

## SECTION 07210 - BUILDING INSULATION

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes the following:
  1. Concealed building insulation.
  2. Vapor retarders.
  3. Z-furring and J-furring supporting rigid insulation.
- B. Related Sections include the following:
  1. Division 7 Section "Fluid-Applied Air/Vapor Barrier System."
  2. Division 7 Section "EPDM-Single-Ply Membrane Roofing" for insulation specified as part of roofing construction.
  3. Division 9 Section "Gypsum Board Assemblies" for provision in metal-framed assemblies of interior acoustical insulation.
  4. Division 15 Sections for insulation on ducts, piping, and equipment.

#### 1.03 DEFINITIONS

- A. Thermal Resistivity: Where the thermal resistivity of insulation products are designated by "r-values," they represent the reciprocal of thermal conductivity (k-values). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

#### 1.04 SUBMITTALS

- A. General: Submit in accordance with Section 01330.
- B. Product Data: For each type of product indicated.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

#### 1.05 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of Work.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having

jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84.
2. Fire-Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
  1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
  2. Products: Subject to compliance with requirements, provide one of the products specified.

#### 2.02 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
  1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Rigid Insulation: Extruded-polystyrene board insulation, ASTM C 578, Type IV, 1.60 lb./cu. ft., unless otherwise indicated, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively:
  1. Thickness: 2 inch, unless otherwise noted.
  2. Edges: Provide tongue and groove or shiplap edges for stacked insulation and square edges for insulation installed in z-furring.
  3. Products:
    - a. Styrofoam; Dow Chemical Company.
    - b. Foamular 250; Owens Corning.
    - c. Amofoam; Tenneco Building Products.
- C. Unfaced Mineral-Fiber Blanket (Batt) Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from glass; with maximum flame-spread

and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

1. Thickness: Full depth of cavity. Where cavity requires insulation that is thicker than standard size, provide next larger size and compress into cavity.
2. R-Value: Not less than R-38; R-19 batt plus R-value of R-19 blown-in insulation.
3. Manufacturers:
  - a. CertainTeed Corporation.
  - b. Owens Corning.
  - c. Johns Manville Corporation.

D. Polyurethane Foam Insulation (Minimal Expansive): Single- or two-component, UL classified sealant, to insulate, seal, fill, and stop air infiltration; shall not expand to the point to cause pressure on opening jambs.

1. Density: 1.2 lbs./cu. ft.
2. R-Value: Not less than 4.0 per inch of thickness.
3. Fire-Test-Response Characteristics: ASTM E 84, as follows:
  - a. Flame Spread: 25.
  - b. Smoke Developed: 50.
4. Products:
  - a. Insta-Foam Products Inc., 1500 Cedarwood Drive, Joliet, IL 60435, (800) 800-FOAM.
  - b. Fomo Products Inc., 2775 Barber Rd., Norton, OH 44203, (800) 321-5585.
  - c. Convenience Products, 866 Horan Drive, Fenton, MO 63026, (800) 325-6180.

E. Sound Attenuation Blankets (Acoustical Insulation): See Division 9 Section "Gypsum Board Assemblies."

## 2.03 VAPOR RETARDERS

- A. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.08 perm.
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

## 2.04 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.
- C. Eave Ventilation Baffles: Preformed, rigid extruded polystyrene foam sheets designed and sized to fit between roof framing members, 48 inches long, to provide cross ventilation between insulated attic spaces and vented eaves. At lower end of baffle, provide eave air infiltration block; preformed, waterproof polyboard formed to accommodate multiple roof pitches, with top profile to match shape of eave ventilation trough to block air and moisture infiltration at eaves.
  1. Product: Durovent with Windbloc; ADO Products.

## 2.05 MISCELLANEOUS METAL FRAMING

- A. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with ASTM A 653, G40, hot-dip galvanized zinc coating.
- B. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, bare metal thickness of not less than 0.047 inch, and depth required to fit insulation thickness indicated.
- C. J-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches minimum, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0478 inch (18 gage), and depth required to fit insulation thickness indicated.
- D. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members through gypsum sheathing into cold-formed steel framing.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

### 3.03 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

### 3.04 INSTALLATION OF PERIMETER INSULATION

- A. On vertical surfaces, set units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.

1. Extend insulation to top of footing.

### 3.05 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units. Fill voids in thermal envelope not covered by the work of other sections.
- B. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Install glass-fiber blankets in cavities formed by framing members according to the following requirements:
  1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
  2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  3. Install insulation support anchors at top of cavity and spaced every 5 feet on center full length of each cavity.
- D. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..
- E. Attic Insulation: Place insulation in two-layer application consisting of a layer of 6-inch thick batt insulation covered with 7-inch thick glass fiber loose fill insulation. Level horizontal applications to uniform thickness, lightly settle to uniform density, but do not excessively compact.

### 3.06 INSTALLATION OF EXTERIOR WALL RIGID INSULATION

- A. Rigid Insulation Installation: Extend insulation in thickness indicated to cover entire wall. Erect insulation horizontally and hold in place with Z-shaped furring members spaced 24 inches o.c. Butt edges and ends tightly. Butt insulation to blocking.
- B. Fill cracks and open gaps in insulation, and between insulation and window and blocking with minimal expanding foam crack sealer.
- C. Securely attach narrow flanges of Z-furring members securely through gypsum sheathing into cold-formed steel framing. Screw fasteners spaced no greater than 12 inches on center.
- D. Protect rigid insulation from exposure to sunlight by immediately installing wood furring provided in Division 6 Section "Rough Carpentry" to z-furring and covering with fiber-cement siding provided in Division 7 Section "Fiber-Cement Siding."

### 3.07 INSTALLATION OF FOAM-IN-PLACE INSULATION

- A. Install foam-in-place insulation sealant to a minimum depth of 1 inch, sealing roof deck flutes and construction cracks and gaps where outside air and cold can infiltrate, providing an airtight building envelope.

### 3.08 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
  - 1. Location: Underside of roof trusses and where indicated.
- B. Seal overlapping joints in vapor retarders with adhesives or vapor-retarder tape according to vapor-retarder manufacturer's instructions. Seal butt joints and fastener penetrations with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
- C. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor-retarder manufacturer.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
- E. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

### 3.09 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210