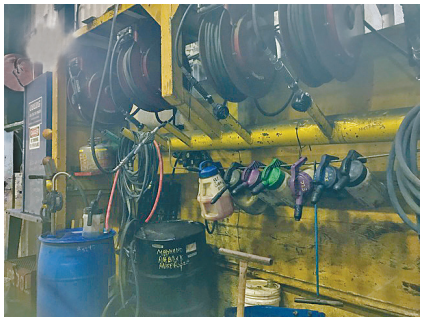
ZINC MINE WEATHERS EXTREME CONDITIONS BY FOCUSING ON LUBRICANT CLEANLINESS

Switch to Certified Clean Lubricants helps improve uptime and extend gearbox life

Storing bulk products in totes equipped with desiccant breathers is a Best-in-Class practice that helps reduce lubricant contamination. Pictured: Rolling stock shop before (below) and after (above) implementation of Chevron Site Assessment recommendations.



The Challenge

Operating in a remote arctic location, one of the largest zinc mines in the world produces hundreds of kilotons of zinc per year. The mine's three grinding mill crushers are critical equipment that pulverize mined rock so zinc can be extracted. If a grinding mill goes down, production stops and financial losses begin. Due to the time required for new parts to be delivered to the remote location, a typical unplanned equipment issue costs the mine hundreds of thousands of dollars.

A longtime Chevron customer, the mine was using high performance Chevron lubricants, including Rando® HDZ, Delo® XLE and Meropa® EP, to protect its equipment from the extreme environment.

Management gave the reliability and maintenance team two goals: increase uptime and achieve a three-year life for the grinding mill gearboxes.

The team learned the importance of clean lubricants when they participated in a lubrication training program. Following their training, the team implemented on-site lubricant filtration and a fluid analysis program and started focusing on the component life of their critical gearboxes.

Although the team made progress toward their goals, they were unable to achieve the extended component life they desired. Filtering higher viscosity oils on-site to meet desired cleanliness levels required more time and specific filter types, which created too much work for the team. So, the mine asked Chevron for help.

Investigation and Findings

A team of Chevron lubrication experts traveled to the mine and performed a thorough Best-In-Class Site Assessment. The visit confirmed that the mine was performing well in many areas. The mine was making a strong investment in safety, with training and education focused on maintaining a safe operation. There were continuous efforts to improve operations, and maintenance personnel were engaged and actively seeking opportunities for improvement. The mine was using technology — including a fluid analysis program, software for maintenance reporting and ultrasonic grease guns — to streamline, standardize and improve work procedures. And, the mine made organizational changes, such as having oilers report directly to the reliability group, to improve effectiveness.

The assessment also revealed areas where the mine could improve its maintenance and lubrication program and achieve its uptime goal. For example: the mine's lube room was located in a high traffic area and lubricants were exposed to air contamination; fluid transfers took place in a wash bay that exposed lubricants to both water and particulate contamination; and some lubricants were stored outdoors and exposed to the elements, creating more lubricant storage and handling risks.

OIL TYPE	TARGET ISO 4406	LIFE EXTENSION FACTOR
Low Viscosity Hydraulic Oil	15/13/11	2
High Viscosity Hydraulic Oil	15/13/11	4
Engine Oil	18/16/13	3.5
Gear Oil	18/16/13	N/A
Torq Fluid	18/16/13	1.5

Moving critical assets to ISOCLEAN® Certified Lubricants enabled the mine to extend equipment life.

Chevron's SMARTFill® program is an easy-to-use color-coded and icon-based system that reduces the risk of improper top-off and cross-contaminating of products by matching the lubricant product displayed on the chart to the labels and assisting in the chain of custody process.

Solution - Start Clean and Stay Clean

The Chevron Site Assessment detailed the value of a proactive, condition-based maintenance strategy. With Chevron's assistance, the mine completed numerous improvements, including:

- **Product Selection.** To ensure the correct ISO 4406 specification is achieved for every changeout and top-off, critical assets such as the grinding mills were moved to ISOCLEAN® Certified Lubricants, which includes Delo Torqforce Synthetic 5W30. This eliminated the time and expense required to pre-filter oils on site.
- **Product Integrity.** To prevent cross-contamination of incompatible products, the mine applied Chevron SMARTFill® labels to lubricant storage, top-off containers and grease guns. To ensure no contamination takes place during storage or handling, the assessment detailed methods to keep lubricants clean after they were delivered ISOCLEAN® Certified. Implementing tools like clean transfer containers and desiccant breathers to manage atmospheric contamination is key to maintaining product integrity.
- **Lubrication Program Management.** To enable the mine to benchmark progress, the mine developed a maintenance scorecard and established lubricant cleanliness targets. To ensure a consistent sampling process, the mine installed oil sampling ports on equipment and Chevron provided training on how to take a sample. Chevron also recommended additional training to educate operators and oilers as to why these changes are critical to the success of the mine's operation.
- **Optimized Lubrication.** To enable the mine to identify opportunities to reduce operational costs and reduce waste produced on site, the maintenance team installed a computerized maintenance management system to track and trend data over a longer period of time. Additionally, the switch to ISOCLEAN® Certified Lubricants has provided other opportunities to extend component life and drain intervals.
- **Inventory Management.** To improve product storage and handing, the mine moved from small package styles to totes and bulk where possible, added desiccant breathers, implemented a breather replacement schedule, created a dedicated indoor lube room, and covered lubricants stored outside.

Results - Increased Uptime and Profitability

Less than a year after implementing Chevron's Site Assessment recommendations, the mine is already seeing positive results in component life and is using fewer bearings. The mine is experiencing less unplanned downtime and the maintenance work done is scheduled, helping staff become proactive instead of reactive.

Future Goals

The mine is focusing on its critical stationary equipment and plans to expand its lubrication program to its rolling stock.

Chevron's lubricant recommendations for the mill included product consolidation to reduce the risk of incompatible greases being used. The mine had eight greases on hand and is looking to reduce that to four.

The mine also wants to create a lubrication manual for all lubrication and reliability personnel, and continue Chevron training among employees.

Contact us to learn more about Chevron ISOCLEAN® Certified Lubricants:

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