

## ICC-ES Evaluation Report

ESR-3340

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DIVISION: 07 00 00—THERMAL AND MOISTURE  
PROTECTION

Section: 07 42 43—Composite Wall Panels

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## EVALUATION SUBJECT:

## MAX EXTERIOR F-QUALITY

## 1.0 EVALUATION SCOPE

## Compliance with the following codes:

- 2009 and 2006 *International Building Code*® (IBC)
- 2009 and 2006 *International Residential Code*® (IRC)

## Properties evaluated:

- Weather resistance
- Wind load resistance
- Interior finish
- Noncombustible construction

## 2.0 USES

The Max Exterior F-Quality Wall Panel Cladding System is used as a nonload-bearing exterior wall covering in accordance with Chapter 14 of the IBC. The system may also be used for interior applications as part of a Class A interior wall finish. The Max Exterior F-Quality Wall Panel Cladding System may be installed on buildings of all construction types under the IBC and on buildings constructed in accordance with the IRC.

## 3.0 DESCRIPTION

## 3.1 General:

The Max Exterior F-Quality Wall Panel Cladding System is an open-jointed wall covering system that allows air to circulate between the panels and the exterior face of the installed water-resistive barrier or mineral wool insulation. The panels are mounted on an extruded aluminum substructure. When used as an exterior wall covering, the system must be installed over a water-resistive barrier. See Figure 1 for system details.

## 3.2 Components:

**3.2.1 Panels:** Max Exterior F-Quality wall panels are decorative high-pressure laminates (HPLs) consisting of a core material made up of kraft paper and resin, and exterior faces consisting of melamine and resin. The panels have an integrated decorative surface. Max Exterior F-Quality wall panels are nominally  $\frac{3}{8}$  inch (10 mm) thick, and are available in a variety of sheet sizes, colors, finishes and textures. The panels weigh a nominal 3.0 psf (14.7 kg/m<sup>2</sup>).

The Max Exterior F-Quality wall panels meet the requirements of IBC Section 803.1.1 as a Class A interior finish when tested in accordance with ASTM E84.

**3.2.2 Substructure System:** The substructure is a system of extrusions made of ASTM B317, 6063-T5 or -T6 alloy aluminum, which is fastened to the existing building to provide support for the panels. The substructure includes  $\frac{1}{8}$ -inch-thick (3.18 mm) channels, including a J-channel with a nominal width of 3 inches (76 mm) and depth of 1 inch (25.4 mm), and a Hat channel with a nominal width of  $4\frac{1}{4}$  inches (108 mm) and depth of 1 inch (25.4 mm). The channels are fastened directly to the wall substrate or to the Allface F2.10 Fixing System.

**3.2.3 Allface F2.10 Fixing System:** The Fixing System is composed of horizontal L-profile rails and wall brackets of various lengths manufactured from ASTM B221, 6060-T68 alloy aluminum, fastened to the wall substrate providing a space for 2-inch-thick to 7-inch-thick (51 to 178 mm) mineral wool insulation. The L-profile rails are  $\frac{3}{32}$  inch (2.38 mm) thick and have  $2\frac{3}{8}$ -inch-wide (60.3 mm) horizontal and  $1\frac{9}{16}$ -inch-wide (39.7 mm) vertical legs. The wall brackets are  $\frac{5}{32}$  inch (3.97 mm) thick,  $3\frac{7}{16}$  inches (87 mm) wide and  $5\frac{1}{4}$  inches (133 mm) tall. The channels and rails weigh less than 1.0 pound per foot of length (1.5 kg/m).

## 4.0 DESIGN AND INSTALLATION

## 4.1 General:

The Max Exterior F-Quality Wall Panel Cladding System must be designed by a qualified design professional and the details must be submitted to the code official for approval. The cladding system must be installed in accordance with the project-specific structural calculations, details, and instructions, and with this report, by qualified installers recognized by Fundermax GmbH. A copy of the design and installation documents must be available on the jobsite at all times during construction.

## 4.2 Design:

The cladding system is designed to accommodate various architectural appearances within the limitations described

in this report. The allowable loads for the Max Exterior F-Quality Wall Panel Cladding System given in Table 1, and the wind-load capacity of the underlying wall and substrate, must equal or exceed the design uniform transverse wind loads determined in accordance with Chapter 16 of the IBC or Section R301.2.1 of the IRC, as applicable. The substructure system connections used to connect the Max Exterior F-Quality Wall Panel Cladding System to the underlying wall or substrate must be included in the design documents described in Section 4.1. The allowable loads must be reduced to the capacity of the attachment system connections to the substrate if these are less than the values in Table 1.

#### 4.3 Installation:

**4.3.1 General:** The Max Exterior F-Quality Wall Panel Cladding System (panels and substructure) must be installed over existing wall assemblies capable of supporting the imposed loads including, but not limited to, transverse wind loads. The system must be installed over wall assemblies complying with IBC Section 1403.3, using the substructure systems described in Section 3.2.2. The substructure must be securely connected to the supporting wall with corrosion-resistant fasteners that are compatible with the substructure materials and the substrate. The channels, L-profile rails, wall brackets, and fasteners are provided with the panels.

Exterior wall assemblies, on which the system is to be installed, must include flashing, a water-resistive barrier, a means of draining water, and protection against condensation in accordance with IBC Section 1403.2. A ventilation path must be maintained to allow air to flow into, out of, and within the cavity between the water-resistive barrier and the panels. The panels are cut and trimmed in accordance with the limitations described in the design documents and this report. Panel-to-panel joints and panel-to-penetration joints (such as at windows, doors, and air conditioning outlets) require a nominal gap of  $\frac{3}{8}$  inch (10 mm). To restrict pest and vermin access to the ventilation cavity, a vent screen may be installed at the base of the system and at window and door heads. The vent screen is composed of a perforated aluminum angle to cover the opening. Ventilation perforations must allow for a minimum opening of 2.36 square inches per linear foot (464 mm<sup>2</sup>/m). Joint closures may be installed at horizontal joints and corner closures may be installed at vertical corner joints as decorative elements when specified by the building designer.

**4.3.2 Substructure System Installation:** Connection of the channels to the underlying wall substrate must be designed in accordance with Section 4.2 and this section. The channels must be installed vertically at nominally 16, 24, or 32 inches (406, 610, or 813 mm) on center and fastened no more than 32, 21, or 16 inches (813, 533, or 406 mm) on center, respectively, to the underlying substrate of the building, to withstand the wind loads noted in Table 1. Fasteners must be compatible with the aluminum substructure extrusions and the wall substrate.

Alternatively, the channels may be fastened to the L-profile rails when the F2.10 Fixing System is used. The wall brackets must be spaced at 32, 24, or 16 inches (813, 610, or 406 mm) on center horizontally, and no more than 16, 21, and 32 inches (406, 533, or 813 mm) on center, respectively, vertically. Connection of the wall brackets to the underlying wall substrate must be designed in accordance with Section 4.2. The L-profiles must be fastened to the wall brackets using two  $\frac{3}{4}$ -inch-long (19.1 mm), No.  $\frac{3}{16}$ -14 stainless steel screws at each intersection. The channels must be spaced along the

L-profiles at a maximum spacing to coincide with the horizontal spacing of the wall brackets, and fastened with 1-inch-long (25.4 mm), No. 5.5, self-tapping screws with washers.

**4.3.3 Panel Fastening:** The panels must be connected to the substructure with minimum 1-inch-long (25.4 mm), No.12-11, self-tapping, stainless steel screws at a maximum of 32 inches (813 mm) on center, with at least one screw in every 3.55 square feet (0.33 m<sup>2</sup>) of panel area [example: screws must be spaced every 16 inches (406 mm) horizontally and 32 (812 mm) inches vertically, or every 21 inches (533 mm) horizontally and 24 inches (610 mm) vertically]. Each wall panel, at the panel attachment point, must be predrilled maintaining a minimum fastener edge distance of  $\frac{13}{16}$  inch (21 mm).

#### 4.4 Noncombustible Construction:

When installed as described in this section (Section 4.4), the Max Exterior F-Quality wall panels may be used on the exterior face of exterior walls of buildings required to be of Type I, II, III or IV construction.

The supporting wall must consist of minimum No.18 gage,  $\frac{3}{8}$ -inch (92 mm), C-channel steel studs spaced 16 inches (406 mm) on center. At each floor line, the stud cavities must be fire-stopped according to code. The studs must be covered with  $\frac{5}{8}$ -inch-thick (15.9 mm), Type X gypsum wallboard on the interior side, and  $\frac{1}{2}$ -inch-thick (12.7 mm) gypsum sheathing meeting ASTM C1177 on the exterior side, installed with the long dimensions perpendicular to the studs. The gypsum board must be fastened to the steel framing with No. 6 by  $\frac{1}{4}$ -inch-long (31.8 mm), Type S, bugle head screws at 8 inches (203 mm) on center around the perimeter and 12 inches (305 mm) on center in the field. The interior wallboard must be brought to a Level 2 finish in accordance with GA-214. The exterior side of the sheathing must be covered with a Grade D building paper that has a flame-spread rating of 25 or less and a smoke developed rating of 450 or less in accordance with ASTM E84.

**4.4.1 Assembly 1—Channels Fastened Directly to the Wall Substrate:** To the wall described in Section 4.4, aluminum channels as described in Section 3.2.2 must be installed over and fastened to each steel stud using 2-inch-long (51 mm), No. 12-11 self-drilling screws at 12 inches (305 mm) on center. The Max Exterior F-Quality wall panels must be fastened to the channels using 1-inch-long (25.4 mm), No.12-11, self-tapping, stainless steel screws at a maximum of 32 inches (813 mm) on center. A maximum free air cavity depth of 1 inch (25.4 mm) must be maintained behind the panels.

**4.4.2 Assembly 2—Channels Fastened to the F2.10 Fixing System Fastened to the Wall Substrate:** To the wall described in Section 4.4, the F2.10 Fixing System wall brackets described in Section 3.2.2 must be fastened to the steel studs at a maximum of 32 inches (813 mm) on center horizontally and a maximum of 24 inches (610 mm) on center vertically, using two No.14 by  $\frac{1}{2}$ -inch-long (38.1 mm) self-drilling screws per bracket [where installation is in maximum wind load conditions in accordance with Table 1, the maximum vertical spacing must be reduced to 16 inches (406 mm)]. The L-profile rails must be fastened to the wall brackets in accordance with Section 4.3.2. The space between the L-profile rails and the water-resistive barrier must be filled with nominally 4-pound-per-cubic-foot (64 kg/m<sup>3</sup>) mineral wool insulation, friction fit to fill the cavity. Aluminum channels as described in Section 3.2.2 must be installed vertically, spaced at a maximum of 24 inches (610 mm) on center, and fastened to the L-profile rails using self-tapping screws as described

in Section 4.3.2. The Max Exterior F-Quality wall panels must be fastened to the channels using 1-inch-long (25.4 mm), No.12-11, self-tapping, stainless steel screws spaced at a maximum of 32 inches (813 mm) on center. A maximum free air cavity depth of 1 inch (25.4 mm) must be maintained behind the panels.

**5.0 CONDITIONS OF USE**

The Max Exterior F-Quality Wall Panel Cladding 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 project-specific structural calculations, details, and instructions, and the applicable code. If there is a conflict between the installation instructions and this report, this report governs.
- 5.2 The underlying support structure and substrate must be adequate to resist the positive and negative transverse wind loads shown in Table 1.
- 5.3 Drawings, design details and calculations verifying compliance with this report and adequacy of the connections and supporting framing must be submitted to the code official for approval. The drawings and calculations must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.4 The maximum allowable wind pressures for the Max Exterior F-Quality Wall Panel Cladding System are shown in Table 1. The capacity of the supporting wall or substrate, and the capacity of the connections used to attach the system to the wall, must be equal to or exceed the design wind pressure.
- 5.5 When use is as an exterior wall covering, a water-resistant barrier complying with IBC Section 1403.2 must be installed behind the wall panel system and over the wall sheathing.

- 5.6 When installed with spaces between adjacent panels on interior walls, the Max Exterior F-Quality Wall Panel Cladding System must be installed over a substrate having a Class A finish.
- 5.7 The Max Exterior F-Quality Wall Panel Cladding System must be installed by qualified installers recognized by Fundermax GmbH.
- 5.8 The panels are manufactured in Wiener Neudorf, Austria, under a quality control program with inspections by QCC, LLC (AA-727).

**6.0 EVIDENCE SUBMITTED**

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Polymer-based and Polymer-modified Exterior and Interior Wall Cladding (AC92), dated April 2002 (corrected December 2010).
- 6.2 Reports of testing for noncombustible use in accordance with NFPA 285, NFPA 268, and NFPA 259.
- 6.3 Engineering calculations.

**7.0 IDENTIFICATION**

The Max Exterior F-Quality wall panels are labeled with the manufacturer's name (Fundermax GmbH) and address, the product name, thickness, color, finish, batch number, the evaluation report number (ESR-3340), and the name of the inspection agency (QCC, LLC). The panels arrive at the jobsite precut and with supplies of the channels, L-profile rails, wall brackets, and fasteners necessary for their installation. A panel cutting traceability sheet, project-specific placement instructions, and design documentation with calculations concerning attachment of the system to the underlying framing or substrate, are also included in the system packaging. This documentation must be available on the jobsite at all times during construction.

**TABLE 1— MAXIMUM SPACING AND ALLOWABLE TRANSVERSE LOADS**

PANEL THICKNESS	FASTENER/SUPPORT/SPAN MAXIMUM SPACING <sup>2</sup>	ALLOWABLE TRANSVERSE LOAD <sup>1</sup> (psf) POSITIVE AND NEGATIVE
3/8 inch	32 inches <sup>3</sup>	50

For SI: 1 inch = 25.4 mm; 1 psf = 47.9 N/m<sup>2</sup>.

<sup>1</sup>Maximum allowable transverse wind load capacity determined from ASTM E330 testing.

<sup>2</sup>Testing was carried out in a multi-span support configuration.

<sup>3</sup>Maximum spacing for fixing system, channels, fasteners, and panel span is 32 inches on center, with a minimum of one support, intersection, and fastener in every 3.55 square feet of panel area (example: horizontally / vertically, every 16 / 32 inches, or every 21 / 24 inches).

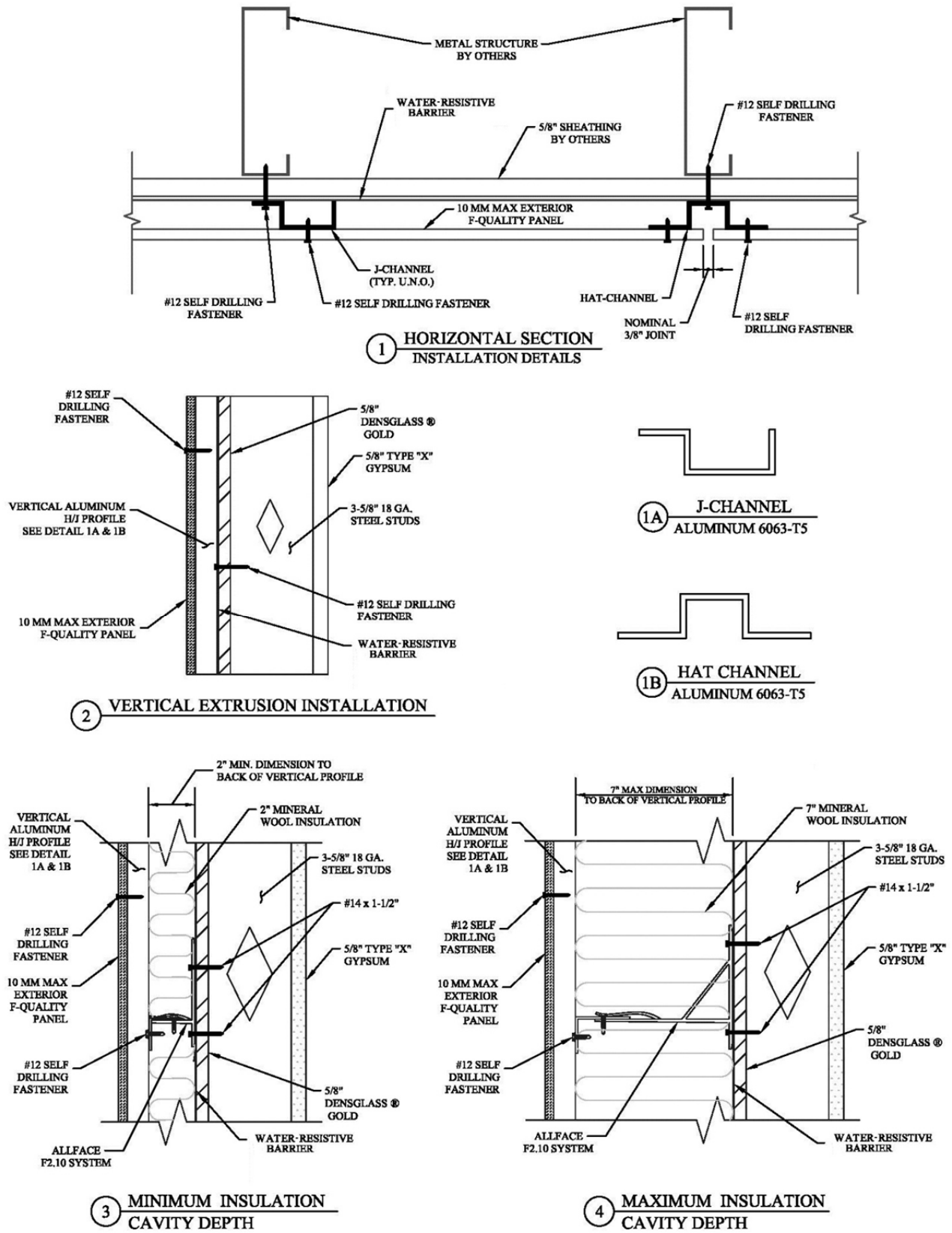


FIGURE 1—MAX EXTERIOR F-QUALITY WALL PANEL CLADDING SYSTEM DETAILS