

## SECTION 07 21 13

## BOARD AND BLOCK INSULATION

04/06

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

## ASTM INTERNATIONAL (ASTM)

ASTM C 203	(2005a) Breaking Load and Flexural Properties of Block-Type Thermal Insulation
ASTM C 272	(2001; R 2007) Water Absorption of Core Materials for Structural Sandwich Constructions
ASTM C 578	(2007) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 930	(2005) Potential Health and Safety Concerns Associated with Thermal Insulation Materials and Accessories
ASTM D 1621	(2004a) Compressive Properties of Rigid Cellular Plastics
ASTM D 3833/D 3833M	(1996; R 2006) Water Vapor Transmission of Pressure-Sensitive Tapes
ASTM E 136	(2004) Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
ASTM E 154	(1999; R 2005) Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
ASTM E 84	(2007b) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E 96/E 96M	(2005) Standard Test Methods for Water Vapor Transmission of Materials

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 211	(2006) Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances
NFPA 54	(2006) National Fuel Gas Code
NFPA 70	(2007; AMD 1 2008) National Electrical Code - 2008 Edition

## 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

### SD-03 Product Data

Block or board insulation; G, AE

Vapor retarder; G, AE

Pressure sensitive tape; G, AE

Protection board or coating; G, AE

Accessories; G, AE

### SD-08 Manufacturer's Instructions

Block or Board Insulation; G, AE

Adhesive; G, AE

## 1.3 DELIVERY, STORAGE, AND HANDLING

### 1.3.1 Delivery

Deliver materials to the site in original sealed wrapping bearing manufacturer's name and brand designation, specification number, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled, crushed, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storing, and protecting of materials before and during installation.

### 1.3.2 Storage

Inspect materials delivered to the site for damage; unload and store out of weather in manufacturer's original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling.

## 1.4 SAFETY PRECAUTIONS

### 1.4.1 Other Safety Considerations

Consider safety concerns and measures as outlined in [ASTM C 930](#).

## PART 2 PRODUCTS

### 2.1 BLOCK OR BOARD INSULATION

Provide only thermal insulating materials recommended by manufacturer for type of application indicated. Provide board or block thermal insulation conforming to the following standards and the physical properties listed below:

Extruded Preformed Cellular Polystyrene: **ASTM C 578**.

#### 2.1.1 Thermal Resistance

As indicated on Drawings.

#### 2.1.2 Fire Protection Requirement

- a. Flame spread index of 25 or less when tested in accordance with **ASTM E 84**.

#### 2.1.3 Other Material Properties

Provide thermal insulating materials with the following properties:

- a. Rigid cellular plastics: Compressive Resistance at Yield: Not less than **25 pounds per square inch (psi)** when measured according to **ASTM D 1621**.
- b. Flexural strength: Not less than **50 psi** when measured according to **ASTM C 203**.
- c. Water Vapor Permeance: Not more than **1.1 Perms** or less when measured according to **ASTM E 96/E 96M**, desiccant method, in the thickness required to provide the specified thermal resistance, including facings, if any.
- d. Water Absorption: Not more than 0.1 percent by total immersion, by volume, when measured according to **ASTM C 272**.

#### 2.1.4 Prohibited Materials

Do not provide materials containing more than one percent of asbestos.

### 2.2 VAPOR RETARDER

#### 2.2.1 Vapor Retarder under Floor Slab

- a. Water vapor permeance: **0.2 Perm** or less when tested in accordance with **ASTM E 96/E 96M**.
- b. Puncture resistance: Maximum load no less than **40 pounds** when tested according to **ASTM E 154**.

### 2.3 PRESSURE SENSITIVE TAPE

As recommended by manufacturer of vapor retarder and having a water vapor permeance rating of **one perm** or less when tested in accordance with **ASTM D 3833/D 3833M**.

### 2.4 PROTECTION BOARD OR COATING

As recommended by insulation manufacturer.

## 2.5 ACCESSORIES

### 2.5.1 Adhesive

As recommended by insulation manufacturer.

### 2.5.2 Mechanical Fasteners

Corrosion resistant fasteners as recommended by the insulation manufacturer.

## PART 3 EXECUTION

### 3.1 EXISTING CONDITIONS

Before installing insulation, ensure that all areas that will be in contact with the insulation are dry and free of projections which could cause voids, compressed insulation, or punctured vapor retarders. If installing perimeter insulation, check that the fill is flat, smooth, dry, and well tamped. If moisture or other conditions are found that do not allow the proper installation of the insulation, do not proceed but notify the Contracting Officer of such conditions.

### 3.2 PREPARATION

#### 3.2.1 Blocking Around Heat Producing Devices

Unless using insulation board that passes **ASTM E 136** in addition to the requirements in Part 2, install non-combustible blocking around heat producing devices to provide the following clearances:

- a. Recessed lighting fixtures, including wiring compartments, ballasts, and other heat producing devices, unless certified for installation surrounded by insulation: **3 inches** from outside face of fixtures and devices or as required by **NFPA 70** and, if insulation is to be placed above fixture or device, **24 inches** above fixture.
- b. Vents and vent connectors used for venting products of combustion, flues, and chimneys other than masonry chimneys: minimum clearances as required by **NFPA 211**.
- c. Gas Fired Appliances: Clearances as required in **NFPA 54**.

Blocking is not required if flues are certified by the Manufacturer for use in contact with insulating materials.

### 3.3 INSTALLATION

#### 3.3.1 Insulation Board

Install and handle insulation in accordance with the manufacturer's installation instructions. Keep material dry and free of extraneous materials. Observe safe work practices.

#### 3.3.2 Electrical Wiring

Do not install insulation in a manner that would sandwich electrical wiring between two layers of insulation.

### 3.3.3 Continuity of Insulation

Butt tightly against adjoining boards. Provide continuity and integrity of insulation at roof. Avoid creating any thermal bridges or voids.

## 3.4 PERIMETER INSULATION

Install perimeter thermal insulation where heated spaces are adjacent to exterior walls.

### 3.4.1 Manufacturer's Instructions

Install, attach, tape edges, provide vapor retarder and other requirements such as protection against vermin, insects, damage during construction as recommended in manufacturer's instructions.

### 3.4.2 Insulation on Vertical Surfaces

Install thermal insulation as indicated. Fasten insulation with adhesive.

### 3.4.3 Protection of Insulation

Protect insulation on vertical surfaces from damage during construction and back filling by application of protection board or coating. Do not leave installed vertical insulation unprotected overnight. Provide protection extending at least **one foot** below grade.

## 3.5 VAPOR RETARDER

Apply a continuous vapor retarder as indicated. Overlap all joints at least **6 inches** and seal with pressure sensitive tape. Seal at openings and utility penetrations. Repair punctures or tears with pressure sensitive tape.

-- End of Section --