

MEASURING RISK POTENTIAL OF ACIDS IN LUBRICANTS

Oxidative and thermal stress on a lubricant can produce many undesirable by-products that increase machine wear, and decrease tribological performance. Acids are one of the key actors in the degradation of a lubricant which can affect both the base oil and its additives. In oil and lubricant analysis, quantifying these acids can give insight into the net potential for oxidation and corrosion. For most lubricant end users, the total acid number (AN), is the most widely deployed measurement for this type of corrosion risk.

The advantage of AN is that it is a quantification method giving linear results that are intuitive to understand, and easily comparable to other AN values from other methods. However, like most test methods, a single data point does not provide enough information for prescriptive or reactionary maintenance, especially when those decisions may incur significant monetary costs. Compounding this is that there are no set condemning limits for intervention because AN trends are variable between base stocks and additives. Acid number, as a singular metric of corrosion potential, does not paint the whole picture.

The most logical addition to the technicians' toolkit for measuring risk potential associated with acids is measurement of the lubricant's pH. The duality of acidity and alkalinity are ingrained as opposite ends of the pH spectrum, presenting seemingly binary information. However the simplicity of pH as a measurement is deceptive, and requires thoughtful consideration. When used in tandem with other acid quantification metrics, it can provide a useful rubric for making intelligent and informed decisions surrounding your oil and lubricants.

Here's how an operator can use the information provided by simultaneous i-pH/AN testing, and what actions that data indicates should be taken.

To learn more about the science behind this diagram, and why each quadrant indicates the quality and criteria shown, [download the technical white paper.](#)

