SHELL OMALA S4 GX* CONTRIBUTES TO A 2.1% REDUCTION IN ELECTRICITY CONSUMPTION IN A SEVEN-MONTH TRIAL

TOTAL REPORTED ANNUAL CUSTOMER SAVING

US$74,473

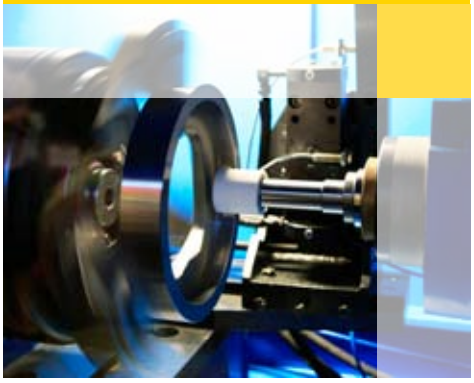
COMPANY: Norilsk Nickel

COUNTRY: Australia

APPLICATION: Gearboxes

SAVING: US$74,473 total reported annual customer saving

KEY EDGE: Shell Omala S4 GX, Shell LubeAdvisor



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Norilsk Nickel's Black Swan mine in Western Australia is active in sourcing nickel. An existing Shell customer, the company agreed to consider implementing a product rationalisation project at the mine that aimed to reduce the number of products servicing the facility while improving operational performance.

This would include changing all the gearboxes on-site from a mineral oil to a fully synthetic product, Shell Omala S4 GX. The changeover to new oil also had the potential to extend oil-drain intervals and equipment life while reducing sump temperature, downtime and electricity consumption.

Using Shell LubeAdvisor, the Shell Lubricants technical team presented a report to the mine's engineering staff outlining the potential financial and operational benefits that could be realised by converting to Shell Omala S4 GX. Norilsk Nickel agreed to a 14-month project: the first seven months gathering baseline data and the second seven months trialling Shell Omala S4 GX and evaluating the operational benefits.

The trial of Shell Omala S4 GX in the gearboxes of the mine's two grinding mills showed a 2.1% decrease in the electricity consumption of the units. Shell Omala S4 GX has the potential to last twice as long as a mineral oil and thereby to extend oil-drain intervals and reduce labour costs and downtime. Over 12 months, Norilsk Nickel estimated that changing the two grinding mills over to Shell Omala S4 GX 220 would save US$74,473 in waste disposal and electricity costs, even after the cost of the oil.

*Shell Omala S4 GX is the new name for the Shell Lubricant formerly known as Shell Omala HD.

1 CHALLENGE

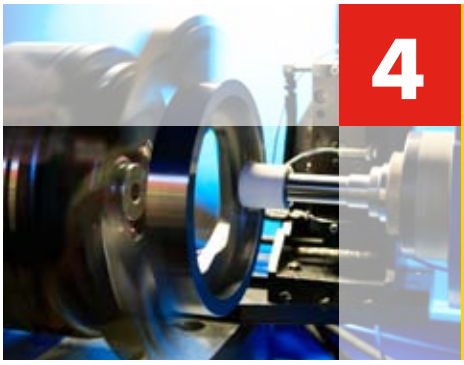
Norilsk Nickel's Black Swan mine agreed to consider implementing a product rationalisation project at the mine to reduce the number of products servicing the facility while improving operational performance, including changing all the gearboxes on-site from a mineral oil to a fully synthetic product, Shell Omala S4 GX.

2 SOLUTION

Following a Shell LubeAdvisor report outlining the potential financial and operational benefits from converting to Shell Omala S4 GX, Norilsk Nickel agreed to a 14-month project: seven months gathering baseline data followed by seven months trialling Shell Omala S4 GX and evaluating the operational benefits.

3 OUTCOME

The trial of Shell Omala S4 GX in the gearboxes of the mine's two grinding mills showed a 2.1% decrease in the electricity consumption of the units. The company also benefited from extended oil-drain intervals and reduced oil disposal costs and downtime.



4 VALUE

Over 12 months, Norilsk Nickel estimates that changing the two grinding mills over to Shell Omala S4 GX 220 would save US$74,473[1] in waste disposal and electricity costs, even after the cost of the oil.

[1]The savings indicated are specific to the calculation date and mentioned site. These calculations may vary from site to site and from time to time, depending on, for example, the application, the operating conditions, the current products being used, the condition of the equipment and the maintenance practices.

SHELL OMALA S4 GX

ADVANCED, SYNTHETIC INDUSTRIAL GEAR OIL

Shell Omala S4 GX is an advanced, synthetic heavy-duty industrial gear oil offering outstanding lubrication performance under severe operating conditions, including reduced friction, long service life and high resistance to micropitting for optimal gear protection.

Applications

- Wind turbines and other inaccessible installations. Shell Omala S4 GX is particularly recommended for systems where extra long oil life is required, maintenance is infrequent or systems are inaccessible
- Enclosed industrial gear systems. Shell Omala S4 GX is recommended for industrial reduction-gear systems operating under severe conditions, such as high load, very low or elevated temperatures and wide temperature variations.
- Other applications. The oils are suitable for lubricating bearings and other components in circulating and splash-lubricated systems.

For highly loaded worm drives, the Shell Omala W series oils are recommended. For automotive hypoid gears, the appropriate Shell Spirax oil should be used.

Performance features and benefits

- Long oil life – maintenance saving. Shell Omala S4 GX is formulated using an advanced additive system in combination with specially selected synthetic base fluids to provide outstanding resistance to breakdown over long-duration and/or high-temperature operation. This performance is recognised by Flender: a formal approval for 20,000 hours' (four years) use at 80°C (bulk oil temperature) has been granted. Shell Omala S4 GX can operate successfully at bulk oil temperatures up to 120°C. The product offers the potential to significantly extend service intervals compared with conventional industrial gear oils.
- Excellent wear and corrosion protection. Shell Omala S4 GX is formulated to have excellent load-carrying capacity and micropitting performance to provide long component life, even under shock-load conditions. These features provide benefits over mineral oil-based products in terms of gear and bearing component life. Shell Omala S4 GX also offers excellent corrosion protection, even when contaminated by water and solids.
- Maintains system efficiency. Shell Omala S4 GX can help to maintain or enhance the efficiency of industrial gear systems through improved low-temperature performance and lower friction compared with mineral oil-based products. This provides better lubrication at low start-up temperatures. Shell Omala S4 GX oils have excellent water separation properties, so that excess water can be easily drained from lubrication systems to help extend the life of the gears and ensure efficient lubrication of the contact areas.

Specification and approvals

Shell Omala S4 GX is fully approved by Flender and Gamesa (wind turbine gearboxes). It meets the requirements of ISO 12925-1 Type CKD, except ISO 1000; ANSI/AGMA 9005-E02 (EP), except ISO 1000; US Steel 224, except ISO 1000; David Brown S1.53.106, except ISO 1000; and DIN 51517-3 (CLP), except ISO 1000.

Complementary products

Application	Lubricants
Draglines	Shell Malleus, Shell Omala, Shell Gadus
Shovels and excavators	Shell Malleus, Shell Omala, Shell Gadus
Mills	Shell Malleus, Shell Omala
Crushers and conveyors	Shell Gadus, Shell Tactic EMV, Shell Omala
Ore processing	Shell Gadus, Shell Tactic EMV, Shell Omala, Shell Tellus, Shell Corena
Haul trucks	Shell Rimula, Shell Omala, Shell Spirax, Shell Gadus
Power plant	Shell Argina, Shell Gadinia, Shell Turbo