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**THERMOSEAL FLAMEGUARD 500 OPEN CELL SPRAY-APPLIED FOAM PLASTIC INSULATION**

**CSI Section:**  
**07 21 00 Thermal Insulation**

**1.0 RECOGNITION**

Thermoseal FlameGuard 500 open cell spray-applied polyurethane foam plastic insulation recognized in this report has been evaluated for use as a nonstructural thermal insulating material in Type V construction under the IBC and dwellings constructed under the IRC. The surface burning characteristics and physical and thermal properties comply with the intent of the provisions of the following codes and regulations:

- 2021, 2018, 2015 and 2012 International Building Code® (IBC)
- 2021, 2018, 2015 and 2012 International Residential Code® (IRC)
- 2021, 2018, 2015 and 2012 International Energy Conservation Code® (IECC)

**2.0 LIMITATIONS**

Use of Thermoseal FlameGuard 500 recognized in this report is subject to the following limitations:

**2.1** The insulation shall be installed in accordance with the applicable code, the manufacturer’s published installation instructions, and this report. Where there is a conflict, the most restrictive requirements shall govern.

**2.2** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation shall be installed by contractors certified by Thermoseal Inc.

**2.3** When Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation is used in areas where in the likelihood of termite infestation is “very heavy,” it shall be installed in accordance with IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4, as applicable.

**2.4** Jobsite labeling and certification of the insulations shall comply with the 2021, 2018 and 2015 IRC Sections N1101.10 and N1101.10.1.1, 2012 IRC Sections N1101.12 and N1101.12.1, IRC Sections N1101.4 and N1101.4.1 and IECC Sections C303.1.1 and C303.1.2, as applicable.

**2.5** Where applicable, Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation shall be installed with a vapor retarder in accordance with the applicable code.

**2.6** Except as indicated in Section 3.3.3.2 of this report or by the applicable code, the insulations shall be separated from the interior of the building by a code approved thermal barrier.

**2.7** During installation the insulation and the surfaces to which it is applied shall be protected from exposure to weather.

**2.8** The insulation recognized in this report is produced in Norwalk, Connecticut.

**3.0 PRODUCT USE**

**3.1 General:** Thermoseal FlameGuard 500 is an open cell spray-applied polyurethane foam plastic (SPF) insulation and is used as a nonstructural thermal insulating material in Type V construction under the IBC and dwellings under the IRC. The insulation complies with IBC Section 2603; IRC Section R316; and IECC Sections C303, C402, R303; and R402.

**3.2 Design:**

**3.2.1 Surface Burning Characteristics:** FlameGuard 500 open-cell polyurethane foam plastic insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf (8.0 kg/m<sup>3</sup>), has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

**3.2.2 Thermal Resistance:** For uses in accordance with the IECC or other codes, Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation has a thermal resistance, R-value, at a mean temperature of 75°F (24°C) as shown in Table 1 of this report.

*The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.*





**Table 1—FlameGuard 500 Thermal Resistance (R-Values)<sup>1</sup>**

Thickness (inch)	R-Value (°F·ft <sup>2</sup> ·hr/Btu)
1.0	3.9
2	7.6
3.0	11
3.5	13
4.0	15
5	19
5.5	20
6	22
7	26
7.25	27
8	30
9	33
9.25	34
10	37
11	41
11.25	42
12	44
13	48
14	51

SI: 1 inch = 25.4 mm; 1 °F·ft<sup>2</sup>·hr/Btu = 0.176 °K·m<sup>2</sup>·hr/W

<sup>1</sup>R-values are calculated based on tested k-factors at 1- and 3.5-inch thicknesses.

**3.2.3 Air Permeability:** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation is classified as air-impermeable based on testing in accordance with ASTM E283 at a minimum thickness of 5 inches (127 mm) in accordance with the 2021 and 2018 IBC Section 1202.3; 2015 IBC Section 1203.3, and IRC Section 806.5.

### 3.3 Installation:

**3.3.1 Installation General:** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation shall be installed in accordance with the manufacturer's published installation instructions and this report. A copy of these instructions and this evaluation report shall be available on the jobsite at all times during installation.

**3.3.2 Application:** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation shall be applied using spray equipment specified by Thermoseal Inc.

### 3.3.3 Thermal Barrier:

**3.3.3.1 Application with a Prescriptive Thermal Barrier:** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulations shall be separated from the interior of the building by an approved thermal barrier of 1/2-inch-thick (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with and installed in accordance with the applicable code.

**3.3.3.2 Application with an Alternative Thermal Barrier Assembly:** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation and coating may be spray-applied to the interior facing of walls and ceilings and may be left exposed as an interior finish without a

prescribed 15-minute thermal barrier. The thickness of Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation applied to the ceiling or other horizontal assembly shall not exceed 14 inches (356 mm). The thickness of the foam plastic applied to vertical wall surfaces shall not exceed 8 1/2 inches (216 mm). The foam plastic shall be covered on all surfaces with DC315 intumescent coating at a minimum wet film thickness of 18 (12 mils dry film thickness), at a rate of 1.1 gallons (4.2 L) per 100 square feet (9.2 m<sup>2</sup>). The coating shall be applied over the Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation in accordance with the coating manufacturer's instructions and this report. Surfaces to be coated shall be dry, clean and free of dirt, loose debris, and other substances that could interfere with adhesion of the coating.

### 3.3.4 Attics and Crawl Spaces:

#### 3.3.4.1 Application with a Prescriptive Ignition Barrier:

When Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulations are installed within attics or crawl spaces where entry is made only for service of utilities, an ignition barrier shall be installed in accordance with IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4, as applicable. The ignition barrier shall be consistent with the requirements for the type of construction required by the applicable code and shall be installed in a manner so that the foam plastic insulation is not exposed. Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation, as described in this section, may be installed in unvented attics in accordance with IRC Section R806.4. The attic or crawl space area shall be separated from the interior of the building by an approved 15-minute thermal barrier or alternative thermal barrier assembly as described in Section 3.3.3 of this report.

#### 3.3.4.2 Application with an Alternative Ignition Barrier Assembly:

Where the spray-applied insulation is installed in accordance with the following conditions apply, the prescriptive ignition barrier as required in Section 3.3.4.1 is not required:

- a) Entry to the attic or crawl space is to service utilities, and no storage is permitted.
- b) There are no interconnected attic or crawl space areas.
- c) Air in the attic or crawl space is not circulated to other parts of the building.
- d) Attic ventilation is provided when required by 2021 and 2018 IBC Section 1202.2, 2015 and 2012 IBC Section 1203.2 or IRC Section R806, except when air impermeable insulation is permitted in unvented attics in accordance with IRC Section R806.5. Under-floor (crawl space) ventilation is provided when required by 2021 and 2018 IBC Section 1202.4; 2015



and 2012 IBC Section 1203.3; or IRC Section R408.1, as applicable.

- e) Combustion air is provided in accordance with International Mechanical Code® Section 701.
- f) FlameGuard 500 open-cell spray-applied polyurethane foam insulation is applied as required in Section 3.3.4.2.1 or 3.3.4.2.2 of this report, as applicable.

**3.3.4.2.1 Application without Coating:** Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam insulation may be spray-applied to the underside of roof rafters; and in crawl spaces, Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam insulation may be applied to the underside of floors as described in this section. The thickness of the foam plastic applied to the underside of the top space shall not exceed 1 1/4 inches (286 mm). The thickness of the foam plastic applied to vertical surfaces shall not exceed 5/2 inches (127 mm). The attic and crawl space area must be separated from the interior of the building by an approved 15-minute thermal barrier as described in Section 3.3.3.

**3.3.4.2.2 Use on Attic Floors:** When installed without a prescriptive ignition barrier, Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam insulation may be installed at a maximum thickness of 5 1/2 inches (127 mm) between joists of the attic floor. The insulation shall have an ignition barrier applied on the surface meeting the requirements of Section 3.3.4.1 or 3.3.4.2 and shall be separated from the area beneath the attic by an approved thermal barrier.

## 4.0 PRODUCT DESCRIPTION

**4.1 Thermoseal FlameGuard 500:** Thermoseal FlameGuard 500 is a two-part low-density spray-applied, open-cell polyurethane foam plastic insulation having a nominal density of 0.5 pcf (8.0 kg/m<sup>3</sup>). The two components of the insulation are polymeric isocyanate (A-Component) and proprietary resin (B-Component, Thermoseal FlameGuard 500).

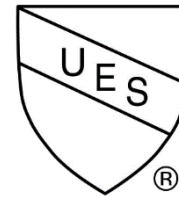
**4.2 DC315 Intumescent Coating:** DC315 Fireproof Paint, recognized in ER-499, is manufactured by International Fireproof Technology, Inc. as a water-based coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating material has a shelf life of 24 months when stored in factory-sealed containers at temperatures between 50°F (10°C) and 90°F (32°C).

## 5.0 IDENTIFICATION

Thermoseal FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation components are identified by the Thermoseal name and trademark, product name address; the product trade name (Thermoseal FlameGuard 500); the lot number; the flame spread and smoke developed indices; mixing instructions; the shelf life;

the expiration date; and the IAPMO Uniform ES Evaluation Report number (ER-819).

The identification includes the IAPMO Uniform Evaluation Service Mark of Conformity as shown below:



## IAPMO UES ER-819

## 6.0 SUBSTANTIATING DATA

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, (AC377), Approved April 2020, (Editorially Revised in July 2020), including Appendix X.

**6.2** Data in accordance with IAPMO/ANSI ES1000, Standard for Building Code Compliance of Spray-Applied Polyurethane Foam.

**6.3** Data in accordance with ICC1100-2019, Standard for Spray-applied Polyurethane Foam Plastic Insulation.

**6.4** Report of room corner fire testing in accordance with NFPA 286.

**6.5** Test reports are from laboratories in compliance with ISO/IEC 17025

## 7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Thermoseal's FlameGuard 500 open-cell spray-applied polyurethane foam plastic insulation to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at the location noted in Section 2.8 of this report under a quality control program with periodic inspection under the surveillance program by IAPMO UES.

For additional information about this evaluation report please visit [www.uniform-es.org](http://www.uniform-es.org) or email us at [info@uniform-es.org](mailto:info@uniform-es.org)