



Technical Topic

Grease Static Oil Bleed

If you have ever opened a grease container and found a puddle of free oil, you almost certainly may have wondered whether the grease is still fit for use. The phenomenon described is called static oil bleed, and some in-depth review of grease fundamentals is needed to comprehend the root cause of this and its potential impact on grease performance.

ASTM International defines lubricating grease as “a semifluid to solid...dispersion of a thickener in a liquid lubricant.... Other ingredients are commonly included to impart special properties” (ASTM D4175 Rev A).

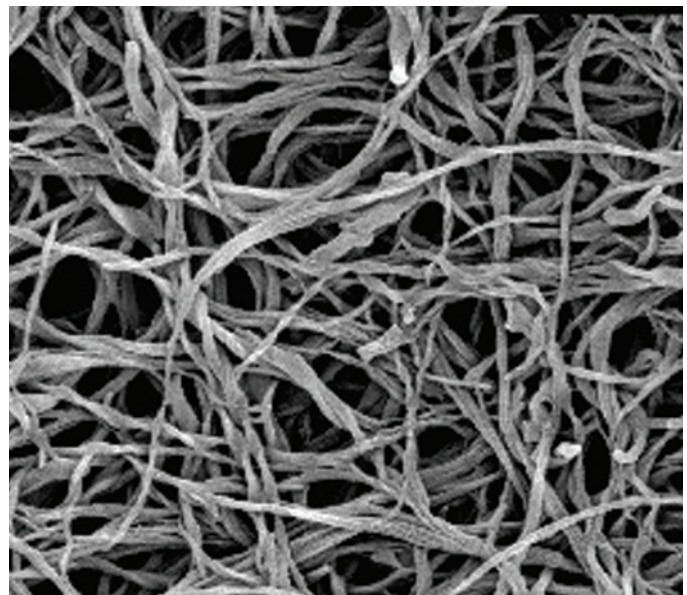
In other words, a grease is made by dispersing a thickening agent in lubricating oil.

- The lubricating oil composition is dictated by the application needs, including load, temperature, speed, surface roughness, and others. It is the oil that provides the lubrication.
- The grease thickener is a matrix of fibers or platelets forming a large surface area with many holes (voids). It is in these voids or adhered-to surfaces that the oil is held until it is needed to lubricate.

A lubricating grease can be thought of as a sponge, saturated with the lubricating oil, which must be liberated from within the thickening matrix to provide lubrication. The sponge analogy is rather appropriate, as the grease thickener matrix imparts no lubricating characteristics. As the sponge releases water when squeezed, the grease releases oil under the mechanical stress in the application. If the thickener did not release the oil when stressed, the grease could not perform its lubricating duties. Additionally, as the stress is removed, the grease can absorb some of the released oil back into the thickener.

While releasing some oil under conditions of the application is a prerequisite for sufficient lubrication, oil release can also

occur during storage conditions as a result of temperature changes or vibration (static oil bleed or oil puddling). These stresses are extremely weak compared to the mechanical stress in the application but can still result in the release of small amounts of oil. And thus, over time, puddles of oil are formed.



Grease contains a thickener like the soap fibers pictured above, which hold a lubricating oil in suspension.

So, is the grease still suitable for use? Yes, with the following conditions:

- The amount of oil is small, covering only low spots in the surface of the grease.
- The grease readily absorbs the oil upon stirring.

If you're in doubt or want to know more about ExxonMobil greases, contact your ExxonMobil Technical Help Desk or Field Engineer for assistance.

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