

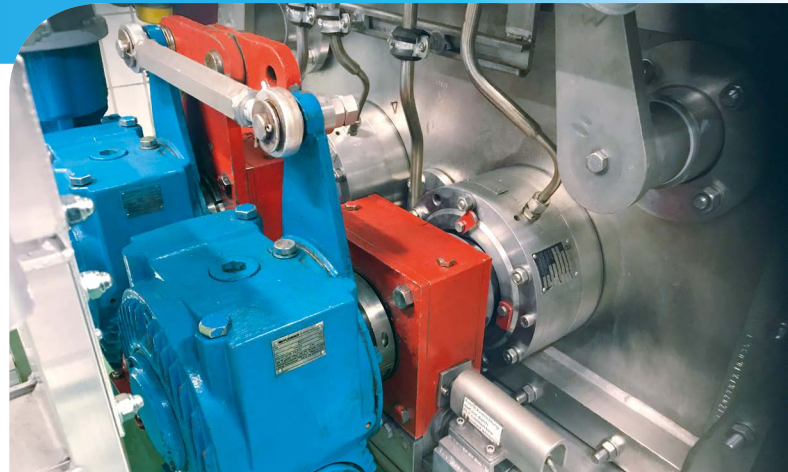
RELY ON EXCELLENCE

Innovative new sealing concept for roller dryers in pharmaceutical production

SeccoLip ensures efficient operation – smooth and maintenance free

After having previously used liquid-lubricated mechanical seals, the pharmaceutical manufacturer decided to change the sealing concept for its roller dryers. Radial shaft deflections had frequently resulted in problems with sealing the shafts. The dry-running lip seal SeccoLip reliably seals against large deflections even without the typical compensation elements used in sealing technology.

A German plant of an international pharmaceutical company uses multiple roller dryers for the production of pharmaceutical powder. The dryers used to be equipped with typical liquid-lubricated mechanical seals. These proved to be very maintenance-intensive in the respective application, however.



Roller dryer with rollers driven from the side



The brittle silicon rings in the seal proved to be the weak point. They could not withstand the sudden deflections of the shaft and the resulting vibrations that occurred while drying the coarse-grained product.

For that reason, the manufacturer decided to upgrade the roller dryers. The process began with the search for a new sealing concept that would enable efficient, fault-free operation.

The dryers each have two heated rollers, which are operated in a vacuum. The product is applied evenly to the rollers and dried within a half rotation. Then it falls past wipers into the paddle dryer situated below. This process ensures rapid and gentle drying of the product.

The seals are installed horizontally on the driven and non-driven sides of both rollers with side entry drive. It quickly became clear that dry-running seals would be a good choice for the moderate operating conditions.

Uncomplicated and efficient

In comparison with liquid- or gas-lubricated mechanical seals, these seals can even be operated without a supply system. Faults due to barrier medium or flushing medium and the task of selecting an appropriate barrier medium are eliminated. Plus, the investment and operating costs are significantly lower.

The next step was to ensure that the sealing solution could handle the shaft deflections and prevent the high levels of wear previously observed on the sealing rings.

This is exactly where the newly developed SeccoLip lip seal from EagleBurgmann can demonstrate its strengths.

CASE STUDY

- **Reference:** Conversion of roller dryers, Germany
- **Client:** Manufacturer of pharmaceutical powder
- **Industry:** Pharma
- **Challenge:** Radial shaft deflections had been causing increased wear and making operation of the mechanical seals maintenance-intensive
- **EagleBurgmann services:** Consulting, design, and implementation of a novel seal concept
- **Technical solution:** SeccoLip lip seal



Innovative SeccoLip impresses with patented technology

The seal has been fully reconceived and now combines the functional principle of shaft seal lips with the reliability and safety of a mechanical seal. The combination of a sealing lip of special PTFE compound and a sliding part is patented and can directly and reliably compensate for any deflections in the agitator shaft. This means that the seal gets by without compensation elements such as O-rings, expansion disks, or metal bellows.

Unique compensation function

The sliding bearing compensates for shaft movements by following the movement with the entire sealing element. The installation of U-caps instead of dynamic O-rings reliably compensates radial deflections up to 3 mm. At the same time, the sealing gap between the shaft and the sealing lip remains constant. Because the contact force of the lip against the sleeve is also minimized, the heat production, wear, and leakage are low. An additional bearing is unnecessary, eliminating the associated costs and maintenance effort.

Perfect fit thanks to modular design

The arrangement of the sealing lips is variable with the SeccoLip and can be tailored to the needs of the specific customer. Four lip elements were integrated for the roller dryer application.

The first and second sealing lips each face towards the product. These ensure that no product penetrates the seal. They also per-

mit the seal to be flushed. Hot steam at 4 bar can be supplied through a flushing port for regular cleaning.

The third and fourth sealing lips face the atmosphere. This arrangement protects the processed product from external contamination and makes vacuum operation possible. The sealing capability of the SeccoLip is ensured at regular intervals by a defined period of vacuum in the roller dryer.

Advantages of SeccoLip

The patented lip seal SeccoLip is ideal for machines such as agitators, mixers, kneaders, and reactors whether they feature top, bottom, or side entry drives. It is designed as a dry running seal and can be operated both with or without a gas supply system.

- Unique shaft deflection compensation through patented technology
- Customer-specific adaptation with 2, 3, or 4 sealing lips
- Version available for glass-lined vessels (flange need not be replaced)
- Simple installation thanks to cartridge design
- Service-friendly design
- Low-maintenance, uncomplicated operation
- CIP/SIP compatibility
- Sealing system compliant with TA-Luft (German Technical Instructions on Air Quality Control) requirements



Result

Since the successful conversion of the roller dryers to the dry-running SeccoLip seals at the end of 2020, they have been operating reliably and without issues. Regular maintenance is no longer necessary. The conversion quickly paid for itself thanks to the savings.

Strict regulatory requirements

In the pharmaceutical industry, all production systems, plants, and components are subject to strict regulatory requirements. In this case, the manufacturer required verification that the materials met the requirements of the U.S. Food & Drug Administration (FDA). Furthermore, the seal had to be certified for use in ATEX zone 2 with temperature class 2. The new design was able to meet these requirements as well.

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, energy, 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.](#)

