

# ICC-ES Evaluation Report

**ESR-1154**

Reissued September 1, 2011

This report is subject to renewal in one year.

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

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**EVALUATION SUBJECT:**
**SEALITE™ SPRAY APPLIED POLYURETHANE INSULATION**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2012 and 2009 *International Building Code*® (IBC)
- 2012 and 2009 *International Residential Code*® (IRC)
- 2012 and 2009 *International Energy Conservation Code*® (IECC)
- Other Codes (see Section 8.0)

**Properties evaluated:**

- Surface-burning characteristics
- Physical properties
- Thermal resistance
- Attic and crawl space installation
- Air permeability
- Exterior walls in Type I through IV construction

**2.0 USES**

The Sealite™ insulation is used as a nonstructural thermal insulating material in Type I, II, III, IV and V construction (IBC) and dwellings under the IRC. The insulation is for use in wall cavities, floor/ceiling assemblies and, when installed in accordance with Section 4.3, in attic and crawl spaces. Under the IRC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.4.

**3.0 DESCRIPTION**
**3.1 General:**

Sealite™ insulation is a spray-applied cellular polyurethane foam plastic that is installed as a nonstructural foam component in cavities of roofs, ceilings, floors and stud

wall assemblies. The foam plastic is a two-component, open-cell, one-to-one by volume spray foam system with a nominal density of 0.5 pcf (8 kg/m<sup>3</sup>).

**3.2 Surface-burning Characteristics:**

The insulation, at a maximum thickness of 4<sup>1</sup>/<sub>2</sub> inches (114 mm) and a nominal density of 0.5 pcf (8 kg/m<sup>3</sup>), has a flame-spread index of less than 25 and a smoke-developed index of less than 450 when tested in accordance with ASTM E 84. Thicknesses of up to 8 inches (203 mm) for wall cavities and 12 inches (305 mm) for ceiling cavities are recognized based on room corner fire testing in accordance with UBC Standard 26-3.

**3.3 Thermal Transmission 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:**

Sealite™ spray-applied polyurethane foam plastic insulation, at a minimum thickness of 3 inches (76 mm), is considered an air-impermeable insulation in accordance with IRC Section R202, based on testing in accordance with ASTM E 283.

**3.5 Aldocoat® 757 Intumescent Coating:**

Aldocoat® 757 intumescent ignition barrier coating manufactured by Aldo Products Company is a water-based latex coating with specific gravity of 1.4. Aldocoat® 757 is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of 6 months when stored in a factory-sealed container at temperatures between 40°F (4.5°C) and 90°F (32°C).

**3.6 DC 315 Fireproof Paint:**

DC 315 Fireproof Paint is manufactured by International Fireproof Technology, Inc., and is a water-based coating supplied in 5-gallon (19L) pails and 55-gallon (208L) 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).

**4.0 INSTALLATION**
**4.1 General:**

The Sealite™ insulation must be installed in accordance with the manufacturer's published installation instructions and this report.

The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available at all times on the jobsite during installation.

The Sealite™ insulation is spray-applied on the jobsite using a volumetric positive displacement pump as identified in the NCFI Polyurethanes application manual. The insulation can be installed at a maximum per pass thickness of up to 12 inches (305 mm). The Sealite™ insulation passes must be allowed to fully expand and be cured for a minimum of 10 minutes prior to application of an additional pass. The Sealite™ insulation components must be stored in areas where the ambient temperature is between 65°F (18°C) and 100°F (38°C). Sealite™ must not be used in areas that have a maximum service temperature greater than 180°F (82°C). The foam plastic must not be used in electrical outlets or junction boxes or in contact with rain, water, or soil. The substrate must be free of moisture, frost or ice, and loose scales, rust, oil, and grease. The insulation must be protected from the weather during and after application.

#### 4.2 Thermal Barrier:

##### 4.2.1 Application with a Prescriptive Thermal Barrier:

The Sealite™ insulation, with a maximum nominal thickness of 8 inches (203 mm) for wall cavities and 12 inches (305 mm) for ceiling cavities, must be separated from the interior of the building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with and installed in accordance with the applicable code.

##### 4.2.2 Application without a Prescriptive Thermal Barrier:

The prescriptive 15-minute 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, 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 prescribed ignition barrier. The thickness of the foam plastic applied to the underside of the roof sheathing must not exceed 12 inches (305 mm). The thickness of the foam plastic applied to vertical wall surfaces must not exceed 8 inches (203 mm). The foam plastic must be covered on all surfaces with DC 315 Fireproof Paint at a minimum wet film thickness of 22 wet mils (0.56 mm) [14 dry mils (0.36 mm)], at a rate of 1 gallon (3.38L) per 73 square feet (6.8 m<sup>2</sup>). The coating must be applied over the Sealite™ 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 adhesion of the coating. The coating is applied in one coat with brush, roller or low-pressure airless equipment.

#### 4.3 Attics and Crawl Spaces:

##### 4.3.1 Application With a Prescriptive Ignition Barrier:

When Sealite™ insulation is installed 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 Sections R316.5.3 and 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. Sealite™ insulation as described in Section 3.4 may be installed in unvented attics in accordance with the 2009 IRC Section R806.4 or the 2012 IRC Section R806.5.

##### 4.3.2 Application without a Prescriptive Ignition Barrier:

Where Sealite™ insulation is installed in accordance with this section and Section 4.3.3, 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 basement or attic areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Ventilation of the attic or crawl space is provided in accordance with IBC Section 1203.2 or IRC Section R806, except when insulation is permitted in unvented attics in accordance with Section R806.4 of the 2009 IRC or Section R806.5 of the 2012 IRC.
- Combustion air is provided in accordance with IMC Sections 701.

In attics and crawl spaces, Sealite™ insulation may be spray-applied to the underside of roof sheathing or roof rafters, 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 16 inches (406 mm). The thickness of the foam plastic applied to vertical surfaces must not exceed 11.75 inches (298 mm). The foam plastic on both horizontal and vertical surfaces must be covered with Aldocoat® 757 intumescent coating described in Section 3.5 at a minimum application rate of 1 gallon per 100 square feet (0.41 L/m<sup>2</sup>). The Aldocoat® 757 intumescent ignition barrier coating must be applied over the Sealite™ 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 any other substances that could interfere with adhesion of the coating. The Aldocoat 757 coating is applied with a medium size nap roller, soft brush or conventional airless spray equipment. The coating must be applied when ambient and substrate temperatures are within a range of 50°F (10°C) and 90°F (32°C) and requires a twenty-four hour curing time.

The prescriptive ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.4 or R316.5.3 may be omitted. The foam plastic insulation described in this section may be installed in unvented attics in accordance with 2009 IRC Section R806.4 or 2012 IRC Section R806.5.

**4.3.3 Use on Attic Floors:** When used on attic floors, Sealite™ insulation may be installed at a maximum thickness of 12 inches (305 mm) between joists in attic floors. The Sealite™ insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier in accordance with IBC Section 2603.4.1.6, or IRC Section R316.5.3 may be omitted.

#### 4.4 Exterior Walls of Type I, II, III and IV Construction:

**4.4.1 General:** When used on exterior walls of Type I, II, III and IV construction, the Sealite™ insulation must comply with Section 2603.5 of the IBC and this section (Section 4.4), and the insulation must be installed at a maximum thickness of 5 inches (127 mm). The potential heat of Sealite™ insulation is 676.5 Btu/ft<sup>2</sup> (7.7 MJ/m<sup>2</sup>) per inch of thickness when tested in accordance with NFPA 259.

**4.4.2 Specific Wall Assemblies:** Wall assemblies complying with Section 4.4 must be as described in Table 2.

#### 5.0 CONDITIONS OF USE

The Sealite™ 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 This evaluation report and the manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application.
- 5.2 The insulation must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. The instructions within this report govern if there are any conflicts between the manufacturer's published installation instructions and this report.
- 5.3 The insulation must be separated from the interior of the building by an approved 15-minute thermal barrier, as described in Section 4.1, except when installation is as described in Section 4.2.
- 5.4 The insulation must not exceed the thickness and density noted in Sections 3.2, 4.2, 4.3 and 4.4 of this report.
- 5.5 The insulation must be protected from the weather during and after application.
- 5.6 The insulation must be applied by contractors certified by NCFI Polyurethanes.
- 5.7 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2009 IBC Section 2603.8, 2012 IBC Section 2603.9 or IRC Section R318.4, as applicable.
- 5.8 The Sealite™ insulation must have a clearance above grade and exposed earth of 6 inches (152 mm) or greater.
- 5.9 When use is on exterior walls of buildings of Type I, II, III and IV, construction must be as described in Section 4.4.
- 5.10 Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 303.1.1 and 303.1.2, as applicable.
- 5.11 A vapor retarder must be installed in accordance with the applicable code and in accordance with Section R806.5 (4) of the 2012 IRC for Climate Zones 5, 6, 7 and 8.
- 5.12 Sealite™ insulation is produced in Mount Airy, North Carolina, under a quality control program, with inspections by Intertek Testing Services NA, Inc. (AA-690).

## 6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated June 2011, including reports of the fire tests in accordance with Appendix X.
- 6.2 Test reports on room corner fire testing of spray-applied foam plastic in accordance with UBC 26-3 and NFPA 286.
- 6.3 Reports on air leakage rate tests in accordance with ASTM E 283.
- 6.4 Reports of potential heat of foam plastics tests in accordance with NFPA 259.

- 6.5 Reports of fire propagation characteristics tests in accordance with NFPA 285.

- 6.6 Reports on critical radiant flux of exposed attic floor in accordance with ASTM E 970.

## 7.0 IDENTIFICATION

Components for Sealite™ insulation are identified with the manufacturer's name (NCFI Polyurethanes), address and telephone number; the product trade name (Sealite™); use instructions; the density; the flame-spread and smoke-development indices; the evaluation report number (ESR-1154); and the name of the inspection agency (Intertek Testing Services NA, Inc.).

Intumescent coatings are identified with the manufacturer's name and address, the product name and use instructions.

## 8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the following codes:

- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)
- 2006 *International Energy Conservation Code*® (2006 IECC)

The products comply with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report except as noted below:

- **Application with a Prescriptive Thermal Barrier:** See Section 4.2.1, except the approved thermal barrier must be installed in accordance with Section R314.4 of the 2006 IRC.
- **Application without a Prescriptive Thermal Barrier:** See Section 4.2.2.
- **Application with a Prescriptive Ignition Barrier:** See Section 4.3.1, except attics must be vented in accordance with 2006 IBC Section 1203.2, and crawl space ventilation must be in accordance with 2006 IBC Section 1203.3, as applicable. Additionally, an ignition barrier must be installed in accordance with 2006 IRC Section R314.5.3 or R314.5.3, as applicable.
- **Application without a Prescriptive Ignition Barrier:** See Section 4.3.2, except attics must be vented in accordance with 2006 IBC Section 1203.2 or 2006 IRC Section R806, and crawl space ventilation must be in accordance with 2006 IBC Section 1203.3 or 2006 IRC Section R408, as applicable.
- **Protection Against Termites:** See Section 5.7, except use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with Section R320.5 of the 2006 IRC.
- **Jobsite Certification and Labeling:** See Section 5.10, except jobsite certification and labeling must comply with Sections 102.1.1 and 102.1.11, as applicable, of the 2006 IECC.

TABLE 1—THERMAL RESISTANCE (R-VALUES<sup>1,2</sup>)

THICKNESS (inches)	R-VALUE (°F.ft <sup>2</sup> .h/Btu)
1	4.1
2	7.5
3	11
3.5	13
4	14
5	18
6	22
7	25
7.5	27
8	29
9	32
10	36
11	40
11.5	41
12	43
16	58

For SI: 1 inch = 25.4 mm; 1°F.ft<sup>2</sup>.h/Btu = 0.176 110°K.m<sup>2</sup>/W.

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

<sup>2</sup>R-values greater than 10 are rounded to the nearest whole number.

TABLE 2—NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES

WALL COMPONENT	MATERIALS <sup>1</sup>
Base Wall System – Use either 1, 2 or 3	1 – Concrete wall 2 – Concrete masonry wall 3 – 1 layer 5/8-inch-thick Type X gypsum wallboard complying with ASTM C 36 or C 1396 on interior, installed over minimum 3 5/8-inch-deep, No. 20 gage, C-shaped steel studs, spaced a maximum of 24 inches on center. Gypsum wallboard must be attached with No.6, 1 1/4-inch-long self-tapping screws located 8 inches on center along the perimeter and in the field of wallboard. Gypsum wallboard joints must be taped and treated with joint compound in accordance with ASTM C 840 or GA-216
Floorline Firestopping	4 pcf mineral wool (e.g., Thermafiber) in each stud cavity at each floorline attached with Z-clips
Cavity Insulation – Use either 1, 2 or 3	1 – None 2 – Full cavity depth or less of Sealite® applied using exterior sheathing as substrate and covering the width of the cavity and inside the stud flange 3 – Fiberglass batt insulation (faced or unfaced)
Exterior Sheathing – Only for Base Wall System No. 3 Use either 1 or 2	1 – 1/2-inch-thick, exterior type gypsum sheathing 2 – 5/8-inch-thick, exterior type gypsum sheathing
Exterior Insulation Use either 1 or 2	1 –None 2 –InsulStar® or InsulBloc® (ESR-1615) spray-applied foam insulation up to a maximum nominal thickness of 3 inches
Exterior Wall covering– Use either 1, 2, 3 or 4	1 – Brick - standard nominally 4-inch-thick clay brick - Brick veneer anchors – standard types installed a maximum of 24 inches OC vertically on each stud - Maximum 2-inch air gap between exterior insulation and brick 2 – Stucco - minimum 3/4-inch-thick, exterior cement plaster and lath. A secondary water-resistive barrier may be installed between the exterior insulation and the lath. The secondary water-resistive barrier must not be full-coverage asphalt or butyl-based self-adhered membranes. 3 – Minimum 2-inch-thick limestone, natural stone or minimum 1 1/2-inch-thick cast artificial stone. Any standard non-open-jointed installation technique such as ship-lap, etc., may be used. 4 – Terracotta cladding – Use any terracotta cladding system in which the terracotta is a minimum of 1 1/4 inch thick. Any standard non-open-jointed installation technique such as ship-lap, etc., may be used.

For SI: 1 inch = 25.5 mm; 1 pcf = 16.018 kg/m<sup>3</sup>.

**ICC-ES Evaluation Report****ESR-1154 Supplement**

Issued September 1, 2011

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[www.ncfi.com](http://www.ncfi.com)**EVALUATION SUBJECT:****SEALITE™ SPRAY-APPLIED POLYURETHANE INSULATION****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2007 *Florida Building Code—Residential*
- 2007 *Florida Building Code—Building*

**Properties evaluated:**

- Surface-burning characteristics
- Physical properties
- Thermal resistance
- Attic and crawl space installation
- Air permeability
- Exterior walls in Type I through IV construction

**2.0 PURPOSE OF THIS SUPPLEMENT**

This supplement is issued to indicate that the Sealite™ spray-applied polyurethane foam insulation described in Sections 2.0 through 7.0 of the master report complies with the 2007 *Florida Building Code—Building* and the 2007 *Florida Building Code—Residential*, when designed and installed in accordance with the master evaluation report under the following condition:

Sealite™ spray-applied polyurethane foam insulation used in exterior walls of multistory buildings located in the High-Velocity Hurricane Zones must comply with Section 2612.3.2.4 of the *Florida Building Code—Building*.

For products falling under Florida Rule 9N-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).

This supplement expires concurrently with the master report reissued September 1, 2011.