



Standard Test Methods for Polymeric Films Used for Electrical Insulation¹

This standard is issued under the fixed designation D 2305; 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.

1. Scope

1.1 These test methods cover the testing of homogeneous organic polymer films not over 2.4 mm (95 mils) thick that are to be used for electrical insulation.

1.2 These test methods are not necessarily applicable to testing films in combinations with a coating, another film, or with other types of substrate, such as fabrics or papers.

1.3 The values stated in SI units are the standard. The values in parentheses are provided for information only.

1.4 The procedures appear in the following sections:

Procedure	Sections
Conditioning	5 and 6
Dielectric Breakdown Voltage & Dielectric Strength	20 to 25
Extractables	64
Heat-Seal Strength	58 to 63
Permittivity and Dissipation Factor	41 to 46
Resistance Method for Measuring the Tendency to Corrode Metals	37 to 40
Sampling	4
Shrinkage	47 to 52
Strain Relief	12 to 19
Surface Resistivity	26 to 30
Tensile Properties	11
Thickness	7 to 10
Volume Resistivity	31 to 36
Water Absorption	52 to 57

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.* For a specific warning statement see 23.1.

NOTE 1—These test methods are similar to IEC 60674–2.

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 Frequencies²

D 150 Test Methods for A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials²

D 257 Test Methods for D-C Resistance or Conductance of Insulating Materials²

D 374 Test Methods for Thickness of Solid Electrical Insulation²

D 570 Test Method for Water Absorption of Plastics³

D 882 Test Methods for Tensile Properties of Thin Plastic Sheeting³

D 883 Terminology Relating to Plastics³

D 1000 Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications²

D 1531 Test Methods for Relative Permittivity (Dielectric Constant) and Dissipation Factor by Fluid Displacement Procedures⁴

D 1676 Test Methods for Film-Insulated Magnet Wire²

D 1711 Terminology Relating to Electrical Insulation²

D 5032 Practice for Maintaining Constant Relative Humidity by Means of Aqueous Glycerin Solutions⁴

D 6054 Practice for Conditioning Electrical Insulating Materials for Testing²

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁵

2.2 IEC Standard:

Publication 60674–2 Specification for Plastic Films for Electrical Purposes⁶

3. Terminology

3.1 Definitions:

3.1.1 Definitions are in accordance with Terminologies D 1711 and D 883 unless otherwise specified.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *sheet*, *n*—material greater than 75 mm in width.

3.2.2 *strain relief*, *n*—relaxation at a specified elevated temperature of induced strains.

3.2.3 *strip*, *n*—material 75 mm or less in width.

4. Sampling

4.1 Remove the outer three or more layers down from the roll or stack of material before sampling.

4.2 If the film is known or suspected to be anisotropic for a

¹ These test methods are under the jurisdiction of ASTM Committee D-9 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 *Annual Book of ASTM Standards*, Vol 10.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

⁶ Available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.