

SECTION 07 21 29

SPRAY POLYURETHANE FOAM INSULATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Provide insulation to a thickness that meets the minimum insulation thickness (R-value) as outlined in Section 07 21 00 and as required by Code.
- B. Related work specified in other sections:
 - 1. Structural Steel studs – Section 05 41 00.
 - 2. Wood studs and sheathing – Section 06 10 00.
 - 3. Metal studs, thermal barrier – Section 09 21 16.
 - 4. Gypsum Sheathing – Section 06 16 43.

1.02 REFERENCES

- A. The following specifications and standards are incorporated by reference. Where provisions of these Project Specifications are at variance with those reference specifications, the maximum criteria or requirements shall govern.
 - 1. ASTM C 1029 – Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
 - 2. ASTM C 518 – Standard Test Method for Steady-State Heat Flux Measurements and 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 2856 – Standard Test Method for Open-Cell Content of Rigid Cellular Plastics by the Air Pycnometer.
 - 6. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 7. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.
 - 8. ASTM E 119 – Standard Test Methods for Fire Test of Building Construction Materials.
 - 9. API bulletin AX-119 – MDI-Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal; Alliance for the Polyurethanes Industry(API), American Plastics Council.
 - 10. SSPC-SP 6 – Commercial Blast Cleaning (Part of Painting Manual, Volume 2); Steel Structures Painting Council.

1.03 QUALITY ASSURANCE

- A. Foam and Coating Manufacturer Qualifications: Firms which can show evidence of ability to manufacture the products specified and sufficient financial resources and manufacturing facilities to furnish materials on this project; evidence required includes references, past project descriptions, specimen warranty, product data, test data, and code approvals.
- B. Installer Qualifications: A firm with experience installing insulation systems of the type specified.
 - 1. Show contractor level accreditation by Spray Polyurethane Foam Alliance Accreditation Program.
 - 2. Approved or certified by the foam manufacturer as qualified to install the specified system.
 - 3. Provide information concerning projects similar in nature to the one proposed including location and person to be contacted.

- C. Manufacturer Field Representation: Provide qualified representatives of the foam and coating manufacturers to monitor and inspect the installation of their products.
- D. Independent Inspection: Provide inspection of the installation by a qualified SPFA or RCI inspector member.

1.04 PROJECT CONDITIONS

- A. Comply with the manufacturer’s instructions and recommendations as to handling and safety procedures.
- B. Do not install insulation if substrate or air temperature is below 40° F or temperature is within 5° of the dew point.
 - 1. Heating can be done to bring up surface temperatures recommended by manufacturer using indirect fire propane heaters, radiant (surface) heaters or #2 fuel oil heaters 24 to 72 continuous hours before applying foam.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide products furnished by BASF Polyurethane Foam Enterprises, LLC. Or equivalent.
- B. www.basf-pfe.com. Products by Bayer Material Science and Icynene Corporation, as well as equivalent products that meet these specifications are acceptable.

2.02 PRODUCTS

- A. Foam: Spraytite 178 for walls, floors, and ceilings sprayed-in-place two-component closed-cell polyurethane made by combining an isocyanate (A) component with a polyol (B) component, with the following physical characteristics:

1. CLOSED CELL TYPE POLYURETHANE FOAM (AS CURED)

<u>PROPERTIES</u>	<u>ASTM TEST</u>	<u>VALUE</u>	
ISO: Resin Mix Ratio	-----	1:1 (vol:vol)	
Density, Core	D-1622	Nominal 2.0 (pcf@2” lift)	
Compressive Strength	D-1621	22 psi	
Tensile Strength	D1623 Type C	28 psi	
Closed Cell Content	D-6226	>90%	
R-Value	C-518	6.1 per inch aged	
Permeance	E96	1.82 perms	
Permeability	E96	1.82 perms per inch @ 1” SPF	
	E96	0.91 perms per inch @ 2” SPF	
	E96	0.61 perms per inch @ 3” SPF	
	E96	0.46 perms per inch @ 4” SPF	
Air Permeance	E 2178-01	0.000025 L/s/m ² @ 75 Pa	
Air Leakage	E 283-99	0.000025 L/s/m ² @ 75 Pa	
Dimensional Stability			
	Dry Age 28 Days (158°F)	D2126	+8 to +12% Volume Charge
	Freeze Age 14 Days (-20°F)	D2126	+0.07 to -0.21% Volume Charge
Flame Spread Index	E-84	25	
Smoke Development Index	E-84	350	

- B. Substrate Primers (if required). The primer to be applied must be specifically selected for the given substrate to be primed and must be compatible with the sprayed polyurethane foam.
 - 1. Wood: chlorinated rubber, modified alkyds, others.
 - 2. Steel: modified alkyds, epoxy, acrylics, others (typically including rust inhibitors).
 - 3. Galvanized: vinyl copolymer, “wash primer”, modified alkyds, others.
 - 4. Concrete/masonry: chlorinated rubber, vinyl copolymer acrylic, asphaltic, other.

PART 3 EXECUTION

3.01 GENERAL

- A. The products intended for use in the building-envelope insulation system must be applied within the manufacturer's guidelines for temperature, humidity and other atmospheric conditions. In addition, they must be sequenced so as to take into consideration substrate preparation.
- B. When required, the primer shall be applied to the properly prepared substrate in accordance with the manufacturer's guidelines so as to achieve a minimum thickness of dry milk. The primer shall be allowed to cure a minimum of hours prior to application of sprayed polyurethane foam or other products.

3.02 CLEAN UP

- A. Properly dispose of waste materials and containers, in compliance with the manufacturer's guidelines and/or appropriate regulating agencies.

END OF SECTION 07 21 29