

ELIMINATING REPEAT SEAL FAILURES IN ABRASIVE CHEMICAL PROCESS



MTBF Increased from 6 Weeks to Over 3 Years

AVTPUMP was engaged by an existing customer following ongoing reliability issues within a critical chemical process line. A process pump was experiencing repeated mechanical seal failures, averaging one failure every six weeks. Each failure required the pump to be removed from service for seal replacement, resulting in regular plant downtime, increased labour requirements, and ongoing spend on replacement components.

The objective was to identify the root cause of failure and implement a long-term solution to improve reliability and reduce maintenance intervention.



THE CHALLENGE

The pump operates on a potassium chloride process, where the abrasive nature of the fluid places significant demands on sealing systems.

If the OEM seal arrangement was not suitable for the duty, rapid degradation of seal components and frequent failure would occur creating a cycle of reactive maintenance.

OUR APPROACH

AVTPUMP worked in collaboration with AESSEAL® to review the application, operating conditions, and existing sealing arrangement.

The pump was removed from site and returned to AVTPUMP's Grangemouth workshop for a full strip, inspection, and overhaul. This ensured that the mechanical condition of the pump was restored before implementing any changes to the sealing system.

The focus was on selecting a sealing solution that could withstand the abrasive nature of the process while improving overall reliability and ease of operation.

OUR FINDINGS

Assessment of the application confirmed that the primary cause of failure was the incompatibility of the existing seal design with the process conditions.

The abrasive potassium chloride fluid was causing accelerated wear of the seal faces and components, leading to premature failure and repeated intervention.

The issue was not related to installation or maintenance practices, but to the suitability of the seal for the duty.

The scale of improvement in MTBF highlights the effectiveness of the engineered solution and the value of a collaborative approach



THE RESULT

The upgraded sealing arrangement delivered a significant improvement in reliability.

Mean Time Between Failures increased from approximately six weeks to over three and a half years, effectively eliminating the cycle of repeated failures and unplanned downtime. The solution reduced maintenance intervention, lowered ongoing repair costs, and improved overall process stability.

This project demonstrates the impact of selecting the correct sealing solution for the application, particularly in abrasive chemical processes where standard OEM configurations may not be suitable.

SERVICE MATTERS

OUR SOLUTION

A decision was made to upgrade the sealing arrangement to an AESSEAL® DMSF double cartridge seal, fitted with a Super Duplex gland to provide enhanced resistance to the process environment.

To further support seal performance, an AESSEAL® seal support system was installed, providing improved flushing and operating conditions for the seal faces.

Following overhaul, the pump was returned to site, where AVTPUMP carried out reinstallation and laser alignment. AESSEAL® completed the installation and commissioning.

AT A GLANCE

Industry: Chemical Processing,
Application: Potassium chloride process (abrasive duty)

Services provided:

- » Pump strip, inspection, and overhaul
- » Mechanical seal upgrade
- » Installation and laser alignment
- » Seal support system implementation

Key Outcome: MTBF improved from 6 weeks to 3.5 years, significantly reducing downtime and maintenance costs.

Need help?

Contact our experts