



Designation: E2556/E2556M – 10 (Reapproved 2022)

Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment¹

This standard is issued under the fixed designation E2556/E2556M; 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 This specification is limited to vapor permeable flexible sheet materials which are intended to be mechanically attached and are generally installed behind the cladding system in exterior walls.

1.2 This specification is limited to the evaluation of materials and does not address installed performance. Although the fastening practices (type of fastener, fastening schedule, etc.) may affect the installed function of these materials, they are not included in this specification.

1.3 This specification does not address integration of the water-resistive barrier with other wall elements. The topic is addressed in more detail in Practice E2112 and Guide E2266.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *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.*

¹ This specification is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.55 on Performance of Building Enclosures.

Current edition approved Oct. 1, 2022. Published October 2022. Originally approved in 2009. Last previous edition approved in 2016 as E2556/E2556M – 10 (2016). DOI: 10.1520/E2556_E2556M-10R22.

2. Referenced Documents

2.1 ASTM Standards:²

- D226/D226M** Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
- D779** Test Method for Determining the Water Vapor Resistance of Sheet Materials in Contact with Liquid Water by the Dry Indicator Method
- D828** Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus
- D882** Test Method for Tensile Properties of Thin Plastic Sheeting
- D4869/D4869M** Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing
- D5034** Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- E96/E96M** Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials
- E631** Terminology of Building Constructions
- E1677** Specification for Air Barrier (AB) Material or Assemblies for Low-Rise Framed Building Walls
- E2112** Practice for Installation of Exterior Windows, Doors and Skylights
- E2128** Guide for Evaluating Water Leakage of Building Walls
- E2136** Guide for Specifying and Evaluating Performance of Single Family Attached and Detached Dwellings—Durability (Withdrawn 2022)³
- E2266** Guide for Design and Construction of Low-Rise Frame Building Wall Systems to Resist Water Intrusion
- G154** Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

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.

³ The last approved version of this historical standard is referenced on www.astm.org.

TABLE 1 Requirements for Water Resistive Barriers

Test Requirement	Specimen Type	Test Method	Minimum Performance Requirements	
			Type I	Type II
Dry tensile strength or dry breaking force (choose 1)	(1) as manufactured and	Test Method D828 for paper and felt materials, or	3500 N/m [20 lb/in.] minimum (machine and cross direction)	
	(2) aged in accordance with A1.2	Test Method D882 for polymeric materials, or Test Method D5034 (Grab Method)	3500 N/m [20 lb/in.] minimum (machine and cross direction)	
Water resistance test (choose 1)	(1) as manufactured and	Test Method D779 , or	10 min minimum	60 min minimum
	(2) aged in accordance with A1.2	Water Resistance Ponding Test (A1.1), or AATCC Test Method 127 except that the specimens shall be held at a hydrostatic head of 55 cm [21.6 in.]	No water shall penetrate through the membrane in 120 min not applicable	not applicable
Water vapor transmission test	as received	Test Methods E96/E96M (Dessicant Method)	290 ng/(Pa · s · m ²) (5 perms) minimum	
Pliability test	as received	see A1.3	The material shall not crack when bent over a 1.6 mm [¹ / ₁₆ in.] diameter mandrel at a temperature of 0 °C [32 °F]	

2.2 Other Standards:

AATCC Test Method 127 Water Resistance: Hydrostatic Pressure Test⁴

CGSB CAN2-51.32.M77 Sheathing Membrane, Breather Type⁵

Federal Specification UU-B-790a Federal Specification Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellent and Fire Resistant)⁶

TAPPI T-410 Test Method for Grammage of Paper and Paperboard (Weight Per Unit Area)⁷

UBC Standard 14-1 Kraft Waterproof Building Paper⁸

UBC Standard 32-1 Asphalt Saturated Rag Felt⁸

ICC-ES Acceptance Criteria AC38 for Water-Resistive Barriers⁹

3. Terminology

3.1 Definitions—For definitions of general terms related to building construction used in this specification, refer to Terminology **E631**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 felt-based barrier, n—asphalt-saturated organic felts that comply with Specification **D226/D226M** and are intended for use as water-resistive barriers.

3.2.2 paper-based barrier, n—building papers composed predominantly of sulfate pulp fibers that comply with Federal Specification UU-B-790a and that are intended for use as water-resistive barriers.

3.2.3 polymer-based barrier, n—plastic sheet materials for use as water-resistive barriers. These materials are generally referred to as a housewrap or building wrap. These materials can be perforated with small holes or may be non-perforated, composed of films or non-woven materials.

3.2.4 Type I WRB, n—water-resistive barrier with base-level water resistance (see **Table 1**).

3.2.5 Type II WRB, n—water-resistive barrier with enhanced water resistance (see **Table 1**).

3.2.6 Water-Resistive Barrier (WRB), n—a material that is intended to resist liquid water that has penetrated the cladding system.

NOTE 1—Wall assemblies often include two lines of defense against rain water ingress. The cladding serves as the first line of defense and the water-resistive barrier as the second line of defense.

NOTE 2—Water-resistive barriers are sometimes referred to as weather resistant barriers or sheathing membranes.

4. Classification

4.1 This specification covers vapor permeable flexible sheet materials that are classified as Type I and Type II, which are determined by the degree of water resistance. The water-resistive barrier material composition shall determine the specific test method used to measure physical and mechanical properties (see **Table 1**). **Appendix X1** provides explanatory information on the physical and mechanical property test methods.

5. Materials and Manufacture

5.1 Description of the material composition and structure shall be made available upon request.

5.1.1 Descriptions of the materials shall include roll weight and dimensions.

⁴ Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709-2215, <http://www.aatcc.org>.

⁵ Available from Canadian General Standards Board (CGSB), 11 Laurier St., Phase III, Place du Portage, Gatineau, Quebec K1A 0S5, Canada, <http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb>.

⁶ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁷ Available from Technological Association of the Pulp and Paper Industry (TAPPI), 15 Technology Parkway South, Suite 115, Peachtree Corners, GA 30092, <http://www.tappi.org>.

⁸ Uniform Building Code (UBC) information is available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

⁹ Available from the ICC Evaluation Service (ICC-ES), 3060 Saturn Street, Suite 100, Brea, CA 92821, <http://www.icc-es.org>.