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RELY ON EXCELLENCE

Seal standardization for agitators in multi-product and cryogenic plants

Solution - The dry-running agitator seal, SeccoMix, allows efficiently serviceable, contamination-free and trouble-free production of materials.

Retrofitting more than 40 agitators to a new seal solution presupposes positive experiences and long-term advantages for the production process, especially in the pharmaceutical industry. The healthcare company, Lonza AG in Visp, Switzerland reviewed ways of preventing product contamination by the sealing medium, of increasing the reliability of the agitators, and making it easier to maintenance the seals. Together with the seal manufacturer, EagleBurgmann, Lonza began equipping the shafts of agitators with dry-running seals in 2012.

At its location in Visp, the company has multipurpose plants with a production capacity greater than 850 m^3. In the "Fine Chemical Complex", bulk materials for pharmaceutical products and highly effective active ingredients are produced which includes the exclusive synthesis of pharmaceutical agents. Reliable and service-friendly seals in the agitators of six multi-product plants and a cryogenic system for stirring and mixing the active ingredients are essential for the production process to operate smoothly.

The SeccoMix dry-running double seal by EagleBurgmann satisfied Lonza's expectations in many respects. It is completely noiseless during operation and thereby satisfies the basic requirement for a dry running mechanical seal. More important is that the product is prevented from being contaminated by sealing liquid.

Liquid-lubricated double seals are normally sealed in pharmaceutical applications with white oil, solvents, alcohol mixtures or steam condensate. With the SeccoMix, nitrogen is the barrier medium and is classified as non-contaminating. The slight amount of nitrogen consumption also renders the seal an energy and cost-saving component.

Front view of the top container part. The green housing surrounding the agitator shaft and the display case with the instruments for the gas supply system are clearly visible.

Retrofitting to the dry-running SeccoMix allows the standardization of agitator seals. This simplifies spare parts management and makes the spares highly available.

The SeccoMix dry-running seal has proven itself in production at Lonza AG:

- No product contamination
- Silent operation
- Low maintenance requirement
- Explosion protection

The gas supply system filters the nitrogen out of the supply system, continuously monitors the flow of gas and the leakage level of the seal, and regulates the buffer pressure. Should this nonetheless fluctuate or drop unexpectedly, the seal independently closes and prevents gases from escaping into the atmosphere.

Minimal service effort, standardized replacement parts

After the first test phase, it was evident that the SeccoMix required less servicing than previously-used seals, and it is moreover more easily serviced. For example, the white oil does not have to be replenished as the barrier medium, and the operating personnel find electronic monitoring through the gas supply system reliable and convenient.

The gas flow and leakage levels can be read from the instruments of the gas supply system.

The agitator of the container driven from above – in this case a top view of the upper part of the container.

Over seven years, EagleBurgmann together with Lonza has retrofitted 42 agitators of different manufacturers with the SeccoMix and thereby reduced the number of different seals to nine types with three diameters. Through this standardization, the stock of replacement parts has been greatly unified and is highly available. Currently, three sets of replacement parts are sufficient for 40 SeccoMix seals. This simplifies the labor of the technical personnel and minimizes the risk of missing replacement parts or accidentally selecting the wrong replacement part.

Minimal abrasion, greater explosion protection

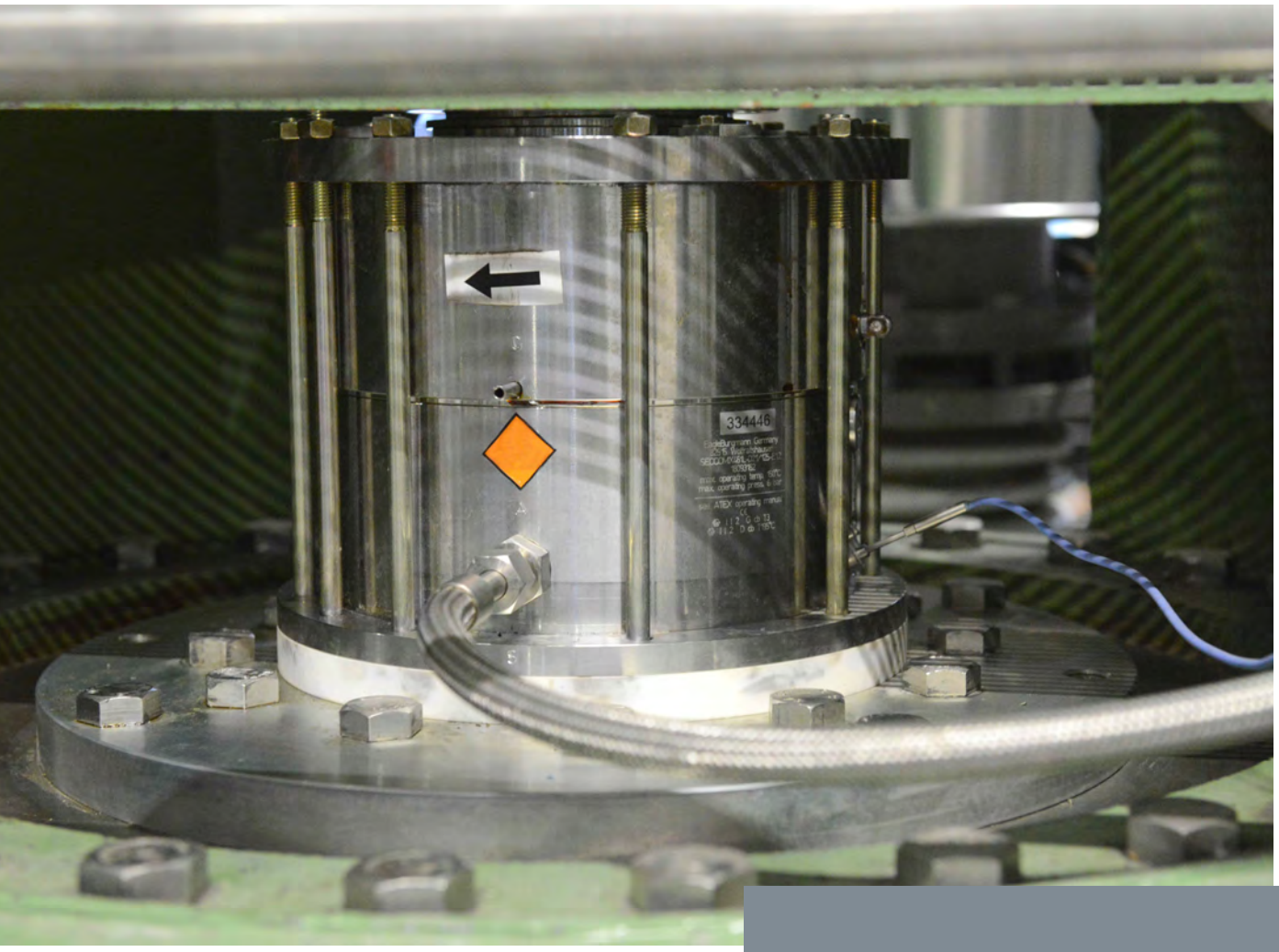
The paired materials in the sealing rings comprise a specially developed carbon graphite for the seal face and silicon carbide for the seat. It is suitable for sliding speeds of 0 to 2 m/s (0 to 6 ft/s). This minimizes abrasion sufficiently for it to not exceed the thresholds required by the pharmaceutical industry. For use at Lonza, an optional wear trap was installed as an additional safeguard to prevent any abraded carbon from the sealing ring entering the active ingredients.

Since an explosive atmosphere can form at Lonza during the production process, the SeccoMix seal must be compliant with the ATEX directive. It is approved as a double seal for ATEX category 2, zone 1, and is also approved for zone 0 provided that a type examination has been performed. When designed as a single seal which is also installed in some agitators at Lonza, air cooling prevents strong overheating of the sealing ring. The single-acting version therefore can also be used in explosive environments of ATEX category 1, zone 0 without temperature monitoring.

Since Lonza has increased explosion safety requirements and desires further temperature monitoring after the seals have been used for a while, EagleBurgmann equipped both the single-acting and double-acting SeccoMix with a temperature sensor.

The SeccoMix agitator seals installed in 2012 still operate problem-free after seven years. The workshops at Lonza AG in Visp are well-suited to handle modifications; all that is required form EagleBurgmann is to deliver spare parts. Should bottlenecks arise, the technicians from EagleBurgmann are on hand to provide support. As an additional service, the seal specialist offers retrofits and develops seal designs for the existing installation space that satisfy the new requirements.

The upper parts of two containers. The SeccoMix can be seen on the left through the bottom opening in the green shaft housing. On the top are the instruments for the supply system for the seal.



View from outside on the installed SeccoMix.

Operating conditions

- Shaft diameter: d_1 = 40 ... 125 mm (15.7 ... 49.2")
- Pressure: p_1 = vacuum ... 6 bar (87 PSIG)
- Temperature: t = 150 °C (302 °F)
- Speed: n = 30 ... 120 rpm

EagleBurgmann – at the leading edge of industrial sealing technology

Our products are used wherever safety and reliability count: in the industries of oil & gas, refineries, petrochemicals, chemicals, pharmaceuticals, food, power, water and many more. About 6,000 employees contribute their ideas, solutions and dedication every day to ensure that customers around the globe can rely on our seals. With our modular TotalSealCare Service, we emphasize our strong customer orientation and offer custom-tailored services for every need. **Rely on excellence.**

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