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Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat*, *SectionFormat*, and *PageFormat*, as described in *The CSI Construction Specifications Practice Guide*.

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" after editing this section.

Section numbers and titles are based on *MasterFormat 2014 Update*.

SECTION 07 21 53

REFLECTIVE INSULATION

Specifier Notes: This section covers Fi-Foil "HY-Fi" reflective insulation intended for use in wall cavities. Two versions are available. Standard Version: Non-perforated reflective insulation and vapor retarder. Hi-Perm Version: Perforated hi-perm reflective insulation. Consult Fi-Foil Company, Inc. for assistance in editing this section for the specific application.

Fi-Foil "HY-Fi Hybrid Insulation System" consists of Fi-Foil "HY-Fi" reflective insulation combined with traditional insulation, such as spray foam, fiberglass batts, cellulose, or foam board in a hybrid system to create superior resistance to heat transfer. The traditional insulation is not manufactured by Fi-Foil and must be specified in a separate section. Consult Fi-Foil Company, Inc. for more information.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reflective insulation.

1.2 RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

- A. Section 06 11 00 – Wood Framing.
- B. Section 07 26 00 – Vapor Retarders.
- C. Section 07 27 00 – Air Barriers.
- D. Section 09 22 13 – Metal Furring.

1.3 REFERENCE STANDARDS

Specifier Notes: List reference standards used elsewhere in this section, complete with designations and titles.

- A. ASTM C 727 – Standard Practice for Installation and Use of Reflective Insulation in Building Constructions.
- B. ASTM C 1224 – Standard Specification for Reflective Insulation for Building Applications.
- C. ASTM C 1338 – Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
- D. ASTM C 1363 – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
- E. ASTM C 1371 – Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
- F. ASTM D 3310 – Standard Test Method for Determining Corrosivity of Adhesive Materials.
- G. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.
- I. ASTM STP 1116 – Insulation Materials: Testing and Applications.
- J. ICC-ES AC 02 – Acceptance Criteria for Reflective Insulation.

1.4 SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

- A. Comply with Section 01 33 00 – Submittal Procedures.

- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Samples: Submit manufacturer's sample of reflective insulation, minimum 6 inches square.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. Sustainable Design Submittals: Submit manufacturer's sustainable design submittals.
 - 1. Recycled Content: Certify percentages of pre-consumer and post-consumer recycled content.
- F. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of reflective insulation of similar type to that specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store materials in clean, dry area indoors.
 - 4. Protect materials during storage, handling, and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Fi-Foil Company, Inc., PO Box 800, Auburndale, Florida 33823. Toll Free 800-448-3401. Phone 863-965-1846. Fax 863-967-0137. Website www.fifoil.com. E-mail info@fifoil.com.

Specifier Notes: Specify if substitutions will be permitted.

- B. Substitutions: [Not permitted] [In accordance with Division 1].

2.2 REFLECTIVE INSULATION

- A. Reflective Insulation: Fi-Foil "HY-Fi".

Specifier Notes: Two versions of Fi-Foil "HY-Fi" reflective insulation are available: Standard Version: Non-perforated reflective insulation and vapor retarder. Hi-Perm Version: Perforated hi-perm reflective insulation. Specify required version. Delete version not required.

1. Version: [Standard version, non-perforated reflective insulation and vapor retarder] [Hi-Perm version, perforated hi-perm reflective insulation].

Specifier Notes: Two types of tabs are available. Specify required type. Delete type not required.

2. Tabs: [Staple tabs for wood furring] [Tape tabs for metal framing].

B. Description:

1. Three-layer reflective insulation.
2. Outer Layer: Blue kraft paper coated with polyethylene.
3. Middle Layer: Aluminum foil.
4. Inner Layer: Kraft paper laminated to aluminum foil reinforced with fiberglass scrim.
5. When Installed: Layers open using internal expanders.

C. Compliance and Approvals:

1. Compliance: ASTM C 1224.
2. Evaluated: ICC-ES AC 02.
3. Evaluation Report: IAPMO UES ER 358.

D. Recycled Content, by weight:

1. Reflective Insulation, 16-inch width:
 - a. Total: Has more than 48 percent recycle content, with at least 43 percent Post-consumer content.
2. Reflective Insulation, 24-inch width:
 - a. Total: Has more than 41 percent recycle content, with at least 37 percent Post-consumer content.

E. Testing:

1. R-Value, Heat Flow Horizontal, ASTM C 1363, ASTM STP 1116:

Specifier Notes: For other R-value calculations, refer to Fi-Foil website.

- a. 2-inch by 4-inch frame wall, reflective insulation with 2-inch R-6.75 spray foam: 21.
- b. 2-inch by 6-inch frame wall, reflective insulation with 4-inch R-3.5 spray foam: 22.
- c. 2-inch by 6-inch frame wall, reflective insulation with 3.5-inch R-13 fiberglass: 21.
2. Water Vapor Permeance, ASTM E 96:
 - a. Standard Version: Less than 1.0 perms.
 - b. Hi-Perm Version: 2.6 perms.
3. Surface Burning Characteristics, ASTM E 84:
 - a. Flame Spread Index: Less than 25.
 - b. Smoke Developed Index: Less than 450.
4. Corrosivity, ASTM D 3310: None.
5. Adhesive Performance, ASTM C 1224, Section 9.5:

- a. Bleeding: None.
- b. Delamination: None:
- c. Pliability: No signs of cracking or delamination.
6. Mold and Mildew Resistance, ASTM C 1338: Pass.
7. Foil Emittance, ASTM C 1371: 0.034.

2.3 ACCESSORIES

- A. Aluminum Foil Tape: Fi-Foil aluminum foil tape.
 1. Description: 2-mil aluminum foil coated with cold weather acrylic adhesive.
 2. UL Classified facing.
 3. Width: 3 inches.
 4. Thickness: 3.5 mils, exclusive of liner.
 5. Adhesion: 96 oz/inch width.
 6. Elongation: 4.4 percent.
 7. Tensile Strength: 27 lbs/inch width.

- B. Double Sided Tape: Fi-Foil double sided tape.
 1. Description: 0.5-mil polyester film coated on both sides with 3-mil acrylic adhesive.
 2. Width: 3/4 inch.
 3. Temperature Resistance: Minus 40 degrees F to 200 degrees F (minus 40 degrees C to 93 degrees C).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive reflective insulation.
- B. Notify Architect of conditions that would adversely affect installation.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install reflective insulation in accordance with manufacturer's instructions and ASTM C 727.
- B. Install reflective insulation at locations indicated on the Drawings.
- C. Splice reflective insulation in wall cavities in accordance with manufacturer's instructions to avoid gaps.
 1. Tape seams if gaps appear where splice has been butted.
- D. Cut reflective insulation to fit snugly around electrical wall outlets and other cutouts.
 1. Tape edges of reflective insulation to outlets and cutouts, if wall can be seen.
- E. Tape tears in reflective insulation.

Specifier Notes: Include the following sentence when the standard version of Fi-Foil "HY-Fi" reflective insulation is specified.

- F. Tape seams, outlets, and pipes for reflective insulation to perform as continuous vapor retarder.
- G. Replace damaged reflective insulation as directed by Architect.

3.3 PROTECTION

- A. Protect installed reflective insulation from damage during construction.

END OF SECTION