The Basics of Lubricating Grease and In-Use Testing

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Summary

Lubricants are applied to moving equipment for several reasons, including friction reduction, heat removal, corrosion prevention and contaminant removal. The most commonly understood reason lubricants are employed is to reduce friction, thereby minimizing wear between moving parts.

The three major categories of lubricants are fluids, semisolids and solids. In most cases, fluid lubricants are the most efficient, as they have the best flow properties. This strength can also be a fluid lubricant's weakness. In some types of moving equipment, it is impossible to contain the lubricant. In other words, it can easily leak out.

A lubricant cannot perform when it will not stay in the area where it is needed. In these cases, a solid lubricant that can be applied to a surface and not flow would be advantageous. Unfortunately, this creates a new performance challenge. In some cases, solid lubricants can be easily scraped away from moving surfaces. In such cases, a lubricant that possesses properties somewhere between a solid and liquid is needed. This semi-solid lubricant is called grease.

While many end users have just chosen to put lubricant into the equipment and let it run, many have learned that analysis of lubricants while in-service can provide useful information about the condition of the lubricant and the equipment in which it is installed. This condition monitoring of used fluid samples has been performed for many years and has become very mainstream. Due to the nature of solid lubricants, sampling and analysis often provides little to no sample and is often found to be of little use. Semisolid grease sample testing is, however, becoming more and more common, due to new sampling and testing procedures being developed within the industry. At this pint, more useful information can be gained from in-service sampling of greases than of solid lubricants, but not quite as much as can be gained from fluids.

It is the goal of this paper to provide background and insight on grease and grease testing to help end users who are seeking to improve their lubrication reliability program through condition monitoring.