



ICC-ES Evaluation Report ESR-1365

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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

REPORT HOLDER:

LOUISIANA-PACIFIC CORPORATION

EVALUATION SUBJECTS:

LP® FLAMEBLOCK® FIRE-RATED SHEATHING
 BLAZEGUARD® FR DECK PANELS AND MULE-HIDE FR DECK PANELS

ADDITIONAL LISTEE:

MULE-HIDE PRODUCTS COMPANY, INC.

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)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-1365 LABC and LARC Supplement](#).

Properties evaluated:

- Structural
- Surface-burning characteristics
- Durability
- Thermal barrier
- Component of fire-resistance-rated assemblies
- Component of roof covering classified assemblies
- Wind uplift assemblies

2.0 USES

LP® FlameBlock® Fire-Rated Sheathing (includes the former Blazeguard® Fire-Rated Sheathing) is used as floor sheathing, roof sheathing, wall sheathing, an interior finish, a thermal barrier and a component of a fire-resistance-rated assembly. Blazeguard® FR Deck Panel and Mule-Hide FR

Deck panels are used as a component of a fire-classified roof covering assembly.

3.0 DESCRIPTION

3.1 General:

The products described in this report are composite panels consisting of a layer of Pyrotite® coating, a noncombustible inert, inorganic fire-shield, that is factory-applied to either plywood or oriented strand board (OSB) complying, respectively, with US DOC PS1 or US DOC PS2. The Pyrotite® layer is applied to one or both faces of the plywood or OSB, either adhesively, mechanically or through direct application, as specified in the approved quality control documentation and manufacturing standard.

The products are typically 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 3/8 inch (9.5 mm) to 1 1/8 inch (28.6 mm).

3.2 Product Numbers, Names and Descriptions:

3.2.1 15382-1: LP® FlameBlock® Fire-Rated Sheathing—Adhesively or Mechanically Applied on Plywood: The Pyrotite® layer attached with adhesive or mechanically fastened to a minimum 3/8 Performance Category plywood substrate.

3.2.2 15382-2: LP® FlameBlock® Fire-Rated Sheathing—Adhesively or Mechanically Applied on Oriented Strand Board (OSB): The Pyrotite® layer attached with adhesive or mechanically fastened to a minimum 3/8 Performance Category OSB substrate.

3.2.3 15382-3: LP® FlameBlock® Fire-Rated Sheathing—Directly Applied on Plywood: The Pyrotite® layer directly applied to a minimum 3/8 Performance Category plywood substrate.

3.2.4 15382-5: Blazeguard® FR and Mule-Hide FR Deck Panel A—Directly Applied on Plywood or Oriented Strand Board (OSB): The Pyrotite® layer directly applied to a minimum 15/32 Performance Category plywood or a minimum 7/16 Performance Category OSB substrate.

3.2.5 15382-6: Blazeguard® FR and Mule-Hide FR Deck Panel C—Directly Applied on Plywood or Oriented Strand Board (OSB): The Pyrotite® layer directly applied to a minimum 15/32 Performance Category plywood or minimum 7/16 Performance Category OSB substrate.

3.2.6 15382-7: LP® FlameBlock® Fire-Rated OSB Sheathing—Directly Applied on Oriented Strand Board (OSB): The Pyrotite® layer directly applied 3/8 Performance Category OSB substrate.

3.2.7 15382-10: LP® FlameBlock® Plus Fire-Rated OSB Sheathing, Directly Applied on Oriented Strand Board (OSB): The Pyrotite® layer directly applied to a minimum 3/8 Performance Category OSB substrate.

3.3 Single-ply Roofing Membranes:

3.3.1 Mule-Hide EPDM Membrane: The single-ply membranes are Mule-Hide Standard EPDM, Standard Reinforced EPDM, White-on-Black EPDM or FR Reinforced EPDM, available in thicknesses of 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, as described in [ESR-1463](#).

3.3.2 Mule-Hide TPO Membrane: The single-ply membranes are Mule-Hide TPO or Mule-Hide TPO (FR), available in thicknesses of 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, as described in [ESR-1463](#).

3.3.3 Mule-Hide PVC Membrane: The single-ply membranes are Mule-Hide PVC, available in thicknesses of 0.050 or 0.060 inch (1.27 or 1.52 mm) thick, as described in [ESR-1463](#).

3.4 Adhesives for Single-ply Roofing Membranes:

3.4.1 Mule-Hide Acrylic Water-Based 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 m²/3.78 L). The adhesive is supplied in 5-gallon (18.9L) containers and has a shelf life of one year.

3.4.2 Aqua Base 120 Bonding Adhesive: This is a water-based contact adhesive, as recognized in [ESR-1463](#), used to adhere TPO membranes to the FR deck panel substrate. It has a coverage of approximately 100 square feet per gallon (9.29 m²/3.78 L). The adhesive is supplied in 5-gallon (18.9L) containers and has a shelf life of one year.

4.0 DESIGN AND INSTALLATION

4.1 General:

The panels must be installed in accordance with the manufacturer's published literature and the requirements for wood structural panels in Chapter 23 of the IBC, or Sections R604 and R803.2 of the IRC.

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

If there are any conflicts between the manufacturer's instructions and this report, this report governs.

4.2 Applications:

The panels are installed in the following applications:

- a) Roof sheathing on buildings of Type III, IV and V construction for a distance of 4 feet (1220 mm) on both sides of a fire wall to provide continuity [IBC Section 706.6, Exception 4.3, and 2021 and 2018 IRC Section R302.2.4 Exception (2015 and 2012 IRC Section R302.2.2(2) Exception)]. The panels must be installed with the Pyrotite® layer facing the interior of the building.
- b) Exterior walls and roof sheathing on buildings of Type I and II construction, as described in 2021, 2018, 2015 and 2012 IBC Section 603.1, Subsection 1. The Pyrotite® layer must be laminated to both sides of the panels.

- c) Wall sheathing for exterior walls in buildings of Type III construction with a two-hour rating or less. The Pyrotite® layer must be laminated to each side of the panels and the studs must be of noncombustible material or fire-retardant-treated wood.
- d) Class A interior finish material for walls and ceilings of Type V construction (IBC Section 803). The panels must be installed with the Pyrotite® layer facing the interior of the building.
- e) Thermal barrier for separating foam plastic insulation from the interior of a building (IBC Section 2603.4). The panels must be installed with the Pyrotite® layer facing the interior of the building.
- f) Component of fire-resistance-rated construction (IBC Section 703). Refer to assemblies described in Section 4.3 of this report.
- g) Component of fire-classified roof covering assemblies (IBC Section 1505.1). Refer to Section 4.4 of this report for installation details.

4.3 Structural Design: The structural design of LP® FlameBlock® Fire-Rated Sheathing, and Blazeguard® FR and Mule-Hide FR Deck Panels, shall be in accordance with IBC and IRC, and with the APA Engineered Wood Construction Guide (E30, revised December 2019). In addition, LP® FlameBlock® Fire-Rated Sheathing manufactured with an OSB substrate and a directly applied Pyrotite® layer only, as described in Sections 3.2.6 and 3.2.7, may have an enhanced equivalent performance category as shown Table 1, the enhanced fastener withdrawal values as shown in Table 2 and the enhanced uniform live load capacities for roofs and floors as shown, respectively, in Tables 3 and 4.

4.4 Fire-resistance-rated Wall Assemblies:

For the fire-resistance-rated wall assemblies listed in Section 4.3, screws complying with ASTM C1002 may be substituted for the specified nails, provided the screws are of equal length and head diameter as that specified for the nails and must not exceed the nail spacing for attachment of the gypsum wallboard.

4.4.1 One-hour Exterior Wall Assembly—Wood Stud Limited Load Bearing Wall—Interior Fire Exposure:

The wall assembly must be constructed as follows:

- a) Wall Framing:
 - Minimum nominal 2-inch-by-4-inch wood studs spaced a maximum 16 inches (406 mm) on center, or minimum nominal 2-inch-by-6-inch wood studs spaced a maximum 24 inches (609 mm) on center, with two top plates and one bottom plate of same size as studs.
- b) Interior Wall Sheathing:
 - One layer of 5/8-inch-thick (15.88 mm), 4-foot-wide (1219 mm), Type X gypsum wallboard installed vertically, with horizontal joints blocked.
 - Attach wallboard with minimum 6d, cement coated cup-head drywall nails 1 7/8-inch-long (47.63 mm), with 0.0915-inch (2.32 mm) shank diameters and 1/4-inch (6.35 mm) head diameters, spaced maximum 7 inches (178 mm) on center along all studs, blocking and plates.
 - Finish exposed fastener heads and wallboard joints with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or

fiberglass tape must be embedded in the first layer of compound over wallboard joints.

- c) Insulation:
- Mineral fiber batts, faced or unfaced, with a minimum 3.0 pcf (48.1 kg/m³) nominal density to fill stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates.
- d) Exterior Wall Sheathing:
- One layer of LP® FlameBlock® Fire-Rated Sheathing (product 15382-3 or 15382-7, with the Pyrotite® layer applied to one face of the sheathing) installed vertically, with horizontal joints blocked, and with the Pyrotite® layer facing the wall cavity.
 - Attach sheathing to studs with 1⁷/₈-inch-long (47.63 mm), 6d sinker nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (305 mm) on center in the field.

The wall must have a fire separation distance of greater than 10 feet (3048 mm).

The design axial compressive stresses for the wood stud must be calculated in accordance with Sections 3.6 and 3.7 of ANSI/AWC/AF&PA *National Design Specification® for Wood Construction* (NDS) and must be limited to the least of the following:

- 387 psi.
- 0.95 F'_c.
- 0.95 F'_c, where F'_c is calculated assuming a slenderness ratio of 33.

4.4.2 One-hour Exterior Wall Assembly—Wood Stud Limited Load Bearing Wall, Fire Exposure from Either Side:

The wall assembly must be constructed as follows:

- a) Wall Framing:
- Minimum nominal 2-inch-by-6-inch wood studs spaced a maximum 16 inches (406 mm) on center, with two top plates and one bottom plate.
- b) Interior Wall Sheathing:
- One layer of 5/8-inch-thick (15.88 mm), 4-foot-wide (1219 mm), Type X gypsum wallboard installed vertically, with horizontal joints blocked.
- Attach wallboard with minimum 6d, cup-head drywall nails 1⁷/₈-inch-long (47.63 mm), with 0.0915-inch (2.32 mm) shank diameters and 1/4-inch (6.35 mm) head diameters, spaced maximum 8 inches (203 mm) on center along all studs, blocking and plates.
- Finish exposed fastener heads and wallboard joints with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or fiberglass tape must be embedded in the first layer of compound over wallboard joints.
- c) Insulation:
- Mineral fiber batts, faced or unfaced, with a minimum 2.5 pcf (40.1 kg/m³) nominal density to fill stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates.
- d) Exterior Wall Sheathing:
- One layer of LP® FlameBlock® Fire-Rated Sheathing (product 15382-3 or 15382-7, with the Pyrotite® layer applied to one face of the sheathing)

installed vertically, with horizontal joints blocked, and with the Pyrotite® layer facing the exterior.

Attach sheathing to studs with 1⁷/₈-inch-long (47.63 mm), 6d sinker nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (305 mm) on center in the field.

Fire exposure may be from either side of the wall.

The design axial compressive stresses for the wood stud must be calculated in accordance with Sections 3.6 and 3.7 of ANSI/AWC/AF&PA NDS and must be limited to the least of the following:

- 260 psi.
- 0.31 F'_c.
- 0.31 F'_c, where F'_c is calculated assuming a slenderness ratio of 21.

4.4.3 One-hour Exterior Wall Assembly, Fire Exposure from Either Side:

The wall assembly must be constructed as follows:

- a) Wall Framing:
- Minimum nominal 2-inch-by-6-inch wood studs spaced a maximum 16 inches (406 mm) on center, with two top plates and one bottom plate.
- b) Interior Wall Sheathing:
- One layer of 5/8-inch-thick (15.88 mm), 4-foot-wide (1.2 m), Type X gypsum wallboard installed vertically, with horizontal joints blocked.
- Attach wallboard with minimum 6d, cup-head drywall nails 1⁷/₈-inch-long (47.63 mm), with 0.0915-inch (2.32 mm) shank diameters and 1/4-inch (6.35 mm) head diameters, spaced maximum 6 inches (152 mm) on center along all studs, blocking and plates.
- Finish exposed fastener heads and wallboard joints with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or fiberglass tape must be embedded in the first layer of compound over wallboard joints.
- c) Insulation:
- Glass fiber batts, faced or unfaced, 6¹/₄-inch-thick (140 mm) with a minimum R-19 thermal insulation rating. Friction-fit batts between studs, blocking, and top and bottom plates.
- d) Exterior Wall Sheathing:
- One layer of LP® FlameBlock® Plus Fire-Rated Sheathing (product 15382-10 with the Pyrotite® layer applied to one face of the sheathing) installed vertically, with horizontal joints blocked, and with the Pyrotite® layer facing the exterior. Gap panels 1/8 inch (3.18 mm) and fill panel edge gaps with 3M™ Fire Barrier Sealant IC 15WB+.
- Attach sheathing to studs with 2¹/₂-inch-long (47.63 mm), 8d nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (305 mm) on center in the field.
- The design axial compressive stresses for the wood stud must be calculated in accordance with Sections 3.6 and 3.7 of ANSI/AWC/AF&PA NDS and must be limited to the least of the following:
- 303 psi.
 - 0.29 F'_c.

- c. $0.29 F'_c$, where F'_c is calculated assuming a slenderness ratio of 21.

4.4.4 Two-hour Exterior Wall Assembly—Wood Stud Limited Load Bearing Wall (Optional Steel Stud)—Interior Fire Exposure:

The wall assembly must be constructed as follows:

a) Wall Framing:

- Minimum nominal 2-inch-by-4-inch wood studs spaced a maximum 16 inches (406 mm) on center, or minimum nominal 2-inch-by-6-inch wood studs spaced a maximum 24 inches (609 mm) on center, with two top plates and one bottom plate of same size as studs.
- (Optional) Minimum $3\frac{1}{2}$ inch (89 mm) deep steel studs, minimum No. 20 MSG corrosion protected cold formed steel, spaced a maximum 24 inches (406 mm) on center. Studs are attached to floor and ceiling steel tracks with $\frac{1}{2}$ -inch-long Type S-12 steel screws on both sides of the studs or by welded or bolted connections. Design calculations and details of the steel stud framed wall must be in accordance with AISI Specifications and must be submitted to the local code official.

b) Interior Wall Sheathing:

- Two layers of $\frac{5}{8}$ -inch-thick (15.88 mm), 4-foot-wide (1219 mm), Type X gypsum wallboard installed vertically. Except at wall plates, horizontal joints of the base layer of wallboard must be blocked unless horizontal joints of the face layer of wallboard are staggered a minimum of 12 inches (305 mm). The face layer must be installed with vertical joints staggered a minimum of 16 inches (406 mm) from the base layer.

Attached base layer of wallboard to studs with minimum 6d cup-head drywall nails $1\frac{7}{8}$ -inch-long (47.63 mm), with 0.0915-inch (2.32 mm) shank diameters and $\frac{1}{4}$ -inch (6.35 mm) head diameters, spaced maximum 6 inches (152 mm) on center along all studs, blocking and plates.

Attached face layer of wallboard to studs with minimum 8d, cup-head drywall nails $2\frac{3}{8}$ -inch-long (60.33 mm), with 0.113-inch (2.87 mm) shank diameters and $\frac{9}{32}$ -inch (7.14 mm) head diameters, spaced maximum 8 inches (203 mm) on center along all studs, blocking and plates.

Finish exposed fastener heads and wallboard joints of face layer with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or fiberglass tape must be embedded in the first layer of compound over wallboard joints.

c) Insulation:

- Mineral fiber batts, faced or unfaced, with a minimum 3.0 pcf (48.1 kg/m³) nominal density to fill stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates.
- (Optional) For wood studs only: Glass fiber batts, faced or unfaced, with a minimum 0.25 pcf (4 kg/m³) nominal density to fill stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates. The insulation may be applied in multiple layers to achieve thickness.

d) Exterior Wall Sheathing:

- One layer of LP® FlameBlock® Fire-Rated Sheathing (product 15382-3 or 15382-7, with the Pyrotite® layer applied to both faces of the sheathing) installed with the Pyrotite® layer facing the wall cavity. Sheathing is installed vertically, with horizontal joints blocked.

Attach sheathing to studs with $1\frac{7}{8}$ -inch-long (47.63 mm), 6d sinker nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (304.8 mm) on center in the field. The wall must have a fire separation distance of greater than 10 feet (3048 mm).

The design axial compressive stresses for the wood stud must be calculated in accordance with Sections 3.6 and 3.7 of ANSI/AWC/AF&PA NDS and must be limited to the least of the following:

- 387 psi.
- $0.95 F'_c$.
- $0.95 F'_c$, where F'_c is calculated assuming a slenderness ratio of 33.

4.4.5 Two-hour Exterior Wall Assembly, Fire Exposure from Either Side:

The wall assembly must be constructed as follows:

a) Wall Framing:

- Minimum nominal 2-inch-by-6-inch wood studs spaced a maximum 16 inches (406 mm) on center, with two top plates and one bottom plate.

b) Interior Wall Sheathing:

- Two layers of $\frac{5}{8}$ -inch-thick (15.88 mm), 4-foot-wide (1.2 m), Type X gypsum wallboard installed vertically. Except at wall plates, horizontal joints of the base layer of wallboard must be blocked unless horizontal joints of the face layer of wallboard are staggered a minimum of 12 inches (305 mm). The face layer must be installed with vertical joints staggered a minimum of 16 inches (406 mm) from the base layer.

Attached base layer of wallboard to studs with minimum 6d, cup-head drywall nails $1\frac{7}{8}$ -inch-long (47.63 mm), with 0.0915-inch (2.32 mm) shank diameters and $\frac{1}{4}$ -inch (6.35 mm) head diameters, spaced maximum 6 inches (152 mm) on center along all studs, blocking and plates.

Attached face layer of wallboard to studs with minimum 8d, cement-coated, cup-head drywall nails $2\frac{3}{8}$ -inch-long (60.33 mm), with 0.113-inch (2.87 mm) shank diameters and $\frac{9}{32}$ -inch (7.14 mm) head diameters, spaced maximum 8 inches (203 mm) on center along all studs, blocking and plates.

Finish exposed fastener heads and wallboard joints of face layer with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or fiberglass tape must be embedded in the first layer of compound over wallboard joints.

c) Insulation:

- Mineral fiber batts, faced or unfaced, with a minimum 2.7 pcf (43.3 kg/m³) nominal density to fill stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates.

d) Exterior Wall Sheathing:

- One layer of 2-sided LP® FlameBlock® Fire-Rated Sheathing (product 15382-3 or 15382-7, with the Pyrotite® layer to both faces of the sheathing). Sheathing is installed vertically, with horizontal joints blocked.

Attach sheathing to studs with 1⁷/₈-inch-long (47.63 mm), 6d sinker nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (304.8 mm) on center in the field.

- One layer of 5/8-inch-thick (15.88 mm), 4-foot-wide (1219 mm), Exterior Type X gypsum wallboard installed vertically. Except at wall plates, horizontal joints of the base layer of wallboard must be blocked. The face layer must be installed with vertical joints staggered a minimum of 16 inches (406 mm) from the sheathing layer.

Attached face layer of exterior wallboard through sheathing into studs with minimum 6d, cement-coated, cup-head drywall nails 1⁷/₈-inch-long (47.63 mm), with 0.0915-inch (2.32 mm) shank diameters and 1/4-inch (6.35 mm) head diameters, spaced maximum 6 inches (152 mm) on center along all studs, blocking and plates.

Fastener heads and exterior wallboard joints are not required to be finished.

The design axial compressive stresses for the wood stud must be calculated in accordance with Sections 3.6 and 3.7 of ANSI/AWC/AF&PA NDS and must be limited to the least of the following:

- 625 psi.
- 0.73 F_c.
- 0.73 F_c, where F_c is calculated assuming a slenderness ratio of 21.

4.3.6 Two-hour Assembly—Wood Stud Limited Load Bearing Fire-resistance-rated—Interior Party Wall: The wall assembly must be constructed as follows:

a) Wall Framing:

- Double-framed wall consisting of two identical stud walls with a 1-inch (25.4 mm) air space between.
- Minimum nominal 2-inch-by-4-inch wood studs spaced a maximum 16 inches (406 mm) on center, or minimum nominal 2-inch-by-6-inch wood studs spaced a maximum 24 inches (609 mm) on center, with two top plates and one bottom plate of same size as studs.
- Wall studs in opposing walls may be aligned or staggered.

b) Wall Sheathing:

Configuration A: (see Figure 1)

- Base layer of LP® FlameBlock® Fire-Rated Sheathing (Product 15382-3 or 15382-7), with the Pyrotite® layer applied to one face of the sheathing) installed with the Pyrotite® layer facing the wall studs. The sheathing is installed vertically, with horizontal joints blocked. For vertical installation, horizontal joints of the sheathing layer must be blocked unless horizontal joints of the face layer of wallboard are staggered a minimum of 12 inches (305 mm).

- Attach base layer to studs with 1⁷/₈-inch-long (47.63 mm), 6d sinker nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (304.8 mm) on center in the field.

- Face layer of 5/8-inch-thick (15.88 mm), 4-foot-wide (1219 mm), Type X gypsum wallboard installed vertically with vertical joints staggered a minimum of 16 inches (406 mm) from the fire-rated sheathing.

Attach face layer of wallboard to studs with minimum 8d, cup-head drywall nails 2³/₈-inch-long (60.33 mm), with 0.113-inch (2.87 mm) shank diameters and 9/32-inch (7.14 mm) head diameters, spaced maximum 8 inches (203 mm) on center along all studs, blocking and plates.

Finish exposed fastener heads and wallboard joints of face layer with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or fiberglass tape must be embedded in the first layer of compound over wallboard joints.

Configuration B: (see Figure 1)

- LP® FlameBlock® Fire-Rated Sheathing (product 15382-3 or 15382-7, with the Pyrotite® layer applied to one face of the sheathing) installed to gap-side of walls with the Pyrotite® layer facing the wall studs. The sheathing is installed vertically, with horizontal joints blocked. For vertical installation, horizontal joints of the sheathing layer must be blocked unless horizontal joints of the face layer of wallboard are staggered a minimum of 12 inches (305 mm).

Attach sheathing to studs with 1⁷/₈-inch-long (47.63 mm), 6d sinker nails, spaced 6 inches (152 mm) on center around the perimeter of the sheathing and 12 inches (305 mm) on center in the field.

- One layer of 5/8-inch-thick (15.88 mm), 4-foot-wide (1.2 m), Type X gypsum wallboard installed vertically to occupancy-side of walls.

Attach face layer of wallboard to studs with minimum 8d, cup-head drywall nails 1⁷/₈-inch-long (60.33 mm), with 0.113-inch (2.87 mm) shank diameters and 9/32-inch (7.14 mm) head diameters, spaced maximum 8 inches (203 mm) on center along all studs and plates.

(Optional) Attach face layer of wallboard to 25 MSG galvanized steel resilient channel, spaced vertically 24 inches (610 mm) on center, flange portion screw-attached to one side of studs with 1¹/₄-inch long diamond-shaped point, double lead, Phillips head screws.

Finish exposed fastener heads and wallboard joints of face layer with two layers of gypsum compound. A minimum 2-inch-wide (51 mm) paper, plastic or fiberglass tape must be embedded in the first layer of compound over wallboard joints.

c) Insulation:

- Mineral fiber batts, faced or unfaced, with a minimum 3.0 pcf (48.1 kg/m³) nominal density to fill stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates.
- Optional) Glass fiber batts, faced or unfaced, with a minimum 0.25 pcf (4 kg/m³) nominal density to fill

- stud cavity. Friction-fit batts between studs, blocking, and top and bottom plates. The insulation may be applied in multiple layers to achieve thickness.

Fire exposure may be from either side of the wall.

The design axial compressive stresses for the wood stud must be calculated in accordance with Sections 3.6 and 3.7 of ANSI/AWC/AF&PA NDS and must be limited to the least of the following:

- 387 psi.
- $0.95 F'_c$.
- $0.95 F'_c$, where F'_c is calculated assuming a slenderness ratio of 33.

STC Ratings:

- Configuration A: STC = 61
- Configuration B: STC = 61

To achieve the STC ratings, the wall must be constructed as follows:

- Wall studs in opposing wall must be staggered 8 inches (203 mm) on center.
- Insulation must be mineral fiber batts.
- Configuration B requires the gypsum wallboard attached to resilient channels.

4.5 Fire-classified Roof Covering Assemblies:

The following assemblies must be installed at a minimum slope of 1/4:12 (2 percent) and a maximum slope of:

- Class A: 1/2:12 (4 percent)
- Class C: 2:12 (16 percent)

4.5.1 Class A, Fully Adhered, Single-ply Membrane Roof Covering Assembly:

The roof deck must be product No. 15382-5, Blazeguard® FR or Mule-Hide FR Deck Panel A installed with the Pyrotite® layer facing the exterior (up). All deck joints must be blocked with nominally 2-by-4 lumber. Gaps in the deck panels must be caulked with Rectorseal FlameSafe FS900+ UL-classified sealant. The deck must be covered with an EPDM, TPO or PVC membranes, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, or a self-adhered modified bitumen cap sheet. Roofing membranes must be UL-classified for roofing systems and must be recognized in a current ICC-ES evaluation report.

An EPDM membrane must be fully adhered to the deck with Mule-Hide Acrylic Water-Base Bonding Adhesive, recognized in Section 3.4 of this report. The adhesive must be applied at a rate of 100 square feet per gallon (2.45 m²/L).

A TPO or PVC membrane must be fully adhered to the deck with Aqua Base 120 Bonding Adhesive, recognized in this Section 3.4 of this report. The adhesive 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 roll back over the substrate and broomed smooth to ensure proper contact.

4.5.2 Class A, Mechanically Attached, Single-ply Membrane Roof Covering Assembly:

The roof deck must be product No. 15382-5, Blazeguard® FR Deck Panel A installed with the Pyrotite® layer facing the exterior (up). The deck must be covered with an EPDM or TPO membrane, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, mechanically attached. The membrane must be UL-classified for roofing systems and must be recognized in a current ICC-ES evaluation report.

4.5.3 Class C, Fully Adhered, Single-ply Membrane Roof Covering Assembly:

The roof deck must be product No. 15382-6, Blazeguard® FR or Mule-Hide Deck Panel C installed with the Pyrotite® layer facing the exterior (up). The deck must be covered with an EPDM or TPO membrane, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, or a PVC membrane, either 0.050 or 0.060 inch (1.27 or 1.52 mm) thick.

See Section 4.4.1 for membrane and adhesive application.

4.5.4 Class C, Mechanically Attached, Single-ply Membrane Roof Covering Assembly:

The roof deck must be product No. 15382-6, Blazeguard® FR Deck Panel C installed with the Pyrotite® layer facing the exterior (up). The deck must be covered with an EPDM or TPO membrane, either 0.045 or 0.060 inch (1.14 or 1.52 mm) thick, mechanically attached. The membrane must be UL-classified for roofing systems and must be recognized in a current ICC-ES evaluation report.

4.6 Wind Uplift Resistance—EPDM or TPO Membrane:

Assemblies with an EPDM or TPO membrane, fully adhered only, described and installed in accordance with Section 4.4 have an allowable uplift resistance as follows:

Membrane Type	Panel Thickness (in. (mm))	Allowable Uplift ¹ (psf (kPa))
EPDM	⁷ / ₁₆ (11.1)	120 (5.75)
TPO	¹⁵ / ₃₂ (11.9)	45 (2.15)
TPO	¹⁹ / ₃₂ (15.1)	55 (2.63)

¹Allowable Uplift loads are based on a test load divided by 2.

5.0 CONDITIONS OF USE

The LP® FlameBlock® Fire-Rated Sheathing, Blazeguard® FR and Mule-Hide FR 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 The structural system is outside the scope of this report and must be designed in accordance with the IBC or the IRC.
- 5.2 The LP® FlameBlock® Fire-Rated Sheathing, must be covered with a wall covering complying with the IBC or IRC, when installed as exterior sheathing.
- 5.3 Use of the LP® FlameBlock® Fire-Rated Sheathing, and Blazeguard® FR and Mule-Hide FR Deck Panels for applications other than those noted in Section 4.2 of this report is outside the scope of this report.
- 5.4 Shear walls constructed with LP® FlameBlock® Fire-Rated Sheathing with the Pyrotite® layer directly applied to an OSB substrate only, as described in Sections 3.2.6 and 3.2.7, may be designed in accordance with the ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS) Section 4.3.7.1 and Table 4.3A for the Equivalent Performance Category, noted in Table 1 of this report.

Shear walls constructed with LP® FlameBlock® Fire-Rated Sheathing with the Pyrotite® layer either adhesively or mechanically applied to either plywood or OSB substrates must be designed for the Base Performance Category, noted in Table 1 of this report.

5.5 LP® FlameBlock® Fire-Rated Sheathing, and Blazeguard® FR and Mule-Hide FR Deck Panels are manufactured by Louisiana-Pacific Corporation, in Watkins, Minnesota, and in Thomasville, Alabama, 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 August 2020).
- 6.2 Reports of physical and mechanical tests in accordance with the US DOC Voluntary Product Standard PS 2.
- 6.3 Report of the cyclic shear wall testing in accordance with ASTM E2126.

7.0 IDENTIFICATION

- 7.1 Each panel covered by this report must be identified by a stamp bearing the manufacturer's name (Louisiana-Pacific Corporation) or listee's name (Mule-Hide Products Company, Inc.), the product name, the

product identification number, the manufacturer's location or mill number, and the evaluation report number (ESR-1365).

Each panel must have the grade, thickness and span rating designation for the wood structural panels visible for field identification after lamination.

- 7.2 The report holder's contact information is the following:

LOUISIANA-PACIFIC CORPORATION
414 UNION STREET, SUITE 2000
NASHVILLE, TENNESSEE 37219
(888) 820-3025
www.lpcorp.com
customer.support@lpcorp.com

- 7.3 The Additional Listee's contact information is the following:

MULE-HIDE PRODUCTS COMPANY, INC.
1195 PRINCE HALL DRIVE
BELOIT, WISCONSIN 53511
(608) 365-3111
www.mulehide.com
mulehide@mulehide.com



15/32
CATEGORY
FIRE-RATED
OSB SHEATHING

RATED SHEATHING

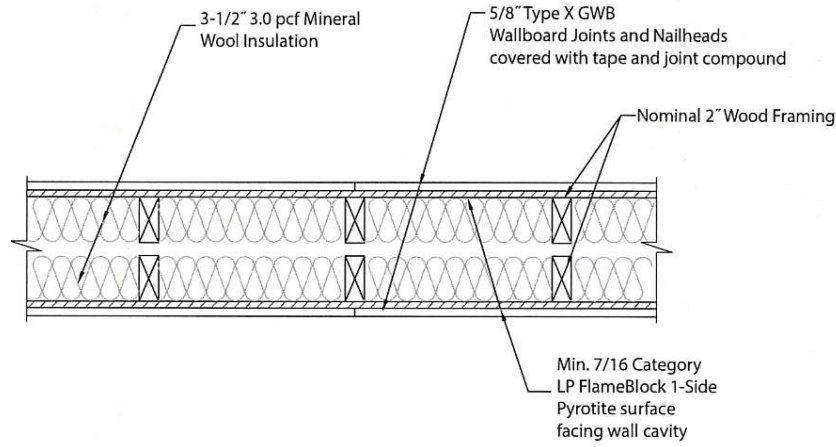
32/16

SIZED FOR SPACING
 EXPOSURE 1

DESIGN LOADS AT: LPCORP.COM/FLAMEBLOCK

888-820-0325 LPCorp.com

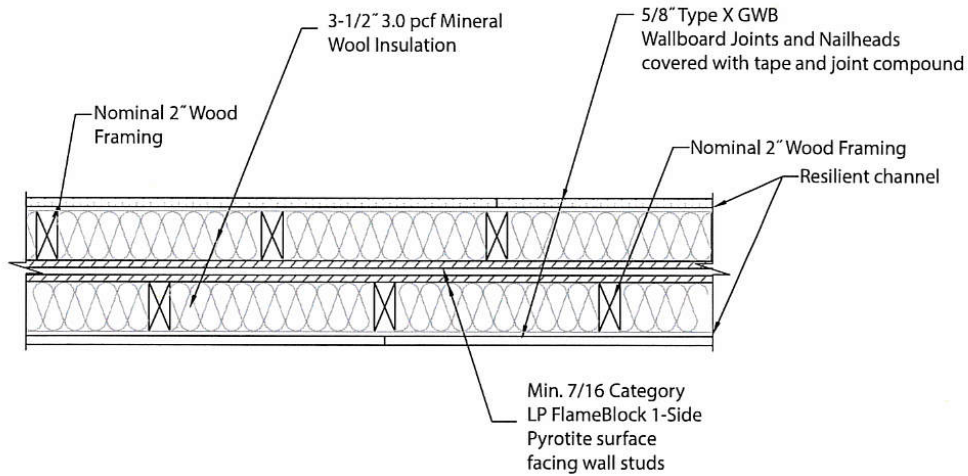
PRODUCT LABEL



HORIZONTAL SECTION
 DESIGN No. - UL BXUV.U350
 2-HOUR INTERIOR PARTY WALL
 STC Rating = 61

Configuration A

NOTE: Wall studs in opposing walls must be staggered to achieve STC rating.



HORIZONTAL SECTION
 DESIGN No. - UL BXUV.U350
 2-HOUR INTERIOR PARTY WALL
 STC Rating = 61

Configuration B

NOTE: Wall studs in opposing walls must be staggered to achieve STC rating.

FIGURE 1—CONFIGURATIONS A AND B (REFER TO SECTION 4.3.6)

NOTE: Except to achieve STC ratings, walls studs in both configurations may be aligned or staggered.

TABLE 1—EQUIVALENT PERFORMANCE CATEGORY¹ FOR LP® FLAMEBLOCK® FIRE-RATED SHEATHING

BASE OSB SUBSTRATE: SHEATHING			BASE OSB SUBSTRATE: STRUCTURAL I SHEATHING		
Base Performance Category	Coated 1-side	Coated Both Sides	Base Performance Category	Coated 1-side	Coated Both Sides
3/8 OSB	7/16 OSB ²	7/16 Structural I ²	3/8 Structural I	7/16 Structural I ²	7/16 Structural I ²
7/16 OSB	15/32 OSB ²	15/32 Structural I ²	7/16 Structural I	15/32 Structural I ²	15/32 Structural I ²
15/32 OSB	15/32 OSB	15/32 Structural I ²	15/32 Structural I	15/32 Structural I	15/32 Structural I
19/32 OSB	19/32 OSB	19/32 OSB	19/32 Structural I	19/32 Structural I	19/32 Structural I
23/32 OSB	23/32 OSB	23/32 OSB	23/32 Structural I	23/32 Structural I	23/32 Structural I

Notes:

¹Equivalent performance categories apply only to LP® FlameBlock® Fire-Rated Sheathing manufactured with an OSB substrate and are based on testing in accordance with the US DOC Voluntary Product Standard PS 2. Tabulated equivalent performance categories are subject to change pending additional testing.

²Equivalent performance category verified as better than original base OSB substrate through testing in accordance with the US DOC Voluntary Product Standard PS 2.

TABLE 2—FASTENER WITHDRAWAL VALUES FOR LP® FLAMEBLOCK® FIRE-RATED SHEATHING

PRODUCT DESCRIPTION	DESIGN LOADS (lbf)					
	1-1/4" Hand Driven Roofing Nail	1-1/4" Power Driven Roofing Nail	#10 Wood Screw	#12 Wood Screw	#14 Wood Screw	#15 Wood Screw
7/16 Performance Category OSB w/ Chopped Fiberglass	14.9	21.2	97.0	98.6	106.3	107.5
7/16 Performance Category OSB w/ Continuous Mat Fiberglass	16.4	16.4	---	---	---	---
19/32 Performance Category OSB w/ Continuous Mat Fiberglass	29.5	26.0	---	---	---	---

For SI: 1 lbf = 4.448 N.

TABLE 3—UNIFORM ROOF LIVE LOAD CAPACITIES WITH SHEATHING STRENGTH AXIS PERPENDICULAR TO SUPPORTS

Description		7/16 Performance Category OSB w/ Chopped Fiberglass	7/16 Performance Category OSB w/ Mat Fiberglass	19/32 Performance Category OSB w/ Mat Fiberglass
Framing Spacing	Coated Side	Uniform (psf)	Uniform (psf)	Uniform (psf)
16" o.c.	Up	141	140	275
16" o.c.	Down	---	200	---
24" o.c.	Up	62	72	151
24" o.c.	Down	---	94	---
32" o.c.	Up	---	34	81

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

TABLE 4—UNIFORM FLOOR LIVE LOAD CAPACITIES WITH SHEATHING STRENGTH AXIS PERPENDICULAR TO SUPPORTS

Description		19/32 Performance Category OSB w/ Mat Fiberglass
Framing Spacing	Coated Side	Uniform (psf)
16" o.c.	Up	192
19.2" o.c.	Up	100

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

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

REPORT HOLDER:

LOUISIANA-PACIFIC CORPORATION

EVALUATION SUBJECT:

LP® FLAMEBLOCK® FIRE-RATED SHEATHING
BLAZEGUARD® FR DECK PANELS AND MULE-HIDE FR DECK PANELS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the LP® FlameBlock® Fire-Rated Sheathing and Blazeguard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing, described in ICC-ES evaluation report [ESR-1365](#), 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:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The LP® FlameBlock® Fire-Rated Sheathing and Blazeguard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1365](#), comply with the LABC Chapters 15 and 23, and the LARC Sections R604 and R803.2, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The LP® FlameBlock® Fire-Rated Sheathing and Blazeguard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1365](#).
- The design, installation, conditions of use and identification of the LP® FlameBlock® Fire-Rated Sheathing and Blazeguard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing, are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report [ESR-1365](#).
- The design is in accordance with the additional requirements of LABC Chapter 16 and 23, as applicable.
- The fire resistive wall assemblies specified in Section 4.3.1 and Section 4.3.4 are not approved for use in Group A, E, H, I, L and R occupancies and other application listed in Section 1.11 of the 2020 LABC, regulated by the Office of State Fire Marshal.
- Panels must be used only in locations where combustible materials are permitted in the 2020 LABC.
- Exterior wall assemblies must be covered with an approved exterior weather resistive barrier as required per Section 1403.2 of the 2020 LABC.

This supplement expires concurrently with the evaluation report ESR-1365, reissued April 2022.

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

REPORT HOLDER:

LOUISIANA-PACIFIC CORPORATION

EVALUATION SUBJECT:

LP® FLAMEBLOCK® FIRE-RATED SHEATHING
BLAZEGUARD® FR DECK PANELS AND MULE-HIDE FR DECK PANELS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that LP® FlameBlock® Fire-Rated Sheathing, BlazeGuard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing, described in ICC-ES evaluation report ESR-1365, has 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 LP® FlameBlock® Fire-Rated Sheathing, BlazeGuard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing described in Sections 2.0 through 7.0 of the evaluation report ESR-1365, complies with the *Florida Building Code—Building* and the *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-1365 for the 2018 and 2015 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the LP® FlameBlock® Fire-Rated Sheathing, BlazeGuard® FR Deck Panel and Mule-Hide FR Deck panels, LP® FlameBlock® and BlazeGuard® Rated Sheathing, and LP® FlameBlock® and BlazeGuard® Structural 1 Sheathing 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 supplemental 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).

This supplement expires concurrently with the evaluation report ESR-1365, reissued April 2022.