



## SECTION 07214

### FOAMED-IN-PLACE INSULATION

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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Foamed-in-place low-density spray polyurethane foam for use in certain interior and exterior assemblies.
- B. Foamed-in-place medium density spray polyurethane foam for use in certain interior and exterior assemblies
- C. Thermal barrier (fire resistive) materials.

##### 1.2 RELATED SECTIONS

- A. Section 03300 - Cast-in-Place Concrete.
- B. Section 03400 - Precast Concrete.
- C. Section 04200 - Unit Masonry.
- D. Section 05300 - Metal Decking.
- E. Section 05400 - Cold-Formed Metal Framing.
- F. Section 06100 - Rough Carpentry.
- G. Section 07100 - Damp-proofing and Waterproofing.
- H. Section 07260 - Vapor Retarders.
- I. Section 07270 - Air Barriers.
- J. Section 07410 - Roofing and Siding Panels.
- K. Section 07650 - Flexible Flashing.

- L. Section 07800 - Fire and Smoke Protection.
- M. Section 07800: Thermal Barriers for Plastics.
- N. Section 09110 - Non-Structural Metal Stud Framing.
- O. Section 09290 - Gypsum Board.
- P. Section 15100 - Plumbing: Components penetrating insulation.
- Q. Section 157000 - Heating, Ventilating and Air-Conditioning: Components penetrations insulation.
- R. Section 16050 - Electrical: Electrical components penetrating insulation.

### 1.3 REFERENCES

- A. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- B. ASTM C 1029 - Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
- C. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- D. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics
- E. ASTM D 1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
- F. ASTM D 2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
- G. ASTM D 6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics
- H. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Material
- I. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials
- J. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- K. ASTM E413 - Classification of Rating Sound Insulation
- L. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials
- M. NFPA 285 - Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

- N. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
- O. ICC-ES AC377 Appendix X, Approved June, 2010
- P. Alliance for the Polyurethanes Industry (API) - Bulletin AX-119: MDI-Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal, Alliance for the Polyurethanes Industry, American Plastics Council

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Application instructions.
- C. Submit manufacturer's Authorized Contractor Certificate for the installer and certificates of course completions or credentials for all applicators on the project. Training from CPI, SPFA, ABAA and Premium Spray Products, Inc. are acceptable.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements including.
  - 1. Certification that the product(s) meets or exceeds specified requirements.
  - 2. International Code Council – Evaluation Service (ICC-ESR) report or other proof of code compliance.
  - 3. Other applicable Listings, classification, and approval certifications.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Spray polyurethane foam insulation application shall be performed by experienced professionals who maintain a current Authorized Contractor Certification from the spray-in-place foam insulation manufacturer and who have a current Accreditation from the Spray Polyurethane Foam Alliance (SPFA) as proof of training in the safety, materials and equipment required for field installation of spray polyurethane foam.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Deliver materials in manufacturer's original, tightly sealed containers or unopened packages. Materials to be clearly labeled with the manufacturer's name, product identification, safety information, and batch or lot numbers where appropriate.

Where materials are covered by a referenced approval, the labels shall bear the number, type and class, as applicable.

- C. Store materials in a safe manner, out of the weather and direct sunlight. Store in a location where the temperatures are within the limits specified by the product manufacturer.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

## 1.7 SEQUENCING

- A. Ensure that information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Premium Spray Products, Inc.; 1255 Kennestone Circle, Suite 200, Marietta, GA 30066. ASD. Telephone: (770) 528-9556; Fax: (770) 423-9781; Web: [www.premiumspray.com](http://www.premiumspray.com). Email: [marketing@premiumspray.com](mailto:marketing@premiumspray.com).
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 FOAMED-IN-PLACE BUILDING INSULATION

- A. Spray Polyurethane Foam - Low Density: Foamsulate 50, sprayed-in-place low-density, with the following physical characteristics:
  - 1. Formulation: Two-component open cell polyurethane, made by combining an isocyanate (A) component with a polyol (B) component.
  - 2. Core Density: Nominal 0.5-lb/cu ft., when tested in accordance with ASTM D 1622.
  - 3. Tensile Strength: 5.19 psi, when tested in accordance with ASTM D 1623.
  - 4. Open Cell Content: >97 percent, when tested in accordance with ASTM D 6226.
  - 5. R-Value: 3.7 per inch, when tested in accordance with ASTM C 518.
  - 6. Sound Transmission Coefficient: 42 in accordance with ASTM E 413.
  - 7. Water Vapor Permeance: 21 Perms at 1 inch when tested in conformance with ASTM E 96.
  - 8. Air Leakage Rate: < 0.02 (L/s-m<sup>2</sup>, when tested in accordance with ASTM E 283.

9. Noise Reduction Coefficient: 0.10, when tested in accordance with ASTM E 423.
  10. Dimensional Stability: < 5 percent when tested in accordance with ASTM D 2126.
  11. Evaluation Service Report: CC - FBC Supplement, Florida Building Code - Building Florida Building Code - Residential.
  12. Building Types: Approved for I, II, III, IV, V: Nonstructural Insulation material.
  13. Flame Spread Index: Class 1 < 20, when tested in accordance with ASTM E 84.
  14. Smoke Developed Index: Class 1 < 400, when tested in accordance with ASTM E 84.
  15. NFPA 259: 2603.5.3 Potential Heat, 508 Btu/ft<sup>2</sup> per inch.
  16. NFPA 285: Pass: Standard fire test method for evaluation of fire propagation characteristics of exterior non-load bearing wall assemblies containing combustible components.
  17. NFPA 286: Pass: Can be used without a code prescribed 15-minute thermal barrier when covered with one of the approved intumescent coatings specified.
  18. NFPA 286 AC377 Appendix X: Pass: Complies with the applicable requirements of ICC-ES AC377 Appendix X for use in attics and crawlspaces with one of the approved intumescent coatings specified..
  19. UL Listing: FWFY.R38039 Exterior Wall System Components
  20. UL Listing: FWFO.EWS0013 System No. EWS0013 Exterior Wall Systems
- B. Spray Polyurethane Foam - Low Density - Low Viscosity: Foamsulate 50 N-IB, sprayed-in-place low-density/low viscosity that expands to fill the cracks, crevices, gaps and voids that exist in every structure, with the following physical characteristics:
1. Formulation: Two-component open cell polyurethane, made by combining an isocyanate (A) component with a resin (B) component.
  2. Core Density: Nominal 0.5-lb/cu ft., when tested in accordance with ASTM D 1622.
  3. Open Cell Content: >92 percent, when tested in accordance with ASTM D 6226.
  4. R-Value: 3.7 per inch, when tested in accordance with ASTM C 518.
  5. Sound Transmission Coefficient: 39 in accordance with ASTM E 413.
  6. Air Permeability: 1 inch minimum thickness, when tested in accordance with ASTM E 283.
  7. Flame Spread Index: Class 1 < 25 at 5-1/2 inches, when tested in accordance with ASTM E 84.
  8. Smoke Developed Index: Class 1 < 450 at 5-1/2 inches, when tested in accordance with ASTM E 84.
  9. Evaluation Summary Report IAPMO #394
  10. NFPA 286 AC377 Appendix X: Pass: Complies with the applicable requirements of ICC-ES AC377 Appendix X for use in attics and crawlspaces without a prescriptive ignition barrier.
- C. Spray Polyurethane Foam - Medium Density: Foamsulate 210, sprayed-in-place medium density, with the following physical characteristics:
1. Formulation: Two-component closed cell polyurethane, made by combining an isocyanate (A) component with a polyol (B) component.
  2. Core Density: Nominal 2.0-lb/cu ft., when tested in accordance with ASTM D 1622.
  3. Compressive Strength: 41 psi, when tested in accordance with ASTM D 1621.
  4. Tensile Strength: 51 psi, when tested in accordance with ASTM D 1623.

5. R-Value: 6.7 per inch, when tested in accordance with ASTM C 518.
6. Permeance: 0.77 perms @ 2 inches in accordance with ASTM E 96.
7. Air Permeance: Air Impermeable at 1.50 inches (38.10 mm) at 75 Pa (25 mph wind), when tested in accordance with ASTM E 283.
8. Core Density: 2.0 LB / Cubic Foot, when tested in accordance with ASTM D 1622.
9. Closed Cell Content: > 96%, when tested in accordance with ASTM D 1940
10. Sound Transmission Coefficient: 38, when tested in accordance with ASTM E 413.
11. Noise Reduction Coefficient: 0.10, when tested in accordance with ASTM E 423.
12. Flame Spread Index: Class 1 < 10, when tested in accordance with ASTM E 84.
13. Smoke Developed Index: Class 1 < 195, when tested in accordance with ASTM E 84.
14. NFPA 286: Pass: Can be used without a code prescribed 15-minute thermal barrier when covered with one of the approved intumescent coatings specified.
15. NFPA 286 AC377 Appendix X: Pass: Complies with the applicable requirements of ICC-ES AC377 Appendix X for use in attics and crawlspaces without a prescriptive ignition barrier.
16. Florida Building Code: FL 17185; FL Building Code 2010 RULE 61G20-3. Approved for use as supplemental attachment of roof OSB deck to rafters/truss top chords (dimensional lumber) for commercial and residential buildings. Product may be used for code-plus wind resistance in new construction or enhancing the wind uplift resistance on existing structures.

### 2.3 ACCESSORY PRODUCTS

- A. General Purpose Primer: Premicote P75 a plasticizer free, 100 percent acrylic, single component, water-based, black primer for spray, brush, or roller application. Suitable for use over: spray polyurethane foam, concrete, masonry, primed metal and wood.
- B. Water Based Intumescent Coating:
  1. Water Based Fireproof Foam Paint: DC315 as manufactured by International Fireproof Technology Inc.
  2. When the insulation is installed within attics or crawlspaces, where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code and must be installed in a manner so that the foam plastic insulation is not exposed. Insulation, specified in this Section, may be installed in unvented attic assemblies in accordance with IRC R806.4.
    - a. Formulation: Single component, water-based, air dry, fire retardant coating. Product is designed for applications where a low smoke index is necessary.
    - b. Flame Spread Index: < 0, when tested in accordance with ASTM E 84.
    - c. Smoke Developed Index: < 25, when tested in accordance with ASTM E 84.
    - d. Compliance:
      - 1) UL 1715, NFPA 286 - over 130 test passed.
      - 2) Warnock Hersey Intertek W/N 20947.

- 3) CAN/ULC S102 FSR 23 SDC 145 - (tested as a system over SPF).
- 4) Passed CAL 1350 - safe for use in schools and high occupancy buildings.
- 5) Passed strict EPA – V.O.C. and AQMD air emission requirements (for all 50 states).
- 6) Approved for Incidental Food Contact complies with NSF/ANS1-51 requirements of USDA.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify Work within construction spaces or crevices is complete prior to insulation application.
- C. Verify surfaces are clean, dry, and free of matter capable of inhibiting insulation [or overcoat] adhesion.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
  1. Primed Steel: Surfaces shall be free of loose scale, rust, weathered or chalking paint. Clean using vacuum equipment and hand or power tools to remove loose materials. Remove oil, grease, form release agents, laitance, and other contaminants using proper cleaning solutions.
  2. Previously Painted Steel: Clean using hand or power tools to remove loose scale and dirt. Remove oil, grease, form release agents, laitance, and other contaminants using proper cleaning solution.
  3. Galvanized Steel and Unpainted Steel: Clean as recommended by primer and or polyurethane foam manufacturer.
  4. Ferrous Metal: Gritblast iron and steel surfaces, which are not primed, shop painted, or otherwise protected in accordance with SSPC SP-6. Remove loose rust and unsound primer from shop-primed iron and steel surfaces by scraping or wire brushing.
  5. Non-Ferrous Metal: Clean aluminum, copper and stainless steel surfaces as recommended by the manufacturer of materials to be applied. Priming is required.
  6. If metal surfaces are free of loose scale, corrosion, weathered or chalking paint, clean using compressed air jet, vacuum equipment, and hand or power broom to remove loose dirt. Remove grease, oil and other contaminants using proper cleaning solutions.
  7. New Concrete: Allow to cure for 28 days prior to the application of primer or polyurethane foam. Remove laitance, loose dirt and any other contaminants.
  8. Previously Painted Surfaces: Clean surface and remove all loose paint.
  9. Remove loose dirt, dust and debris by using compressed air, vacuum equipment or brooming. Remove oil, grease, form release agents, laitance,

and other contaminants using proper cleaning solutions. Do not wash wood or porous materials with water.

10. Grout, tape, or caulk all joint openings that exceed 1/4 inch (6 mm) in width.
  11. Prime all concrete surfaces.
  12. Mask and protect adjacent surfaces from over spray or dusting.
- C. Do not begin application of polyurethane foam until all preparation requirements have been completed and surfaces requiring priming are primed and are completely dry.

### 3.3 INSTALLATION

- A. Apply polyurethane foam and related products in accordance with the manufacturer's specifications and processing guidelines.
- B. Apply polyurethane foam insulation by spray method, to uniform monolithic density without voids.
- C. Do not apply polyurethane foam when the temperature is below the installation specifications of the manufacturer for both ambient air and substrate. Do not apply polyurethane foam when temperature is within 5 degrees F (3 degrees C) of dew point.
- D. Apply the polyurethane foam insulation to the thickness required that will meet or exceed the desired design specifications of the project. Do not exceed the maximum lift per pass requirements of the manufacturer. Allow cooling time of 15-30 minutes between passes.
- E. Prime polyurethane foam insulation surfaces if required in accordance with the requirements of the manufacturer.
- F. Apply applicable intumescent coating over entire surface of polyurethane foam to \_\_\_\_\_ mil thickness and in accordance with manufacturer guidelines. Allow the intumescent coating to cure. Inspect for defects and repair defects prior to subsequent coats

### 3.4 CLEANING AND PROTECTION

- A. Remove any excess polyurethane foam from all surfaces not intended to receive the material. Properly dispose of excess per manufacturer's recommendations.
- B. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION