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ICC-ES Evaluation Report

ESR-4322

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Issued 09/2018
This report is subject to renewal 09/2019.

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

REPORT HOLDER:

LAPOLLA INDUSTRIES, INC.

EVALUATION SUBJECT:

LAPOLLA FOAM-LOK FL 750



“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

LAPOLLA INDUSTRIES, INC.

EVALUATION SUBJECT:

LAPOLLA FOAM-LOK FL 750

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)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Surface burning characteristics
- Physical properties
- Thermal performance (*R*-values)
- Attic and crawl space installation
- Air permeability
- Exterior walls of Types I–IV construction

1.2 Evaluation to the following green standard:

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

Attributes verified:

See Section 2.0.

2.0 USES

Lapolla Foam-Lok FL 750 is used to provide thermal insulation in buildings and to seal areas such as plumbing and conduit penetrations against air infiltration. The insulations are for use in wall cavities and floor assemblies; and in attic and crawl space installations as described in Section 4.4.

The Foam-Lok FL 750 insulation is for use in non-fire-resistance-rated construction under the IBC and dwellings

under the IRC; and in Types I through IV construction when installed in accordance with Section 4.5.

The attribute of the insulation has 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.

3.0 DESCRIPTION

3.1 Foam-Lok FL 750:

The Lapolla Foam-Lok FL 750 foam plastic insulation is two-component, low density, open cell, spray-applied, foam plastic with a nominal density of 0.7 pcf (11 kg/m³). The polyurethane foam is produced by combining a polymeric isocyanate (A component) and proprietary resin, Foam-Lok FL 750 (B component). When stored at temperatures between 50°F (10°C) and 100°F (38°C), the components have a shelf life of twelve months.

3.2 Surface Burning Characteristics:

When tested in accordance with ASTM E84/UL 723, at a thickness of 4 inches (152 mm) and a nominal density of 0.7 pcf (11 kg/m³), Lapolla Foam-Lok FL 750 has a flame spread index of 25 or less and a smoke-developed index of 450 or less. There is no thickness limit when installed behind a code-prescribed thermal barrier, except as noted in Section 4.3.2 and Table 2.

3.3 Thermal Resistance:

Lapolla Foam-Lok FL 750 has thermal resistance (*R*-values) at a mean temperature of 75°F (24°C) as shown in Table 1.

3.4 Air Permeability:

Lapolla Foam-Lok FL 750 is considered air-impermeable insulation in accordance with 2015 IBC Section 1203.3 and 2015 and 2012 IRC Sections R202 and R806.5 (2009 IRC Sections R202 and R806.4), at a minimum thickness of 2 inches (51 mm) based on testing in accordance with ASTM E2178.

3.5 Intumescent Coatings:

3.5.1 DC 315 Coating: DC 315 coating ([ESR-3702](#)), manufactured by International Fireproof Technology, International Inc. / Paint To Protect Inc., is a water-based intumescent coating supplied in 5-gallon (19L) pails and 55-gallon (208L) 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 INSTALLATION

4.1 General:

The manufacturer's published installation instructions and this report must be strictly adhered to. A copy of these instructions and this evaluation report must be available on the jobsite at all times during installation.

4.2 Application:

4.2.1 General: Lapolla Foam-Lok FL 750 foam plastic insulation must be applied on the jobsite using two-component, 1-to-1 ratio, spray equipment specified by Icnene, Inc. The foam plastic must not be sprayed onto a substrate that is wet, or covered with frost or ice, loose scales, rust, oil or grease. The foam plastic insulation must not be used in electrical outlet or junction boxes or in contact with rain or water, and must be protected from the weather during and after application. Where the insulation is used as air-impermeable insulation, such as in unvented attic spaces regulated by 2015 IBC Section 1203.3 or IRC Section R806, the insulation must be installed at a minimum thicknesses noted in Section 3.4. The insulation can be installed in one pass to the maximum thickness. Where multiple passes are required, the cure time between passes is negligible.

The insulation may be used in areas where the maximum service temperature is no greater than 180°F (82°C). The insulation must be applied when the temperature is at or above 14°F (-10°C) and be protected from the weather during and after application.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier: Lapolla Foam-Lok FL 750 foam plastic insulation must be separated from the interior of the building by an approved thermal barrier, such as 1/2-inch (12.7 mm) gypsum wallboard installed using mechanical fasteners in accordance with the applicable code, or an equivalent thermal barrier complying with the applicable code. 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 foam plastic insulation and the interior of the building. There is no thickness limit when installed behind a code-prescribed thermal barrier, except as noted in Section 4.3.2 and Table 2.

4.3.2 Application without a Prescriptive Thermal Barrier or Ignition Barrier: The prescriptive 15-minute thermal barrier or ignition barrier may be omitted 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 Attics and Crawl Spaces:

4.4.1 Application without a Prescriptive Ignition Barrier: When Lapolla Foam-Lok FL 750 is installed up to a maximum thickness of 4 inches (102 mm) 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 and IRC Sections R316.5.3 and 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. Lapolla Foam-Lok FL 750 may be installed in unvented attics when the foam plastic is applied at a minimum thickness of 2 inches (51 mm) in accordance with 2015 IBC Section 1203.3, 2015 and 2012 IRC Section R806.5 or 2009 IRC Section R806.4, as applicable.

4.4.2 Application with a Prescriptive Ignition Barrier: Where Lapolla Foam-Lok FL 750 insulation is installed in accordance with Sections 4.4.2.1, 4.4.2.2, and 4.4.2.3, the following conditions apply:

1. Entry to the attic or crawl space is to service utilities, and no storage is permitted.
2. There are no interconnected attic or crawl space 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 IMC 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 or 2009 IRC Section R806.4, as applicable.
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: In attics, Lapolla Foam-Lok FL 750 insulation may be spray-applied to the underside of the roof sheathing and/or rafters, the underside of wood floors, and vertical surfaces, as described in this section. The thickness of the foam plastic applied to the underside of the top of the space must not exceed 14 inches (356 mm). The thickness of the spray foam plastic insulation applied to vertical wall surfaces must not exceed 8 inches (203 mm). The foam plastic insulation must be covered on all exposed surfaces with DC315 intumescent coating at a minimum thickness of 4 wet mils (0.1 mm) [3 dry mils (0.08 mm)], applied at a rate of 0.25 gallon (0.95 L) per 100 square feet (9.2 m²). The coating must be applied over the Lapolla Foam-Lok FL 750 insulation in accordance with the coating manufacturer's instructions and this report. 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. The coating is applied in one coat with low-pressure airless spray equipment.

The coating must be applied when ambient and substrate temperature is at least 60°F (16°C) and no more than 95°F (35°C). All other surfaces (including glass) must be protected against damage from the coating.

Lapolla Foam-Lok FL 750 insulation may be installed in unvented attics when the foam plastic is applied at a minimum thickness of 2 inches (51 mm) as described in this section, in accordance with 2015 IBC Section 1203.3, 2015 and 2012 IRC Section R806.5 or 2009 IRC Section R806.4, as applicable.

4.4.2.2 Crawl Spaces: In crawl spaces, Lapolla Foam-Lok FL 750 insulation may be spray-applied to vertical

walls and the underside of floors, as described in this section. The thickness of the foam plastic applied to the underside of the floors must not exceed 14 inches (356 mm). The thickness of the spray foam plastic insulation applied to vertical wall surfaces must not exceed 8 inches (203 mm). The insulation must be covered with DC-315 coating as described in Section 4.4.2.1.

4.4.2.3 Use on Attic Floors: Lapolla Foam-Lok FL 750 insulation may be installed at a maximum thickness of 13 inches (330 mm) between joists in attic floors. The insulation must be separated from the interior of the building by an approved thermal barrier. The insulation does not require an ignition barrier or a coating.

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, and the Foam-Lok FL 750 insulation must be installed at a maximum thickness described in Table 3. The potential heat of Foam-Lok FL 750 insulation is 1963 Btu/ft² (22.1 MJ/m²) per inch of thickness when tested in accordance with NFPA 259.

4.5.2 Specific Wall Assemblies: Wall assemblies complying with Section 4.5 must be as described in Table 3.

5.0 CONDITIONS OF USE

The Lapolla Foam-Lok FL 750 spray-applied polyurethane foam plastic 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 This evaluation report and the manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application.
- 5.2 The insulation must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. If there is a conflict between the installation instructions and this report, this report governs.
- 5.3 The insulation must be separated from the interior of the building by an approved thermal barrier, except as noted in this report.
- 5.4 The insulation must not exceed the thicknesses and densities noted in this report.
- 5.5 The insulation must be protected from the weather during and after application.
- 5.6 The insulation must be applied by licensed dealers and installers certified by Lapolla, Inc.
- 5.7 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 IBC Section 2603.8, as applicable.

5.8 Jobsite certification and labeling of the insulation must comply with 2015 IRC Sections N1101.10.1 and N1101.10.1.1 (2012 IRC Sections 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 303.1.1.1), as applicable.

5.9 A vapor retarder must be installed in accordance with the applicable code.

5.10 Lapolla Foam-Lok FL 750 foam plastic insulation is manufactured 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 April 2016 (editorially revised April 2018).
- 6.2 Report of tests in accordance with AC377 Appendix X.
- 6.3 Test report on air leakage rate in accordance with ASTM E2178.
- 6.4 Reports of room corner fire testing in accordance with NFPA 286.
- 6.5 Test report in accordance with NFPA 285, and related engineering analysis.
- 6.6 Report of testing in accordance with NFPA 259.
- 6.7 Report of fire testing in accordance with ASTM E970.

7.0 IDENTIFICATION

7.1 All packages and containers of Foam-Lok FL 750 insulation must be labeled with the Lapolla, Inc., name and address; the product name; component designation (A or B); the flame spread index and the smoke-developed index; the expiration date; the name of the inspection body (ICC-ES); and the evaluation report number (ESR-4322).

The International Fireproof Technology, Inc. / Paint To Protect Inc. DC 315 coating described in Section 3.5.1 is identified with the manufacturer's name and address, the product trade name, date of manufacture, shelf life or expiration date, the manufacturer's application instructions and the evaluation report number ([ESR-3702](#)).

7.2 The report holder's contact information is as follows:

LAPOLLA INDUSTRIES, INC.
15402 VANTAGE PARKWAY EAST
SUITE 332
HOUSTON, TEXAS 77032
(281) 219-4100
www.icynene-lapolla.com

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (inches)	R-VALUE (°F·ft ² ·h/Btu)	THICKNESS (inches)	R-VALUE (°F·ft ² ·h/Btu)	THICKNESS (inches)	R-VALUE (°F·ft ² ·h/Btu)
1	4.0	5.5	22	9.5	38
2	8.0	6	24	10	40
3	12	7	28	11.5	42
3.5	14	7.5	30	13.5	54
4	16	8	32	14	56
5	20	9	36		—

For SI: 1 inch = 25.4 mm, 1°F·ft²·h/Btu = 0.176 110°K·m²/W.

¹R-values are calculated based on tested K values at 1- and 3.5-inch thicknesses.

²R-values greater than 10 are rounded to the nearest whole number.

TABLE 2—USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER¹

INSULATION TYPE	MAXIMUM THICKNESS (in.) (Walls & Vertical Surfaces)	MAXIMUM THICKNESS (in.) (Ceilings, Underside of Roof Sheathing/Rafters & Floors)	FIRE-PROTECTIVE COATING MINIMUM THICKNESS & TYPE (Applied to all Foam Surfaces) ²	MINIMUM THEORETICAL APPLICATION RATE OF FIRE-PROTECTIVE COATING ³	TEST SUBMITTED
FOAM-LOK FL 750	6½	11½	DC315 20 mils WFT / 13 mils DFT	1.25 gal / 100 ft ²	NFPA 286

For SI: 1 inch = 25.4 mm; 1 mil = 0.0254 mm; 1 gallon = 3.38 L; 1 ft² = 0.093 m².

¹See Section 4.3.2.

²See Section 3.5.1.

³As reported in the manufacturer's application instructions. Actual application rate, based on specific project conditions, must be in accordance with the manufacturer's application instructions.

TABLE 3—NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES

WALL COMPONENT	MATERIALS
Base Wall System – Use either 1, 2 or 3	1 – Concrete wall. 2 – Concrete masonry wall. 3 – Minimum 3 ⁵ / ₈ -inch-deep (92 mm), No. 20 gage, C-shaped steel studs, spaced a maximum of 24 inches on center with lateral bracing every 4 feet (1219 mm) as required by code. Sheathing shall be a described in Exterior Sheathing below.
Floorline Firestopping	Minimum 4 pcf mineral wool in each stud cavity at each floorline, attached with Z-clips. Thickness must match stud cavity depth.
Cavity Insulation – Use either 1, 2, 3, 4 or 5	1 – None. 2 – Partial cavity fill with a maximum air space of 2 inches (51 mm) or full cavity depth not exceeding 7 ⁵ / ₈ inches (194 mm) of Lapolla Foam-Lok FL 750; Icynene MD-R-210 (ESR-3493); Icynene MD-C-200 (ESR-3199); or Icynene Proseal (ESR-3500). 3 – Any insulation qualified as noncombustible in accordance with ASTM E136. 4 – Glass fiber batt insulation ^a . 5 – Mineral fiber insulation ^a . ^a Insulation must comply with the applicable requirements of 2015 or 2012 IBC Section 720.2 (2009 IBC Section 719.2).
Exterior Sheathing – Only for Base Wall System No.3 – Use either 1 or 2	1 – Minimum 1/2-inch-thick (12.7 mm), glass mat gypsum sheathing complying with ASTM C1177. 2 – Sheathing shall be attached with No. 6, 1 1/4-inch-long (32 mm) self-tapping screws located 8 inches (203 mm) on center along the perimeter and 12 inches (302 mm) on center in the field of wallboard. Joints must be taped and treated with joint compound in accordance with ASTM C840 or GA-216.
Exterior Insulation	Maximum thickness of 5 1/2 inches (140 mm) of Icynene Proseal Eco (MD-R-210) (ESR-3493) or Icynene Proseal (ESR-3500).
Exterior Wall Covering – Use either 1, 2, 3, 4, 5, 6 or 7	1 – Brick - standard nominally 4-inch-thick (102 mm) clay brick; brick veneer anchors – standard types installed a maximum of 24 inches OC vertically on each stud ^b . 2 – Stucco - minimum 3/4-inch-thick (19.1 mm), exterior cement plaster and lath with a secondary water-resistive barrier may be installed between the exterior insulation and the lath. 3 – Natural stone (limestone, granite, marble, sandstone), minimum 2-inch-thick (51 mm) ^c . 4 – Cast artificial stone, minimum 1 1/2-inch-thick (38 mm), complying with AC51 and subject of a current ICC-ES evaluation report ^c . 5 – Terracotta cladding, minimum of 1 1/4-inch-thick (32 mm) ^c . 6 – Precast concrete panels, minimum of 1 1/2-inch-thick (32 mm) ^c . 7 – Concrete masonry units (CMU), minimum of 1 1/2-inch-thick (38 mm) ^c . ^b The maximum air gap between exterior insulation and cladding shall be 2 inches (51 mm). ^c Any standard non-open-jointed installation technique such as ship-lap, etc., may be used.