Designation: D1122 – 08

StandardTest Method for Density or Relative Density of Engine Coolant Concentrates and Engine Coolants By The Hydrometer[1]

This standard is issued under the fixed designation D1122; 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 Department of Defense.

1. Scope*

1.1 This test method covers the determination of the relative density of engine coolant concentrates and engine coolants.

1.2 The values stated in SI units are to be regarded as standard. The values given 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:*[2]

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

E1 Specification for ASTM Liquid-in-Glass Thermometers

E100 Specification for ASTM Hydrometers

3. Terminology

3.1 *Definitions:*

3.1.1 *relative density, n*—the ratio of the density of a material at a stated temperature to the density of water at the same stated temperature.

4. Significance and Use

4.1 The relative density of an engine coolant may be used to determine the approximate percent glycol, freezing point, and boiling point, provided the glycol type is known.

4.2 The relative density of an engine coolant concentrate can be used as a production control test.

5. Apparatus

5.1 *Hydrometers*—Hydrometers shall be of glass, graduated in specific gravity range as listed in Table 1, and shall conform to Specification E100.

5.2 *Hydrometer Cylinder*—The hydrometer cylinder in which the sample for the relative density test is confined shall be made of clear glass and shall be cylindrical in shape. For convenience in pouring, it may have a lip on the rim. The inside diameter of the cylinder shall be at least 25.4 mm (1.0 in.) greater than the outside diameter of the hydrometer. The height of the cylinder shall be such that the length of the column of sample it contains is greater by at least 25.4 mm (1.0 in.) than the portion of the hydrometer which is immersed beneath the surface of the sample after a state of equilibrium has been reached.

5.3 *Thermometer*—An ASTM Gravity Thermometer 12C, having a range from −20 to 120°C (or 12F having a range from −5 to 215°F) and conforming to Specification E1, or some other suitable non-mercury containing temperature measuring device, such as a thermocouple, capable of operating in the same temperature range and having equal or better accuracy.

5.4 *Water Bath*—A water bath capable of maintaining a sample temperature of 15.5 ± 0.3°C (60 ± 0.5°F) during the test.

6. Sampling

6.1 Sample the coolant in accordance with Test Method D1176, except as specified in this test method.

7. Procedure

7.1 If the coolant has a small amount of separated upper layer, remove it before determining the relative density of the lower layer. To separate, pour the sample into a 500-mL separatory funnel, allow to stand for 3 h at room temperature but not below 20°C (68°F), and then draw off the lower layer.

7.2 If the original coolant is homogeneous, no separation will be required.

7.3 Cool the homogeneous sample or the separated lower layer sample to about 14°C (57°F). Pour the sample into the

[1] This test method is under the jurisdiction of ASTM Committee D15 on Engine Coolants and is the direct responsibility of Subcommittee D15.03 on Physical Properties.

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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.

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