Written by Dr. Lube, aka Ken Bannister Monday, 18 October 2010 08:15



Symptom: "Are there consistent values for the acceptable limits of oil properties, such as viscosity and TAN, before the oil needs to be changed?

Diagnosis: Throughout its life, oil is subjected to load-induced shear stresses, thermal degradation, water, induced aeration, wear-metal catalyzing and possible contamination. These outside influences produce fluid-property-altering effects that primarily manifest as major thickening or dilution in viscosity, acid buildup and sludge.

We analyze oil's fluid properties to determine the effective remaining life before an oil change is required. Two of the most effective tests are the analysis of viscosity change and the increase in TAN (Total Acid Number or acidity) against a benchmark virgin-oil sample.

Prescription: The viscosity rating of new oil is typically expressed in *centistokes* (cSt), which is the oil's kinematic viscosity rating depicting its measured resistance to flow and shear by the force of gravity. As oil thickens or dilutes, its specific gravity changes, which can lead to gravity-based testing errors. Absolute viscosity is a more consistent measurement; it depicts resistance to flow and shear through measurement of the oil's internal friction. Because absolute viscosity is measured by multiplying kinematic viscosity by actual specific gravity, it provides error-free trending, making it the preferred measurement for most oil labs. (Absolute viscosity is measured in *centipoise* [cPs].)

Work with a laboratory that has experience in setting caution and critical limits for YOUR industry. For industrial oils, most labs usually start with clearly defined viscosity limits of -10% CL (Critical Lower), -5% CaL (Caution Lower), +5% CaU (Caution Upper) and +10% CU (Critical Upper). In more severe conditions, the CaU and CU limits can be reduced to +4% and +8%, respectively. For oils with viscosity improvers, the lower limits are usually doubled.

Lubrication Checkup: Acceptable Limits

Written by Dr. Lube, aka Ken Bannister Monday, 18 October 2010 08:15

The AN (Acid Number), which reflects acid concentration in oil—not strength—is greatly affected by water. Most oils start with ANs under 2. Setting acidity limits is not as easy as viscosity, since caution and critical limits depend on the additive package. Most standard mineral oils are considered corrosive over AN 4, whereas AW (AntiWear) or R & O (Rust and Oxidation) oils are considered critical well below AN 3. Working with your supplier and/or a reputable lab experienced in your industry is the best way to set meaningful acceptable limits for YOUR environment. Remember, the rate of change is more important than the actual change number, as it signifies a specific change that likely needs immediate investigation.

MT

Lube questions? Ask Dr. Lube, aka Ken Bannister, author of the book Lubrication for Industry and the Lubrication section of the 28th edition Machinery's Handbook. He's also a contributing editor for Maintenance Technology and Lubrication Management & Technology. E-mail: doctorlube@atpnetwork.com

For more info, enter 02 at www.MT-freeinfo.com