



Standard Test Method for Simulated Service Corrosion Testing of Engine Coolants¹

This standard is issued under the fixed designation D2570; 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.

1. Scope*

1.1 This test method evaluates the effect of a circulating engine coolant on metal test specimens and automotive cooling system components under controlled, essentially isothermal laboratory conditions.

1.2 This test method specifies test material, cooling system components, type of coolant, and coolant flow conditions that are considered typical of current automotive use.

1.3 The values stated in foot-pound-second units are to be regarded as the standard. The values given in parentheses (SI units) are approximate equivalents for information only.

1.4 *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.* Specific precautionary statements are given in Section 6.

2. Referenced Documents

2.1 ASTM Standards:²

D1121 Test Method for Reserve Alkalinity of Engine Coolants and Antirusts

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

D1193 Specification for Reagent Water

D1287 Test Method for pH of Engine Coolants and Antirusts

D1384 Test Method for Corrosion Test for Engine Coolants in Glassware

D2758 Test Method for Engine Coolants by Engine Dynamometer

D2847 Practice for Testing Engine Coolants in Car and Light Truck Service

D3306 Specification for Glycol Base Engine Coolant for

Automobile and Light-Duty Service

D4985 Specification for Low Silicate Ethylene Glycol Base Engine Coolant for Heavy Duty Engines Requiring a Pre-Charge of Supplemental Coolant Additive (SCA)

2.2 SAE Standard:³

SAE J20e Standard for Coolant System Hoses

2.3 ASTM Adjuncts:

Coolant reservoir (1 drawing)

Framework for test equipment (3 drawings and B/M)

3. Summary of Test Method

3.1 An engine coolant is circulated for 1064 h at 190°F (88°C) in a flow loop consisting of a metal reservoir, an automotive coolant pump, an automotive radiator, and connecting rubber hoses. Test specimens representative of engine cooling system metals are mounted inside the reservoir, which simulates an engine cylinder block. At the end of the test period, the corrosion-inhibiting properties of the coolant are determined by measuring the mass losses of the test specimens and by visual examination of the interior surfaces of the components.

4. Significance and Use

4.1 This test method, by a closer approach to engine cooling system conditions, provides better evaluation and selective screening of engine coolants than is possible from glassware testing (Test Method **D1384**). The improvement is achieved by controlled circulation of the coolant, by the use of automotive cooling system components, and by a greater ratio of metal surface area to coolant volume.

4.2 Although this test method provides improved discrimination, it cannot conclusively predict satisfactory corrosion inhibition and service life. If greater assurance of satisfactory performance is desired, it should be obtained from full-scale engine tests (Test Method **D2758**) and from field testing in actual service (Practice **D2847**).

4.3 Significance and interpretation of the test and its limitations are discussed further in **Appendix X1**.

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 **D15.09** on Simulated Service Tests.

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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.

³ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, <http://www.sae.org>.

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