

# Standard Specification for Expanded Polystyrene (EPS) Insulation for Use in Exterior Insulation And Finish Systems

## 1.0 Scope

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

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

□

**1.3** The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information purposes only.

## 2.0 Normative References

The following standards contain provisions which through reference in this text, constitute provisions of this American National Standard.

### 2.1 ASTM Standards

C 273 Test Method for Shear Properties of Sandwich Core Materials  
C 578 Specification for Rigid Cellular Polystyrene Thermal Insulation

D 1623 Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics  
D 2863 Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-like Combustion of Plastics (Oxygen Index)

E 84 Test Method for Surface Burning Characteristics of Building Materials

## 3.0 Terminology:

### 3.1 Description of terms specific to this specification.

**3.1.1** Exterior Insulation and Finish Systems (EIFS) – a non-load bearing exterior wall cladding system consisting of an insulation board, and adhesive and/or mechanical attachment of the insulation board to the substrate, and 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

## 4. Classification:

**4.1** This specification covers Type I expanded polystyrene insulation board (as defined by ASTM C578) intended for use in Exterior Insulation and Finish Systems.

## 5.0 Ordering Information:

### 5.1 Standard board sizes.

The following are nominal dimensions. □ See Section 8 for dimensions and permissible variations.

**5.1.1** Thickness: □ 0 mm ( \_ in.) min

**5.1.2 Width:** 610 mm (24 in.)

**5.1.3 Length:** 1219 mm (48 in.)

## **5.2 Number of pieces and thickness required**

**5.3 Shipping address**

**5.4 Required delivery date**

**5.5 Billing information**

**5.6 Certificate of compliance**

**5.7 Special shapes**

**5.7.1** In addition to the ordering information required in Sections 5.1 through 5.6 above, dimensional drawings or sketches shall be furnished for all special shapes.

**5.8** All requests for insulation boards larger than the standard sizes listed in Sections 5.1.1 and 5.1.2 above must be approved in writing by the Exterior Insulation and Finish System manufacturer.

**5.9 EIFS manufacturer.**

## **6.0 Materials and Manufacturer:**

**6.1** Insulation board shall be formed by expansion of polystyrene resin beads in a molding process. 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, flame spread and smoke development requirements of this specification. See Table 1.

**6.2** All insulation boards shall be molded from modified grade, expandable polystyrene beads. The addition of any amount of scrap or regrind is not permitted.

## **7.0 Inspection Requirements:**

**7.1** In accordance with the Third Party Certification and Quality Assurance Program.

## **8.0 Physical Properties**

**8.1** Physical properties shall be in accordance with Table 1. Shear modulus and tensile strength values are only required to be evaluated at the beginning of the program.

**8.2 Dimensions and Permissible Variations:**

**8.2.1** Insulation board covered by this specification shall conform to the nominal dimensions in Section 5.1.

**8.2.2 Dimensional Tolerances**

Length:  $\pm 1.6$  mm ( $\pm 1/16$  in.)

Width:  $\pm 1.6$  mm ( $\pm 1/16$  in.)

Thickness: 20 mm ( $\pm$  in.)  $\pm 1.6$  mm ( $\pm 1/16$  in.)

25.4 mm (1 in.) and greater  $\pm 1.6$  mm ( $\pm 1/16$  in.)

**8.2.3 Edge Trueness** – Unless otherwise specified and approved by the Exterior Insulation and Finish System manufacturer, 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.).

**8.2.4 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.

**8.2.5 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.

## 9. Qualification Requirements:

**9.1** Shall meet dimensional requirements as described in Section 8.

**9.2** Shall meet workmanship, finish and appearance requirements as described in Section 10.

**9.3 Combustibility Characteristics** – Shall meet requirements for Oxygen Index, Flame Spread and Smoke Developed in Table 1.

**Note:** 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 ASTM D2863 and ASTM E84 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.

**9.4** Prior to being cut into boards or special shapes, molded billets shall be conditioned in accordance with either Section 9.4.1, Section 9.4.2, Section 9.4.3, or Section 9.4.4.

**9.4.1** Molded billets shall be cured in existing temperature and humidity conditions of the storage location for a minimum of six weeks.

**9.4.2** Molded billets shall be heat cured for a minimum of five (5) days at a constant temperature of 60°C (140°F) and existing humidity conditions of the curing location.

**9.4.3** Molded billets manufactured using low pentane EPS resin (4.5% pentane) and vacuum molding technology shall be cured in existing temperature and humidity conditions of the storage location for a minimum of 12 days.

**9.4.4** Molded billets manufactured using full pentane EPS resin (nominal 6% pentane) and vacuum molding technology shall be cured in existing temperature and humidity conditions of the storage location for a minimum of 18 days.

## 10. Workmanship, Finish and Appearance

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

**10.2 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 no more than 5% of the total surface area.

**10.3 Voids** – Insulation board shall have no more than 8 voids having dimensions larger than 3.2 mm (1/8 in.)  $\times$  3.2 mm (1/8 in.) per 0.74 m<sup>2</sup> (8 ft<sup>2</sup>) of surface area.

**10.4 Projections** – Insulation board shall be free of surface projections or wire marks in excess of 1.6 mm (1/16 in.)

### **11. Rejection:**

**11.1** Material that fails to conform to the requirements of this specification shall be rejected by the Quality Control agency, installer, special inspector, or other appropriate party.

**11.1.1** Rejection shall be reported in writing within five (5) days to the manufacturer or supplier or the Exterior Insulation and Finish System manufacturer.

**11.2** The insulation board manufacturer or supplier may resubmit rejected materials after removal of that portion not conforming to this specification.

**11.2.1** The re-inspection and re-submittal shall be completed within three (3) days of notification by written communication.

### **12. Certification:**

**12.1** Upon request, certification of compliance with this specification shall be forwarded within 5 days to the Exterior Insulation and Finish System manufacturer or its designee.

**NOTE:** See Appendix A for sample certification format.

### **13. Product Marking**

**13.1** Insulation boards shall be marked (stamped) in accordance with the requirements of this Section.

**13.1.1** Each board shall be marked on at least one edge.

**13.1.2** In addition, one board in each package shall be marked on both faces.

**13.2** Marking and layout shall be in accordance with the requirements of the applicable building code.

### **14. Packaging and Package Marking**

**14.1** All insulation board shall be packaged in polyethylene bags as required by the Exterior Insulation and Finish System manufacturer.

**14.2** Alternate methods of packaging shall be submitted to the Exterior Insulation and Finish System manufacturer and approved in writing prior to use.

**14.3** The supplier shall mark the lot number on each package as required.

TABLE 1

**PROPERTIES AND REQUIREMENTS OF EPS FOR USE IN EIFS**

Properties (In accordance with ASTM C578 or as otherwise indicated):

**Classification:** Type I

**Density, min:** kg/m<sup>3</sup> (lb/ft<sup>3</sup>) 5 (0.90)

**Thermal resistance of 25.4mm(1.0in) thickness, Min:** KΣm<sup>2</sup>/W (FΣft<sup>2</sup>Σh/Btu)

**Mean Temperature:**

4.4°C (40°F) 0.70 (4.00)

23.9°C (75°F) 0.63 (3.60)

**Compressive resistance at 10% deformation or yield, whichever occurs first, min:** kPa, (psi) 69 (10.0)

**Tensile strength, min:** kPa, (psi) 03 (15.0) (In accordance with ASTM D1623)

**Flexural strength, min:** kPa, (psi) 1730 (25.0)

**Shear modulus, max:** kPa (psi) 2758 (400) (In accordance with ASTM C273)

**Water vapor permeance of 25.4mm (1.0in.) 287 ( 5 ) Thickness, max:** ng/PaΣsΣm<sup>2</sup> ( perm )

**Water absorption by total immersion, max:** volume % 4.0

**Dimensional stability (change in dimensions), max:** % 2.0

**Oxygen index, min:** volume % 24.0

**Flame spread, max:** 25 (In accordance with ASTM E84)

**Smoke developed, max:** 450 (In accordance with ASTM E84)

**Requirements:**

**Board Thickness, Minimum:** mm ( in. ) 19 ( \_ )

**Board Width, max:** mm ( in. ) 610 ( 24 )

**Board Length, max:** mm (in.) 1219 ( 48 )

APPENDIX A

(To be typed on supplier's letterhead)

**Exterior Insulation and Finish System Manufacturer**

**Address**

**City, State, Zip**

**Attention:** \_\_\_\_\_

**Re:**  Insulation Board Certification

**Project Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City, State, Zip:** \_\_\_\_\_

**To Whom it May Concern:**

This letter is to certify that the Expanded Polystyrene Insulation Board supplied to the above referenced project meets the requirements of the current edition of the ANSI/EIMA Standard Specification for Expanded Polystyrene (EPS) Insulation Board for Use in Exterior Insulation and Finish Systems.

**Company Name:**  \_\_\_\_\_

**Owner, Principal or Corporate Officer:** \_\_\_\_\_

**Authorized Signature:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**cc:**  Distributor, Applicator