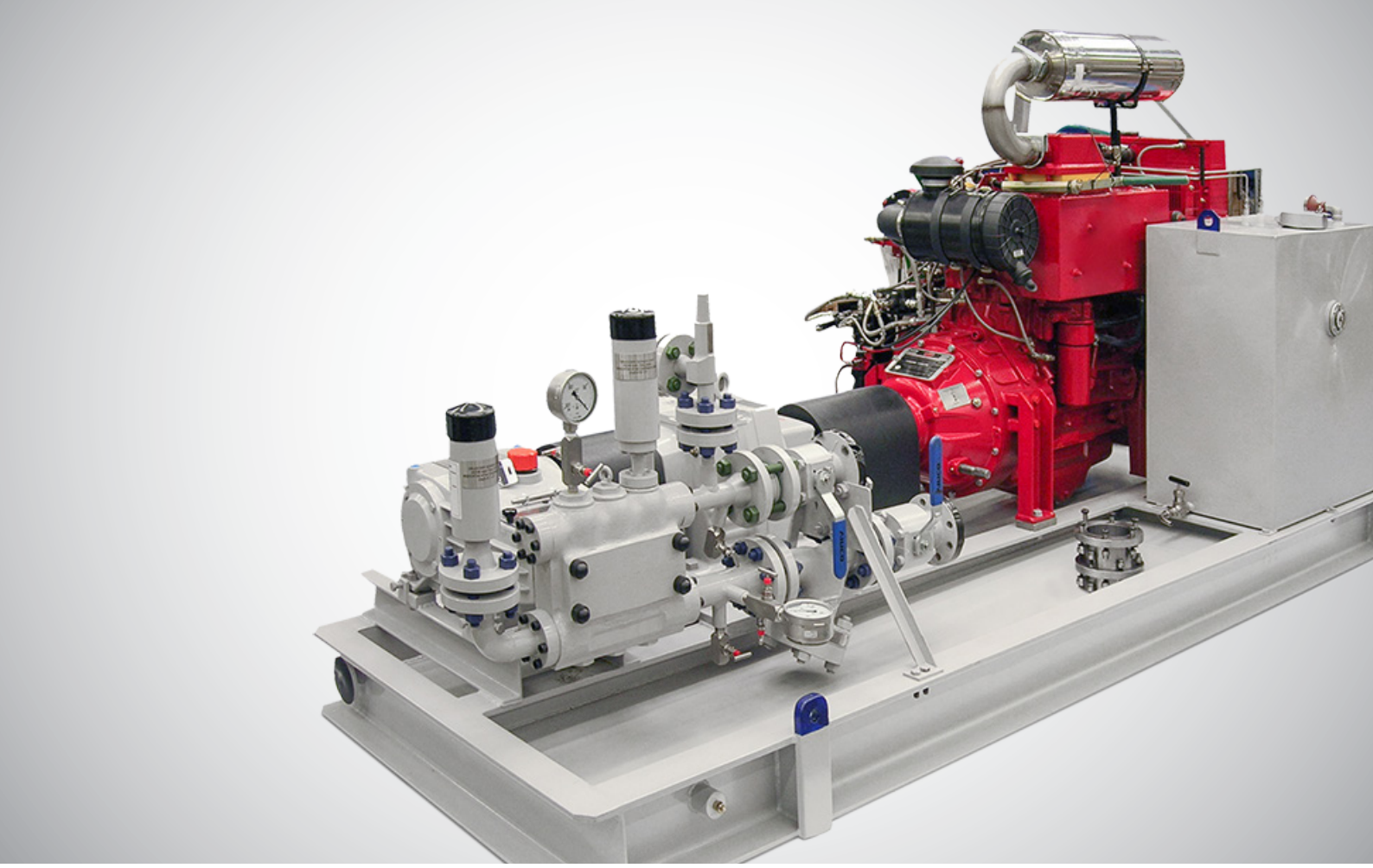


Plunger Pump

Case Study

Triplex pump service life extended by 75% and monthly running costs reduced by €20k

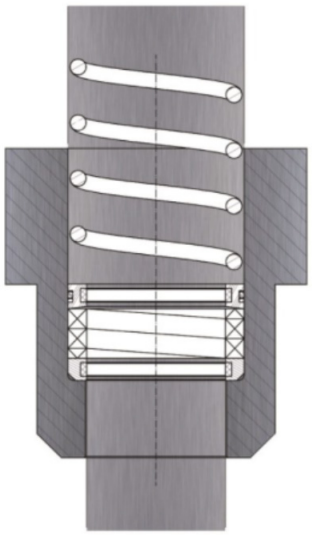
Service life of Triplex plunger pump extended by 75% (from 4 months to 7 months running autonomously)

Advantages of an optimised plunger pump include:

- Longer service life than conventional packings and chevron seals.
- Cost savings possible as a result of self-lubricating properties.
- Reduced low pressure leakage.
- Low friction, for low power loss.
- Dry running capabilities.
- Live loading allows for controlled wear loss.
- Packing materials suitable for use in abrasive media.

The Client

A Triplex plunger pump manufacturer commissioned FTL to find an optimised seal arrangement. This Triplex plunger pump would be used as part of an underground gas storage project, required to run autonomously for a period of between four and six months.



LLPA used in place of braided packings

Monthly savings of €20k+ achieved as a result of improvements in pump reliability

The Challenge

The current set up on the Triplex plunger pump ram was experiencing significant leakage issues on test. As a result, the client had little confidence in their current sealing design being able to perform unmanned for the lengthy duration of the application.

The incumbent sealing arrangement comprised of three standard braid and two fluorocarbon packing rings — including lantern rings for a lubrication and flush system. The set up was spring-loaded from the non-pressure end.

Speed	0.639 m/s
Pressure	220 bar
Stroke	180mm
Media	Oily water
Temperature	-10 — 100 °C
Ram	22% Duplex with HVOF Chrome Carbide

The Solution

The solution was to live load the assembly from the pressure side, providing a constant sealing force.

The client wished to keep the lubrication and flush system, so FTL ensured that the solution incorporated this. However, the size of the lantern rings were reduced for immediate cost savings on the previous seal arrangement.

The chosen packing material was a bespoke PTFE compound, which from start-up enabled smooth running and low friction coefficients. The packing material included reinforced edges to improve wear resistance, guarding against packing extrusion and protecting against the abrasive and chemically aggressive media surrounding the application.

This seal arrangement was coated with a universally stable lubricant, ensuring superior lubrication during the run-in phase. Additional support was provided to the ram along with dedicated sealing arrangements on the O/D to prevent any further leak path.

Reduced friction, superior lubrication, improved wear resistance and eliminated leakage

The Benefit

The pump was installed and ran unmanned for a total of seven months. As a result of the LLPA solution, no leaks were detected when the pump was retrieved, and the site has been decommissioned without any further issues.

FTL's LLPA solution improves sealing performance over conventional packings and chevron seals, with the addition of self lubricating capabilities and a significant reduction in low pressure leakage.

The solution developed by FTL in this case allowed for controlled wear compensation, and together with full design and technical support, the customer was able to solve their leakage problems through high quality products and innovative engineering.

The client has gone on to use FTL for subsequent troublesome applications, such as a LLPA in a ram pump working in aggressive media (including barite, sand and sea water).

Alongside improvements to reliability, the FTL solution delivered monthly cost savings of over €20k over the previous sealing system.

In-depth Solutions

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