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.

Designation: D8485 – 23

Standard Test Method for Corrosion Test for Electric Vehicle Coolants in Glassware[1]

This standard is issued under the fixed designation D8485; 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 a simple beaker-type procedure for evaluating the effects of glycol-based electric vehicle coolants on metal specimens under controlled laboratory conditions.

1.2 This test method evaluates the corrosion on test specimens of stainless steel and aluminum, with an option for a copper test specimen.

1.3 This test method evaluates coolants without the addition of any corrosive elements.

1.4 Additional types of metal test specimens may be evaluated.

1.5 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.6 *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.*

1.7 *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:*

D1125 Test Methods for Electrical Conductivity and Resistivity of Water

D1193 Specification for Reagent Water

D1384 Test Method for Corrosion Test for Engine Coolants in Glassware

D4725 Terminology for Engine Coolants and Related Fluids

D6130 Test Method for Determination of Silicon and Other Elements in Engine Coolant by Inductively Coupled Plasma-Atomic Emission Spectroscopy

E178 Practice for Dealing With Outlying Observations

E2470 Specification for Polyester Grade Ethylene Glycol

3. Terminology

3.1 *Definitions:* For definitions of general terms used in D15 standards, refer to Terminology D4725.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *electric vehicle, n*—a motor vehicle that uses an electric motor as a means of propulsion.

3.2.1.1 *Discussion*—An electric vehicle may be either a fuel cell vehicle, battery electric vehicle or a plug-in hybrid electric vehicle.

4. Summary of Test Method

4.1 In this test method, specimens of metals typical of those present in electric vehicle cooling systems are totally immersed in aerated coolant solutions for 336 h at 88 °C. The corrosion-inhibitive properties of the test solution are evaluated on the change in weight incurred by the specimens. Each test is run in triplicate, and the average weight change is determined for each metal.

5. Significance and Use

5.1 This test method provides a method to distinguish between coolants that are deleterious from the corrosion standpoint and those suitable for further evaluation.

6. Apparatus

6.1 *Container*—1000 mL 3-Neck Glass Cylinder Reactor, Flat Bottom Reaction Flask with a PTFE O-Ring and clamp. See Fig. 1.

6.2 *Water Condenser,* joint size to match middle neck of container in 6.1.

6.3 Two inlet adapters to accommodate an aerator tube and temperature probe. Joint size to match side necks of container in 6.1.

6.4 Optionally a 1000 mL, tall-form, spoutless beaker, made of heat-resistant glass, for containing the engine coolant solution and test specimens. The beaker shall be tightly closed

[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 D15.93 on Research and Long Range Planning.

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