

ICC-ES Evaluation Report

ESR-1184

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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
**Section: 07 53 23—Ethylene-Propylene-Diene-Monomer
Roofing**
Section: 07 54 23—Thermoplastic-Polyolefin Roofing

REPORT HOLDER:

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EVALUATION SUBJECT:

**CARLISLE BALLASTED SINGLE-PLY ROOFING
SYSTEMS MEMBRANES—EPDM AND TPO**

ADDITIONAL LISTEES:

VERSICO, INCORPORATED
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CARLISLE, PENNSYLVANIA 17013

MULE-HIDE PRODUCTS COMPANY, INCORPORATED
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BELOIT, WISCONSIN 53511

1.0 EVALUATION SCOPE**Compliance with the following codes:**2009 and 2006 *International Building Code*® (IBC)**Properties evaluated:**

- Weather resistance
- Fire classification
- Wind uplift resistance
- Impact resistance

2.0 USES

The Carlisle ethylene propylene diene monomer (EPDM) and thermoplastic polyolefin (TPO) single-ply membranes are used in ballasted single-ply membrane roofing systems.

3.0 DESCRIPTION**3.1 General:**

The Carlisle Ballasted Single-ply Membrane Roofing Systems consist of single-ply EPDM or TPO membranes, insulation where used, flashing, ballast, splicing cement and splice tape that are installed on a combustible or noncombustible deck.

The Carlisle Ballasted Single-ply Membrane Roofing System is also available as the Versico and Mule-Hide Ballasted Single-ply Membrane Roofing Systems. Information in this report pertaining to the Carlisle Ballasted Roofing System is also applicable to the Versico and Mule-Hide Ballasted Roofing Systems.

3.2 Single-ply Membranes:

3.2.1 EPDM Membrane: The Carlisle Sure-Seal membrane is a black, reinforced or nonreinforced EPDM membrane available in thicknesses ranging from 45 mils (0.045 inch [1.14 mm]) to 90 mils (0.090 inch [2.29 mm]). The Sure-Seal membrane is also available as the Versico Versigard or the Mule-Hide Standard EPDM.

3.2.2 PO Membrane: The Carlisle Sure-Weld membrane consists of a polyester reinforcement encapsulated between two layers of TPO and is available in thicknesses ranging from 45 mils (0.045 inch [1.14 mm]) to 80 mils (0.080 inch [2.03 mm]). The Sure-Weld membrane is also available as the Versico Versiweld Premier or the Mule-Hide TPO-c.

3.3 Insulation:

See Table 1 for insulations for use with specific roofing systems. Foam plastic insulation, where used, must have a flame-spread index of not more than 75 when tested at the maximum thickness intended for use in accordance with ASTM E 84.

3.4 Flashing:

Flashing must be provided in accordance with Section 1503.2 of the IBC. Where flashing is of metal, the metal must be corrosion-resistant, minimum No. 26 gage [base-metal thickness 0.019 inch (0.483 mm)] galvanized steel.

3.5 Ballast:

Ballast must be provided in accordance with IBC Section 1504.8 and ANSI/SPRI RP-4. Nominally 1½-inch (38.1 mm) or 2½-inch (63.5 mm) smooth river bottom stone must be as specified in ASTM D 448. Pavers may be substituted in accordance with ANSI/SPRI RP-4.

3.6 Splicing Cement and Tape:

3.6.1 Sure-Seal EP-95 Splicing Cement: Sure-Seal EP-95 Splicing Cement is a high-strength, solvent-based contact cement used for seaming EPDM membranes together. The splicing cement is supplied in 1-gallon (3.78 L) cans or 5-gallon (18.9 L) pails and has a shelf life of one year.

3.6.2 Sure-Seal SecurTAPE: Sure-Seal SecurTAPE is a pressure-sensitive splice tape used for seaming EPDM membranes together. The splice tape is supplied in cartons of two or four rolls each and has a shelf life of one year.

3.7 Impact Resistance:

The EPDM and TPO roofing membranes described in this report meet requirements for impact resistance in Section 1504.7 of the IBC, based on testing in accordance with FM 4470.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of the Carlisle ballasted EPDM and TPO membrane roofing systems must comply with the applicable code, the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions must be available at all times on the jobsite during installation. Typical installation details are shown in Figure 1.

The slope of the roof on which the Carlisle single-ply membranes are installed must be a minimum of $1/4:12$ (2 percent slope) and must not be more than $2:12$ (17 percent slope).

Penetrations and terminations of the roof covering must be flashed and made weather-tight in accordance with the requirements of the membrane manufacturer and the applicable code.

4.2 Fire Classification:

Carlisle ballasted single-ply membrane roofing systems installed in accordance with this report are classified as Class A roof coverings as noted in Table 1.

4.3 Wind Uplift Resistance:

The Carlisle ballasted single-ply membrane roofing systems must be designed for wind resistance in accordance with ANSI/SPRI RP-4 Wind Design Guide and IBC Section 1504.8. Metal edge securement for roofing systems must be designed in accordance with ANSI/SPRI ES-1 and must comply with IBC Section 1504.5. The allowable uplift pressure for Carlisle-supplied drip edge (refer to Figure 3) must not exceed 212 psf (10.2 kN/m²). The allowable uplift line pressure for Carlisle's SecurEdge 300 series [0.050-inch (1.27 mm) 3003 aluminum] fascia systems must not exceed 234 plf (348 kg/m) and for Carlisle's SecurEdge 3000 series [0.040-inch (1.02 mm) 3003 aluminum] fascia systems must not exceed 200 plf (298 kg/m).

4.4 Reroofing:

The existing deck must be inspected to verify that the structure to be reroofed is structurally sound and adequate to support and secure the roofing membrane. Prior to installation of new roof coverings, inspection by and written approval from the code official having jurisdiction must be required.

The Carlisle EPDM and TPO ballasted roof covering systems described in Table 1 are classified as Class A roof assemblies when installed over existing classified roof assemblies.

5.0 CONDITIONS OF USE

The EPDM and TPO membranes 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 the applicable code, the manufacturer's published installation instructions and this report. The instructions within this report must govern if there are any conflicts between the manufacturer's instructions and this report.
- 5.2 The Carlisle Ballasted Single-Ply Membrane Roofing Systems must be installed by professional roofing contractors trained and approved by the manufacturer.
- 5.3 Foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4.
- 5.4 Foam plastic insulation, where used, must bear the label of an approved agency indicating that the foam plastic has a flame-spread index of not more than 75 when tested in accordance with ASTM E 84 at the maximum thickness intended for use, subject to the approval of the code official.
- 5.5 The ballasted roofing system must be designed for wind resistance in accordance with the ANSI/SPRI RP-4 Wind Design Guide for Ballasted Single-Ply Roofing Systems. Design drawings must be prepared, signed and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed, and submitted to the code official for approval.
- 5.6 Design wind uplift pressure on any roof area, including edge and corner zones, must not exceed the allowable wind-uplift pressure for the system installed in that particular area.
- 5.7 The structural roof system to which the ballasted membrane is to be applied must be certified as being capable of sustaining the construction, membrane, ballast, and ancillary material loads that will be encountered during and subsequent to membrane application. This certification must be provided by a registered design professional.
- 5.8 The membranes are manufactured at Carlisle, Pennsylvania; Greenville, Illinois; Senatobia, Mississippi; and Tooele, Utah, under a quality control program with inspections by Underwriters Laboratories Incorporated (AA-668).
- 5.9 For buildings under the IBC, above-deck thermal insulation board must comply with the applicable standards listed in Table 1508.2 of the IBC.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Membrane Roof Covering Systems (AC75), dated July 2010.

7.0 IDENTIFICATION

Each roll or package of rolls of EPDM and TPO membrane must bear a label noting the product name, the report holder's name (Carlisle SynTec, Incorporated) or the name of the additional listee (Versico, Incorporated, or Mule-Hide Products Company, Incorporated), the manufacturer's address or plant code, the name or label of the inspection agency (Underwriters Laboratories Incorporated), and the evaluation report number (ESR-1184).

TABLE 1—FIRE CLASSIFICATION ASSEMBLIES—BALLASTED ROOFING SYSTEMS¹

SYSTEM NO.	ROOF CLASS	ROOF DECK	MAXIMUM ROOF SLOPE	INSULATION ^{1,2}	COVER BOARD	MEMBRANE ¹
1	A	Combustible or noncombustible	2:12	Any of the following insulations, 1-inch min. to 6-inch max. thickness: Carlisle "Polyiso HP-H" or Hunter Panels "H-Shield"; and to 5-inch max. thickness: Premier Industries "Insulfoam EPS,"	Optional: 1/4-inch-thick G-P "DensDeck", 1/4-inch-thick USG "Securock" or 1/2-inch-thick gypsum board	EPDM or TPO membrane
2	A	Combustible or noncombustible	2:12	1/2-inch-thick fiberboard	-	EPDM or TPO membrane
3	A	Combustible or noncombustible	2:12	-	1/4-inch-thick G-P "DensDeck", 1/4-inch-thick USG "Securock" or 1/2-inch-thick gypsum board	EPDM or TPO membrane
4	A	Combustible or noncombustible	2:12	None	-	EPDM or TPO membrane

For SI: 1 inch = 25.4 mm.

¹Insulation and membrane are laid loosely and surfaced with river-bottom stones, nominally 1 1/2 inches in diameter, at 1000 lbs per square (min.).

²All foam plastic insulation must be UL-classified foamed plastic for roofing systems, and must conform to ASTM C 578 or ASTM C 1289 specifications.

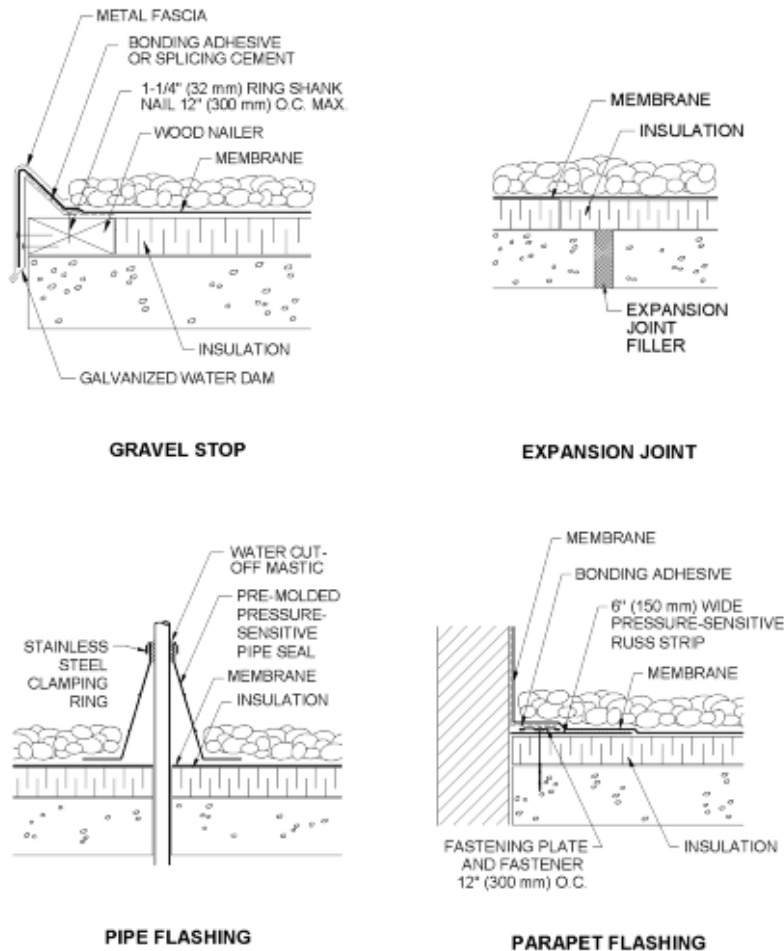


FIGURE 1

Option 1



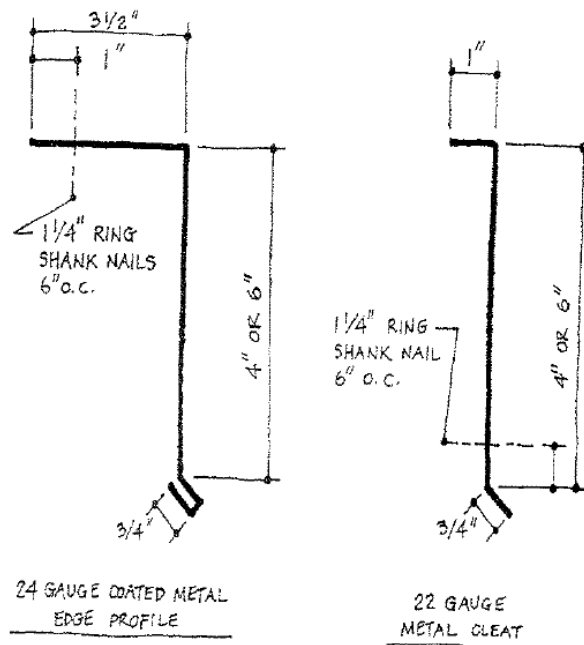
Membrane for Roofing Systems
 as to External Fire Exposure
 See UL Directory of Products Certified for Canada
 and UL Roofing Materials and Systems Directory
 60P6

Option 2



Membrane for Roofing Systems
 as to External Fire Exposure
 See UL Directory of Products Certified for Canada
 and UL Roofing Materials and Systems Directory
 60P6

FIGURE 2—INSPECTION AGENCY LABEL



NOTE: ALL 1 1/4" RING SHANK NAILS MUST HAVE 1" MINIMUM EMBEDMENT INTO WOOD.

FIGURE 3—DRIP EDGE DETAIL