

ICC-ES Evaluation Report


ESR-5432

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<p>DIVISION: 07 00 00— THERMAL AND MOISTURE PROTECTION</p> <p>Section: 07 21 00 – Thermal Insulation</p>	<p>REPORT HOLDER: HUNTSMAN BUILDING SOLUTIONS</p>	<p>EVALUATION SUBJECT: ICYNENE XPRESS 55</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)
- 2021, 2018, 2015 and 2012 [International Residential Code® \(IRC\)](#)
- 2021, 2018, 2015 and 2012 [International Energy Conservation Code® \(IECC\)](#)

Property evaluated:

- Surface burning characteristics
- Physical Properties
- Thermal performance (R-values)
- Attic and crawl space installation

2.0 USES

ICynene Xpress 55 insulation is an open cell spray foam insulation used as a nonstructural thermal insulating material for Type V construction under the IBC and dwellings under the IRC. The insulation is used in wall cavities, floor assemblies, ceiling assemblies or attics and crawl spaces when installed in accordance with Section 4.4.

3.0 DESCRIPTION

3.1 Icynene Xpress 55:

Icynene Xpress 55 is a low-density rigid spray-applied cellular polyurethane foam plastic insulation. It is a two component, open cell, one-to-one by volume spray foam system with a nominal density of 0.55 pcf (8.81 kg/m³). The foam is produced by blending polymeric isocyanate (A component) and a polymeric resin (B component). Component A has a shelf life of 12 months and Component B has a shelf life of 6 months when stored in factory-sealed containers at temperatures between 50°F and 77°F (10°C and 25°C).

3.2 Surface-Burning Characteristics:

Icynene Xpress 55 insulation, at a maximum thickness of 4 inches (102 mm) and nominal density of 0.55 pcf (8.8 kg/m³), has a flame spread index of 25 or less and smoke-developed index of 450 or less when tested in accordance with ASTM E84 (UL 723). There are not any thickness limitations when the insulation is covered by a code prescribed thermal barrier.

3.3 Thermal Resistance:

Icynene Xpress 55 insulation has a thermal resistance, R-value, at a mean temperature of 75°F (24°C), as shown in [Table 1](#).

3.4 DC315 Coating:

DC315 Intumescent Coating, described in [ESR-3702](#) and manufactured by International Fireproof Technology, Inc., is a single-component, water-based, liquid applied intumescent coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of one (1) year when stored in factory-sealed containers at temperatures between 50°F and 77°F (10°C and 38°C).

4.0 DESIGN AND INSTALLATION

4.1 General:

Icynene Xpress 55 insulation must be installed in accordance with the manufacturer's published installation instructions and this report. A copy of the manufacturer's published installation instructions must be available at all times on the jobsite during installation.

4.2 Application:

The insulation is spray-applied on the jobsite using equipment identified in the manufacturer's published installation instructions. The insulation must be applied with the ambient and substrate temperature between 23°F and 120°F (-5°C and 49°C). 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 outlets or junction boxes, or in continuous contact with rain or water. The substrate must be free of moisture, frost or ice, loose scales, rust, oil and grease, or contaminants that will interfere with adhesion of the spray foam insulation. Icynene Xpress 55 insulation is applied in passes having a maximum thickness of 4 inches (102 mm) per pass. When multiple passes are required, applicators should wait a minimum of 5 minutes, until the core temperature has dropped below 135°F (57°C) before subsequent passes can be sprayed.

4.3 Thermal Barrier

4.3.1 Application with a Prescriptive Thermal Barrier

Icynene Xpress 55 insulation must be separated from the interior of the building by an approved thermal barrier of 1/2-inch-thick (12.7 mm) gypsum wallboard, 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 insulation and the interior of the building. There is no thickness limit when installed behind a code-prescribed thermal barrier.

4.3.2 Application without a Prescriptive Thermal Barrier

Icynene Xpress 55 insulation may be installed without a thermal barrier prescribed in IBC Section 2603.4 and IRC Section R316.4, when installation is in accordance with this section. The insulation and coating may be spray-applied to the interior facing of walls, the underside of roof sheathing or roof rafters, and in crawl spaces, and may be left exposed as an interior finish without a prescriptive thermal barrier. The thickness of the insulation applied to the underside of ceilings or roof sheathing must not exceed 12 inches (309 mm). The thickness of the insulation applied to vertical wall surfaces must not exceed 8 inches (229 mm). The insulation must be covered on all surfaces with DC 315 ([ESR-3702](#)) at a minimum wet film thickness of 30 mils [0.03-inch (0.76 mm)]{20 dry mils [0.02-inch (0.508mm)]}, at a rate of 1.88 gallons (3.79 L) per 100 square feet (9.2m²). The substrate must be dry, clean, and free of dirt and loose debris or other substances that could interfere with the adhesion of the coating. The coating must be applied in accordance with the coating manufacturer's installation instructions when the ambient or surface temperature is between 50°F (10°C) and 80°F (27°C) and a relative humidity below 85%.

4.4 Ignition Barrier – Attics and Crawl Spaces

4.4.1 Application with a Prescriptive Ignition Barrier:

When Icynene Xpress 55 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 2603.4.16 and IRC Section R316.5.3 and R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code and must be separated from the interior of the building by an approved thermal barrier as described in Section 4.3.1.

4.4.2 Application without a Prescriptive Ignition Barrier:

Icynene Xpress 55 may be installed within an attic or crawl space without a prescriptive ignition barrier when all of the following conditions apply:

1. Entry to the attic or crawl space is only for the service of utilities and no storage is permitted.
2. There are no interconnected attic or crawl space areas.

3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Attic ventilation is provided when required by 2021 and 2018 IBC Section 1202.2 (2015 IBC Section 1203.2) or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or IRC Section R806.5.
5. Underfloor (crawl space) ventilation is provided when required by 2021 and 2018 IBC Section 1202.4 (2015 and 2012 IBC Section 1203.3) or IRC Section R408.1, as applicable.
6. Combustion air is provided in accordance with IMC (International Mechanical Code[®]) Section 701.
7. If hot work is to be performed, all necessary procedures, precautions and limitations must be observed in accordance with OSHA 1926 Subpart J Standard 1926.352 requirement for hot work (welding/cutting) performed in the vicinity of combustible materials.
8. An installation certificate with the following information must be posted at each entrance:
 - Product name and installation thickness
 - Manufacturer name, address and contact information.
 - Installation contractor name, address and contact information.
 - Attestation that the product(s) have been installed in accordance with the manufacturer's installation instructions and the requirements of the evaluation report.
 - A notice that the certificate is not to be removed or altered.
 - A list of limitations for the space including the following:
 - o Entry to the space is only to service utilities, and no storage is permitted.
 - o FIRE SAFETY WARNING: If hot work is to be performed, all necessary procedures, precautions and limitations must be observed in accordance with OSHA 1926 Subpart J Standard 1926.352 requirements for hot work (welding/ cutting) performed in the vicinity of combustible materials.

In attics and crawl spaces, Icynene Xpress 55 insulation may be spray-applied to the underside of the roof sheathing and/or rafters, and to the vertical walls and the underside of floors as described. The thickness of the foam plastic applied to the underside of the wood floor or roof sheathing must not exceed 12 inches (304.8 mm). The thickness of the spray foam insulation applied to vertical wall surfaces in attics and crawl spaces must not exceed 8 inches (203 mm). The insulation may be left exposed without a prescriptive ignition barrier or an intumescent coating.

5.0 CONDITIONS OF USE:

Icynene Xpress 55 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 manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application.
- 5.2** Icynene Xpress 55 insulation and applicable coating must be installed in accordance with the manufacturer's published installation instructions, this report and the applicable code. The instructions within this report will govern if there are any conflicts between the manufacturer's published installation instructions and this report.
- 5.3** Icynene Xpress 55 insulation must be separated from the interior of the building by an approval thermal barrier, as described in Section 4.3.1. In attics and crawl spaces, the insulation must be separated from the interior of the attic or crawl space by ignition barrier, as described in Section 4.4.1 exception when installed in accordance with Section 4.3.2 and 4.4.2.
- 5.4** Icynene Xpress 55 insulation must be protected from the weather during application.
- 5.5** Icynene Xpress 55 insulation must be applied by installers approved by Huntsman Building Solutions.
- 5.6** Use of Icynene Xpress 55 insulation in areas where probability of termite infestation is "very heavy" must be in accordance with 2021, 2018 and 2015 IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4, as applicable.
- 5.7** Jobsite certification and labeling of the insulation must comply with 2021 and 2018 IRC Section N1101.10.1 and N1101.10.1.1 and IECC Sections C303.1.1., C303.1.1.1, R303.1.1 and R303.1.1.1, as applicable.
- 5.8** When installed in accordance with Section 4.4.2 of this report, the associated installation certificate(s) containing the required information referenced in Section 4.4.2 must be installed at each entrance to the crawlspace or attic, as applicable. The certificate(s) must be red in color and constructed of durable materials, such as metal, plastic, or laminated paper.

5.9 Icynene Xpress 55 is 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 \(AC377\)](#), dated June 2023.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5432) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, the components from Icynene Xpress 55 are identified with the manufacturer's name (Huntsman Building Solutions), address and telephone number; the products (Icynene Xpress 55); the product type (A or B component); use instruction; the density; the flame spread index and smoke developed index; the evaluation report number (ESR-s5432).

The International Fireproof Technology Inc. DC315 intumescent coating is identified with the manufacturer's name; the product trade name; date of manufacture, shelf life or expiration date; manufacturer's instructions for application and evaluation report number ([ESR-3702](#)).

7.3 The report holder's contact information is the following:

HUNTSMAN BUILDING SOLUTIONS
3315 E. DIVISION STREET
ARLINGTON, TEXAS 76011
(817) 640-4900
www.huntsmanbuildingsolutions.com

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (inches)	R-VALUE (°F.ft ² .h/Btu)
1	3.8
2	7.5
3.5	13
4	15
5	19
6	22
7	26
8	30
9	33
10	37
11	41
12	44
13	48
14	52
15	55
16	59
17	63

For SI: 1 inch= 25.4 mm; 1°F.ft².hr/Btu=0.176 110k.m²/W

¹Calculated R-values are based on tested K-values at 1- and 3.5 inch thickness.

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