



Designation: D1881 – 24

Standard Test Method for Foaming Tendencies of Engine Coolants in Glassware¹

This standard is issued under the fixed designation D1881; 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 U.S. Department of Defense.

1. Scope*

1.1 This test method covers a simple glassware test for evaluating the tendency of engine coolants to foam under laboratory-controlled conditions of aeration and temperature.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are approximate equivalents provided for information purposes only.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific warning statements, see Section 7, Materials and Reagents.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1176 Practice for Sampling and Preparing Aqueous Solutions of Engine Coolants or Antirusts for Testing Purposes

D1193 Specification for Reagent Water

D3585 Specification for ASTM Reference Fluid for Coolant Tests

E1 Specification for ASTM Liquid-in-Glass Thermometers

E128 Test Method for Maximum Pore Diameter and Permeability of Rigid Porous Filters for Laboratory Use

E230/E230M Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *break time, n*—the time required for the foam to collapse (after the air supply has been shut off) to the first appearance of an “eye” on the surface of the test solution.

3.1.2 *eye, n*—the appearance of foam free area on the surface of the test coolant surrounded by a ring of foam clinging to the cylinder walls.

4. Summary of Test Method

4.1 A solution of coolant and ASTM Type II water is blown with air at a constant rate for 5 min. The solution is heated by means of a suitable temperature bath and the aeration shall start once the temperature reaches $88^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($190^{\circ}\text{F} \pm 2^{\circ}\text{F}$). The volume of foam, and the time for such foam to break, are measured.

5. Significance and Use

5.1 The test method generally will distinguish coolants that have a tendency to foam excessively from those that are suitable for further evaluation to determine performance in actual service.

NOTE 1—In use, the foaming tendency of a coolant solution may be increased by service aging or contamination. A properly functioning pressure cap will tend to suppress foaming in coolant solutions.

6. Apparatus

6.1 *Container*—A 500 mL graduated container of heat-resistant glass, having a diameter of 45 mm to 50 mm and a length of 380 mm.

6.2 *Temperature Bath*—A heat-resistant glass container large enough to permit immersion of the graduated container at least to the 350 mL graduation mark. A 4000 mL beaker is satisfactory.

6.3 *Heat Source*—Any heating system capable of maintaining a uniform bath temperature $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$). A 750 W electric hot-plate is satisfactory.

¹ This test method is under the jurisdiction of ASTM Committee D15 on Engine Coolants and Related Fluids and is the direct responsibility of Subcommittee D15.06 on Glassware Performance Tests.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard