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# ICC-ES Report

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# ESR-2398

Reissued 04/2017

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**DIVISION: 05 00 00—METALS**  
**SECTION: 05 05 23—METAL FASTENINGS**  
**DIVISION: 09 00 00—FINISHES**  
**SECTION: 09 22 16.23—FASTENERS**

**REPORT HOLDER:**

**ET&F FASTENING SYSTEMS, INC.**

**29019 SOLON ROAD**  
**SOLON, OHIO 44139**

**EVALUATION SUBJECT:**

**PANELFAST® PNEUMATIC FASTENERS USED TO ATTACH SHEATHING**  
**TO METAL STUDS**



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# ICC-ES Evaluation Report

**ESR-2398**

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**DIVISION: 05 00 00—METALS**

**Section: 05 05 23—Metal Fastenings**

**DIVISION: 09 00 00—FINISHES**

**Section: 09 22 16.23—Fasteners**

**REPORT HOLDER:**

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**EVALUATION SUBJECT:**

**PANELFAST® PNEUMATIC FASTENERS USED TO ATTACH SHEATHING TO METAL STUDS**

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2009 *International Building Code*® (IBC)
- 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)<sup>†</sup>

<sup>†</sup>The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

**Property evaluated:**

Structural

## 2.0 USES

PanelFast® AGS-100 series pneumatic fasteners are used to attach gypsum-based sheathing to the exterior side of cold-formed steel wall framing to resist transverse loads. The fasteners may be used under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

## 3.0 DESCRIPTION

### 3.1 General:

Various gypsum-based sheathing materials are attached to cold-formed steel framing, using the PanelFast® AGS-100 series pneumatic fasteners at the spacings indicated in Table 1.

### 3.2 Fasteners:

The PanelFast® AGS-100 Series pneumatic fasteners are manufactured from steel wire complying with the chemistry

requirements in the manufacturer's quality documentation. The fasteners are then heat treated to a through hardness  $R_c$  of 52 to 54. The fasteners have a shank diameter of 0.100 inch (2.5 mm), a nominal head diameter of  $\frac{5}{16}$  inch (7.9 mm), and a minimum length of  $1\frac{1}{2}$  inches (38 mm). The fastener shanks have a spiral knurl pattern. The fasteners have a corrosion-resistant coating.

### 3.3 Sheathing:

The sheathing must be a minimum of  $\frac{5}{8}$  inch (15.9 mm) thick and must be one of the following:

- Dens-Glass® Gold gypsum sheathing manufactured by G-P Gypsum Corporation.
- FIBEROCK® Brand Sheathing Panels manufactured by USG Corporation.

### 3.4 Framing:

Cold-formed steel wall framing members must comply with IBC Section 2210. The framing must be manufactured from steel with minimum yield and tensile strengths and minimum uncoated base-metal thicknesses as noted in Table 1. The framing must have a minimum G60 coating in accordance with ASTM A653.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

Allowable transverse loads on sheathing attached to cold-formed steel studs using the AGS-100 pneumatic fasteners are given in Table 1. The steel framing members and the sheathing must be designed to resist the applied transverse loads, in accordance with the code.

### 4.2 Installation:

Fasteners must be installed using the pneumatic tools recommended by ET&F. The fasteners must pierce the sheathing panels being fastened, and must protrude through the steel framing members a minimum of  $\frac{5}{16}$  inch (7.9 mm). The heads of the fasteners must be flush with the sheathing without overdriving. The minimum distance of the fasteners from the edge or end of the sheathing is  $\frac{3}{8}$  inch (9.5 mm), and the maximum spacing is noted in Table 1. At the adjoining panel edges, the framing must be a minimum of 1.5 inches (38 mm) wide and the fasteners must be staggered.

## 5.0 CONDITIONS OF USE

The PanelFast® Pneumatic Fasteners 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 Fasteners must be manufactured, installed and identified in accordance with this report.
- 5.2 Allowable positive and negative transverse loads on sheathing attached to steel wall studs using the AGS-100 fasteners must be limited to the values noted in Table 1. The steel framing members must be designed to sustain the applied positive and negative transverse loads. Calculations justifying that the applied loads are less than the maximum allowable loads must be submitted to the code official for approval.
- 5.3 For exterior wall applications, the sheathing must be covered by a water-resistive barrier and exterior wall covering in accordance with the requirements of the applicable code.
- 5.4 Compliance of Dens-Glass® Gold gypsum sheathing with ASTM C1177 must be demonstrated to the satisfaction of the code official.

5.5 Compliance of FIBEROCK® Brand Sheathing Panels with ASTM C1278 must be demonstrated to the satisfaction of the code official.

**6.0 EVIDENCE SUBMITTED**

Data in accordance with the ICC-ES Acceptance Criteria for Power-driven Pins for Attaching Gypsum Board Materials to Cold-formed Steel Wall Framing (AC259), dated June 2010.

**7.0 IDENTIFICATION**

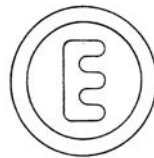
Cartons of ET&F pneumatic fasteners are identified with the manufacturer’s name (ET&F Fastening Systems, Inc.), product name, catalog number (AGS-100) and the evaluation report number (ESR-2398). The head of each fastener is stamped with the logo shown in Figure 1.

**TABLE 1—ALLOWABLE POSITIVE AND NEGATIVE TRANSVERSE LOAD ON SHEATHING FASTENED TO STEEL STUDS USING AGS-100 SERIES FASTENERS**

SHEATHING <sup>1</sup>	FRAMING REQUIREMENTS				FASTENER SPACING (inches)	ALLOWABLE LOAD (psf)
	Minimum Uncoated Thickness (mils)	Minimum Yield Strength (ksi)	Minimum Tensile Strength (ksi)	Maximum Spacing (inches)		
Den-Glass® Gold	36	33	45	24	6	24
	45	33	45	24	8	20
FIBEROCK®	36	33	45	24	6	27
	36	33	45	24	8	22

For **SI**: 1 mil = 0.001 inch = 0.0254 mm, 1 inch = 25.4 mm, 1 ksi = 6.89 MPa, 1 psf = 47.88 Pa.

<sup>1</sup>Gypsum-based sheathing must be a minimum of 5/8 inch thick. The sheathing board orientation relative to steel framing members may be horizontal or vertical.



**FIGURE 1—FASTENER HEAD MARKING**