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

REPORT HOLDER:

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EVALUATION SUBJECT:

**SWD QUIK-SHIELD® | 106 AND SWD QUIK-SHIELD® | 111
SPRAY-APPLIED POLYURETHANE FOAM INSULATION
AND SWD QUIK-SHIELD® | 450 POLYURETHANE FOAM
INSULATION**

1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Properties evaluated:

- Surface-burning characteristics
- Physical properties
- Thermal transmission

2.0 USES

2.1 SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111:

The SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111 insulations are used as nonstructural thermal insulating material in Type III and V construction (IBC) and dwellings under the IRC. The insulations are used in wall cavities and floor and ceiling assemblies, and in attic and crawl space applications when installed in accordance with Section 4.0.

2.2 SWD Quik-Shield® | 450:

The SWD Quik-Shield® | 450 is used as a nonstructural thermal insulating material in Type III and V construction (IBC) and dwellings under the IRC. The insulation is used to fill hollow cores of concrete masonry block walls.

3.0 DESCRIPTION

3.1 SWD Quik-Shield® | 106:

SWD Quik-Shield® | 106 is a two component, open-cell, foam plastic insulation. The insulation is produced in the field by combining Component A with resin Component B, resulting in insulation with a nominal density of 0.5 pcf (8 kg/m³). The

insulation components have a shelf life of six months when stored at temperatures between 50°F (10°C) and 100°F (37.7°C) before installation.

3.1.1 Surface-burning Characteristics: The insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf (8 kg/m³), has a flame spread index of 25 or less and a smoke-developed index of less than 450 when tested in accordance with ASTM E 84.

3.1.2 Thermal Transmission (R-values): The insulation has thermal resistance (R-value) of 3.2 ft²hr°F/Btu (0.570 k·m²/W), for a 1-inch (25.4 mm) thickness at a mean temperature of 75°F (24°C).

3.1.3 Vapor Retarder: The insulation is vapor permeable. Therefore, when required by IRC Section R318 or IECC Sections 402.5 and 502.5, a vapor retarder must be provided.

3.1.4 FireFree 88: FireFree 88 is supplied by SWD Urethane Co. The coating is available in both 5- and 55-gallon containers (18.9 and 208 L) and has a shelf life of six months when stored in a factory-sealed container at temperatures between 50°F (10°C) and 100°F (37.7°C).

3.2 SWD Quik-Shield® | 111:

SWD Quik-Shield® | 111 is a two-component foam plastic insulation. The insulation is produced in the field by combining Component A with resin Component B, resulting in insulation with a nominal density of 2.0 pcf (32 kg/m³). The insulation components have a shelf life of six months when stored at temperatures between 50°F (10°C) and 100°F (37.7°C) before installation.

3.2.1 Surface-burning Characteristics: The insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 2.0 pcf (32 kg/m³), has a flame spread index of 25 or less and a smoke-developed index of less than 450 when tested in accordance with ASTM E 84.

3.2.2 Thermal Transmission (R-values): The insulation has thermal resistance (R-value) of 6.26 ft²hr°F/Btu (1.10 k·m²/W), for a 1-inch (25.4 mm) thickness at a mean temperature of 75°F (24°C).

3.2.3 Vapor Retarder: The insulation, at a minimum thickness of 1.40 inches (35.6 mm), is a vapor retarder in accordance with IRC Section R318 or IECC Sections 402.5 and 502.5.

3.3 SWD Quik-Shield® | 450:

SWD Quik-Shield® | 450 is a two-component, one-to-one by volume foam plastic insulation with a nominal density of 2.0 pcf (32 kg/m³). The insulation is produced in the field by combining Component A with resin Component B. The insulation components have a shelf life of six months when stored at temperatures between 50°F (10°C) and 100°F (37.7°C) before installation.

3.3.1 Surface-burning Characteristics: The insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 2.0 pcf (32 kg/m³), has a flame spread index of less than 25 and a smoke-developed index of less than 450 when tested in accordance with ASTM E 84.

3.3.2 Thermal Transmission (R-values): The insulation has thermal resistance (R-value) of 5.29 ft²hr²F/Btu (0.93 k·m²/W), for a 1-inch (25.4 mm) thickness at a mean temperature of 75°F (24°C).

4.0 INSTALLATION

4.1 General:

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 outlet or junction boxes or in contact with rain, water, or soil. The substrate must be free of moisture, frost or ice, loose scales, rust, oil, and grease. The insulation must be protected from the weather during and after application. The manufacturer's published installation instructions must be available on the jobsite at all times during installation.

4.2 SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111:

The SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111 insulations must be applied in accordance with the manufacturer's published installation instructions, the applicable code and this report.

4.2.1 Application: The insulation is spray-applied at the jobsite using a volumetric positive displacement pump as recommended in the manufacturer's published installation instructions. The insulation must not exceed a total thickness of 4 inches (102 mm) in wall cavities and in ceiling cavities. Each insulation pass must be allowed to fully expand prior to application of additional passes.

4.2.2 Thermal Barrier:

The insulations must be separated from the interior of the building by an approved thermal barrier of ½-inch-thick (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R314.4, as applicable, except where installation is in an attic or crawl space as described in Section 4.2.3.

4.2.3 Attics and Crawl Spaces:

4.2.3.1 Application with a Prescriptive Ignition Barrier: Where SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111 spray-applied insulations are 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 R314.5.3 and R314.5.4, 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 that the foam plastic insulation is not exposed. The insulations, as specified in this section, may be installed in unvented conditioned attics in accordance with IRC Section R806.4.

4.2.3.2 Application without a Prescriptive Ignition Barrier: In attics and crawl spaces, SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111 insulations may be applied to walls and to the underside of roof sheathing or roof rafters; and in crawl spaces, to walls and to the underside of wood floors, as described in this section. The thickness of the foam plastic insulation applied to the underside of the top of the space must not exceed 9.5 inches (241 mm). The thickness of the foam plastic insulation applied to the vertical surfaces of walls must not exceed 5.5 inches (140 mm). The foam plastic insulation must be covered with Fire-Free 88, as described in Section 3.1.4. Surfaces to be coated must be dry,

clean, and free of dirt, loose debris and any other substances that could interfere with adhesion of the coating. Fire-Free 88 is applied with a medium-size nap roller, soft brush or conventional airless spray equipment at a rate of 0.75 gallon (2.81 L) per 100 ft² (9.29 m²), resulting in a minimum 7.5-mil (0.19 mm) dry film thickness. The coating must be applied when ambient and substrate temperatures are within a range of 50°F (10°C) to 100°F (37.7°C) and requires a 24-hour curing time. SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111 with exposed surfaces, coated with Fire-Free 88, may be installed in accordance with this section only under the following conditions:

- Entry to the attic or crawl space is only to service utilities, and no heat-producing appliances are permitted.
- There are no interconnected basement or attic areas.
- Air in the attic is not circulated to other parts of the building.
- Ventilation of the attic or crawl space is provided in accordance with the applicable code, except when insulation is permitted in unvented attics in accordance with IRC Section R806.4.

4.2.3.3 Use on Attic Floors: SWD Quik-Shield® | 106 and SWD Quik-Shield® | 111 insulations may be installed exposed at a maximum thickness of 9.5 inches (241 mm) between joists in attic floors. The insulations must be separated from the area beneath the attic by an approved thermal barrier. The ignition barrier in accordance with IBC Section 2603.4.1.6 and IRC Section R314.5.3 may be omitted.

4.3 SWD Quik-Shield® | 450:

The insulation is applied at the jobsite by using a volumetric positive displacement pump as recommended in the manufacturer's published installation instructions. The insulation is injected into the cavities of code-complying concrete masonry block walls from the bottom up.

Joints between concrete masonry blocks must be mortared or the insulations must be separated from the interior of the building by an approved thermal barrier of ½-inch-thick (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R314.4, as applicable.

5.0 CONDITIONS OF USE

The SWD Urethane Co. Quik-Shield® insulations described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** The foam plastic insulations and the Fire-Free 88 coating must be installed in accordance with the manufacturer's published installation instructions, this 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 spray-applied and poured insulations must be separated from the interior of the building by an approved 15-minute thermal barrier, as described in Sections 4.2.2 and 4.3.1, except as noted in this report.
- 5.3** The spray-applied and poured insulations must not exceed the thicknesses noted in Sections 4.2.1 and 4.3.
- 5.4** The spray-applied and poured insulations must be protected from the weather during and after application.
- 5.5** The spray-applied and poured insulations must be applied by contractors certified by SWD Urethane Co.

- 5.6 The spray-applied and poured insulations may be used in any buildings under the IRC, within the parameters set forth in IRC Section R314. The spray-applied and poured insulations were evaluated for use in Type V-B construction under the IBC.
- 5.7 Use of SWD Urethane Co. Quik-Shield® insulations in areas where the probability of termite infestation is “very heavy” must be in accordance with IBC Section 2603.8 or IRC Section R320.5.
- 5.8 Insulation installers must provide certification and labeling complying with IRC Section N1101.4 or IECC Section 102.1.1, as applicable.
- 5.9 The polyurethane foam plastic insulation components are produced in Mesa, Arizona, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-657).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated October 2007.

- 6.2 Reports of air leakage tests in accordance with ASTM E 283.
- 6.3 Reports of comparative crawl space fire tests.
- 6.4 Intertek Engineering Evaluation No. 31353706SAT-001, dated June 3, 2008.

7.0 IDENTIFICATION

Components of SWD Urethane Co. insulation products are identified with the manufacturer’s name (SWD Urethane Co.), address and telephone number; the product trade name (SWD Quik-Shield® | 106, SWD Quik-Shield® | 111 or SWD Quik-Shield® | 450) ; Product Type (A or B component); use instructions; the density; the flame-spread and smoke-developed indices; the shelf life and date of manufacture; the evaluation report number (ESR-2003); and the name of the inspection agency (Intertek Testing Services NA, Inc.).