

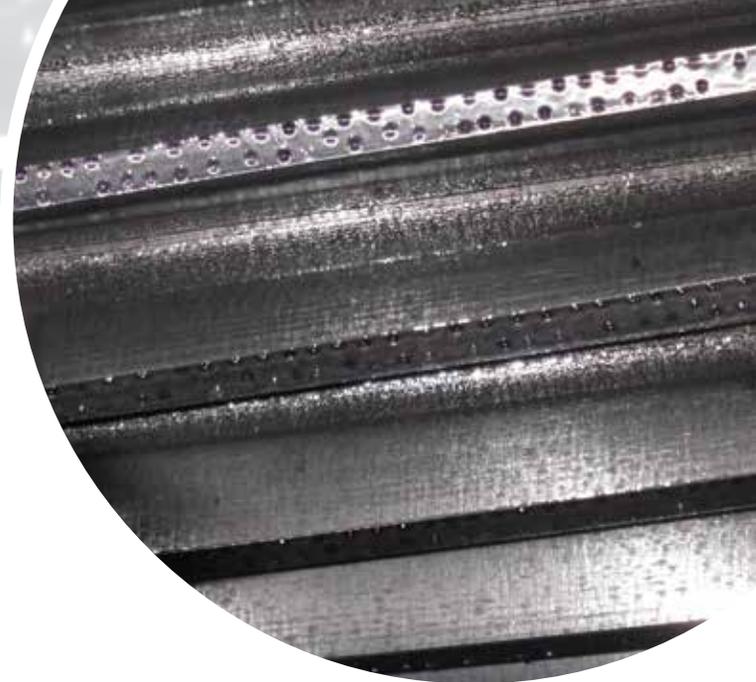
Lubrication Best Practices Maximize Open Gear Life

Large open gears on grinding and pulverizing mills present significant lubrication challenges due to the high-load, heavy-shock nature of the application and constant exposure to harsh environmental conditions, such as cement, limestone, coal or silica dust.

Lubrication reliability best practices for open gears include selecting the right lubricant and the right method of application to combat these challenges. Choosing wisely will help protect the gears from wear, increase uptime, and – in most cases – dramatically reduce gear set operating temperatures, lubricant consumption, energy consumption, and waste disposal. This will lead to a cleaner, safer working environment. The right choice for open gears is a heavy-duty, high-viscosity lubricant with an extreme pressure, anti-wear additive package. A lubricant with a Timken rating of 70 pounds or more reduces wear and extends gear life.

In the past, open gear lubricants were asphaltic-based, had Timken ratings of 20 to 25 pounds and relied on excessive volume for adequate protection. Most open gear lubricants on the market today use a variety of thickeners, such as graphites, silicas and traditional soap thickeners. With these newer types of lubricants, operators still report excessive consumption that leads to difficulty with the lubricants building up around the shrouds, not draining well and creating housekeeping issues.

Other concerns include needing to be heated for pumpability, plugging spray system nozzles, not spraying in low temperatures, drawing in contaminants, obscuring the gear from visual inspection, and not reducing gear temperatures.



Pyroshield® Open Gear Lubricant



Before Pyroshield Conversion



After Pyroshield Conversion

Unlike some open gear lubricants (top), Pyroshield is translucent in service (bottom), making gears easy to visually inspect. Pyroshield has a higher viscosity than most competitive products, and at the same time will not build up on itself or cause spray nozzle or lube system problems.

Components of an Effective Open Gear Lubrication Reliability Program



Open Gear Lubricant



Training



Reliability Assessment



Automatic Lubrication System

Identify the suffering points

Move forward with proven solutions for extending equipment life



Wear

Open gears experience high-load, heavy-shock conditions and a dusty environment that can lead to surface wear like scoring, pitting and spalling. An inferior lubricant will not stand up to the extreme conditions. An extremely tacky lubricant with high film strength is needed.



LE Solution: Heavy-duty synthetic Pyroshield® Open Gear Lubricants exhibit exceptionally high film strength to provide outstanding protection for high-load, heavy-shock applications. Formulated specifically for open gear applications, they cling tenaciously to metal surfaces without accumulating; prevent metal-to-metal contact; and, in most cases, reduce gear temperatures. Pyroshield lubricants flow from shrouds and are pumpable at temperatures down to 0°C (32°F).



Housekeeping, Consumption & Gear Inspection

Because many lubricants for open gear systems are not sufficiently tacky or high viscosity, they have to be applied in excessive amounts to provide a thick coating. Some operators use two to three times more lubricant than recommended. This leads to the need for extensive cleanup and waste disposal, and can make it difficult to visually inspect the gear.



LE Solution: Pyroshield lubricants are extremely tacky and cling to metal without buildup. Pyroshield is translucent once applied, allowing for a visual inspection of the gear surfaces. With high-viscosity Pyroshield, LE customers have been able to reduce the amount used, which means a reduction in lubricant consumption, cleaning and waste disposal.



Clear, flowing Pyroshield 9011 is lubricating these ball mill open gears, making it easy for the operator to visually inspect with a strobe light during operation.



Automatic Lubrication Systems & Lubricant Conversion

The lubricant needs to be applied evenly and consistently to prevent wear. To ensure this, the spray patterns on automatic lubrication systems must remain consistent, which means it is critical to prevent the nozzles from clogging due to excessive lubricant buildup.



LE Solution: LE personnel work with customers to help design the right automatic lubrication system. They also help during the lubricant conversion process to optimize lubrication intervals and establish spray patterns with an emphasis on achieving overlapping patterns.

Converting ball mills and kilns is simple using LE's proven, effective and safe procedure that provides no interruption in production or operation.



The spray nozzles on this open gear lubrication system remain clean and free of clogging while applying Pyroshield.

Kilns, finish mills and other open gear applications are no longer the nasty place you don't want to be. Pyroshield is a cool, clear, clean, pumpable solution for easily lubricating open gears at far less cost in the end.



Xpert Automatic Lubrication System

Pyroshield™ Open Gear Lubricants

Full Circle of Reliability

Armed with knowledge of best practices and all of the necessary tools to get the job done, your local LE lubrication consultant will help you plan and implement a world class lubrication reliability program to protect your assets.



Xpert Training



Xpert Equipment Reliability Assessment





LE's state-of-the-art manufacturing facility, technology center, warehouse and primary office is located in Wichita, KS, with regional distribution out of Knoxville, TN, and Las Vegas, NV. Additional support functions are located in Fort Worth, TX. The company's international presence includes distributors in more than 60 countries.



LE Helps Protect Your Equipment & Grow Your Bottom Line

Leaders in Lubricants Since 1951

Does your lubricant supplier do all of this?

- ✓ Professional, onsite equipment reliability assessment
- ✓ Comprehensive lubricant line (industrial oils, engine oils and greases)
- ✓ Web-based oil analysis, with results reviewed by experts
- ✓ Storage systems, including stackable bulk units
- ✓ Visual identification, including tags, labels, color-coding and wall charts
- ✓ Handling and transfer equipment, including portable transfer containers, clear grease guns, grease pumps and lube reels
- ✓ Single- and multi-point automatic grease lubricators and lubricating systems
- ✓ Contamination exclusion and removal tools, including oil reservoir sight glasses, desiccant breathers and filtration equipment
- ✓ Local, factory-trained specialist available 24/7



Lubrication Engineers, Inc. is the total solutions provider for lubrication reliability. We work closely with our customers to learn about their specific equipment and lubrication needs, and then help them create a world class lubrication reliability program that provides equipment protection and enhanced profits.

We start with an onsite equipment assessment. A trained, local lubrication consultant provides a detailed report recommending lubricants, application methods, usage amounts, and drain or lube intervals.

LE's line of high-performance lubricants – manufactured in the U.S. and featuring proprietary additives – far exceed the performance of conventional lubricants in a wide variety of industrial and automotive applications. In addition, your LE consultant can offer you several other best practice products and services to ensure the effectiveness of your program, including solutions for oil analysis, storage, handling and transfer, contamination exclusion, contamination removal, education and training.



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