



EVALUATION SUBJECT: SES 2.0, SES 2.0 LE, NEXSEAL™ 2.0 AND NEXSEAL™ 2.0 LE SPRAY FOAM INSULATIONS

REPORT HOLDER:
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CSI Division: 07 THERMAL AND MOISTURE
PROTECTION
CSI Section: 07 21 00 Thermal Insulation

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:

- 2015, 2012 and 2009 International Building Code® (IBC)
- 2015, 2012 and 2009 International Residential Code® (IRC)
- 2015, 2012 and 2009 International Energy Conservation Code® (IECC)
- 2014 Florida Building Code, Building (2014 FBC, Building) and 2014 Florida Building Code, Residential (FBC, Residential)- supplement attached.

1.2 Evaluated in accordance with:

- ICC-ES AC377, approved April 2016

1.3 Properties assessed:

- Physical Properties
- Thermal Resistance (R-Values)
- Surface Burning Characteristics
- Exterior Walls Type I, II, III or IV Construction
- Air Permeability
- Vapor Permeance
- Attic and crawl space installations
- Alternate Thermal Barrier Assemblies

2.0 PRODUCT USE

SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations comply with IBC Section 2603, IRC Section R316, 2015 and 2012 IECC Sections C303, C402, R303, and R402, and 2009 IECC Sections 303 and 402. When installed in accordance with Section 4.0 of this report, SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations may be used in wall cavities, floor assemblies or ceiling assemblies, and/or in attic and crawl spaces as nonstructural thermal insulation material. The spray-applied foam plastic insulations are used in Type V-B construction under the IBC and in

dwellings under the IRC. The spray-applied foam plastic Insulations also may be used in Type I, II, III or IV construction when installed in accordance with Section 4.6 of this report.

SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations may be used as air impermeable insulations when installed in accordance with Section 3.4 of this report.

3.0 PRODUCT DESCRIPTION

3.1 Properties: SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations are a spray-applied, polyurethane foam plastic and comply as medium-density insulation in accordance with Section 3.1.1 and Table 1 of AC377. The insulation is a two-component spray foam plastic with a nominal in-place density of 2.0 pcf (32 kg/m³).

The spray-applied insulation is mixed in the field by combining a polymeric isocyanate (A component) and a resin blend (B component). The liquid components shall be stored in 55-gallon (208 L) drums at temperatures between 50°F and 70°F (10°C and 21°C). When Component A and Component B are stored in factory-sealed containers at the recommended temperatures, the maximum shelf life is six months.

3.2 Thermal Resistance (R-Values): SES 2.0, SES 2.0 LE Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations have a thermal resistance (R-Value) at a mean temperature of 75°F (24°C) as shown in Table 1 of this report.

Table 1 – Thermal Resistance (R-Value) (°F•ft ² •h/Btu)		
Thickness (inch)	SES 2.0 and SES 2.0 LE	Nexseal™ 2.0 and Nexseal™ 2.0 LE
1	6.8	7.0
2	14	14
3	20	21
3.5	24	24
4	27	28
5	34	35
6	41	42
7	48	49
8	55	56
9	62	63
10	68	70
11	75	77
12	82	84

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

¹ R-Values are calculated based on tested K values at 1-inch and 3.5-inch thicknesses.

² R-Values greater than 10 are rounded to the nearest whole number.





3.3 Surface Burning Characteristics: At a maximum thickness of 4 inches (102 mm) and a nominal density of 2.0 pcf (32 kg/m³), the SES 2.0, SES 2.0 LE, Nexseal™ 2.0, Nexseal™2.0 LE Spray Foam Insulations have a flame spread index of 25 or less and smoke-developed index of 450 or less when tested in accordance with ASTM E84. Thicknesses are not limited for ceiling cavities and wall cavities when covered by a code complying prescriptive thermal barrier, such as minimum ½ inch (12.7 mm) thick gypsum board.

3.4 Air Permeability: When tested in accordance with ASTM E2178 at a minimum thickness of 1 inch (25.4 mm), SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™2.0 LE Spray Foam Insulations are classified as air-impermeable insulations in accordance with Section 1203.3 of the 2015 IBC, and Section R806.5 of the 2015 and 2012 IRC or Section R806.4 of the 2009 IRC, as applicable.

3.5 Vapor Permeance: When tested in accordance with the ASTM E96 desiccant method (Procedure A), SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™2.0 LE Spray Foam Insulations have a vapor permeance of less than 1.0 perms [57.4 x 10⁻⁹ g/(Pa•s•m²)], at a minimum thickness of 1⁵/₈ inch (41.3 mm) and qualifies as a Class II vapor retarder in accordance with IBC Section 202 and IRC Section R202.

3.6 DC-315 Fireproof Paint: DC-315 Fireproof Paint is a water-based latex intumescent coating manufactured by International Fireproof Technology, Inc. and is supplied in 5 gallon (19L) pails and 55-gallon (208L) drums. When stored in factory-sealed containers at temperatures between 50°F (10 °C) and 80°F (27°C), the coating has a shelf life of 24 months.

4.0 DESIGN AND INSTALLATION

4.1 Design: SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™2.0 LE Spray Foam Insulations shall comply with requirements in 2015 and 2012 IECC Sections C402.1 and R402, or 2009 IECC Section 402, as applicable. The manufacturer's published installation instructions for SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulation and this report shall be available and strictly adhered to at all times on the jobsite during installation.

4.2 Installation: SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™2.0 LE Spray Foam Insulations shall be spray-applied on the jobsite using a volumetric positive displacement pump in accordance with the manufacturer's published installation instructions. The applied insulation shall be sprayed in multiple passes having a maximum thickness of 2 inches (50.8 mm) per pass for SES 2.0 and

Nexseal™ 2.0 and 4 inches (50.8 mm) per pass for SES 2.0 LE and Nexseal™2.0 LE up to the maximum insulation thickness specified in this report. The maximum in-service temperature for all areas shall not exceed 180°F (82°C). The spray-applied foam plastic insulation shall not be used in electrical outlets or junction boxes or in continuous contact with rain or water. The spray-applied foam plastic insulation shall be sprayed onto a substrate that is protected and clean from any debris or weather related conditions during application.

4.3 Installation with a Prescriptive Thermal Barrier: SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations shall be separated from the interior by an approved thermal barrier of minimum ½ inch thick (12.7 mm) gypsum wallboard or an equivalent thermal barrier. When installed in accordance with this section the spray foam may be any thickness when installed behind a prescriptive thermal barrier. The barrier shall comply with, and be installed in accordance with IBC Section 2603.4 or IRC Section R316.4, as applicable.

4.4 Installation without a Prescriptive Thermal Barrier: The thermal barrier required by IBC Section 2603.4 or IRC Section R316.4 may be omitted when all of the following apply:

- a. The thickness of SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™2.0 LE Spray Foam Insulations shall not exceed 8¼ inches (210 mm) on walls and other vertical surfaces and 10¼ inches (260 mm) on ceilings and other horizontal and overhead surfaces; and
- b. The SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™2.0 LE Spray Foam Insulations are coated with a minimum 18 mils (0.46 mm) wet film thickness (12 mils [0.30 mm] dry film thickness) of DC-315 Fireproof Paint intumescent coating as described in Section 3.6 of this report. The coating shall be applied 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 contaminants that could impact adhesion of the coating.

4.5 Installation for Attics and Crawl Spaces: When used in an attic or crawl space where entry is made only for service of utilities SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations shall be installed in accordance with this section. The insulation shall be separated from the interior of the building by an approved thermal barrier as described in Section 4.3, 4.4 and 5.2 of this report, as applicable.



4.5.1 Installation with a Prescriptive Ignition Barrier:

Where entry is made only for the service of utilities, SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations may be installed within attics or crawl spaces with an ignition barrier in accordance with

IBC Section 2603.4.1.6, or IRC Sections R316.5.3 and R316.5.4, as applicable. The ignition barrier shall be installed in a manner such that the foam plastic insulation is not exposed, and is consistent with the requirements of the type of construction required by the applicable code.

4.5.2 Installation without a Prescriptive Ignition Barrier: When installation is in accordance with this section, the ignition barrier specified by Section 2603.4.1.6 of the IBC or Sections R316.5.3 and R316.5.4 of the IRC, as applicable, may be omitted.

4.5.2.1 General: When SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations are installed in attics and crawl spaces without a prescriptive ignition barrier, the following conditions apply:

- a. The thickness of the foam plastic insulation applied to the underside of the top of the space shall not exceed 1 1/2 inches (292 mm).
- b. The thickness of the foam plastic insulation applied to the vertical surfaces shall not exceed 7/8 inches (190 mm).
- c. Entry is only to service utilities in the attic or crawl space and no storage is permitted.
- d. Attic or crawl space areas cannot be interconnected.
- e. Air from the attic or crawl space cannot be circulated to other parts of the building.
- f. In accordance with IBC Section 1203.2 or IRC Section R806, as applicable, attic ventilation is provided, as applicable.
- g. In accordance with IBC Section 1203.3 or IRC Section R408.1, as applicable, crawl-space ventilation is provided, as applicable.
- h. In accordance with IMC (International Mechanical Code®) Section 701, combustion air is provided.

4.5.2.2 Attics and Crawl Spaces: SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations may be spray-applied in attics to the underside of roof sheathing, roof rafters and/or vertical surfaces, and in crawl spaces to the underside of floors and/or vertical surfaces as described in this section. When applied to the underside of the top of the space, the thickness of the SES 2.0 Spray Foam Insulation shall not exceed 1 1/2 inches (292 mm), and when applied to vertical surfaces maximum thickness shall not exceed 7/8 inches (190 mm). The SES 2.0 Spray Foam Insulation does not require the application of either an ignition barrier or a fire protective coating.

Optional: If desired, SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulation may be coated with 4 mils (0.1 mm) wet film thickness (2.7 mils dry film thickness [0.07 mm]) of DC-315 Fireproof Paint as described in Section 3.6.

4.5.3 Unvented Attics: SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulation may be installed in unvented attic assemblies and unvented enclosed rafter assemblies in accordance with Section 1203.3 of the 2015 IBC or Section R806.5 of the 2015 and 2012 IRC, or Section R806.4 of the 2009 IRC, as applicable.

4.6 Exterior Walls of Buildings of Type I, II, III or IV Construction. When SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulations are used in exterior walls of buildings of Type I, II, III or IV construction of any height the insulation shall comply with Section 2603.5 of the IBC and this section. SES 2.0 Spray Foam insulation shall be installed at a maximum thickness of 4-inches (102 mm).

4.6.1 Complying Exterior Wall Assemblies. Wall assemblies that comply with Section 2603.5 of the IBC and this report that may be used in exterior walls of buildings of Type I, II, III or IV construction of any height are described in Table 2 of this report.

5.0 LIMITATIONS

The SES 2.0, SES 2.0 LE, Nexseal™ 2.0 and Nexseal™ 2.0 LE Spray Foam Insulation described in this report complies with those codes listed in Section 1.0 of this report or is considered a suitable alternative to what is specified, subject to the following conditions:

5.1 The insulation shall be installed in accordance with the manufacturer's published installation instructions. It shall also be installed in accordance to this evaluation report and the applicable code, and if there are any conflicts between the manufacturer's published installation instructions and this report, the more restrictive governs.

5.2. Except as indicated in Section 4.3 and Section 4.4 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.

5.3. As noted in Sections 3.1 and 3.2 of this report, the insulations shall not exceed the nominal density and thickness.

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



weather.

5.5. The contractors that will be installing the insulations shall be certified by SES Foam, LLC.

5.6. Use of the insulation in areas of "very heavy" termite infestation shall be in accordance with 2015 IBC Section 2603.8, 2012 IBC Section 2603.9, or 2009 IBC Section 2603.8, or IRC Section 318.4, as applicable.

5.7 The insulation at a 1⁵/₈-inch (41.3 mm) thickness or greater is a Class II vapor retarder as defined in Section R202 of the IRC and Section 202 of the IECC.

5.8. Labeling and jobsite certification of the insulation and coatings shall comply with 2015 IRC 1101.10 and 1101.10.1.1, 2012 IRC Sections 1101.12 and 1101.12.1, 2009 IRC Sections N1101.4 and N1101.4.1, IECC Sections C303.1.1 and C303.1.2, as applicable.

5.9 The insulations produced at SES Foam, LLC, located in St. Louis, Missouri shall be under a quality control program with inspections by Quality Control Consultants, LLC.

6.0 SUBSTANTIATING DATA

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, AC377, dated April 2016, including reports of tests in accordance with Appendix X of AC377.

6.2 Reports of room corner testing in accordance with NFPA 286.

6.3 Reports of fire characteristics testing in accordance with NFPA 285.

6.4 Reports of potential heat of building material testing in accordance with NFPA 259.

6.4 Reports of water vapor transmission testing in accordance with ASTM E96.

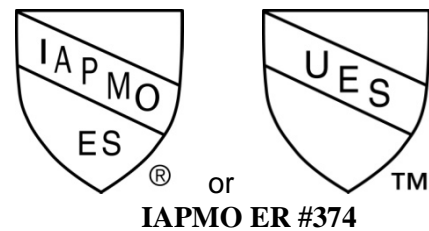
7.0 IDENTIFICATION

The spray foam insulation containers are identified with the following:

- a. Manufacturer's name (SES Foam, LLC)
- b. address and telephone number,
- c. the product trade name (SES 2.0, SES 2.0 LE, Nexseal™ 2.0 or Nexseal™ 2.0 LE Spray Foam Insulation)
- d. use instructions
- e. density, flame-spread and smoke-development indices
- f. date of manufacture or batch/run number
- g. the IAPMO Uniform ES evaluation report number (ER-374) and Mark of Conformity
- h. the name or logo of the inspection agency (Quality Control Consultants, LLC)

Each container of the DC-315 Fireproof paint is labeled with the manufacturer's name (International Fireproof Technology, Inc.), the product name, and use instructions.

Either Mark of Conformity may be used as shown below:



Brian Gerber

Brian Gerber, P.E., S.E.
Vice President, Technical Operations
Uniform Evaluation Service

Richard Beck

Richard Beck, PE, CBO, MCP
Vice President, Uniform Evaluation Service

Russ Chaney

GP Russ Chaney
CEO, The IAPMO Group

For additional information about this evaluation report please visit www.uniform-es.org or email at info@uniform-es.org



Table 2 – NFPA 285 Complying Exterior Wall Assemblies	
Wall Component	Material Description
Base Wall System (BWS) Use either 1, 2 or 3	1 – concrete wall 2 – concrete masonry wall 3 – 1 layer of 5/8-inch thick Type X gypsum wallboard installed on the interior side of minimum 35/8-inch-deep minimum No. 20-gauge thick steel studs spaced a maximum or 24 inches on center. Lateral bracing installed minimum every 4 feet vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 pcf density mineral wool (e.g. Thermafiber) friction fit between steel wall studs.
Resilient Channel when used with BWS 3 above	Double-leg ‘hat’ shaped steel resilient channel, minimum 30 gage, installed perpendicular to the wall studs (interior side only) and spaced a maximum of 24-inches on center between steel studs and Type X gypsum wallboard. Entire perimeter of window opening to be framed with resilient channel.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2012 IBC shall be installed, as applicable, to fill the void created at the intersection of the exterior curtain wall assembly and the concrete floor slab.
Interior Insulation Use either 1, 2, 3, 4 or 5; or combination of 3 and 4; or combination of 3 and 5	1 – None 2 – Maximum 35/8-inch thickness of SES Foam 0.5 lb. (Sucraseal 0.5) applied to the interior surface of BWS 1 or 2 above. ^{1,4} 3 – SES Foam 0.5 lb. (Sucraseal 0.5) applied to the full depth of the wall stud cavity, or less, with exterior gypsum sheathing (see BWS 3 above) as the substrate covering the width of the cavity and the inside of the steel wall stud framing flange. ⁴ 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior Sheathing Use either 1, 2 or 3	1 – None (for BWS 1 or 2 above) 2 – 1/2 inch thick exterior gypsum sheathing (for BWS 3 above) 3 – 5/8-inch-thick Type X exterior type gypsum sheathing (for BWS 3 above)
Exterior Insulation	Maximum 4-inch thick SES Foam 2.0 Spray Foam Insulation ³
Exterior Wall Covering² Use either 1, 2, 3, 4 or 5	1 – Brick - steel brick veneer anchors, installed a maximum 24-inches on-center, vertically on each stud with maximum 2-inch air gap between exterior insulation and brick. Brick to be standard nominal 4-inch thick clay brick installed in a running bond pattern using Type S mortar. 2 – Stucco - minimum 3/4-inch thick, exterior cement plaster and lath. A secondary water-resistive barrier (WRB) shall be installed between the exterior insulation and the lath. The Secondary WRB shall not be full-coverage asphalt or butyl-based self-adhering membranes. 3 – Minimum 2-inch thick natural stone. Joints shall be mortared (non-open jointed). 4 – Minimum 1 1/2-inch thick concrete masonry unit, pre-cast concrete or artificial cast stone. Joints shall be mortared. 5 – Minimum 1 1/4-inch thick terra cotta. Joints shall be mortared.
Flashing of windows, doors or other exterior wall penetrations	As an option, flash around windows, doors and other exterior wall penetrations with limited amounts of maximum 12-inch wide flashing tape (acrylic, asphalt or butyl-based) or liquid-applied membrane material with or without fiber mesh reinforcement.

SI: 1 inch = 25.4 mm; 1 pcf = 16.0 kg/m³; 1 Btu/ft² = 0.01128 MJ/m²

¹ Fireblocking per Section 718 of the 2012 IBC and thermal barrier material requirements per Section 2603.4 of the 2012 IBC shall be met for Base Wall Systems 1 and 2, as required by specific wall construction details when a combustible concealed space is created on interior side of exterior wall assembly.

² Exterior wall coverings shall be installed in accordance with the manufacturer’s installation instructions and shall comply with the provisions of Chapter 14 of the IBC and Chapter 7 of the IRC, as applicable.

³ The potential heat of 4-inch-thick SES 2.0 Spray Foam Insulation is 2,066 Btu/ft² per inch of thickness when tested in accordance with NFPA 259.

⁴ The potential heat of 35/8-inch-thick SES 0.5 lb. Spray Foam Insulation is 466 Btu/ft² per inch of thickness when tested in accordance with NFPA 259.



FLORIDA SUPPLEMENT

SES 2.0 SPRAY FOAM INSULATION

CSI Section: 072100 Thermal Insulation

1.0 RECOGNITION

SES 2.0 Spray Foam Insulation evaluated in IAPMO UES Evaluation Report ER-374 is a satisfactory alternative to the following codes and regulations:

- 2014 Florida Building Code, Building (FBC, Building)
- 2014 Florida Building Code, Residential (FBC, Residential)

2.0 LIMITATIONS

2.1 Installation of spray foam insulation in exterior walls of one-story buildings located in High-Velocity Hurricane Zones shall comply with Section 2612.3.2.3 of the Florida Building Code, Building.

2.2 Installation of spray foam insulation in exterior walls of multistory buildings located in High-Velocity Hurricane Zones shall comply with Section 2612.3.2.4 of the Florida Building Code, Building.

2.3 The clearance between the foam insulation installed above grade and exposed earth shall be in accordance with Section 2603.8 of the FBC, Building or Section R318.6 of the Florida Building Code, Residential, as applicable.

2.4 Verification shall be provided that a quality assurance agency audits the manufacturers quality assurance program and audits the production quality of products, in accordance with Section (5)(d) of Florida Rule 61G20-3.008. The quality assurance agency shall be approved by the Commission (or the building official when the report holder does not possess an approval by the Commission).

For additional information about this evaluation report please visit www.uniform-es.org or email at info@uniform-es.org

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