

FORD MODIFIED OXIDATION TEST**Application**

This method is used to determine the stability of lubricating oils. Evaluation of the lubricant consists in determining the tendency of oil to thicken and/or to form insolubles, varnish and strong acids.

Description of Test

A covered beaker containing the sample is maintained at test temperature in a temperature controlled heating device. The sample is agitated by means of a steel paddle. Aluminum, steel and copper strips are immersed in the lubricant throughout the test. Periodic oil sampling and aluminum strip inspection permit continuous test monitoring.

Apparatus Required**Heating Device**

For temperatures of 80 - 175 °C in the range of +/- 1.

Glass Beaker

Tall form, 400 mL, without spout.

Stirring Rod

Stainless steel (Sketch No. 3 shows suitable design).

Cover

Suitable metal (Sketch No. 1 shows suitable design).

Strip Holder

For dimension (see Sketch No. 2).

Test Strips

Steel body skin panels, aluminum, copper (see Figure 3).

Filter Apparatus

Millipore XX10 047 00

Date	Action	Revisions
2001 07 24	Revised	Editorial – no technical change A. Cockman
1994 02 28		

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Filter

Millipore type HA, Catalogue No. WP 047 00 (0.45 microns).

Balance

Accuracy +/- 0.1 mg.

Viscometer

Suitable for this test.

Timing Device

For viscosity determination.

Sanding Paper

220 grit.

Standard CRC Varnish Manual No. 8

Source: Coordinating Research Council, Inc.
Thirty Rockefeller Plaza
New York 20, New York USA

Potentiograph (suitable)

Stirring Device

1000 +/- 50 rpm

Thermometer

Set of thermometers for the temperature ranges as required in the relevant Material Specification.

Solvent

- (a) Normal Pentane, commercial grade
- (b) Petroleum Naphtha U-MC004-8004-01

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Set the temperature at the specified test temperature.
2. Polish the aluminum (5), steel (1), and copper (1) strips using 220 grit paper for each lubricant to be tested. Rinse test strip in naphtha and dry.
3. Clean a 400 mL beaker and add 275 mL of the oil to be tested.
4. Using laboratory tongs place 1 steel, 1 copper and 5 aluminum test strips in the beaker strip holder.
5. Place the beaker and contents in the heating device, insert the stirring rod through the opening of the cover and fit the strip holder and strips into the beaker. Ensure that the end of the stirring rod is 20 +/- 1 mm above the bottom of the glass beaker.
6. Start the test, being careful not to overheat the sample, and run continuously (24 h per day) until completion of the specified number of test hours.
7. A 15 mL sample of test oil and an aluminum strip is removed from each beaker at 24 h intervals.
8. The aluminum test strip is washed in petroleum naphtha and rated for varnish deposits using standard CRC varnish rating.
9. Viscosity at 37.78 °C and 98.89 °C are determined using the ASTM D 445 method. The pentane insolubles are determined by diluting 1 gram of sample with 100 mL pentane and filtering through a 0.3 micron millipore filter, or as specified in the relevant specification.
10. At the conclusion of the test, the additional data to be obtained is strong acid number, infrared spectra from new and aged oil and viscosity increase.
11. ASTM procedures are to be used when applicable.