



Code Compliance Research Report CCRR-1026

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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07 57 00 – Coated Foam Roofing

REPORT HOLDER:
General Coatings Manufacturing Corp.
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REPORT SUBJECT:
Ultra-Thane Foam System

1.0 SCOPE OF EVALUATION

This Research Report addresses compliance with the following Codes:

- 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)

The Ultra-Thane Foam System has been evaluated for the following properties:

- Physical properties
- Flame spread characteristics
- Wind resistance
- Impact resistance
- Fire classification
- Thermal resistance (R-value)

See Table 1 for applicable Code sections related to these properties.

NOTE: This report references 2015 Code sections with [2012] and [2009] Code sections shown in brackets where they differ.

2.0 USES

The Ultra-Thane Foam System is used as a non-structural thermal insulating material for Class A or Class B roof coverings, and roofing recovers over existing classified roof systems. Roof coverings with an A or B classification, as noted in Table 1, are permitted on buildings of any type of construction.

3.0 DESCRIPTION

3.1 Materials:

The Ultra-Thane Foam System consists of the Ultra-Thane 230 Roofing Foam, a spray-applied polyurethane foam plastic, covered with Ultra-Flex 1000 or Ultra-Guard 5700, liquid applied, elastomeric coatings.

3.1.1 Ultra-Thane 230 Roofing Foam: The Ultra-Thane 230 Roofing Foam consists of two components, "A" (isocyanate) and "B" (polyol resin), which are intended to be interacted in a one to one ratio, by volume, and spray-applied to form a closed cell rigid foam plastic roof covering/insulation material with a nominal density of 3 pounds per cubic foot. The A and B components are available in 55 gallon drums and have a shelf life of 6 months when stored at temperatures between 50°F and 80°F. Further information may be found at www.generalcoatings.net.

3.1.2 Ultra-Flex 1000 Coating: Ultra-Flex 1000 Acrylic Elastomeric Coating is a single component water-borne acrylic elastomeric coating specifically designed to adhere to polyurethane foam. The coating is supplied in 55 gallon containers and has a shelf life of 12 months when stored at temperatures between 40°F and 80°F. The materials must be protected from freezing.

3.1.3 Ultra-Guard 5700 Coating: Ultra-Guard 5700 Silicone Coating is a single-component silicone elastomer coating specifically designed to adhere to polyurethane foam. The coating is supplied in 5 gallon pails, 50 gallon drums, and 250 gallon totes, and has a shelf life of 12 months when stored at temperatures between 32°F and 100°F. The materials must be protected from freezing. The coating is available in white and grey colors.

3.2 Performance Characteristics:

3.2.1 Surface-burning Characteristics: Ultra-Thane 230 Roofing Foam has a flame-spread rating of 40 or less when tested in accordance with ASTM E84 at a maximum thickness of 2 inches.

3.2.2 Impact Resistance: The Ultra-Thane Foam System complies with the requirements of the Resistance to Foot Traffic Test in Section 5.5 of FM 4470, as referenced in IBC Section 1504.7.

3.2.3 Wind Resistance: The wind resistance of the roofing system is limited to the wind resistance for the roof deck and structural framing to which it is applied.

3.2.4 Fire Classification: The Ultra-Thane Foam System, when installed in accordance with this report, and as described in Table 2, is a Class A or Class B roof covering in accordance with ASTM E108. The Ultra-Thane Foam System may be used over any existing roof system and maintain its new construction rating when the roof deck is noncombustible. On installations over existing BUR roofing systems with combustible decks, construction must be as described in Table 2.

3.2.5 Thermal Resistance: Ultra-Thane 230 Roofing Foam has thermal resistance (*R*-value) as shown in Table 3.

4.0 INSTALLATION

4.1 General:

The Ultra-Thane Foam System must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. The manufacturer's published installation instructions and this Research Report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

4.2 Preparation of Substrates:

The substrates to be covered must be prepared as described in the General Coatings installation instructions.

4.3 Substrates:

4.3.1 Combustible Substrates: Combustible substrates must be minimum 15/32 inch thick, Code-complying, exterior grade or Exposure 1 plywood. All plywood edges must be supported by blocking or have tongue and groove joints as required by IBC Section 2603.4.1.5.

4.3.2 Noncombustible Substrates:

4.3.2.1 Cementitious Substrates: Structural concrete substrates must have a minimum compressive strength of 2500 psi.

4.3.2.2 Metal Substrates: Metal substrates must be a minimum No. 22 gauge galvanized steel [0.030 inch (0.76mm)] substrate.

4.4 Roof Slope:

Minimum slope must be 1/4:12 (2 percent) and the maximum roof slope is as specified in Table 2.

4.5 Foam Application:

The Ultra-Thane 230 Roofing Foam is applied in a 1:1 ratio by volume of the A and B components using foam spraying equipment recommended by General Coatings. Application of the spray foam must be performed when the substrate temperature is at least 50°F, the ambient temperature is at least 50°F, and the wind speed is equal to or less than 15 miles per hour. The spray foam must not be applied to wet or damp substrates, or when dew, condensation, precipitation, or freezing temperatures are expected prior to completion of the foam and coating application.

The Ultra-Thane Roofing Foam must be applied in uniform passes ranging from 1/2 to 1-1/2 inches, to reach the desired thickness as noted in Table 2. The total finished thickness must be achieved within the same day. The finished surface of the foam must be smooth and free of voids, pinholes, and crevices.

4.6 Coating Application:

The surface of the foam plastic must be dry and free of all damaged foam, dirt, and foreign materials before application of the coating. If the insulation surface is damaged to the point where cracks, voids, or large depressions appear, additional insulation must be applied to create a satisfactory surface. After the insulation has developed sufficient strength to support foot traffic, but within 24 hours, the coating must be brush, roller, or spray-applied at the application rates noted in Table 2. The ambient temperature must be at least 50°F during coating application and above 32°F for the 24 hour period after application. The coating must not be applied when dew, condensation, precipitation, or freezing temperatures are anticipated prior to completion of the coating application.

4.7 Reroofing:

Prior to installation of new roof coverings, inspection in accordance with IBC Section 1510 and approval from the code official having jurisdiction are required.

5.0 CONDITIONS OF USE

The Ultra-Thane Foam System described in this Research 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 Installation must comply with this Research Report, the manufacturer's published installation instructions and the applicable Code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

5.2 The thickness and density of the foam plastic must not exceed that noted in Section 3.2 and Table 2 of this report.

5.3 The foam roofing system must be applied by qualified trained applicators.

5.4 Where moderate to heavy foot traffic occurs for maintenance of equipment, or is otherwise necessary, the roof covering must be adequately protected to prevent mechanical damage or wearing of the surface.

5.5 The foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4.

5.6 The Ultra-Thane 230 Roofing Foam, Ultra-Flex 1000 Coating, and Ultra-Guard 5700 Coating are produced in Fresno, California under a quality control program with inspections by Intertek (AA-647).

6.0 SUPPORTING EVIDENCE

6.1 Reports of tests in accordance with ASTM D6083, ASTM D6694, ASTM E108, FM 4470, and FM4474.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, (AC377), dated May 2015.

6.3 Intertek Listing Report "[General Coatings Ultra-Thane 230 Roof Foam System](#)".

7.0 IDENTIFICATION

Components of the Ultra-Thane Foam System are identified with a label containing the General Coatings Manufacturing Corp. name, address and telephone number, the product name, use instructions, the product density, the flame-spread and the smoke-development indices, the Intertek Mark, Code Compliance Research Report number (CCRR-1026), and the name of the inspection agency (Intertek). The products are also labeled with the shelf life and batch number.

8.0 OTHER CODES

This section is not applicable.

9.0 CODE COMPLIANCE RESEARCH REPORT USE

9.1 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.

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

9.3 Reference to the [Intertek website](#) is recommended to ascertain the current version and status of this report.

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TABLE 1 – PROPERTIES EVALUATED

PROPERTY	IBC SECTION ¹	IRC SECTION ¹	IECC SECTION ¹
Physical properties	1507.14, 1507.15	R905.14, R905.15	n/a
Surface burning characteristics	2603.3	R316.3	n/a
Thermal barrier	2603.4	R316.4	n/a
Wind resistance	1504.3	R905.1	n/a
Impact resistance	1504.7	n/a	n/a
Fire classification	1505	R902	n/a
Thermal resistance	n/a	N1102	C303.1.1, C303.1.4, R303.1.1, R303.1.4, [303.1.1 and 303.1.2]

¹ Section numbers in parentheses refer to the 2009 Code
n/a – not applicable

TABLE 2 – FIRE CLASSIFICATION – COATED FOAM ROOF ASSEMBLIES

FIRE CLASSIFICATION	SUBSTRATE	MAXIMUM ROOF SLOPE	FOAM PLASTIC INSULATION		COATING		TOP SURFACING
			Designation	Thickness (Inches)	Designation	Application Rate	
Class A	Non-combustible	4 : 12	Ultra-Thane 230	1 - 2	Ultra-Flex 1000 Acrylic Elastomeric Coating	Two coats at 1½ gallons per 100 ft ² each	No. 11 granules, 32 pounds per 100 ft ²
Class A	Combustible deck covered with a DensDeck substrate	½ : 12	Ultra-Thane 230	2	Ultra-Flex 1000 Acrylic Elastomeric Coating	Two coats at 1½ gallons per 100 ft ² each	No. 11 granules, 32 pounds per 100 ft ²
Class B	15/32-inch thick plywood minimum	½ : 12	Ultra-Thane 230	1 - 2	Ultra-Flex 1000 Acrylic Elastomeric Coating	Two coats at 1½ gallons per 100 ft ² each	No. 11 granules, 32 pounds per 100 ft ²
Class A	BUR over 15/32-inch plywood	½ : 12	Ultra-Thane 230	2	Ultra-Flex 1000 Acrylic Elastomeric Coating	Two coats at 1½ gallons per 100 ft ² each	No. 11 granules, 32 pounds per 100 ft ²
Class A	Non-combustible	2: 12	Ultra-Thane 230	1 - 2	Ultra-Guard 5700 Silicone Coating	One coat at 1-1/5 gallons per 100 ft ² each	Non-granulated
Class A	Non-combustible	Unlimited	Ultra-Thane 230	1 - 2	Ultra-Guard 5700 Silicone Coating	One coat at 1-1/5 gallons per 100 ft ² each	No. 11 granules, 26 pounds per 100 ft ²
Class B	15/32-inch thick plywood minimum	½:12	Ultra-Thane 230	1 - 2	Ultra-Guard 5700 Silicone Coating	One coat at 1-1/5 gallons per 100 ft ² each	No. 11 granules, 26 pounds per 100 ft ²
Class A	Combustible deck covered with a DensDeck substrate ¹	Unlimited	Ultra-Thane 230	1 - 2	Ultra-Guard 5700 Silicone Coating	One coat at 1-1/5 gallons per 100 ft ² each	No. 11 granules, 26 pounds per 100 ft ²

¹Joints in the noncombustible substrate must be staggered from joints in the combustible deck and must be aligned with framing members.

TABLE 4 – THERMAL RESISTANCE (R-VALUE) OF ULTRA-THANE 230 ROOFING FOAM

Thickness (inch)	R-value ($^{\circ}\text{F}\cdot\text{ft}^2\cdot\text{h}/\text{Btu}$) ^{1,2}
1	5.80
1.5	9
2	13

¹R-values are based on tested K-values at 1- and 4-inch thicknesses

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