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# ICC-ES Evaluation Report

# ESR-1776

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Reissued 07/2017  
This report is subject to renewal 07/2018.

**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**

**SECTION: 06 05 83—SHOP-APPLIED WOOD COATINGS**

**SECTION: 06 16 00—SHEATHING**

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**

**SECTION: 07 53 23—ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING**

**SECTION: 07 54 19—POLYVINYL-CHLORIDE ROOFING**

**SECTION: 07 54 23—THERMOPLASTIC-POLYOLEFIN ROOFING**

## REPORT HOLDER:

### MULE-HIDE PRODUCTS COMPANY, INC.

1195 PRINCE HALL DRIVE  
BELOIT, WISCONSIN 53511

## EVALUATION SUBJECT:

### MULE-HIDE FR DECK PANELS AND MULE-HIDE PYROXL® ROOF DECK PANELS



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**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**  
**Section: 06 05 83—Shop-Applied Wood Coatings**  
**Section: 06 16 00—Sheathing**

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**Section: 07 53 23—Ethylene-Propylene-Diene-Monomer Roofing**  
**Section: 07 54 19—Polyvinyl-Chloride Roofing**  
**Section: 07 54 23—Thermoplastic-Polyolefin Roofing**

## REPORT HOLDER:

**MULE-HIDE PRODUCTS COMPANY, INC.**  
**1195 PRINCE HALL DRIVE**  
**BELOIT, WISCONSIN 53511**  
**(608) 365-3111**  
[www.mulehide.com](http://www.mulehide.com)

## EVALUATION SUBJECT:

**MULE-HIDE FR DECK PANELS AND MULE-HIDE PYROXL® ROOF DECK PANELS**

## 1.0 EVALUATION SCOPE

### Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *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:

- Fire classification
- Wind uplift resistance

## 2.0 USES

Mule-Hide FR deck panels are used as roof decking in Class A or Class C roof covering assemblies. Mule-Hide PyroXL® roof deck panels are used as roof decking in Class C roof covering assemblies.

## 3.0 DESCRIPTION

### 3.1 General:

The roof covering assemblies consist of single-ply roofing membranes (EPDM or TPO) fully adhered over Mule-Hide FR Deck Panel A or FR Deck Panel C. The roof covering assemblies may also consist of single-ply

roofing membranes (EPDM, TPO or PVC) fully adhered over PyroXL® Roof Deck Panels.

### 3.2 Mule-Hide FR Deck Panels:

The product is a composite panel consisting of a layer of Pyrotite—an inert, inorganic fire shield—factory-applied to one side of either plywood or oriented strand board (OSB) complying, respectively, with U.S. DOC PS1 or U.S. DOC PS2. The panels are available in sizes from 4 feet by 8 feet (1219 mm by 2438 mm) up to 8 feet by 24 feet (2438 mm by 7315 mm), and in nominal thicknesses of <sup>7</sup>/<sub>16</sub> inch (11.1 mm), <sup>15</sup>/<sub>32</sub> inch (11.9 mm), <sup>1</sup>/<sub>2</sub> inch (12.7 mm), <sup>19</sup>/<sub>32</sub> inch (15.1 mm) and <sup>23</sup>/<sub>32</sub> inch (18.3 mm). The Pyrotite material is applied by sprayer or by application of the Pyrotite slurry through other means (e.g., roll coating or curtain coating) to the surface of the plywood or OSB. The Pyrotite slurry is allowed to cure prior to stacking. Excess material is trimmed from the panel edges.

**3.2.1 Mule-Hide FR Deck Panel A:** A proprietary sheathing panel with a minimum Pyrotite thickness of 0.08 inch (2.03 mm) directly applied to a minimum <sup>15</sup>/<sub>32</sub>-inch-thick (11.9 mm) plywood or a minimum <sup>7</sup>/<sub>16</sub>-inch-thick (11.1 mm) OSB substrate. The minimum coating weight of the finished panel is 0.66 lb/ft<sup>2</sup> (3.22 kg/m<sup>2</sup>).

**3.2.2 Mule-Hide FR Deck Panel C:** A proprietary sheathing panel with a minimum Pyrotite thickness of 0.04 inch (1.02 mm) directly applied to a minimum <sup>15</sup>/<sub>32</sub>-inch-thick (11.9 mm) plywood or a minimum <sup>7</sup>/<sub>16</sub>-inch-thick (11.1 mm) OSB substrate. The minimum coating weight of the finished panel is 0.22 lb/ft<sup>2</sup> (1.07 kg/m<sup>2</sup>).

**3.3 Mule-Hide PyroXL® Roof Deck Panels:** PyroXL® is a proprietary sheathing panel, minimum <sup>15</sup>/<sub>32</sub>-inch-thick (12 mm) plywood. The PyroXL® panels are available in a sheet size of 4 feet by 8 feet (1219 mm by 2438 mm) and in nominal thicknesses of <sup>15</sup>/<sub>32</sub> inch (11.9 mm), <sup>19</sup>/<sub>32</sub> inch (15.1 mm) and <sup>23</sup>/<sub>32</sub> inch (18.3 mm).

### 3.4 Single-ply Roofing Membranes:

**3.4.1 Mule-Hide EPDM Membrane:** The single-ply membrane may be Mule-Hide Standard EPDM, Standard Reinforced EPDM, White-on-Black EPDM or FR Reinforced EPDM, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, as recognized in [ESR-1463](#).

**3.4.2 Mule-Hide TPO Membrane:** The single-ply membrane may be Mule-Hide TPO or Mule-Hide TPO (FR), either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, as recognized in [ESR-1463](#).

**3.4.3 Mule-Hide PVC Membrane:** The single-ply membrane may be Mule-Hide PVC either 0.050 or 0.060 inch (1.27 or 1.52 mm) thick, as recognized in [ESR-1463](#).

### 3.5 Adhesives:

#### 3.5.1 Mule-Hide Acrylic Water Base Bonding Adhesive:

This is an acrylic water-based adhesive that is applied as a wet lay-in adhesive when adhering EPDM membranes to the FR deck panel substrate. It has a coverage of approximately 100 square feet per gallon (9.29 m<sup>2</sup>/ 3.78 L). The adhesive is supplied in 5-gallon (18.9 L) containers and has a shelf life of one year.

**3.5.2 Aqua Base 120 Bonding Adhesive:** This is a water-based contact adhesive used to adhere TPO membranes to the substrate. It has a coverage of approximately 100 square feet per gallon (2.46 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers and has a shelf life of one year.

## 4.0 DESIGN AND INSTALLATION

### 4.1 General:

The roof covering assemblies must be installed in accordance with the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the installation instructions must be available on the jobsite at all times during installation.

The roof covering assembly must be installed at a minimum slope of 1/4:12 (2 percent) and a maximum slope of 1/2:12 (4 percent) for the FR Deck Panel A (Class A assemblies). The roof covering assembly must be installed at a minimum slope of 1/4:12 (2 percent) and a maximum slope of 2:12 (16 percent) for the FR Deck Panel C (Class C assemblies) and PyroXL<sup>®</sup> Roof Deck Panels (Class C assemblies).

### 4.2 Fire Classification:

**4.2.1 Class A, Fully Adhered, Single-ply Membrane Roof Covering Assembly:** The roof deck must be Mule-Hide FR Deck Panel A installed with the Pyrotite laminate facing the exterior (up). All deck joints must be blocked with nominally 2-inch-by-4-inch (51 mm by 102 mm) lumber. Gaps in the deck panels must be caulked with Rectorseal FlameSafe FS900+ UL Classified Sealant. The deck must be covered with Mule-Hide EPDM or TPO membranes, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, recognized in [ESR-1463](#).

The EPDM membrane must be fully adhered to the deck with Mule-Hide Acrylic Water Base Bonding Adhesive. The adhesive must be applied directly to the deck and the EPDM membrane immediately rolled into the adhesive while wet.

The TPO membrane must be fully adhered to the deck with Aqua Base 120 Bonding Adhesive. The adhesive is a contact adhesive and must be applied to both the substrate and the underside of the membrane. The adhesive must dry until tacky to the touch and then the membrane may be rolled back over the substrate and broomed smooth to ensure proper contact.

**4.2.1.1 Class C, Fully Adhered, Single-ply Membrane Roof Covering Assembly:** The roof deck must be Mule-Hide FR Deck Panel C installed with the Pyrotite laminate facing the exterior (up) or one of the PyroXL<sup>®</sup> Roof Deck Panels. The deck must be covered with the Mule-Hide EPDM or TPO membrane, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick or Mule-Hide PVC Membrane, either 0.050 or 0.060 (1.27 or 1.52 mm) thick, recognized in [ESR-1463](#).

See Section 4.2.1 for EPDM and TPO membrane and adhesive application.

The PVC membrane must be fully adhered to the deck with Aqua Base 120 Bonding Adhesive. The adhesive is a contact adhesive and must be applied to both the substrate

and the underside of the membrane. The adhesive must dry until tacky to the touch and the membrane may be rolled back over the substrate and broomed smooth to ensure proper contact.

### 4.3 Wind Resistance:

The assemblies described and installed in accordance with Section 4.2, using the EPDM membrane, have an allowable uplift resistance of 120 pounds per square foot (5.7 kPa) when installed to a minimum 7/16-inch-thick (11.1 mm) FR Deck Panels.

The assemblies described and installed in accordance with Section 4.2, using the TPO membrane, have an allowable uplift resistance of 45 pounds per square foot (2.15 kPa) when installed to a minimum 15/32-inch-thick (11.9 mm) FR Deck Panel, and an allowable uplift resistance of 52 pounds per square foot (2.49 kPa) when installed to a minimum 19/32-inch-thick (15.1 mm) FR Deck Panel.

The assemblies described and installed in accordance with Section 4.2 using the EPDM, TPO or PVC membrane, have an allowable uplift resistance of 140 pounds per square foot (5.7 kPa) when installed to a minimum 15/32-inch-thick (11.9 mm) PyroXL<sup>®</sup> Roof Deck Panel has an allowable uplift resistance of 135 pounds per square foot (6.46 kPa) when installed to a minimum 23/32-inch-thick (18.3 mm) PyroXL Roof Deck Panel.

## 5.0 CONDITIONS OF USE

The Mule-Hide FR deck panels and the PyroXL<sup>®</sup> Roof Deck Panels 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 applicable code and the manufacturer's published installation instructions. If there is a conflict between this report and the manufacturer's installation instructions, this report governs.
- 5.2 Installation must be by applicators approved by Mule-Hide Products Company, Inc.
- 5.3 The structural system is outside the scope of this report and must be designed in accordance with the IBC or the IRC.
- 5.4 Mule-Hide FR Deck Panels must be installed with the inert, inorganic fire shield facing up.
- 5.5 Mule-Hide FR Deck Panels are manufactured in Watkins, Minnesota, under a quality-control program with inspections by ICC-ES.
- 5.6 Mule-Hide PyroXL Roof Deck Panels are manufactured in Thomson, Georgia; Pine Bluff, Arkansas; Milford, Virginia; Detroit, Michigan; and Winston, Oregon; 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 Wood Structural Panels Laminated with an Inert, Inorganic Fire Shield (AC264), dated February 2012 (editorially revised October 2016) for Mule-Hide FR Deck Panels.
- 6.2 Data in accordance with ASTM E108 and FM4470 for Mule-Hide FR Deck Panels.
- 6.3 Data in accordance with UL 580 and UL 790 for PyroXL<sup>®</sup> Roof Deck Panels.

## 7.0 IDENTIFICATION

Each panel covered by this report is identified by a stamp bearing the report holder's name (Mule-Hide Products Company, Inc.), the manufacturing location, the product name, and the evaluation report number (ESR-1776).