



NATURAL POLYMERS, LLC
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NATURAL-THERM® 1.0 PCF SPRAY-APPLIED POLYURETHANE FOAM PLASTIC INSULATION

CSI Section:

07 21 00 Thermal Insulation

1.0 RECOGNITION

Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation has been evaluated for physical properties, thermal resistance, surface burning characteristics, vapor permeance, attic and crawl space installations, and use in Type V-B construction. Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation complies with the intent of the provisions of the following codes and regulations:

- 2018, 2015, and 2012 International Building Code® (IBC)
- 2018, 2015, and 2012 International Residential Code® (IRC)
- 2018, 2015, and 2012 International Energy Conservation Code® (IECC)
- 2020 Florida Building Code, Building, (FBC, Building)-supplement attached
- 2020 Florida Building Code, Residential (FBC, Residential)- supplement attached
- 2020 Florida Building Code, Energy Conservation (FBC, Energy Conservation)- supplement attached

2.0 LIMITATIONS

The Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation described in this report complies with those codes listed in Section 1.0 of this report or are considered suitable alternatives to what is specified in the code, 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 4.5.1 and 4.5.3 of this report, the insulation shall be separated from the interior of the building by a code-complying thermal barrier or ignition barrier as appropriate.

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 Natural Polymers, LLC, 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, or 2012 IBC Section 2603.9, or IRC Section R318.4, as applicable.

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

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

- 2018, 2015, or 2012 IBC Section 2603.2
- 2018, 2015, or 2012 IRC Section R316.2
- 2015 IRC Section N1101.10.
- 2012 IRC Section N1101.12.
- 2018, 2015 or 2012 IECC Sections C303.1.1.1 or R303.1.1.1

2.9 The insulation shall be produced by Natural Polymers, LLC in Cortland, Illinois.

3.0 PRODUCT USE

Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation complies with IBC Section 2603, IRC Section R316, and IECC Sections C303, C402, R303, and R402. When installed in accordance with Section 4.0 of this report, the foam plastic insulation may be used in wall cavities, floor assemblies, or ceiling assemblies, and/or in attics and crawl spaces as nonstructural thermal insulation material. Natural-Therm® 1.0 PCF insulation is used in Type V-B construction under the IBC and in one- and two-family dwellings under the IRC.

4.0 PRODUCT DESCRIPTION

4.1 Properties: Natural-Therm® 1.0 PCF is a low 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 1.3 pcf (20.8 kg/m³). The two-component spray foam plastic is

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.





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 50°F and 90°F (10°C and 33°C). When Component A and Component B are stored in factory-sealed containers at the recommended temperatures, the maximum shelf life is one year.

4.2 Thermal Resistance (R-Values): Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation has thermal resistance (R-Value) at a mean temperature of 75°F (24°C) as shown in Table 1 of this report.

Thickness (inch)	Natural-Therm® 1.0 PCF R-Value (°F·ft ² ·h/Btu)
1	4.9
2	9.8
3	15
3.5	17
4	20
5	25
5.5	27
6	30
7	34
7.5	37
8	39
9	44
9.5	47
10	49
11.5	57

For SI: 1 inch = 25.4 mm, 1°F·ft²·h/Btu = 0.176 110 K·m²/W.
¹R-Values are calculated based on tested K values at 1-inch and 4-inch thicknesses.

4.3 Surface Burning Characteristics: At a maximum thickness of 4 inches (102 mm) and a nominal density of 1.9 pcf (30 kg/m³), the Natural-Therm® 1.0 PCF insulation yields a flame spread index of 25 or less and a 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.

4.4 Vapor Permeance: When tested in accordance with ASTM E96 Desiccant method (Procedure A), Natural-Therm® 1.0 PCF spray-applied foam plastic insulation has a vapor Permeance of 8.2 perms [47 x 10⁻⁸ g/(Pa·s·m²)], at a minimum thickness of 2 inches (51 mm) and qualifies as a Class III vapor retarder in accordance with IBC Section 202 and IRC Section R202.

4.5 Installations: Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation shall comply with one of the following requirements:

- IECC Sections C402.1 (prescriptive)
- IECC Section R407 (performance)

The manufacturer’s published installation instructions for Natural-Therm® 1.0 PCF insulation and this report shall be available on the job site during installation.

Natural-Therm® 1.0 PCF insulation shall be spray-applied on the job site using equipment specified in the manufacturer’s published installation instructions. The insulation is applied in multiple passes having a maximum thickness of 3 inches (76 mm) per pass up to the maximum insulation thickness specified in this report. The spray-applied foam plastic Insulation shall be allowed to fully expand and cure for a minimum of 15 minutes prior to application of additional passes. 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 soil.

4.5.1 Installation With a Thermal Barrier: Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation in ceiling cavities and in wall cavities shall be separated from the interior by an approved thermal barrier in accordance with IBC Section 2603.4, or IRC Section R316.4, as applicable. Thicknesses are not limited for ceiling cavities and wall cavities when covered by a code complying thermal barrier.

4.5.2 Installation in Attics or Crawl Spaces: Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation may be installed in attics or crawl spaces when installed in accordance with this section.

When installed in attics or crawl spaces where entry is made only for the service of utilities, Natural-Therm® 1.0 PCF insulation may be installed in accordance with Section 4.5.3. Natural-Therm® 1.0 PCF 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 4.5.1 of this report.

4.5.3 Installation With a Prescriptive Ignition Barrier: When installed within attics or crawl spaces where entry is made only for the service of utilities, Natural-Therm® 1.0 PCF spray-applied polyurethane foam plastic insulation, at a maximum of 4 inches (102 mm) thick, shall be covered with a prescriptive ignition barrier in accordance with IBC Section 2603.4.1.6, or IRC Sections R316.5.3 and R316.5.4, as applicable.

5.0 IDENTIFICATION

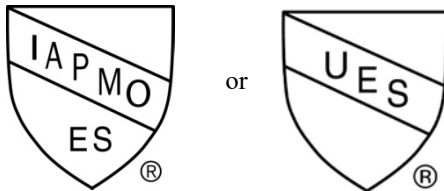
The spray foam insulation is identified with the following:

- a. Manufacturer’s name (Natural Polymers, LLC).
- b. address and telephone number.
- c. the product trade name (Natural-Therm® 1.0 PCF)



- 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-534).
- i. the name or logo of the inspection agency .

Either Mark of Conformity may also be used as shown below:



IAPMO UES ER-534

6.0 SUBSTANTIATING DATA

Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, AC377, dated February 2020. Test reports submitted are from laboratories complying with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Natural-Therm® 1.0 PCF to assess its conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification. Products are manufactured at locations noted in Section 2.9 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

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



FLORIDA SUPPLEMENT

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1.0 RECOGNITION

Natural-Therm® 1.0 PCF spray-applied foam plastic insulation as evaluated and represented in IAPMO UES Evaluation Report ER-534 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 Florida Building Code, Building, (FBC, Building)
- 2020 Florida Building Code, Residential (FBC, Residential)
- 2020 Florida Building Code, Energy Conservation (FBC, Energy Conservation)

2.0 LIMITATIONS

Use of Natural-Therm® 1.0 PCF 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 Sections 1403.8 and 2603.8 of the FBC, Building or Sections R318.7 and R318.8 of the FBC, Residential.

2.2 Verification shall be provided that a quality assurance agency audits the manufacturer's 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).

2.3 This supplement expires concurrently with ER-534.

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