



Standard Test Method for Deposition Tendencies of Liquids in Thin Films and Vapors¹

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1. Scope

1.1 This test method covers the determination of the tendency of liquids in thin films and of vapors to form deposits on metal surfaces. The test method applies to both petroleum-based and synthetic lubricants, hydraulic fluids, heat-transfer fluids, and related materials.²

1.2 The values stated in SI units are to be regarded as the standard. In cases where materials, products, or equipment are available in inch-pound units only, SI units are omitted.

1.3 *This standard does not purport to address all of 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.* For specific warning statements, see Section 7 and Annex A2.

2. Referenced Documents

2.1 ASTM Standards:³

D216 Method of Test for Distillation of Natural Gasoline
(Withdrawn 1988)⁴

D323 Test Method for Vapor Pressure of Petroleum Products
(Reid Method)

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.L0.07 on Engineering Sciences of High Performance Fluids and Solids (Formerly D02.1100).

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² United States Patent 2,669,865. Joseph Cole and John Krawetz.

³ 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.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

E230 Specification and Temperature-Electromotive Force (EMF) Tables for Standardized Thermocouples

2.2 *ANSI Standard:*

C96.1 Temperature Measurement Thermocouples.⁵

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *deposit tendency, n*—deposition tendency of a thin film or vapor is an index of the propensity of a material to form carbonaceous residues on hot surfaces in contact with the liquid or vapor phase of the sample.

4. Summary of Test Method

4.1 The test specimen is allowed to flow slowly in a thin film over a steel test specimen in a constant-temperature chamber (furnace liner). Circulation of the sample from the sump to the heated surface and back to the sump is accomplished by means of a peristaltic pump. After the prescribed test period, the steel test specimen is removed from the apparatus and evaluated. The masses of deposits remaining after washing with pentane, after washing with chloroform, and after wiping with a paper tissue are reported.

4.2 An optional procedure (see Annex A1) provides a method for the determination of the tendency of sample vapors to form deposits on heated surfaces. A second test specimen is placed in the vapor space over a thin flowing film of the liquid in a constant-temperature chamber (furnace liner). After circulation of the test liquid for a specified time the deposits on the test specimen exposed to the liquid and the vapor phases are measured in the manner described in 4.1.

5. Significance and Use

5.1 The test method shall measure the deposit formation tendencies of liquids on steel surfaces in air at 101.3 KPa (1-atm) pressure. Other surfaces and other atmospheric media

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.