



ICC-ES Evaluation Report

ESR-4566

Reissued April 2023

This report is subject to renewal April 2025.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 42 43—Composite Wall Panels

REPORT HOLDER:

ALFLEX, INC.

EVALUATION SUBJECT:

ALFLEX FR COMPOSITE PANELS

1.0 EVALUATION SCOPE

1.1 Compliance with the following code:

2021 and 2018 *International Building Code*® (IBC)

Properties evaluated:

- Interior Finish
- Structural
- Fire-Resistance

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-4566 LABC and LARC Supplement](#).

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning (OSHPD) and Division of State Architects (DSA), see [ESR-4566 CBC Supplement](#).

1.2 Evaluation to the following green code(s) and/or standards:

- 2022 and 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 National Green Building Standard™ (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

Alflex FR composite panels are the cladding component of the MCM systems (fabricated panels and extrusion attachment systems), used as exterior wall panels in accordance with Chapter 14, and as interior wall finish in accordance with Chapter 8 of the IBC.

When Alflex FR MCM panels are used on exterior walls of Types I through IV Construction, they must be installed in accordance with Section 4.5 of this report.

3.0 DESCRIPTION

3.1 General:

Alflex FR panels are metal composite materials (MCM) that comply with the requirements of IBC Section 1406. The panels are fabricated to size and fitted with aluminum profiles used for stiffening the panel against deflection and for anchorage to the building substructure.

The attributes of the composite panels have been verified as conforming to the provisions of (i) 2022 and 2019 CALGreen Sections A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (ii) ICC 700-2020 Sections 601.7 and 11.601.7 and ICC 700-2015 and ICC 700-2012 Sections 601.7, 11.601.7, and 12.1(A).601.7 (site-applied finishing materials); and (iii) ICC 700-2008 Section 601.7 (site-applied finishing materials). Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. The code may provide supplemental information as guidance.

3.2 Material:

Alflex FR metal composite material consists of 0.019-inch (0.5 mm) thick aluminum facers bonded to both sides of a 0.118-inch (3 mm) extruded copolymer core material containing polyethylene with inorganic and fire-retardant fillers. The core components are compounded and extruded to form the final core profile and then bonded to the facers in a continuous process involving controlled heat and pressure to make the MCM. The aluminum facers may be painted or anodized as required.

Alflex FR material is manufactured in a nominal thickness of 0.157 inch (4 mm) and is available in widths up to 62 inches (1575 mm) and lengths up to 25 feet (7620 mm).

The Alflex FR panels have a Class A interior finish classification with a flame spread index less than 25 and a smoke developed index less than 450 when tested in accordance with ASTM E84.

3.3 Aluminum Extrusions:

The aluminum extrusions used as stiffeners and for perimeter anchorage are typically extruded 6063-T5 alloy

aluminum complying with ASTM B317. Stiffener extrusions are adhered to the backside of the panel using a combination of tape and structural adhesive. Perimeter extrusions are mechanically fastened to the fabricated "return leg" of the panel and fastened to the substructure to transfer panel loading.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The maximum allowable design wind load pressure for the Alfrex FR system installed in accordance with this report is +20 psf and -35 psf (+958 N/m² and -1677 N/m²). The MCM panel system as well as the MCM panel support framing, including wall studs and extrusions must be designed in accordance with the IBC to support applicable load combinations.

4.2 Installation:

The MCM fabricators (Fabricator) cut a route into the flat MCM panels a fixed distance from each edge leaving the face sheet uncut at the base of the routed groove. The edges are then folded to a 90-degree angle to create return legs measuring 3/4-inch (19 mm) deep, using the uncut facer to act as a hinge so that the flat MCM panel is formed into a pan shape. The Fabricator then attaches the aluminum perimeter extrusions to each return leg with No. 10 corrosion-resistant self-drilling screws. The Fabricator also installs H-shaped aluminum stiffeners to the back facer of the panels, parallel to the 60 inches (1524 mm) maximum panel span at a maximum spacing of 24 inches (610 mm) on center. The stiffeners are adhered to the back side of the MCM panels using self-adhering foam tape and an approved structural silicone sealant/adhesive complying with ASTM C1184, and attached to the perimeter aluminum extrusions with No. 8 corrosion-resistant self-drilling screws at each end. The maximum panel width, measured in the direction parallel to the stiffeners, must not exceed 5 feet (1.52 m). The perimeter extrusions are anchored with 2-inch (51 mm) aluminum anchor clips that interlock with the perimeter extrusion and are then attached to the supporting structure as determined by a registered design professional.

MCM systems must be assembled in a fabrication facility with only minor adjustments allowed to account for an accurate system installation. The appropriate installation procedures must follow the manufacturer's published installation instructions and the specific requirements of this report must be strictly adhered to.

4.3 Interior Wall Covering:

Alfrex FR panels may be used as an interior wall finish in compliance with IBC Chapter 8. The panels must be installed on the interior side of the wall in accordance with Section 4.2 of this report. The panels have a class A interior finish classification.

4.4 Two-hour Fire-resistance-rated Nonload-bearing Wall Assembly:

Where exterior nonload-bearing walls are required to be of two-hour fire-resistance-rated, the Alfrex FR panels must be built in accordance with the following:

Two layers of Type X gypsum board must be installed with the long dimension oriented perpendicular to minimum 25-gage thick steel studs spaced 24 inches (610 mm) on center on both the interior and exterior surfaces. The base layer must be fastened to the framing with 1 1/4-inch (31.8 mm) Type S self-drilling drywall screws spaced 16 inches (406 mm) on center. The face layer must be installed with the long dimension oriented horizontally offset 24 inches from the base layer and secured using 1 5/8-inch

(41.3 mm) self-tapping Type S drywall screws spaced 16 inches (406 mm) on-center, 8-inch (203 mm) offset from those of the base layer. The opposite side of the wall assembly must receive the gypsum board in the same manner, but with the joints offset 24 inches (610 mm) from the opposite side of the assembly. The joints and fasteners of the face layers must receive a Level 2 finish.

The MCM panels must be installed in accordance with Section 4.2 of this report and this section. The MCM panel must be installed with the long dimension oriented vertically leaving a nominal 1/2-inch (12.7 mm) wide joint between panel edges. The MCM panels must be secured to the perimeter extrusions using No. 12 corrosion-resistant self-drilling screws. The joint must be filled with 0.875-inch-thick (22 mm-thick) open cell polyurethane backer rod (Industrial Thermo Polymers Limited Tundra Foam) and then sealed using Dow Corning 795 silicone sealant/adhesive.

4.5 Exterior Walls of Buildings of Type I, II, III or IV (Noncombustible) Construction of Any Height in Accordance with IBC Section 1406.10:

Where exterior walls are required to be of noncombustible construction, Alfrex FR panels must be built in accordance with the following:

The walls must be framed with minimum 20 gage C-channel steel studs at 24 inches (610 mm) on center. The interior surface of the wall must be faced with one layer of 5/8-inch (16 mm) thick Type X gypsum board in compliance with ASTM C1396. The gypsum board must be fastened to the wall framing with No. 6 by 1 1/4-inch (31.8 mm) long, self-drilling screws with a spacing of 8 inches (203 mm) around the board perimeter and 12 inches (305 mm) in the field. Gypsum board joints and fastener heads must be finished and taped in accordance with ASTM C840 or GA216. The walls must be filled with 4 pcf (64 kg/m³) mineral wool insulation at the intersection of the floor and exterior wall in accordance with IBC Section 715.4.

The exterior surface of the wall assembly must be faced with one layer of horizontally installed 5/8-inch (16 mm) thick gypsum sheathing in compliance with ASTM C1177. The gypsum sheathing must be fastened to the wall framing with No. 6 by 1 1/4-inch (31.8 mm) long, corrosion-resistant self-drilling screws at a spacing of 8 inches (203 mm) around the board perimeter and 12 inches (305 mm) in the field. Openings must be framed with No. 20 gage cold-formed steel framing. 0.040-inch (1.1 mm) thick aluminum flashing must be installed around the opening.

The exterior gypsum sheathing was covered with VaproShield® WrapShield® SA as a water membrane (water-resistive barrier). The self-adhering membrane must be installed with a minimum 6 inches (152 mm) overlap in accordance with the manufacturer's installation instructions.

Horizontally placed 18 gage thick cold-formed steel Z-shaped members are attached to frame wall studs using corrosion-resistant 5/16-inch-diameter (8 mm-diameter) hex head self-drilling screws. 3 inches (76 mm) thick mineral wool insulation with a density of 6.2 pcf (100 kg/m³) is installed between the Z-shaped members. The MCM panel system is attached through the aluminum perimeter extrusions in accordance with Section 4.2 of this report. The MCM panels were secured to the Z-shaped steel members using 5/16-inch-diameter (8 mm-diameter) hex-head self-drilling screws fastened to aluminum clips spaced 24 inches (610 mm) on center around the perimeter of the MCM panels. The MCM panel joints measured 1/2-inch (12.7 mm) wide. MCM panel splines were installed into vertical and horizontal panel joints to conceal the anchor fasteners.

5.0 CONDITIONS OF USE

The Alfrex FR composite panels and panel installation system described in this report complies with, or is a suitable alternative 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 manufacturer's published instructions, the applicable code and the approved plans. If there are any conflicts between this report and the manufacturer's installation instructions, this report governs. A copy of the manufacturer's instructions must be available on the jobsite during installation.
- 5.2 The design of the structural support system (building framing, attachment accessories, and fasteners) and panel connections provided by the MCM systems fabricator must be submitted to and approved by the code official for each project. The allowable load capacity reported in Section 4.1 of this report must not exceed the design loads determined in accordance with Chapter 16 of the IBC.
- 5.3 The MCM systems fabricator must provide a certificate of compliance to the code official attesting that the MCM system fabrication includes the use of adhesives approved for use, that the adhesive application complies with the adhesive manufacturer's installation guidelines, and that the MCM system fabrication complies with approved construction documents. Additionally, when the attachment methods employ adhesives other than to adhere stiffeners to the backs of the panels, special inspections are required in accordance with IBC Section 1704.2.5, or the fabricator must be approved by the code official in accordance with IBC Section 1704.2.5.1, as such operations are outside the scope of this report.
- 5.4 Where Alfrex MCM panels are installed on exterior walls of Types I, II, III or IV construction, Alfrex MCM systems must be installed as specified in Section 4.5 of this report.

5.5 Installation of Alfrex MCM systems onto a fire-resistance-rated exterior wall must comply with Section 4.4 of this report. Alternatively, MCM systems may be installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly.

5.6 Evidence of weather protection of the wall cladding system must be submitted to the code official in accordance with IBC Section 1406.6.

5.7 The Alfrex panels are manufactured under a quality control program with inspections conducted by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Metal Composite Material (MCM) (AC25), dated October 2010 (editorially revised March 2021), including NFPA 285.

7.0 IDENTIFICATION

7.1 Labeling includes product name, product identification information, thickness, flame-spread and smoke-developed indices, manufacture date and time, and ICC-ES ESR number (ESR-4566).

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

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 42 43—Composite Wall Panels

REPORT HOLDER:

ALFREX, INC.

EVALUATION SUBJECT:

ALFREX FR COMPOSITE PANELS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Alfrex FR composite panels, described in ICC-ES evaluation report [ESR-4566](#), have also been evaluated for compliance with the code noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code edition:2020 *City of Los Angeles Building Code* (LABC)**2.0 CONCLUSIONS**

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4566](#), comply with LABC Chapters 7, 8 and 14 and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Alfrex FR composite panels described in this evaluation report supplement must comply with the following conditions:

- All applicable sections in the evaluation report [ESR-4566](#).
- The design, installation, conditions of use and identification of the Alfrex FR composite panels are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4566](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 7, 8, 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued April 2023.

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Applicable code edition:2022 and 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 and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS**2.1 CBC:**

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4566, comply with CBC Chapters 7, 8 and 14, provided the design and installation are in accordance with the 2021 and 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16 and 17, as applicable.

2.1.1 OSHPD:

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4566, comply with CBC Chapters 7, 8 and 14 [OSHPD 1, 1R, 2, 4 and 5], provided the design and installation are in accordance with the 2021 and 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16 and 17, as applicable.

2.1.2 DSA:

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4566, comply with CBC Chapters 7, 8 and 14 [DSA-SS and DSA-SS/CC], provided the design and installation are in accordance with the 2021 and 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued April 2023.