EXPANDED POLYSTYRENE (EPS) INSULATION BOARD SPECIFICATIONS

DSC131

1. SCOPE

1.1. This specification covers the type, physical properties and dimensions of Expanded Polystyrene Insulation Board intended for use in Dryvit Exterior Insulation and Finish Systems (EIFS).

1.2. The use of the Expanded Polystyrene Insulation Board covered by this specification is regulated by building codes.

2. APPLICABLE DOCUMENTS

2.1. Standards:

ASTM-C 177 OR C518 – Thermal Resistance
ASTM-C 203 - Flexural Strength
ASTM-C 273 - Shear Test in Flatwise Plane of Flat Sandwich Constructions or Sandwich Cores
ASTM-D 1621 - Compressive Strength
ASTM-D 1623 - Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
ASTM-D 2842 – Water Absorption
ASTM-D 2126 – Dimensional Stability
ASTM-E 96 – Vapour Permeability
ASTM-E 2430 – Expanded Polystyrene (EPS) Thermal Insulation Boards for Use in Exterior Insulation and Finish Systems (EIFS)
CAN/ULC-S701 – Standard for Thermal Insulation, Polystyrene Boards, and Pipe Covering
CAN/ULC-S102.2 - Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

2.2. Dryvit Systems Canada Requirements for Insulation Board Suppliers, as per letter of approval provided to each individual supplier.

2.3. Quality Control Manual and Inspection Procedures for Molders Supplying Dryvit Systems Canada

2.4. Hold Harmless and Indemnification Agreement for Insulation Board Suppliers.

3. TERMINOLOGY

3.1. Description of terms specific to this specification.

3.1.1. Dryvit Exterior Insulation and Finish System (EIFS) - a nonload-bearing exterior wall cladding system consisting of a liquid-applied water-resistive barrier, an insulation board, an adhesive and/or mechanical attachment of the insulation board to the substrate, an integrally reinforced base coat on the face of the insulation board, a protective finish applied to the surface of the base coat and applicable accessories that interact to form an energy-efficient exterior wall.

3.1.2. EPS – Expanded Polystyrene, as per Canadian Standard CAN/ULC-S701, Annex A.

3.1.3. GPS – Graphite Enhanced Expanded Polystyrene, as per Canadian Standard CAN/ULC-S701, Annex A.

4. CLASSIFICATION

4.1. This specification covers CAN/ULC-S701, Type 1 EPS and GPS insulation board intended for use in Dryvit Exterior Insulation and Finish Systems (EIFS).

5. MATERIALS AND MANUFACTURE

5.1. Insulation board shall be formed by steam expansion of polystyrene resin beads in a closed mold. The insulation board shall be of uniform density and have essentially closed cells. All insulation board shall contain sufficient flame-retardants to meet the oxygen index, flammability and smoke development requirements of this specification. See Table I.

5.2. All insulation boards shall be molded from modified grade, expandable polystyrene beads listed in accordance with the requirements of the building code having jurisdiction.

6. PHYSICAL REQUIREMENTS

6.1. Inspection Requirements
- 6.1.1. In accordance with the Third Party Certification and Quality Assurance Program.
- 6.1.2. As otherwise deemed necessary by Dryvit Systems Canada.
- 6.1.3. Physical properties shall be in accordance with Table I. Shear modulus and tensile strength values are only required to be evaluated at the beginning of the program.

6.2. Qualification Requirements
- 6.2.1. All dimensional requirements are described in Section 7.
- 6.2.2. All workmanship, finish and appearance requirements are described in Section 8.
- 6.2.3. Combustibility Characteristics - Insulation board is an organic material and is, therefore, combustible. It should not be exposed to flames or other ignition sources. The values obtained by CAN/ULC-S102.2 do not necessarily indicate or describe the fire risk of the materials in end use configuration and are used in this specification primarily to distinguish between insulation formulated with flame retardants and those not so formulated.
- 6.2.4. Molded billets shall be dimensionally stable prior to being cut into boards or special shapes.
  - 6.2.4.1. Molded billets shall be conditioned in accordance with Section 6.2.4.1.1, 6.2.4.1.2, 6.2.4.1.3, or 6.2.4.1.4.
    - 6.2.4.1.1. Molded billets shall be aged (air dried) in ambient conditions for a minimum of six (6) weeks.
    - 6.2.4.1.2. Molded billets shall be heat dried for a minimum of five (5) days at a constant temperature of 60 °C (140 □F)
    - 6.2.4.1.3. Molded billets shall be air dried at ambient conditions for a minimum of 12 days when the billets are manufactured using low pentane EPS resin (<4.5% pentane) and vacuum molding technology.
    - 6.2.4.1.4. Molded billets shall be air dried at ambient conditions for a minimum of 18 days when the billets are manufactured using full pentane resin (nominal 6% pentane) and using vacuum molding technology.

NOTE: Suppliers furnishing insulation board or shapes conditioned under Section 6.2.4.1.2 shall advise Dryvit Systems Canada and the Third Party Certification and Quality Assurance Agency in writing. The Block Molders plant shall be inspected by the Third Party Certification and Quality Assurance Agency and approved by Dryvit Systems Canada prior to the use of this conditioning method.

7. DIMENSIONS AND PERMISSIBLE VARIATIONS

7.1. Insulation board covered by this specification shall conform to the nominal dimensions in Table 1.

7.2. Dimensional Tolerances:
- 7.2.1. Length: +/- 1.6 mm (+/-1/16 in)
- 7.2.2. Width: +/- 1.6 mm (+/-1/16 in)
- 7.2.3. Thickness: 25 mm (1 in) + 1.6 mm (+1/16 in); >25 mm (1 in) +/- 1.6 mm (+/-1/16 in)

7.3. Edge Trueness - Unless otherwise specified and approved by Dryvit Systems Canada, insulation board shall be furnished with true edges. Edges shall not deviate more than 0.8 mm (1/32 in) in 305 mm (12 in).

7.4. Face Flatness - Insulation board shall be furnished flat and shall not exhibit any bowing of more than 0.8 mm (1/32 in) in the length.

7.5. Squareness - Insulation board shall not deviate from squareness by more than 0.8 mm (1/32 in) in 305 mm (12 in) of total length or width.

8. WORKMANSHIP, FINISH AND APPEARANCE AT TIME OF DELIVERY

8.1. Defects - Insulation board shall have no defects that will adversely affect its service qualities. It shall be of uniform texture and free from foreign inclusions, broken edges or corners, slits or objectionable odors.

8.2. Crushing and Depressions - Insulation board shall have no crushed or depressed areas on any surface exceeding 1.6 mm (1/16 in) in depth on more than 5% of the total surface area.

8.3. Voids - Insulation board shall have no more than 8 voids having dimensions larger than 3.2 mm (1/8 in) x 3.2 mm (1/8 in) x 3.2 mm (1/8 in) per 0.74 m2 (8 ft2) of surface area.
8.4. Projections - Insulation board shall be free of surface projects or wire marks in excess of 1.6 mm (1/16 in).

9. SAMPLING AND INSPECTION

9.1. Sampling shall be in accordance with the Third Party Certification and Quality Assurance Program.
9.2. As otherwise deemed necessary by Dryvit Systems Canada

10. REJECTION

10.1. Material that fails to conform to the requirements of this specification shall be rejected.
10.1.1. Rejection shall be reported in writing within five (5) days of discovery of the defect to the producer or supplier and Dryvit Systems Canada
10.2. The insulation board supplier may resubmit rejected materials after removal of that portion not conforming to this specification.
10.2.1. The re-inspection and resubmittal shall be completed within three (3) days of notification by telephone or written communication.

11. CERTIFICATION

11.1. Upon request, certification of compliance with this specification shall promptly be forwarded to Dryvit Systems Canada or their designee.

12. PACKAGING

12.1. All insulation boards shall be packaged in polyethylene bags as required by Dryvit Systems Canada.
12.2. Alternate methods of packaging shall be submitted to Dryvit Systems Canada and approved in writing prior to use.
12.3. All packaging shall be clearly marked with the manufacturer’s name, the certifier’s name, the ULC Standard number, it’s type number, thermal resistance per unit of thickness, the lot number, the product name and size, and certification markings.
12.4. All packaging shall be clearly marked with Dryvit Systems Canada name and logo.

13. INSTALLATION

13.1. GPS insulation boards must be both adhesively fastened and mechanically fastened as per Technical Bulletin TB-2017-04 and the appropriate Outsulation System Application Instructions.

14. INDEMNIFICATION

14.1. Insulation board supplier shall agree to indemnify and hold harmless Dryvit Systems Canada for any loss, cost or damage incurred by Dryvit Systems Canada as a result of the Insulation Board Supplier’s and/or the insulation board’s failure to meet these specifications.

TABLE I

Properties and Requirements of EPS for Use in Dryvit EIFS

Classification (CAN/ULC S701)	Type 1	
Density, kg/m3 (lb/ft3)	15.2 (0.95) min. 20.0 (1.25) max.	
Thermal Resistance of 25.4 mm (1.00 in) thickness, min. $K \cdot m^2/W$ ($F \cdot ft^2 \cdot h/Btu$) 4.4°C (40°F) 23.9°C (75°F)	Regular EPS 0.70 (4.00) 0.65 (3.75)	Graphite Enhanced EPS 0.81 (4.58)
Compressive strength, min., kPa (psi)	70 (10.0)	
Tensile strength, min., kPa (psi)	103 (15.0)	
Flexural strength, min., kPa (psi)	172 (25.0)	
Shear modulus, max., kPa (psi)	2758 (400)	
Water vapor permeance of 25.4 mm (1.00 in) thickness, max., ng/Pa·s·m^2 (perm)	300 (5.2)	
Water absorption by total immersion, max., volume %	6	
Dimensional stability (change in dimensions), max. %	1.5	
Oxygen index, min., volume %	24	
Flame-spread Max. as per ULC-S102.2	500[1]	
Board thickness Maximum Minimum	 152 (6 in)[2] 25 mm (1 in)	
Board width, max.	610 mm (24 in)	
Board length, max	12219 mm (48 in)	

***NOTES:**

1. **Flame-spread to conform with Sentence 3.1.5.12.(3) of the National Building Code of Canada**
2. **Contact Dryvit Systems Canada Technical Department for thicknesses exceeding 6 inches.**

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