EVALUATION SUBJECT:
BAYSEAL® OCX

REPORT HOLDER:
Accella Polyurethane Systems
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CSI Division: 07 00 00 THERMAL AND MOISTURE PROTECTION
CSI Section: 07 21 00 Thermal Insulation

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:
- 2015, 2012, 2009 and 2006 International Building Code® (IBC)
- 2015, 2012, 2009, 2006 International Residential Code® (IRC)
- 2015, 2012, 2009 and 2006 International Energy Conservation Code® (IECC)

1.2 Evaluated in accordance with:
- ICC-ES AC377, approved April 2016

1.3 Properties assessed:
- Surface-burning characteristics
- Physical properties
- Thermal resistance
- Use in attics and crawl spaces
- Exterior Walls in Types I through V Construction

2.0 PRODUCT USE

Bayseal® OCX is a spray-applied polyurethane foam plastic (SPF) insulation and is used as a nonstructural thermal insulating material in Type V construction under the IBC and dwellings under the IRC. The insulation may also be used in construction Types I, II, III or IV when installed in accordance with Section 4.5 of this report. The insulation complies with IBC Section 2603; 2015, 2012 and 2009 IRC Section R316 (2006 IRC Section R314); and 2015 and 2012 IECC Sections C303, C402, R303; and R402 (2009 IECC Sections 303 and 402; 2006 IECC Section 402).

3.0 PRODUCT DESCRIPTION

3.1 Bayseal® OCX Insulation: Bayseal® OCX is a low-density spray-applied, open cell polyurethane foam plastic insulation having a nominal density of 0.5 pcf (8.0 kg/m^3).

3.2 Surface Burning Characteristics

3.2.1 The Bayseal® OCX foam plastic insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf (8.0 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.

3.2.2 Thicknesses are not limited for ceiling cavities and wall cavities when covered by a prescriptive thermal barrier (minimum ½-inch-thick (12.7 mm) gypsum wallboard) complying with and installed in accordance with the IBC or IRC. Thicknesses of up to 11.5 inches (292 mm) for ceiling cavities and 7.5 inches (191 mm) for wall cavities are recognized, based on testing in accordance with NFPA 286, when installed in accordance with Section 4.3.2 of this report.

3.3 Thermal Resistance: For uses in accordance with the IECC or other codes, Bayseal® OCX foam plastic insulation has a thermal resistance, R-value, at a mean temperature of 75°F (24°C) as shown in Table 1 of this report.

Table 1—Thermal Resistance (R-Values)[1]

Thickness (inch)	**R-Value** (°F•ft^2•hr/Btu)
1.0	3.7
4.0	14
7.5	27
11.5	41

SI: 1 inch = 25.4 mm; 1 °F•ft^2•hr/Btu = 0.176 °K•m^2•hr/W
[1]R-values are calculated based on tested k-factors at 1- and 4-inch thicknesses.

3.4 Intumescent Coatings

3.4.1 DC315: DC315 intumescent coating and DC315 Primer are manufactured by International Fireproof Technology Inc., and is a water-based coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating and primer have a maximum shelf life of 24 months when stored in factory-sealed containers at temperatures between 50°F (10°C) and 90°F (32°C).

3.4.2 Flame Control No. 60-60A: 60-60A is a water-based intumescent coating manufactured by Flame Control Coatings supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating has a maximum shelf life of one year when stored in factory-sealed container between 50°F (10°C) and 80°F (27°C).

4.0 DESIGN AND INSTALLATION

4.1 General

Bayseal® OCX spray-applied foam plastic insulation shall be installed in accordance with the manufacturer's published

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safely, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.

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installation instructions and this report. A copy of these instructions and this evaluation report shall be available on the jobsite at all times during installation. Where conflicts occur, the more restrictive shall govern.

4.2 Application: Bayseal® OCX shall be applied using spray equipment specified by Accella Polyurethane Systems.

4.3 Thermal Barrier

4.3.1 Application with a Prescriptive Thermal Barrier: Bayseal® OCX insulation at any thickness in ceiling cavities and in wall cavities shall be separated from the interior of the building by a code-complying prescriptive thermal barrier. The IBC and IRC prescribe an approved thermal barrier of minimum ½-inch-thick (12.7 mm) gypsum wallboard or equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or 2015, 2012 and 2009 IRC Section R316.4 (2006 IRC Section 314.4), as applicable and installed in accordance with applicable code.

4.3.2 Application without a Prescriptive Thermal Barrier: As an alternative assembly to the use of a prescriptive thermal barrier, Bayseal® OCX insulation may be installed in accordance to one of the following methods:

DC315: Bayseal® OCX insulation may be installed without a prescriptive thermal barrier when coated on all exposed surfaces with DC135 Primer and DC315 intumescent coating. The DC315 Primer shall be applied to a wet film thickness of 4 mils (0.102 mm) 3 mils (0.076 mm) dry film thickness and allowed to fully cure. DC315 intumescent coating is applied to the primed insulation surface at a 1.0 gallon / 100 ft^2 (0.4 L/m^2) theoretical application rate to a thickness of 16 mils (0.406 mm) wet film thickness, 11 mils (0.279 mm) dry film thickness. The maximum thickness of the spray foam insulation is limited to 7.5 inches (190 mm) on vertical surfaces and 11.5 inches (292 mm) on overhead surfaces. Primer and coating shall be applied in accordance with International Fireproof Technology's installation instructions and this report. Where conflicts occur, the more restrictive shall govern. Surfaces to be coated shall be dry, clean, and free of dirt, loose debris and other substances. The primer and coating is applied in one coat with low-pressure airless spray equipment.

Flame Control 60-60A: Bayseal® OCX insulation may be installed without a prescriptive thermal barrier when coated on all exposed surfaces with Flame Control No. 60-60A intumescent coating. 60-60A intumescent coating is applied to the insulation surface at a 1.25 gallon / 100 ft^2 (0.51 L/m^2) theoretical application rate to a thickness of 20 mils (0.51 mm) wet film thickness, 13 mils (0.33 mm) dry film thickness. The maximum thickness of the spray foam insulation is limited to 7.5 inches (190 mm) on vertical surfaces and 11.5 inches (292 mm) on overhead surfaces. Coating shall be applied in accordance with Flame Control Coating's installation instructions and this report. Where conflicts occur, the more restrictive shall govern. Surfaces to be coated shall be dry, clean, and free of dirt, loose debris and other substances. The coating is applied in one coat using brush, roller or airless spray equipment.

4.4 Attics and Crawl Spaces: When installing Bayseal® OCX in attics or crawl spaces and a thermal barrier is omitted in accordance with IBC Section 2603.4.1.6 or IRC Sections R316.5.3 or R316.5.4, installation shall comply with either Sections 4.4.1 or 4.4.2 of this report.

4.4.1 Application with a Prescriptive Ignition Barrier: When Bayseal® OCX insulation is installed within attics and crawl spaces where entry is made only for service of utilities, an ignition barrier shall be installed in accordance with IBC Section 2603.4.1.6 or 2015, 2012 and 2009 IRC Sections R316.5.3 and R316.5.4 (2006 IRC Sections R314.5.3 and R314.5.4), as applicable. The ignition barrier shall be consistent with the construction type of the building.

4.4.2 Application without a Prescriptive Ignition Barrier: Where the spray-applied insulation is installed in accordance with Section 4.4.2.1 or 4.4.2.2 of this report, the following conditions apply:

a) Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
b) There are no interconnected attic or crawl space areas.
c) Air in the attic or crawl space is not circulated to other parts of the building.
d) Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when an air-impermeable insulation is permitted in unvented attics in accordance with Section R806.4 of IRC. Under-floor (crawl space) ventilation is provided when required by 2015 IBC Section 1203.4 (2012, 2009 and 2006 IBC Section 1203.3) or IRC Section R408.1, as applicable.
e) The foam plastic insulation is limited to the maximum thickness and density tested, as described in Section 4.3.2 of this report.
f) Combustion air is provided in accordance with 2015, 2012 and 2009 IMC (International Mechanical Code®) Section 701 (2006 IMC Sections 701 and 703).
g) The installed coverage rate or thickness of coatings, if part of the insulation system, shall be equal to or greater than that which was tested.

4.4.2.1 Attics and Crawl Spaces: Bayseal® OCX spray foam insulation may be spray-applied without a prescriptive ignition barrier to the underside of the roof deck to thicknesses not exceeding 11.5 inches (292 mm) and/or vertical surfaces to thicknesses not exceeding 7.5 inches (190 mm), as described in this section. When Bayseal® OCX is installed as described in this section, no ignition barrier or coating is required.

Alternative: Bayseal® OCX insulation may be covered on all exposed surfaces with an application of DC 315

intumescent coating and primer as described in Section 3.4 of this report. The DC315 Primer shall be applied to a wet film thickness of 4 mils (0.102 mm), 3 mils (0.076 mm) dry film thickness, and allowed to fully cure. DC315 intumescent coating is applied to the primed insulation surface at a 1.0 gallon / 100 ft^2 (0.4 L/m^2) theoretical application rate to a thickness of 16 mils (0.406 mm) wet film thickness, 11 mils (0.279 mm) dry film thickness and DC315 intumescent coating shall be applied in accordance with International Fireproof Technology's installation instructions and this report. Where conflicts occur, the more restrictive shall govern. Surfaces to be coated shall be dry, clean, and free of dirt, loose debris and other substances. The coating is applied in one-coat with low-pressure airless spray equipment.

4.4.2.2 Use on Attic Floors: Bayseal® OCX insulation may be installed exposed (no coating), without an ignition barrier up to a maximum thickness of 11½ inches (292 mm) between and over the joist in attic floors. The insulation shall be separated from the interior of the building by an approved thermal barrier complying with IBC Section 2603.4 or 2015, 2012 and 2009 IRC Section R316.4 (2006 IRC Section 314.4). The ignition barrier required by IBC Section 2603.4 and 2015, 2012 and 2009 IRC Section R316.5.3 (2006 IRC Section R314.5.3) may be omitted in this case.

4.5 Exterior Walls of Types I, II, III, IV or V Construction (IBC)

4.5.1 General: Bayseal® OCX insulation may be used in exterior walls of Type V construction of any height. When Bayseal® OCX insulation is used in exterior walls of Types I, II, III or IV construction of any height, the insulation shall comply with IBC Section 2603.5 and this section.

4.5.2 Complying Exterior Wall Assemblies of Types I, II, III and IV Construction (IBC): Wall assemblies that comply with Section 2603.5 of the IBC and this report that may be used in exterior walls of buildings of Type I, II, III or IV construction of any height are described in Table 2 of this report.

5.0 LIMITATIONS

The Bayseal® OCX 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 insulation and coating products shall be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. Where conflicts occur, the more restrictive shall govern.

5.2 Bayseal® OCX insulation shall be protected by a 15-minute thermal barrier in accordance with Section 4.3.1 of this report except when installation complies with Section 4.3.2 (Application without a Prescriptive Thermal Barrier) or 4.4 (Attics and Crawl Spaces) of this report.

5.3 The A and B components of the insulation are produced under a quality control program with inspections by IAPMO Uniform ES.

5.4 Bayseal® OCX insulation shall be installed by contractors certified by Accella Polyurethane Systems.

5.5 When Bayseal® OCX insulation is used in areas where in the likelihood of termite infestation is "very heavy," it shall be installed in accordance with IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4 (2006 IRC Section R320.5), as applicable.

5.6 Jobsite labeling and certification of the insulation shall comply with 2015 IRC Sections N1101.10 and N1101.10.1.1, 2012 IRC Sections N1101.12 and N1101.12.1, IRC Sections N1101.4 and N1101.4.1 and IECC Sections C303.1.1 and C303.1.2 (2009 IECC Section 303.1.1.1; 2006 IECC Sections 102.1.1 and 102.1.1.1), as applicable.

5.7 Where applicable, Bayseal® OCX shall be installed with a vapor retarder in accordance with the applicable code.

6.0 SUBSTANTIATING DATA

6.1 Data and test reports submitted are from laboratories in compliance with ISO/IEC 17025 and in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, (AC377), Approved April 2016, including reports of tests in accordance with Appendix X of AC 377.

6.2 NFPA 286 test reports dated May 9, 2013 and April 17, 2015.

6.3 Reports on fire propagation characteristics tests in accordance with NFPA 285.

7.0 IDENTIFICATION

Containers of Bayseal® OCX components are identified with a label bearing the Accella Polyurethane Systems name address; the product trade name (Bayseal® OCX); the lot number; the flame spread and smoke developed indices; mixing instructions; density; the shelf life; the expiration date; and the IAPMO Uniform ES Evaluation Report number (ER-541).

IAPMO ES ® or UES ™

IAPMO ER-541

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For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 2 - NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES FOAMSULATE 220[2] APPLIED TO EXTERIOR OF WALL ASSEMBLY WITH FOAMSULATE 220[2] OR BAYSEAL® OCX IN WALL STUD CAVITY

WALL COMPONENT	MATERIAL DESCRIPTION
Base Wall System (BWS) Use either **1**, **2** or **3**	**1** – concrete wall **2** – concrete masonry wall **3** – 1 layer of 5/8-inch thick Type X gypsum wallboard installed on the interior side of minimum 3 5/8-inch deep minimum No. 20 gauge steel studs spaced a maximum or 24 inches on center. Lateral bracing installed minimum every 4 feet vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 pcf density mineral wool (e.g. Thermafiber) friction fit between steel wall studs.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2015 or 2012 IBC shall be installed, as applicable, to fill the void created at the intersection of the exterior curtain wall assembly and the concrete floor slab.
Interior Insulation Use either **1**, **2**, **3**, **4** or **5**; or combination of **3** and **4**; or combination of **3** and **5**	**1** – None **2** – Maximum 3 5/8-inch thickness of Bayseal® OCX open-cell SPF insulation applied to the interior surface of **BWS 1** or **2** above.[1, 3, 4] **3** – Bayseal® OCX insulation applied to the full depth of the wall stud cavity, or less, with exterior gypsum sheathing (see **BWS 3** above) as the substrate covering the width of the cavity and the inside of the steel wall stud framing flange.[3, 4] **4** – Fiberglass batt insulation (faced or unfaced) **5** – Mineral wool insulation (faced or unfaced)
Exterior Sheathing Use either **1** or **2**	**1** – None (for **BWS 1** or **2** above) **2** – ⅝-inch thick exterior gypsum sheathing (for **BWS 3** above)
Exterior Insulation	Maximum 4-inch thickness of Foamsulate 220[2] insulation
Exterior Wall Covering[2] Use either **1**, **2**, **3, 4** or **5**	**1** – Brick: Standard type brick veneer anchors, installed at a minimum 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 (WRB) may be installed between the exterior insulation and the lath. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes. **3** – Natural Stone: Minimum 2-inch thick natural stone (granite, limestone, marble, sandstone). Any standard non-open jointed installation technique may be used. **4** – CMU and others: Minimum 2-inch thick concrete masonry unit (CMU), pre-cast concrete or artificial cast stone. Any standard non-open jointed installation method may be used. **5** – Terra Cotta: Minimum 1¼-inch thick Terra Cotta non-open jointed. Any standard non-open jointed installation method may be used.
Flashing of window, door and other exterior wall penetrations	As an option, flash around windows, doors 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 reinforcements.

SI: 1 inch = 25.4 mm; 1 pcf = 16.0 kg/m^3; 1 Btu/ft^2 = 0.01128 mJ/m^2

[1] Fireblocking per Section 718 of the 2015 or 2012 IBC and thermal barrier material requirements per Section 2603.4 of the2015 or 2012 IBC shall be met for Base Wall Systems 1 and 2, as required by specific wall construction details when a combustible concealed space is created on interior side of exterior wall assembly.

[2] Foamsulate 220 in accordance with IAPMO UES ER-352.