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BAYSEAL® OCX

CSI Section:
07 21 00 Thermal Insulation

1.0 RECOGNITION

Bayseal® OCX spray-applied polyurethane foam plastic insulation described in this report have been evaluated for use as thermal insulation and for use in Types I through V construction. The physical properties, thermal resistance, surface burning characteristics, fire-resistance-rating properties, alternative thermal barrier assemblies and attic and crawl space installations were evaluated for compliance with the following codes and regulations:

- 2018, 2015, 2012 2009, and 2006 International Building Code® (IBC)
- 2018, 2015, 2012 2009, and 2006 International Residential Code® (IRC)
- 2018, 2015, 2012 2009, and 2006 International Energy Conservation Code® (IECC)

2.0 LIMITATIONS

Use of Bayseal® OCX spray-applied polyurethane foam plastic insulation recognized in this report is subject to the following limitations:

2.1 The insulation shall be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. If there are any conflicts between the manufacturer's published installation instructions and this report, the more restrictive shall govern.

2.2 In accordance with Sections 4.5.1 and 4.5.2 of this report, the insulation shall be separated from the interior of the building by a code-complying thermal barrier or ignition barrier as appropriate.

2.3 The insulation shall not exceed the nominal density and thickness for the installation conditions described in this report.

2.4 During installation the insulation and the surfaces to which it is applied shall be protected from exposure to weather.

2.5 The insulation shall be installed by professional spray polyurethane foam installers approved by Accella Polyurethane Systems, LLC, or by the Spray Polyurethane Foam Alliance (SPFA).

2.6 Use of the insulation in areas of "very heavy" termite infestation probability shall be in accordance with 2018 and 2015 IBC Section 2603.8, 2012 IBC Section 2603.9, 2009 or 2006 IBC Section 2603.8, or 2018, 2015, 2012 and 2009 IRC Section R318.4, or 2006 IRC Section R320.5, as applicable.

2.7 When required by the applicable code, a vapor retarder shall be installed.

2.8 Labeling and jobsite certification of the insulation and coatings shall comply with the following code sections as applicable:

- 2018, 2015, 2012 or 2009 IBC Section 2603.2
- 2018, 2015, 2012 or 2009 IRC Section R316.2
- 2018, 2015 IRC Section N1101.10.1.1
- 2012 IRC Section N1101.12.1.1
- 2009 IRC Section N1101.4.1
- 2018, 2015 or 2012 IECC Sections C303.1.1.1 or R303.1.1.1
- 2009 IECC Section 303.1.1.1

2.9 Foam Plastic used in plenums as interior finish or interior trim under the 2018 edition IBC shall comply with Section 2603.7.

2.10 The insulation shall be produced by Accella Polyurethane Systems, LLC in Cartersville, Georgia or Spring, Texas.

3.0 PRODUCT USE

Bayseal® OCX spray-applied polyurethane foam plastic insulation complies with IBC Section 2603, IRC Section R316, 2012 IECC Sections C303, C402, R303, and R402, 2009 IECC Sections 303 and 402, and 2006 IECC Section 402. When installed in accordance with Section 4.0 of this report, the foam plastic insulation may be used in wall cavities, floor assemblies or ceiling assemblies, and/or in attics and crawl spaces as nonstructural thermal insulation material. Bayseal® OCX insulation is used in Type V-B construction under the IBC and in one- and two-family dwellings under the IRC.

Bayseal® OCX insulation may also be used in Types I, II, III or IV construction when installed in accordance with Section 4.5.3 of this report.

4.0 PRODUCT DESCRIPTION

4.1 Properties: Bayseal® OCX are open cell, spray-applied polyurethane foam plastic insulation in accordance with Section 3.1.1 and Table 1 of AC377. The insulation has a nominal in-place density of 0.5 pcf (8 kg/m^3). The two-component spray foam plastic is produced in the field by combining a polymeric isocyanate (A component) and a polymeric resin (B component). The liquid components shall be stored in 55-gallon (208 L) drums at temperatures between 65°F and 85°F (18°C and 29°C). When Component A and Component B are stored in factory-sealed containers at the recommended temperatures, the maximum shelf life is six months.

4.2 Thermal Resistance (R-Values): Bayseal® OCX spray-applied polyurethane foam plastic insulation have 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•h/Btu)
1	3.7
4	14
7.5	27
11.5	41

For **SI:** 1 inch = 25.4 mm, 1°F·ft^2·h/Btu = 0.176 110 K·m^2/W.
[1]R-Values are calculated based on tested K values at 1-inch and 3.5-inch thicknesses.

4.3 Surface Burning Characteristics: At a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf (8.0 kg/m^3), the Bayseal® OCX insulation yields a flame spread index of 25 or less and smoke-developed index of 450 or less when tested in accordance with ASTM E84. Greater thicknesses, depending on the end use, are recognized when installed in accordance with this report.

4.4 Fire- Protective Coatings and Coverings: Fire protective coatings, for use as alternative thermal barriers or ignition barriers, shall be in accordance with Tables 2 and 3 of this report, as applicable, and installed in accordance with Section 4.5 of this report.

4.5 Installation: Bayseal® OCX spray-applied polyurethane foam plastic insulation shall complies with one of the following requirements:

- 2018, 2015, 2012 IECC Sections C402.1 (prescriptive)
- 2018, 2015, 2012 IECC Section R407 (performance)
- 2009 IECC Sections 402, 405, 502 or 506 as appropriate.

The manufacturer's published installation instructions for Bayseal® OCX insulation and this report shall be available on the jobsite during installation. Where conflicts occur, the most restrictive governs.

Bayseal® OCX insulation shall be spray-applied on the jobsite using equipment specified in the manufacturer's published installation instructions. The maximum in-service temperature for all areas shall not exceed the maximum temperature stated in the manufacturer's published installation instructions. The insulation shall be sprayed onto a substrate that is protected and clean from any debris or weather-related conditions during and after application and shall not be used in electrical outlets or junction boxes or in contact with rain, water, or soil.

4.5.1 Thermal Barrier

4.5.1.1 Application with a Prescriptive Thermal Barrier: Bayseal® OCX Spray-Applied Polyurethane Foam Plastic Insulation, of any thickness, shall be separated from the interior by an approved thermal barrier of minimum ½ inch thick (12.7 mm) gypsum wallboard or equivalent 15-minute thermal barrier. The thermal barrier shall comply with and be installed in accordance with the 2018, 2015, 2012, 2009 and 2006 editions IBC Section 2603.4, or the 2018, 2015, 2012 and 2009 IRC Section R316.4 or 2006 IRC Section 314.4, as applicable.

4.5.1.2 Alternative Thermal Barrier Assemblies: Bayseal® OCX spray applied foam plastic insulation may be installed without a prescriptive thermal barrier as defined in Section 4.5.1.1 of this report when installed in accordance with Table 2 of this report.

4.5.2 Installation in Attics or Crawl Spaces: Bayseal® OCX Spray-applied Polyurethane Foam Plastic Insulation may be installed in attics or crawl spaces in accordance with this section (Section 4.5).

When installed in attics or crawl spaces where entry is made only for the service of utilities, Bayseal® OCX insulation may be installed in accordance with this section. Bayseal® OCX insulation need not be surfaced with a thermal barrier; however, such attic and crawl space areas shall be separated from the interior of the building by a ignition barrier in accordance with Section 4.5.2.1, 4.5.2.2, and 4.5.2.3 of this report.

4.5.2.1 Installation Using a Prescriptive Ignition Barrier: When installed within attics or crawl spaces where entry is made only for the service of utilities, Bayseal® OCX spray-applied polyurethane foam plastic insulation, at a maximum 11.5 inches (292 mm) thick shall be covered with a prescriptive ignition barrier in accordance with 2018, 2015, 2012, 2009 or 2006 IBC Section 2603.4.1.6, 2018, 2015, 2012 or 2009 IRC Sections R316.5.3 and R316.5.4 or 2006 IRC Sections R314.5.3 and R314.5.4, as applicable.

Exception: The prescriptive ignition barrier may be omitted when installed in accordance with Section 4.5.2.2. 4.5.2.3 or 4.5.2.4 of this report.

4.5.2.2 Installation Using an Alternative Ignition Barrier Assembly: Spray-Applied Polyurethane Foam Plastic Insulation may be installed in attics and crawl spaces using an alternative ignition barrier assembly provided:

a. Entry is only to service utilities in the attic or crawl space and no storage is permitted.
b. Attic or crawl space areas cannot be interconnected.
c. Air from the attic or crawl space cannot be circulated to other parts of the building.
d. Attic ventilation is provided as required by the 2018 edition IBC Section 1202 or 2018 edition IRC Section R806 except where air-impermeable insulation is permitted in unvented attics and shall comply with the following code sections as applicable:

   For Unvented Attics:

   - 2018 IBC Section 1202.3
   - 2015 IBC Section 1203.3
   - 2018, 2015 and 2012 IRC Section R806.5
   - 2009 IRC Section R806.4

   Crawl space ventilation is provided as required by the following code sections as applicable:

   - 2018 IBC Section 1202.4
   - 2015 IBC Section 1203.4
   - 2012, 2009 and 2006 IBC Section 1203.3
   - 2018, 2015, 2012, 2009 and 2006 IRC Section R408.1

e. The foam plastic insulation is limited to the maximum thickness and density tested.
f. In accordance with Uniform Mechanical Code ((UMC) Section 701.1 or IMC (International Mechanical Code®) Section 701, [2006 IMC Sections 701 and 703], combustion air is provided.
g. The installed coverage rate or thickness of coatings, if part of the insulation system, shall be equal to what is described in Section 4.5.2.3 of this report.

4.5.2.3 Installation Using an Alternative Ignition Barrier with Application of Fire-Protective Coatings: Bayseal® OCX Spray-Applied Polyurethane Foam Plastic Insulation may be spray-applied in attics to the underside of roof sheathing or roof rafters, and vertical surfaces; and may be spray-applied in crawl spaces to the underside of floors and vertical surfaces as described in this section. Coating thickness shall be in accordance with Table 3 of this report.

The coating shall be applied over the insulation using airless spray equipment, roller, or a brush in accordance with the coating manufacturer's published installation instructions and this report. The ambient and substrate temperatures shall be minimum 50°F (10°C), and the surface shall be dry, clean, free of dirt and loose debris, and any other substance that could interfere with adhesion of the coating.

4.5.2.4 Application without a Fire-protective Coating: Bayseal® OCX spray foam insulations may be spray-applied without a prescriptive ignition barrier to the underside of the roof deck and underside of floors in crawl space to thicknesses not exceeding 11.5 inches (292 mm) and/or vertical surfaces in attics or crawl spaces to thicknesses not exceeding 7.5 inches (190 mm), as described in this section. When Bayseal® OCX is installed as described in this section and Section 4.5.2.2, no ignition barrier or coating is required.

4.5.2.5 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.

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

4.5.3.1 General: 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.

4.5.3.2 Complying Exterior Wall Assemblies: 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 4 of this report.

5.0 IDENTIFICATION

The spray foam insulation is identified with the following:

a. Manufacturer's name (Accella Polyurethane Systems, LLC)
b. address and telephone number,
c. the product trade name (Bayseal® OCX)
d. use instructions
e. density, flame-spread and smoke-development indices
f. date of manufacture or batch/run number
g. thermal resistance values
h. the evaluation report number (ER-541)
i. the name or logo of the inspection agency

Either mark of conformity may be used as shown below:

or

IAPMO UES ER-541

6.0 SUBSTANTIATING DATA

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, AC377, dated April 2016, including Appendix X (Editorially Revised in April 2018).

6.2 Reports of room corner fire testing in accordance with NFPA 286.

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

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Bayseal® OCX to assess its conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification. Products are manufactured at locations noted in Section 2.10 of this report under a quality control program with periodic inspections under the supervision of IAPMO UES.

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TABLE 2 - ALTERNATIVE THERMAL BARRIER ASSEMBLIES [2]				
FIRE-PROTECTIVE COATING/COVERING[1]			MAXIMUM SPF THICKNESS (inch)	
TYPE	MINIMUM THICKNESS (mils)	THEORETICAL APPLICATION RATE	WALLS AND VERTICAL SURFACES	CEILING AND OVERHEAD SURFACES
DC315 [3]	14 WFT (9 DFT)	115 ft^2/gal.	8.5	14
Flame Control 60-60A	20 WFT (13 DFT)	80 ft^2/gal	7.5	11.5

For **SI:** 1 inch = 25.4 mm, 1 gallon = 3.785 L, 1 ft^2 = 0.0929 m^2

[1] Fire-protective coatings and coverings shall be applied over all exposed SPF surfaces in accordance with the coating/covering manufacturer's instructions and this report.

[2] International Fireproof Technology, Inc, recognized in IAPMO UES ER-499.

[3] Flame Control Coatings, recognized in IAPMO UES ER-596.

TABLE 3 ALTERNATIVE IGNITION BARRIER ASSEMBLIES				
FIRE-PROTECTIVE COATING/COVERAGE[1]			MAXIMUM SPF THICKNESS (inch)	
TYPE	MINIMUM THICKNESS (mils)	THEORETICAL APPLICATION RATE	WALLS AND VERTICAL SURFACES	CEILINGS AND OVERHEAD SURFACES
DC315[2]	4 WFT (3 DFT)	400 ft^2/gal	7.5	11.5

For **SI:** 1 inch = 25.4 mm, 1 gallon = 3.785 L, 1 ft^2 = 0.0929 m^2

[1] Fire-protective coatings and coverings must be applied over all exposed SPF surfaces in accordance with the coating/covering manufacturer's instructions and this report.

[2] International Fireproof Technology, Inc, recognized in IAPMO UES ER-499

TABLE 4 - 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 2018, 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** – $^5/_8$-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 2018, 2015 or 2012 IBC and thermal barrier material requirements per Section 2603.4 of the 2018, 2015 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.