

# TECHNI/TIPS

A Publication of the Lubrication Engineers Technical Department

LEADERS IN LUBRICANTS

NUMBER 108

## LE'S PYROSHIELD® PRODUCTS THE CHOICE FOR OPEN GEARS

**INTRODUCTION-** Many electric generating, mineral mining and manufacturing facilities require materials to be ground or pulverized prior to fueling generator sets or to be utilized in final product processing. Much of this material is ground in Ball, Pebble, Rod or Breaker Mills. Many of these mills have large, open bull or ring gear and pinion gearsets as drive mechanisms. Large kilns, some as long as a football field, are also rotated by using open gearsets.

Lubrication of these large open gear systems presents a unique challenge due to the harsh environmental considerations as well as heavily loaded conditions. Grinding or pulverizing mills are exposed to cement dust, silica or mineral dusts like limestone and coal dust. These conditions magnify the need for superior lubricating products. Empty grinding mills can weigh in excess of 400,000 pounds. Add product and a charge of grinding medium, and the gear system can be moving over half a million pounds or more. Open gear systems on kilns are frequently found in the same environment and are additionally exposed to high operating temperatures.

**HISTORY--**Historically, open gear systems have used asphaltic compounds that provide a cushioning effect. In the past, most open gear compounds contained lead that provided protection for the gears. In recent years, many of the lead containing products have been removed from the market due to its being classified as a hazardous waste material. The resulting products without the lead have diminished performance characteristics and offered less protection for the gears. Users of the asphaltic based products experienced many problems.

Housekeeping is a major consideration due to the large volume of product that must be used in an attempt to provide a continuous coating to the gears. In addition, where the asphaltic products have been used for many years, there is often a build up of hardened lubricant product in the roots of the gears. This presents multiple problems of cleaning and mechanical interference that can result in gear misalignment or stress on the pedestal mountings.

Many large open gear systems are lubricated using automatic spray systems. These systems are manufactured by Farval, Trabon, Lincoln and others. They function by providing the lubricants to the bull or ring gear teeth at set intervals in metered amounts. The solids in many of these asphaltic compounds have been found to cause abrasion or erosion of the closely machined parts in the metering blocks and have plugged the nozzles. This can result in uneven or inadequate lubrication of the gearset. The remedy for this problem is the periodic scheduled or unscheduled maintenance and cleanup. The cleanup of these products can result in lost production that is extremely expensive and hard to recover.

Until recently, many operators had no choice but to use the asphaltic compounds. Lubrication Engineers, Inc. has designed and developed a product line that addresses the demanding needs of open gear lubrication. LE's PYROSHIELD line provides superior lubrication and resolves the many concerns that confront the operators of large open gear driven equipment.

**The benefits from using LE's PYROSHIELD Open Gear Lubricants are as follows:**

**IMPROVED CLEANLINESS**--The housekeeping costs associated with the use of asphaltic based products are difficult to estimate. Operators have reported labor requirements in excess of four man-days to clean some units. Due to the volume of product used, build up around the shrouds and the local area can be sticky, messy and dangerously slippery. Normally, less volume of LE's PYROSHIELD products are required to provide far superior gear protection while maintaining the system cleanliness and ultimately, the housekeeping is improved.

**ELIMINATION OF HAZARDOUS WASTE DISPOSAL COSTS**--LE's PYROSHIELD products can be treated as ordinary used lubricants and can often be added to the fuel or coal burned in the normal operation of many plants. As mentioned, many asphaltic compounds contained lead as an extreme pressure additive, and the waste product is considered hazardous. The asphaltic compounds can also contain Polycyclic Aromatic Hydrocarbons (PAH) that require disposal as a hazardous waste. Costs for disposal of hazardous waste range from \$.50 per pound to more than \$2.00 per pound in some areas, not to mention the cost and bother of record keeping for these products. In these times of environmental protection, the choice of using a safe, nonhazardous lubricant like LE's PYROSHIELD is surely the wise

**IMPROVED GEAR PROTECTION**--Asphaltic based compounds typically have Timken Load ratings of 20 to 25 lbs. and rely on excessive volume for adequate protection. The Timken ratings for LE's PYROSHIELD products exceed 70 lbs. for LE's 9000-9001 PYROSHIELD Syn-Gear Lubricant and exceeds 90 lbs. for LE's 5180 PYROSHIELD. This added protection reduces gear wear and extends the life of the gear system. Pinion gears can cost from \$10,000 to \$35,000 to replace. Extending the life of

**LOWER LUBRICATION COSTS**--Although LE's 9000-9001 PYROSHIELD Syn-Gear Lubricant and LE's 5180 PYROSHIELD may cost more per pound to purchase, reduced consumption often results in an overall reduction in lubrication cost. Many asphaltic compounds leave a five to eight inch layer of product in the bottom of the drum that cannot be used. Hardening of LE's PYROSHIELD products does not occur and product waste is eliminated.

**UNIQUE CONVERSION PROCESS**--Converting to LE's PYROSHIELD Open Gear Lubricants is accomplished by using a proven, effective and safe procedure that provides no interruption in production or operation. Protection of your gear system is provided throughout the process. Engineering support is provided by the local LE Sales Representative who is supported by Lubrication Engineers' Technical

**REDUCED ELECTRICAL CONSUMPTION**--Because of the superior lubricating qualities of LE's PYROSHIELD Open Gear Lubricants, many operators have experienced up to a 2% to 2.5% reduction in electrical costs. Reduced friction resulting from superior lubrication can be reflected in reduced energy consumption. LE has documented substantial temperature drops, some exceeding 30°F., during the conversion process and continuing during normal operation. The source of heat is friction in an open gearset. Lower friction means less energy required to overcome that friction, thereby reducing electrical consumption.

Consider the advantages of converting to LE PYROSHIELD products. The choice should be clear. Your local LE Sales Representative can provide the assistance to set up your conversion and determine which of these LE PYROSHIELD products best fits your particular open gear setup.

**LE's 5180 PYROSHIELD and LE's 9001 PYROSHIELD Syn-Gear Lubricant contain a nonchlorinated, USDA H1 solvent as a diluent.**



**LUBRICATION ENGINEERS, Inc.**<sup>®</sup>

300 Bailey Ave, Fort Worth, TX 76107 | 817-834-6321 | 800-537-7683  
fax 817-834-2341 | <http://www.le-inc.com>