



ICC-ES Evaluation Report

ESR-2668

Reissued November 2022

This report is subject to renewal November 2023.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

HUNTSMAN BUILDING SOLUTIONS

EVALUATION SUBJECT:

SEALECTION® NM OPEN-CELL SPRAY FOAM INSULATION

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2021, 2018, 2015, 2012 and 2009 *International Energy Conservation Code*® (IECC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Surface-burning characteristics
- Attic and crawl space installation
- Physical properties
- Air permeability
- Thermal resistance

1.2 Evaluation to the following green standard:

2008 ICC 700 *National Green Building Standard*™ (ICC 700-2008)

Attributes verified:

See Section 3.4

2.0 USES

Sealection® NM Open-Cell Spray Foam Insulation is used as a nonstructural thermal insulating material in buildings of Type V-B construction under the IBC, and in structures constructed in accordance with the IRC. The insulation is for use in wall cavities, floor/ceiling assemblies, and when installed in accordance with Section 4.4 in attics and crawl spaces.

3.0 DESCRIPTION

3.1 General:

Sealection® NM Open-Cell Spray Foam Insulation is a spray-applied, semirigid, low-density, cellular polyurethane foam plastic insulation. The insulation is a two-component, open-cell, spray-applied, semirigid, polyurethane foam plastic system. The foam plastic has a nominal density of 0.5 pcf (8.0 kg/m³). The polyurethane foam plastic is produced by combining a polymeric isocyanate Part A (Sealection® NM A) with a resin-based Part B (Sealection® NM BOC) on site, during the spraying application. The component products have a shelf life of six months when stored in factory-sealed containers at temperatures between 55°F and 80°F (13°C and 27°C). Sealection® NM Open-Cell Spray Foam Insulation meets or exceeds the minimum requirements set forth in Section 2603.1.1 of the 2021 IBC.

3.2 Surface-burning Characteristics:

The insulation, at a maximum thickness of 6 inches (152 mm) and a nominal density of 0.5 pcf (8.0 kg/m³), has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84 (UL 723). Thicknesses of up to 8 inches (203 mm) for wall cavities and 12 inches (205 mm) for ceiling cavities have been evaluated based on room corner fire testing in accordance with NFPA 286, when covered with minimum 1/2-inch-thick (12.7 mm) gypsum board or an equivalent thermal barrier complying with, and installed in accordance with, the applicable code.

3.3 Thermal Resistance, R-values:

The insulation has thermal resistance (R-values), at a mean temperature of 75°F (24°C), as shown in Table 1.

3.4 Air Permeability:

The Sealection® NM Open-Cell Spray Foam Insulation is considered air-impermeable, based on testing in accordance with ASTM E283, when installed at a thickness of 3.5 inches (89 mm) or greater.

The attributes of the insulation have been verified as conforming to the provisions of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.5 Intumescent Coatings:

3.5.1 Flame Seal TB: Flame Seal TB, manufactured by Flame Seal Products Inc., is a two-component, four-to-one-by-volume, liquid-applied, water-based polymer intumescent coating, manufactured by Flame Seal Products. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of six months when stored in a factory-sealed container at temperatures between 40°F and 90°F (4°C and 32°C).

3.5.2 Bay Seal IC: Bay Seal IC, manufactured by Bayer MaterialScience, LLC is a one-component, water-based polymer coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of one year when stored in a factory-sealed container at temperatures of 50°F (10°C) and above.

3.5.3 Blazelok™ TBX or Fireshell® F10E: Blazelok™ TBX or Fireshell® F10E intumescent coating is a proprietary, water-based, one-part, nonflammable coating manufactured by ICP Construction ([ESR-3997](#)). The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 45°F (7.2°C) and 95°F (35°C).

4.0 INSTALLATION

4.1 General:

Sealection® NM Open-Cell Spray Foam Insulation must be installed in accordance with the manufacturer's published installation instructions, the applicable code and this report. A copy of the manufacturer's published installation instructions must be available at all times on the jobsite during installation.

4.2 Application:

The insulation is spray-applied on the jobsite using a volumetric positive displacement pump to combine the Part A and Part B components at a one-to-one ratio, as specified in the manufacturer's published installation instructions. The spray foam insulation may be applied at a maximum of 6 inches (152.4 mm) per pass to the maximum thicknesses specified in Sections 3.2 and 4.4. Sealection® NM Open-Cell Spray Foam Insulation must not be applied in areas that are exposed to a maximum ambient temperature greater than 180°F (82°C). The substrates to which the insulation is applied must be clean, dry and free of frost, ice, loose debris, or contaminants that will interfere with adhesion of the spray foam insulation. The spray foam insulation must not be applied in electrical outlets or junction boxes, or in direct contact with water or soil. The spray-applied foam insulation must be protected from the weather during and after application.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier: Sealection® NM Open-Cell Spray Foam Insulation at the

maximum thickness specified in Section 3.2 must be separated from the interior of the building by a thermal barrier of 1/2-inch-thick (12.7 mm) gypsum wallboard or an equivalent thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4, as applicable, except when installation is in attics or crawl spaces as described in Section 4.4. There is no thickness limit when installation is separated from the interior of the building by a code-prescribed thermal barrier.

4.3.2 Application without a Prescriptive Thermal Barrier:

In attics, Sealection® NM Open-Cell Spray Foam Insulation may be installed without the prescriptive thermal barrier described in Section 4.3.1, when the installation is in accordance with the following requirements: The prescriptive thermal barrier may be omitted when installation is in accordance with this section. The insulation and coating may be spray-applied to the interior facing of 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 thickness of the foam plastic applied to the underside of the roof sheathing must not exceed 1 1/4 inches (286 mm). The thickness of the foam plastic applied to the vertical wall surfaces must not exceed 9 1/4 inches (235 mm). The foam plastic must be covered on all surfaces with Blazelok™ TBX ([ESR-3997](#)) or Fireshell® F10E coating ([ESR-3997](#)) at a minimum wet film thickness of 18 wet mils (0.46 mm) (12 dry mils [0.31 mm]), at a rate of 1.15 gal/100 ft² (0.45 L/m²). The coating must be applied over the Sealection® NM Open-Cell Spray Foam Insulation in accordance with the coating manufacturer's instructions and this report. Surfaces to be coated must be dry, clean and free of dirt, loose debris and other substances that could interfere with the adhesion of the coating. The coating is applied in one coat by airless spray equipment at ambient temperatures above 50°F (10°C) and relative humidity of less than 70 percent.

4.4 Ignition Barrier—Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier:

When Sealection® NM Open-Cell Spray Foam Insulation is applied within attics or crawl spaces where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code, and must be installed in a manner so that the foam plastic insulation is not exposed. The insulation may be installed as described in this section in unvented attics in accordance with 2021, 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

4.4.2 Application without a Prescriptive Ignition Barrier:

Where Sealection® NM Open-Cell Spray Foam Insulation is installed in accordance with Sections 4.4.2.1, 4.4.2.2, 4.4.2.3 and 4.4.2.4, the following conditions apply:

- Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
- There are no interconnected crawl space or attic areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Attic ventilation is provided when required by 2021 and 2018 IBC Section 1202.2 (2015, 2012 and 2009 IBC Section 1203.2) or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with the 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or 2021, 2018, 2015 or 2012 IRC Section R806.5 (2009 IRC Section R806.4).

- Under-floor (crawl space) ventilation is provided when required by 2021 and 2018 IBC Section 1202.4 (2015 IBC Section 1203.4, 2012 and 2009 IBC Section 1203.3) or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with *International Mechanical Code* (IMC) Section 701.

4.4.2.1 Application with Flame Seal TB Intumescent Coating: In attics, Sealection® NM Open-Cell Spray Foam Insulation may be spray-applied to the underside of roof sheathing, roof rafters and walls; and in crawl spaces, the insulation may be spray-applied to the underside of wood floors and walls as described in this section. The thickness of the foam plastic applied to the vertical surfaces or the underside of the wood floor or roof sheathing must not exceed 12 inches (304 mm). The foam plastic must be covered with Flame Seal TB, applied in accordance with the coating manufacturer's instructions, at an application rate of 0.64 gallon per 100 square feet, resulting in a 7-mil dry film thickness.

Surfaces to be coated must be dry, clean and free of dirt, loose debris and any other substances that could interfere with adhesion of the coating. The Flame Seal TB coating is applied by airless sprayer at ambient temperatures between 50°F and 115°F (10°C and 46°C) and relative humidity of less than 70 percent.

The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 may be omitted. The foam plastic insulation described in this section may be installed in unvented attics in accordance with 2021, 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4) when the foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

4.4.2.2 Application with Bay Seal IC Intumescent Coating: In attics, Sealection® NM Open-Cell Spray Foam Insulation may be spray-applied to the underside of roof sheathing, roof rafters and walls; and in crawl spaces, the insulation may be spray-applied to the underside of wood floors and walls as described in this section. The thickness of the foam plastic applied to the vertical surfaces or the underside of the wood floor or roof sheathing must not exceed 12 inches (304 mm). The foam plastic must be covered with Bay Seal IC, applied in accordance with the coating manufacturer's instructions at a minimum application rate of 0.60 gallon per 100 square feet, resulting in a 5-mil dry film thickness.

Surfaces to be coated must be dry, clean and free of dirt, loose debris and any other substances that could interfere with the adhesion of the coating. The Bay Seal IC coating is applied with brush, roller or airless sprayer at ambient temperatures between 50°F and 115°F (10°C and 46°C) and relative humidity of less than 75 percent.

The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 may be omitted. The foam plastic insulation described in this section may be installed in unvented attics in accordance with 2021, 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4) when the foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

4.4.2.3 Use on Attic Floors: Sealection® NM Open-Cell Spray Foam Insulation may be installed between joists in attic floors without a prescriptive ignition barrier or it may be installed with one of the intumescent coatings described in Section 4.2.2.1, 4.2.2.2 and 4.2.2.3 at a maximum thickness of 12 inches (304 mm). The foam plastic insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 may be omitted.

5.0 CONDITIONS OF USE

The Sealection® NM Open-Cell Spray Foam Insulation described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report subject to the following conditions:

- 5.1** Sealection® NM Open-Cell Spray Foam Insulation and coatings described in this report must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. If there are any conflicts between the manufacturer's published installation instructions and this report, this report governs.
- 5.2** The insulation has been evaluated only for use in Type V-B construction under the IBC and dwellings under the IRC.
- 5.3** A vapor retarder must be installed in accordance with the applicable code.
- 5.4** The thickness and density of the insulation must not exceed what is specified in Sections 3.2 and 4.4.
- 5.5** Sealection® NM Open-Cell Spray Foam Insulation must be applied by contractors authorized by Huntsman Building Solutions.
- 5.6** Sealection® NM Open-Cell Spray Foam Insulation must be separated from the building interior as described in Section 4.3.1, except when installation is as described in Section 4.3.2 or 4.4.
- 5.7** Installation in unvented attics, when equipped with vapor diffusion ports in accordance with Section 1202.3, Item 5.2 of the 2021 IBC and Section R806.5, Item 5.2 of the 2021 and 2018 IRC, is outside the scope of this report.
- 5.8** Jobsite certification and labeling of the insulation must comply with 2021, 2018 and 2015 IRC Sections N1101.10.1 and N1101.10.1.1, 2012 IRC Sections N1101.12.1 and N1101.12.1.1, 2009 IRC Sections N1101.4 and N1101.4.1) and 2021, 2018, 2015 and 2012 IECC Sections C303.1.1 and C303.1.1.1 or R303.1.1 and R303.1.1.1 (2009 IECC Sections 303.1.1 and 303.1.1.1), as applicable.
- 5.9** In areas where the probability of termite infestation is "very heavy" as determined in accordance with 2021, 2018, 2015 and 2009 IBC Figure 2603.8 (2012 IBC Figure 2603.9) or 2021 IRC Figure R301.2 (7) [2018, 2015, 2012, and 2009 IRC Figure R301.2 (6)], the foam plastic must be installed in accordance with 2021, 2018, 2015 and 2009 IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4.
- 5.10** The A and B components of the insulation are produced under a quality control program, with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated April 2020 (editorially revised July 2020).
- 6.2** Reports of air leakage tests in accordance with ASTM E283.
- 6.3** Reports of room corner tests in accordance with NFPA 286.
- 6.4** Reports of tests in accordance with Appendix X of AC377.
- 6.5** Report of critical radiant heat flux of exposed attic floor insulation in accordance with ASTM E970.

7.0 IDENTIFICATION

7.1 Product labeling shall include, the name of the report holder or listee, and the ICC-ES mark of conformity. The listing or evaluation report number (ICC-ES ESR-2668) may be used in lieu of the mark of conformity. The Part A and Part B components for Sealection® NM Open-Cell Spray Foam Insulation are packaged in 55-gallon drums that bear the report holder’s name (Huntsman Building Solutions) and address; the date of manufacture or the lot number; the product trade name (Sealection® NM); the product type (Part A or Part B); the installation instructions; the density; the flame-spread and smoke-developed indices; and the evaluation report number (ESR-2668).

Each pail of FeElame Seal TB or Bay Seal IC intumescent coating is labeled with the manufacturer’s name (Flame Seal Products or Bayer MaterialScience) and address and the product trade name.

ICP Construction Blazelok™ TBX or Fireshell† F10E coating is labeled with the manufacturer’s name and

address; the product name; the date of manufacture, the shelf life or expiration date; the manufacturer’s instructions for application, and the evaluation report number ([ESR-3997](#)).

7.2 The report holder’s contact information is the following:

HUNTSMAN BUILDING SOLUTIONS
3315 EAST DIVISION STREET
ARLINGTON, TEXAS 76011
(817) 640-4900
info@huntsmanbuilds.com
www.huntsmanbuilds.com

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (inches)	R-VALUE (°F.ft².h/Btu)
1	3.7
1.5	5.6
2	7.5
2.5	9.4
3	11
3.5	13
4	15
4.5	17
5	19
5.5	21
6	23
7	26
8	30
9	34
10	37
11	41
12	45

For SI: 1 inch = 25.4 mm; 1°F.ft².h/Btu = 0.176 110°K.m²/W

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

HUNTSMAN BUILDING SOLUTIONS

EVALUATION SUBJECT:

SEALECTION® NM OPEN-CELL SPRAY FOAM INSULATION

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Sealection® NM Open-Cell Spray Foam Insulation, described in ICC-ES evaluation report ESR-2668, has also been evaluated for the codes noted below.

Applicable code editions:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of the State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)
- 2019 *California Energy Code* (CEC)

2.0 CONCLUSIONS**2.1 CBC and CRC:**

The Sealection® NM Open-Cell Spray Foam Insulation, described in Sections 2.0 through 7.0 of the evaluation report ESR-2668, complies with the 2019 CBC and CRC, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) and 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CEC:

The Sealection® NM Open-Cell Spray Foam Insulation, described in Sections 2.0 through 7.0 of the evaluation report ESR-2668, complies with the 2019 CEC, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report.

2.2.1 Conditions of Use:

In accordance with Section 110.8 of the 2019 California Energy Code, verification of certification by the Department of Consumer Affairs, Bureau of Household Goods and Services, must be provided to the code official, demonstrating that the insulation conductive thermal performance is approved pursuant to the California Code of Regulations, Title 24, Part 12, Chapters 12-13, Article 3, "Standards for Insulating Material." The certification must be verified with the DCA Bureau of Household Goods and Services. The following directory link may be used for verification:

https://bhgs.dca.ca.gov/consumers/ti_directory.pdf

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

HUNTSMAN BUILDING SOLUTIONS

EVALUATION SUBJECT:

SEALECTION® NM OPEN-CELL SPRAY FOAM INSULATION

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Sealection® NM insulation, described in ICC-ES evaluation report ESR-2668, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Sealection® NM insulation, described in Sections 2.0 through 7.0 of the evaluation report ESR-2668, complies with the *Florida Building Code—Building* and *Florida Building Code—Residential*. The design requirements shall be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2668 for the 2018 *International Building Code*® (IBC) meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable with the following condition:

- Installation must meet the requirements of Sections 1403.8 and 2603.8 of the *Florida Building Code—Building* and Sections R318.7 and R318.8 of the *Florida Building Code—Residential*, as applicable.

Use of the Sealection® NM insulation for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

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