Designation: D 229 – 01

An American National Standard

Standard Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation[1]

This standard is issued under the fixed designation D 229; 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 Department of Defense.

1. Scope

1.1 These test methods cover procedures for testing rigid electrical insulation normally manufactured in flat sheet or plate form. They are generally used as terminal boards, spacers, voltage barriers, and circuit boards.

NOTE 1—For tests applying to vulcanized fibre reference should be made to Test Methods D 619.

NOTE 2—This standard resembles IEC 60893-2, Specification for Rigid Industrial Laminated Sheets Based On Thermosetting Resins for Electrical Purpose, Methods of Tests.

1.2 The test methods appear in the following sections:

Test	Sections	ASTM Test Method
Acetone extractable matter	83 to 84	D 494
Arc resistance	47	D 495
Ash	56 to 60	...
Bonding strength	49 to 54	...
Burning rate and flame resistance	61 to 75	...
Compressive strength	25	D 695
Conditioning	4	D 6054
Dissipation factor	34 to 40	D 669
Dielectric strength	28 to 33	D 149
Expansion (linear thermal)	76	D 696
Flexural properties	12 to 24	D 790
Hardness (Rockwell)	55	D 785
Insulation resistance and resistivity	41 to 46	D 257
Permittivity	34 to 40	D 150
Resistance to impact	26	D 256
Tensile properties	7 to 11	D 638
Thickness	5 to 6	D 374
Tracking resistance	48	D 2132
Warp or twist	77 to 82	...
Water absorption	27	D 570

1.3 The values stated in inch-pound units are to be regarded as the standard. The metric equivalents of inch-pound units given in these test methods may be approximate.

1.4 This is a fire-test-response standard. See Sections 61 through 75, which are the procedures for burning rate and flame resistance.

1.5 *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.* Specific precautionary statements are given in 31.1 and 61.5.

2. Referenced Documents

2.1 *ASTM Standards:*

D 149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies[2]

D 150 Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation[2]

D 256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics[3]

D 257 Test Methods for DC Resistance or Conductance of Insulating Materials[2]

D 374 Test Methods for Thickness of Solid Electrical Insulation[2]

D 494 Test Method for Acetone Extraction of Phenolic Molded or Laminated Products[4]

D 495 Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation[2]

D 570 Test Method for Water Absorption of Plastics[3]

D 617 Test Method for Punching Quality of Phenolic Laminated Sheets[2]

D 619 Test Methods for Vulcanized Fibre Used for Electrical Insulation[2]

D 638 Test Method for Tensile Properties of Plastics[3]

D 669 Test Method for Dissipation Factor and Permittivity Parallel with Laminations of Laminated Sheet and Plate Materials[2]

D 695 Test Method for Compressive Properties of Rigid Plastics[3]

[1] These test methods are under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and are 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] *Annual Book of ASTM Standards*, Vol 08.01.

[4] *Discontinued*; see *1991 Annual Book of ASTM Standards*, Vol 10.01.

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