



THERMOSEAL™
SECTION 07 21 29
SPRAY FOAM INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Spray-in-place, medium-density, semi-rigid, closed-cell polyurethane foam insulation in assemblies indicated on the Drawings, to provide an air barrier and insulation. (ThermoSeal 2000)

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 03 41 16 - Precast Concrete Slabs.
- C. Section 04 20 00 - Unit Masonry.
- D. Section 05 30 00 - Metal Decking.
- E. Section 05 40 00 - Cold-Formed Metal Framing.
- F. Section 06 10 00 - Rough Carpentry.
- G. Section 07 10 00 - Dampproofing and Waterproofing.
- H. Section 07 26 23 - Below-Grade Gas Retarders .
- I. Section 07 42 00 - Wall Panels.
- J. Section 07 65 26 - Self-Adhering Sheet Flashing.
- K. Section 07 80 00 - Fire and Smoke Protection.
- L. Section 07 84 13 - Penetration Firestopping.
- M. Section 09 22 16 - Non-Structural Metal Framing.
- N. Section 09 28 13 - Cementitious Backing Boards.

1.3 REFERENCES

- A. ASTM International (ASTM):
 1. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 2. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 3. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 4. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 5. ASTM D 1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.

6. ASTM D 2126 - Standard Test Method for Response of Rigid Cellular Plastic to Thermal and Humid Aging.
 7. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Plastics.
 8. ASTM D 6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics.
 9. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 10. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
 11. 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.
 12. ASTM E 413 - Classification for Rating Sound Insulation.
- B. Greenguard Certification from UL Environment.
 - C. International Code Council - International Residential Code.
 - D. International Code Council - International Building Code.
 - E. ICC Evaluation Service.
 - F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
 - G. Standards Council of Canada: CAN/ULC-S776-09: Standard Laboratory Guide for the Determination of Volatile Organic Compound Emissions from Polyurethane Foam.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Before commencing work, submit in accordance with local code:
 1. Technical data sheet from the manufacturer showing the test results from the ASTM E84 (Surface Burning Characteristics).
 2. Other technical data sheets and samples as required by local code officials.
- C. 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. Installation methods.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 1. Contractor performing work under this section shall be trained and certified by ThermoSeal, LLC in the art of application of spray polyurethane foam insulation.
- B. 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 installation is approved by Architect.
 3. Rework mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be delivered in manufacturer's original containers clearly labeled with manufacturer's name, product identification, safety information, net weight of contents and expiration date.

- B. Material shall be stored in a safe manner and where the temperatures are in the limits specified by the material manufacturer.
- C. Empty containers shall be removed from site on a daily basis.

1.7 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 recommended limits.
- B. Ventilate insulation application area in accordance with the Spray Foam Coalition's Guidance on best practices for the installation of Spray Polyurethane Foam.
- C. Protect workers as recommended by the standards of the Spray Foam Coalition's Guidance on best practices for the installation of Spray Polyurethane Foam.
- D. Protect adjacent surfaces, windows, equipment and site areas from damage of overspray.

1.8 WARRANTY

- A. Manufacturer's Warranty: ThermoSeal, LLC warrants spray-in-place urethane foam insulation, when installed by authorized contractors using factory-trained applicators and applied in accordance to the Installation Instructions, will perform as stated in the Product Technical Data Sheet.
 - 1. This warranty is in effect throughout the life of the building provided the original purchaser registers with the Warranty Department of the Manufacturer within thirty days of occupancy.
 - 2. Manufacturer's sole responsibility under this Limited Lifetime Warranty shall be to repair or replace any defective Product at the cost of the material only.
 - 3. Manufacturer shall not be responsible for labor cost or any other costs whatsoever related to, or in connection with the removal or installation of either the original or replacement product.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: ThermoSeal, LLC , which is located at: P. O. Box 32; New Canaan, CT 06840 ; Toll Free Tel: 800-853-1577; Email: (info@thermosealusa.com); Web: www.thermosealusa.com
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 SPRAY FOAM INSULATION

- A. Spray Applied Semi Rigid Polyurethane Closed Cell Foam Insulation System: Two component, high density insulation.
 - 1. Product: **Thermoseal 2000** manufactured by ThermoSeal, LLC.
 - 2. Contains zero ozone depleting agents, catalysts, polyols, and fire retarding materials.
 - 3. Fills cracks, crevices, and voids to form air seal and thermal insulation. .
 - 4. Evaluation Report: ICC-ESR Pending Publication.
 - 5. Physical Properties:
 - a. Density (ASTM D 1622): 2.0 lb/cf.

- b. Thermal Resistance (ASTM C 518): R-6.9 (sf.h degree F/BTU) at 1 inch at 90 days at 76 degree F (24.4 degree C).
 - c. Closed Cell Content (ASTM D 6226): Minimum 92 percent.
 - d. Water Vapor Transmission - Permeance (ASTM E 96): 0.8 Perms at 1 inch, 0.23 at 3.5 inches.
 - e. Air Leakage (ASTM E 283): Zero at 75 Pa.
 - f. Compressive Strength (ASTM D 1621): 20 psi.
 - g. Tensile Strength (ASTM D 1623): 60 lbf/sq. inch (414 kPa).
 - h. Dimensional Stability (ASTM D 2126): Less than 5 percent.
 - i. Fungi Resistance (ASTM G 21): Zero rating.
 - j. Surface Burning Characteristics (ASTM E 84): Class 1 Pass, Flame Spread Index less than 25, Smoke Developed Index less than 450.
- 6. Ignition/ Thermal Barrier: DC315 manufactured by International Fireproof Technology, Inc.
 - 7. Equipment used to apply the foam insulation shall have fixed ratio positive displacement pumps and approved by ThermoSeal, LLC.
 - 8. Equipment used to apply the water based intumescent coating shall be an airless sprayer approved by ThermoSeal, LLC.
 - a. Ignition Barrier (ICC-ES AC377, Appendix X): Pass at 4 wet mils, 3 dry mils.
 - b. Thermal Barrier (NFPA 286): Pass at 88.88 sq.ft./gal at 18 mils wet, 12 mils dry, coverage rate of 1.136 gallons (4.3 L) per 100 square feet (9.3 m2).

2.3 ACCESSORY PRODUCTS

- A. Water Based Intumescent Coating:
 - 1. Product: DC315 Intumescent Coating, Manufactured by International Fireproof Technologies, Inc. (IFTI).
 - 2. Application: Follow manufacturer's application recommendations.
 - 3. Physical Properties:
 - a. Surface Burning Characteristics (ASTM E 84): Class I. Flame Spread Index of 0, Smoke Developed Index less than 25
 - b. Expands up to 2000 percent.
 - c. Flash Point: None.
 - d. Volatility/VOC: Less than 50 g/L.
 - e. Non-toxic, drain safe, water based, non-fuming.
 - 4. Color: Dull flat / light gray or special order white and dark gray.
 - a. Do not add tint.
 - b. Wait minimum 24 hours prior to topcoating with quality latex paint. Verify dryness with moisture meter.
 - 5. Refer to products International Code Council Evaluation Services Report for additional Intumescent Coating information.
- B. Water Based Intumescent Coating:
 - 1. Product: Pyrodyne (Acry-Tek 5026) Fire-Retardant Acrylic Coating manufactured by Acella, Inc.
 - 2. Application: Follow manufacturer's application recommendations.
 - 3. Physical Properties:
 - a. Surface Burning Characteristics (ASTM E 84): Class I. Flame Spread Index of 10, Smoke Developed Index less than 25
 - b. Flash Point: None.
 - c. Volatility/VOC: Less than 50 g/L.
 - 4. Color: White.
 - 5. Refer to products International Code Council Evaluation Services Report for additional Intumescent Coating information.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved submittals. Apply as recommended by manufacturer to thickness as indicated on drawings.
- B. Apply thermal barrier as required by applicable codes noting the following:
 - 1. Except as provided in Section 314.5 and Section 314.6 of the 2006 International Residential Code, Section 316.5 and Section 316.6 of the 2009 International Residential Code and Section 2603.4.1 and Section 2603.9 of the International Building Code, all plastic insulation shall be separated from the interior of the building by an approved thermal barrier of 1/2 inch (13 mm) gypsum wallboard or equivalent thermal barrier material. Code compliant intumescent coating in lieu of a thermal barrier may be achieved with the use of DC 315. For more information contact ThermoSeal, LLC for assistance, (800) 853-1577.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION