

# UNDERSTANDING

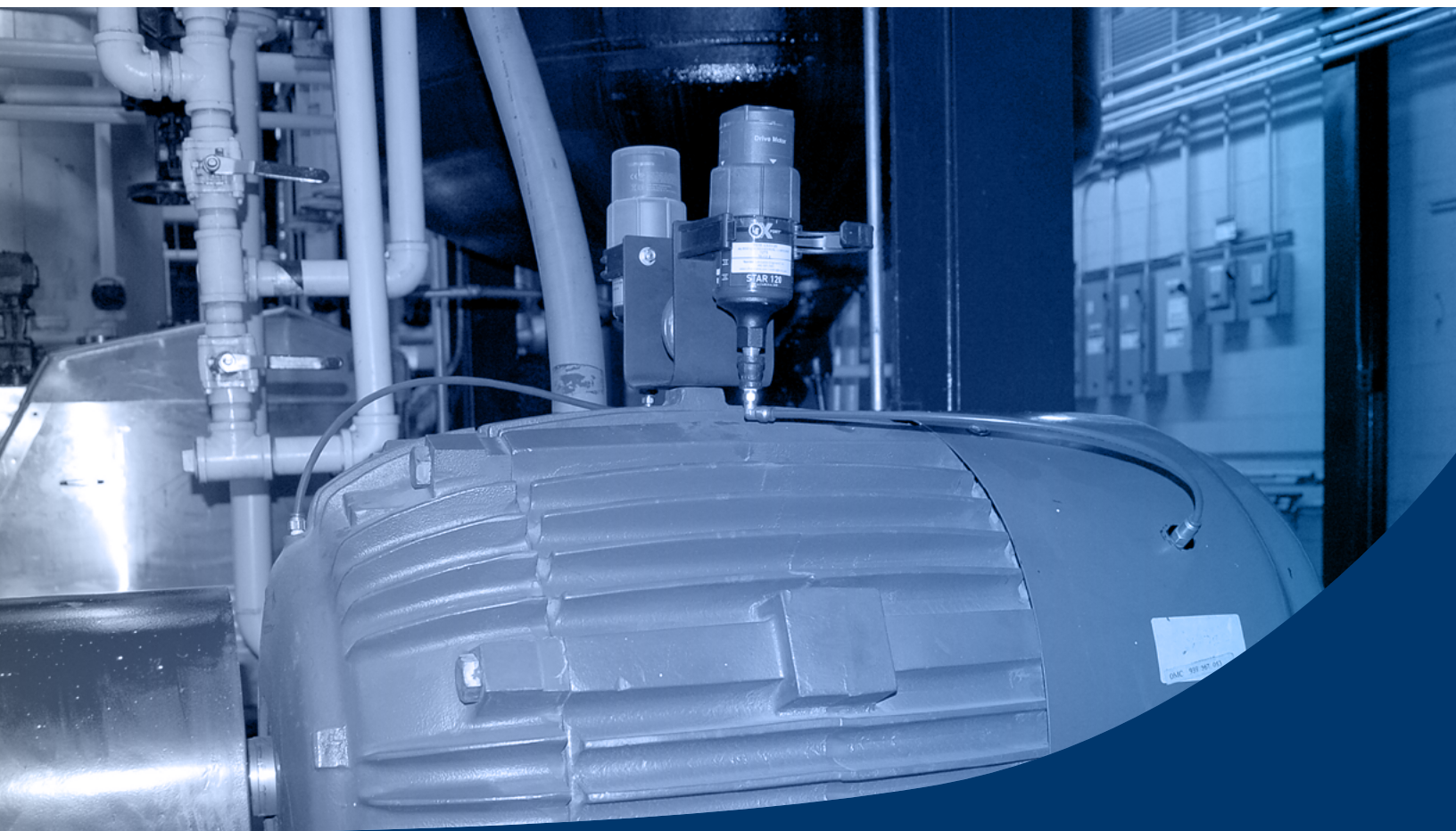
## **Industrial Greases**





# Understanding Industrial Greases

Proper lubrication of equipment is essential for efficient, cost-effective industrial operations. High-quality industrial lubricants are key to long-lasting performance with minimal downtime. A lubricant type employed at most industrial facilities is grease. Learn more about the different types of industrial greases to choose the best solution for your application.





## **What Is Industrial Grease?**

Industrial grease is a semi-solid lubricant consisting of base fluid, thickener and additives. The base fluid and additives are often considered the most important parts of industrial grease formulations because they affect the grease's lubricating characteristics. The thickener holds the base oil and additives in place in applications where fluid lubricant would run right out. The thickening agents used in industrial grease are often likened to a sponge. Like fluid held in a sponge, the oil and additives are trapped between dispersed particles of the thickener until they are exposed to agitation and pressure, such as in a rolling element bearing. Then the oil and additives “bleed” from the thickener into the contact zone and provide lubrication.



Depending upon the thickener type employed, grease can liquify between 200°F and 500°F (93°C and 260°C). A test that has been used to indicate the liquification point of grease is called the dropping point. As a general rule, the higher the dropping point, the higher the service temperature that can be recommended for a grease. For example, clay-thickened greases are often considered excellent high-temperature greases because they don't have a dropping point.

Understanding the proper grease to use and adding it to routine maintenance can keep your facility operating at peak performance.





## **Functionality of Grease**

Grease provides lubrication between moving, contacting surfaces without leaking or losing lubricity under the force of centrifugal action, gravity or pressure.

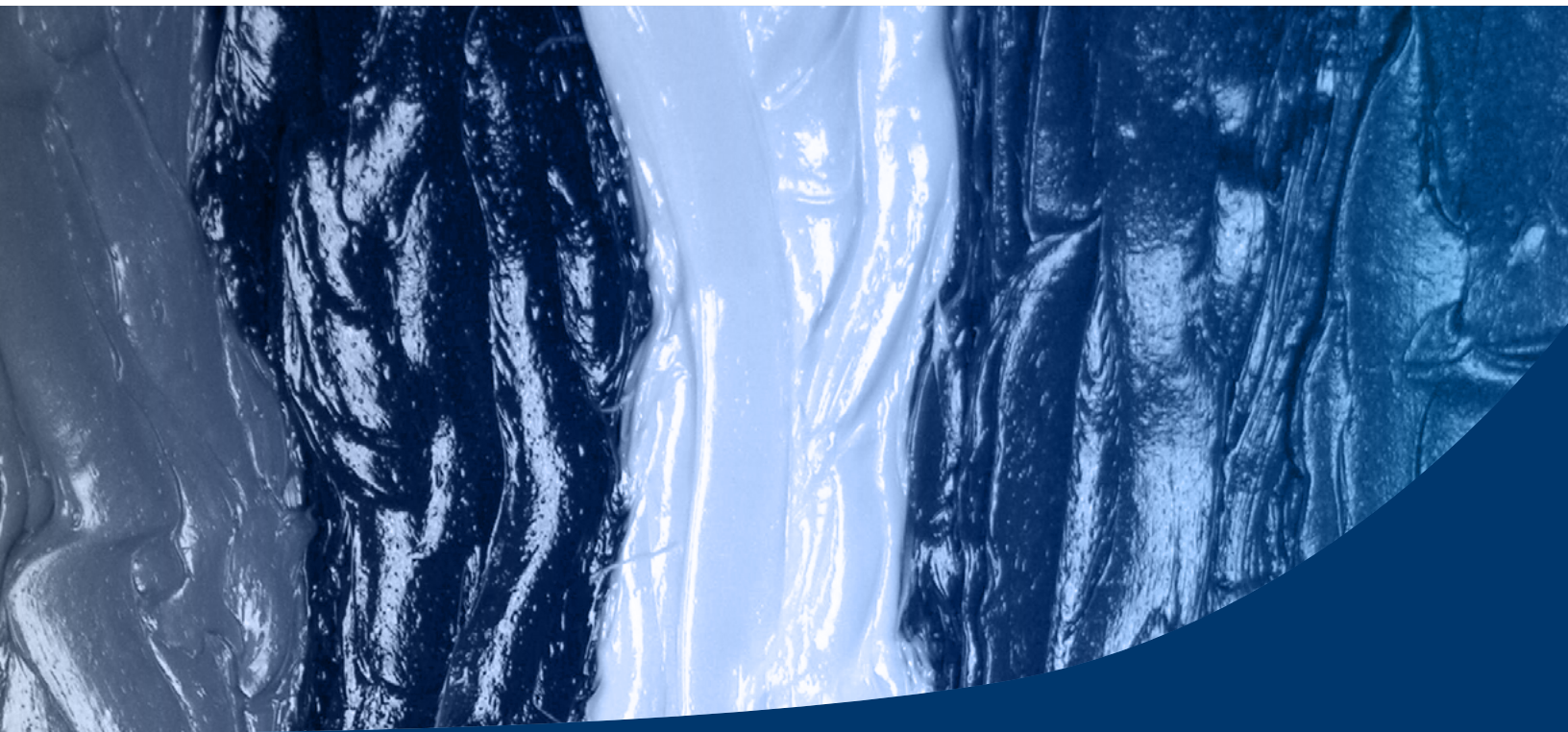
Industrial grease acts as a sealant to keep out contaminants and foreign substances, minimize lubricant leakage, and prevent corrosion. When there is a desire to include solid lubricants, such as very heavily loaded applications, the thickened grease keeps them in suspension whereas they could settle out of a fluid lubricant before reaching the lubricated contact.

Grease's rigidity allows for easier containment than oil, with simpler, less expensive retention devices.



## **Characteristics of Industrial Grease in Your Application**

Industrial greases are often recommended for specific applications through an evaluation of various physical and chemical characteristics. One of the most common is the thickener type. Next, they are often characterized by their base fluid type, typically mineral oil or synthetic. After that, they may be characterized by the base fluid viscosity grade, for example ISO 100, 150, and so on; and then by the grease consistency grade, with the most common being NLGI #2. The last, but not least, characteristic is the types of additives that are included in the grease formulation, such as extreme pressure, wear-reducing, water-resistant, corrosion-resistant, or high-temperature.





To choose the best grease for the proper application, it can be helpful to look at these characteristics in a little more depth, starting with the ingredients:

- » **Thickener:** The three broad categories of thickeners are soap, organic and inorganic. Soap-thickened greases are by far the most used. Different soaps can provide specific benefits in thickening efficiency, shear stability and compatibility with additives, base fluids and other greases they might be mixed with. They are formed by reacting a metallic base with a carboxylic fatty acid and are named for the metal in the base, such as lithium or lithium complex.
- » **Base fluid:** Grease often contains one or several base fluids mixed in a ratio to adjust the base fluid to a desired viscosity. The base fluid viscosity is often specified in applications, such as rolling element bearings, based upon the size, speed and temperature under which the bearing will be operating.
- » **Additives:** Ingredients are added to grease to impart additional performance properties, such as extreme pressure, anti-wear, corrosion resistance, oxidation resistance, and tackiness.



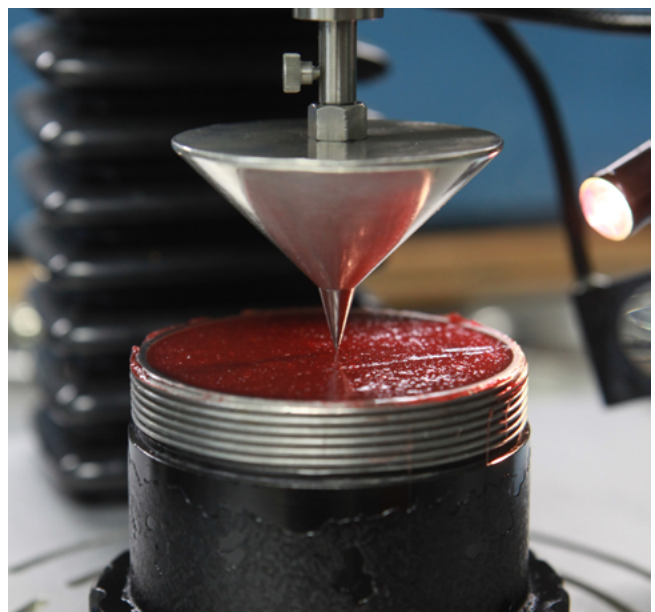




All grease ingredients, properly dispersed, affect the following characteristics:

» **Pumpability:** A measure of how easily it is pushed into a mechanical device via nozzles, lines and fittings of the systems that dispense industrial grease.

» **Consistency:** Ability to resist deformation due to an applied force. The measure of consistency is known as the penetration. Greases are typically marketed based upon the NLGI grade, which is the cone penetration after 60 worked strokes. Two factors that determine grease consistency are the base oil's viscosity and the type and amount of thickening agent used.

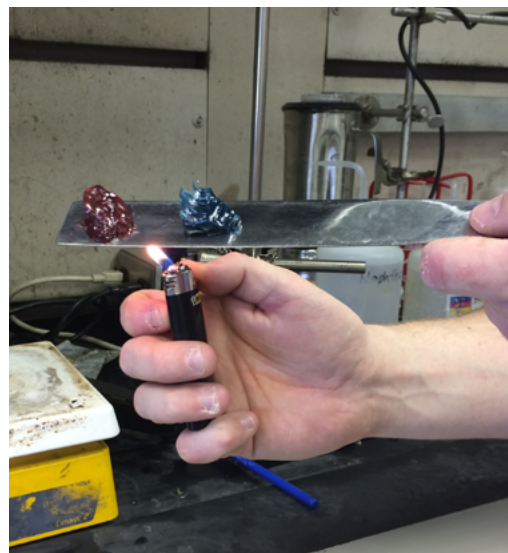


» **Water resistance:** Determines how susceptible its properties are to change when exposed to water. Water may dilute the grease or change its consistency, reducing lubricity. Some greases could emulsify or wash away when exposed to water.

» **Oxidation stability:** Hydrocarbon molecules that comprise grease ingredients can react with oxygen at elevated temperatures or pressures. Oxidation stability is a grease's ability to resist reacting with oxygen. Oxidation typically causes sludge or lacquer-like deposits in equipment, which can slow operation and increase friction and wear. Oxidation accelerates grease deterioration with prolonged exposure to high heat.



- » **Dropping point:** Indicates a grease's heat resistance. It is the temperature at which the grease will become liquid enough to drip. The dropping point number only determines the maximum temperature at which the grease will retain its structure, not its maximum usability temperature.
- » **Low-temperature effects:** Typically, the base oil's pour point provides a guideline for the low-temperature limit of most industrial greases. When temperatures become too low, industrial grease can become thick and viscous, and possibly even harden. In these cases, pumpability and flow decreases, or even ceases, and certain operations may not be possible.
- » **High-temperature effects:** Because grease is semi-solid, it cannot dissipate heat by convection like fluid lubricants. High temperatures can damage the thickener structure of the grease, allowing it to soften and possibly flow out of the application. Under extremely high temperature exposure, the grease can oxidize and harden, base fluid can evaporate, or the grease can even burn. Therefore, it's crucial to select the proper high-temperature grease in excessive heat applications.







## Types of Industrial Greases by Thickener

There are many ways to categorize greases, such as by application (food grade, high-temp, etc.), base oil type (mineral or synthetic), base oil viscosity, additive type, and thickener. LE's lineup of greases – categorized by thickener – are listed below.

### Lithium Complex Grease

#### » **Almagard Vari-Purpose Lubricant (3750-3752)**

- This is an incredibly tacky grease that remains highly effective even in harsh conditions and has a high dropping point. It provides long-lasting, cool-running, water-resistant performance that can help increase bearing life and grease intervals.



#### » **Monolec Multiplex Lubricant (4622)**

- Meeting NLGI's GC-LB grease specification, this lithium complex grease is ideal for applications requiring extreme pressure performance. It is highly versatile and provides dependable performance over a broad range of operating temperatures.





## Lithium Hydroxy 12 Grease

### » Almatek General Purpose Lubricant (1232)

- With versatility and long-lasting performance, this distinctive red grease reduces maintenance and lubrication costs while improving uptime.



## Aluminum Complex Grease

### » Almaplex Industrial Lubricant (1274-1275)

- This is a general-purpose, extreme-pressure grease that protects equipment from moisture and heat.



### » Almaplex Ultra-Syn Lubricant (1295-1299)

- As a heavy-duty synthetic grease, this product provides optimal performance under extreme conditions, such as high temperatures, low temperatures, and high water environments.





### » Earthwise Eal Wire Rope Grease (3353)

- This soft, semifluid grease is designed to coat wire rope, chain and cable. It is an EAL grease recommended for use on or near waterways.



### » H1 Quinplex Food Machinery Lubricant (4022-4025)

- This semi-synthetic incidental food contact grease has a broad operating temperature range. It provides extreme water resistance, mechanical stability, reversibility, and tackiness.



### » Monolec Industrial Lubricant (4700-4702)

- This industrial grease offers excellent pumpability, water resistance, and corrosion resistance. It is ideally suited for centralized lubrication system application.







## Calcium Sulfonate Complex Grease

### » **Monocal GP Grease (1498-1499)**

- This high-performance grease protects equipment from heat, moisture and heavy loads using our proprietary wear-reducing additive.



### » **Almamoly HD Grease (1487-1488)**

- Containing molybdenum disulfide, this grease operates well in extreme conditions like high temperatures, water and heavy loads.



### » **H1 Quincal Syn FG Grease (4070-4072)**

- Using Lubrication Engineers' proprietary impact-resistant additive, Quinplex, this full synthetic, incidental food contact grease is ideal for a wide range of food processing applications.





## Polyurea Grease

### » Monolec Extend EM Grease (1282)

- Specifically designed for protecting electric motors, this industrial grease offers superior mechanical stability to extend service life, even in extreme temperatures and high-speed operating conditions.



## Clay (Bentone) Grease

### » Almasol High-Temperature Lubricant (1250-1251)

- Developed to withstand high temperatures, this grease provides constant lubrication where other lubricants melt and run.



### » H1 Quinplex High-Temperature Lubricant (4051)

- This long-lasting incidental food contact grease with stands high temperatures and resists oxidation, water and vaporization.





### » Almasol Syntemp Lubricant (9901)

- This heavy-duty, extreme-pressure synthetic grease is formulated for high-temperature applications using LE's exclusive wear-reducing additive, Almasol. This grease offers exceptional water resistance and rust resistance.



### » Pyroshield Syn Open Gear Grease (5100, 5180, 5182)

- This heavy-duty synthetic grease was developed for large unshrouded open gears in the mining, mineral processing and cement industries. It has superior wear protection, exceptional load-carrying capacity, outstanding tackiness, and is easy to apply at various temperatures.



## Calcium Grease

### » Wirelife Almasol Coating Grease (451-453)

- This tacky, water-resistant, semifluid grease is ideal for coating wire ropes, chains and cables.







## **Typical Applications of Industrial Greases**

Many applications require high-performance industrial grease to protect components from wear and to extend equipment service life. Common uses for the different types of industrial greases include:

- **Chassis**
- **Front axle arrangements**
- **Wheel bearings**
- **Electric motor bearings**
- **U-joints**
- **Bucket pins**
- **Cable sheave bushings**
- **Wire rope and cables**
- **Automatic lubrication systems**
- **Printing presses**
- **Leaky gearboxes**
- **Forging equipment**
- **Rotary aerators**
- **Pivoting and swiveling parts, including bucket pins, articulated joints, and latches**
- **Plain and anti-friction bearings used in conveyors, fans, and electric motors**
- **Components in large mobile agriculture, construction, and open-pit mining equipment**
- **Food processing equipment, such as blenders, cookers, filling machines, and packing equipment**



## LE Is a One-Stop Shop for Industrial Greases

As a leading developer and manufacturer of industrial greases, Lubrication Engineers works with companies all over the world to create customized lubrication reliability programs using top-of-the-line grease formulations. Offering a full line of high-performance industrial greases, LE provides proven lubrication solutions for many industries. LE's expertise and support helps companies improve their bottom line by effectively protecting production equipment and devices over the long term.



Learn more about industrial grease solutions for your equipment by [contacting Lubrication Engineers](#) today.

## About Us

We formulate and manufacture our own lubricants – using our proprietary additives – in Wichita, KS, home of our state-of-the-art manufacturing facility, technology center, warehouse, and offices. We also offer regional distribution out of warehouses in Tennessee and California.

We place a strong emphasis on R&D and technology to ensure that LE lubricants meet the needs of our customers and continue to exceed the performance of conventional oils and greases in a wide variety of industrial and automotive applications.

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