Guide

Specification

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***Single Application, NFPA-275* Foam-in-place Insulation**

**NFPA-275 certified closed cell Foam Insulationas Basis of Design**

Firestable® Insulation Company

36 Plains Rd

Essex, Ct 06426 rev 06/22/23



SECTION 07 21 19 - NFPA-275 FOAMED-IN-PLACE THERMAL INSULATION

SECTION 07 81 00 – APPLIED FIRE PROTECTION

SECTION 07 84 26 – THERMAL BARRIERS FOR FOAM PLASTICS

**\*\* NOTE TO SPECIFIER \*\***

**This section is provided to outline the revolutionary spray foam insulation solutions of Firestable Insulation Company**

**Email:** **mail@firestable.com**

**Web:** [www.firestable.com](http://www.firestable.com/)

**Firestable® Insulation Company manufactures it’s patented Firestable® Thermal Barrier Spray Foam Insulation which provides closed cell foam insulative and structural benefits AND superior fire safety during construction and throughout the building life.**

**This single application, 1 product solution is a closed-cell, Monolithic, *Equivalent Thermal Barrier and* *Alternative Thermal Barrier* which can be installed exposed, eliminating time and costs to install gypsum board or other fire-protective products. The Product is available in multiple colors, and fully satisfies thermal barrier, fire barrier and Insulation requirements. Being a Closed Cell foam insulation, it provides high R value benefits as a 1 product solution OR with Hybrid Systems, all being *DIRECTLY CODE COMPLIANT.***

**The 2006, 2009, 2012, 2015, 2018 and 2021 editions of the International Building Code (IBC) and the International Residential Code (IRC) have specific fire performance requirements when Spray Foam Insulation (SPF) is installed in occupied building spaces. Although most SPF is formulated to have code-compliant flame spread and smoke development ratings as determined by laboratory fire tests, such ratings are not indicative of actual fire performance. As a result, these codes require all SPF be protected from ignition sources by 1/2 inch thick gypsum board, other *Equivalent Thermal Barriers* or alternate thermal barriers. Any barrier products over SPF must be qualified by complying with the IBC and IRC as defined in IBC2603.4(shown here):** 

PART 1 GENERAL

1.1 SECTION INCLUDES

**\*\*NOTE TO SPECIFIER\*\* Delete items not required for project.**

1. Foamed-In-Place Insulation consisting of one or more of the following:
2. Single-layer, closed-cell, Thermal Barrier spray polyurethane foam insulation (Firestable® FS2.0, Monolithic System)
3. Cloud White color OR Charcoal color
4. Two-layer, closed-cell, Thermal Barrier spray polyurethane foam insulation (Firestable® Hybrid System)
5. Two-layer, Thermal Barrier spray polyurethane foam insulation over Thermosets or thermoplastic foam (Firestable® & generic base foam System)
6. Two-layer, closed-cell, Thermal Barrier spray polyurethane foam insulation & fiberglass ‘flash & Batt’ (Firestable® flash & batt hybrid System)

1.2 RELATED SECTIONS

**\*\*NOTE TO SPECIFIER\*\* Delete any sections below not relevant to this project; add others as required.**

* + 1. Section 03 30 00 - Cast-in-Place Concrete (03 30 00) - Cast-in-Place Concrete
		2. Section 03 41 10 - Plant-Precast Structural Concrete (03 41 16) - Precast Concrete Slabs
		3. Section 04 21 13 - Brick Masonry (04 20 00) - Unit Masonry
		4. Section 05 30 00 - Metal Decking (05 30 00) - Metal Decking
		5. Section 05 40 00 - Cold-Formed Metal Framing (05 40 00) - Cold-Formed Metal Framing
		6. Section 06 10 00 - Rough Carpentry (06 10 00) - Rough Carpentry
		7. Section 07 10 00 - Dampproofing and Waterproofing (07 10 00) – Damp proofing and Waterproofing
		8. Section 07 27 19 - Plastic Sheet Air Barriers (07 26 00) - Vapor Retarders
		9. Section 07 27 00 - Air Barriers (07 27 00) - Air Barriers
		10. Section 07 42 00 - Wall Panels (07 40 00) - Roofing and Siding Panels
		11. Section 07 65 00 - Flexible Flashing (07 65 00) - Flexible Flashing
		12. Section 07 80 00 - Fire and Smoke Protection (07 80 00) - Fire and Smoke Protection
		13. Section 07 84 13 - Penetration Firestopping (07 84 00) - Firestopping
		14. Section 09 28 13 - Cementitious Backing Boards (09 29 00) - Gypsum Board
		15. Section 07 14 00 – Fluid Applied Water Barriers
		16. Section 07 27 36 - Spray Foamed Air Barrier(07 27 00)

1.3 REFERENCES

**\*\*NOTE TO SPECIFIER\*\* Delete references from the list below that aren’t actually required by the text of the edited section.**

* + 1. ASTM International (ASTM):
			1. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
			2. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics
			3. ASTM D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics
			4. ASTM D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
			5. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
			6. ASTM E2768 – Method for extended duration surface burning of building materials (**30 min** tunnel test)
			7. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
			8. ASTM D2126 - Method for response of rigid cellular plastics to thermal and humid aging.
			9. ASTM D2842 – Method for water absorption of rigid cellular plastics

* + 1. National Fire Protection Association (NFPA):
			1. NFPA 275 - Standard Method of Fire Tests for the Evaluation of Thermal Barriers
			2. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load

 Bearing Wall Assemblies Containing Combustible Components

* + 1. Underwriters Laboratories (UL) / Other Accrediting Standards:
			1. UL 1715 - Fire Test of Interior Finish Material
			2. UBC 26 - 2 – Test Method For the evaluation of Thermal Barriers.
			3. IBC 2603.4 – Thermal Barriers
			4. ICC-1100-2019 – Standard for Spray Applied Polyurethane Foam Plastic Insulation
			5. ICC AC 377 – Acceptance Criteria for Spray Applied Foam Plastic Insulation
			6. IBC 803.14 – Stability Test for Interior Finished Materials.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements
		2. Product Data:
			1. Manufacturer's technical and safety data sheets on each product to be used
			2. Surface preparation instructions, Manufacturer's application guide(s) and recommendations
			3. Storage, handling, and clean up requirements and recommendations
			4. Typical installation methods and PPE
		3. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
		4. Manufacturers Certification(s):
			1. Submit Manufacturers certification(s) that materials comply with specified requirements and are suitable for intended application
			2. Submit Sprayfoam Applicators approval from SPFA PCP as accredited Sprayer
		5. Applicators Project references: Submit applicators list of successfully completed polyurethane foam insulation projects, including project name/location, Name of architect, and type/quantity of materials applied.

* 1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with documented experienced personnel.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
			1. Applicator shall be an authorized applicator of manufacturer at time when bids or quotes are approved.
			2. Use persons and rig(s) authorized by the manufacturer and certified by SPFA PCP as a Master Installer – Insulation, closed cell.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

**\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.**

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
		2. Review the following:
			1. Materials
			2. Protection of in place conditions
			3. Surface preparation
			4. Material storage, preparation, application, and clean up.
			5. Field application criteria and quality control
			6. Cleaning
			7. Protection
			8. Coordination with other work
	2. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature(cold or hot), and construction operations.
		3. Requirements:
			1. Store and handle in accordance with manufacturer’s instructions
			2. Keep materials in manufacturers original, unopened containers until application
			3. Store materials in clean, dry, indoor area
			4. Store materials at 70- 80 degrees F(21-27c) a minimum of 48 hours before use
			5. Never store in direct sunlight
			6. Protect materials from freezing
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions of substrate(s) and ambient (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
			1. DO NOT apply polyurethane foam insulation when moisture in the form of rain, snow, ice, fog, frost or dew is expected during application.
			2. DO NOT apply polyurethane foam insulation when relative humidity of over 85 percent is expected during application or dew point is beyond 5%.
			3. DO NOT apply polyurethane spray foam insulation with wind speed above 12 mph(19kmh).
		2. Properly adapt application for ‘heat sink’ materials.
		3. Cross ventilate area to receive insulation to maintain safe working conditions.
		4. Protect workers as recommended by SPFA, OSHA and other standards and manufacturer's recommendations.
	4. WARRANTY

A. Manufacturer’s Warranty: Provide manufacturer’s standard limited warranty

PART 2 PRODUCTS

* 1. MANUFACTURERS
		1. Acceptable Manufacturer: FIrestable® Insulation Company, 36 Plains Rd, Essex Ct 06426 Main # 860 767 8773

Email: **mail@firestable.com** Website: [**www.firestable.com**](http://www.firestable.com)

**\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

* + 1. Substitutions: Not permitted
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

**\*\* NOTE TO SPECIFIER \*\* Firestable® FS 2.0 Thermal Barrier closed cell SPF can be specified for use in multiple systems as it is rated as an equivalent thermal barrier with direct code compliance to IBC 2603.4 and IRC R316.4 as a Single-layer (Monolithic System) or as the top layer applied onto Stablebase® closed cell SPF (or other generic thermosetting or thermoplastic foamed insulation base layer (Hybrid Systems).**

 **When used at 2 ½” or more of Firestable® FS 2.0, both Systems are classified as *Equivalent Thermal Barrier Assemblies* and do not require distinct fire protective coverings when installed in accordance with tested assemblies and product listings.**

**Firestable® FS 2.0 , at under 2 ½”, can be used as an *Alternate Thermal Barrier* and does not require distinct fire protective coverings when installed in accordance with tested assemblies and product listings. After 2 ½”, FS 2.0 acts as an *Equivalent Thermal Barrier* over itself.**

**The closed-cell, Monolithic and Hybrid Systems are classified as both *Equivalent Thermal Barrier and* *Alternative Thermal Barriers* when installed exposed, eliminating time and costs to install gypsum board or other fire-protective products.**

 **The Firestable® Monolithic and Hybrid Systems are often specified to maximize fire safety during the construction process.**

**SPF products that require the installation of distinct fire-protective products, termed “thermal barriers”, can be fire hazards during the construction process when the SPF is exposed to cutting torches, welding sparks, trash fires, vandalism or arson during the weeks or months prior to the SPF being covered with gypsum board or other fire-protective products.**

**The Firestable® Monolithic System is typically specified for applications where an R-38 or lower rating is required, as it is consistently more cost effective head to head. In projects requiring greater than R-38, where access to the surfaces to be sprayed is limited or speed favors one product to be installed, The Monolithic Firestable® may be also be the most cost-effective solution due to project schedule or speed & simplicity of installation and no need for code inspector participation.**

 **In some cases, both the Monolithic and Hybrid Systems can be specified to enable the installing contractor to quote the most cost-effective system.**

**\*\* NOTE TO SPECIFIER \*\* Delete article if not required.**

* 1. SINGLE-LAYER OR HYBRID SYSTEM CLOSED-CELL INTUMESCENT POLYURETHANE FOAM INSULATION
		1. Basis of Design: Firestable® Monolithic System; Firestable® FS 2.0, manufactured by Firestable® Insulation Company and directly classified as an *Equivalent Thermal Barrier.*
			+ 1. Performance and Design requirements:
1. Interior Standards compliance:

**\*\* NOTE TO SPECIFIER \*\* Delete options not required.**

* 1. NFPA 275: *Equivalent Thermal Barrier*
		1. *Equivalent Thermal Barrier* over thermoplastics or thermosets in any combinations of walls AND ceilings with thicknesses as defined in QAI Cert # B1134.
	2. UL 1715: Alternate thermal barrier
		1. Approved alternate thermal barrier without need of fire resistant top barrier or coating.
		2. ICC 1100 & AC 377 compliance via evaluation report IAPMO UES-857.
		3. Underside of Roofs, Ceilings, and Floors AND associated walls:

Exposed interior application thicknesses as defined in QAI Cert # B1134.

**\*\* NOTE TO SPECIFIER \*\* Use either the thickness or R-rating required. Delete options not required.**

1. NFPA 285 compliance for exterior walls in Building Types I, II, III, IV, and V when required by building code
2. ASTM E84, Class A
3. ASTM 2768 compliance for 30 minute extended duration ignition resistance.
4. Interior or exterior weatherproof coating compliance per IBC 803.2.
	* + 1. Description: CLOSED CELL sprayed-in-place polyurethane foam insulation. Available in **Cloud white** or **Charcoal**
				1. Moisture Vapor Transmission, Permeance, ASTM E96:

Thickness, 1 inch (25 mm): Class I (0.01 perm).

* + - * 1. Core Density per ASTM D1622: 2.4 lb. / cu. ft.
				2. R-Value, Aged, ASTM C518:

Thickness, 1 inch (25 mm): 5.0.

Thickness, 2.5 inches (64 mm): 12.3

* + - * 1. Compressive Strength, ASTM D1621: 19.5psi nominal.
				2. Tensile Strength, ASTM D1623: 35psi nominal.
				3. Water Absorption, ASTM D2842: Less than 3 percent.
				4. Dimensional Stability, ASTM D2126, Change in Volume:

158 Degrees F (70 degrees C), 97 Percent Relative Humidity: 3.5 percent.

* + - * 1. Surface Burning Characteristics, ASTM E84, 4 Inches (102 mm):

Flame Spread Index: Less than 25.

Smoke Developed Index: Less than 450.

* + - * 1. Toxicity and Hazardous Materials.

Product containing no added urea-formaldehyde.

PBDE-free product.

Free of flammable blowing agents.

* 1. ACCESSORlES

\*\* NOTE TO SPECIFIER \*\* Consult Manufacturer for substrate conditions requiring application of a primer. Delete if not required.

* + 1. Primer: \_\_\_\_\_(as required for heat sinks like concrete and metal)
		2. Top coats up to .036 inch as allowed by IBC 803.2

PART 3. EXECUTION

* 1. EXAMINATION
		1. Examine areas to receive polyurethane foam insulation.
		2. Notify Architect of conditions that would adversely affect application.
		3. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 PREPARATION

1. Protection of In-Place Conditions:
	1. Protect adjacent surfaces from contact with overspray.
	2. Protect electrical outlet and junction boxes from contact with polyurethane foam insulation.
2. Surface Preparation:
	* + 1. Prepare surfaces in accordance with manufacturer's instructions.
			2. Remove dirt, dust, debris, oil, grease, rust, loose scale, ice, frost, moisture, and other surface contaminants which could adversely affect application of polyurethane foam insulation.

3.3 INSTALLATION

1. Spray-apply polyurethane foam insulation in accordance with manufacturer's instructions at locations indicated on the Drawings.
2. Material Temperature: Maintain materials in containers at 65 to 85 degrees F (18 to 29 degrees C) while in use.
3. Ensure substrates are dry during application.
	1. Total Thickness: Indicated on the Drawings.
4. Apply polyurethane foam insulation to uniform thickness without voids, pinholes, cracks, and crevices.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

3.4 FIELD QUALITY CONTROL

1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Modify as required.

1. Inspect completed application of polyurethane foam insulation, including:
	* + 1. Total thickness.
			2. Free of voids, pinholes, cracks, and crevices.
			3. Adhesion to substrate.
			4. Applicator to complete manufacturer ‘Insulation Certificate’ & post copy near main electric panel.

3.5 CLEANING AND PRO thicknesses as TECTION

* + 1. Promptly clean surfaces that receive overspray of polyurethane foam insulation.
		2. Do not use harsh cleaning materials or methods that could damage surfaces.
		3. Protect Work of this Section from damage during construction.

END OF SECTION