# **SECTION 072100 - THERMAL INSULATION**

### PART 1 - GENERAL

- 1.1 SUMMARY
  - A. Section Includes:
    - 1. Molded (expanded) polystyrene foam-plastic board.
    - 2. Polyisocyanurate foam-plastic board.
    - 3. Mineral-wool blanket.
    - 4. Vacuum Insulated Panel.
  - B. Related Requirements:
    - 1. Section 061600 "Sheathing" for composite insulated wall sheathing panels and nail base insulated roof sheathing panels.

### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- 1.3 INFORMATIONAL SUBMITTALS
  - A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
  - B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

#### PART 2 - PRODUCTS

- 2.1 MOLDED POLYSTYRENE FOAM-PLASTIC BOARD
  - A. Molded Polystyrene Board, Type XIV: ASTM C 578, Type XIV, 40-psi (276-kPa) minimum compressive strength.
    - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. ACH Foam Technologies, LLC.
      - b. Insulfoam LLC; a Carlisle company.
      - c. Plymouth Foam, Inc.

#### 2.2 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Polyisocyanurate Board, coated glass-faced Class A: ASTM C 1289, Type II, Class 1 or 2.
  - <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide Carlisle R2+ Matte (Class A) Coated-Glass Faced Polyiso Insulation:
    - 2. Alternate Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Atlas Roofing Corporation.
      - b. Dow Chemical Company (The).
      - c. Firestone Building Products.
      - d. Hunter Panels.

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- e. Rmax, Inc.
- B. Fire-Resistance Exterior Wall Assembly: As tested according to NFPA 285; tested by a qualified testing agency. All components of the exterior wall assembly shall be part of the tested Exterior Wall Assembly.

# 2.3 MINERAL-WOOL BLANKETS

- A. Mineral-Wool Blanket, Unfaced: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Roxul Inc.
    - b. Thermafiber, Inc.; an Owens Corning company.

## 2.4 VACUUM INSULATION PANELS (VIP)

- A. Vacuum Insulation Panel with a microporous core which is evacuated, encased and sealed in a thin, gastight envelope.
- B. Performance Requirements
  - 1. Compressive Strength, Min. (psi) @ 10% deformation (ASTM C165): 25 psi
  - 2. Dimensional Stability (ASTM D2126) % change
    - a. 20mm thickness: length: -0.47 width: -0.59
    - b. 50mm thickness: length: -0.30 width: -0.13
  - 3. Thermal Resistance (ASTM C1667) Insulant Thickness (in)/Thermal Resistance (R-value)
    - a. 0.79in (20mm): R-26
    - b. 0.98in (25mm): R-32
    - c. 1.18in (30mm): R37
- C. Basis-of-Design Product: Kingspan OPTIM\_R

#### 2.5 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
  - 1. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flamespread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.
- C. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

#### PART 3 - EXECUTION

- 3.1 INSTALLATION, GENERAL
  - A. Comply with insulation manufacturer's written instructions applicable to products and applications.

- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

## 3.2 INSTALLATION OF SLAB INSULATION

- A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
  - 1. If not otherwise indicated, extend insulation a minimum of 36 inches (915 mm) below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
  - 1. Extend insulation from exterior walls continuously under entire slab-on-grade.

# 3.3 INSTALLATION OF FOUNDATION WALL INSULATION

- A. Butt panels together for tight fit.
- B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

## 3.4 INSTALLATION OF CAVITY-WALL INSULATION

- A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.
  - 1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."

## 3.5 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

- 4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
  - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION

### THERMAL INSULATION