

# ICC-ES Evaluation Report


ESR-3803

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<p><b>DIVISION: 07 00 00— THERMAL AND MOISTURE PROTECTION.</b></p> <p><b>Section: 07 21 00— Thermal Insulation</b></p> <p><b>Section: 07 27 00—Air Barriers</b></p>	<p><b>REPORT HOLDER:</b>  <b>UNIVERSAL POLYMERS CORPORATION</b></p>	<p><b>EVALUATION SUBJECT:</b>  <b>UPC 500—HALF POUND SPRAY-APPLIED POLYURETHANE FOAM INSULATION</b></p>	
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## 1.0 EVALUATION SCOPE

### 1.1 Compliance with the following codes:

- 2018, 2015, 2012 and 2009 [International Building Code® \(IBC\)](#)
- 2018, 2015, 2012 and 2009 [International Residential Code® \(IRC\)](#)
- 2018, 2015, 2012 and 2009 [International Energy Conservation Code® \(IECC\)](#)
- 2013 *Abu Dhabi International Building Code (ADIBC)*<sup>†</sup>

<sup>†</sup>The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

### Properties evaluated:

- Surface-burning characteristics
- Physical properties
- Thermal resistance (*R*-values)
- Air Permeability
- Attic and crawl space installation

### 1.2 Evaluation to the following green standard:

- 2008 ICC 700 [National Green Building Standard™](#) (ICC 700-2008)

### Attributes verified:

See Section 3.1

## 2.0 USES

UPC 500 insulation is used as a nonstructural thermal insulating material in buildings of Type VB construction under the IBC and dwellings under the IRC. The insulation is for use in wall cavities, floor assemblies or ceiling assemblies when installed in accordance with Section 4.0.

The insulation may be used as an air impermeable insulation when installed in accordance with Section 3.4.

## 3.0 DESCRIPTION

### 3.1 General:

UPC 500 is a two-component, open-cell, spray-applied polyurethane foam plastic with a nominal density of 0.5 pcf (8 kg/m<sup>3</sup>). The polyurethane foam is produced by combining a polymeric isocyanate (A component) and a proprietary resin (B component). The components have a shelf life of six months from the date of manufacture, when stored in factory-sealed containers at temperatures between 50°F and 80°F (10.0°C and 26.7°C).

The attribute of the insulation has been verified as conforming to the provisions of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

### 3.2 Surface-Burning Characteristics:

UPC 500 insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pounds per cubic foot (8 kg/m<sup>3</sup>), has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 (UL 723). UPC 500 thickness is not limited when separated from the interior of the building by a prescriptive thermal barrier as complying with the IBC or IRC and as described in Section 4.3.

### 3.3 Thermal Resistance:

UPC 500 insulation has thermal resistances, *R*-values, at a mean temperature of 75°F (24°C) as shown in [Table 1](#).

### 3.4 Air Permeability:

UPC 500 insulation, at a minimum thickness of 3½ inches (89 mm), is considered an air-impermeable insulation in accordance with 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) and 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4), based on testing in accordance with ASTM E2178.

### 3.5 DC315 Coating:

DC315 Coating, manufactured by International Fireproof Technology, Inc. / Paint to Protect Inc. (ESR-3702), is a water-based intumescent coating supplied in 5-gallon (19 L) pails and 55 gallon (208 L) drums. The coating material has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 50°F and 80°F (10°C and 27°C)

## 4.0 DESIGN AND INSTALLATION

### 4.1 General:

UPC 500 insulation must be installed in accordance with the manufacturer's published installation instructions and this report. A copy of the instructions must be available on the jobsite at all times during installation.

### 4.2 Application:

The UPC 500 insulation is spray applied on the jobsite using equipment identified in the UPC 500 Processing Guide. The insulation is applied in passes ranging from 3 inches (76 mm) thick to a maximum thickness of 6 inches (152 mm) per pass. The insulation must be applied when the ambient and substrate temperature is at or above 23°F (-5°C) and must be protected from the weather during and after application. The insulation must not be used in areas that have a maximum service temperature greater than 180°F (82°C). The foam plastic insulation must not be used in electrical outlet or junction boxes or in contact with rain, water or soil. The substrate must be clean, dry and free of moisture, frost or ice, loose scales, rust, oil, grease or contaminants that will interfere with the adhesion of the spray foam insulation.

Where insulation is used as an air-impermeable insulation, such as in unvented attic assemblies under the 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section 806.4) or 2018 IBC Section 1202.3 (2015 IBC Section 1203.3), the insulation must be installed at a minimum thickness of 3.5 inches (90 mm).

### 4.3 Thermal Barrier:

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

UPC 500 insulation must be separated from the interior of the building by an approved thermal barrier of 1/2-inch-thick (12.7 mm) gypsum board or an equivalent thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4, as applicable. When installation is within an attic or crawl space as described in Section 4.4, a thermal barrier is not required between the foam plastic and the attic or crawl space, but is required between the insulation and the interior of the building.

UPC 500 thickness is not limited when separated from the interior of the building by a prescriptive thermal barrier as complying with the IBC or IRC.

**4.3.2 Application without a Prescriptive Thermal Barrier:** The prescriptive thermal barrier or ignition barrier may be omitted when installation is in accordance with the following requirements:

**4.3.2.1** The insulation must be covered on all surfaces with a fire protective coating at the minimum thickness set forth in [Table 2](#).

**4.3.2.2** The maximum installed thickness of the insulation must not exceed the thickness set forth in [Table 2](#).

**4.3.2.3** The coating must be applied over the insulation in accordance with the coating manufacturer's instructions and this report.

### 4.4 Use in Attics and Crawl Spaces:

#### 4.4.1 Application with a Prescriptive Ignition Barrier:

When UPC 500 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 comply 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. The attic or crawl space area must be separated from the interior of the building by a prescriptive thermal barrier as described in Section 4.3.

UPC 500 insulation may be installed in unvented attics when the foam plastic insulation is applied at a minimum thickness of 3 1/2 inches (89 mm) in accordance with 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

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

**4.4.2.1 General:** UPC 500 spray-applied foam insulation may be installed in attics and crawl spaces, without a prescriptive ignition barrier as described in IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4, in accordance with Section 4.4.2.2, 4.4.2.3 or 4.4.2.4, when all of the following conditions apply:

- 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 2018 IBC Section 1202.4 [(2015 IBC Section 1203.4) or (2012 and 2009 IBC Section 1203.3)] or IRC Section R408.1, as applicable.
- e. Attic ventilation is provided when required by 2018 IBC Section 1202.2.1 (2015, 2012 and 2009 IBC Section 1203.2) or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).
- f. Combustion air is provided in accordance with IMC (*International Mechanical Code*<sup>®</sup>) Section 701, if applicable.

**4.4.2.2** The insulation must be covered on all surfaces with a fire protective coating at the minimum thickness set forth in [Table 3](#).

**4.4.2.3** The maximum installed thickness of the insulation must not exceed the thicknesses set forth in [Table 3](#).

**4.4.2.4** The coating must be applied over the insulation in accordance with the coating manufacturer's instructions and this report.

## 5.0 CONDITIONS OF USE:

The UPC 500 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 UPC 500 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 thermal barrier as described in Section 4.3.
- 5.4 The insulation must be protected from the weather during and after application.
- 5.5 The insulation must be applied by installers certified by Universal Polymers Corporation or the Spray Polyurethane Foam Alliance (SPFA).
- 5.6 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with IRC Section R318.4 or 2018, 2015 and 2009 IBC Section 2603.8 (2012 IBC Section 2603.9), as applicable.
- 5.7 Jobsite certification and labeling of the insulation must comply with 2018 and 2015 IRC Sections N1101.10.1 and N1101.10.1.1 (2012 IRC Sections N1101.12.1 and N1101.12.1.1 or 2009 IRC Sections N1101.4 and N1101.4.1) and 2018, 2015 or 2012 IECC Sections C303.1.1, C303.1.1.1, R303.1.1 and R303.1.1.1 (2009 IECC Sections 303.1.1 and 303.1.1.1), as applicable.
- 5.8 The A and B components of the insulation are produced under a quality-control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation \(AC377\)](#), dated April 2016 (Editorially revised April 2018).

## 7.0 IDENTIFICATION

- 7.1 Containers of UPC 500 Part A and Part B components are identified with a label bearing the manufacturer's name (Universal Polymers Corporation); the product trade name (UPC 500); product type (A or B component); use instructions; the density; the lot number; the flame spread and smoke developed indices; the shelf life and the expiration date; and the evaluation report number (ESR-3803).
- 7.2 The report holder's contact information is the following:

**UNIVERSAL POLYMERS CORPORATION**  
**3001 E. PIONEER PARKWAY**  
**ARLINGTON, TEXAS 76010**  
**(682) 503-8069**  
[www.upcfoam.com](http://www.upcfoam.com)

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (inch)	R-VALUE (°F.ft².h/Btu)
1.0	3.9
2.0	7.6
3.0	11
3.5	13
4.0	15
5.0	19
5.5	21
6.0	22
7.0	26
7.75	29
8.0	30
9.0	34
10	37
11	41
12	45
13	49
14	52
15	56
16	60

For SI: 1 inch= 25.4 mm; 1°F.ft².h/Btu = 0.176110°K.m².h/W.

<sup>1</sup>R-values are calculated based on tested K-values at 1- and 3½-inch thicknesses.

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

TABLE 2—USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER<sup>1</sup>

Coating	Maximum Insulation Thickness (in.) Vertical Surfaces	Maximum Insulation Thickness (in.) Ceiling Surfaces	Fire Protective Coating <sup>2</sup> (Applied to all Foam Surfaces)		
			Minimum Coating Dry Film Thickness (mils) <sup>3</sup>	Minimum Coating Wet Film Thickness (mils) <sup>3</sup>	Minimum Application Rate <sup>3</sup>
DC315	8½	14	12	18	1.13 gal/100 ft²

For SI: 1 inch= 25.4 mm; 1 gal = 3.785 L; 1 ft² = 0.093 m².

<sup>1</sup>See Section 4.3.2.

<sup>2</sup>See Section 3.5.

<sup>3</sup>As reported in the manufacturer's application instructions. Actual application rate, based on specific project conditions, must be in accordance with the manufacturer's application instructions.

TABLE 3—ATTIC OR CRAWL SPACE ASSEMBLIES WITHOUT A PRESCRIPTIVE IGNITION BARRIER<sup>1</sup>

Coating	Maximum Insulation Thickness (in.) Vertical Surfaces and Attic Floors	Maximum Insulation Thickness (in.) Ceiling Surfaces	Fire Protective Coating <sup>2</sup> (Applied to all Foam Surfaces)		
			Minimum Coating Dry Film Thickness (mils) <sup>3</sup>	Minimum Coating Wet Film Thickness (mils) <sup>3</sup>	Minimum Application Rate <sup>3</sup>
DC 315	8½	14	4	6	0.38 gal/100 ft²

For SI: 1 inch= 25.4 mm; 1 gal = 3.785 L; 1 ft² = 0.093 m².

<sup>1</sup>See Section 4.4.2.

<sup>2</sup>See Section 3.5.

<sup>3</sup>As reported in the manufacturer's application instructions. Actual application rate, based on specific project conditions, must be in accordance with the manufacturer's application instructions.