

Proper lubrication of open gear equipment



Energy lives here

Optimising open gear equipment performance

You can enhance the profitability of your mining operation by optimising your equipment productivity and minimising maintenance costs. Equipment maintenance typically accounts for between 30 and 50 per cent of a mine's total costs, and as much as 60 per cent of a mine's workforce can be dedicated to servicing or repairing mining equipment.

To help control these costs, Mobil™ lubricants recommends following lubrication best practices, which can help:

- Minimise unplanned downtime for equipment maintenance, repair and replacement
- Enhance equipment life and reliability
- Maximise the productivity of your mining operation

Protection challenges

Open gears in critical mining equipment – such as shovels, draglines and mills – can be especially challenging to protect due to their exposure to extreme temperatures, rain, snow, contaminants such as dust and dirt, and other corrosive materials.

Open gear equipment also commonly operates in extreme conditions of load and pressure, which can lead to wear and even premature failure.

Protecting your open gear equipment despite these challenges demands a multifaceted approach involving:

- Choosing the right lubricants
- Applying lubricants properly
- Monitoring lubricant performance
- Managing the centralised grease system properly
- Working with a supplier who can provide lubrication expertise



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Choose the right lubricants

Optimum protection for open gears requires using high-quality lubricants, preferably ones that are specifically formulated for the applications. Lubricant quality varies greatly, and you should choose a lubricant formulated to handle the typical challenges open gears face. When making your decision, consider the following challenges, formulations and lubricant capabilities.

Severe loads and extreme pressures

Your open gear lubricants should be formulated using the heaviest base oil viscosity that the ambient temperatures will allow, while still pumping in a centralised lubrication system. To help minimise wear and enhance equipment life, the formulations should include large amounts of Extreme Pressure (EP) additives, as well as solid additives, such as molybdenum and graphite.

Moving components

To stay in place and resist fling off, the lubricants must be viscous and tacky, and they must possess excellent adhesive and cohesion properties.

Extreme temperatures

Choose lubricants capable of being dispensed in your centralized system in temperatures ranging

from -45 to +45 degrees Celsius. For varying seasons and climates, you may need a variety of lubricants with different viscosity grades.

Open environments

For optimum protection, your lubricants must be able to resist contaminants (such as dust and dirt), as well as maintain lubricant strength when exposed to heavy rain or snow.

Severe vibration

Choose lubricants that resist separation due to the vibration typical of many types of open gear equipment. The thickener and additives must stay suspended for proper distribution and performance. Product separation should also be considered for lubricants stored on site for long periods or that remain in machinery experiencing long periods of downtime.

To protect your mining equipment, use only highly engineered oils and greases designed to meet the needs of open gear components. Mobil™ open gear lubricants, for example, are formulated using exceptional base oils and specialized additives so they can provide optimum performance even under severe conditions.

Apply the lubricants correctly

After you have chosen the right lubricants for your open gears, it's equally important to apply them correctly. Unfortunately, there is no formula you can use to ensure a perfect amount is being applied at the perfect interval. Each machine, component and lubrication system has its own needs.

Successful application requires regular monitoring of the lubricant films. Look for signs of overlubrication or underlubrication and make adjustments as needed.

Overlubrication

The components appear bare, because excessive lubrication can cause a loss of adhesion. The product essentially washes itself off, usually leaving a mess of spent lubricant.

Underlubrication

The components appear bare or shiny and the lubricant may appear dry or flaky.

When applied properly, the lubricant appears dark, velvety and tenacious. The lubricated surface will have even coverage, and the lubricant will be difficult to wipe off with a gloved finger or rag.

Make adjustments

Striking the right balance requires constant attention, as well as detailed component inspections

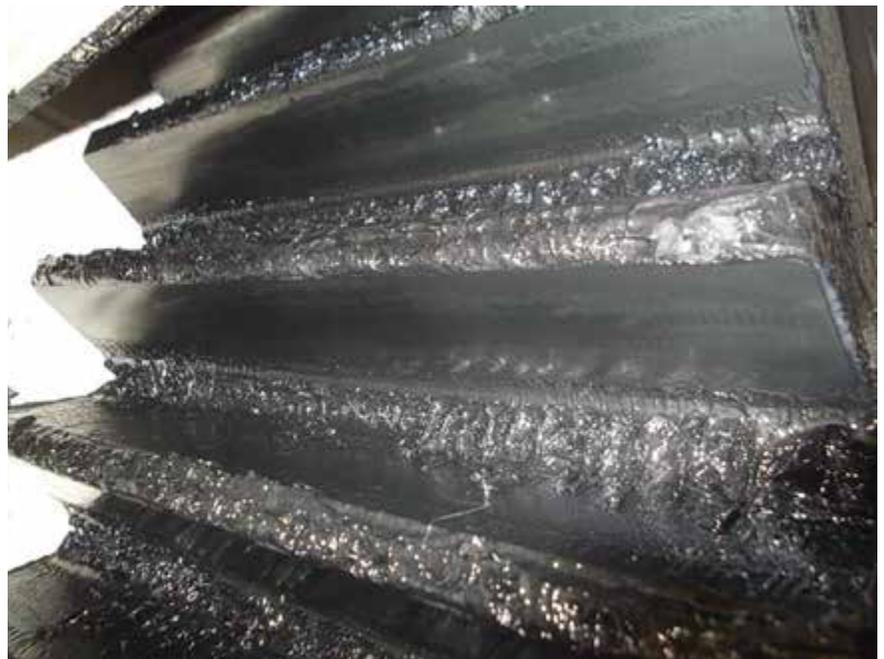
during machine downtime. When making injector and timer adjustments, take small steps and consider all the components in the system that will be affected. Be sure to document adjustments and review documentation regularly to evaluate trends.

Create a team

Consider forming a team of dedicated lubricant specialists to make and document these adjustments, conduct inspections and monitor your lubrication program. To minimise mistakes, this team should be limited to only a few people.



Overlubrication



Proper lubrication



Properly manage your grease system

Most mines use centralised grease systems to deliver lubricants. These automated systems use various delivery methods, such as direct injection, drip tubes or lubricant sprayers. They allow for delivery of numerous lubricant types, viscosities and NLGI grades.

Automated systems can help minimise downtime and enhance efficiency. By helping to limit employee-equipment interaction, these systems also can maximise safety. Be sure that your lubrication team understands the system and is capable of managing it and handling any issues that may arise.

Partner with an expert supplier

To get the most out of your program, it's important to work with a lubricant supplier that offers

application expertise and on-site guidance. An expert supplier can help you make informed equipment and lubrication maintenance decisions, as well as help ensure the integrity of your central system by checking for issues such as contamination ingress, leaking lines and plugged or missing nozzles.

Mobil™ lubricants, for example, can offer expert service and specialised lubricants by drawing upon more than 100 years of working closely with equipment builders. The company's experienced field technical advisors can provide valuable insights and training that help ensure your mining operation reaches optimum productivity through reliable equipment performance.

By following these best practices for open gear lubrication, you can make a valuable impact on your business.