



Designation: **E2925–17** **E2925 – 19**

Standard Specification for Manufactured Polymeric Drainage and Ventilation Materials Used to Provide a Rainscreen Function¹

This standard is issued under the fixed designation E2925; 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 applicable to manufactured polymeric materials used to provide a rainscreen function, a means for the drainage of liquid moisture and the ventilation of vapor moisture that enters an above-grade exterior wall assembly. Rainscreen materials that comply with this specification are intended to be used behind exterior cladding products and intended to cover one hundred percent (100 %) of the wall area that is designed to provide a rainscreen function to resist water infiltration.

1.2 This specification addresses the following types of rainscreen materials:

1.2.1 *Type A*—entangled mesh materials.

1.2.2 *Type B*—formed/textured sheet material.

1.2.3 *Type C*—formed battens.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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.*

1.5 *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

C578 Specification for Rigid, Cellular Polystyrene Thermal Insulation

C1338 Test Method for Determining Fungi Resistance of Insulation Materials and Facings

D3045 Practice for Heat Aging of Plastics Without Load

D5199 Test Method for Measuring the Nominal Thickness of Geosynthetics

D5322 Practice for Laboratory Immersion Procedures for Evaluating the Chemical Resistance of Geosynthetics to Liquids

D6108 Test Method for Compressive Properties of Plastic Lumber and Shapes

D6364 Test Method for Determining Short-Term Compression Behavior of Geosynthetics

E84 Test Method for Surface Burning Characteristics of Building Materials

E283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

E631 Terminology of Building Constructions

E2273 Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies

G154 Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

2.2 *Other Standard:*³

CAN/CGSB 51.33-M89 Vapor Barrier Sheet, Excluding Polyethylene, for Use in Building Construction

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.

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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.

³ Available from Canadian General Standards Board (CGSB), 11 Laurier St., Phase III, Place du Portage, Gatineau, Quebec K1A 0S5, Canada, <http://www.tpsgc.gc.ca/ongc-egsb>; Standards Council of Canada, 600-55 Metcalfe Street Ottawa, ON K1P 6L5, Canada, <https://www.scc.ca/>.

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 *capillary action, v*—liquid water movement against gravity induced by the force of molecular attraction (surface tension) between the water and the material it contacts, facilitated by a small gap between materials.

3.2.2 *exterior cladding, n*—weather-exposed materials of a wall assembly including but not limited to siding, stucco, masonry veneer, but excluding fenestration (doors and windows).

3.2.3 *mortar screen, n*—layer of material designed to prevent mortar from entering the drainage space.

3.2.4 *polymeric, n*—materials composed primarily of polymers.

3.2.5 *polymeric rainscreen material, n*—material intended to be installed behind exterior cladding products which creates a drainage and ventilation space for liquid and vapor moisture that enters an above-grade exterior wall assembly reducing water transfer to the water resistive barrier (WRB).

3.2.6 *rainscreen space, n*—separation behind the cladding in the wall assembly intended to inhibit capillary action and moisture bridging as well as to promote ventilation and the drainage of moisture.

3.2.7 *water-resistive barrier (WRB), n*—material that is intended to resist liquid water that has penetrated the cladding system.

4. Classification

4.1 *Type A*—entangled mesh materials.

4.2 *Type B*—formed/textured sheet material.

4.3 *Type C*—formed battens.

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 or package weight and dimensions.

5.1.2 Descriptions of the material composition shall include linear density (basis weight).

5.1.3 All materials claiming compliance with this specification shall be described in such statements as described in all applicable test reports.

6. Material Properties

6.1 *Ventilation/Airflow Test:*

6.1.1 The airflow rate shall be measured in accordance with **Annex A1**.

6.2 *Drainage Test:*

6.2.1 The drainage test shall be conducted in accordance with **Annex A2**.

6.3 *Thickness Test:*

6.3.1 The thickness shall be measured in accordance with Test Method **D5199** at 0.20 kPa.

6.4 *Compression Test:*

6.4.1 The compressive strength for Type A and B shall be determined in accordance with Test Method **D6364** at 10 % compression and at full yield (if yield occurs).

6.4.2 The compressive strength for Type C shall be determined in accordance with Test Method **D6108**.

6.5 *UV Exposure Test:*

6.5.1 The test specimens shall be exposed in accordance with Practice **G154** following Cycle 1 for 336 h.

6.5.2 After the UV exposure test has been completed, the compression test (6.4) shall be repeated.

6.6 *Heat Aging:*

6.6.1 The test specimens shall be heat aged in accordance with Practice **D3045** at a temperature of $(77 \pm 3)^\circ\text{C}$ for 90 days.

6.6.2 After the heat aging test has been completed, the thickness test (6.3) and the compression test (6.4) shall be repeated.

6.7 *Mold and Fungi Resistance:*

6.7.1 The specimens shall be tested in accordance with Test Method **C1338** for 28 days exposure.

6.8 *Water Exposure:*

6.8.1 The specimens with dimensions (250 ± 2) mm by (250 ± 2) mm shall be immersed in water in accordance with Practice **D5322** using tap water at $(50 \pm 2)^\circ\text{C}$ for 168 h.

6.8.2 After the water exposure test has been completed and within one hour of removal from the water, the compression test (6.4) shall be repeated.

6.9 Flame Spread Test (Optional):

6.9.1 When desired, the material shall be tested in accordance with Test Method E84 for flame spread.

6.10 Freeze-Thaw (Optional):

6.10.1 The freeze-thaw exposure shall be conducted in accordance with the aging procedure of Section 8.3.2.1 of CAN/CGSB 51.33-M89.

6.10.2 After the freeze thaw exposure test has been completed and within one hour of the completion of the test, the compression test (6.4) shall be repeated.

7. Material Performance Requirements

7.1 All materials shall provide the minimum performance requirements listed in Table 1.

8. Sampling

8.1 The material to be tested for conformance to this specification shall be taken directly from a randomly selected roll or package which is representative of the commercial product.

9. Specimen Preparation

9.1 The specimens from roll materials shall be cut from the interior of the sample roll so that no specimen edge is nearer than 75 mm to the original roll edge.

9.2 Unless otherwise stated in the test method, all specimens shall be conditioned for a minimum period of 40 h at $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 10) \%$ relative humidity (RH).

9.3 The specimen size shall be determined by the test method.

9.4 If not otherwise specified in the referenced test method, a minimum of five specimens shall be tested and each specimen shall meet the minimum performance requirements.

10. Reporting Requirements

10.1 Report required and declared test data in the form of a table(s) with property, result and pass/fail status including results for all properties tested.

10.2 In addition to the information specified in the individual test methods, all reports describing the testing of the material in accordance with the specification shall include the following information:

- 10.2.1 date test conducted;
- 10.2.2 manufacturer's name, address, production facility address and product designation;
- 10.2.3 type and name of the material and other material description;
- 10.2.4 description of the material composition and structure;
- 10.2.5 lot number and manufactured date;
- 10.2.6 expiration date; if applicable;
- 10.2.7 material sampling procedure used;
- 10.2.8 description of test apparatus, calibration standards used and their source;
- 10.2.9 name and location of laboratory performing the tests and the accreditation agency for the laboratory;
- 10.2.10 description of the specimen preparation;

TABLE 1 Material Performance Requirements

Test	Method	Units	Performance Requirements Minimum
Ventilation/Airflow	3.1	L/s	Declare
Drainage	3.2	%	Declare
Thickness	3.3	mm	5
Compression Strength	3.4	kPa	Declare
UV Exposure	3.5	%	80 % of the compression strength before UV exposure
Heat Aging	3.6	%	80 % of the compression strength before heat aging
Mold/Fungal Growth	3.7	visual	no visible mold or fungi growth on the test specimens
Water Exposure	3.8	%	80 % of the compression strength before water exposure
Optional Tests			
Flame Spread	3.9	...	Declare
Freeze/Thaw	3.10	...	80 % of the compression strength before freeze thaw

- 10.2.11 size of specimens used for each test (length, width (or diameter) and thickness);
- 10.2.12 declaration of conformity with this specification;
- 10.2.13 if the standard requirements were modified, a statement in the test report and a complete description of the modifications;
- 10.2.14 results of drainage test shall be reported as the percentage and weight of water drained from the test wall assembly (with and without insect screen), and the percentage and weight of the water retained in the test wall assembly;
- 10.2.15 the compression test results shall provide the complete compression curve;
- 10.2.16 the compression test values shall be reported at 10 % compression and at yield for each sample, and the average values shall be calculated;
- 10.2.17 the flame spread test results shall include the flame spread rating and smoke developed index;

11. Marking and Labeling

- 11.1 The material shall be marked or labeled with manufacturer name and product name.

12. Packaging and Package Marking

- 12.1 The information on the material or packaging shall include the manufacturer's name, product name, and reference to this specification.
- 12.2 Installation instructions shall be provided as part of the packaging and shall include as a minimum.
 - 12.2.1 maximum weather exposure time allowed before cladding shall be installed;
 - 12.2.2 type of mechanical fastener;
 - 12.2.3 minimum fastener spacing to attach the material to the underlying structure; and
 - 12.2.4 minimum over lapping requirements.

13. Keywords

- 13.1 drainage plane; rainscreen; water-resistive barrier; weather-resistive barrier

ANNEXES

(Mandatory Information)

A1. DRAINAGE AND VENTILATION/AIRFLOW TEST

A1.1 Objective

A1.1.1 The objective of this test is to measure the assembly's ability to allow for ventilation from the bottom of the specimen up and behind the cladding. Due to the design of the test apparatus, a separate specimen; other than that which is tested for drainage, shall be permitted to be tested. The air flow testing procedure is designed to determine the amount of airflow under a range of relatively low air pressure differences in a wall cavity created by the rainscreen material, over the height of a wall, which are understood to be in the range of 1 to 10 Pa under most natural exposure conditions.

A1.2 Test Apparatus

A1.2.1 Construct a test apparatus using 50 by 100 mm wood framing material. The perimeter framing shall be 1200 mm wide by 2400 mm high, outside dimensions. Two wood framing members, spaced 400 mm on center shall be inserted in the 1200 mm width. All framing members shall be secured at each joint using #10 by 75 mm wood screws. Install a 6 mm (nominal) clear polycarbonate sheet to the framing members to simulate both the sheathing and the water resistive barrier. Secure the polycarbonate sheet to the framing members by drilling holes in the polycarbonate material and installing #10 by 25 mm wood screws every 200 mm (nominal).

A1.2.2 Install the rainscreen material being tested over (on the exterior side of) the polycarbonate sheet in accordance with the polymeric rainscreen material manufacturer's instructions. The instructions shall include the perimeter conditions (that is, flashing/assembly details at the top and bottom of the wall assembly). The sides of the test apparatus with the rainscreen material installed shall be completely sealed to restrict air from being able to exit out the sides during the ventilation testing.