



LE PRODUCTS
MANUFACTURED
UNDER AN ISO
9001:2000
CERTIFIED QUALITY
SYSTEM

9000-9001 PYROSHIELD® 9011 PYROSHIELD® XH SYN-GEAR LUBRICANTS

Advanced lubricant technology providing unique synthetic lubricants for shrouded open gears and other similar open gear applications.

LE's PYROSHIELD® Syn-Gear Lubricants have been formulated to provide heavy synthetic fluids designed to withstand heavy shock loading. These lubricants provide exceptional EP technology plus the advantages of ALMASOL®, LE's exclusive wear-reducing additive. They have been designed for providing superior protection for open gears and can be applied manually or through automatic spray lubrication systems. They are non-asphaltic and are environmentally safe.



USER BENEFITS:

All the features of LE's PYROSHIELD® Syn-Gear Lubricants provide the user many performance benefits. These include more uptime, longer gear life, less lubricant consumption and less maintenance.

- **Shrouded Open Gears** - Present a unique environment for open gear lubricants. LE's PYROSHIELD® Syn-Gear Lubricants will not accumulate on interior surfaces of open gear shrouds, thus eliminating the need for periodic cleanup which could result in production interruptions.
- **Reduced Wear** - Is realized because a microscopic layer of ALMASOL® creates a film on contacting metal surfaces thus preventing destructive metal-to-metal contact.
- **Clingability** - Is achieved with these lubricants because they have excellent adhesive qualities and possess the ability to cling tenaciously to metal surfaces.
- **High Load-Carrying Capacity** - Is provided because of the synergistic combination of EP additive and ALMASOL®, along with the heavy shear stable viscosity of the synthetic base fluid. The exceptionally high film strength and

load carrying ability enables these lubricants to withstand heavy loads and cushion shock loading in applications where commercial grade lubricants would fail.

- **Lower Operating Costs** - These lubricants perform better and last longer in difficult operating conditions. This insures trouble free operation, fewer failures, less downtime and maintenance costs for repairs, parts and labor, which ultimately means lower expense and increased profitability to the end user.
- **Environmentally Safe** - LE's PYROSHIELD® Syn-Gear Lubricants are considered non-hazardous and can be disposed of like any other non-hazardous petroleum oil.
- **Continuous Production** - Unique conversion process where the ball mill does not have to be stopped.
- **Translucent in Color** - Allows open gears to be easily inspected.
- **Reduced Lubricant Consumption** - LE's PYROSHIELD® Syn-Gear Lubricants reduce consumption by up to 80%.
- **Gear Temperature Reduction** - LE's PYROSHIELD® Syn-Gear Lubricants reduce temperatures 5-15%.

**LUBRICATION
ENGINEERS, Inc.**

Leaders in Lubricants



WHY WERE LE's PYROSHIELD® SYN-GEAR LUBRICANTS DEVELOPED?

They were developed specifically to meet the requirements for the lubrication of large shrouded open gear trains. LE's PYROSHIELD® Syn-Gear Lubricants offer outstanding wear protection and reduced consumption as LE's other PYROSHIELD® open gear lubricants do, yet have the ability to flow and be pumped at low temperatures. This eliminates the tendency to accumulate on the shroud and pinion areas. Users of other types of lubricants often experience an accumulation which requires periodic scheduled removal. Because LE's product is a fluid, this cleanup is not required. Also, the possibility of gear damage from unchecked accumulations is eliminated.

Lubrication Engineers' PYROSHIELD® has been specifically designed to address the many issues associated with traditional lubricants for open gear systems. Since modern large gear systems often operate with heavy loads, many operators apply an increased amount of lubricant to deal with this problem. This can be seen if we compare the amount of lubricant used versus the amount recommended by the AGMA (American Gear Manufacturers Association). It is not unusual to find usage amounts 2 to 3 times higher than recommended usage amounts.

The main issues identified are as follows:

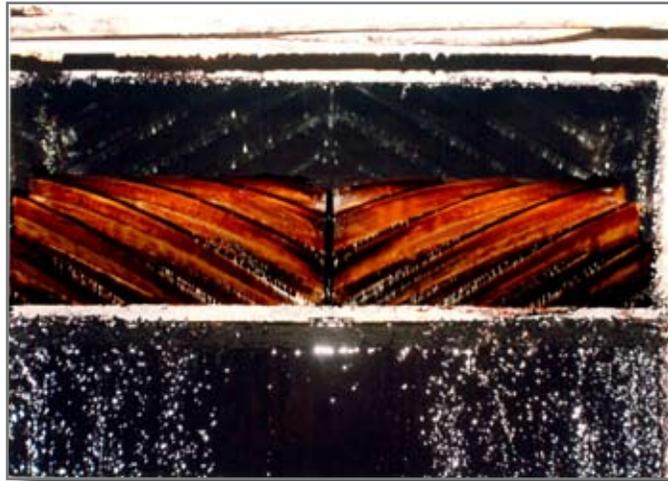
- Wear - Some common lubricants for open-gear systems are only specified as "cushioning compounds", thus providing poor lubrication, which could result in excessive wear, frequent downtime for repairs, malfunctioning and high operating temperatures.
- Housekeeping - Many lubricants for open gear systems need to be used in large amounts to provide a thick coating because they have poor clingability. Consequently, large amounts of lubricant run off and considerable cleanup and housekeeping are required.
- Build-up - A common problem with many other lubricants is that they build up in the roots of the gear teeth, which can result in bearing stress and damage, as well as possible damage to foundations. Build-up removal can be messy and time consuming.
- Excessive Lubricant Consumption - Due to product run off and the need for a thick layer, common lubricants have to be used in large amounts, which results in higher operating costs, as well as unnecessary clean up and waste disposal costs.



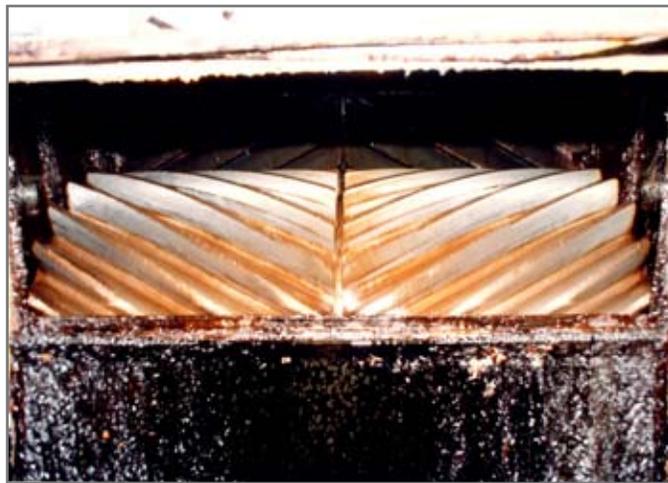
TYPICAL INDUSTRIES WHERE LARGE OPEN GEARS ARE IN SERVICE:

- Coal-Fired Power Generation
- Mining - Iron, Copper and other minerals
- Ceramics
- Cement
- Sugar Beet processing
- Paint
- Glass and Sand production

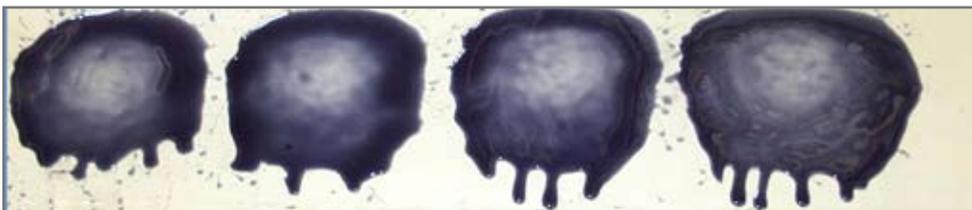
Using a commercial grade open gear lubricant



Using PYROSHIELD Syn-Gear Lubricant



Spray pattern using a commercial grade lubricant.



Spray pattern after converting to PYROSHIELD Syn-Gear Lubricant

9000-9001 / 9011 TECHNICAL DATA

PHYSICAL CHARACTERISTICS - TYPICAL:

	9000	9001	9011
Gravity, °API	23.9	24.7	24.9
Viscosity,			
SUS @ 210° F (99°C)	3,189	3,239 w/o diluent	5,444 w/o diluent
cSt @ 40°C (104°F)	24,340	24,490 w/o diluent	54,560 w/o diluent
cSt @ 100°C (212°F)	655.5	665.9 w/o diluent	1,175 w/o diluent
cSt @ 40°C (104°F) w/diluent	—	6,000 min.	7,196
Viscosity Index, min.	120	120	120
Flash Point, °F (°C)	385 (196)	235 (112) w/diluent	218 (103) w/ diluent
Pour Point, °F (°C)	54 (12)	21 (-6) w/diluent	32 (0) w/ diluent
Color	Purple	Purple	Purple
Diluent	No	Yes	Yes

PERFORMANCE TEST REQUIREMENTS:

Timken OK Load, lbs., ASTM D-2509	70	70	95
Rust Test, ASTM D-665, 48 hrs. fresh water	Pass	Pass	Pass
Rust Test, ASTM D-665B, 48 hrs. sea water	Pass	Pass	Pass
Four-Ball EP, ASTM D-2596			
Weld Point, kgs.	500	500	500
LWI	100	100	115
Copper Corrosion, ASTM D-130	1a	1a	1a
FZG Fail Stage	12+	12+	14+
SRV EP, 50 Hz, 1 mm, 121°C; N	1100	1100	900

SPECIFICATIONS EXCEEDED:

AGMA 9005-EO2

APPROVED FOR USE BY / MEETS PERFORMANCE REQUIREMENTS OF:

Falk Corporation
Metso
Foster Wheeler
FFE Minerals
Fuller Traylor
Walchandnagar Industries Ltd, India



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