



Designation: D 709 – 00

Standard Specification for Laminated Thermosetting Materials¹

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This standard has been approved for use by agencies of the 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, asbestos fabric, glass fabric, and synthetic fiber fabrics.

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

NOTE 1—The properties included in this specification are those required to identify the types and grades of laminated thermosetting materials covered. There may be other requirements necessary to identify particular characteristics. These will be added to the specification as their inclusion becomes generally desirable and the necessary test data and methods become available.

NOTE 2—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.* For a specific warning statement see Note 10.

2. Referenced Documents

2.1 ASTM Standards:

- D 229 Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation²
- D 257 Test Methods for DC Resistance or Conductance of Insulating Materials²
- D 348 Test Methods for Rigid Tubes Used for Electrical Insulation²
- D 349 Test Methods for Laminated Round Rods Used for Electrical Insulation²
- D 495 Test Method for High-Voltage, Low-Current, Dry

Arc Resistance of Solid Electrical Insulation²

D 621 Test Methods for Deformation of Plastics Under Load³

D 668 Test Methods for Measuring Dimensions of Rigid Rods and Tubes Used for Electrical Insulation²

D 785 Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials⁴

D 883 Terminology Relating to Plastics⁴

D 1180 Test Method for Bursting Strength of Round Rigid Plastic Tubing⁵

D 1711 Terminology Relating to Electrical Insulation²

D 2303 Test Method for Liquid-Contaminant, Inclined-Plane Tracking and Erosion of Insulating Materials²

D 2304 Test Method for Thermal Endurance of Rigid Electrical Insulating Materials²

D 3636 Practice for Sampling and Judging Quality of Solid Electrical Insulating Materials⁶

D 6054 Practice for Conditioning Electrical Insulating Materials for Testing⁵

2.2 IEEE Standards:⁷

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:⁸

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 Flexible and Rigid Insulating Materials.

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² *Annual Book of ASTM Standards*, Vol 10.01.

³ *Discontinued*—See 1993 *Annual Book of ASTM Standards*, Vol 08.01.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.

⁵ *Discontinued*—See 1989 *Annual Book of ASTM Standards*, Vol 08.04.

⁶ *Annual Book of ASTM Standards*, Vol 10.02.

⁷ Available from the Institute of Electrical and Electronics Engineers, 345 E. 47 St., New York, NY 10017.

⁸ Available from the National Electrical Manufacturers Association, 2101 L Street, NW, Washington, DC, 20037.