



Designation: D710 – 19

Standard Specification for Vulcanized Fibre Sheets, Rolls, Rods, and Tubes Used for Electrical Insulation¹

This standard is issued under the fixed designation D710; 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 vulcanized fibre (Note 1) sheets, rolls, round rods, and round tubes of such grades suitable for use as electrical insulation.

NOTE 1—The variant spelling “fibre” has been approved by Committee D09 for use in this standard.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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

- D495 Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation
- D619 Test Methods for Vulcanized Fibre Used for Electrical Insulation
- D696 Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer
- D952 Test Method for Bond or Cohesive Strength of Sheet Plastics and Electrical Insulating Materials
- D3636 Practice for Sampling and Judging Quality of Solid Electrical Insulating Materials

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 Nov. 1, 2019. Published December 2019. Originally approved in 1943. Last previous edition approved in 2013 as D710 – 97 (2013). DOI: 10.1520/D0710-19.

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.

2.2 Other Documents:³

IEEE Publication No. 1, “General Principles for Temperature Limits in the Rating of Electrical Equipment.”

3. Terminology

3.1 Definitions:

3.1.1 *vulcanized fibre, n*—a material made from chemically gelatinized cellulosic paper or board using zinc chloride as the gelatinizing agent.

3.1.1.1 *Discussion*—The zinc chloride is subsequently removed by leaching. The resulting product, after being dried and finished by calendering, is a material of partially regenerated cellulose in which the fibrous structure is retained in varying degrees depending on the grade of paper used and on the processing conditions. Vulcanized fibre does not contain vulcanized rubber or sulfur as the name might imply. It is almost completely pure cellulose, with a trace amount of zinc chloride.

4. Grades

4.1 Three grades of vulcanized fibre are covered, as follows:

4.1.1 *Bone Grade*—This grade is characterized by the greater hardness and stiffness associated with higher density. It machines more smoothly and with less tendency to separate the plies in difficult machining operations than the other grades. It is made in thickness of $\frac{1}{64}$ to $\frac{1}{16}$ in. (0.38 to 1.59 mm).

4.1.2 *Commercial Grade*—This grade is considered as the general-purpose grade and is sometimes referred to as mechanical and electrical grade. It possesses good physical and electrical properties and can be fabricated satisfactorily by punching, turning, and forming operations. It is made in thicknesses from 0.005 to 0.100 in. (0.12 to 2.54 mm).

4.1.3 *Electrical Insulation Grade*—This grade is intended primarily for electrical applications and others involving difficult bending or forming operations. It is made in thicknesses from 0.005 to $\frac{3}{32}$ in. (0.12 to 2.35 mm). Thin material of this grade is sometimes referred to as “fish paper.”

³ 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>.

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