Code Compliance Research Report
CCRR-0375

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DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION
Section: 07 21 00 – Thermal Insulation
Section: 07 21 19 – Foamed-In-Place Insulation

REPORT HOLDER:
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REPORT SUBJECT:
Ultra-Thane 205 HFO (Regular, High Lift, MAX and Premium) and UPC 2.0 HFO (Regular, High Lift, MAX and Premium) Spray-applied Polyurethane Foam Plastic Insulation

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2024, 2021, 2018, and 2015 *International Building Code®* (IBC)
- 2024, 2021, 2018, and 2015 *International Residential Code®* (IRC)
- 2024, 2021, 2018, and 2015 *International Energy Conservation Code®* (IECC)
- 2026, 2023 *Florida Building Code* – See Section 9

NOTE: This report references the most recent edition of the Codes cited. Section numbers for earlier Code editions may differ.

1.2 The insulations have been evaluated for the following properties (see Table 1):

- Physical properties
- Surface-burning characteristics
- Thermal resistance
- Air permeance
- Vapor permeance

1.3 The insulations have been evaluated for the following uses (see Table 1):

- Use as a nonstructural thermal insulating material on or in interior and exterior walls, floors, ceilings and the underside of roofs
- Alternative to Code-prescribed thermal barriers
- Alternative to Code-prescribed ignition barriers
- Use as a water-resistive barrier
- Use in Types I, II, III, IV, and V construction (IBC) and buildings regulated under the IRC

2.0 STATEMENT OF COMPLIANCE

Ultra-Thane 205 HFO (Regular, High Lift, MAX and Premium), and UPC 2.0 (Regular, High Lift, MAX and Premium) comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2, and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.0.

2.1 2024 IBC and IRC Evaluation Reports: The Intertek CCRR is an *Evaluation Report* for approval of an alternate material, design, or method of construction in accordance with Section 104.2.3.6.1 of the 2024 IBC and Section R104.2.2.6.1 of the 2024 IRC.

3.0 DESCRIPTION

3.1 Ultra-Thane 205 HFO (Regular, High Lift, MAX and Premium) and UPC 2.0 HFO (Regular, High Lift, MAX and Premium):

The insulations are two-component, closed cell, spray-applied polyurethane foam plastics. Nominal density is as follows:

- Ultra-Thane 205 HFO Regular and UPC 2.0 HFO Regular – 2.1 pcf

- Ultra-Thane 205 HFO High Lift and UPC 2.0 HFO High Lift – 2.2 pcf
- Ultra-Thane 205 HFO MAX and UPC 2.0 HFO MAX – 1.97 pcf
- Ultra-Thane 205 HFO Premium and UPC 2.0 HFO Premium – 2.1 pcf

The insulations are produced in the field by combining a polymeric isocyanate (A component) with a resin (B component). The insulation liquid components are supplied in 55-gallon drums and must be stored at temperatures between 50°F and 80°F. The resin (B component) must be protected from freezing temperatures. The A components have a shelf life of twelve months and B components have a shelf life of six months when stored in factory-sealed containers at these temperatures.

3.2 DC315 Intumescent Coating: DC315 intumescent coating, manufactured by International Fireproof Technology, Inc., is a water-based coating supplied in 5-gallon pails and 55-gallon drums. The coating material has a shelf life of 24 months when stored in factory-sealed containers at a temperature between 41°F and 95°F. DC315 complies with ICC-ES AC456 and is recognized in IAPMO ER-0499.

3.3 No Burn Plus ThB Intumescent Coating: No Burn Plus ThB intumescent coating, manufactured by No Burn, Inc., is a water-based coating supplied in 5-gallon pails and 55-gallon drums. The coating material has a shelf life of one year when stored in unopened containers at a temperature between 40°F and 90°F. No Burn Plus ThB complies with ICC-ES AC456 and is recognized in IAPMO ER-0305.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Surface-burning Characteristics: The insulations, at a maximum thickness of 4 inches and the nominal density stated in Section 3.1 of this report, have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84. Based on large scale tests in accordance with NFPA 286 and ICC-ES AC377 Appendix X, the insulation can be installed at greater thicknesses as described in Sections 5.3 and 5.4. When the insulations are separated from the interior occupied space of the building with minimum 1/2-inch-thick gypsum board, the maximum insulation thickness is not limited. Under the IRC, a thermal barrier of minimum 23/32-inch-thick wood structural panel is also permitted, and the maximum insulation thickness is not limited.

4.2 Thermal Resistance: The insulations have a thermal resistance, *R*-value, as shown in Table 2.

4.3 Air Permeability: The insulations, at a minimum thickness of 2-3/16 inches are considered air-impermeable insulation in accordance with IBC Section 1202.3 or IRC Sections R202 and R806.5 and are considered air barrier materials complying with IECC Section C402.5.1.3 based on testing in accordance with ASTM E2178.

4.4 Vapor Permeance: The insulations, at a minimum thickness of 1 inch, have a vapor permeance no greater than 1.0 perm (5.7×10^{-11} kg/Pa-s-m^2) and may be used where a Class II vapor retarder is required by the applicable code.

4.5 Water-resistive Barrier: The insulations may be used as a water-resistive barrier as required by IBC Section 1403.2 and IRC Section R703.2 when spray-applied to the exterior side of exterior sheathing, masonry or other suitable exterior wall substrates to form a continuous layer of 1-inch minimum thickness. All construction joints and penetrations must be sealed with the insulation. The insulation must be covered with an exterior wall covering within the time specified in the General Coatings Manufacturing Corp. installation instructions.

5.0 INSTALLATION

5.1 General: The insulations must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Application: The insulations are spray-applied on the jobsite using a volumetric positive displacement pump as identified in the General Coatings application instructions. The insulations must be applied when the ambient temperature is greater than 32°F. The insulations must not be used in areas that have a maximum in-service temperature of greater than 180°F. The insulations must not be used in electrical outlet or junction boxes or in contact with water, rain, or soil. The insulations must not be sprayed onto a substrate that is wet or covered with frost or

ice, loose scales, rust, oil, or grease. The insulations must be protected from the weather during and after application.

The insulations are applied in passes a minimum of 1/2-inch thick and the maximum is as follows:

- Ultra-Thane 205 HFO and UPC 2.0 HFO – 3 inches
- Ultra-Thane 205 HFO High Lift and UPC 2.0 HFO High Lift – 5 inches
- Ultra-Thane 205 HFO MAX and UPC 2.0 HFO MAX – 2 inches
- Ultra-thane 205 HFO Premium and UPC 2.0 HFO Premium – 2.5 inches

5.3 Thermal Barrier:

5.3.1 Application with a Prescriptive Thermal Barrier: The insulations must be separated from the interior living space of the building by an approved thermal barrier of 1/2-inch-thick gypsum board or an equivalent 15-minute thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R303.4, as applicable. Exceptions are provided in Sections 5.3.2 and 5.4.

When the insulations are separated from the interior living space of the building with minimum 1/2-inch-thick gypsum board, the maximum thickness is not limited. Under the IRC, a thermal barrier of 23/32-inch-thick wood structural panel is also permitted, and the maximum insulation thickness is unlimited.

5.3.2 Application without a Prescriptive Thermal Barrier: The insulations may be installed without the 15-minute thermal barrier prescribed in IBC Section 2603.4 and IRC Section R303.4, when installed as described in this section. The insulation must be a maximum of 8 inches on walls and 12 inches on ceilings and be covered on all surfaces with either DC315 applied at 16 wet mils (1.01 gal/100ft^2) or No Burn Plus ThB applied at 14 wet mils (0.87 gal/100 ft^2).

The coating must be applied over the 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 with low-pressure airless spray equipment.

5.4 Attics and Crawl Spaces: The insulations may be applied in attics and crawl spaces as described in either 5.4.1 or 5.4.2. When the insulation is installed in an attic or crawlspace in accordance with this section, a thermal barrier is not required between the insulation and the attic or crawl space but is required between the insulation and the interior living space. Attics and crawl spaces must be ventilated in accordance with the applicable Code.

5.4.1 Application with a Prescriptive Ignition Barrier: When the insulations are installed within attics and crawl spaces where entry is made only for service of utilities, the ignition barrier must be installed in accordance with IBC Section 2603.4.1.6, or IRC Section R303.5.3 or R303.5.4, 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 the foam plastic insulation is not exposed.

5.4.2 Application without a Prescriptive Ignition Barrier: The insulations may be installed in attics and crawl spaces without the ignition barrier prescribed in IBC Section 2603.4.1.6 and IRC Sections R303.5.3 and R303.5.4, subject to the following conditions:

a. Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
b. There are no interconnected attic or crawl space areas.
c. Air in the attic or crawl space is not circulated to other parts of the building.
d. Under-floor (crawl space) ventilation is provided when required by IBC Section 1202.4 or IRC Section R408.1, as applicable.
e. Attic ventilation is provided when required by IBC Section 1202.2.1 or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with IBC Section 1202.3 or IRC Section R806.5.
f. Combustion air is provided in accordance with IMC (International Mechanical Code) Section 701.

The insulations may be spray-applied to the underside of the roof sheathing and/or rafters in attics; the underside of wood floors in crawl spaces; and to vertical surfaces in both attics and crawl spaces, as described in this section. The thickness of the insulation applied to the underside of horizontal surfaces must not exceed 12 inches, and to vertical surfaces must not exceed 8 inches. The insulation may be installed without the prescriptive ignition barrier

required by IBC Section 2603.4 and IRC Section R303.5.3 or a protective coating.

5.4.3 Use on Attic Floors: The insulations may be applied between and over the joists in attic floors to a maximum thickness of 12 inches. The insulation may be installed without the prescriptive ignition barrier required by IBC Section 2603.4 and IRC Section R303.5.3, or a protective coating.

The insulation must be separated from the interior occupied space by an approved thermal barrier.

5.5 Use in Types I, II, III, and IV Construction: The insulations may be installed in exterior walls of buildings of Types I, II, III, and IV construction complying with IBC Section 2603.5 and as described in this section. Intertek Design Listings GCM/FI 30-02 and GCM/FI 30-03 describe the assemblies tested and certified by Intertek as complying with NFPA 285, including extensions for various wall constructions determined through engineering analysis. The potential heat of the foam plastic in any portion of the wall must not exceed 6448 Btu/ft^2.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 The insulations must be separated from the interior occupied space of the building by a thermal barrier as described in Section 5.3, except as described in Section 5.3.2 and 5.4.

6.3 The insulations must not exceed the thicknesses noted in Sections 4.1, 5.3, and 5.4, as applicable.

6.4 Use of the insulations in areas where the probability of termite infestation is "very heavy" must be in accordance with IRC Section R318.4 or IBC Section 2603.8, as applicable.

6.5 Walls must include a vapor retarder complying with the Code.

6.6 Jobsite certification and labeling of the insulation must comply with IRC Section N1101.10, N1101.14, and IECC Sections C303.1 or R303.1 and R403.1, as applicable.

6.7 The insulations are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of tests in accordance with ASTM E84, ASTM E96, ASTM E970, ASTM E2178, NFPA 259, NFPA 285, NFPA 286 and UL 1715.

7.2 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC 377), dated April 2020, editorially revised July 2020, including reports of tests in accordance with Appendix X.

7.3 Data in accordance with ICC 1100 (2019).

7.4 Research Reports for evaluation of data in accordance with ICC-ES Acceptance Criteria for Fire-protective Coatings Applied to Spray-applied Foam Plastic Insulation Installed without a Code-prescribed Thermal Barrier (AC456), dated October 2015.

7.5 Intertek Listing Report "General Coatings - Ultra-Thane 205 HFO and UPC 2.0 HFO Spray-applied Polyurethane Foam Plastic Insulations", on the Intertek Directory of Building Products.

8.0 IDENTIFICATION

The A and B components of the insulations described in this Research Report are identified with the manufacturer's name (General Coatings Manufacturing Corp or Universal Polymers Corporation), address and telephone number; the product name; use instructions; the flame-spread and smoke-developed indices; the lot number; the Intertek Mark as shown below; and the Code Compliance Research Report number (CCRR-0375).



9.0 FLORIDA BUILDING CODE

The Ultra-Thane 205 HFO (Regular, High Lift, MAX and Premium), and UPC 2.0 (Regular, High Lift, MAX and Premium) insulations described in Sections 2.0 through 7.0 of this Research Report comply with the 2023 *Florida Building Code – Building, Florida Building Code – Residential* and *Florida Building Code – Energy*, including High-Velocity Hurricane Zones, subject to the following conditions:

- Installation is as described in Sections 2.0 through 7.0 of this Research Report.
- The products are under a quality assurance program audited by Intertek.

Intertek is an approved evaluation entity and quality assurance entity pursuant to Florida Statute 553.842 – *Product Evaluation and Approval*.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

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TABLE 1A - PROPERTIES EVALUATED

PROPERTY	2024 IBC SECTION[1]	2024 IRC SECTION[1]	2024 IECC SECTION[1]
Physical properties	2603.1.1	R303.1.1	Not required
Surface-burning characteristics	2603.3	R303.3	Not applicable
Thermal barrier/ignition barrier	2603.4	R303.4	Not applicable
Air permeability	1202.3	R806.5	C402.6 R402.5
Vapor permeance	202, 1404.3	R202, R702.7.1	Not applicable
Thermal resistance	1301	N1101.10 N1102	C303.1 R303.1
Water-resistive barrier	1403.2	R703.2	Not applicable

[1] Section numbers may be different for earlier versions of the International Codes.

TABLE 1B – PROPERTIES EVALUATED – FLORIDA BUILDING CODES

PROPERTY	2026 FBC - BUILDING SECTION	2026 FBC - RESIDENTIAL SECTION	2026 FBC - ENERGY SECTION
Physical properties	2603.1.1	R316.1.1	Not required
Surface-burning characteristics	2603.3	R316.3	Not applicable
Thermal barrier/ignition barrier	2603.4	R316.4	Not applicable
Air permeability	1203.3	R806.5	C402.5 R402.4
Vapor permeance	202, 1405.3	R202, R702.7.1	Not applicable
Thermal resistance	1301	See FBC – Energy	C303.1 R303.1
Water-resistive barrier	1403.6	R703.2	Not applicable

TABLE 2 - THERMAL RESISTANCE

THICKNESS (inches)	R-VALUE (°F.ft^2.h/Btu)		
	205 HFO Regular 2.0 HFO Regular	205 HFO (High Lift and MAX) 2.0 HFO (High Lift and MAX)	205 HFO Premium 2.0 HFO Premium
1	7.6	7.9	8.1
2	15	15	16
3	22	23	23
4	30	30	31
6	45	46	47
8	59	61	62
10	74	76	78
12	89	91	93

[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]To determine R values for thickness not listed:

a. Between 1 inch and 3.5 inches is determined through linear interpolation
b. Greater than 3.5 inches:
   - 205 HFO Regular and 2.0 HFO Regular are calculated based on R=7.43/inch
   - 205 HFO (High Lift and MAX) and 2.0 HFO (High Lift and MAX) are calculated based on R= 7.61/inch
   - 205 HFO Premium and 2.0 HFO Premium are calculated based on R=7.79/inch