Drill Cylinder Rod Seals Increase Blast Furnace MBTR by 125%

Steel
Chesterton 28K V-Ring Set
Case Study 037 Fluid Power

Challenge

Background

A large steel plant experienced premature seal failure and intensive leakage of its mobile drilling machine cylinders. The cylinders start the flow of the liquid crude steel from the furnace. Operating temperature is extremely high: 300°C (570°F). A conventional stacked set was being used as a rod seal and has a maximum of 2–3 weeks of service life.

Root Cause

Premature seal failure was caused by high temperature exposure. The cylinder rod was scored and worn by abrasive particles in the working environment. A wiper seal was not used for protection against ingress of abrasives into the cylinders.

Solution

Service

Chesterton specialist provided an upgraded rod seal system for this demanding application.

Products

- **W21K Wiper Seal:** Split positive-rake profile effectively wipes away contaminants and protects the equipment
- **R28K Rod Seal:** Split robust multi-lip design provides tight, leak-free operation, improving hydraulic equipment efficiency
- **19K Wear Rings:** Guide the rod and eliminate metal-to-metal contact
- **AWC727 FEPM Seal Material:** High-temperature resistant elastomer with outstanding chemical compatibility

Results

Improved Performance and Reliability

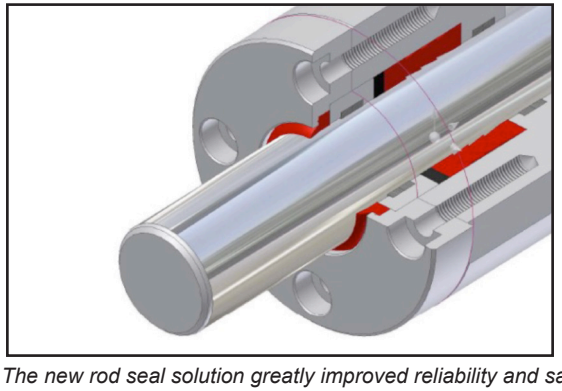
The Chesterton seal solution extended the cylinder rebuild cycle from 2–3 weeks to 250 weeks, providing greatly extended reliability and a leak-free operation.

Benefits

- MTBR increased: 125x
- Significant cost savings on cylinder repair and seal replacement
- Maintenance-free operation and greater availability of the drilling unit for operation
- Greater safety by eliminating leakage of working media

Leaking media was a fire hazard.

The cylinders were exposed to extremely high temperatures



The new rod seal solution greatly improved reliability and safety.

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