



EVALUATION SUBJECT: FLX-500

REPORT HOLDER:

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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:

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

1.2 Evaluated in accordance with:

- ICC-ES AC377, approved November 2012

1.3 Properties assessed:

- Surface-burning characteristics
- Physical properties
- Thermal resistance
- Use in attics and crawl spaces

2.0 PRODUCT USE

FLX-500 is a spray-applied foam plastic insulation and is used as a nonstructural thermal insulating material in Type VB construction under the IBC and dwellings under the IRC. The insulation complies with IBC Section 2603, IRC Section R316, and IECC Sections C402 and R402.

3.0 PRODUCT DESCRIPTION

3.1 FLX-500 Insulation: FLX-500 is a spray-applied, open cell polyurethane foam plastic insulation having a nominal density of 0.5 pounds per cubic foot (8 kg/m³).

3.2 Surface Burning Characteristics

3.2.1 The FLX-500 foam plastic insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pounds per cubic foot (8.0 kg/m³), has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84.

3.2.2 Thicknesses are not limited for ceiling cavities and wall cavities when covered by a prescriptive thermal barrier (minimum ½ inch (12.7 mm) thick gypsum wallboard) 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, FLX-500 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.

3.4 Intumescent Coatings: DC 315: DC 315 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).

4.0 DESIGN AND INSTALLATION

4.1 General

FLX-500 spray-applied foam plastic insulation shall be installed in accordance with the manufacturer's published 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: FLX-500 shall be applied using spray equipment specified by Lapolla Industries, Inc.

4.3 Thermal Barrier

4.3.1 Application with a Prescriptive Thermal Barrier: FLX-500 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 1/2-inch thick (12.7 mm) gypsum wallboard or equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4 as applicable and installed in accordance with applicable code.

4.3.2 Application without a Prescriptive Thermal Barrier: FLX-500 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 ft² (0.4 L/m²) 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.

4.4 Attics and Crawl Spaces: When installing FLX-500 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 below.

4.4.1 Application with a Prescriptive Ignition Barrier: When FLX-500 insulation is installed within attics and crawl spaces where entry is made only service of utilities, an ignition barrier shall be installed in accordance with IBC Section 2603.4.1.6 or IRC Sections R316.5.3 and R316.5.4, 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, 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 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 Sections 701 and 703 (2006 IMC) and Section 701 (2012 and 2009 IMC).
- 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: FLX-500 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 FLX-500 is installed as described in this section, no ignition barrier or coating is required.

Alternative: FLX-500 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 ft² (0.4 L/m²) 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: FLX-500 insulation may be installed exposed (no coating), without an ignition barrier up to a maximum thickness of 11 ½ 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 IRC Section R306.4. The ignition barrier required by IBC Section 2603.4 and IRC Section R316.5.3 may be omitted in this case.

5.0 LIMITATIONS

The FLX-500 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. The instructions within this report govern if there are any conflicts between the manufacturer's published installation instructions and this report.

5.2 FLX-500 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 Sections 4.3.2 (Application with a Prescriptive Thermal Barrier) and/or 4.4 (Attics and Crawl Spaces) of this report.



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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 FLX-500 insulation shall be installed by contractors certified by Lapolla Industries, Inc.

5.5 When FLX-500 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 or IRC Section R318.4, as applicable.

5.6 Jobsite labeling and certification of the insulation shall comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 303.1.1 and 303.1.2, as applicable.

5.7 Where applicable, FLX-500 shall be installed with a vapor retarder in accordance with the applicable code.

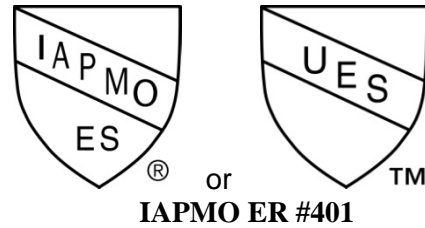
5.8 Use of FLX-500 insulation under this report is limited to Construction Type VB.

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), dated November 2012, including reports of tests in accordance with Appendix X of AC 377.

7.0 IDENTIFICATION

Containers of FLX-500 components are identified with a label bearing the Lapolla Industries, Inc. name and address; the product trade name (FLX-500); 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-401).



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

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•ft²•hr/Btu = 0.176 °K•m²•hr/W

¹R-values are calculated based on tested k-factors at 1- and 4-inch thicknesses.