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ICC-ES Evaluation Report

ESR-3005*

Reissued February 1, 2013

This report is subject to renewal April 1, 2014.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

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EVALUATION SUBJECT:

ICYNENE MD-R-200™ SPRAY-APPLIED FOAM PLASTIC INSULATION

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 *International Building Code®* (2009 IBC)
- 2009 *International Residential Code®* (2009 IRC)
- 2009 International Energy Conservation Code® (2009 IECC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Surface burning characteristics
- Physical properties
- Thermal performance (*R*-values)
- Air permeability

2.0 USES

Icynene MD-R-200™ is used to provide thermal insulation in buildings and to seal areas such as plumbing and wiring penetrations against air infiltration, in Type III and Type V construction (IBC) and dwellings under the IRC.

3.0 DESCRIPTION

3.1 General:

Icynene MD-R-200™ is a medium-density, open-cell, polyurethane foam plastic insulation and air barrier system that is 100 percent water-blown with an installed nominal density of 2.0 pcf. Icynene LD-C-50 is a two-component, spray-applied product. The two components of the insulation are Base Seal MDI™, a polyisocyanate, and Icynene MD-R-200™, a resin. The polyisocyanate must be stored at a temperature between 60°F and 90°F (15.6°C and 32.2°C), and has a shelf life of 12 months. The resin must be stored at a temperature between 60°F and 90°F (15.6°C and 32.2°C), and has a shelf life of three months.

3.2 Surface Burning Characteristics:

The foam plastic insulation is limited to a maximum thickness of 2 inches (51 mm) in walls and ceilings, based on testing in accordance with ASTM E84. At a thickness of 2 inches (51 mm) and a nominal density of 2.0 pcf, Icynene MD-R-200 has a flame spread index of 25 or less and a smoke-developed index of 450 or less.

3.3 Thermal Resistance:

Icynene MD-R-200 has thermal resistance (*R*-values) at a mean temperature of 75°F (24°C) as shown in Table 1.

3.4 Air Permeability:

Based on testing in accordance with ASTM E283, Icynene MD-R-200, at a thickness of 2 inches (51 mm), is considered air-impermeable.

4.0 DESIGN AND INSTALLATION

4.1 General:

The manufacturer's published installation instructions and this report must be strictly adhered to, and copies must be available on the jobsite at all times during installation.

4.2 Application:

Icynene MD-R-200 must be applied using spray equipment specified by Icynene, Inc. Icynene MD-R-200 must not be used in areas that have a maximum service temperature greater than 180°F (82°C). The foam plastic must not be used in electrical outlet or junction boxes or in contact with rain or water, and must be protected from the weather during and after application. Where Icynene MD-R-200 is used as an air-impermeable barrier, such as in unventilated attic spaces regulated by IRC Section R806, the insulation must be installed at a thickness of 2 inches (51 mm). Icynene MD-R-200 can be installed in one pass to the maximum thickness. Where multiple passes are required, the cure time between passes is negligible. Icynene MD-R-200 must only be installed by licensed dealers certified by Icynene, Inc., to install Icynene MD-R-200.

4.3 Thermal Barrier:

Icynene MD-R-200 must be separated from the interior of the building by an approved thermal barrier, such as $^1/_2$-inch (12.7 mm) gypsum wallboard installed using mechanical fasteners in accordance with the applicable

code, or an equivalent 15-minute thermal barrier complying with, and installed in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4, as applicable.

4.4 Ignition Barriers:

When installation is in attics and crawl spaces where entry is made only for service of utilities, the insulation must be protected against ignition in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4, as applicable.

5.0 CONDITIONS OF USE

in Section 1.0 of this report, subject to the following The Icynene MD-R-200 spray-applied foam plastic insulation described in this report complies with, or is a suitable alternative to what is specified in, those codes listed 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 insulation must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. If there is a conflict between the installation instructions and this report, this report governs.

5.3 The insulation must be separated from the interior of the building by an approved 15-minute thermal barrier, as described in Section 4.3.

5.4 The insulation must not exceed the thickness and density noted in Section 3.2.

5.5 The insulation must be protected from the weather during and after application.

5.6 The insulation must be applied by installers certified by Icynene, Inc.

5.7 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 IBC Section 2603.8, as applicable.

5.8 Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 303.1.1 and 303.1.2, as applicable.

5.9 A vapor retarder must be installed in accordance with the applicable code.

5.10 The insulation is manufactured in Mississauga, Ontario, Canada, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-690).

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated June 2011.

6.2 Test report on air leakage rate in accordance with ASTM E283.

7.0 IDENTIFICATION

All packages and containers of Base Seal MDI and Icynene MD-R-200 must be labeled with the Icynene, Inc., name and address; the product name; the flame spread index and the smoke-developed index; the shelf life expiration date; the label of the inspection agency (Intertek Testing Services); and the evaluation report number (ESR-3005).

8.0 OTHER CODES

The products recognized in this report have also been evaluated for compliance with the following codes:

- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)
- 2006 *International Energy Conservation Code*® (2006 IECC)

Recognition under these codes is as noted in Sections 2.0 through 7.0 of this report, except for the following:

- **Application with a Prescriptive Thermal Barrier:** See Section 4.3, except the approved thermal barrier must be installed in accordance with Section R314.4 of the 2006 IRC, as applicable.
- **Application with a Prescriptive Ignition Barrier:** See Section 4.4, except attics must be vented in accordance with Section 1203.2 of the 2006 IBC and crawl space ventilation must be in accordance with Section 1203.3 of the 2006 IBC, as applicable. Additionally, an ignition barrier must be installed in accordance with Sections R314.5.3 or R314.5.4 of the 2006 IRC, as applicable.
- **Protection Against Termites:** See Section 5.7, except use of the insulation is areas where the probability of termite infestation is "very heavy" must be in accordance with Section R320.5 of the 2006 IRC.
- **Jobsite Certification and Labeling:** See Section 5.8, except jobsite certification and labeling must comply with Sections 102.1.1 and 102.1.11, as applicable, of the 2006 IECC.

TABLE 1—THERMAL RESISTANCE (*R*-VALUES)

THICKNESS (inches)	*R*-VALUE (°F·ft²·h/Btu)
1	5.2
2	10

For SI: 1 inch = 25.4 mm, 1°F·ft²·h/Btu = 0.176 110°K·m²/W.