



Standard Test Method for Oxidation Stability of Inhibited Mineral Insulating Oil by Pressure Vessel¹

This standard is issued under the fixed designation D 2112; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method is intended as a rapid method for the evaluation of the oxidation stability of new mineral insulating oils containing a synthetic oxidation inhibitor. This test is considered of value in checking the oxidation stability of new mineral insulating oils containing 2,6-ditertiary-butyl para-cresol or 2,6-ditertiary-butyl phenol, or both, in order to control the continuity of this property from shipment to shipment. The applicability of this procedure for use with inhibited mineral insulating oils of more than 12 cSt at 40°C (approximately 65 SUS at 100°F) has not been established.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* (See 6.7).

NOTE 1—A modification of this test method, which uses the same procedure and apparatus but a higher (150°C) bath temperature, has been published as Test Method D 2272.

2. Referenced Documents

2.1 ASTM Standards:

B 1 Specification for Hard-Drawn Copper Wire²

D 2272 Test Method for Oxidation Stability of Steam Turbine Oils by Rotating Pressure Vessel³

E 1 Specification for ASTM Thermometers⁴

3. Summary of Test Method

3.1 The test specimen is agitated by rotating axially at 100 rpm at an angle of 30° from the horizontal, under an initial oxygen pressure of 90 psi (620 kPa), in a stainless steel or copper vessel (for rapid temperature equilibrium), with a glass test specimen container and copper catalyst coil, in the pres-



FIG. 1 Rotating Vessel Oxidation Test Apparatus

ence of water, at a bath temperature of 140°C. The time for an oil to react with a given volume of oxygen is measured; completion of the test is indicated by a specific drop in pressure.

4. Significance and Use

4.1 This is a control test of oxidation stability of new, inhibited mineral insulating oils for determining the induction period of oxidation inhibitors under prescribed accelerated aging conditions. There is no proven correlation between oil performance in this test and performance in service. However, the test method may be used to check the continuity of oxidation stability of production oils.

5. Apparatus

5.1 *Oxidation Vessel*—Glass test specimen container with cover and catalyst coil, pressure gage, thermometer, test bath, and accessories as described in Annex A1. The assembled apparatus is shown in Fig. 1, and its design shown schematically in Fig. 2.

6. Reagents and Materials

6.1 *Purity of Reagents*—Use reagent grade chemicals in all tests. Unless otherwise indicated, all reagents shall conform to the specifications of the Committee on Analytical Reagents of

¹ This test method is under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Gases and is the direct responsibility of Subcommittee D27.06 on Chemical Test.

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² Annual Book of ASTM Standards, Vol 02.03.

³ Annual Book of ASTM Standards, Vol 05.01.

⁴ Annual Book of ASTM Standards, Vol 14.03.