



### CARLISLE SPRAY FOAM INSULATION

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### FOAMSULATE™ HFO SPRAY-APPLIED POLYURETHANE FOAM PLASTIC INSULATION

#### CSI Section:

07 21 00 Thermal Insulation

#### 1.0 RECOGNITION

Foamsulate™ HFO spray-applied polyurethane foam plastic insulation described in this report has been evaluated for use as thermal insulation. The physical properties, thermal resistance, surface burning characteristics, air permeability, water resistance, fire-resistance-rating, attic and crawl space installations and application in Type V construction and in exterior walls of Types I-IV construction were evaluated for compliance with the following codes and regulations:

- 2018, 2015, 2012, 2009, and 2006 International Building Code® (IBC)
- 2018, 2015, 2012, 2009, and 2006 International Residential Code® (IRC)
- 2018, 2015, 2012, 2009, and 2006 International Energy Conservation Code® (IECC)
- 2020 and 2017 Florida Building Code, Building (FBC, Building) – Supplement attached
- 2020 and 2017 Florida Building Code, Residential (FBC, Residential) – Supplement attached
- 2020 and 2017 Florida Building Code, Energy Conservation (FBC, Energy Conservation)

#### 2.0 LIMITATIONS

Use of Foamsulate™ HFO spray-applied polyurethane foam plastic insulation recognized in this report is subject to the following limitations:

**2.1** The insulation shall 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, the more restrictive shall govern.

**2.2** In accordance with Sections 4.6.1 and 4.6.2 of this report, the insulation shall be separated from the interior of the building by a code-complying thermal barrier or ignition barrier as required by the applicable code.

**2.3** The insulation shall not exceed the nominal density and thickness for the installation conditions described in this report.

**2.4** During application, the insulation shall be protected from exposure to weather.

**2.5** The insulation shall be installed by professional spray polyurethane foam installers approved by Carlisle Spray Foam Insulation, or by the Spray Polyurethane Foam Alliance (SPFA).

**2.6** Use of the insulation in areas of “very heavy” termite infestation probability shall be in accordance with 2018 and 2015 IBC Section 2603.8, 2012 IBC Section 2603.9, 2009 or 2006 IBC Section 2603.8, or 2015, 2012 and 2009 IRC Section R318.4, or 2006 IRC Section R320.5, as applicable.

**2.7** When required by the applicable code, a Class I vapor retarder shall be installed.

**2.8** Labeling and jobsite certification of the insulation and coatings shall comply with the following code sections as applicable:

- 2018, 2015, 2012 or 2009 IBC Section 2603.2
- 2018, 2015, 2012 or 2009 IRC Section R316.2
- 2018, 2015 IRC Section N1101.10.1.1
- 2012 IRC Section N1101.12.1.1
- 2009 IRC Section N1101.4.1
- 2018, 2015 or 2012 IECC Sections C303.1.1.1 or R303.1.1.1
- 2009 IECC Section 303.1.1.1

**2.9** Foam Plastic used in plenums as interior finish or interior trim shall comply with Section 2603.7 of the IBC.

**2.10** The insulation recognized in this report shall be produced by Carlisle Spray Foam Insulation in Cartersville, Georgia.

#### 3.0 PRODUCT USE

Foamsulate™ HFO spray-applied polyurethane foam plastic insulation complies with IBC Section 2603, IRC Section R316, 2012 IECC Sections C303, C402, R303, and R402, 2009 IECC Sections 303 and 402, and 2006 IECC Section 402. When installed in accordance with Section 4.0 of this report, the foam plastic insulation can be used in wall cavities, floor assemblies or ceiling assemblies, interior and/or exterior side of vertical foundations, the underside of on-grade slabs, and/or in attics and crawl spaces as nonstructural thermal insulation material. Foamsulate™ HFO spray-applied polyurethane foam

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.





plastic insulation is used in Type V construction under the IBC and in one- and two-family dwellings under the IRC.

Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be used in Types I, II, III or IV construction when installed in accordance with Section 4.8 of this report.

Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be used as air impermeable insulation when installed in accordance with Section 4.4 of this report.

#### 4.0 PRODUCT DESCRIPTION

**4.1 Properties:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation is a medium density, closed cell, spray-applied polyurethane foam plastic insulation in accordance with Section 3.1.1 and Table 1 of AC377. The insulation has a nominal in-place density of 2.0 pcf (32 kg/m³). The two-component spray foam plastic is produced in the field by combining a polymeric isocyanate (A component) and a polymeric resin (B component). The liquid components shall be stored in 55-gallon (208 L) drums at temperatures between 70°F and 80°F (21°C and 27°C). When Component A and Component B are stored in factory-sealed containers at the recommended temperatures, the maximum shelf life is six months.

**4.2 Thermal Resistance (R-Values):** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation has thermal resistance (R-Value) at a mean temperature of 75°F±5°F (23.8°C ±2.8°C) as shown in Table 1 of this report.

Thickness (inch)	Foamsulate™ HFO R-Value (°F·ft²·h/Btu)
1	6.9
2	14
3	21
3.5	24
4	28
5	34
5.5	38
6	41
7	48
7.5	52
8	55
9	62
10	69
11	76
11.5	79
12	83

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

**4.3 Surface Burning Characteristics:** At a maximum thickness of 4 inches (102 mm) and a nominal density of 2.0 pcf (32 kg/m³), the Foamsulate™ HFO spray-applied polyurethane foam plastic insulation yields a flame spread index of 25 or less and smoke-developed index of 450 or less when tested in accordance with ASTM E84. Greater thicknesses, depending on the end use, are recognized when installed in accordance with this report.

Foam insulation thicknesses are not limited when covered by a code complying thermal barrier and installed in accordance with Section 4.6.1.1 of this report.

**4.4 Air Permeability:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation is classified as air-impermeable insulations when tested in accordance with ASTM E283 at a minimum thickness of 1 inch (25.4 mm), in accordance with 2018 IBC Section 1202.3 and 2015 IBC Section 1203.3, 2018, 2015 and 2012 IRC Section R806.5 and 2009 and 2006 IRC Section R806.4.

**4.5 Fire-Protective Coatings and Coverings:** Fire protective coatings, for use as part of an alternative thermal barrier assembly, shall be in accordance with Table 2 of this report, as applicable, and installed in accordance with Section 4.6 of this report.

**4.6 INSTALLATIONS:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation shall comply with one of the following requirements:

- 2018, 2015, 2012 IECC Sections C402.1 (prescriptive)
- 2018, 2015, 2012 IECC Section R402.1 (prescriptive)
- 2009 IECC Sections 402, 405, 502 or 506 as appropriate.

The manufacturer’s published installation instructions for Foamsulate™ HFO spray-applied polyurethane foam plastic insulation and this report shall be available on the jobsite during installation. Where conflicts occur, the most restrictive governs.

Foamsulate™ HFO spray-applied polyurethane foam plastic insulation shall be spray-applied on the jobsite using equipment specified in the manufacturer’s published installation instructions. The maximum in-service temperature for all areas shall not exceed the maximum temperature stated in the manufacturer’s published installation instructions. The insulation shall be sprayed onto a substrate that is protected and clean from any debris or weather-related conditions during and after application, and shall not be used in electrical outlets or junction boxes or in contact with rain, water, or unprepared soil.



### 4.6.1 Thermal Barrier

**4.6.1.1 Application With an Approved Thermal Barrier:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation, in any thickness, in ceiling cavities and in wall cavities shall be separated from the interior by an approved thermal barrier thermal barrier. The thermal barrier shall comply with, and be installed in accordance with IBC Section 2603.4, 2018, 2015, 2012 and 2009 IRC Section R316.4 or 2006 IRC Section 314.4, as applicable.

**Exception:** The thermal barrier is not required when the insulation is installed in attics or crawlspaces as described in Section 4.6.2 but shall be installed between the insulation and the interior of the building.

**4.6.1.2 Alternative Thermal Barrier Assemblies:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be installed without a thermal barrier as defined in Section 4.6.1 of this report when installed with a fire-protective coating as described in Table 2 of this report based on testing in accordance with NFPA 286 or UL1715.

**4.6.2 Installation in Attics or Crawl Spaces:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be installed in attics or crawl spaces when installed in accordance with this section (Section 4.6). The insulation may be installed in unvented attics and unvented enclosed rafter spaces for use as air-impermeable insulation as described in Section 4.4 of this report.

When installed in attics or crawl spaces where entry is made only for the service of utilities, Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be installed in accordance with this section. Foamsulate™ HFO spray-applied polyurethane foam plastic insulation need not be surfaced with a thermal barrier, however, such attic and crawl space areas shall be separated from the interior of the building by a thermal barrier in accordance with Section 4.6.1 of this report.

**4.6.2.1 Installation in Attics and Crawl Spaces Without a Prescriptive Ignition Barrier:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be installed in attics and crawl spaces without a prescriptive ignition barrier provided:

- Entry is only to service utilities in the attic or crawl space and no storage is permitted.
- Attic or crawl space areas cannot be interconnected.
- Air from the attic or crawl space cannot be circulated to other parts of the building.
- Attic ventilation is provided as required by 2018 IBC Section 1202.2, 2015, 2012, 2009 and 2006 IBC Section 1203.2 or IRC Section R806 except where air-impermeable insulation is permitted in unvented attics and shall comply with the

following code sections as applicable:

For Unvented Attics:

- 2018 IBC Section 1202.3
- 2015 IBC Section 1203.3
- 2018, 2015 and 2012 IRC Section R806.5
- 2009 IRC Section R806.4

Unvented crawl spaces shall meet the requirements of Section 4.6.2.2 of this report.

Ventilated crawl spaces shall be provided with ventilation as required by the following code sections as applicable:

- 2018 IBC Section 1202.4
- 2015 IBC Section 1203.4
- 2012, 2009 and 2006 IBC Section 1203.3
- 2018, 2015, 2012, 2009 and 2006 IRC Section R408.1

- Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be applied at a maximum density of 2.0 pcf to the underside of roof sheathing or roof rafters and vertical surfaces of attics and in crawl spaces. When applied to the underside of the top of the space, the thickness of the Foamsulate™ HFO spray-applied polyurethane foam plastic insulation shall not exceed 1 1/4 inches (286 mm), and when applied to vertical surfaces or floor, the maximum thickness shall not exceed 7/4 inches (184 mm).
- In accordance with IMC (International Mechanical Code®) Section 701, [2006 IMC Sections 701 and 703], combustion air is provided.

### 4.6.2.2 Installation in Unvented Crawl Spaces:

Foamsulate™ HFO spray-applied polyurethane foam plastic insulation shall be installed in unvented crawl spaces using an prescriptive ignition barrier when complying with the following sections as applicable:

- 2018 IRC Section R408.3.2.1
- 2018 IRC Section R408.3.2.2
- 2018 IRC Section R408.3.2.3
- 2015 IRC Section R408.3
- 2012 IRC Section R408.3
- 2009 IRC Section R408.3
- 2006 IRC Section R408.3

**Exception:** The prescriptive ignition barrier assembly may be substituted with an alternative thermal barrier assembly when installed in accordance with Section 4.6.1.2 of this report.

**4.7 Weather Protection:** spray-applied polyurethane foam plastic insulation when applied to form a minimum 1 1/2 inches (38.1 mm) thick continuous layer may be used as weather protection specified in Section 1402.2 of the



2018 IBC and Section 1403.2 of the 2015, 2012, 2009 and 2006 IBC and Section R703.2 of the IRC, as applicable.

#### 4.8 Use in Exterior Walls of Types I, II, III and IV Construction (IBC)

**4.8.1 General:** When Foamsulate™ HFO spray-applied polyurethane foam plastic insulation is used in exterior walls of Types I, II, III or IV construction of any height, the insulation shall comply with IBC Section 2603.5 and Section 4.8 of this report.

**4.8.2 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 Tables 3 and 4 of this report. The potential heat of Foamsulate™ HFO spray-applied polyurethane foam plastic insulation is 10,438 BTU/lb.

**4.9 Fire-resistance-rated Assemblies:** Foamsulate™ HFO spray-applied polyurethane foam plastic insulation may be used in non-loadbearing and loadbearing one-hour fire-resistance-rated wall and floor/ceiling assemblies in accordance with this section.

**4.9.1 Fire-resistance-rated Wall Assembly 1 (Non-loadbearing):** Steel studs shall be nominally 5½ inch (140 mm) deep, minimum 20 gauge, spaced a maximum of 24 inches (610 mm) on-center. The interior of the wall assembly shall be covered with minimum 5/8 inch (15.9 mm) thick Type X gypsum wallboard complying with ASTM C1396 fastened with No. 6, 1¼ inch (32 mm) long self-drilling drywall screws spaced 8 inches (203 mm) on-center around the perimeter and 12 inches (305 mm) on-center in the field. Foamsulate™ HFO foam plastic insulation shall be spray-applied into the stud cavities to a maximum nominal thickness of 3-inches (76.2 mm). The exterior of the wall assembly shall be covered with minimum 5/8 inch (15.9 mm) thick Type X exterior gypsum sheathing complying with ASTM C1396 or ASTM C1177 fastened with No. 6, 1¼ inch (32 mm) long self-drilling drywall screws spaced 8 inches (203 mm) on-center around the perimeter and 12 inches (305 mm) on-center in the field. A layer of DuPont Tyvek HomeWrap water-resistive barrier shall be attached over the Type X exterior gypsum sheathing. The water-resistive barrier shall be covered with 5/16-inch (7.9 mm) thick HardiPanel® cement board fastened with screws spaced 6 inches (152 mm) on-center around the perimeter and 12 inches (305 mm) on-center in the field.

**4.9.2 Fire-resistance-rated Wall Assembly 2 (Non-loadbearing):** Steel studs shall be nominally 3<sup>5</sup>/<sub>8</sub> inch (92 mm) deep, minimum 25 gauge, spaced a maximum of 24 inches (610 mm) on-center. The interior of the wall assembly shall be covered with minimum 5/8 inch (15.9 mm) thick Type X gypsum wallboard complying with ASTM C1396 fastened with No. 6, 1¼ inch (32 mm) long

self-drilling drywall screws spaced 8 inches (203 mm) on-center around the perimeter and 12 inches (305 mm) on-center in the field. The exterior of the wall assembly shall be covered with minimum 5/8 inch (15.9 mm) thick Type X exterior gypsum sheathing complying with ASTM C1396 or ASTM C1177 fastened with No. 6, 1¼ inch (32 mm) long self-drilling drywall screws spaced 8 inches (203 mm) on-center around the perimeter and 12 inches (305 mm) on-center in the field. Foamsulate™ HFO spray-applied polyurethane foam plastic insulation shall be spray-applied onto the exterior sheathing to a maximum nominal thickness of 3-inches (76.2 mm).

**4.9.3 Fire-resistance-rated Wall Assembly 3:** Framing members shall be min. nominal 2-by-4 wood studs spaced 16 inches (406 mm) on-center. The exterior of the wall assembly shall be covered with minimum 5/8 inch (15.9 mm) thick Type X gypsum wallboard or exterior gypsum sheathing complying with ASTM C1396 or ASTM C1177 mounted vertically and fastened with 1½ in. (41.3 mm) Type W gypsum panel steel screws spaced 8 in. on-center at the perimeter and in the field. Fasteners must have minimum edge and end distances of ½ inch (12.7 mm). Foamsulate™ HFO foam plastic insulation shall be spray-applied into the stud cavities up to full cavity depth. The interior of the wall assembly shall be covered with min. 5/8 in. (15.9 mm) Type X gypsum wallboard complying with ASTM C1396 mounted vertically, staggered one stud cavity and fastened with 1½ in. (41.3 mm) Type W gypsum panel steel screws spaced 8 in. on-center at the perimeter and in the field. Allowable bearing loads must not exceed 1888 pounds (8398 N) per stud, 100 percent of the allowable F<sub>c</sub>, or 100 percent of the calculated stress with studs having a slenderness ratio, l/d, of 33, whichever is less.

**4.9.4 Fire-resistance-rated Horizontal Assembly:** Parallel chord wood trusses spaced a maximum of 24 in. on-center fabricated from 2-by-4 in. lumber with lumber oriented vertically or horizontally. Subflooring shall be nominal ¾ inch (19mm) tongue-and-groove (T&G) plywood identifies as APA, 23/32 Category, fastened to the trusses after a bead of flooring adhesive was applied to the top of the trusses. Subfloor is fastened to the trusses with 6d nails spaced at 12 inches (305 mm) on center. Finish flooring shall be minimum 19/32-inch (15 mm) tongue-and-groove wood structural panels, minimum grade "Underlayment" or "Single-Floor", with strength axis perpendicular to joists and joints staggered from subflooring joints. The finish flooring sheets are secured to the joists with 8d nails spaced 8 inches (203 mm) on center. Foamsulate™ HFO spray foam insulation is installed directly to the underside of the plywood subflooring to a maximum thickness of 11 inches (279 mm) while maintaining a minimum 7 inch (178 mm) clearance between the spray foam insulation and the gypsum board. This foam thickness requires a minimum 18 inch (457 mm) truss depth. Resilient channels formed from 25 GA steel shall be installed using 1¼ inch screws, perpendicular to



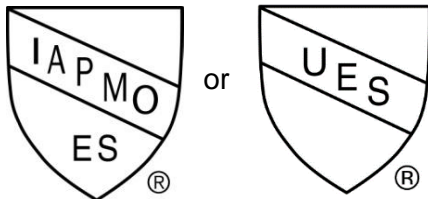
the trusses at 12 inches (305 mm) on-center, with channels adjacent to the butt joints of gypsum board spaced a maximum of 3 inches (76 mm) from gypsum butt joints. Gypsum board, one layer, (minimum 5/8 inch (15.9 mm) proprietary Type C) shall be installed using minimum 1 1/4 inch (31.8 mm) long Type S screws spaced a maximum 8 inches (203 mm) on-center, and located 1-inch (25.4 mm) from the tapered edge and 3 inches (76.2 mm) from the butt joint edge. Gypsum joints were taped 2 inches (50.8 mm) and covered with two layers of dry mix joint compound. Exposed nail heads were also covered with two layers of compound. Butted end-joints shall be staggered a minimum one truss cavity. The allowable live load on the assembly shall not exceed 59.1 psf (2.83 kPa).

### 5.0 IDENTIFICATION

The spray foam insulation is identified with the following:

- a. Manufacturer's name (Carlisle Spray Foam Insulation)
- b. address and telephone number,
- c. the product trade name (Foamsulate™ HFO)
- d. use instructions
- e. density, flame-spread and smoke-development indices
- f. date of manufacture or batch/run number
- g. thermal resistance values
- h. the evaluation report number (ER-650)
- i. the name or logo of the inspection agency

Either mark of conformity may be used as shown below:



**IAPMO UES ER-650**

### 6.0 SUBSTANTIATING DATA

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, AC377, approved February 2020 including Appendix X. Test Results are from Laboratories in conformance with ISO/IEC 17025.

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

**6.3** Report of room fire testing in accordance with UL 1715.

**6.4** Reports of fire propagation characteristics tests in accordance with NFPA 285.

**6.5** Reports of water penetration tests in accordance with ASTM E331, modified (6.24 psf, 2 hours).

**6.6** Reports of water resistance tests in accordance with AATCC Test Method 127.

**6.7** Report of potential heat of foam plastics tests in accordance with NFPA 259.

**6.8** Report of Fire-resistance ratings in accordance with ASTM E119.

### 7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Foamsulate™ HFO spray-applied polyurethane foam plastic insulation to assess conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification. This spray foam is produced at locations noted in section 2.10 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

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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)



**TABLE 2 - ALTERNATIVE THERMAL BARRIER ASSEMBLIES**

FIRE-PROTECTIVE COATING/COVERING <sup>1</sup>			MAXIMUM SPF THICKNESS (inch)	
TYPE	MINIMUM THICKNESS	THEORETICAL APPLICATION RATE (COATINGS ONLY)	WALLS AND VERTICAL SURFACES	CEILING AND OVERHEAD SURFACES
DC315 <sup>2</sup>	14 mils WFT (9 mils DFT)	0.87 gal/100 ft <sup>2</sup>	5.5	9.5
Plus ThB <sup>3</sup>	14 mils WFT (9 mils DFT)	0.87 gal/100 ft <sup>2</sup>	6.5	9.5
60-60A <sup>4</sup>	14 mils WFT (9 mils DFT)	0.87 gal/100 ft <sup>2</sup>	6	10

For SI: 1 inch = 25.4 mm, 1 gallon = 3.785 L, 1 ft<sup>2</sup> = 0.0929 m<sup>2</sup>

<sup>1</sup> Fire-protective coatings and coverings shall be applied over all exposed SPF surfaces in accordance with the coating/covering manufacturer's instructions and this report.

<sup>2</sup> International Fireproof Technology, Inc, recognized in [IAPMO UES ER-499 and tested to the requirements of NFPA 286](#).

<sup>3</sup> No-Burn, Inc, recognized in IAPMO UES ER-305 and tested to the requirements of UL-1715.

<sup>4</sup> Flame Control Coatings, recognized in IAPMO UES ER-596 and tested to the requirements NFPA 286.

**TABLE 3 – NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES (Part 1)  
FOAMSULATE HFO APPLIED IN WALL STUD CAVITY**

Wall Component	Material Description
<b>Base Wall (BWS)</b> Use either 1, 2, or 3	<ol style="list-style-type: none"> <li>1) Concrete Walls</li> <li>2) Concrete Masonry Unit Walls</li> <li>3) Steel Stud Wall - 1 layer of 5/8-inch Type X gypsum wallboard installed on the interior side of minimum 3 3/8-inch deep No. 20 gauge steel studs spaced a maximum of 24 inches on center.</li> <li>4) Fire-retardant-treated wood (FRTW) Stud Wall – 1 layer of 5/8-inch thick Type X gypsum wallboard on the interior, installed on 2X4 (min.) FRTW studs spaced a maximum of 24 inches on center.</li> </ol>
<b>Fire-Stopping in Stud Cavity at Floor Lines</b>	<ol style="list-style-type: none"> <li>1) 4-inch 4 pcf mineral wool (friction fit or installed with Z-Clips)</li> <li>2) FRTW lumber -1.5 inches thick (min.) (FRT firestop shall only be used with FRT framing)</li> </ol>
<b>Cavity Insulation</b> Use Item 1, 2 or 3	<ol style="list-style-type: none"> <li>1) None</li> <li>2) Full stud cavity depth or less of Foamsulate™ HFO</li> <li>3) Any noncombustible fiberglass insulation (faced or unfaced).</li> </ol>
<b>Exterior Sheathing</b>	Minimum 1/2-inch thick exterior gypsum sheathing.
<b>Exterior Insulation</b>	<ol style="list-style-type: none"> <li>1) None – for construction requiring a water resistive barrier (WRB), the structure shall incorporate a WRB meeting Exception 1 or 2 of Section 1402.5 of the 2018 IBC. These water resistive barriers shall only be used with noncombustible claddings.</li> <li>2) Any noncombustible insulation which meets ASTM E136. Insulation shall be attached per manufacturer instructions. For construction requiring a WRB, the installation shall use the WRB's indicated above if the insulation is 2-inch minimum mineral fiber.</li> </ol>
<b>Exterior Cladding</b>	<ol style="list-style-type: none"> <li>1. Any combustible cladding that has passed NFPA 285 testing (examples below) <ol style="list-style-type: none"> <li>a. NFPA 285 approved MCM/ACM Metal/Aluminum Composite building panels</li> <li>b. NFPA 285 approved stone/aluminum honeycomb composite</li> <li>c. NFPA 285 approved HPL High-Pressure Laminate Panels.</li> </ol> </li> <li>2. Any noncombustible cladding such as (but not limited to): <ol style="list-style-type: none"> <li>a. Brick - Nominal 4-inch clay brick or veneer with a maximum 2-inch air gap behind the brick. Brick Ties/Anchors 24 inches o.c. (maximum).</li> <li>b. Stucco - 3/4 - inch exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the insulation and lath. The secondary WRB may not be full coverage asphalt or butyl based self-adhering membranes.</li> <li>c. Natural Stone (granite, limestone marble, sandstone) – 2 inch using any installation technique with a 2-inch air gap (max.).</li> <li>d. Artificial Cast Stone – 1 1/2 – inch using any installation technique with a 2-inch air gap (max)</li> <li>e. Terra Cotta Cladding - 1 1/4-inch using any installation technique with a 2-inch air gap (max)</li> <li>f. 1/4-inch (min) fiber cement panels (installed per manufacturer instructions)</li> <li>g. Concrete - 2 inches thick with a 2-inch air gap (max)</li> <li>h. CMU blocks – 4 inches with a maximum 2-inch air gap</li> </ol> </li> </ol>
<b>Window/Door Perimeters</b>	Framed as required for base wall. .



**TABLE 4. NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES (Part 2)  
SPF APPLIED TO EXTERIOR OF WALL ASSEMBLY WITH OPTIONAL SPF IN WALL STUD CAVITY**

Wall Component	Material Description
<b>Base Wall System (BWS)</b> – Use Item 1, 2, 3 or 4	<ol style="list-style-type: none"> <li>1) Cast Concrete Walls</li> <li>2) CMU Walls</li> <li>3) Steel Stud Wall - 1 layer of 5/8-inch Type X gypsum wallboard installed on the interior side of minimum 3 3/8-inch No. 20 gauge steel studs spaced a maximum of 24 inches on center.</li> <li>4) Fire-retardant-treated wood (FRTW) Stud Wall – 1 layer of 5/8-inch thick Type X gypsum wall board on the interior, installed on 2X4 (min) FRTW studs spaced a maximum of 24 inches on center.</li> </ol>
<b>Fire-Stopping at floor lines</b> – Use Item 1 or 2	<ol style="list-style-type: none"> <li>1) 4-inch 4 pcf mineral wool (friction fit or installed with Z-clips)</li> <li>2) FRT lumber -1 1/2 -inch thick (min) (FRT firestop shall only be used with FRT framing)</li> </ol>
<b>Cavity Insulation</b> Use Item 1, 2 or 3	<ol style="list-style-type: none"> <li>1) None</li> <li>2) Full stud cavity or less of Foamsulate™ HFO insulation</li> <li>3) Any noncombustible insulation per ASTM E136</li> <li>4) Any fiberglass insulation (faced or unfaced)</li> </ol>
<b>Exterior Sheathing</b>	Minimum 1/2 - inch thick exterior gypsum sheathing
<b>Exterior Insulation</b> - Use Item 1 or 2	<ol style="list-style-type: none"> <li>1) None – for construction requiring a water resistive barrier (WRB), the structure shall incorporate a WRB meeting Exception 1 or 2 of Section 1402.5 of the 2018 IBC. These water resistive barriers shall only be used with noncombustible claddings.</li> <li>2) Maximum nominal 3-inch thickness of Foamsulate™ HFO insulation</li> </ol>
<b>Exterior Cladding<sup>2</sup></b> - Use any of Items 1-8	<ol style="list-style-type: none"> <li>1) Brick – Nominal 4-inch clay or concrete brick or veneer with maximum 2-inch air gap behind the brick. Brick Ties/Anchors 24 inches OC (max.)</li> <li>2) Stucco – minimum 3/4-inch thick exterior cement plaster and lath. A secondary water-resistive barrier (WRB) may be installed between the exterior insulation and the lath. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes.</li> <li>3) Natural Stone Veneer – minimum 2-inch thick natural stone (granite, limestone, marble, sandstone). Any standard non-open joint installation technique may be used.</li> <li>4) CMU blocks: Minimum 4-inch thick concrete masonry unit with 2-inch air gap (max). Any standard non-open joint installation technique may be used.</li> <li>5) Cast Artificial Stone – minimum 1 1/2-inch thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap.</li> <li>6) Terra Cotta Cladding – minimum 1 1/4-inch thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap.</li> <li>7) Uninsulated steel building panels, including steel, copper, and aluminum when the surface of the exterior foam insulation is covered with 16 wet mils of DC315 and topcoat paint for weather protection and mounted per UL EWS0054.</li> <li>8) Concrete – 2-inch thick with a 2-inch air gap (max) using any standard non-open joint installation technique.</li> </ol>
<b>Window/Door Perimeters</b>	Framed as required for base wall. .

For SI: 1 inch = 25.4 mm



## FLORIDA SUPPLEMENT

### CARLISLE SPRAY FOAM INSULATION

100 Enterprise Drive  
Cartersville, GA 30120  
Phone: (770) 607-0755  
[www.CarlisleSFI.com](http://www.CarlisleSFI.com)

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](http://www.uniform-es.org) or email us at [info@uniform-es.org](mailto:info@uniform-es.org)

### FOAMSULATE™ HFO SPRAY-APPLIED POLYURETHANE FOAM PLASTIC INSULATION

#### CSI Section:

07 21 00 Thermal Insulation

#### 1.0 RECOGNITION

The Foamsulate™ HFO closed cell spray-applied foam plastic insulation as evaluated and represented in IAPMO UES Evaluation Report ER-650 and with changes as noted in this supplement is a satisfactory alternative for use in buildings built under the following codes (and regulations) including locations in the High-velocity Hurricane Zone:

- 2020 and 2017 Florida Building Code, Building, (FBC, Building)
- 2020 and 2017 Florida Building Code, Residential (FBC, Residential)
- 2020 and 2017 Florida Building Code, Energy Conservation (FBC, Energy Conservation)

#### 2.0 LIMITATIONS

Use of Foamsulate™ HFO closed cell spray-applied foam plastic insulation recognized in this report is subject to the following limitations:

**2.1** The clearance between the foam insulation installed above grade and exposed earth shall be in accordance with Section 1403.8 and 2603.8 of the FBC, Building or Section R318.7 and R318.8 of the FBC, Residential.

**2.2** 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