

## SECTION 07 21 13 THERMAL INSULATION

### GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Thermal insulation
    - a. Batt or blanket insulation at exterior framed and furred walls.

#### 1.2 RELATED REQUIREMENTS

- A. Adhesives VOC Limits: Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS.
- B. Insulation for Insulated Wall Panels: Section 07 40 00, ROOFING AND SIDING PANELS.
- C. Safing Insulation: Section 07 84 00, FIRESTOPPING.

#### 1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. ASTM International (ASTM):
  - C516-08(2013)e1 - Vermiculite Loose Fill Thermal Insulation.
  - C549-06(2012) - Perlite Loose Fill Insulation.
  - C552-15 - Cellular Glass Thermal Insulation.
  - C553-13 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
  - C578-15 - Rigid, Cellular Polystyrene Thermal Insulation.
  - C591-15 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
  - C612-14 - Mineral Fiber Block and Board Thermal Insulation.
  - C665-12 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - C728-15 - Perlite Thermal Insulation Board.
  - C954-15 - Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Base to Steel Studs From 0.033 (0.84 mm) inch to 0.112 inch (2.84 mm) in thickness.
  - C1002-14 - Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - D312/D312M-15 - Asphalt Used in Roofing.
  - E84-15a - Surface Burning Characteristics of Building Materials.

F1667-15 - Driven Fasteners: Nails, Spikes, and Staples.

**1.4 SUBMITTALS**

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
  - 1. Show insulation type, thickness, and R-value for each location.
- C. Manufacturer's Literature and Data:
  - 1. Description of each product.
  - 2. Adhesive indicating manufacturer recommendation for each application.
- D. Sustainable Construction Submittals:
  - 1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
  - 2. Low Pollutant-Emitting Materials:
    - a. Show volatile organic compound types and quantities.

**1.5 DELIVERY**

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

**1.6 STORAGE AND HANDLING**

- A. Store products indoors in dry, weathertight facility.
- B. Protect products from damage during handling and construction operations.
- C. Protect foam plastic insulation from UV exposure.

**1.7 WARRANTY**

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

**PRODUCTS**

**2.1 INSULATION - GENERAL**

- A. Insulation Thickness:
  - 1. Provide thickness required by R-value shown on drawings.
  - 2. Provide thickness indicated when R-value is not shown on drawings.
- B. Insulation Types:

1. Provide one insulation type for each application.
- C. Sustainable Construction Requirements:
1. Insulation Recycled Content:
    - a. Polyisocyanurate/polyurethane rigid foam: 9 percent recovered material.
    - b. Polyisocyanurate/polyurethane foam-in-place: 5 percent recovered material.
    - c. Glass fiber reinforced: 6 percent recovered material.
    - d. Rock wool material: 75 percent recovered material.
  2. Low Pollutant-Emitting Materials: Comply with VOC limits specified in Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS for the following products:
    - a. Non-Flooring Adhesives and Sealants.

## 2.2 THERMAL INSULATION

- A. Exterior Framing or Furring Insulation:
1. Mineral Fiber: ASTM C665, Type II, Class C, Category I where concealed by thermal barrier.
  2. Mineral Fiber: ASTM C665, Type III, Class A at other locations.
- B. Inside Face of Exterior Wall Insulation:
1. Mineral Fiber: ASTM C612, Type IB or II.

## 2.3 ACCESSORIES

- A. Fasteners:
1. Staples or Nails: ASTM F1667, zinc-coated, size and type to suit application.
  2. Screws: ASTM C954 or ASTM C1002, size and length to suit application with washer minimum 50 mm (2 inches) diameter.
  3. Impaling Pins: Steel pins with head minimum 50 mm (2 inches) diameter.
    - a. Length: As required to extend beyond insulation and retain cap washer when washer is placed on pin.
    - b. Adhesive: Type recommended by manufacturer to suit application.
- B. Insulation Adhesive:
1. Nonflammable type recommended by insulation manufacturer to suit application.
- C. Tape:
1. Pressure sensitive adhesive on one face.

## EXECUTION

### 3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Clean substrates. Remove contaminants capable of affecting subsequently installed product's performance.

### 3.2 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions and approved submittal drawings.
  1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.
- B. Install insulation with vapor barrier facing the heated side, unless indicated otherwise.
- C. Install batt and blanket insulation with joints tight. Fill framing voids completely. Seal penetrations, terminations, facing joints, facing cuts, tears, and unlapped joints with tape.
- D. Fit insulation tight against adjoining construction and penetrations, unless indicated otherwise.

### 3.3 THERMAL INSULATION

- A. Perimeter Insulation In Contact with Soil:
  1. Vertical insulation:
    2. Fill joints of insulation with same material used for bonding.
    3. Bond polystyrene board to surfaces with adhesive.
    4. Bond cellular glass insulation to surfaces with hot asphalt or adhesive cement.
- B. Exterior Framing or Furring Insulation:
  1. General:
    - a. Open voids are not acceptable.
    - b. Pack insulation around door frames and windows, in building expansion joints, door soffits, and other voids.
    - c. Pack behind outlets, around pipes, ducts, and services encased in walls.
    - d. Hold insulation in place with pressure sensitive tape.
    - e. Lap facing flanges together over framing for continuous surface. Seal penetrations through insulation and facings.
  2. Metal Studs:

- a. Fasten insulation between metal studs, framing, and furring with pressure sensitive tape continuous along flanged edges.

**3.4 CLEANING**

- A. Remove excess adhesive before adhesive sets.

**3.5 PROTECTION**

- A. Protect insulation from construction operations.
- B. Repair damage.

**END OF SECTION 07 21 13**