



ICC-ES Evaluation Report ESR-2653

Reissued September 2022

Revised June 2023

This report is subject to renewal September 2024.

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

REPORT HOLDER:

MITSUBISHI CHEMICAL AMERICA, ALPOLIC DIVISION

ADDITIONAL LISTEES:

MITSUBISHI CHEMICAL INFRADEC CO., LTD.

MITSUBISHI POLYESTER FILM GmbH ALPOLIC DIVISION

EVALUATION SUBJECT:

ALPOLIC®/fr WALL PANELS

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018, 2015 2012, 2009 *International Building Code*®
- Other Codes (see Section 8.0)
- 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.

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-2653 LABC Supplement](#).

Properties evaluated:

- Structural
- Fire performance
- Durability

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

- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 70-2015, ICC 700-2012 and ICC 700-2008)

Attributed verified:

- See Section 3.1

2.0 USES

The Alpolic®/fr wall panels are aluminum composite panels complying with the 2021 and 2018 IBC Section 1406 (2015, 2012, and 2009 IBC Section 1407) for metal composite materials (MCM) and are used as nonload-bearing exterior wall panels in accordance with Section 1406 of the 2021 and 2018 IBC (Section 1407 of the 2015, 2012, and 2009 IBC). Additionally, the Alpolic®/fr wall panels are used as an interior wall finish in accordance with Section 803 of the IBC. For installation on exterior walls of Type I, II, III, or IV construction, the Alpolic®/fr wall panels must be installed as a component of exterior wall assemblies constructed in accordance with Section 4.3 of this report. For installation on exterior fire-resistance-rated walls, the wall assemblies must be constructed in accordance with Section 4.5.

3.0 DESCRIPTION

3.1 Panels:

The Alpolic®/fr wall panels are aluminum composite wall panels manufactured in two nominal thicknesses, 4 millimeters and 6 millimeters (0.16 or 0.23 inch). The panels consist of two nominally 0.020-inch-thick (0.5 mm) aluminum skins bonded to both surfaces of a polyethylene-based core [nominal density of 93 pcf (1490 kg/m³)] that contains inorganic fillers. The panel skins have a factory-applied painted finish.

The nominal thickness of the core material is 0.118 inch (3 mm) for the 4-millimeter-thick (0.16 mm) wall panels and 0.197 (5.0 mm) for the 6-millimeter-thick (0.23 inch) wall panels.

The Alpolic®/fr wall panels are available in widths from 30 inches (762 mm) to 62 inches (1575 mm). Lengths are available from 4 feet (1219 mm) to 24 feet (7315 mm). The 4-millimeter- and 6-millimeter-thick Alpolic®/fr MCM wall panels weigh 1.54 psf and 2.23 psf (7.5 and 10.9 kg/m²), respectively.

The Alpolic®/fr wall panels have a flame-spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in accordance with ASTM E84.

The attributes of the Alpolic®/fr wall panels have been verified as conforming to the provisions of (i) CALGreen Sections A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (ii) 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 Panel Stiffeners and Attachment Accessories:

Installation of the Alpolic®/fr wall panels requires the following materials that are supplied by the MCM systems fabricator in a rout-and-return, dry-set type installation method (see Figure 1):

- Continuous I-shaped extruded aluminum stiffeners (see callout 1 of Figure 1), alloy 6063-T6.
- Extruded aluminum mounting bars along perimeter of the panels (see callouts 2 and 3 of Figure 1), alloy 6063-T6.
- Extruded aluminum retainer clips (see detail of callout 3), alloy 6063-T6.
- Spline angles.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The maximum allowable transverse loads for the Alpolic®/fr panels installed in accordance with this report are as follows:

- 4mm Alpolic®/fr wall panels: 75 psf (3.6 kPa) positive; and 22.5 psf (1.1 kPa) negative
- 6mm Alpolic®/fr wall panels: 75 psf (3.6 kPa) positive; and 22.5 psf (1.1 kPa) negative

4.2 Installation:

4.2.1 General: If there are any conflicts between this report and the manufacturer's installation instructions, this report governs. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the manufacturer's instructions must be available at all times on the jobsite during installation.

4.2.2 Installation (Rout-and-return, Dry-set Type Method):

The system's fabricator must route around the entire perimeter of the flat panels along the panel edges using a V-groove router, leaving the face sheet uncut at the base of the routed groove. The panel edges are then folded at a right angle to create a return leg at each panel edge, using the uncut facer sheet to act as a hinge so that the flat panels are formed into "pans." A $\frac{3}{4}$ moon-shaped groove is also cut into each return leg of the panels to facilitate panel interlock with the mounting bars described below. Spline angles must be shop-attached at the panel corners by the panel fabricator using pop-rivets. Additionally, the system's fabricator must install I-shaped extruded aluminum stiffeners on the back of the panels, running the full panel width, parallel to the panel span at a maximum spacing of 24 inches (610 mm) on center. The stiffeners must be adhered to the panels using an approved structural silicone sealant/adhesive complying with ASTM C1184; and secured to the top and bottom of the panels using No. 10 x $\frac{1}{4}$ -inch long (32 mm) buglehead, fine-

thread, self-drilling screws at each stiffener location. The panel length measured in the direction parallel to the stiffeners shall not exceed 5 feet (1.52 m). See Figure 1.

4.3 Exterior Walls of Buildings of Type I, II, III or IV Construction in accordance with NFPA 285 testing:

Extruded aluminum mounting bars must be attached to the building walls at the jobsite. The panels are then attached to the mounting bars using extruded aluminum retainer clips so that the panels are pressure interlocked into the bulb end of the mounting bars.

1. Where exterior walls are required to be noncombustible construction, the walls with the Alpolic®/fr wall panels must be constructed as follows: Minimum 43-mil [0.0428 inch minimum base-metal thickness (1.09 mm)], $3\frac{5}{8}$ -inch-deep (92.1 mm), cold-formed steel C-shaped studs spaced a maximum of 16 inches (406 mm) on center.
2. The interior side of the wall must be covered with one layer of minimum $\frac{5}{8}$ -inch-thick (15.9 mm), Type X gypsum wallboard, applied vertically with horizontal joints blocked. The wallboard must be fastened to the studs and blocking in accordance with the IBC. The interior wallboard joints must be taped and treated with paper tape and joint compound. The screw heads must be treated with joint compound.
3. The exterior side of the wall must be covered with one layer of minimum $\frac{5}{8}$ -inch-thick (15.9 mm), Type X gypsum sheathing complying with ASTM C79, with horizontal joints blocked. The sheathing must be attached to studs and blocking in accordance with the IBC.
4. The wall cavity between the steel studs must be filled with $3\frac{5}{8}$ -inch-thick (92 mm), R-11, foil-faced, glass-fiber insulation.
5. All openings in the wall construction must be framed with minimum 43-mil [0.0428 inch minimum base-metal thickness (1.09 mm)] galvanized steel framing.

The Alpolic®/fr panels must be installed on the exterior side of the wall in accordance with Section 4.2, except that the horizontal panel joints must not occur within 5 feet (1.52 m) above an opening. The floor level cavity at the intersection of the floor slab and the exterior wall framing system must be completely filled with an approved material or system meeting the criteria specified in 2021, 2018, 2015 and 2012 IBC Section 715.4 or 2009 IBC Section 714.4.

4.4 Interior Wall Covering:

The Alpolic®/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. The panels have a Class A interior finish classification.

4.5 Fire-resistance Rated Wall Assemblies:

The Alpolic®/fr wall panels used in fire-resistance-rated walls must be in accordance with the following:

4.5.1 Two-hour Fire-resistance Rated, Nonload-bearing Wall Assembly:

1. Minimum 43-mil [0.0428 inch minimum base-metal thickness (1.09 mm)], $3\frac{5}{8}$ -inch-deep (92.1 mm), cold-formed steel C-shaped studs spaced a maximum of 16 inches (406 mm) on center.
2. The interior side of the wall must be covered with two layers of $\frac{5}{8}$ -inch-thick (16 mm), Type X gypsum

wallboard applied vertically. Horizontal joints of the first layer of wallboard must be blocked unless horizontal joints of the adjacent wallboard layers are staggered a minimum of 12 inches (305 mm). The first layer must be attached to the steel studs and blocking with 1⁵/₈-inch-long (41 mm), No. 6, Type S drywall screws spaced at 8 inches (203 mm) on center along the wallboard perimeter and joints and 12 inches (305 mm) on center in the field of the wallboard. The second layer must be attached to the steel studs and blocking with 2¹/₄-inch-long (57 mm), No. 6, Type S drywall screws spaced at 8 inches (203 mm) on center at the perimeter, and 12 inches (305 mm) on center in the field of the wallboard. The joints of the face layer must be taped and treated with joint compound complying with ASTM C474 and ASTM C475. The screw heads must be treated with the same joint compound.

3. The exterior side of the wall must be covered with two layers of 5/₈-inch-thick (16 mm), Type X gypsum sheathing applied vertically. Horizontal joints of the first layer of wallboard must be blocked unless horizontal joints of the adjacent sheathing layers are staggered a minimum of 12 inches (305 mm). The first layer must be attached to the steel studs and blocking with 1⁵/₈-inch-long (41 mm), No. 6, Type S drywall screws spaced at 8 inches (203 mm) on center along the perimeter and joints and 12 inches (305 mm) on center in the field of the sheathing. The second layer must be attached to the steel studs and blocking with 2¹/₄-inch-long (57 mm), No. 6, Type S drywall screws spaced at 8 inches (203 mm) on center at the perimeter, and 12 inches (305 mm) on center in the field of the sheathing. The joints of the face layer must be taped and treated with joint compound complying with ASTM C474 and ASTM C475. The screw heads must be treated with same joint compound.
4. The wall cavity between the steel studs must be filled with 3⁵/₈-inch-thick (92 mm), 16-inch-wide (406 mm), R-13 fiberglass batt insulation.
5. The Alpoli[®]/fr wall panels must be attached to the exterior face of the wall assembly in accordance with Section 4.2.

4.5.2 One-hour Fire-resistance-rated Nonload-bearing Wall Assembly:

1. Minimum 43-mil [0.0428 inch minimum base-metal thickness (1.09 mm)], 3⁵/₈-inch-deep (92.1 mm), cold-formed steel C-shaped studs spaced a maximum of 16 inches (406 mm) on center.
2. The interior side of the wall must be covered with one layer of 5/₈-inch-thick (16 mm), Type X gypsum wallboard, applied vertically with horizontal joints blocked and fastened to the steel studs and blocking with 1⁵/₈-inch-long (41 mm), No. 6, Type S drywall screws spaced at 8 inches (203 mm) on center along the wallboard perimeter and joints and 12 inches (305 mm) on center in the field of the wallboard. The wallboard joints must be taped and treated with joint compound complying with ASTM C474 and ASTM C475. The screw heads must be treated with the same joint compound.
3. The exterior side of the wall must be covered with one layer of 5/₈-inch-thick (16 mm), Type X gypsum sheathing, applied vertically with horizontal joints blocked and attached to the steel studs and blocking with 1⁵/₈-inch-long (41 mm), No. 6, Type S drywall screws spaced at 8 inches (203 mm) on center along the sheathing perimeter and joints and 12 inches (305 mm) on center in the field of the sheathing. The sheathing joints must be taped and treated with joint compound complying with ASTM C474 and ASTM C475. The screw heads must be treated with the same joint compound.
4. The wall cavity between the steel studs must be filled with 3⁵/₈-inch-thick (92 mm), 16-inch-wide (406 mm), R-13 fiberglass batt insulation.
5. The Alpoli[®]/fr wall panels must be attached to the exterior face of the wall assembly in accordance with Section 4.2.

5.0 CONDITIONS OF USE

The Alpoli[®]/fr wall panels described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation must comply with this report, the manufacturer's published installation instructions, the applicable code and approved construction documents.
- 5.2 The design of the structural support system (building framing, panel mounting hardware, attachment accessories, and silicone adhesive) and panels' connections to their supporting mounting bars provided by the MCM systems fabricator must be submitted to and approved by the code official for each project.
- 5.3 The allowable transverse load capacity for the MCM system, including the panels' screw attachment to stiffeners and the panels' interlock with the mounting bar/retainer clip assembly must be submitted to and approved by the code official for each project. The allowable transverse load capacity must equal or exceed the design loads determined in accordance with IBC Chapter 16. The allowable transverse loads for the MCM panels are set forth in Section 4.1.
- 5.4 Where Alpoli[®]/fr wall panels are installed on exterior walls on buildings of Type I, II, III and IV construction, the walls must be constructed in accordance with Section 4.3 of this report.
- 5.5 The MCM system 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, should the use of adhesives extend beyond the installation of stiffeners to the back of the panels for the purpose of increasing panel stiffness only, special inspections are required in accordance with the 2021, 2018, 2015 and 2012 IBC Section 1704.2.5 or 2009 IBC Section 1704.2, or the fabricator must be approved by the code official in accordance with the 2021, 2018, and 2015 IBC Section 1704.2.5.1, 2012 IBC Section 1704.2.5.2 or 2009 IBC Section 1704.2.2.
- 5.6 Where a fire-resistance-rated exterior wall is required, walls must be constructed in accordance with Section 4.5 of this report. Additionally, Alpoli[®]/fr wall panels are permitted on the outer face of a fire-resistance-rated exterior wall assembly as allowed under the Exception to 2021 and 2018 IBC Section 1406.8 (2015, 2012 and 2009 IBC Section 1407.8).

- 5.7 Evidence of weather tightness of the wall cladding system in accordance with 2021 and 2018 IBC Section 1406.6 (2015, 2012, and 2009 IBC Section 1407.6) must be submitted to the code official.
- 5.8 The panels are manufactured by Mitsubishi Chemical America, ALPOLIC Division, in Chesapeake, Virginia, by Mitsubishi Chemical Infratec Co., Ltd. in Ueda City, Japan, and Mitsubishi Polyester Film GmbH in Wiesbaden, Germany 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 Composite Material (AC25), dated October 2010 (editorially revised March 2021), including NFPA 285 and ASTM E119 tests.

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-2653) along with the name (Mitsubishi Chemical America, ALPOLIC Division; Mitsubishi Chemical Infratec Co., Ltd.; or Mitsubishi Polyester Film GmbH), registered trademark, or registered logo of the report holder or additional listee must be included in the product label.
- 7.2 In addition, the panels are identified by a label noting the applicable manufacturing address, product name, thickness, and the flame-spread index.
- 7.3 The report holder's contact information is the following:

**MITSUBISHI CHEMICAL AMERICA,
ALPOLIC DIVISION
401 VOLVO PARKWAY
CHESAPEAKE, VIRGINIA 23320
(757) 382-5750
www.alpolic-americas.com**

- 7.4 The Additional Listees' contact information is the following:

**MITSUBISHI CHEMICAL INFRATEC CO., LTD.
1-1-1 MARUNOCHI
CHIYODA-KU, TOKYO 100-8251
JAPAN**

**MITSUBISHI POLYESTER FILM GmbH
ALPOLIC DIVISION
KASTELER STRASSE 45/E512
WIESBADEN 65203
GERMANY**

8.0 OTHER CODES

8.1 Evaluation Scope:

In addition to the code referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the 2006 *International Building Code*® (2006 IBC).

The Alpolic®/fr exterior and interior wall panels described in this report comply with, or are suitable alternatives to what is specified in, the 2006 IBC, subject to the provisions of Sections 8.2 through 8.7 as noted below.

8.2 Uses:

See Section 2.0.

8.3 Description:

See Section 3.0.

8.4 Installation:

See Section 4.0 except that, in the last paragraph of Section 4.3, the floor level cavity at the intersection of the floor slab and the exterior wall framing system must be completely filled with an approved material or system meeting the criteria specified in IBC Section 713.4.

8.5 Conditions of Use:

See Section 5.0 but replace the wording in Section 5.5 with the following:

Where a fire-resistance-rated exterior wall is required, walls must be constructed in accordance with Section 4.5 of this report.

8.6 Evidence Submitted:

See Section 6.0.

8.7 Identification:

See Section 7.0.

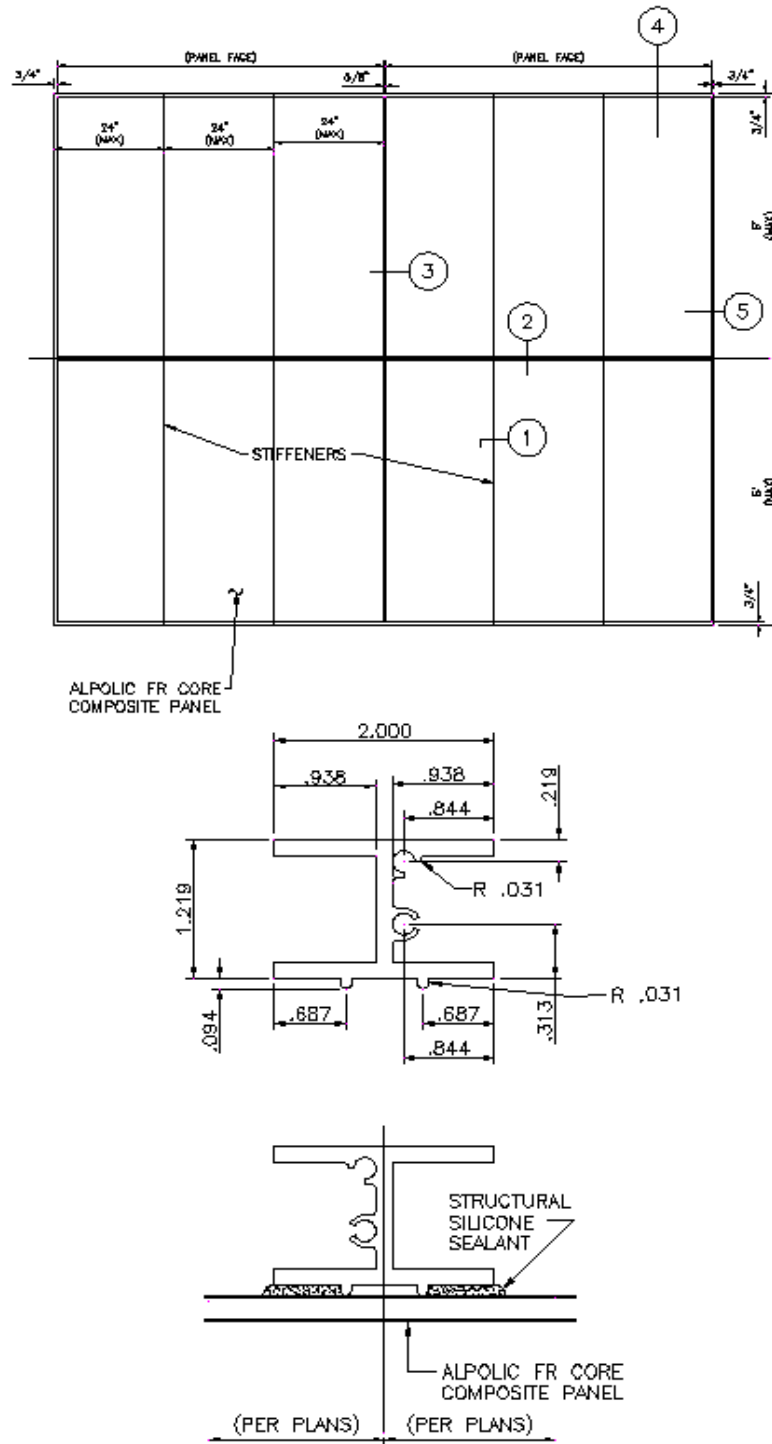


FIGURE 1—STIFFENER

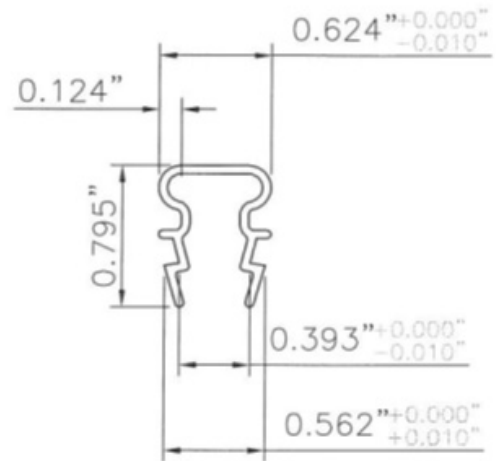
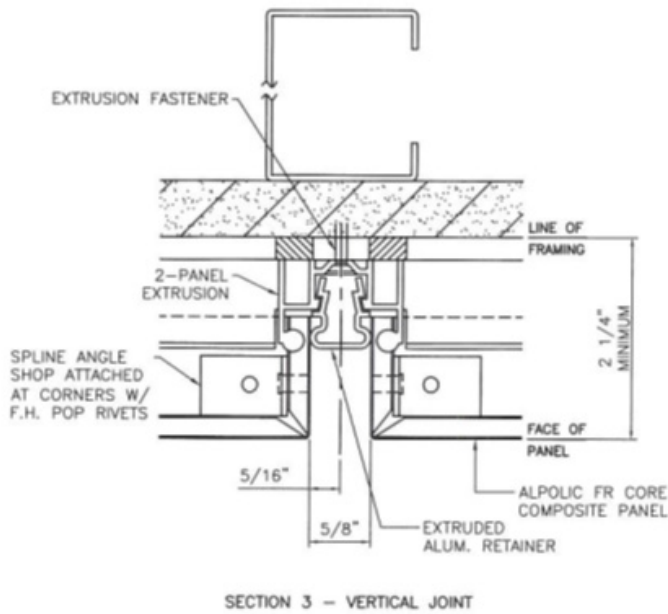
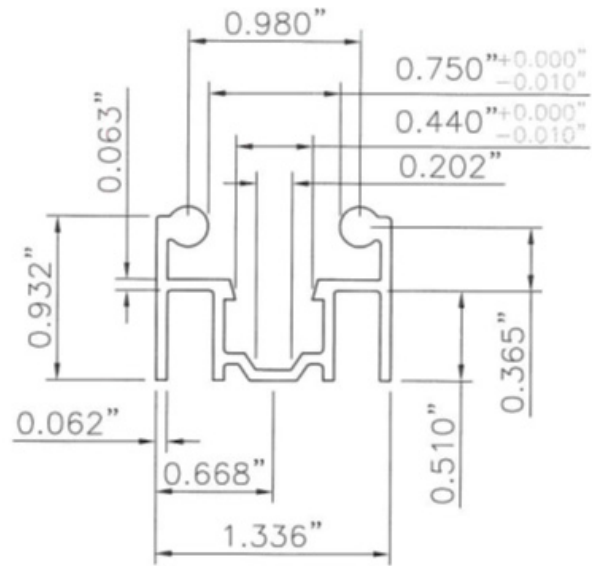
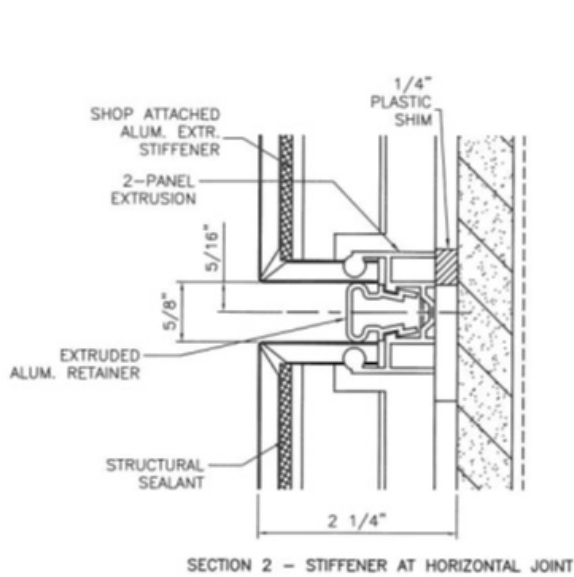
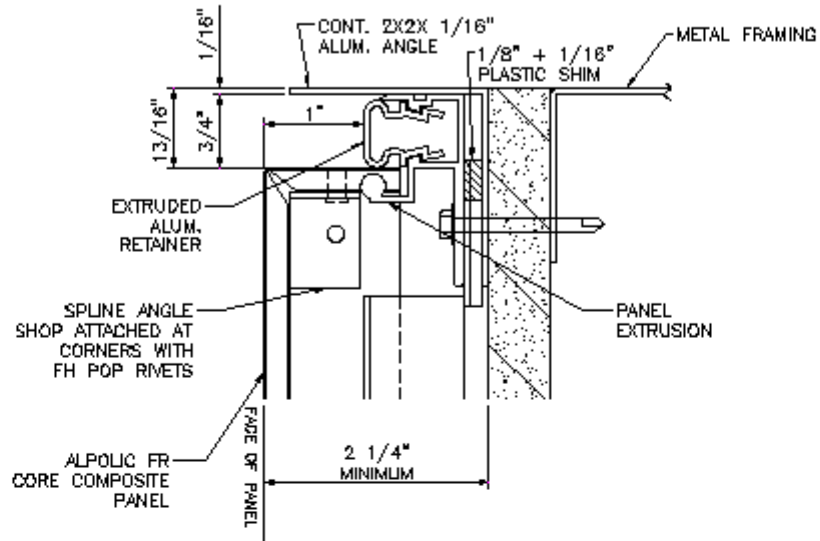
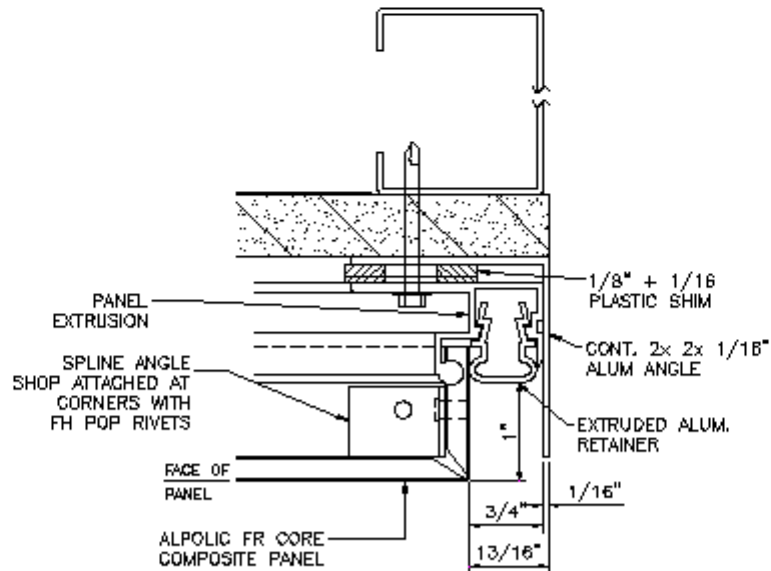


FIGURE 1—STIFFENER (Continued)



SECTION 4 - HORIZONTAL TOP JOINT



SECTION 5 - SIDE JOINT

FIGURE 1—STIFFENER (Continued)

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

REPORT HOLDER:

MITSUBISHI CHEMICAL AMERICA, ALPOLIC DIVISION

EVALUATION SUBJECT:

ALPOLIC®/fr WALL PANELS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Alpolic®/fr wall panels described in ICC-ES evaluation report [ESR-2653](#), 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:

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

2.0 CONCLUSIONS

The Alpolic®/fr wall panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-2653](#), comply with the LABC Chapters 7, 8 and 14, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Alpolic®/fr wall panels described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-2653](#).
- The design, installation, conditions of use and identification of the Alpolic®/fr wall panels are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-2653](#).
- 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, reissued September 2022 and revised June 2023.

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

REPORT HOLDER:

mitsubishi chemical america, alpolic division

EVALUATION SUBJECT:

ALPOLIC®/fr WALL PANELS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Alpolic®/fr Wall Panels, described in ICC-ES evaluation report ESR-2653, have also been evaluated for compliance with the code noted below.

Applicable code edition:

- 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.

2.0 CONCLUSIONS**2.1 CBC:**

The Alpolic®/fr Wall Panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-2653, comply with CBC Chapters 7, 8, and 14, 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 CBC Chapters 16 and 17, as applicable.

2.2 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.3 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued September 2022 and revised June 2023.