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ESR-3954

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

SPRAY FOAM POLYMERS, LLC

POST OFFICE BOX 1182

NEW CANAAN, CONNECTICUT 06480

EVALUATION SUBJECT:

THERMOSEAL 500HY SPRAY-APPLIED POLYURETHANE INSULATION



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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:**THERMOSEAL 500HY SPRAY-APPLIED
POLYURETHANE INSULATION****1.0 EVALUATION SCOPE****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)

Properties evaluated:

- Surface-burning characteristics
- Physical properties
- Thermal resistance (*R*-values)

2.0 USES

ThermoSeal 500HY 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.

3.0 DESCRIPTION**3.1 General:**

3.2 ThermoSeal 500HY: ThermoSeal 500HY insulation is a two-component, open-cell, spray-applied polyurethane foam plastic with a nominal density of 0.5 pcf (8 kg/m³). The polyurethane foam is produced by combining a polymeric isocyanate (the A component) and a polymeric resin (the B component). The components have a shelf life of six months when stored in factory-sealed containers at temperatures between 65°F and 85°F (18°C and 29°C).

Surface-Burning Characteristics:

ThermoSeal 500HY insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pounds per cubic foot (8 kg/m³), 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). There is no thickness limit when installation is behind a code-prescribed 15-minute thermal barrier.

3.3 Thermal Resistance:

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

4.0 DESIGN AND INSTALLATION**4.1 General:**

The manufacturer's published installation instructions and this report must be strictly adhered to and a copy of these instructions and this evaluation report must be available on the jobsite at all times during installation.

ThermoSeal 500HY insulation must be applied using spray equipment specified by Spray Foam Polymers, LLC. The insulation must not be used in areas having a maximum service temperature greater than 180°F (82°C), must not be used in electrical outlet or junction boxes or in direct continuous contact with rain or water, and surfaces to which the spray-applied foam insulation is to be applied to must be protected from the weather during and after application.

ThermoSeal 500HY insulation is applied to the intended thickness, with each pass being a maximum of 12 inches (305 mm). Where multiple passes are required, the cure time between passes is negligible. ThermoSeal 500HY insulation must be installed by installers certified by Spray Foam Polymers, LLC or the Spray Polyurethane Foam Alliance (SPFA).

4.2 Application with a Prescriptive Thermal Barrier:

ThermoSeal 500HY 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 15-minute thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4. When installation is within an attic or crawl space as described in Section 4.3, 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. There is no thickness limit when installed behind a code-prescribed 15-minute thermal barrier.

4.3 Application with a Prescriptive Ignition Barrier:

When ThermoSeal 500HY 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 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.

5.0 CONDITIONS OF USE

The ThermoSeal 500HY 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 The product 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.
- 5.2 The insulation must be separated from the interior of the building by an approved 15-minute thermal barrier in accordance with IBC Section 2603.4, except when installation is in attics and crawl spaces as described in Section 4.3.
- 5.3 The insulation must not exceed the thickness and density noted in Sections 3.2 and 4.2 of this report.
- 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 Spray Foam Polymers, LLC 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 2015 or 2012 IBC Section 2603.9 or 2009 IBC Section 2603.8, as applicable.
- 5.7 Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and 2015 or 2012 IECC Sections C303.1.1, 303.1.2 and R401.3 or 2009 IECC Sections 303.1.1, 303.1.2 and 401.3, 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 May 2015.

7.0 IDENTIFICATION

Containers of ThermoSeal 500HY Part A and Part B components are identified with a label bearing the Spray Foam Polymers, LLC name and address; the product trade name (ThermoSeal 500HY Part A or Part B); the lot number; the flame spread and smoke developed indices; mixing instructions; density; the shelf life and the expiration date; and the evaluation report number (ESR-3954).

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (inch)	R-VALUE (°F.ft².h/Btu)
	THERMOSEAL 500HY
1.0	3.6
2.0	6.9
3.0	10
3.5	12
4.0	14
5.0	17
5.5	19
6.0	21
7.0	24
7.75	27
8.0	28
9.0	31
10.0	34
11.0	38
12.0	41
13.0	45
14.0	48
15.0	52
16.0	55

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

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

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