



Oil Analysis
& Research

Overview of oxidation laboratory tests on industrial lubricants



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1. Introduction

The technologies and industrial material developments lead the additives and lubricants manufacturers to elaborate higher performance lubricants. One of the key characteristic, besides antiwear and EP resistance, good surface properties, anti-corrosion protection, is the oxidation and thermal stability. The aim of this presentation is to give you an overview of existing laboratory oxidation tests and a guide to select the right test related to the application.

2. General principle of oxidation tests

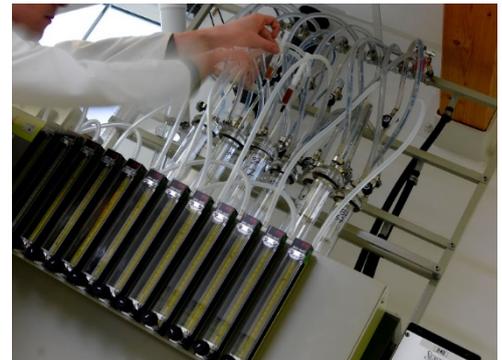
Oxidation stability of lubricant is its ability to resist to its oxidative degradation when it is in contact with oxygen (air) at high temperature. The presence of catalysts, contaminants, and water increase the oil stress. Oxidation is a reaction between oxygen and lubricant. It results in a increase of viscosity (decrease in case of depolymerisation) and acidity, the formation of sludge and/or varnish ; these contaminants may be the source of corrosion or wear problems. So oxidation is a important factor in the prediction of oil performance. Fortunately, anti-oydants play a important role preventing the oxidation reaction propagation and protecting the lubricant.

3. Overview of industrial oils laboratory oxidation test

Through the large number of oxidation laboratory tests dedicated to hydraulic fluids as well as turbine, compressor and industrial gear oils, this paper aim to define which laboratory oxidation tests are relevant for each type of oils.

From the universal TOST dedicated to many industrial lubricants, some thermal and oxidation stability tests are more specific (Pneurop, Dry Tost MHI, Cinicinnati-Milacron,...).

The test principle as well as the conditions, air/oxygen flow rate, temperature, catalysts, water, duration will be review in details.



4. Interpretation and specifications

Interpretation must always be done carefully because test conditions are strenghtened in comparison with real conditions in order to generate data on a shorter time.

Fortunately, national, international and OEM specifications is a great help as a guideline in the interpretation of test results.



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