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DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 – Thermal Insulation

Section: 07 21 19 – Foamed In-Place Insulation

REPORT HOLDER:

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REPORT SUBJECT:

JM Corbond® OC Spray-Applied Polyurethane Foam Insulation and JM Corbond® HY OC Spray-Applied Polyurethane Foam Insulation

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2021, 2018, 2015 *International Building Code®* (IBC)
- 2021, 2018, 2015 *International Residential Code®* (IRC)
- 2021, 2018, 2015 *International Energy Conservation Code®* (IECC)

NOTE: This report references the most recent edition of the Codes noted. Sections numbers for earlier Code editions may differ.

1.2 The insulations have been evaluated for the following properties (see Table 1):

- Physical Properties
- Surface Burning Characteristics
- Thermal Resistance
- Air Permeability

1.3 The insulations have been evaluated for the following uses (see Table 1):

- Alternatives to thermal barriers
- Alternatives to ignition barriers
- Use in Types I, II, III, and IV construction

- Use in Type V construction

2.0 STATEMENT OF COMPLIANCE

JM Corbond® OC SPF and JM Corbond® HY OC SPF comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

3.0 DESCRIPTION

3.1 Insulations: JM Corbond® OC SPF and JM Corbond® HY OC SPF are two-component, open-cell, spray-applied polyurethane foam plastic insulations. The insulations are produced in the field by professional contractors combining an isocyanate component "A" with a proprietary resin component "B".

JM Corbond® OC has a nominal in place density of 0.5 pcf and JM Corbond® HY OC has a nominal in place density of 0.4 pcf.

The "A" component has a shelf life of 12 months and the "B" component has a shelf life of 6 months, both when stored in factory-sealed containers at temperatures between 50°F and 85°F.

3.2 Intumescent Coatings:

3.2.1 FIRESHELL® JM-IC/JM-TC Coating: FIRESHELL® JM-IC and JM-TC intumescent coatings are a proprietary, water-based, one-part, coating manufactured by ICP Construction. The coatings are supplied in 5-gallon pails and 55-gallon drums and have a shelf life of 12 months when stored in factory-sealed containers at temperatures above 45°F. Fireshell JM-TC complies with ICC-ES AC456 as recognized in ICC-ES ESR-3997.



3.2.2 FIRESHELL® IB4/F10E/TB Coating: FIRESHELL® IB4/F10E/TB intumescent coatings are proprietary, water-based, one-part, coatings manufactured by ICP Construction. FIRESHELL® IB4 is identical to FIRESHELL® JM-IC, and FIRESHELL® F10E/TB is identical to FIRESHELL® JM-TC. The coatings are supplied in 5-gallon pails and 55-gallon drums and have a shelf life of 12 months when stored in factory-sealed containers at temperatures above 45°F. Fireshell F10E and TB comply with ICC-ES AC456 as recognized in ICC-ES ESR-3997.

3.2.3 DC315 Intumescent Coating: DC315 intumescent coating, manufactured by International Fireproof Technology Inc., is a single-component, water-based, liquid-applied intumescent coating. The coating is supplied in 5-gallon pails and 55-gallon drums, and has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 50°F and 80°F. DC315 complies with ICC-ES AC456 as recognized in IAPMO UES ER-0499.

3.2.4 No-Burn® Plus ThB: No-Burn® Plus ThB is a one-part water-based intumescent coating manufactured by No-Burn Inc. The coating is supplied in 5-gallon pails and 55-gallon drums, and has a shelf life of 18 months when stored in unopened containers between 40°F and 90°F. No-Burn® Plus ThB complies with ICC-ES AC456 as recognized in IAPMO UES Report ER-0305.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Surface Burning Characteristics: The insulations have a flame-spread index of 25 or less and a smoke-developed index of 450 or less, when tested in accordance with ASTM E84 at a nominal thickness of 4 in. The insulations may be installed at greater thicknesses as described in Sections 5.3 and 5.4 of this report. When the insulation is separated from the interior living space of the building with minimum 1/2 in. thick gypsum board, the maximum insulation thickness is not limited. Under the IRC, a prescriptive thermal barrier of minimum 23/32 in. thick wood structural panel is also permitted, and the maximum insulation thickness is not limited.

4.2 Thermal Resistance: The insulations have thermal resistance (*R*-values) at a mean temperature of 75°F as shown in Table 2.

4.3 Air Permeability: JM Corbond® OC SPF, at a minimum thickness of 3-3/4 inches, and JM Corbond® HY OC, at minimum thickness of 3-1/2 inches, are considered air-impermeable insulation in accordance with IBC Section 202 or IRC Section R202, based on testing in accordance with ASTM E2178.

5.0 INSTALLATION

5.1 General: The insulations must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. The manufacturer's published installation instructions and this Research Report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

5.2 Application: The insulations are spray-applied on the jobsite using plural-component metering and processing equipment as recommended in the manufacturer's published installation instructions. The insulation must not be used in areas that have a maximum continuous service temperature greater than 180°F or in contact with heat-producing appliances. The foam plastic insulations must not be used in electrical outlet or junction boxes. The substrate must be free of moisture, frost or ice, loose scales, rust, oil, and grease or other surface contaminants. The insulations must be protected from the weather during and after application. The insulations can be installed in multiple passes, up to 12 inches per pass, to the maximum specified thickness. Multiple passes can be applied to obtain the desired thickness. Refer to the manufacturer's installation instructions for appropriate expansion and cure times between passes.

5.3 Thermal Barrier:

5.3.1 Application with a Prescriptive Thermal Barrier: The insulations must be separated from the interior of the building by an approved thermal barrier, such as minimum 1/2 inch gypsum wallboard, installed using mechanical fasteners in accordance with applicable Code, or an equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4, as applicable, with exceptions as described in Sections 5.3.2 and 5.4, or when applied to a sill plate or header in dwellings under the IRC at a maximum insulation thickness of 3-1/4 inches as permitted by IRC Section R316.5.11. When the insulation is





separated from the interior living space of the building with prescriptive thermal barrier of minimum 1/2 inch thick gypsum board, the maximum insulation thickness is not limited. Under the IRC, a thermal barrier of minimum 23/32 inch thick wood structural panels is also permitted, and the maximum insulation thickness is not limited.

5.3.2 Application without a Prescriptive Thermal Barrier:

The insulations may be spray-applied to the interior surface of walls, the underside of roof sheathing, and in crawl spaces without the 15-minute thermal barrier prescribed in the IBC Section 2603.4 and IRC Section R316.4, when all surfaces of the insulations are covered with intumescent coating as described in Table 3.

The insulation and coating may be left exposed as an interior finish without the prescriptive thermal or ignition barrier.

The coating must be applied when ambient and substrate temperatures are above 50°F and less than 70% relative humidity, unless otherwise permitted by the coating manufacturer's installation instructions. Surfaces to be coated must be clean, dry, and free of loose dirt, loose debris, and any other substances that could interfere with the adhesion of the coating.

5.4 Attics and Crawl Spaces:

5.4.1 Application with a Prescriptive Ignition Barrier:

When the 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 Section R316.5.3 or R316.5.4, 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 attics and unvented enclosed rafter assemblies in accordance with IBC Section 1202.3 or IRC Section R806.5 at a minimum thickness of 3-3/4 inches for JM Corbond OC SPF and 3-1/2 inches for JM Corbond HY OC SPF.

5.4.2 Application without a Prescriptive Ignition Barrier:

The insulations may be installed in an attic or crawl space without the prescriptive ignition barrier described in IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4, as described in Section 5.4.2.1 or 5.4.2.2, when all of the following conditions are met and as described in Section 5.4.2.3 when conditions a. through c. and condition f. are met:

- Entry to the attic or crawl space is only for the service of utilities and no storage is permitted.
- There are no interconnected attic or crawl space areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Attic ventilation is provided when required by IBC Section 1202.2 or IRC Section R806, except air-impermeable insulation is permitted in unvented attics in accordance with IBC Section 1202.3 [not applicable under the 2012 or 2009 IBC] or IRC Section R806.5.
- Under-floor (crawl space) ventilation is provided when required by IBC Section 1202.4 or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with IMC (*International Mechanical Code*) Section 701

5.4.2.1 Attics and Crawl Spaces: In attics, the insulations may be spray-applied to the underside of roof sheathing or roof rafters, and/or vertical surfaces, provided the assembly conforms to one of the assemblies described in Table 4. In crawl spaces, the insulation may be spray-applied to the underside of floors and/or vertical surfaces provided the assembly conforms to one of the assemblies described in Table 4. When an intumescent coating is used, 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. The intumescent coating must be applied to all surfaces in accordance with the respective coating manufacturer's installation instructions. The coating must be applied when ambient and substrate temperatures are above of 50°F and less than 70% relative humidity, unless otherwise permitted by the intumescent coating manufacturer's installation instructions. The insulations may be installed in unvented attics, as described in this section, in accordance with IBC Section 1202.3 or IRC Section 806.5 when applied at a minimum thickness of 3-3/4 inches for JM Corbond OC SPF and 3-1/2 inches for JM Corbond OC HY SPF.





5.4.2.2 Use on Attic Floors: When installed on the attic floor only, JM Corbond® OC SPF insulation is approved for exposed (without a protective covering) installation in attic floors up to a maximum thickness of 16 inches. JM Corbond® HY OC SPF is approved up to a maximum thickness of 14 inches. The ignition barrier described in IBC Section 2603.4.1.6 or IRC Section R316.5.3 is not required.

5.4.2.3 Unvented Attics: Johns Manville has conducted end-use configuration testing (per IBC Section 2603.9 and IRC Section R316.6), and analysis to qualify the use of JM Corbond® OC SPF and JM Corbond® HY OC SPF insulations without a prescriptive ignition barrier or intumescent coating in unvented attics conforming with IBC Section 1202.3 or IRC Section R806. The testing and analysis are described in Priest & Associates EEV 10409 Revision 1, dated December 20, 2016, and in Intertek Letter Report 104847205SAT-001 dated November 17, 2021. The conclusions are as follows: When the insulations are applied in unvented attics conforming to IBC Section 1202.3 or IRC Section R806.5, the insulations may be applied to the underside of roof sheathing and/or rafters, and to vertical surfaces to a minimum thickness of 3-3/4 inches. Rafters may be left without foam coverage or may be covered with foam up to the maximum thickness allowed. Maximum thickness on the underside of roof sheathing or on vertical wall surfaces for JM Corbond® OC SPF is 16 inches and for JM Corbond® HYC OC SPF is 14 inches. The insulations may be left exposed to the attic without a prescriptive ignition barrier or an intumescent coating. The attic must have attic access complying with IRC Section R807, horizontally placed in the attic floor, and opening outward toward the living space. For items penetrating the roof deck or walls, such as skylight wells or vents, all surfaces of the penetrating item exposed in the attic must be covered with the insulation to a minimum of 3-3/4 inches.

5.5 Exterior Walls in Types I, II, III, and IV Construction: The insulations may be installed in or on the interior side of exterior walls of buildings of Types I, II, III, and IV construction complying with IBC Section 2603.5 and as described in this section. The potential heat of JM Corbond® OC SPF is 557 Btu/ft² per inch of thickness. The potential heat of JM Corbond® HY OC SPF is 445 Btu/ft² per inch of thickness. The tested wall assembly was extended through a third-party engineering analysis to include additional wall constructions described in Table 5.

6.0 CONDITIONS OF USE

The insulations described in this Research 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:

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

6.2 The insulations must be separated from the interior of the building by an approved 15-minute thermal barrier as described in Section 5.3.1, except as described in Sections 5.3.2 and 5.4.

6.3 The installed thickness must not exceed that noted in Sections 4.2, 5.3, 5.4, and 5.5.

6.4 The insulations must be protected from the weather during and after application.

6.5 A vapor retarder must be installed in accordance with the applicable Code.

6.6 The insulations must be applied by professional spray polyurethane foam installers approved by Johns Manville or by the Spray Polyurethane Foam Alliance (SPFA) for the installation of spray polyurethane foam insulation.

6.7 When the insulations are installed under the conditions of Section 5.4.2.3 of this report, the following conditions apply:

6.7.1 Since the performance of the insulations, when installed in unvented attics without a Code-prescribed ignition barrier or an intumescent coating, is based on fire performance of an unvented attic, the installation must be approved by the Code official. The installation must conform with the provisions of Section 5.4.2.3, and conditions a. through c., and condition f. of Section 5.4.2. A copy of the Priest & Associates Engineering Evaluation (referenced in Section 5.4) must be provided to the Code official upon request.





6.7.2 Signage shall be permanently affixed in the attic and shall be visible from all points within the attic. The sign shall state *"Caution, this is an unvented attic by design. No modification may be made to this unvented condition. The attic shall not be vented. Holes into the unvented attic shall be immediately repaired and sealed. Penetrations of the ceiling or wall membrane between the unvented attic and living space, other than the horizontal access hatch, must be protected in an approved manner. This unvented attic shall not be used for storage. See Intertek Code Compliance Research Report CCRR-1079 on the [Intertek Website](#)."*

6.8 Use of the insulation in fire-resistance-rated construction in outside the scope of this report.

6.9 Use of the insulations in areas where the probability of termite infestation is "very heavy" must be in accordance with IBC Section 2603.8 or IRC Section R318.4, as applicable.

6.10 Jobsite certification and labeling of the insulation must comply with IRC Section N1101.10 and N1101.14, and IECC Sections C303.1 or R303.1 and R401.3, as applicable.

6.11 The insulation components are manufactured under a quality control program with inspection by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of tests in accordance with ASTM E84, ASTM E970, ASTM E2178, NFPA 259, NFPA 285, NFPA 286, and UL 1715.

7.2 Data in accordance with the ICC-ES Acceptance Criteria for Spray-Applied Foam Plastic Insulation (AC377), dated February 2020, including reports of tests in accordance with Appendix X.

7.3 Data in accordance with ICC 1100 (2019).

7.4 Jensen Hughes letter dated June 26, 2015, Re: Project 1AJP00150.000.

7.5 Research Reports for evaluation of data in accordance with ICC-ES Acceptance Criteria for Fire-protective Coatings Applied to Spray-applied Foam Plastic Insulation Installed without a Code-prescribed Thermal Barrier (AC456), dated October 2015.

7.6 Priest & Associates Engineering Evaluation 10409 Revision 1, dated December 20, 2016, entitled "For Inclusion of Johns Manville's JM Corbond® OC SPF Insulation in Unvented Attics without an Ignition Barrier in Intertek CCRR."

7.7 Intertek letter report 104847205SAT-001 dated November 17, 2021, for use of HY OC SPF in unvented attics.

7.8 Intertek Listing Report "JM Corbond® OC SPF and JM Corbond® HY OC SPF ", on the [Intertek Directory of Building Products](#).

8.0 IDENTIFICATION

Each container of components A and B of the insulation bears a label with the Johns Manville name and address; the product name; the flame-spread and smoke-developed indices; the expiration date, the Intertek Mark as shown below; and the Research Report number (CCRR-1079). Intumescent coatings are identified with the manufacturer's name and address, the product trade name and use instructions.



9.0 OTHER CODES

This section is not applicable.





10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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TABLE 1 - PROPERTIES EVALUATED

PROPERTY	2021 IBC SECTION ¹	2021 IRC SECTION ¹	2021 IECC SECTION ¹
Physical properties	2603.1.1	Not required	Not required
Surface-burning characteristics	2603.3	R316.3	Not applicable
Alternative to thermal barrier/ignition barrier	2603.4	R316.4	Not applicable
Air permeability	202, 1202.3	R202, R806.5	C402.4, R402.4
Exterior walls in Types I-IV construction	2603.5	Not applicable	Not applicable
Thermal resistance	1301	N1101.10, N1102	C303.1, R303.1

¹ Section numbers may be different for earlier versions of the International Codes.

TABLE 2 – THERMAL RESISTANCE^{1,2,3,4}

THICKNESS (in.)	JM Corbond OC SPF R-value (°F·ft ² ·hr/Btu)	JM Corbond HY OC SPF R-value (°F·ft ² ·hr/Btu)
1	3.8	3.6
4	14	14

¹ R-values are calculated based on the test K-values at 1-in. and 3-1/2-in. thicknesses.

² R-Values may be interpolated between 1 and 4-in.

³ At above 4-in., R-values may be calculated as follows:

- JM Corbond OC SPF: R-values are calculated using R=3.6/inch
- JM Corbond HY OC SPF: R-values are calculated using R=3.4/inch

⁴R-Values greater than 10 are rounded to the nearest whole number





TABLE 3 – USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER

INSULATION TYPE	MAXIMUM THICKNESS (in.) (Wall Cavities and Attic Floor)	MAXIMUM THICKNESS (in.) (Underside of Roof Sheathing/Rafters and Floors)	INTUMESCENT COATING, MINIMUM THICKNESS & TYPE (Applied to all Exposed Foam Surfaces)	MINIMUM APPLICATION RATE OF INTUMESCENT COATING	TEST SUBMITTED (AC377)
JM Corbond® OC SPF	7-1/2	9-1/2	FIRESHELL® JM-IC 18 mil wet film thickness (12 mil dry film)	1.2 gal / 100 ft ²	NFPA 286
	7-1/2	9-1/2	FIRESHELL® IB4 18 mil wet film thickness (12 mil dry film)	1.2 gal / 100 ft ²	NFPA 286
	7-1/2	11-1/2	DC315 18 mil wet film thickness (12 mil dry film)	1.1 gal / 100 ft ²	NFPA 286
	6	14	No-Burn Plus ThB 14 mil wet film thickness (9 mil dry film)	0.9 gal / 100 ft ²	UL 1715
JM Corbond® HY OC SPF	7	14	No-Burn Plus ThB 14 mil wet film thickness (9 mil dry film)	0.9 gal / 100 ft ²	UL 1715

TABLE 4 – USE OF INSULATION IN ATTICS AND CRAWL SPACES WITHOUT A PRESCRIPTIVE IGNITION BARRIER

INSULATION TYPE	MAXIMUM THICKNESS (in.) (Wall Cavities and Attic Floor)	MAXIMUM THICKNESS (in.) (Underside of Roof Sheathing/Rafters and Floors)	INTUMESCENT COATING, MINIMUM THICKNESS & TYPE (Applied to all Exposed Foam Surfaces)	MINIMUM APPLICATION RATE OF INTUMESCENT COATING	TEST SUBMITTED (AC377)
JM Corbond® OC SPF	7-1/2	9-1/2	FIRESHELL® JM-IC 4 mil wet film thickness (3 mil dry film)	0.27 gal / 100 ft ²	Appendix X
	7-1/2	9-1/2	FIRESHELL® IB4 4 mil wet film thickness (3 mil dry film)	0.27 gal / 100 ft ²	Appendix X
	9-1/2	11-1/2	DC315 4 mil wet film thickness (3 mil dry film)	0.25 gal / 100 ft ²	Appendix X
JM Corbond® HY OC SPF	8	12	No-Burn Plus ThB 6 mil wet film thickness (4 mil dry film)	0.4 gal / 100 ft ²	Appendix X





TABLE 5 – NFPA 285 COMPLYING WALLS – INSULATIONS IN INTERIOR WALL CAVITY

Wall Component	Materials
Base wall system – Use either 1, 2 or 3	1 - Concrete wall 2 - Concrete Masonry wall 3 - One layer of 5/8 in. thick Type X gypsum wallboard installed on the interior side of minimum 3-5/8 in. deep, minimum 20 GA thick steel studs spaced a maximum of 24 in. 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 pcf mineral wool (e.g., Thermafiber) friction fit between steel wall studs
Perimeter Fire Barrier System	Perimeter fire barrier system complying with IBC Section 715.4 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
Wall Cavity Insulation	Full wall stud cavity depth or less of JM Corbond® oc SPF or JM Corbond® oc HY SPF applied using exterior gypsum sheathing as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange
Exterior sheathing	5/8 in. thick Type X exterior type gypsum sheathing complying with ASTM C1177
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 - Any combustible exterior wall covering system with or without a combustible WRB that has successfully been tested in accordance with NFPA 285
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 in. wide flashing tape (acrylic, asphalt, or butyl-based) or liquid applied membrane material with or without fiber mesh reinforcement

Note 1: Fireblocking per 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: Combustible exterior wall coverings shall be installed in accordance with manufacturer's requirements.

