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ESR-3758

Reissued 04/2017
This report is subject to renewal 04/2018.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

CERTAINTEED CORPORATION

18 MOORES ROAD
MALVERN, PENNSYLVANIA 19355

EVALUATION SUBJECT:

CERTASPRAY® CLOSED CELL SPRAY FOAM INSULATION

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ICC-ES Evaluation Report

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Reissued April 2017

This report is subject to renewal April 2018.

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

REPORT HOLDER:

CERTAINTEED CORPORATION
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MALVERN, PENNSYLVANIA 19355
(610) 651-5823
www.certainteed.com

EVALUATION SUBJECT:

CERTASPRAY® CLOSED CELL SPRAY FOAM INSULATION

1.0 EVALUATION SCOPE

1.1 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)
- Other Codes (see Section 8.0)

Properties evaluated:

- Surface-burning characteristics
- Thermal resistance (*R*-values)
- Attic and crawl space installation
- Physical properties
- Air permeability
- Water vapor transmission
- Exterior walls of Types I through IV construction

1.2 Evaluation to the following green standard:

- 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

CertaSpray® Closed Cell Spray Foam Insulation is used as a nonstructural thermal insulating material in Type V construction under the IBC and dwellings under the IRC. The insulation may be used in buildings of Type I, II, III or IV construction when installed in accordance with Section 4.5. The insulation is for use in wall cavities, floor assemblies, ceiling assemblies, or attics and crawl spaces when installed in accordance with Section 4.4. Under the IRC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.4, and as a vapor retarder when installed in accordance with Section 3.5.

3.0 DESCRIPTION

3.1 General:

CertaSpray® Closed Cell Spray Foam Insulation is a two-component, closed cell, spray-applied foam plastic insulation with a nominal density of 2.0 pcf (32 kg/m^3). The insulation is produced by combining a polymeric Isocyanate Part A (CertaSpray A) with a resin-based Part B (CertaSpray B) on site, during the spray application. The products have a shelf life of six months when stored in factory-sealed containers at temperatures between 55°F and 80°F (13°C and 27°C).

The attributes of the insulation have been verified as conforming to the provisions of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Surface-Burning Characteristics:

The insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 2.0 pounds per cubic foot (32.0 kg/m^3), 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 are no thickness limitations on CertaSpray® Closed Cell Spray Foam Insulation when installed behind a code-prescribed 15-minute thermal barrier.

3.3 Thermal Resistance:

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

3.4 Air Permeability:

The insulation, at a minimum 1-inch (25.4 mm) thickness, is considered air-impermeable insulation in accordance with 2015 Section 1203.3 and 2015 and 2012

IRC Section R806.5 (2009 IRC Section R806.4), based on testing in accordance with ASTM E283.

3.5 Vapor Permeability:

The insulation has a vapor permeance of less than 1 perm ($5.7x10^{-11}$ kg/Pa-s-m^2) at a minimum thickness of 1 inch (25.4 mm) and may be used where a Class II vapor retarder is required by the applicable code.

3.6 Intumescent Coatings:

3.6.1 Flame Seal TB®: Flame Seal TB® is a two-component, four-to-one by volume, liquid-applied, water-based polymer intumescent coating, manufactured by Flame Seal Products, Inc. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of twelve months when stored in factory-sealed containers at temperatures between 40°F (4°C) and 90°F (32°C).

3.6.2 Fireshell® F10E Intumescent Coating: Fireshell® F10E is a one-component water-based intumescent coating manufactured by TPR2 Corporation. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of one year when stored in factory-sealed containers at temperatures of 45°F (7°C) and 95°F (35°C).

3.6.3 DC 315 Fireproof Paint: DC 315 Fireproof Paint, manufactured by International Fireproof Technology, Inc., is a water-based, intumescent coating supplied in 5-gallon (19 L) pails and 55 gallon (208 L) drums. The coating material has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 50°F (10°C) and 80°F (27°C).

4.0 DESIGN AND INSTALLATION

4.1 General:

CertaSpray® Closed Cell Spray Foam Insulation must be installed in accordance with the manufacturer's published installation instructions, the applicable code and this report. A copy of this evaluation report must be available on the jobsite at all times during installation.

4.2 Application:

The insulation is spray-applied using a volumetric positive displacement pump to combine the Part A and Part B components in a one-to-one ratio, as specified in the manufacturer's published installation instructions. The insulation is applied to the intended thickness, with each pass being a maximum of $3^1/_4$ inches (83 mm). Where multiple passes are required, the cure time between passes is 15 minutes. The insulation must not be used in areas having a maximum service temperature greater than 180°F (82°C) and must not be used in electrical outlet or junction boxes or in direct continuous contact with water. The substrates to which the insulation is to be applied to must be clean, dry, and free from ice, loose debris, or contaminants that will interfere with adhesion. The insulation must be protected from the weather during application. Where the insulation is used as an air-impermeable barrier, such as in unventilated attic spaces regulated by 2015 IBC Section 1203.3 or 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806), the insulation must be installed at a minimum thickness of 1 inch (25.4 mm). CertaSpray® Closed Cell Spray Foam Insulation must be installed by factory-certified applicators.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier: CertaSpray® Closed Cell Spray Foam 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, as applicable, except where the installation complies with the requirements set forth in Section 4.3.2. When installation is within an attic or crawl space as described in Section 4.4, 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. The insulation is not limited in thickness when installed behind a code-prescribed thermal barrier except as noted in Section 4.4.2.2.

4.3.2 Application without a Prescriptive Thermal Barrier: CertaSpray® Closed Cell Spray Foam Insulation may be installed without the prescriptive thermal barrier described in Section 4.3.1 when installation is in accordance with the following requirements:

4.3.2.1 The insulation must be covered on all surfaces with a fire protective coating at the minimum thickness set forth in Table 2.

4.3.2.2 The maximum installed thickness of the insulation must not exceed the thicknesses set forth in Table 2.

4.3.2.3 The coating must be applied over the insulation in accordance with the coating manufacturer's instructions and this report.

4.4 Protection from Ignition (Ignition Barrier):

4.4.1 Application with a Prescriptive Ignition Barrier: When CertaSpray® Closed Cell Spray Foam 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, except where the installation complies with the requirements set forth in Section 4.4.2. 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. The insulation may be installed in unvented attics in accordance with 2015 IBC Section 1203.3 or 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

4.4.2 Application without a Prescriptive Ignition Barrier: Where CertaSpray® Closed Cell Spray Foam Insulation is installed in an attic or crawl space without a prescriptive ignition barrier, in accordance with Sections 4.4.2.1 and 4.4.2.2, 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, crawl space or basement areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Combustion air is provided in accordance with the IMC (*International Mechanical Code*®) Section 701.
5. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2015 IBC Section 1203.3 or 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).
6. Under-floor (crawl space) ventilation is provided when required by 2015 IBC Section 1203.4 (2012 and 2009 IBC Section 1203.3) or IRC Section R408.1, as applicable.

4.4.2.1 Attics and Crawl Spaces: In attics and crawl spaces, CertaSpray® Closed Cell Spray Foam 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 in this section. The thickness of the foam plastic applied to the vertical surfaces or underside of the floor or roof sheathing must not exceed $11^1/_2$ inches 292 mm). The insulation does not require the application of either an ignition barrier or a fire-protective coating.

Optional: It is permitted to cover all surfaces of the foam plastic with the DC-315 Fireproof Paint coating, as described in Section 3.6.3, when installed as described below. The insulation thickness must not exceed $11^1/_2$ inches (292 mm). The coating must be applied over the insulation in accordance with the coating manufacturer's instructions and this report. The coating is applied in one coat with low-pressure airless spray equipment, and must be applied to a minimum wet film thickness of 4 mil (0.10 mm). The minimum application rate of the coating must be 0.25 gal/100 ft^2. Surfaces to be coated must be dry, clean, and free of dirt, loose debris and other substances that could interfere with adhesion of the coating.

CertaSpray® Closed Cell Spray Foam Insulation may be installed in unvented attics or crawl spaces as described in this section in accordance with 2015 IBC Section 1203.3 or 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

4.4.2.2 Use on Attic Floors: CertaSpray® Closed Cell Spray Foam Insulation may be installed exposed at a maximum thickness of $11^1/_2$ inches (292 mm) between and over the joists in attic floors. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier in accordance with the IBC Section 2603.4 and IRC Section R316.5.3 may be omitted and the insulation left exposed.

4.5 Exterior Walls in Type I, II, III and IV Construction:

4.5.1 General: When used on exterior walls of Types I, II, III or IV construction, the assembly must comply with IBC Section 2603.5 and this section. The CertaSpray® Closed Cell Spray Foam Insulation must be installed at a maximum thickness indicated in Table 3 or 4. The potential heat of insulation is 1880 Btu/ft^2 per inch of thickness, when tested in accordance with NFPA 259.

The wall assemblies must be as described in Table 3 or Table 4.

5.0 CONDITIONS OF USE

The CertaSpray® Closed Cell Spray Foam 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 or IRC Section R316.4, unless otherwise allowed by the applicable code or when installation is as described in Section 4.3.2 or in attics and crawl spaces as described in Section 4.4.

5.3 The insulation must not exceed the thickness noted in Sections 3.2, 4.3, 4.4 and 4.5 of this report.

5.4 The insulation must be protected from the weather during application.

5.5 The insulation must be applied by professional contractors certified, accredited, authorized or approved by CertainTeed Corporation.

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 and 2009 IBC Section 2603.8 (2012 IBC Section 2603.9), as applicable.

5.7 When use is on buildings of Type I, II, III or IV, the construction must be as described in Tables 3 or 4.

5.8 The insulation at 1-inch thickness (25.4 mm) or greater is a Class II vapor retarder as defined in IRC Section R202.

5.9 Jobsite certification and labeling of the insulation must comply with 2015 IRC Section N1101.10.1 and N1101.10.1.1 (2012 IRC Section N1101.12.1 and N1101.12.1.1 or 2009 IRC Sections N1101.4 and N1101.4.1) and 2015 and 2012 IECC Sections C303.1.1, C303.1.1.1, R303.1.1 and R303.1.1.1 (2009 IECC Sections 303.1.1 and 303.1.2), as applicable.

5.10 The Part A and B components of the insulation are produced under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, (AC377), dated May 2015, including reports of tests in accordance with Appendix X of AC377.

6.2 Report of air permeance tests in accordance with ASTM E283.

6.3 Report of vapor permeance tests in accordance with ASTM E96.

6.4 Report of fire tests in accordance with NFPA 285, and related engineering analysis.

6.5 Reports of room corner fire tests in accordance with NFPA 286.

6.6 Report of potential heat tests in accordance with NFPA 259.

7.0 IDENTIFICATION

The Part A and Part B components for CertaSpray® Closed Cell Spray Foam Insulation are packaged in 55-gallon (208 L) drums bearing labels with the report holder's name (CertainTeed Corporation) name and address; the date of manufacture and the lot number; the product trade name (CertaSpray A or CertaSpray B Closed Cell); the installation instructions; density; the flame spread and smoke developed indices; the evaluation report number (ESR-3758).

Fire protective coatings are identified with the manufacturer's name and address, the product trade name and use instructions.

8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, 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)

The products comply with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report, except as noted below:

- **Application with a Prescriptive Thermal Barrier:** See Section 4.3.1, except the approved thermal barrier must be installed in accordance with 2006 IRC Section R314.4.
- **Application with a Prescriptive Ignition Barrier:** See Section 4.4.1, except attics must be vented in accordance with 2006 IBC Section 1203.2; and crawl space ventilation must be in accordance with 2006 IBC Section 1203.3 or 2006 IRC Section R408, as applicable. Additionally, an ignition barrier must be installed in accordance with 2006 IRC Section R314.5.3 or R314.5.4.
- **Application without a Prescriptive Ignition Barrier:** See Section 4.3.2, except attics must be vented in accordance with 2006 IBC Section 1203.2; and crawl space ventilation must be in accordance with 2006 IBC Section 1203.3 or 2006 IRC Section R408, as applicable. Combustion air must be provided in accordance with Sections 701 and 703 of the 2006 *International Mechanical Code*®.
- **Protection against Termites:** Replace Section 5.7 with the following: Use of the insulation in areas where the probability of termite infestation is “very heavy” must be in accordance with 2006 IRC Section R320.5 or 2006 IBC Section 2603.8.
- **Jobsite Certification and Labeling:** See Section 5.8, except jobsite certification and labeling must comply with 2006 IECC Sections 102.1.1 and 102.11, as applicable.

TABLE 1—THERMAL RESISTANCE (*R*-VALUES)[1,2]

THICKNESS (inch)	*R*-VALUE (°F•ft²•h/Btu)
1.0	6.5
1.5	9.8
2.0	13
2.5	17
3.0	20
3.1	21
3.25	22
3.5	23
4.0	27
4.5	30
5.0	33
5.5	37
6.0	40
7.5	50
8.5	56
10.0	66
11.5	76
12.0	80

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

[1] *R*-values are calculated based on tested *K*-values at 1- and 4-inch thicknesses.
[2] *R*-values greater than 10 are rounded to the nearest whole number.

TABLE 2—USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER

Maximum Thickness (in) Wall and Vertical Surfaces	Maximum Thickness (in) Ceiling and Overhead Surfaces	Fire Protective Coating (Applied to all Foam Surfaces)		Test Submitted
		Type and Minimum Thickness	Minimum Application Rate	
$11^1/_4$	$11^1/_4$	Flame Seal TB 24 mils WFT	1.5 gal/100 ft^2	UL 1715
$5^1/_2$	$9^1/_2$	DC315 22 mils WFT	1.4 gal/100 ft^2	NFPA 286
$5^1/_2$	$9^1/_2$	Fireshell F10E 17 mils WFT	1.1 gal/100 ft^2	NFPA 286

For **SI:** 1 inch= 25.4 mm.

TABLE 3—USE OF CERTASPRAY® CLOSED CELL SPRAY FOAM INSULATION IN EXTERIOR WALL CAVITIES

Wall Component	Materials
Base wall system—Use either 1, 2 or 3	1 – Concrete wall 2 – Concrete Masonry wall 3 – 1 layer of ⅝-inch-thick Type X gypsum wallboard installed on the interior side of minimum 3⅝-inch-deep minimum 20-gauge-thick steel studs spaced a maximum of 24 inches on center. Lateral bracing installed minimum every 4 ft. vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 lb/ft^3 mineral wool friction fit between steel wall studs.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the IBC shall be installed, as applicable, to fill the void between the edge of the concrete floor slab and the interior surface of the exterior wall assembly.
Interior Insulation – Use either 1, 2, 3, 4 or 5 or combinations of 3 with 4 or 3 with 5	1 – None 2 – Maximum 4-inch thickness of CertaSpray® Closed Cell Spray Foam Insulation applied to interior surface of Base Wall System 1 and 2 (See Note 1) 3 – Full wall stud cavity depth or less of CertaSpray® Closed Cell Spray Foam Insulation applied using exterior gypsum sheathing of Base Wall System 3 as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange. 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior sheathing	⅝-inch-thick Type X exterior type gypsum sheathing (for Base Wall System 3 above)
Exterior Wall Covering – Use either 1, 2, or 3 (See Note 3)	1 – Any non-combustible exterior wall covering material using any standard installation technique 2 – Any non-combustible exterior wall covering system with a combustible WRB that has successfully been tested in accordance with NFPA 285 3 – Metal Composite Material (MCM) Mitsubishi Plastic Composites America, Inc. Alpolic/fr wall panels (see ICC-ES ESR-2653) or Alcoa Architectural Products Reynobond FR 6-mm panels (see ICC-ES ESR-3435) where there is no exterior insulation in the cavity behind the panels
Flashing of window, door and other exterior wall penetrations.	As an option, flash around window, door and other exterior penetrations with limited amounts of maximum 12-inch-wide flashing tape (acrylic, asphalt or butyl-based) or liquid-applied membrane material with or without fiber mesh reinforcement.

Note 1: Fireblocking per 2015 and 2012 IBC Section 717 (2009 IBC Section 718) and thermal barrier material requirements must be met for Base Wall Systems 1 and 2, as required by specific wall construction details when combustible concealed space is created on interior side of exterior wall assembly.

Note 2: Building code section references may change in different editions of the IBC.

Note 3: Exterior wall coverings shall be installed in accordance with manufacturer's installation requirements and must comply with the applicable provisions of IBC Chapter 14 and IRC Chapter 7.

TABLE 4—USE OF CERTASPRAY® CLOSED CELL SPRAY FOAM INSULATION ON EXTERIOR WALLS

Wall Component	Materials
Base Wall System – Use either 1, 2 or 3	1 – Concrete wall 2 – Concrete Masonry wall 3 – 1 layer of ⅝-inch-thick Type X gypsum wallboard installed on the interior side of minimum 3⅝-inch-deep minimum 20-gauge-thick steel studs spaced a maximum of 24 inches on center. Lateral bracing installed minimum every 4 ft. vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 lbs/ft^3 mineral wool friction fit between steel wall studs.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the IBC shall be installed, as applicable, to fill the void between the edge of the concrete floor slab and the interior surface of the exterior wall assembly.
Interior Insulation – Use either 1, 2, 3, 4, or 5; or combination of 2 and 4 or combination of 2 and 5.	1 – None 2 – Maximum 4-inch-thickness of CertaSpray® Closed Cell Spray Foam Insulation applied to interior surface of Base Wall System 1 and 2 (See Note 1) 3 – Full wall stud cavity depth or less of CertaSpray® Closed Cell Spray Foam Insulation applied using exterior gypsum sheathing of Base Wall System 3 as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange. 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior sheathing – Use either 1 or 2.	1 – None (for Base Wall Systems 1 or 2 above) 2 – ⅝-inch-thick Type X exterior-type gypsum sheathing (for Base Wall System 3 above)
Exterior Insulation	Maximum 3$^7/_8$-inch-thickness of CertaSpray® Closed Cell Spray Foam Insulation applied to exterior surface of Base Wall Systems 1 or 2 or over exterior sheathing of Base Wall System 3
Exterior Wall Covering – Use either 1, 2, 3, 4, or 5 (See Note 3)	1 – Brick – Standard type brick veneer anchors, installed a maximum 24-inches on center, vertically on each stud with maximum 1-inch air gap between exterior insulation and brick. Brick to be standard nominal 4-inch-thick clay brick installed in a running bond pattern using Type S mortar. 2 – Stucco – Minimum ¾-inch-thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3 – Minimum 2-inch-thick natural stone (granite, limestone, marble, sandstone). Any standard non-open jointed installation technique can be used. 4 – Minimum 1½ inch thick concrete masonry unit (CMU), pre-cast concrete, or artificial cast stone. Any standard non-open jointed installation technique can be used. 5 – Minimum 1¼ inch thick Terra Cotta non-open jointed. Any standard non-open jointed installation technique can be used.
Flashing of window, door and other exterior wall penetrations.	As an option, flash around window, door and other exterior penetrations with limited amounts of maximum 12-inch-wide flashing tape (acrylic, asphalt or butyl-based) or liquid-applied membrane material with or without fiber mesh reinforcement.

Note 1: Fireblocking per 2015 and 2012 IBC Section 717 (2009 IBC Section 718) and thermal barrier material requirements must be met for Base Wall Systems 1 and 2, as required by specific wall construction details when combustible concealed space is created on interior side of exterior wall assembly.

Note 2: Building code section references may change in different editions of the IBC.

Note 3: Exterior wall coverings shall be installed in accordance with manufacturer's installation requirements and must comply with the applicable provisions of IBC Chapter 14 and IRC Chapter 7.