



Designation: D3105 – 17

Standard Index of Methods for Testing Elastomeric and Plastomeric Roofing and Waterproofing Materials¹

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1. Scope

1.1 This index is provided for reference to aid in the selection of procedures and test methods used in the evaluation of sheet and liquid roofing materials, as appropriate. Composition specifications and analytical methods in general, as well as tests on raw materials, are not included, the scope being limited to procedures used in the evaluation of the materials as received or as finished materials or coatings.

2. Referenced Documents

2.1 *ASTM Standards*:²

- D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- D93 Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
- D146/D146M Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing
- D228/D228M Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing
- D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- D413 Test Methods for Rubber Property—Adhesion to Flexible Substrate
- D430 Test Methods for Rubber Deterioration—Dynamic Fatigue
- D471 Test Method for Rubber Property—Effect of Liquids
- D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents
- D570 Test Method for Water Absorption of Plastics
- D573 Test Method for Rubber—Deterioration in an Air Oven

- D624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
- D638 Test Method for Tensile Properties of Plastics
- D696 Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer
- D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
- D750 Practice for Rubber Deterioration Using Artificial Weathering Apparatus
- D751 Test Methods for Coated Fabrics
- D816 Test Methods for Rubber Cements
- D823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
- D882 Test Method for Tensile Properties of Thin Plastic Sheeting
- D1002 Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)
- D1004 Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
- D1042 Test Method for Linear Dimensional Changes of Plastics Caused by Exposure to Heat and Moisture
- D1149 Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment
- D1203 Test Methods for Volatile Loss From Plastics Using Activated Carbon Methods
- D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
- D1239 Test Method for Resistance of Plastic Films to Extraction by Chemicals
- D1310 Test Method for Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus
- D1475 Test Method For Density of Liquid Coatings, Inks, and Related Products
- D1499 Practice for Filtered Open-Flame Carbon-Arc Exposures of Plastics
- D1640/D1640M Test Methods for Drying, Curing, or Film Formation of Organic Coatings
- D1653 Test Methods for Water Vapor Transmission of Organic Coating Films

¹ This index of methods is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.01 on Nomenclature, Definitions and Editorial.

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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.

- D1709** Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method
- D1790** Test Method for Brittleness Temperature of Plastic Sheeting by Impact
- D1824** Test Method for Apparent Viscosity of Plastics and Organosols at Low Shear Rates
- D1922** Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method
- D2136** Test Method for Coated Fabrics—Low-Temperature Bend Test
- D2137** Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics
- D2196** Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational Viscometer
- D2240** Test Method for Rubber Property—Durometer Hardness
- D2290** Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe
- D2291/D2291M** Practice for Fabrication of Ring Test Specimens for Glass-Resin Composites
- D2369** Test Method for Volatile Content of Coatings
- D2523** Practice for Testing Load-Strain Properties of Roofing Membranes
- D2565** Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications
- D2697** Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings
- D3045** Practice for Heat Aging of Plastics Without Load
- D3111** Test Method for Flexibility Determination of Hot-Melt Adhesives by Mandrel Bend Test Method
- D3278** Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus
- D3389** Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader)
- D3746/D3746M** Test Method for Impact Resistance of Bituminous Roofing Systems
- D4073** Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes
- D4798/D4798M** Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)
- D4799/D4799M** Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Fluorescent UV, Water Spray, and Condensation Method)
- D4977/D4977M** Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion
- D5147/D5147M** Test Methods for Sampling and Testing Modified Bituminous Sheet Material
- D5405/D5405M** Test Method for Conducting Time-to-Failure (Creep-Rupture) Tests of Joints Fabricated from Nonbituminous Organic Roof Membrane Material
- D5602/D5602M** Test Method for Static Puncture Resistance of Roofing Membrane Specimens
- D5635/D5635M** Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens
- D5636/D5636M** Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials
- D5683/D5683M** Test Method for Flexibility of Roofing and Waterproofing Materials and Membranes
- D5849/D5849M** Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement)
- D5869** Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials
- D6382/D6382M** Practice for Dynamic Mechanical Analysis and Thermogravimetry of Roofing and Waterproofing Membrane Material
- D6383/D6383M** Practice for Time-to-Failure (Creep-Rupture) of Adhesive Joints Fabricated from EPDM Roof Membrane Material
- D7105** Test Method for Determining the Adhesive and Cohesive Strength Between Materials in Roofing or Waterproofing Membranes and Systems
- D7379/D7379M** Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive
- D7635/D7635M** Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement
- E96/E96M** Test Methods for Water Vapor Transmission of Materials
- E108** Test Methods for Fire Tests of Roof Coverings
- E162** Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source
- G21** Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- G154** Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
- G155** Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

3. Significance and Use

3.1 Where more than one test method or testing condition is listed for the same characteristic in this index, selection of the methods and conditions to be followed must be governed by experience and the requirements in each individual case, together with agreement between the purchaser and seller. The user of this standard must be cautioned that results obtained by different test methods and different conditions of test are not directly comparable.

4. Precision

4.1 Precision data for any procedure or test method selected are given in the latest issue of the subject test procedure.

5. Categories

5.1 For convenience in selection, the test methods are indexed in three major groups, as follows:

5.1.1 Dimensions and Masses of Sheet Applied Products (Section 5).

5.1.2 Film and Sheet Characteristics (Section 6).

5.1.3 Liquid Applied Systems (Section 7).

TABLE 1 INDEX OF METHODS

PHYSICAL TEST	ASTM TITLE	ASTM DESIGNATION	
5. Dimensions and Masses of Sheet Applied Products			
5.1 Length	Test Methods for Coated Fabrics (Length Section)	D751	
	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (As Received Mass and Area Determinations, All Types of Roofing Section)	D228/D228M	
5.2 Thickness	Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension (Measuring Thickness Section)	D412	
	Test Method for Tensile Properties of Plastics (Measuring Thickness Section)	D638	
	Test Methods of Testing Coated Fabrics (Thickness Section)	D751	
	Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement	D7635/ D7635M	
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Thickness Section)	D5147/ D5147M	
5.3 Mass	Test Methods of Testing Coated Fabrics (Mass Section)	D751	
	Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing (Mass of Wrapping Material and Mandrel (Core) Section)	D146/D146M	
	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (As Received Mass and Area Determinations, All Types of Roofing Section)	D228/D228M	
5.4 Width	Test Methods of Testing Coated Fabrics (Width Section)	D751	
	Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing (Appearance and Dimensions of Rolls Section)	D146/D146M	
	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (As Received Mass and Area Determinations, All Types of Roofing Section)	D228/D228M	
6. Film and Sheet Characteristics			
6.1 Abrasion Resistance	Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Double-Head Abrader)	D3389	
	Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion	D4977/ D4977M	
6.2 Artificial Weathering	Standard Practice for Rubber Deterioration Using Artificial Weathering Apparatus	D750	
	Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics	D1499	
	Standard Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications	D2565	
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Accelerated Weathering Section)	D5147/ D5147M	
	Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials	D5869	
	Practice for Heat Aging of Plastics Without Load	D3045	
	Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)	D4798/ D4798M	
	Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials Fluorescent UV and Condensation Method	D4799/ D4799M	
	Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials	G154	
	Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials	G155	
6.3 Adhesion:			
6.3.1 Adhesion of Membrane to Substrate	Test Methods for Rubber Property Adhesion to Flexible Substrate	D413	
	Methods of Testing Rubber Cements	D816	
	Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)	D1002	
6.3.2 Adhesion of Membrane to Membrane (Field and Factory Seam Characterization)	Test Methods for Rubber Property Adhesion to Flexible Substrate	D413	
	Test Method for Tensile Properties of Plastics	D638	
	Test Methods of Testing Coated Fabrics (Seam Strength Section)	D751	
	Methods of Testing Rubber Cements	D816	
	Test Method for Conducting Time to Fail (Creep-Rupture) Tests of Joints Fabricated from Non-Bituminous Organic Roof Membrane Material	D5405/ D5405M	
	Practice for Time-To-Failure (Creep-Rupture) of Adhesive Joints Fabricated from EPDM Roof Membrane Material	D6383/ D6383M	
	Standard Test Method for Determining the Adhesive and Cohesive Strength Between Materials in Roofing or Waterproofing Membranes and Systems	D7105	
	Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive (Lap T-Peel Strength and Lap Shear Strength)	D7379/ D7379M	
6.3.3 Adhesion of Polymer to Reinforcement (Ply Laminate Strength)	Test Methods for Rubber Property Adhesion to Flexible Substrate	D413	
	Test Methods of Testing Coated Fabrics (Adhesion of Coating to Fabric)	D751	
6.4 Low Temperature Bend and Brittleness	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (Pliability Section)	D228/D228M	
	Standard Test Methods for Coated Fabrics (Low-Temperature Bend Test and Low-Temperature)	D751	

TABLE 1 *Continued*

PHYSICAL TEST	ASTM TITLE	ASTM DESIGNATION
	Test Method for Coated Fabrics (Low Temperature Bend Test)	D2136
	Test Methods for Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics	D2137
	Test Method for Flexibility of Hot-Melt Adhesives by Mandrel Bend Test Method	D3111
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Low-Temperature Flexibility Section)	D5147/ D5147M
	Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials	D5636/ D5636M
	Test Method for the Flexibility of Roofing and Waterproofing Materials and Membranes	D5683/ D5683M
6.5 Impact, Puncture, and Bursting Strength	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (Fastener Pull-Through Resistance Section)	D228/D228M
	Test Method for Brittleness Temperature of Plastics and Elastomers by Impact	D746
	Test Methods of Testing Coated Fabrics (Bursting Strength and Puncture Resistance Section)	D751
	Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method	D1709
	Test Method for Brittleness Temperature of Plastic Sheeting by Impact	D1790
	Test Method for Impact Resistance of Bituminous Roofing Systems	D3746/ D3746M
	Test Method Static Puncture Resistance of Roofing Membrane Specimens	D5602/ D5602M
	Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens	D5635/ D5635M
6.6 Chemical Resistance	Test Method for Rubber Property Effect of Liquids	D471
	Practice for Evaluating the Resistance of Plastics to Chemical Reagents	D543
6.7 Creep	Test Method for Apparent Tensile Strength of Ring or Tubular Plastics and Reinforced Plastics by Split Disk Method	D2290
	Practice for Fabrication of Ring Test Specimens for Glass-Resin Composites	D2291/ D2291M
	Test Method for Conducting Time to Fail (Creep-Rupture) Tests of Joints Fabricated from Non-Bituminous Organic Roof Membrane Material	D5405/ D5405M
6.8 Dimensional Stability	Test Method for Linear Dimensional Changes of Plastics Under Accelerated Service Conditions	D1042
	Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperatures	D1204
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Dimensional Stability Section)	D5147/ D5147M
6.9 Fatigue Resistance	Test Method for Rubber Deterioration—Dynamic Fatigue	D430
	Test Method for Evaluating Resistance of Modified, Bituminous Roofing Membranes to Cyclic Joint Displacement	D5849/ D5849M
6.10 Flammability	Test Methods of Fire Tests of Roof Coverings	E108
	Test Method for Surface Flammability of Materials using a Radiant Heat Energy Source	E162
6.11 Fungus Resistance	Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	G21
6.12 Hardness	Test Method for Rubber Property—Durometer Hardness	D2240
6.13 Ozone Resistance	Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber	D1149
6.14 Plasticizer Loss	Test Methods for Volatile Loss From Plastics Using Activated Carbon Methods	D1203
6.15 Retention of Properties—Age	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (Mass Loss and Behavior on Heating Sections)	D228/D228M
	Test Method for Rubber-Deterioration in an Air Oven	D573
	Practice for Heat Aging of Plastics Without Load	D3045
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Heat Conditioning Section)	D5147/ D5147M
	Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials	D5869
6.16 Tear Resist and Strength	Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing (Tear Strength Section)	D228/D228M
	Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers	D624
	Test Methods of Testing Coated Fabrics (Tear Resistance and Trapezoidal Tear Sections)	D751
	Test Method for Initial Tear Resistance of Plastic Film and Sheeting	D1004
	Test Method for Propagation Tear Resistance of Plastic Film and This Sheeting by Pendulum Method	D1922
	Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes	D4073
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Tear Strength Section)	D5147/ D5147M

TABLE 1 *Continued*

PHYSICAL TEST	ASTM TITLE	ASTM DESIGNATION
6.17 Tensile Strength and Elongation	Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension	D412
	Test Method Tensile Properties of Plastics	D638
	Test Methods of Testing Coated Fabrics (Elongation Section)	D751
	Test Methods for Tensile Properties of Thin Plastic Sheeting	D882
	Practice for Testing Load-Strain Properties of Roofing Membranes	D2523
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Load Strain Properties Section)	D5147/ D5147M
6.18 Thermal Analysis	Practice for Dynamic Mechanical Analysis and Thermogravimetry of Roofing and Waterproofing Membrane Material	D6382/ D6382M
6.19 Thermal Expansion	Test Method for Coefficient of Linear Thermal Expansion of Plastics Between –30C and 30C with a Vitreous Silica Dilatometer	D696
6.20 Water Absorption	Test Method for Rubber Property Effect of Liquids	D471
	Test Method for Water Absorption of Plastics	D570
	Test Method for Resistance of Plastic Films to Extraction by Chemicals	D1239
	Test Methods for Sampling and Testing Modified Bituminous Sheet Material (Water Absorption Section)	D5147/ D5147M
6.21 Water Vapor Transmission	Test Methods for Water Vapor Transmission of Organic Coating Films	D1653
	Test Methods for Water Vapor Transmission of Materials	E96/E96M
7. Liquid Applied Systems As Received		
7.1 Film formation	Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature	D1640/ D1640M
7.2 Flash Point	Test Method for Flash and Fire Points by Cleveland Open Cup	D92
	Test Methods for Flash Point by Pensky-Martens Closed Cup Tester	D93
	Test Method for Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus	D1310
	Test Method for Flash Point of Liquids by Small Scale Closed-Cup Apparatus	D3278
7.3 Solids, Percent	Test Method for Volatile Content of Coatings ^A	D2369
7.4 Solids, Percent by Volume	Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings	D2697
	Test Method for Apparent Viscosity of Plastics and Organosols at Low Shear Rates by Brookfield Viscometer	D1824
7.5 Viscosity	Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer	D2196
	Test Method for Density of Liquid Coatings, Inks, and Related Products	D1475
7.7 Liquid Applied Film Prep	Test Method of Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels	D823

^A Not applicable for urethane products with toluene di-isocyanate bearing compounds.

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