



Designation: D8567 – 24

Standard Test Method for Analysis of Engine Coolant for Organic Additives by High Performance Liquid Chromatograph¹

This standard is issued under the fixed designation D8567; 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 covers the chemical analysis of engine coolant for azoles and organic acids by high performance liquid chromatography (HPLC).

1.2 This test method is applicable to both new and used engine coolant.

1.3 Analysis can be performed directly by this test method without pretreatment other than dilution and filtration, as required by the calibration ranges of the equipment.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *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.*

1.6 *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

3. Summary of Test Method

3.1 A sample of engine coolant is prepared by dilution with water. This diluted sample is placed into a sample vial which is

then run through the instrument. The outcome will yield the concentration of organic-based coolant additives, specifically carboxylate-, triazole-, and thiazole-based additives.

4. Significance and Use

4.1 This test method provides for the qualitative and quantitative determination of common organic additives in engine coolant in milligrams per liter and only requires a few milliliters of sample per test, with results typically available in 12 min.

5. Interferences

5.1 The example methods have been vetted to provide the least number of interferences.

5.2 Method interferences can be caused by contamination of glassware, eluent, reagents, etc. Care must be taken to ensure that contamination is kept at the lowest possible level.

5.3 Interferences will have to be determined by each system.

NOTE 1—The use of latex or nitrile gloves is highly recommended to prevent contamination during sample and eluent preparation.

6. Apparatus

6.1 *Analytical Balance*, capable of weighing accurately to 0.0001 g.

6.2 *Ultrasonic Bath*.

6.3 *High Performance Liquid Chromatograph*.

6.4 *Gradient Pump*.

6.5 *Appropriate Analytical HPLC Column*.

6.6 *Column Heater (Optional)*.

6.7 *Ultraviolet Detector*.

6.8 *Optional Light Scattering Detector*.

6.9 *Integrator or Chromatography Data System Software*.

6.10 **Table 1** shows some of the specification needs for the example methods.

7. Reagents

7.1 *Purity of Reagents*—Reagent grade or higher purity chemicals should be used for the preparation of all samples,

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 D15.21 on Extended Life Coolants.

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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.