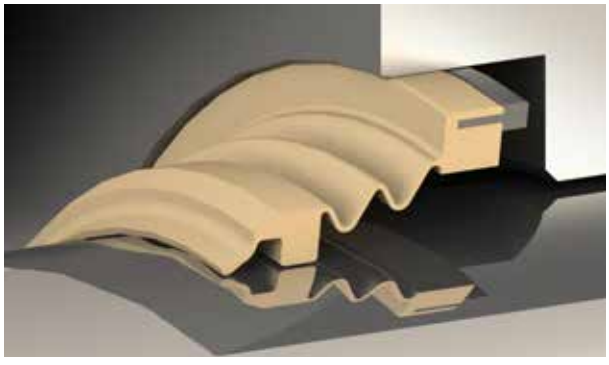
In the food industry today, there is a demand for solutions that meaningfully exploit the advantages of PTFE's material characteristics while compensating for the poor recovery of PTFE shaft sealings. This is the only way to achieve a reliable sealing at high runout that contributes significantly to the functional security of the application.

The Freudenberg Solution
Freudenberg Sealing Technologies Process Seals has developed an innovative solution, the Simmerring Radiamatic HTS II EWS (EWS is an acronym for increased runout), which incorporates all the benefits of PTFE and its reliable properties.

The new development is based on the design of the well-proven Simmerring Radiamatic HTS II (HTS stands for high temperature and speed). This radial shaft seal was conceived for the dynamic sealing of rotating components at temperatures up to 200 °C (392 °F) and circumferential speeds of up to 25 m/s, and it has already been used successfully for more than 10 years.

A bend in the sealing lip joint and the plastic memory effect produce excellent contact pressure. The sealing lip is designed so that the contact surface remains nearly constant regardless of the operating conditions. This exerts a slight contact force on the shaft and simultaneously achieves a strong sealing function.

A bellow element and a slide bearing enhance the Simmerring Radiamatic HTS II to ensure secure processes even under higher stresses. The bellow makes it possible to compensate for the kinetic energy, including increased runout, transferred by the sliding surface. The EWS stands out for its low-dead-space design and meets the hygienic requirements of the food industry.



State-of-the-art Production Technology
Freudenberg relies on the latest generation of high-performance CNC-machines in its manufacture of the Simmerring Radiamatic HTS II EWS. They are capable of achieving roughness depths of <16 µm instead of the usual 30 µm for machined elastomer parts. Special control software provides efficient automation of the process chain, from the CAD drawing to machine control.

This even permits the cost-effective production of relatively short production runs. The machining process makes it possible to produce individual customer fabrications in special sizes up to 4,000 mm. This makes the Simmerring Radiamatic HTS II EWS an efficient solution for manufacturers of mixers and kneading machines for the food industry.

PTFE Characteristics
PTFE compounds offer numerous advantages over other elastomers and thermoplastics for use in the food and beverage industry:

- PTFE is very inert and insoluble as well as resistant to all acids, bases, alcohols, ketones, gasoline, oils and other fluids to an extremely high degree
- The anti-adhesive surface has an extremely low coefficient of friction and hinders the stick-slip effect
- Suitable for temperatures ranging from -200 °C to +250 °C (-392 °F to +482 °F)
- If PTFE is heated, it attempts to revert to its initial form (plastic memory effect)

An Efficient Solution Meeting the Highest Possible Demands
With the Simmerring Radiamatic HTS II EWS, Freudenberg has added a solution to its product portfolio that covers all the requirements of manufacturers of mixers and kneading machines for the food industry. It combines all the advantages of the proven Simmerring HTS technology with a stronger sealing function and long operating times under extreme conditions of use. This makes the Simmerring Radiamatic HTS II EWS a cost-effective and reliable alternative to conventional mechanical seals for applications with increased runout.

FACTS AND BENEFITS AT A GLANCE

- Load-bearing capacity
  - Design with bellow and slide bearing compensates for increased runout under severe stresses
  - Stainless steel clamp ring is partly enclosed by the PTFE body and provides a solid connection between the two parts even under severe stress
  - A variation with an O-ring is also available for special installation situations that do not permit a clamp ring
  - Individual adjustment to different conditions of use
- Long operating life
  - PTFE's low coefficient of friction and the special sealing lip geometry reduces wear
- Cost and time savings
  - Fast mounting by press-fitting into the existing housing bore hole increases the availability of equipment
  - Very good capacity for emergency operation, even in dry-running conditions, boosts operating times
- Efficient production
  - Various, even made-to-order sizes can be carried out with the CNC-technology
- Suited to food regulation
  - FDA-compliant since the materials are suited to foods
  - Low-dead-space for hygienic design
  - ADI-free (free of animal-derived ingredients)

Freudenberg Xpress CNC-machine

Kneading machine for the food industry

Editorial Information

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The Specialist in the Processing Industry
The technology specialist Freudenberg Sealing Technologies is a supplier, development and service partner for customers from a variety of market segments, such as the automotive industry, civil aviation, mechanical engineering and shipbuilding, food processing and pharmaceuticals, or the agricultural and construction machinery industry. On the basis of the Simmerring developed by Freudenberg in 1929, Freudenberg Sealing Technologies now has a broad and continuously customer-oriented product portfolio of seals. Based on detailed process knowledge, innovative development methods and selected materials, the range includes both customized individual solutions as well as complete seal packages.

Together with its partners NOK Corporation, Japan, USA, Sigma Freudenberg NOK, India, and NOK-Freudenberg Group China, Freudenberg Sealing Technologies forms a global network which aims to supply its customers all over the world with products of the same high quality.

Freudenberg Sealing Technologies Process Seals is the sealing specialist for demanding applications in the food, beverage, chemical and pharmaceutical industries.