Lionpak®
2502

James Walker

Case Study: Ammonia triplex plunger pump sealing

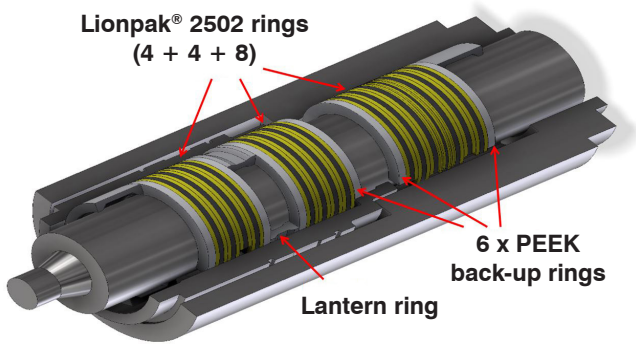
Problem

Short service life and high costs

The customer had tried several types of packing and was experiencing short service life and high costs. The products were failing due to their unsuitable construction and chosen materials in a very corrosive environment where carbamate solution needs to be kept in a liquid state to avoid its crystallization in the sealing area. In addition due to high friction during operation, the customer was experiencing extensive heat build up and had to implement a water cooling system to extend the pump operation.

Application

- Temperature: Ammonia - ambient/carbamate solution 70-90°C (158-194°F)
- Media: Liquid ammonia and carbamate solution
- Size: ID 90 mm x OD 115 mm x DP 12.5 mm
- Speed: 1.33 m/s (262 fpm)
- Stroke length: 180 mm (7.1”)
- Discharge pressure: 260 bar (3771 psi)
- Plunger diameter: Ø90 mm (35.4”)
- Packing configuration: As shown in the image.



Existing solution

Several types of PTFE, carbon or graphite-based packing.

James Walker solution

An aramid core version of Lionpak® 2502 was introduced to overcome the failures and short life cycle of the existing packing. Made of tough aramid yarn at the corners, ePTFE/graphite fiber yarn at the face and with a core of aramid fibers, Lionpak 2502 has a unique construction that enables the packing to withstand the rigorous plunger pump application whilst at the same time offering excellent heat dissipation and reduced friction capabilities.

Results and benefits

The installation of Lionpak® 2502 in combination with PEEK back up-rings enabled the customer to stabilize the process and significantly extend service life, therefore reducing maintenance costs. The pump no longer required water cooling once Lionpak 2502 was installed, presenting an additional saving and environmental benefit.

Reduced costs and extended service life

- **Significantly improved sealing service life**
- **Reduced maintenance costs**
- **Improved operational efficiency due to less downtime**
- **Removal of requirement for water cooling system**