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DIVISION: 05—METALS
Section: 05090—Metal Fastening

DIVISION: 06—WOOD AND PLASTICS
Section: 06090—Wood and Plastic Fastening

REPORT HOLDER:

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EVALUATION SUBJECT:

ET&F PANELFAST® KNURLED AGS-100 SERIES
PNEUMATIC FASTENERS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2003 *International Building Code*® (IBC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

Structural

2.0 USES

ET&F Panelfast® Knurled AGS-100 Series pneumatic fasteners are used to attach wood-structural-panel sheathing to cold-formed steel framing in shear-wall assemblies used to resist wind or seismic loads.

3.0 DESCRIPTION

3.1 General:

ET&F Panelfast® Knurled AGS-100 Series pneumatic fasteners are manufactured from ASTM A 510 Grade 1040, 1060, 1062, 1065 or 1566 steel and are heat-treated to a hardness R_c of 52 to 54, and have a minimum tensile strength of 240 ksi (1655 MPa). The fasteners are coated with a proprietary coating and have a 0.100-inch diameter (2.54 mm) knurled shank, a nominal $5/16$ -inch-diameter (7.94 mm) head and a ballistic point. The AGS-100 Series pneumatic fasteners are available in three lengths, of $1\frac{1}{2}$, 2 and $2\frac{1}{2}$ inches (38, 51, 64 mm), with part numbers, respectively, of AGS-100-0150, AGS-100-0200 and AGS-100-250.

3.2 Materials:

3.2.1 Wood Structural Panel Sheathing: The wood structural panel sheathing must be $7/16$ -inch-thick (11.1 mm) OSB Exposure 1 with a span rating of $24/16$ complying with

DOC PS-2; or $15/32$ -inch-thick (11.9 mm) Structural I Grade, Exposure 1 plywood with a span rating of $32/16$ or better complying with DOC PS-1.

3.2.2 Steel Framing Members: Steel framing members must have the following uncoated minimum base-metal thicknesses:

No. 68 MIL: 0.0677 inch (1.720 mm)

No. 54 MIL: 0.0538 inch (1.367 mm)

No. 43 MIL: 0.0428 inch (1.087 mm)

No. 33 MIL: 0.0329 inch (0.836 mm)

Steel framing members are manufactured from steel complying with ASTM A 653 SS Grade 50 or 33. Steel framing members must have a minimum yield strength of 50 ksi (345 MPa) for No. 68 MIL and 54 MIL, and 33 ksi (228 MPa) for 43 MIL and 33 MIL. The minimum flange width for steel studs and tracks, respectively, must be $1\frac{5}{8}$ inches (41.28 mm) and $1\frac{1}{4}$ inches (31.75 mm).

3.2.3 Hold-down Connectors: For seismic design, the hold-down connector (at its ultimate strength) must be capable of developing the uplift force due to overturning resulting from the lesser of the amplified strength design seismic load ($\Omega_e E$) or the nominal design loads in Tables 1 and 2. For wind design, the hold-down connector must be capable of developing the design load associated with the governing load combinations, without any amplification.

4.0 DESIGN AND INSTALLATION

4.1 Design:

Fastener spacing, required fastener penetrations, sheathing thickness and type, metal framing thickness and spacing, and shear loads on the shear wall assembly are set forth in Tables 1 and 2. Racking shear loads in Table 1 may be used for Type I shear walls and Type II shear walls, in accordance with the provisions of Section 2211.3 of the IBC. Design wind and seismic loads to be resisted by the shear wall assemblies must be determined in accordance with Chapter 16 of the applicable code. For seismic design, the deflection at LRFD must comply with limits in Section 1617.3 of the IBC.

4.2 Installation:

The fasteners must be installed using ET&F pneumatic tools. The fasteners must pierce the sheathing panels being fastened, and protrude through the steel framing members a minimum of $5/16$ inch (7.94 mm). The heads of the fasteners must be flush with the sheathing. Over-driving of the fasteners into the sheathing is not permitted.

4.3 Special Inspection:

When required by the IBC, the site-built shear wall assemblies described in this report must be subjected to special inspections, in accordance with Section 1704.1 of the IBC.

4.4 Quality Assurance:

When required by the IBC, a quality assurance plan must be provided to the code official for seismic and wind requirements, as applicable, in accordance with Sections 1705 and 1706 of the IBC, respectively.

5.0 CONDITIONS OF USE

The ET&F Panelfast® Knurled AGS-100 Series 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 The fasteners must be manufactured, identified and installed in accordance with this report.
- 5.2 Design wind and seismic loads to be resisted by the shear wall assemblies must not exceed the shear loads noted in Tables 1 and 2 of this report.
- 5.3 An approved water-resistive barrier and exterior wall covering must be installed over the wood-structural-

panel sheathing when the sheathing is considered to be a weather-exposed surface, as defined in Section 2502 of the IBC or Section 224 of the UBC.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Shear Wall Assemblies Consisting of Wood Structural Panel Sheathing Attached to Cold-formed Steel Framing With Pneumatic- or Gas-power-driven Pin Fasteners (AC230), dated October 2003.

7.0 IDENTIFICATION

The cartons of ET&F Panelfast® Knurled AGS-100 Series pneumatic fasteners described in this report must be identified by a label bearing the manufacturer's name (ET&F Fastening Systems, Inc.) and catalog number (AGS-100), and the evaluation report number (ESR-1777). The head of each fastener must bear a logo or symbol with the letter "E" as shown in Figure 1.

TABLE 1—IBC WIND AND SEISMIC RACKING SHEAR LOADS FOR SHEAR WALL ASSEMBLIES USING ET&F PANELFAST® AGS-100 SERIES PNEUMATIC FASTENERS^{1,2,4,13}

WALL SHEATHING ^{4,11} (thickness and type)	MINIMUM STEEL STUD THICKNESS ¹² (MIL)	MAXIMUM STUD SPACING ² (inches)	NOMINAL RESISTANCE ^{5,6} (plf)			DEFLECTION ⁷ (Δ) (inches)		
			FASTENER SPACING AT PANEL EDGES ⁸ (inches)			Nominal	LRFD	ASD
			4	3	2			
⁷ / ₁₆ -inch OSB on one side	43	16	—	—	1477	1.927	0.546	0.296
¹⁵ / ₃₂ -inch plywood one side	43	16	—	—	1815	1.817	0.550	0.315
¹⁵ / ₃₂ -inch plywood one side	43	16	—	1245	—	2.376	0.542	0.290
⁷ / ₁₆ -inch OSB one side	43	16	—	962	—	1.781	0.537	0.262
¹⁵ / ₃₂ -inch plywood one side	54	16	—	—	2225	1.821	0.555	0.330
⁷ / ₁₆ -inch OSB one side	33	24	—	—	1167	1.802	0.528	0.263
⁷ / ₁₆ -inch OSB one side	43	24	788	—	—	1.794	0.445	0.206

For SI: 1 inch = 25.4 mm, 1 plf = 14.6 N/m.

¹Maximum shear wall height-to-width aspect ratio is 2:1.

²The 24-inch on-center stud spacing design values may be used where framing spacing is 16 inches on center.

³The fasteners must be driven to a depth at which the shank pierces the steel, such that the tip of the fastener protrudes from the base metal a minimum of ⁵/₁₆ inch.

⁴The minimum distance from the fasteners to the edge or end of the sheathing is ³/₈ inch. The sheathing must be installed with the long dimension oriented parallel to vertical stud framing.

⁵LRFD resistance = 0.55 x nominal resistance (i.e., φ = 0.55).

⁶ASD resistance = nominal resistance / 2.5 (i.e., Ω = 2.5).

⁷Deflection values (Δ) are based on a 2:1 shear wall height-to-width aspect ratio.

⁸Fasteners must be spaced 12 inches on center in the field of the sheathing panels.

⁹Hold-down connectors are required at each end of shear walls in accordance with Section 3.2.3.

¹⁰Sill anchors must be designed to resist shear loads.

¹¹Panel thicknesses shown are minimums. Greater thickness may be used with no increase in design values.

¹²Framing thicknesses shown are minimums. Greater thickness may be used with no increase in design values.

¹³Chords (studs at shear wall ends) must be a minimum of two studs back-to-back and of the same thickness as the framing specified in the table.

TABLE 2—UBC WIND AND SEISMIC RACKING SHEAR LOADS FOR SHEAR WALL ASSEMBLIES
USING ET&F PANELFAST® AGS-100 SERIES PNEUMATIC FASTENERS^{1,3,4,13}

WALL SHEATHING ^{4,11} (thickness and type)	MINIMUM STEEL STUD THICKNESS ¹² (MIL)	MAXIMUM STUD SPACING ² (inches)	NOMINAL RESISTANCE ^{5,6} (plf)			DEFLECTION ⁷ (Δ) (inches)		
			FASTENER SPACING AT PANEL EDGES ⁴ (inches)			Nominal	LRFD	ASD
			4	3	2			
⁷ / ₁₆ -inch OSB on one side	43	16	—	—	1525	2.248	0.588	0.310
¹⁵ / ₃₂ -inch plywood one side	43	16	—	—	1883	1.938	0.598	0.332
¹⁵ / ₃₂ -inch plywood one side	43	16	—	1290	—	2.068	0.596	0.311
⁷ / ₁₆ -inch OSB one side	43	16	—	998	—	1.954	0.592	0.278
¹⁵ / ₃₂ -inch plywood one side	54	16	—	—	2314	1.945	0.601	0.351
⁷ / ₁₆ -inch OSB one side	33	24	—	—	1212	1.962	0.578	0.280
⁷ / ₁₆ -inch OSB one side	43	24	796	—	—	1.945	0.454	0.211

For SI: 1 inch = 25.4 mm, 1 plf = 14.6 N/m.

For footnotes, refer to Table 1.

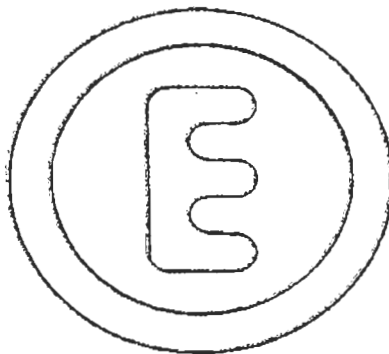


FIGURE 1—FACSIMILE OF FASTENER HEAD LOGO OR SYMBOL