



Standard Test Method for Effect of Cooling System Chemical Solutions on Organic Finishes for Automotive Vehicles¹

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1. Scope

1.1 This test method determines the effect of cooling system chemical solutions on organic finishes used on motor vehicles. Cooling system chemicals include: coolants or corrosion inhibitors, or both, cooling system cleaners or flushes, or both, and stop leak additives.

NOTE 1—This test method is a modification of Practice D 1540.

1.2 The values stated in SI units are to be regarded as the standard. The values stated in parentheses are for information 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products²

D 1176 Test Method for Sampling and Preparing Aqueous Solutions of Engine Coolants or Antirusts for Testing Purposes³

D 1193 Specification for Reagent Water⁴

D 1540 Practice for Effect of Chemical Agents on Organic Finishes Used in the Transportation Industry⁵

3. Summary of Test Method

3.1 Concentrated or diluted cooling system chemical solutions are brought into contact with organic finishes typical of those used on automobiles for 1 h at room temperature. The surface of the finish then is inspected visually for any of the surface changes mentioned in Section 4.

¹ This test method is under the jurisdiction of ASTM Committee D-15 on Engine Coolants and is the direct responsibility of Subcommittee D15.30 on Physical Properties.

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 15.05.

⁴ *Annual Book of ASTM Standards*, Vol 11.01.

⁵ Discontinued 1992. See the 1991 edition of the *Annual Book of ASTM Standards*, Vol 06.01.

4. Significance and Use

4.1 This test method will distinguish between cooling system chemical solutions that do or do not have a tendency to change the surface appearance when applied to organic finishes used on vehicles. Such changes may be manifested by discoloration, loss of gloss, softening, swelling, or other similar phenomena.

5. Materials

5.1 *Test Panels*—Steel panels, approximately 100 by 150 mm (4 by 6 in.) shall be prepared in accordance with the Methods of Preparation of Practice D 609. The surface of the test panels shall be roughened to 0.25 to 0.50 μm (10 to 20 $\mu\text{in.}$) prior to applying the organic finish. These panels shall be coated with an organic finish of the type used on vehicles such as clear coated and non-clear coated thermoset urethane and acrylic urethane finishes. Other finishes may be used upon agreement between the customer and supplier.

6. Test Solution

6.1 The coolant to be tested shall be either a concentrate or a dilution. Sufficient ASTM Type IV water shall be added to yield a solution of 50 % concentration by volume in accordance with Test Method D 1176, section on Preparation of Solutions Requiring Inclusion of Separated Solids and Liquids. Any separated solids or liquids shall be included in the test material.

6.2 Other cooling system chemicals shall be tested both without dilution and at a typical use concentration as indicated by instructions on the label. Any separated solids or liquids shall be included in the test material.

7. Procedure

7.1 Conduct the test at $25 \pm 5^\circ\text{C}$ without humidity control.

7.2 Select a test panel prepared in accordance with Section 5. Place sufficient test solution on the surface of the test panel to form spots approximately 25 mm (1 in.) in diameter.

7.3 After 1 h, wipe the surface with a wet cloth, buff with a soft, dry cloth and examine the finish for visual and physical evidence of the effects listed in Section 4.

7.4 Lightly polish the test surface with any well-known liquid car cleaner. Compare the untreated area with the treated spots on the basis of removability of the stain.

NOTE 2—Stains may disappear after short exposure to the weather, for

example, 8 to 24 h of sunshine. Such stains are considered by some persons to be unobjectionable.

8. Report

8.1 The report shall include the following:

8.1.1 Product and concentration tested.

8.1.2 Coating systems employed.

8.1.3 Type and appearance of the effect obtained on the test panel, as described in Section 4.

8.1.4 Any change in surface effect brought about by use of a polishing agent and by sunlight.

9. Precision and Bias

9.1 *Precision*—It is not practicable to specify the precision of the procedure in this test method because the results are subjective observations.

9.2 *Bias*—There is no acceptable reference material suitable for determining the bias for the procedure in this test method.

10. Keywords

10.1 automotive vehicles; chemical; cooling system; finishes; paint; staining

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