MANUFACTURER'S GUIDE SPECIFICATIONS

SECTION 07 21 13
COATED-GLASS-FACED RIGID FOAM BOARD INSULATION

CARLISLE®
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SECTION 07 21 13
COATED-GLASS-FACED FOAM PLASTIC INSULATION BOARD (FPIB)

1 GENERAL

1.01 SECTION INCLUDES

A. Coated glass mat faced, polyisocyanurate foam plastic insulation board (FPIB) for use in above-grade wall assemblies.

B. Materials and installation to provide continuous insulation in walls as indicated in Drawings.

1.02 RELATED SECTIONS

A. Section 01 41 13 – Codes. [FPIB may trigger code requirement for NFPA 285 wall assembly test.]

B. Section 01 83 16 – Exterior Enclosure Performance Requirements. [Continuous insulation, hygro-thermal performance, proper integration of FPIB with neighboring components.]

C. Section 01 91 19 – Facility Shell Commissioning. [Address continuity of thermal barrier throughout the building enclosure, alignment of FPIB with fenestration thermal breaks, assure that FPIB does not interfere with wall weep/ drainage systems and address any other issues involving proper incorporation of the FPIB into the building enclosure.]

D. [Section] Cladding & Finish Attachment: If the FPIB is installed on the exterior side of the wall, exterior cladding shall be attached to structure through FPIB. If FPIB is installed on interior side of wall, interior finish shall be attached to structure through FPIB. Sections affected include:
   1. Section 04 20 00 – Brick Veneer & Section 04 40 00 – Stone Veneer. Through-wall flashing shall be attached to wall substrate, not over FPIB.
   2. Section 07 42 00 – Wall Panels
   3. Section 07 46 00 – Siding
   4. Section 07 60 00 – Flashings and Sheet Metal
   5. Section 09 22 00 – Supports for Plaster and Gypsum Board
   6. Section 09 24 00 – Portland Cement Plastering
   7. Section 09 29 00 – Gypsum Board

E. Wall substrate to which FPIB will be attached shall be sound, and able to support required fasteners securing FPIB and claddings. Sections affected include:

1. Section 03 30 00 - Cast-In-Place Concrete
2. Section 03 40 00 – Pre-Cast Concrete
3. Section 04 20 00 – Concrete Masonry Unit
4. Section 05 40 00 – Steel Studs
5. Section 06 11 00 – Wood Framing
6. Section 06 16 00 – Wood Sheathing

F. Section 07 25 00 – Weather Barriers and Section 07 27 00 – Air Barriers. Building wrap, paper or membrane materials covered by FPIB or installed over FPIB:
1. Air/weather barrier on base wall assembly covered by FPIB: Verify that air/weather barrier is secure and correctly installed before covering with FPIB. FPIB fastening shall not compromise the performance of the air/weather barrier. Adhesive to bond FPIB shall be compatible with FPIB and air/weather barrier.
2. Over FPIB: FPIB is a substrate for the air/weather barrier, subject to requirements in air/weather barrier Section.

G. Section 07 26 00 – Vapor Barriers. Sheet plastic installed on interior side of wall, or foil facing on stud cavity fiber insulation batts.
1. FPIB is a vapor barrier. Installation of a plastic or foil vapor barrier is generally not recommended, as this can trap moisture between two vapor barriers.
2. Determination shall be made by Design Professional to verify acceptable hygro-thermal performance of wall assembly

H. Division 08 – Openings. Provide an air and water tight seal of fenestration to FPIB.

I. Facility Services Subgroup – Divisions 20 through 28. These trades may be penetrating the FPIB with mechanical, electrical, telecommunications or other service. Rough gaps around penetrations or other damage shall be filled as provided in 3.02 paragraph J.

J. Section [_____] Other

1.03 REFERENCES

A. ASTM C 209 Standard Test Methods for Cellulosic Fiber Insulating Board

B. ASTM C 518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

C. ASTM C 1289 Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

D. ASTM D 2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

E. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials

F. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials

G. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.04 PERFORMANCE REQUIREMENTS

A. Material Properties - FPIB
   1. Shall consist of a closed cell polyisocyanurate foam core with coated glass facing, both sides
   2. Shall meet ASTM C 1289 Type II, Class 2 [Grade 2 (20 psi) or Grade 3 (25 psi)]
   3. Thickness / R Value: [Select one: 1 inch R-6.0, 1.5 inch R-9.0, 2.0 inch R-12.1, 2.5 inch R-15.3, 3.0 inch R-18.5, 3.5 inch R-21.7], units: $F*ft^2*h/$ Btu per inch. Measured at 75 degrees F mean temperature, as per ASTM C 518 according to requirements of ASTM C 1289
   4. Flame spread index: 75 or less and smoke generation index: 450 or less, ASTM E 84
   5. Water vapor permeance of 1 inch thick board: Maximum 1 Perm, ASTM E 96 A
   6. Dimensional stability: Maximum 2% change after 7 days, ASTM D 2126
   7. Water absorption: Maximum 0.05% volume, ASTM C 209

B. Material Properties – Insulation Adhesive
   1. Shall consist of solvent-based synthetic rubber
   2. Percent solids: 58% minimum, ASTM
   3. Low-temp flexibility: No cracking after 180 degree bend over 1” mandrel at minus 25 degrees F, ASTM D 1970
   4. Tensile elongation: 1,000% minimum, ASTM D 412
   5. Peel adhesion on aluminum substrate: 25 lb/in minimum, ASTM D 903
   6. Volatile Organic Content (VOC): 250 g/L, maximum

C. Material Properties – Foam Sealant
   1. Shall consist of one-component, low expansion polyurethane foam.
   2. Flame Spread Index 25 or less, Smoke Developed Index 450 or less, ASTM E 84
   3. Cellular structure: Minimum 60% closed cell
   4. Skin formation time: 10 minutes or less
   5. Waterproof after full cure

D. Properties, Products and Manufacturers – FPIB Fasteners. Use any of the following:
   1. Standard FPIB Fastener: Metal screw with corrosion resistant coating fitted with a low-profile plastic washer designed to grip and hold FPIB:
      a) Approved screw with Thermal-Grip CI Washer or Thermal-GRIP CI Prong Washer, by Rodenhouse Fastening Systems
      b) Approved screw with CI-Lock fasteners by Wind-Lock
   2. Plastic screw FPIB fastener: Plastic tap-in screw with integral washer head designed to grip and hold FPIB to concrete or masonry substrate.
      a) Plasti-Grip PMF by Rodenhouse Fastening Systems
      b) Con-Grip by Wind-Lock
   3. Brick Tie FPIB Fastener: Screw-in brick tie fitted with a low-profile plastic washer designed to grip and hold FPIB:
      a) Heckmann Pos-I-Tie with Thermal-Grip Brick Tie Washer
      b) Hohmann & Barnard 2-Seal Tie with Thermal Wing Nut anchor
   4. Stucco Lath & FPIB Fastener: Metal screw fitted with metal washer, flat plate or pronged. Designed to secure and hold lath and FPIB.
      a) Approved screw with Grip Plate washer by Rodenhouse Fastening Systems
      b) Approved screw with Lath-Lock or Lath-Plate washer by Wind-Lock
   5. Attachment Hardware Securing Rain Screen Cladding and FPIB: Knight CI System. [Note to Specifier: Use 25 psi grade FPIB with Knight CI.]
   6. Furring: Channels, Z's or strips, minimum 24 inches on center. Mechanically-attached to structure, securing FPIB. [Note to specifier: furring over rather than through FPIB layer is preferable to maintain insulation continuity]
   7. [Other - Exterior cladding attachment hardware designed to secure FPIB, approved by Design Professional.]

1.05 SUBMITTALS

A. FPIB manufacturer's product literature, including physical properties, installation instructions and detail drawings.

B. [Retain for Projects of Type I-IV construction: NFPA 285 submittal sheets for Project wall assemblies.]

C. Sample of FPIB, minimum 4 inch X 4 inch size

D. FPIB manufacturer's 15-year thermal performance warranty

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Shall be experienced in applying the same or similar

materials.

B. Comply with the provisions of the Owner's building envelope commissioning program in accordance with [Section 01 91 15]

C. Pre-Installation Meeting: Convene [one] [_____] week prior to commencing Work of this Section, in accordance with [Section 01 31 19 - Project Meetings].

D. [Note to specifier: Mockup construction is recommended but not required. Retain paragraph F if mockups will be built and evaluated.]

E. Field-Constructed Mock-Ups: Prior to installation on Project, apply insulation and accessories on mock-up to verify details under shop drawing submittals, to demonstrate tie-ins with adjoining construction and other termination conditions and to become familiar with properties of materials in application. [NOTE TO SPECIFIER: incorporate sub paragraph 1 or 2 into Paragraph F]
   1. Apply in field-constructed mockups of assemblies as specified in [Section 01 43 39 – Mockups]
   2. Construct typical exterior wall panel, 8 feet long by 8 feet wide, incorporating back-up wall, air/weather barrier, FPIB, FPIB fastening/bonding, cladding, window and doorframe and sill and flashing, [building corner condition,] [junction with roof system] [foundation wall] [and] [typical penetrations and gaps]; illustrating interface of materials.

F. Perform visual inspection of Work before it is covered. Take photographs and notes to document progress and quality.

G. Cooperate and coordinate with the Owner's inspection and testing agency. Do not cover any installed FPIB unless it has been inspected, tested and approved

1.07 DELIVERY, STORAGE AND HANDLING

A. Protect FPIB from physical damage.

B. Store FPIB in an area protected from precipitation and direct sunlight, or store pallets outdoors elevated above ground 4 inches minimum and covered with breathable UV-resistant tarpaulin.

C. Store insulation adhesive, spray contact adhesive and foam sealant in a protected area, within temperature range specified by manufacturer.

D. Handle FPIB carefully, so corners are not damaged or broken off.

1.08 PROJECT CONDITIONS

A. Install insulation adhesive, spray contact adhesive and foam sealant within

approved ambient and substrate temperature range and conditions stated in manufacturer's literature.

B. Do not apply insulation adhesive or foam sealant over incompatible materials

C. Observe safety and environmental measures indicated in manufacturer's MSDS, and mandated by federal, state and local regulations.

2 PRODUCTS

2.01 PRODUCT: Provide coated glass faced polyiso foam plastic insulation boards (FPIB) [] inch thickness [select R-value and thickness from 1.04A] dimensions [select one: 4 ft X 8 ft, 4 ft X 9 ft, 4 ft X 12 ft, 16 inch X 8 ft, 24 inch X 8 ft or [other custom size]]

A. R2+ MATTE as manufactured by Carlisle Coatings & Waterproofing, Incorporated. 900 Hensley Lane, Wylie, TX 75098. Phone 1-800-527-7092. Website http://www.carlisle-ccw.com

B. [Equivalent product by others as approved by Design Professional]]

2.02 ACCESSORIES:

A. Insulation Adhesive:
   1. LM 800 XL by Carlisle Coatings & Waterproofing
   2. Other products as approved by FPIB manufacturer

B. Spray Contact Adhesive:
   1. CAV-GRIP or Travel-Tack by Carlisle Coatings & Waterproofing
   2. Other products as approved by FPIB manufacturer

C. Foam Sealant:
   1. FireBlock Gun Foam by TVM Building Products
   2. Fireblock Foam Sealant by FOMO
   3. Other products as approved by FPIB manufacturer

3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions affecting FPIB installation for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing Work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Wall surfaces shall be of sound condition, free of protrusions of surface defects that would prevent snug fit of FPIB.

C. Weather barrier or air barrier membrane over wall surfaces shall be securely-attached, correctly-installed and in good condition.

3.02 INSTALLATION

A. Install FPIB in [single or multiple] layer[s] over opaque wall surfaces to achieve specified R-value.

B. Cut FPIB to size and shape to go around obstacles and provide snug fit on wall surface.

C. Butt neighboring FPIB pieces tightly together. Offset board joints in neighboring rows 12 inches minimum.

D. Spray contact adhesive may be used to position FPIB during installation.

E. [Retain paragraph E for single-layer installation] Install single layer FPIB as follows:
   1. Secure FPIB snug to wall by fastening as provided in paragraph G or by adhesive bonding as provided in paragraph H.
   2. Fill gaps exceeding 1/8 inch between neighboring FPIB pieces.

F. [Retain paragraph F for multi-layer installation] Install multi-layer FPIB as follows:
   1. Offset board joints in neighboring layers 6 inches minimum.
   2. Fill gaps exceeding ¼ inch between neighboring FPIB pieces.
   3. Secure FPIB snug to wall by fastening as provided in paragraph G. Use a single layer of fasteners, going through all layers of FPIB into substrate.

G. Fastening FPIB in place:
   1. [Note to specifier: Minimize fastener penetrations through the wall weather/air barrier. Fasteners which simultaneously attach FPIB and interior or exterior finish are preferred]
   2. Fasteners securing FPIB shall be spaced no more than 16 inches on center in field and 12 inches on center at terminations.
   3. At FPIB terminations, drive fasteners at least 3/8 inch from edge of boards.
   4. Fasten FPIB securely to strong substrate. Provide fasteners designed for substrate as indicated in 1.04 paragraph D. Fastener shall penetrate substrate as follows:
      a) Metal studs: minimum 4 threads
      b) Wood studs: minimum 1 inch
      c) Plywood or OSB sheathing: minimum 1 inch
      d) Concrete: minimum 1-½ inch
      e) Masonry: minimum 1-½ inch
   5. Fastening FPIB to 24 inch on center or 16 inch on center studs

a) Minimum fastener spacing in studs: 16 inches on center.
b) Board joints: Drive fasteners into board joint with washer bridging and securing two neighboring boards.
c) 3-board intersections: Drive fastener into T joint with washer bridging and securing three neighboring boards

H. Bonding FPIB in place: Apply 3/8 inch thick X 3 inch diameter dabs of insulation adhesive to the FPIB, spaced maximum 16 inches on center. Press FPIB tightly to wall substrate within open time of the insulation adhesive. Fasten as required to secure 1st row of FPIB and to snug FPIB to non-plumb surfaces.

I. Fill gaps exceeding 1/8 inch around penetrations through FPIB and at terminations of FPIB.

J. Use the following materials to fill gaps between neighboring FPIB pieces, around penetrations through FPIB and at terminations of FPIB:
1. Gaps up to ½ inch across: foam sealant
2. Gaps exceeding ½ inch across: pieces of FPIB secured in place with foam sealant or insulation adhesive.
3. Note to installer: Do not seal flashing/weather barrier weep paths.

3.03 REPAIR AND PROTECTION

A. Protect insulation from mechanical damage and exposure to open flame during installation and exposure.

B. FPIB is not approved for permanent exposure. Cover exterior with code-approved cladding. Cover interior with code-approved thermal barrier

C. Cover exterior-applied FPIB with cladding as soon as schedule permits. Do not leave FPIB exposed longer than 60 days, unless FPIB is covered with an approved weather barrier.

END OF SECTION