



THERMAL INSULATION  
SECTION 07 21 19  
Foamed-in-Place Insulation

DEMILEC APX

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Spray-in-place semi-rigid polyurethane foam insulation in various assemblies, to provide an air barrier and improved thermal resistance.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast in Place Concrete.
- B. Section 03400 - Structural Pre-cast 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 - Waterproofing.
- H. Section 07260 - Vapor Barrier.
- I. Section 07400 - Preformed Roofing and Cladding/Siding.
- J. Section 07800 - Fireproofing.
- K. Section 07840 - Thermal Barrier.
- L. Section 07650 - Flexible Flashing.
- M. Section 09110 - Metal Support Systems.
- N. Section 09250 - Gypsum Board.

### 1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

2. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  3. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
  4. 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.
- B. International Code Council – International Residential Code:
1. Section 103.7 - Alternate Materials and Methods.
  2. 2006 IRC Section R314 - Foam Plastic Insulation.
  3. 2009 IRC Section R316 - Foam Plastic Insulation.
  4. Section 806.4 – Unvented Attic Assemblies.
- C. International Code Council – International Building Code:
1. Section 104.11 Alternative materials, design and methods of construction and equipment.
  2. Section 2603 Foam Plastic Insulation.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Before commencing work, submit in accordance with local code.
1. Submit technical data sheets and samples as required by local code officials.
  2. Submit the technical data sheet from the manufacturer showing the test results from the ASTM E84 (Surface Burning Characteristics).
- 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 by DEMILEC USA® in the art of applying spray polyurethane foam insulation.
2. Provide current DEMILEC USA® Authorized Contractor Certificate.

### 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 labelled 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.

- 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 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.
- B. Ventilate insulation application area in accordance with the Spray Foam Coalition's Guidance<sup>1</sup> on best practices for the installation of Spray Polyurethane Foam.
- C. Protect workers as recommended by the Spray Foam Coalition's Guidance<sup>2</sup> 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: DEMILEC USA® warrants spray-in-place urethane foam insulation, when installed by certified contractors using factory-trained applicators and applied in accordance with the Product Application Guide<sup>3</sup>, 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.

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<sup>1</sup> <http://www.spraypolyurethane.org/GoodPractices>

<sup>2</sup> <http://www.spraypolyurethane.org/WorkerProtection>

<sup>3</sup> <http://www.demilecusa.com/wp-content/uploads/2013/02/Demilec-APX-Product-Application-Guide.pdf>

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: DEMILEC USA®; 2925 Galleria Dr, Arlington, TX 76011. Toll Free Tel: (877) DEMILEC. Tel: (817) 640-4900. Fax: (817) 633-2000. Email: [specs@demilecusa.com](mailto:specs@demilecusa.com). Web: <http://www.demilecusa.com>
- B. Substitutions: Equivalent as judged by Architect
  1. Contact DEMILEC USA's Engineering Department for product comparison data
    - a. 817-640-4900
    - b. [specs@demilecusa.com](mailto:specs@demilecusa.com)

### 2.2 SPRAY FOAM INSULATION

- A. Spray Applied Semi Rigid Polyurethane Foam Insulation System:
  1. Product: DEMILEC APX Manufactured by DEMILEC USA®, Arlington, TX.
  2. Product Approval:
    - a. International Code Council Evaluation Services Report #3470.
    - b. Passed NFPA 286 in accordance with IBC 803.2. as an interior finish. Refer to section 3.b.1. of this specification for assembly details.

3. Installation:

a. Application with a prescriptive Thermal Barrier:

- 1) Demilec APX spray foam insulation must be separated from the interior of the building by an approved thermal barrier of 1/2" inch-thick (12.7mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with, and installed in accordance with, IBC 2603.4 of IRC 316.4, as applicable, except where insulation is in an attic or crawl space as described in section 4.4 of ESR #3470, DEMILEC APX foam thickness is not limited when the insulation is separated from the interior of the building by an approved thermal barrier, based on fire testing in accordance with NFPA 286 and AC377.

b. Application without a Thermal or Ignition Barrier (exposed foam)

- 1) The prescriptive 15-minute thermal barrier or ignition barrier may be omitted when installation is in accordance with this section. DEMILEC APX Spray foam insulation and Blazelok TBX intumescent coating may be spray-applied to the interior facing of the walls and the underside of roof sheathing or roof rafters, and in crawl spaces, and may be left exposed as an interior finish without a prescribed 15-minute thermal barrier or ignition barrier. The foam plastic insulation thickness must not exceed 7 1/2 inches (191 mm) in walls and 11 1/2 inches (292 mm) in floors and ceilings. All foam surfaces must be covered with an 11-mil dry thickness (0.28 mm) [17 mils wet thickness (0.43 mm)] of Blazelok TBX intumescent coating. The intumescent coating must be sprayed applied over the insulation in accordance with the coating manufacturer's instructions at a rate of 85 square feet per gallon (2.09m<sup>2</sup>/L).

c. Attics and Crawlspaces: Passed AC 377 Appendix X compliant NFPA 286.

- 1) The insulation may be spray-applied to the underside of the roof sheathing and/or rafters, to the underside of wood floors and to vertical surfaces as described in this section. The thickness of the foam plastic applied to the underside of the top of the space must not exceed 11 3/4" inches (298 mm), and the thickness when applied to vertical surfaces must not exceed 7 3/4" inches (197 mm). The insulation does not require an ignition barrier or coating.

d. Use on Attic Floors:

- 1) Up to 11 3/4" inches (298 mm) between and over the joists in an attic floor without an ignition barrier, coating or covering.

4. Physical Properties:
  - a. Density (ASTM D 1622): 0.45 – 0.5 lb/cf (0.007 to 0.008 gm/cu. cm).
  - b. Thermal Resistance (ASTM C 518):
    - 1) **R-3.7** ( sf.h degree F/BTU) @ 1 inch at 90 days at 76 degree F (24.4 degree C).
    - 2) See ESR 3470 for R-value table.
  - c. Air Leakage (ASTM E 283-04):
    - 1) 3.5 inches (89 mm) At 75 Pa (25 mph wind): **0.003 L/s•m<sup>2</sup>**.
  - d. Compressive Strength (ASTM D 1621): **1.1 psi**.
  - e. Tensile Strength (ASTM D 1623): **3.7 lbf/sq. inch**.
  - f. Water Vapor Transmission (ASTM E 96):
    - 1) 1.008 inches (25 mm): 16.0 perms
  - g. Off Gassing Tests (VOC Emissions) Berkeley Analytical Certificate 130104-01: **Pass or Compliant** (No toxic vapors).
  - h. Surface Burning Characteristics (ASTM E 84) 4" inches (117 mm): Class I. Flame Spread Index **15**, Smoke Developed Index **350**.
5. Equipment used to apply the foam insulation shall have fixed ratio positive displacement pumps and approved by foam manufacturer.
6. Equipment used to apply the Water Based intumescent coating shall be an airless sprayer approved by the manufacturer.
  - A. Water Based intumescent coating:
    - 1) Product: BLAZELOK™ TBX, Distributed by DEMILEC USA®, Manufactured by TPR<sup>2</sup>.
    - 2) Approval: Complies with 2006 IRC 314.6, 2009 IRC 316.6, IBC 2603.9 and IBC 803.2 over *DEMILEC APX*® for use as an interior finish without a prescriptive thermal barrier.
    - 3) Application: Follow manufacturer's application recommendations.
    - 4) Physical Properties:



- 5) Surface Burning Characteristics (ASTM E 84): Class I. Flame Spread Index <25, Smoke Developed Index <50.
- 6) Expands up to 2000 percent.
- 7) Flash Point: None
- 8) Volatility/VOC: < 50 g/L
- 9) Non-toxic, drain safe, water based, non-fuming.
- 10) Can be latex or oil base top coated.
- 11) Dull Flat White / Grey.

### 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. Apply as recommended by manufacturer to thickness as indicated on drawings.

Protection: Except as provided in Section 314.5 and Section 314.6 of the 2006 International Residential Code, Section 316.4, 316.5 and Section 316.6 of the 2009 and 2012 International Residential Code and Section 2603.4 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. DEMILEC APX™ with BLAZELOK™ TBX depending on the application can be used as an interior finish in lieu of a prescribed Thermal barrier, for more information or contact DEMILEC USA®'s Engineering Department for assistance, 817-640-4900.

### 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