



Standard Test Method for Simulated Service Corrosion Testing of Non-Aqueous Engine Coolants¹

This standard is issued under the fixed designation D8034/D8034M; 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 either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard. Some values have only SI units because the inch-pound equivalents are not used in practice.

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

D2570 Test Method for Simulated Service Corrosion Testing of Engine Coolants

D7935/D7935M Test Method for Corrosion Test for Non-Aqueous Engine Coolants in Glassware

E203 Test Method for Water Using Volumetric Karl Fischer Titration

2.2 SAE Standards:³

SAE J20e Standard for Coolant System Hoses

2.3 ASTM Adjuncts:

Coolant reservoir (1 drawing)⁴

Framework for test equipment (3 drawings and B/M)⁵

3. Summary of Test Method

3.1 An engine coolant is circulated for 1064 h at 96.1°C [205°F] 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 **D7935/D7935M**). 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

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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>.

⁴ Detail drawings are available from ASTM International Headquarters. Order Adjunct No. **ADJD257001**. Original adjunct produced in 1982. Reservoirs of cast iron or cast aluminum, made in accordance with these drawings may be obtained from Commercial Machine Service, 1099 Touhy Ave., Elk Grove Village, IL 60007.

⁵ Detail and assembly drawings of a suitable framework and arrangement of components thereon are available from ASTM International Headquarters. Order Adjunct No. **ADJD257002**. Original adjunct produced in 1982.