

Report Number: 0139  
Issued: 02/2009  
Expires: 02/2010  
Revised: 01/11/2010

**DIVISION: 07—THERMAL AND MOISTURE PROTECTION**  
**Section: 07210—Building Insulation**

**REPORT HOLDER:**  
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**EVALUATION SUBJECT:**  
**SOYTHERM<sup>®</sup>50 SPRAY FOAM INSULATION**

## 1.0 EVALUATION SCOPE

### 1.1 Compliance with the following codes:

- 2006 *International Building Code*<sup>®</sup> (IBC)
- 2006 *International Residential Code*<sup>®</sup> (IRC)
- 2006 *International Energy Conservation Code*<sup>®</sup> (IEEC)

### 1.2 Evaluated in accordance with:

- ICC AC 377 Dated May 2008

### Property evaluated:

- Surface burning characteristics
- Thermal performance (R-value)
- Physical properties

## 2.0 USES

SoyTherm<sup>®</sup>50 is a non-structural, spray applied, semi-rigid, low density open-cell polyurethane foam plastic insulation for use in wall cavities, floor assemblies and ceiling assemblies of Type V-B construction (IBC), and residential structures constructed in accordance with the IRC.

## 3.0 DESCRIPTION

### 3.1 Product Information:

**3.1.1** SoyTherm<sup>®</sup>50 is a two component, spray applied, low-density, open-cell, poly-urethane foam plastic insulation system. This system is fully water blown having a nominal density of 0.5 pcf (8 kg/m<sup>3</sup>). It is produced by combining the isocyanate (part A) and a polymeric resin (part B) through an approved proportioner, on site, by factory trained and authorized applicators.

### 3.2 Surface Burning Characteristics:

**3.2.1** When tested in accordance with ASTM E-84, at a maximum thickness of 4.5 inches (114 mm), and a density of 0.5 pcf (8 kg/m<sup>3</sup>), the insulation has a flame spread index of less than 25 and a smoke developed index of not more than 450.

### 3.3 Thermal Transmission, R-Values:

**3.3.1** Refer to Table 1 for the values of thermal resistance (R-Value) for various thicknesses.

## 4.0 INSTALLATION

### 4.1 General:

SoyTherm<sup>®</sup>50 shall be installed in accordance with the manufacturer's most recent installation instructions and this report. A copy of the installation instructions and this report shall be available on the jobsite during installation.

### 4.2 Application:

SoyTherm<sup>®</sup>50 Spray Foam Insulation shall be installed by spray application using a volumetric, positive displacement pump to combine A and B components in a one to one volumetric ratio, as specified in the manufacturer's installation instructions. SoyTherm<sup>®</sup>50 Spray Foam Insulation shall not be applied to areas that are exposed to ambient temperatures in excess of 180°F (82°C). The spray foam insulation shall be applied to substrates that are clean, dry, and free from frost, ice, loose debris or contaminants that will interfere with the adhesion of the spray foam insulation. The spray foam insulation shall not be applied in electrical outlet or junction boxes, or in direct contact with soil or water.

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When the foam insulation is used in conjunction with wood construction, in jurisdictions that have adopted the IRC, and where termite infestation is "very heavy" as determined in accordance with IRC figure 301.2(6), the foam plastic shall be installed in accordance with IRC section R320.4.

#### **4.3 Thermal Barrier:**

SoyTherm<sup>®</sup>50 Spray Foam Insulation shall be separated from the living space of the building by a 15 minute thermal barrier such as 1/2" thick gypsum wallboard or an equivalent approved thermal barrier. The thermal barrier shall comply with, and be installed in accordance with IRC Section R314.2.3, or IBC Section 2603.4.1.6, as appropriate. See Section 4.4 for requirements when installed in attics or crawl spaces.

#### **4.4 Attics and Crawl Spaces**

##### **4.4.1 Attics and Crawl Spaces:**

**4.4.1.1** The SoyTherm<sup>®</sup>50 Spray Foam Insulation may be installed exposed in attic or crawl spaces without a thermal barrier or ignition barrier as described in this section, under the following conditions:

- Entry to the attic or crawl space is limited to service of utilities, mechanical and electrical systems. No storage is permitted.
- Air in the attic or crawl space is not circulated to other parts of the building or between the attic and basement.
- Ventilation of the attic or crawl space is provided in accordance with the applicable code, except when the insulation is installed in unvented attics in accordance with IRC, Section 806.4.
- Heating and cooling from the living space to the unvented attic area is attained through heat transfer diffusion through the ceiling.

The foam insulation may be spray-applied to the underside of wood floors in crawl spaces and roof sheathing and/or roof rafters in attics as described in this section. Exposed rafters may be covered with foam insulation. The thickness of the foam insulation applied to the underside of the floor or roof sheathing must not exceed 13 inches (330 mm).

Foam insulation applied to wall surfaces in attics and crawl spaces must not exceed 5-1/2 inches (140 mm) in thickness.

Installation in unvented conditioned attics is permitted as specified in IRC section 806.4. There shall be no insulation or vapor retarder installed between the living space and the attic.

##### **4.4.2 Attic Floors:**

**4.4.2.1** SoyTherm<sup>®</sup>50 Spray Foam insulations may be installed exposed between and over joists in attic floors without an ignition barrier, at a maximum thickness of 13 inches (330 mm). The insulation must be separated from the interior occupied area of the building by an approved thermal barrier in accordance with Section 4.3.

#### **5.0 CONDITIONS OF USE**

**5.1** The SoyTherm<sup>®</sup>50 Spray Foam Insulation described in this report complies with, or is a suitable alternative to what is specified in the codes listed in Section 1.0 of this report.

**5.1.1** When required by the code official, this evaluation report, and the manufacturers most recently published installation instructions shall be submitted at the time of permit application.

**5.1.2** The spray foam insulation must be installed in accordance with this report, the applicable codes, and the most recently published manufacturer's instructions. If there are any conflicts among these documents, this report shall prevail.

**5.1.3** Except when installed in an attic or crawl space as described in section 4.4 of this report, SoyTherm<sup>®</sup>50 Spray Foam Insulation shall be separated from interior living spaces of the building by an approved 15 minute thermal barrier.

**5.1.4** The thickness of SoyTherm<sup>®</sup>50 Spray Foam Insulation as installed shall not exceed those noted in sections 4.4 and 4.4.1 of this report.

**5.1.5** SoyTherm<sup>®</sup>50 Spray Foam Insulation shall be protected from the weather after installation.

**5.1.6** When installed in buildings of wood construction, in jurisdictions that have adopted the IRC, the spray foam insulation shall not be installed on the exterior of foundation walls, or below floor slabs, on ground or in contact with the ground. The spray foam insulation shall have a



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 Issued: 02/2009  
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clearance above grade and exposed earth of 6 inches or greater.

**5.1.7** Installation of SoyTherm<sup>®</sup>50 Spray Foam Insulation shall be by contractors certified by Urethane Soy Systems.

**5.1.8** SoyTherm<sup>®</sup>50 Spray Foam Insulation is limited to use in dwellings under the IRC, and type V-B construction under the IBC.

**5.1.9** SoyTherm<sup>®</sup>50 Spray Foam Insulation is produced by Urethane Soy Systems under a quality control system, including periodic inspections.

**5.1.10** Labeling of the components A and B must comply with IRC Sections N1101.4 and N1101.4.1 and IECC sections 102.1.1 and 102.1.11 as applicable.

**5.1.11** Use of SoyTherm<sup>®</sup>50 Spray Foam Insulation as a fire blocking material has not been evaluated by, and is outside the scope of, this report.

## 6.0 EVIDENCE SUBMITTED

**6.1** Data in accordance with ICC-ES Acceptance Criteria for Spray-Applied Foam Plastic Insulation (AC377), dated May 2008.

**6.2** Engineering fire risk analysis of comparative crawl-space fire testing in accordance with Appendix B of AC377.

Test results are from laboratories in compliance with ISO/IEC 17025.

## 7.0 IDENTIFICATION

**7.1** Each package of components for the SoyTherm<sup>®</sup>50 Spray Foam Insulation is identified with the following:

- Manufacturer's name (Urethane Soy Systems), address and telephone number
- product trade name (SoyTherm<sup>®</sup>50),
- use instructions
- density
- flame-spread and smoke-development indices
- IAPMO ES Mark of Conformity and the Evaluation Report Number (IAPMO-0139)



Director of Evaluation Services

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

SoyTherm <sup>®</sup> 50	
Thickness (Inch)	R-Value (°F.ft <sup>2</sup> .h/Btu)
1.0	4.0
2.0	8.3
3.0	12.6
3.5	14.8
4.0	17.2
5.0	21.5
6.0	25.8
8.0	34.3
10.0	42.9
13.0	55.8