



Designation: D1275 – 06

315/98

Standard Test Method for Corrosive Sulfur in Electrical Insulating Oils¹

This standard is issued under the fixed designation D1275; 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 adopted for use by government agencies to replace Method 5328-2 of Federal Test Method Standard No. 791b. This standard was adopted as an ASTM-IP Standard.

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

1. Scope

1.1 This test method describes the detection of corrosive sulfur compounds (both inorganic and organic) in electrical insulating oils of petroleum origin.

1.2 New and in-service mineral insulating oils may contain substances that cause corrosion under certain conditions of use. This test method is designed to detect the presence of, or the propensity to form, free (elemental) sulfur and corrosive sulfur compounds by subjecting copper to contact with oil under prescribed conditions.

1.3 Two methods (A and B) have been introduced where historically there has only been one. Method A is the one that has been in place since 1953. Method B is more rigorous and the preferred method.

1.4 The values stated in SI units are to be regarded as the standard. Inch-pound units are included for informational purposes.

1.5 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D130 Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test

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 For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

2.2 Other Document:

ANSI B74.10 Grading of Abrasive Microgrits³

3. Summary of Test Methods

3.1 *Method A*—250 mL of oil is aged in a sealed flask for 19 h at 140°C in the presence of a copper strip.

3.2 *Method B*—220 mL of oil is aged in a sealed heavy-walled bottle for 48 h at 150°C in the presence of a copper strip. This is the preferred method.

4. Significance and Use

4.1 In most of their uses, insulating oils are continually in contact with metals that are subject to corrosion. The presence of corrosive sulfur compounds will result in deterioration of these metals. The extent of deterioration is dependent upon the quantity and type of corrosive agent and time and temperature factors. Detection of these undesirable impurities, even though not in terms of quantitative values, is a means for recognizing the hazard involved.

5. Apparatus

5.1 *Bath*—A hot-air oven or oil bath provided with suitable means of heating to, and controlling at 140 or 150 ± 2°C. A circulating hot-air oven is preferred.

5.2 *Flasks*—Narrow-mouth, 250-mL, ground-glass stoppered flasks, of chemically resistant glass, capable of holding 270 to 280 mL when filled completely to the stopper. Flasks of such capacity are required in order to allow sufficient space for expansion of the oil.

5.3 *Bottles*⁴—Heavy walled, 250 mL, bottles of chemically resistant glass constructed with necks to receive a PTFE

³ Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036, USA.

⁴ The sole source of supply of the bottles and PTFE screw plugs known to the committee at this time is Ace Glass, P.O. Box 688, Vineland, NJ 08362, USA. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.