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

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

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

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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.

- 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
- E2556/E2556M** Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment
- 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

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 Available from Canadian General Standards Board, Place du Portage III, 6B1, 11 Laurier Street, Gatineau, Quebec K1A 1G6 Canada, <http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb>.

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 ± 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

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

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;
- 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