



ICC-ES Evaluation Report ESR-3652

Reissued September 2022

This report is subject to renewal September 2023.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 30 05—Roofing Felt and Underlayment

REPORT HOLDER:

ENVIRONMENTALLY SAFE PRODUCTS, INC.

EVALUATION SUBJECT:

ROOFING UNDERLAYMENTS: ESP LOW-E® THERMA-SHEET 4LMPX 1/8 INCH AND ESP LOW-E® THERMA-SHEET 4LFPX 7/32 INCH

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015 and 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015 and 2012 *International Residential Code*® (IRC)
- 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:

- Physical properties
- Ice barrier

2.0 USES

ESP Low-E® Therma-Sheet 4LMPX 1/8 inch and ESP Low-E® Therma-Sheet 4LFPX 7/32 inch roofing underlayments are used as alternatives to the ASTM D226, Type I and Type II, roofing underlayments specified in IBC Chapter 15 and IRC Chapter 9.

3.0 DESCRIPTION

3.1 ESP Low-E® Therma-Sheet 4LMPX 1/8 inch:

ESP Low-E® Therma-Sheet 4LMPX 1/8 inch consists of a 1/8-inch-thick (3.2 mm) polyethylene core with a 5 x 5 scrim-reinforced aluminum foil top surface and a 2 x 2 scrim-reinforced aluminum foil bottom surface. The total weight is 4.2 pounds per 100 square feet [6.1 oz/yd² (196 g/m²)]. Standard size for the underlayment rolls is 48 inches by 125-foot long (1.22 m by 3.18 m). other roll sizes are available.

3.2 ESP Low-E® Therma-Sheet 4LFPX 7/32 inch:

ESP Low-E® Therma-Sheet 4LFPX 7/32 inch consists of a 7/32-inch-thick (5.6 mm) polyethylene core with a 5 x 5 scrim-reinforced aluminum foil top surface and a 2 x 2 scrim-reinforced aluminum foil bottom surface. The total weight is 4.8 pounds per 100 square feet [7.0 oz/yd² (196 g/m²)]. Standard size for the underlayment rolls is 48 inches by 125-foot long (1.22 m by 3.18 m), other roll sizes are available.

4.0 INSTALLATION

4.1 ESP Low-E® Therma-Sheet 4LMPX 1/8 inch and ESP Low-E® Therma-Sheet 4LFPX 7/32 inch:

Prior to installing, the deck surface must be dry and free of dust, dirt, loose nails and other protrusions. Damaged sheathing must be replaced or repaired. The underlayment must be installed in accordance with IBC Chapter 15 or IRC Chapter 9, as applicable, with the tighter 5 by 5 scrim-reinforced aluminum foil top surface facing up. Beginning at the lower edge of the roof, the first course of underlayment must be laid horizontally (parallel to the eave), with 4-inch (102 mm) horizontal and 6-inch (152 mm) vertical laps. Additional courses must be installed in the same manner as the initial course with the 4-inch flange of the upper layer laid over the lower course. Overlaps must run with the flow of water in a shingling fashion. The underlayment must be attached to the roof deck with a minimum of No. 12 gage [0.109 inch shank diameter (2.77 mm)], corrosion-resistant steel roofing nails having minimum 3/8-inch-diameter (9.5 mm) heads along with minimum 1-inch-diameter (25.4 mm) plastic caps; or No. 16 gage [0.065-inch leg diameter (1.65 mm)] corrosion resistant staples having minimum 7/16-inch crowns (11.1 mm). Fasteners must be long enough to penetrate into the sheathing a minimum of 3/4 inch (19.1 mm) or through the sheathing, whichever is less. When battens are installed over the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens or counterbattens. The underlayment must be fastened in accordance with the underlayment application and high wind attachment requirements specified in IBC Section 1507 or IRC Section R905, as applicable.

Minimum roof slope is 2:12 (17 percent). For roof slopes from 2:12 (17 percent) up to but not including 4:12 (33 percent), where the roof is covered with asphalt shingles, underlayment must be two layers and must be applied in accordance with 2021 and 2018 IBC

Section 1507.1.1 [2015 and 2012 IBC Section 1507.2.8], 2021, 2018 and 2015 IRC Sections R905.1.1 and R905.2.3 [2012 IRC Section R905.2.7]. As an alternative, when the roof is covered with asphalt shingles, one layer of ESP Low-E® Therma-Sheet underlayment and one layer of underlayment conforming to either ASTM D226, Type I, ASTM D4869, Type I or ASTM D6757 may be installed in accordance with 2021 and 2018 IBC Section 1507.1.1 [2015 and 2012 IBC Section 1507.2.8], 2021, 2018 and 2015 IRC Sections R905.1.1 and R905.2.3 [2012 IRC Section R905.2.7]. For roof slopes from 2¹/₂:12 (21 percent) up to but not including 4:12 (33 percent), where the roof is covered with clay or concrete tiles, underlayment must be two layers applied in accordance with 2021 and 2018 IBC Section 1507.1.1 [2015 and 2012 IBC Section 1507.3.3.1], 2021, 2018 and 2015 IRC Sections R905.1.1 and R905.3.3 [2012 IRC Section R905.3.3.1]. For slopes of 4:12 (33 percent) or greater, underlayment must be a minimum of one layer and applied shingle fashion.

For roofs required to have an ice barrier, one layer of ESP Low-E® Therma-Sheet underlayment and one layer of an approved roofing underlayment must be cemented together with a roofing cement complying with ASTM D4586; or one layer of self-adhering polymer modified bitumen sheet complying with ASTM D1970; or one layer of an ice barrier complying with the ICC-ES Acceptance Criteria for Self-adhered Roof Underlayments For Use as Ice Barriers (AC48), must be applied. The underlayment must be applied over the solid substrate in sufficient courses that the underlayment extends from the eave's edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building. The underlayment applied in the field of the roof must overlap the ice barrier.

Flashing must be in accordance with the applicable code. Flashing around protrusions must be over the lower course of the underlayment and under the upper course of the underlayment, to prevent water backup. When used, metal drip edges must be installed beneath the underlayment at the eaves and over the underlayment at rakes.

Installation of the roof covering can proceed immediately following the underlayment application. The underlayment is not intended to be left indefinitely exposed and must be covered by a roof covering in accordance with the report holder's published installation instructions. For reroofing applications, after removal of the old roof covering and roofing felts to expose the roof deck, the same procedures apply as for new construction.

5.0 CONDITIONS OF USE

The ESP Low-E® Therma-Sheet 4LMPX ¹/₈-inch and ESP Low-E® Therma-Sheet 4LFPX ⁷/₃₂-inch roofing underlayments described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the report holder's published installation instructions and the applicable code. A copy of the report holder's

published installation instructions must be available to the code official at the jobsite. In the event of conflict between this report and the report holder's installation instructions, this report governs.

- 5.2** Installation is limited to use with approved roof coverings that are mechanically fastened through the underlayment to the sheathing or rafters, or to use with approved roof coverings that are mechanically fastened to battens or counterbattens that are mechanically fastened through the underlayment to the sheathing or rafters.
- 5.3** Installation is limited to roofing systems that do not involve hot asphalt or coal-tar pitch.
- 5.4** Installation is limited to roofs with a slope of 2:12 (17 percent) or greater.
- 5.5** Installation is limited to roofs with ventilated attic spaces.
- 5.6** Installation is limited to use with nonclassified roof coverings or as a component of a classified roofing assembly when specifically recognized as such in a listing approved by the code official.
- 5.7** ESP Low-E® Therma-Sheet 4LMPX ¹/₈ inch and ESP Low-E® Therma-Sheet 4LFPX ⁷/₃₂ inch roofing underlayments are manufactured in New Oxford, Pennsylvania and Carson City, Nevada under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Roof Underlayments (AC188), dated February 2012 (editorially revised June 2020).

7.0 IDENTIFICATION

- 7.1** Each roll of roofing underlayment is identified with the Environmentally Safe Products, Inc. name and address, the product name, the roll ID number, and the evaluation report number (ESR-3652).
- 7.2** The report holder's contact information is the following:

ENVIRONMENTALLY SAFE PRODUCTS, INC.
313 WEST GOLDEN LANE
NEW OXFORD, PENNSYLVANIA 17350
(717) 624-3581
www.low-e.com

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 30 05—Roofing Felt and Underlayment

REPORT HOLDER:

ENVIRONMENTALLY SAFE PRODUCTS, INC.

EVALUATION SUBJECT:

ROOFING UNDERLAYMENTS: ESP LOW-E® THERMA-SHEET 4LMPX 1/8 INCH AND ESP LOW-E® THERMA-SHEET 4LFPX 7/32 INCH

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that ESP Low-E Therma-Sheet 4LMPX 1/8 inch and ESP 4LFPX 7/32 inch roofing underlayments, described in ICC-ES evaluation report ESR-3652, have also been evaluated for compliance with CBC Chapter 15 and CRC Chapter 9 of the code editions noted below.

Applicable code editions:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) aka: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The ESP Low-E Therma-Sheet 4LMPX 1/8 inch and ESP 4LFPX 7/32 inch roofing underlayments, described in Sections 2.0 through 7.0 of the evaluation report ESR-3652, comply with CBC Chapter 15, provided the design and installation are in accordance with the 2018 *International Building Code*® provisions noted in the report and the additional requirements of CBC Chapter 15, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The ESP Low-E Therma-Sheet 4LMPX 1/8 inch and ESP 4LFPX 7/32 inch roofing underlayments, described in Sections 2.0 through 7.0 of the evaluation report ESR-3652, complies with CRC Chapter 9, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 9, as applicable.

This supplement expires concurrently with the evaluation report, reissued September 2022.

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1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the ESP Low-E® Therma-Sheet 4LMPX 1/8 inch and ESP Low-E® Therma-Sheet 4LFPX 7/32-inch roofing underlayments, described in ICC-ES evaluation report ESR-3652, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The roofing underlayments, described in Sections 2.0 through 7.0 of the evaluation report ESR-3652, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-3652 for the 2018 *International Building Code* and 2018 *International Residential Code* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the roofing underlayments for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this evaluation report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

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