



Designation: D709 – 17

Standard Specification for Laminated Thermosetting Materials¹

This standard is issued under the fixed designation D709; 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 specification covers laminated thermosetting materials consisting of two or more plies or layers of reinforcing material bonded by a thermosetting synthetic resin. Examples of such reinforcement are cellulose paper, cotton fabric, glass fabric, and synthetic fiber fabrics. These materials are available in the form of sheets, rolled and molded tubes, and molded rods.

1.2 The values stated in inch-pound units are to be regarded as the standard.

NOTE 1—This specification resembles IEC 60893-3 in title only. The content is significantly different.

1.3 The following safety hazards caveat pertains only to the test methods described in this specification. *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.*

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

D229 Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation

D257 Test Methods for DC Resistance or Conductance of Insulating Materials

D348 Test Methods for Rigid Tubes Used for Electrical Insulation

D349 Test Methods for Laminated Round Rods Used for Electrical Insulation

D495 Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation

D621 Test Methods for Deformation of Plastics Under Load (Withdrawn 1994)³

D668 Test Methods of Measuring Dimensions of Rigid Rods and Tubes Used for Electrical Insulation

D883 Terminology Relating to Plastics

D1180 Method of Test for Warpage of Sheet Plastics (Withdrawn 1988)³

D1711 Terminology Relating to Electrical Insulation

D2303 Test Methods for Liquid-Contaminant, Inclined-Plane Tracking and Erosion of Insulating Materials

D2304 Test Method for Thermal Endurance of Rigid Electrical Insulating Materials

D3636 Practice for Sampling and Judging Quality of Solid Electrical Insulating Materials

D6054 Practice for Conditioning Electrical Insulating Materials for Testing (Withdrawn 2012)³

2.2 IEEE Standards:⁴

1 General Principles for Temperature Limits in the Rating of Electric Equipment

98 Guide for the Preparation of Test Procedures for the Thermal Evaluation and Establishment of Temperature Indices of Solid Electrical Insulating Materials

99 Guide for the Preparation of Test Procedures for the Thermal Evaluation of Insulation Systems for Electric Equipment

101 Guide for the Statistical Analysis of Thermal Life Test Data

2.3 NEMA Standards:⁵

LI 1-1971 Industrial Laminated Thermosetting Products

LI 5-1969 Temperature Indices of Industrial Thermosetting Laminates

¹ This specification is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.07 on Electrical Insulating Materials.

Current edition approved April 1, 2017. Published April 2017. Originally approved in 1943. Last previous edition approved in 2013 as D709 – 16. DOI: 10.1520/D0709-17.

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 last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., P.O. Box 1331, Piscataway, NJ 08854-1331, <http://www.ieee.org>.

⁵ Available from National Electrical Manufacturers Association (NEMA), 1300 N. 17th St., Suite 1752, Rosslyn, VA 22209, <http://www.nema.org>.

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