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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 2018 Update.*

SECTION 13 49 23

RFI SHIELDING

Specifier Notes: This section covers Fi-Foil "RF Shield" intended for use in the walls of Sensitive Compartmented Information Facilities. Two versions are available. Solid (non-perforated) barrier or Perforated barrier. Consult Fi-Foil Company, Inc. for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

A. RFI Shielding.

1.2 REFERENCE STANDARDS

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

A. ASTM International (ASTM) (www.astm.org):

1. ASTM C665 – Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
2. ASTM C1136 – Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
3. ASTM D774 – Standard Test Method for Bursting Strength of Paper.
4. ASTM D1204 – Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature.
5. ASTM D1790 – Standard Test Method for Brittleness Temperature of Plastic Sheeting by Impact.
6. ASTM D4935 – Standard Test Method for Measuring the Electromagnetic Shielding Effectiveness of Planar Materials.
7. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.
9. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
10. ASTM F3057 – Standard Test Method for Electromagnetic Shielding Effectiveness of Glazings.

B. Institute of Electrical and Electronics Engineers (IEEE) (www.ieee.org)

1. IEEE 299 – IEEE Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures.

1.3 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 barrier, 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. Warranty Documentation: Submit manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

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

1.5 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] [Comply with Division 01]

C. Single Source: provide RFI Shielding and Aluminum Foil Adhesive Tape from single manufacturer.

2.2 RFI SHIELDING

A. RFI Shielding: Fi-Foil "RF Shield".

Specifier Notes: Two versions of Fi-Foil "RF Shield" barrier are available: Solid (non-perforated) barrier and Perforated barrier. Specify required version. Delete version not required.

   1. Version: [Solid (non-perforated) barrier] [Perforated barrier].

B. Description:
   1. Sensitive Compartmented Information Facility RFI Shielding Barrier.
   2. Outer Layers: Minimum 99% Pure Aluminum Foil.
   3. Inner Layer: Fiberglass reinforcing and Kraft paper.

C. Compliance and Approvals:
   1. Compliance: ASTM F3057-16 and ASTM D4935-99.
   2. Evaluated in Accordance with: IEEE Standard 299.
   3. Third Party Verification:
      a. IEEE-299/ASTM F3057-16 Shielding Effectiveness Test Report - Advanced Programs, Inc. Cyber Assurance Services, Columbia, MD; NSA Approved TEMPEST facility.

D. Testing Solid (non-perforated) barrier:

1. Water Vapor Permeance, ASTM E 96: <1.0 perm.
2. Fire Testing, ASTM E84/Foil Side:
   a. Flame Spread: 15
   b. Smoke Developed: 5
3. Bursting Strength, ASTM D774: 40 psi.
4. Puncture Resistance, ASTM C1136: 50 beach units.
5. Tensile Strength, ASTM C1136: 50 lbs/inch width (MD).
   25 lbs/inch width (XD).
6. Caliper / Thickness - Micrometer: 0.009 inch.
7. Accelerated Aging: 30 Days @ 95% RH, 120 ^{0}F (49 ^{0}C)
   No Corrosion/No Delamination.
8. Low Temperature Resistance, ASTM D1790: -40 0F (-40 0 C) Remains Flexible/No Delamination.
9. High Temperature Resistance, ASTM D1790: 4 hours @ 240 ^{0}F (116 ^{0}C)
   Remains Flexible/No Delamination.
10. Water Immersion: 24 hours @ 73 ^{0}F (23 ^{0}C) No Delamination.
11. Mold Resistance, ASTM C665: No Growth.
12. Dimensional Stability, ASTM D1204: 0.25%
13. Emmisivity, ASTM E408: 0.03%.
14. Shielding Effectiveness, ASTM F3057 RF Attenuation Average: 73dB.

E. Testing Perforated barrier:

1. Water Vapor Permeance, ASTM E 96: >10 perm.
2. Fire Testing, ASTM E84/Foil Side:
   a. Flame Spread: 15
   b. Smoke Developed: 5
3. Bursting Strength, ASTM D774: 35 psi.
4. Puncture Resistance, ASTM C1136: 50 beach units.
5. Tensile Strength, ASTM C1136: 45 lbs/inch width (MD).
   25 lbs/inch width (XD).
6. Caliper / Thickness - Micrometer: 0.009 inch.
7. Accelerated Aging: 30 Days @ 95% RH, 120 ^{0}F (49 ^{0}C)
   No Corrosion/No Delamination.
8. Low Temperature Resistance, ASTM D1790: -40 ^{0}F (-40 ^{0} C)
   Remains Flexible/No Delamination.
9. High Temperature Resistance, ASTM D1790: 4 hours @ 240 ^{0}F (116 ^{0}C)
   Remains Flexible/No Delamination.

10. Water Immersion: 24 hours @ 73 ^{0}F (23 ^{0}C) No Delamination.
11. Mold Resistance, ASTM C665: No Growth.
12. Dimensional Stability, ASTM D1204: 0.25%
13. Emmisivity, ASTM E408: 0.03%.
14. Shielding Effectiveness, ASTM F3057 RF Attenuation Average: 73dB

2.3 ACCESSORIES

A. 3M™ Electrically Conductive Aluminum Tape 3302.
   1. Description: High strength dead soft aluminum foil coated with specially formulated conductive pressure sensitive acrylic adhesive system. Designed for EMI and RFI Shielding applications.
   2. UL Classified facing.
   3. Roll Size: 2 inches x 108 feet.
   4. Thickness: 2.0 mils (exclusive of liner).

B. 3M™ Aluminum Foil Tape 1170.
   1. Description: Rolled aluminum foil backing and an electrically conductive, pressure-sensitive acrylic adhesive. Designed for EMI and RFI Shielding applications.
   2. UL Classified facing.
   3. Roll Size: 2 inches x 54 feet.
   4. Thickness: 2.0 mils (exclusive of liner).
   5. Shielding Effectiveness, ASTM D4935: >85dB, 1MHz to 2GHz.

C. Fi-Foil FSK Facing Tape.
   1. Description: Foil/scrim/kraft (FSK) lamination coated with a cold weather solvent pressure sensitive adhesive.
   2. UL Classified facing.
   3. Roll Size: 3 inches x 150 feet.
   4. Thickness: 3.5 mils (exclusive of liner).
   5. Facing meets ASTM C1136, type II and IV.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive barrier.

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 barrier in accordance with manufacturer's instructions, or at direction of the technical authority in accordance with the drawings and specifications of the project.

B. Install barrier at locations indicated on the Drawings. Preferable to install between layers of gypsum board walls, temporarily held in place with general purpose construction adhesive. As an alternative, install with the framing either vertically or horizontally overlapping the seams.

C. Overlap all barrier joints by 3" and seal all seams using a foil tape. Apply squeegee or roller pressure to entire length of all tape at seams, ensuring adhesion of tape to the barrier.

D. At top of wall, extend the barrier so it wraps around the corner and onto the ceiling for 3 inches.

E. At bottom of a wall, extend the barrier so that it wraps around the corner and onto the floor for 3 inches.

F. Cut barrier to fit snugly around electrical wall outlets and other cutouts.

1. Tape edges of barrier on to outlets and cutouts, if wall can be seen.

G. Overlap tears in barrier with additional material to provide 3" overlap beyond tear, or tape tear with RFI blocking tape (3M #1170).

H. Install barrier on the ceiling to complete the job.

I. Tape seams, outlets, and pipes for barrier to perform as continuous vapor retarder.

J. Replace damaged barrier as directed by Architect.

3.3 PROTECTION

A. Protect installed barrier from damage during construction.

END OF SECTION