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NEWSLETTER

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Copper Corrosion: an Oil Analysis Method for Turbine, Gearbox and Hydraulic Lubricants


Photo : Koehler Instrument

Crude petroleum contains sulfur compounds, most of which are removed during refining. However, some of these sulfur compounds remain in the refined petroleum product and can have a corroding action on various non-ferrous metals.

Extreme-pressure additives in gearbox lubricants also contain sulfur and have a tendency to corrode yellow metals. Yellow metal corrosion has become a more critical factor as the EP additives in gear oils have become more concentrated.

This is even more so in older gearbox models that contain non-ferrous brass, bronze or copper parts such as bushings and synchronizers. These parts will be damaged by high extreme-pressure additive content in some new oils. Therefore, use care with older gearboxes and highly corrosive oils.

Photo : Koehler Instrument

Corrosivity however is not necessarily related directly to the total sulfur content. The effect can vary according to the chemical types of sulfur compounds present.

Method : ASTM D130

The copper strip corrosion test is designed to assess the relative degree of corrosivity of a petroleum product due to active sulfur compounds.

The Copper Corrosion test is a widely used oil analysis method for gearbox, turbine and hydraulic lubricants. This oil analysis method will detect the corrosive effects of a lubricant on copper alloys, but it is ineffective on iron or ferrous alloy parts and components.

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The copper corrosion oil analysis method, ASTM D130, is relatively simple. A polished copper strip is immersed in 30mL of sample at elevated temperature, 50 °C or 100° C, depending on the type of gazoline, grease or oil tested, for a period of three hours.

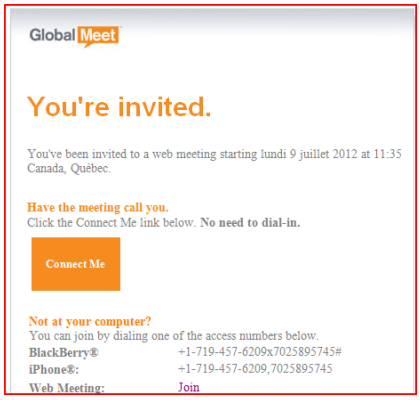
At the end of this period, the copper strip is cleaned and examined for evidence of degradation. Results are rated by comparing the stains on the copper strip to the ASTM color-match scale from 1A to 4C.

The rating of 1A is given for appearance of freshly polished copper coupons with slight discoloration, but barely noticeable; 1B indicates slight tarnish, and the ratings proceed further down the scale as corrosion staining of the test coupon increases, with 4C being the worst, typically appearing as severely corroded, blackened, and pitted coupon.

ASTM Method D130 covers the determination of the corrosiveness to copper of aviation gasoline, aviation turbine fuel, automotive gasoline, cleaners (Stoddard) solvents, kerosene, diesel fuel, distillate fuel oil, lubricating oil, and natural gasoline or other hydrocarbons having a vapor pressure no greater than 124 kPa (18 psi) at 37.8°C.

For additional information, please contact your technical sales rep.

Friday April 26 WEBINAR : Oil Analysis Fundamentals



By **Jeremie Verdene**

Date : Friday April 26, 2013

Time :

- **Ontario, Manitoba : 12:00 PM, Toronto time**
- **Saskatchewan, Alberta : 10:00 AM, Calgary time**

Duration : 30 minutes

Reserve now with Jeremie : jeremie@tribologik.com

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