

# ICC-ES Evaluation Report

**ESR-3704**

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

**Section: 07 42 43—Composite Wall Panels**

**REPORT HOLDER:**

**MITSUBISHI CHEMICAL COMPOSITES AMERICA, INC.**  
401 VOLVO PARKWAY  
CHESAPEAKE, VIRGINIA 23320  
(757) 382-5750  
[www.alpolic.com](http://www.alpolic.com)

**EVALUATION SUBJECT:**

**ALPOLIC® AP AND AT ALUMINUM COMPOSITE EXTERIOR AND INTERIOR WALL PANELS**

**1.0 EVALUATION SCOPE**

**1.1 Compliance with the following codes:**

- 2015 *International Building Code*® (2015 IBC)
- 2012 *International Building Code*® (2012 IBC)
- 2009 *International Building Code*® (2009 IBC)

**Properties evaluated:**

- Structural
- Interior finish classification

**1.2 Evaluation to the following green code:**

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

**Attributes verified:**

- See Section 2.0

**2.0 USES**

The Alpolic® wall panels are aluminum composite panels complying with IBC Section 1407 for metal composite materials (MCM) and are used as nonload-bearing exterior wall panels in accordance with IBC Section 1407. When used as an interior wall finish in accordance with IBC Section 803, the Alpolic® wall panels must be installed as described in Section 4.3. For installation on exterior fire-resistance-rated walls, the wall assemblies must be constructed in accordance with Section 4.4. For installation on exterior walls of Type I, II, III, or IV construction, the

Alpolic® wall panels must be installed as a component of exterior wall assemblies as described in Section 4.5.

The attributes of the Alpolic® Plus wall panels have been verified as conforming to the requirements 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.

**3.0 DESCRIPTION**

**3.1 Panels:**

**3.1.1 Alpolic® AP Panels:** The Alpolic® AP wall panels are aluminum composite wall panels manufactured in three nominal thicknesses of 3, 4 and 6 millimeters. The panels consist of two nominally 0.020-inch-thick (0.51 mm), 3105 Alloy-H14 Temper, aluminum skins bonded to both surfaces of a thermoplastic polyethylene core [nominal density of 57.8 pcf (926 kg/m<sup>3</sup>)]. The panel skins are available with a painted finish.

The nominal thickness of the core material is 0.08 inch (2 mm) for the 3-millimeter-thick wall panels, 0.12 inch (3 mm) for the 4-millimeter-thick wall panels, and 0.2 inch (5 mm) for the 6-millimeter-thick wall panels.

The Alpolic® AP wall panels are available in widths from 36 inches (914 mm) to 60 inches (1524 mm). Lengths are available from 4 feet (1219 mm) to 24 feet (7315 mm). The 3-, 4- and 6-millimeter-thick Alpolic® AP wall panels weigh 0.93 psf, 1.12 psf and 1.50 psf (4.5, 5.5 and 7.3 kg/m<sup>2</sup>), respectively.

The Alpolic® AP 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, and have a Class A interior finish classification.

**3.1.2 Alpolic® AT Panels:** The Alpolic® AT wall panels are aluminum composite wall panels manufactured in a nominal thickness of 3 millimeters (0.13 inch). The panels consist of a nominally 0.020-inch-thick (0.5 mm), 3105 Alloy-H14 Temper, aluminum front skin, and a nominally 0.010-inch-thick (0.3 mm), 5052 Alloy-H32 Temper, aluminum back skin bonded to both surfaces of a thermoplastic polyethylene core [nominal density of 57.8 pcf (926 kg/m<sup>3</sup>)]. The panel skins are available with a painted finish.

The nominal thickness of the core material is 0.09 inch (2.3 mm).

The Alpolic® AT wall panels are available in widths from 36 inches (914 mm) to 60 inches (1524 mm). Lengths are available from 4 feet (1219 mm) to 24 feet (7315 mm). The 3-millimeter-thick Alpolic® AT wall panels weigh 0.84 psf (4.1 kg/m<sup>2</sup>).

The Alpolic® AT wall panels has 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, and have a Class A interior finish classification.

### 3.2 Panel Stiffeners and Attachment Accessories:

Installation of the Alpolic® 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 2):

- Extruded aluminum perimeter rails, Alloy 6063-T5.
- Continuous I-shaped extruded aluminum stiffeners, Alloy 6063-T5.
- Extruded aluminum mounting bars, Alloy 6063-T5.

## 4.0 DESIGN AND INSTALLATION

**4.1 Design:** The maximum allowable transverse loads for the Alpolic® AP and AT wall panels installed in accordance with this report are as follows:

- 3mm (0.13 inch), Alpolic® AP wall panels: 70 psf (3.4 kPa) positive, and 60 psf (2.9 kPa) negative
- 4mm (0.16 inch), Alpolic® AP wall panels: 76 psf (3.6 kPa) positive, and 55 psf (2.6 kPa) negative
- 6mm (0.25 inch), Alpolic® AP wall panels: 70 psf (3.4 kPa) positive, and 55 psf (2.6 kPa) negative
- 3mm (0.13 inch), Alpolic® AT wall panels: 65 psf (3.1 kPa) positive, and 65 psf (3.1 kPa) negative.

The design of the structural support system (building framing, panel mounting hardware, attachment accessories, and silicone adhesive) and panels' fastening to their supporting aluminum perimeter rails, clips and/or framing members provided by the MCM systems fabricator must be submitted to and approved by the code official for each project. The allowable transverse load capacity for the MCM system, including the panels and their interlock with their fastenings, mounting hardware and/or attachment accessories, 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.

### 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 published instructions must be available at all times on the jobsite during installation.

**4.2.2 Installation:** The systems' fabricator must route the entire perimeter of the flat panels using a V-groove router, leaving the face sheet uncut at the base of the routed groove. The perimeter edges are then folded at a right angle to create return legs at the panel edges, using the uncut facer sheets to act as hinges so that the flat panels are formed into "pans". The systems' fabricator then installs aluminum perimeter rails along the inside of and along the folded edges, and secures the rails to the panels with No. 10 self-drilling corrosion-resistant metal screws. The systems' fabricator must also install I-shaped

aluminum stiffeners on the back of the panels, vertically, 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 attached to the perimeter rails at the top and bottom of the panel with a No. 10 self-drilling corrosion-resistant metal screw at each end. The panel length measured in the direction parallel to the stiffeners must not exceed 5 feet (1.52 m). Aluminum mounting bars must then be attached to the perimeter rails using No. 10 self-drilling corrosion-resistant metal screws; and the bars must then be attached to the building frame with ¼-inch-diameter (6.4 mm) self-tapping TEK screws. See Figure 2.

**4.3 Interior Wall Covering:** The Alpolic® AP and AT wall 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 above. The Alpolic® AP and AT wall panels have a Class A interior finish classification.

**4.4 Fire-resistance-rated Construction:** The Alpolic® AP and AT wall panels may be installed on the outer surface of a fire-resistance-rated exterior wall assembly provided the panel assembly attachments do not penetrate through the entire exterior wall assembly.

**4.5 Exterior Walls of Buildings of Type I, II, III or IV Construction:** The Alpolic® AP and AT panels must not be installed more than 40 feet (12 190 mm) in height above grade where installed as follows:

- Where the fire separation distance is 5 feet (1524 mm) or less, the area of MCM must not exceed 10 percent of the exterior wall surface.
- Where the fire separation distance is greater than 5 feet (1524 mm), there is no limit on the area of exterior wall surface using MCM.

## 5.0 CONDITIONS OF USE

The Alpolic® AP and AT 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' fastening to their supporting aluminum perimeter rails and/or framing members provided by the MCM systems fabricator must be submitted to and approved by the code official for each project. The allowable transverse load capacity for the MCM system, including the panels and their interlock with their fastenings, mounting hardware and/or attachment accessories, 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.
- 5.3** 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 2015 IBC Section 1704.2.5 or the 2012 and 2009 IBC Section 1704.2, or the fabricator must be approved by the code official in accordance with the 2015 IBC Section 1704.2.5.1, 2012 IBC 1704.2.5.2 or the 2009 IBC Section 1704.2.2.

- 5.4 Evidence of weather tightness of the wall cladding system in accordance with IBC Section 1407.6 must be submitted to the code official.
- 5.5 Where a fire-resistance-rated exterior wall is required, the walls must be constructed in accordance with Section 4.4 of this report.
- 5.6 Where Alpolic® AP and AT wall panels are installed on exterior walls on buildings of Type I, II, III or IV construction, the walls must be constructed in accordance with Section 4.5 of this report.
- 5.7 Where Alpolic® AP and AT wall panels are installed on exterior walls on buildings of Type I, II, III or IV construction, an approved thermal barrier must be installed to separate the MCM panel from the interior of the building as specified in IBC section 1407.10.2,

except when the MCM panel is an element of a balcony or similar projections, such as architectural trim or embellishments.

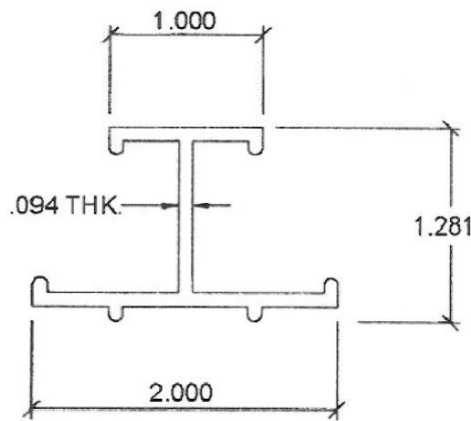
- 5.8 The panels are manufactured by Mitsubishi Chemical Composites America, Inc., in Chesapeake, Virginia, under a quality control program with inspections by ICC-ES.

**6.0 EVIDENCE SUBMITTED**

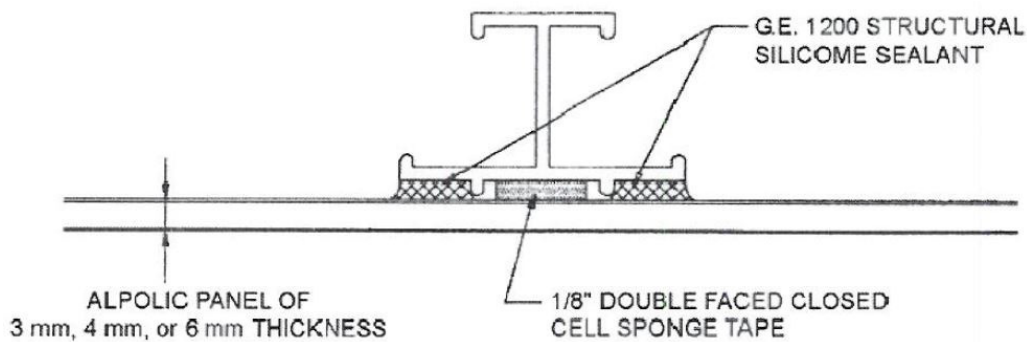
Data in accordance with the ICC-ES Acceptance Criteria for Metal Composite Material (AC25), dated October 2010 (Editorially revised November 2015).

**7.0 IDENTIFICATION**

The panels are identified by a label noting the Mitsubishi Chemical Composites America, Inc., company name and address, the product name, thickness, flame-spread index, and the evaluation report number (ESR-3704).



**INTERMEDIATE STIFFENER PROFILE**



**FIGURE 1—SYSTEM COMPONENTS**

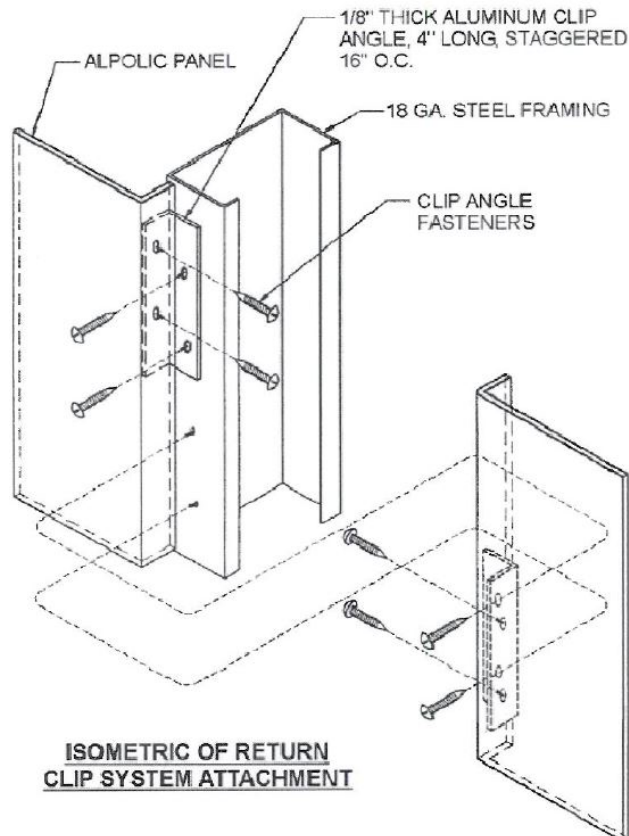
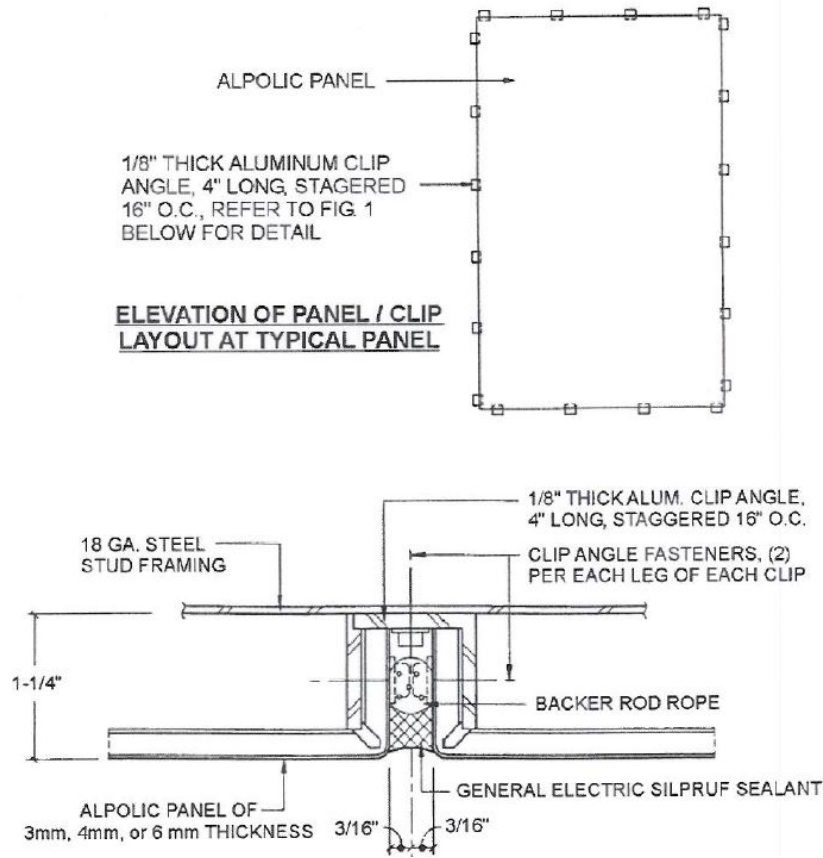


FIGURE 2—TYPICAL INSTALLATION DETAILS