Designation: D4350 – 16 (Reapproved 2022)

Standard Test Method for Corrosivity Index of Plastics and Fillers[1]

This standard is issued under the fixed designation D4350; 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 U.S. Department of Defense.

1. Scope

1.1 This test method is designed for use in obtaining the specific conductance of a water extract of plastics and fillers. The magnitude of this conductance, called the corrosivity index, is an index of the likelihood that, in a humid atmosphere, metal surfaces in contact with these materials can be corroded due to galvanic action or direct chemical attack.

NOTE 1—There is no known ISO equivalent to this standard.

1.2 The values stated in SI units are to be regarded as standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in Section 7.

1.4 *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]

D618 Practice for Conditioning Plastics for Testing

D883 Terminology Relating to Plastics

D1193 Specification for Reagent Water

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

E145 Specification for Gravity-Convection and Forced-Ventilation Ovens

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

3. Terminology

3.1 *Definitions of Terms*—For definitions of terms used in this test method associated with plastics issues refer to the terminology contained in Terminology D883.

4. Significance and Use

4.1 This test method provides a means for comparing the corrosive potential of plastics and fillers in humid atmospheres.

4.2 This test method is intended for use in research and evaluation.

5. Apparatus

5.1 *Conductance Bridge,* Wheatstone type, with a range from 1 to 250 000-Ω measured resistance, a built-in potentiometer, a 1000 ± 50-cycles per second oscillator, and a sensitive null point indicator. The bridge shall be capable of measuring resistance with an accuracy of ±2 %.

5.2 *Conductivity Cell,* dip-type, micro, for solutions of medium conductance. The cell needs to have a cell constant of approximately 1.0 cm^{-1}. The borosilicate glass shall have a maximum outside tube diameter of 12.7 mm, overall length of 177.8 mm, chamber inside diameter of 9.5 mm, and chamber depth of 50.8 mm.[3]

5.3 *Drill,* electric, capable of holding a 10.54-mm drill bit, and rotating at 500-r/min maximum speed.

5.4 *Mill,* such as laboratory Wiley cutting mill or equivalent.

5.5 *Sieves,* standard (alternative) sieve designations 425 µm (No. 40), and 250 µm (No. 60) in accordance with Specification E11.

[1] This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.16 on Thermosetting Materials.

Current edition approved Nov. 1, 2022. Published November 2022. Originally approved in 1984. Last previous edition approved in 2016 as D4350 - 16. DOI: 10.1520/D4350-16R22.

[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] The sole source of supply of the conductivity cell (Model No. 3403) known to the committee at this time is Yellow Springs Instrument Co., Inc., P.O. Box 279, Yellow Springs, OH 45387. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.

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

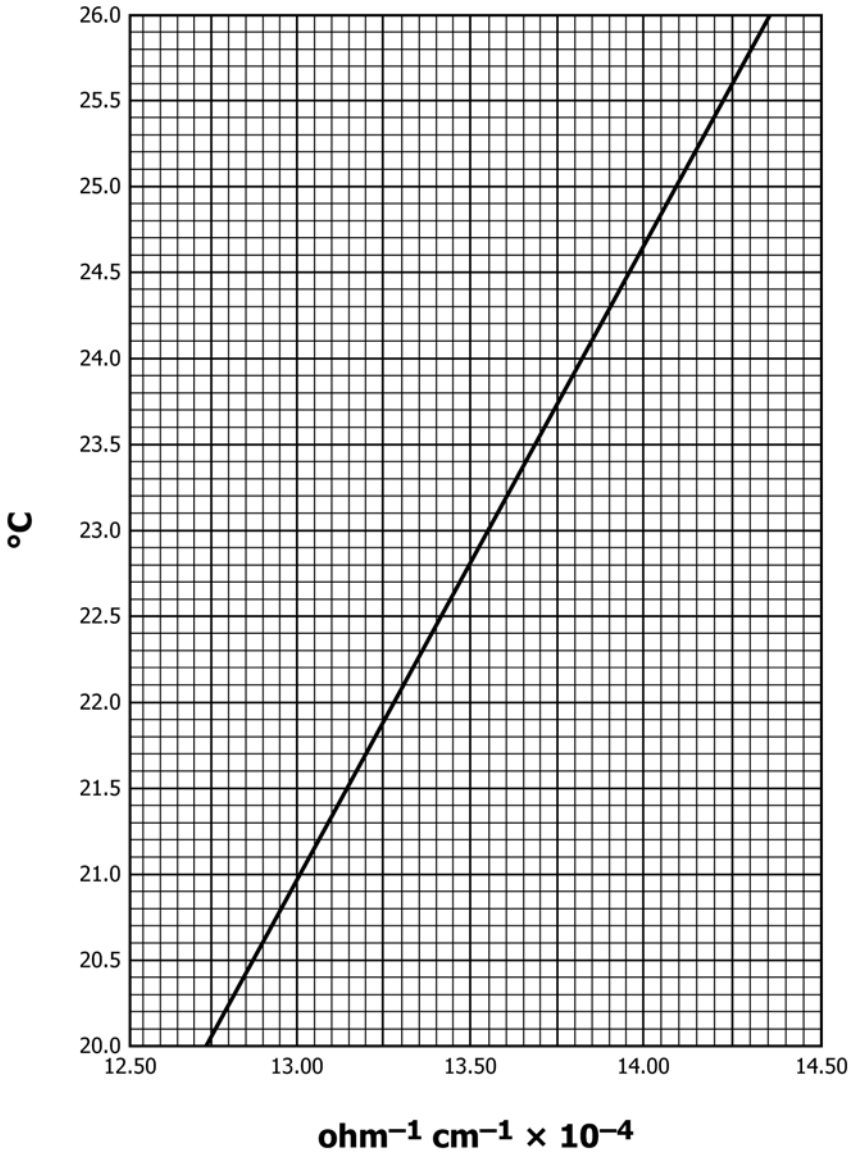

FIG. 1 Specific Conductance of 0.0100 Demal KCl

5.6 *Analytical Balance,* capable of determining mass to the nearest 1.0 mg.

5.7 *Oven,* forced-ventilation type, with uniformity of temperature within ±1 % of the differential between oven and ambient temperature, with a rate of ventilation of 100 to 200 air changes per hour, in accordance with Specification E145, Type IIA.

5.8 *Thermometer,* solid-stem, precision, ASTM No. S63C, in accordance with Specification E2251. Temperature measuring devices with equivalent accuracy and characteristics, such as RTDs and thermistors, are permitted. Additionally, use of ASTM No. S63C in accordance with Specification E2251 is acceptable.

5.9 *Chemical Glassware:*

5.9.1 *Borosilicate Glass Flask,* nominally 1000-mL size, with ground glass stopper.

5.9.2 *Borosilicate Glass Erlenmeyer Flask,* 65-mL actual capacity to bottom of stopper (nominally 50-mL size), with ground glass stopper No. 19.

5.9.3 *Pipet,* volumetric, 50-mL capacity, calibrated "to deliver."

6. Reagents and Materials

6.1 *Distilled Water,* Type III, reagent water as defined in Specification D1193. When stored in borosilicate glass bottles at 23 ± 2°C, the water shall have a calculated specific conductance of less than 2.0×10^{-6}, ohm^{-1}, cm^{-1}.

6.2 *Potassium Chloride Solution,* consisting of 0.7453 g of reagent grade potassium chloride, previously dried at 105 ± 3°C for at least 24 h, dissolved in 1000 g of distilled water. The solution shall be stored in a borosilicate glass stoppered bottle. The specific conductance of this 0.0100 Demal KCl solution is