ICC-ES Evaluation Report

ESR-5605

Issued December 2024

Subject to renewal December 2025

This report also contains:

- City of LA Supplement
- CA Supplement

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DIVISION: 07 00 00 — THERMAL AND MOISTURE PROTECTION Section: 07 31 16 — Metal Shingles Section: 07 41 13 — Metal Roof Panels	REPORT HOLDER: THE ALUMINUM SHINGLE COMPANY	EVALUATION SUBJECT: PERMALOCK SHINGLES	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018 and 2015 *International Building Code®* (IBC)
- 2024, 2021, 2018 and 2015 *International Residential Code®* (IRC)

Section number references in this report are for the 2024 IBC and IRC. Corresponding section numbers for earlier code editions are shown in Table 3 at the end of this report.

Properties evaluated:

- Roof covering fire classification
- Wind uplift resistance

2.0 USES

The PermaLock Shingles are interlocking metal roof shingles used in accordance with IBC Section 1507.5 or IRC Section R905.4, as applicable. The shingles are used over solid or closely fitted sheathing.

3.0 DESCRIPTION

3.1 PermaLock Shingles:

The PermaLock Shingles are nominally $9^1/_4$ inches (235 mm) high and 18 inches (457 mm) wide. The shingles have lips around the edges to allow adjacent shingles to interlock. Each shingle has a tab at the upper right-hand corner that is prepunched for installation of a nail. The shingles addressed in this report have two ribs per shingle. The shingles are manufactured from aluminum sheet material complying with ASTM B209, alloy and temper 3105-H24 or 3003 H14, with a minimum yield strength of 18 ksi (124 MPa) and a tensile strength between 22 and 29 ksi (152 and 200 MPa). The shingles have a base metal (uncoated) thickness of 0.019 inch (0.483 mm) and a weight of 41 pounds per 100 square feet (2 kg/m^2). The shingles have a Kynar 500/Hylar 5000 coating, which is available in a variety of colors and textures. See Figure 1 for a depiction of a typical shingle.

3.2 Clips:

Clips supplied by the report holder to improve the negative wind resistance of the roof system are AMSI Supply stainless steel Bermuda clips, model number BC-2H-22-S. The clips have two holes for installation of fasteners. See Figure 2 for a depiction of the clip.

3.3 Nails:

The nails supplied by the report holder to fasten the shingles or clips to the roof deck are 9 gauge by $1^{1}/_{4}$ inch (32 mm) aluminum ring shank roofing nails with a flat head having a nominal head diameter of $^{7}/_{16}$ inch (11.1 mm), manufactured by Clendenin Brothers, Inc.

3.4 Accessories:

Accessories required for installation of the shingles include rake flashing, eave starter flashing and valley flashing. See Figures 3, 4 and 5, respectively. These accessories are formed from the same aluminum sheet material as the shingles.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Fire Classification: Fire classifications for roof assemblies which include the PermaLock Shingles are shown in Table 1.

4.1.2 Negative Pressure (Wind Uplift): PermaLock Shingles installed in accordance with Section 4.2 have the allowable uplift resistances described in Table 2. The design wind uplift pressure for components and cladding on any portion of the roof, including corners and edge zones, must be determined in accordance with IBC Section 1609.6 or IRC Section R301.2.1, as applicable, and must not exceed the allowable uplift resistance in Table 2. The allowable wind uplift pressures listed in Table 2 are for the roof covering (shingles) only. The sheathing and framing to which the roof covering is attached must be designed for the applicable wind loads in accordance with the IBC or IRC, as applicable.

4.1.3 Positive Pressure: Positive pressure from wind or gravity loads must not exceed the capacity of the supporting structural framing and sheathing, as determined in accordance with the applicable code.

4.2 Installation:

PermaLock Shingles must be installed in accordance with the applicable code and the report holder's published installation instructions, which must be available at the jobsite at all times during installation. The shingles must be installed on roofs having a minimum slope of 3:12 (25-percent). The roof deck must be solid or closely fitted. Underlayment must be used and must comply with IBC Section 1507.1.1 or IRC Section 905.1.1, as applicable. Ice barriers must comply with IBC Section 1507.1.2 or IRC Section 905.1.2, as applicable. Flashing must comply with IBC Section 1507.5.7 or IRC Section 905.4.6, as applicable.

The shingles must be installed over minimum $^{19}/_{32}$-inch-thick (15.1 mm) plywood or OSB complying with DOC PS-1 or PS-2, as applicable. The flashing, underlayment and ice barriers must be installed in accordance with the code and the report holder's published installation instructions. The first row of shingles hook into the lip of the eave starter flashing. The formed shingle edges interlock with the adjacent shingles. The next course must hook into the lip of the course below. The shingles or clips must be fastened as described in Table 2 using the nails described in Section 3.3.

5.0 CONDITIONS OF USE:

The PermaLock Shingles 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 The shingles must be manufactured and identified in accordance with this report.

5.2 In the event of a conflict between the report holder's published installation instructions, the applicable codes, and this report, the most restrictive requirements govern.

5.3 Only clips, nails and accessories supplied by the report holder may be used for the installation of the shingles.

5.4 The shingles are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Metal Roof Coverings (AC166), dated February 2021 (editorially revised June 2024).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5605) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, boxes of shingles are identified with the product name (PermaLock).

7.3 The report holder's contact information is the following:

THE ALUMINIMUM SHINGLE COMPANY
524 N. KAYS DRIVE
KAYSVILLE, UTAH 84037
(877) 319-7999
www.permalockroofing.com

TABLE 1—FIRE CLASSIFICATIONS FOR ROOF ASSEMBLIES WITH PERMALOCK SHINGLES[1]

SYSTEM NO.	DECK	ASSEMBLY DESCRIPTION	CLASSIFICATION
1	Minimum 15/32" rated plywood sheathing	One layer of underlayment complying with ASTM D226 Type II and one of the following: • 1/2-inch thick gypsum board • 1/4-inch thick Georgia Pacific DensDeck Roof Board • Two layers of GAF Versashield Underlayment addressed in ESR-2053	A

For SI: 1 inch = 25.4 mm.

[1]See Section 3.3 for nail requirements.

TABLE 2—ALLOWABLE UPLIFT RESISTANCE FOR PERMALOCK SHINGLES[1]

SYSTEM NO.	DECK	ASSEMBLY DESCRIPTION	ALLOWABLE UPLIFT LOAD (psf)
1	19/32" rated plywood sheathing	Shingles fastened with one nail through the tab in the corner of the shingle, 5/8 inch penetration through sheathing.	22.5
2	19/32" rated plywood sheathing	Shingles installed with one clip near the center of the shingle, spaced roughly 17.5 inches on center, and two nails through the clip	60

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

[1]See Section 3.3 for nail requirements.

TABLE 3—CODE SECTION NUMBER REFERENCE MATRIX

IBC			
2024 IBC	**2021 IBC**	**2018 IBC**	**2015 IBC**
1507.1.1	1507.1.1	1507.1.1	1507.5.3
1507.1.2	1507.1.2	1507.1.2	1507.5.4
1507.5	1507.5	1507.5	1507.5
1507.5.7	1507.5.7	1507.5.7	1507.5.7
1609.6	1609.5	1609.5	1609.5
IRC			
2024 IRC	**2021 IRC**	**2018 IRC**	**2015 IRC**
R301.2.1	R301.2.1	R301.2.1	R301.2.1
R905.1.1	R905.1.1	R905.1.1	R905.1.1
R905.1.2	R905.1.2	R905.1.2	R905.1.2
R905.4	R905.4	R905.4	R905.4
R905.4.6	R905.4.6	R905.4.6	R905.4.6

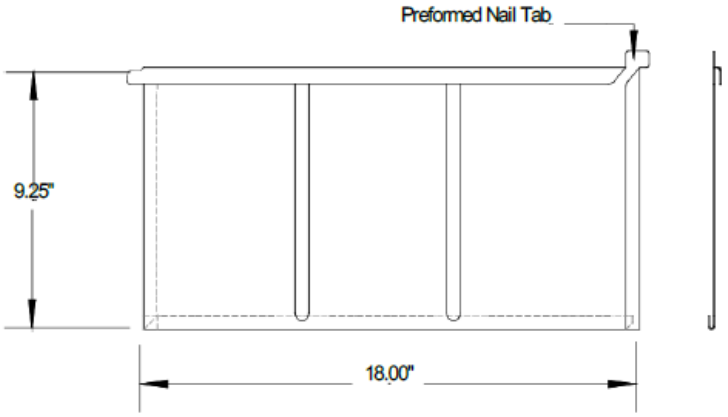

FIGURE 1—PERMALOCK SHINGLE

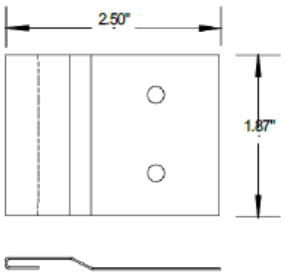

FIGURE 2—PERMALOCK CLIP

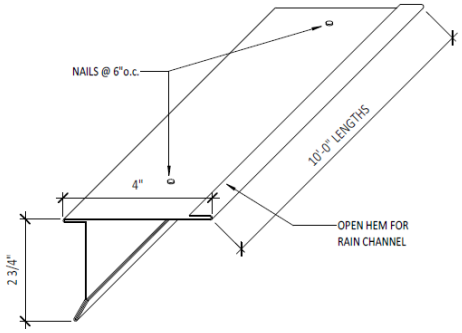

FIGURE 3—RAKE FLASHING

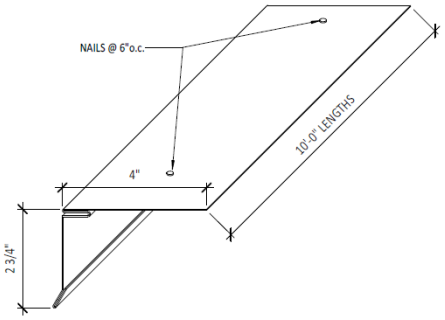

FIGURE 4—EAVE STARTER FLASHING

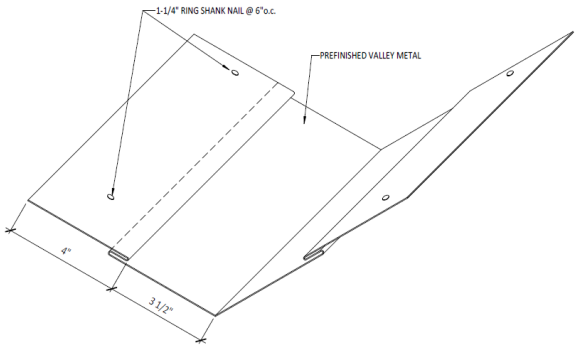

FIGURE 5—VALLEY FLASHING

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 31 16—Metal Shingles
Section: 07 41 13—Metal Roof Panels

REPORT HOLDER:

THE ALUMINUM SHINGLE COMPANY

EVALUATION SUBJECT:

PERMA LOCK SHINGLES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that PermaLock Shingles, described in ICC-ES evaluation report ESR-5605, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The PermaLock Shingles, described in Sections 2.0 through 7.0 of the evaluation report ESR-5605, comply with the LABC Chapter 15, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The PermaLock Shingles described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5605.
- The design, installation, conditions of use and identification of the PermaLock Shingles are in accordance with the 2021 *International Building Code®* (IBC) and 2021 *International Residential Code®* (IRC) provisions, as applicable, noted in the evaluation report ESR-5605.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, issued December 2024.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 31 16—Metal Shingles
Section: 07 41 13—Metal Roof Panels

REPORT HOLDER:

THE ALUMINUM SHINGLE COMPANY

EVALUATION SUBJECT:

PERMALOCK SHINGLES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that PermaLock Shingles, described in ICC-ES evaluation report ESR-5605, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 *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.

- 2022 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The PermaLock Shingles, described in Sections 2.0 through 7.0 of the evaluation report ESR-5605, comply with CBC Chapter 15, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of Chapter 15, as applicable.

The products have not been evaluated under Chapter 7A for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

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 PermaLock Shingles, described in Sections 2.0 through 7.0 of the evaluation report ESR-5605, comply with CRC Chapter 9, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of Chapter 9, as applicable.

The products have not been evaluated under CRC Section R337 for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

The products addressed in this supplement have not been evaluated for compliance with the *International Wildland–Urban Interface Code*®.

This supplement expires concurrently with the evaluation report, issued December 2024.