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ICC-ES Evaluation Report

Reissued February 2023

ESR-2902

This report is subject to renewal February 2025.

DIVISION: 05 00 00—METAL
Section: 05 05 23—Metal Fastenings

REPORT HOLDER:

PNEUTEK, INC.

EVALUATION SUBJECT:

PNEUTEK FASTENERS USED WITH WOOD STRUCTURAL PANEL DIAPHRAGMS

1.0 EVALUATION SCOPE

Compliance with the following code:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The 2013 ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the 2013 ADIBC.

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see ESR-2902 LABC and LARC Supplement.

Property evaluated:

Structural

2.0 USES

The Pneutek fasteners are used in horizontal diaphragms to attach wood structural panels (WSPs) to steel ledgers and other structural steel supports. For structures regulated under the IRC, the fasteners may be used when an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 Fasteners:

The Pneutek fasteners used with wood structural panel diaphragms are power-actuated fasteners (PAFs). The fasteners are formed from carbon steel wire and are heat treated in accordance with the manufacturer's specifications. The fasteners have a zinc coating. See Table 1 for fastener descriptions and dimensions. See Figures 1 through 6 for depictions of the fasteners.

3.2 Steel Ledgers and Other Steel Supports in Horizontal Diaphragms:

The structural steel supports for sheathing in horizontal diaphragms must comply with the minimum requirements of ASTM A36 and have a minimum thickness as noted in Section 4.0.

3.3 Wood Structural Panel Sheathing:

Wood structural panels must have a minimum thickness of $^{15}/_{32}$ inch (11.9 mm), and must comply with the requirements of Section 4.2.7 of AWC Special Design Provisions for Wind & Seismic (SDPWS) (Section 4.2.6 of SDPWS for the 2018, 2015, 2012 and 2009 IBC). The wood structural panel sheathing in horizontal diaphragms must comply with DOC PS1 or DOC PS2, and must be of the applicable grade and thickness prescribed in the AWC SDPWS.

4.0 DESIGN AND INSTALLATION

4.1 Design:

Horizontal diaphragm systems consisting of wood structural panel sheathing fastened to wood supports with nails must be designed in accordance with SDPWS Tables 4.2A and 4.2B. Where the wood structural panel sheathing used in these diaphragms must be fastened to steel members at the perimeter of the diaphragm and/or to incidental structural steel members, the Pneutek fasteners may be substituted for the 10d or smaller common nails prescribed in SDPWS. Applicable allowable shear values based on Tables 4.2A and 4.2B of the AWC SDPWS are shown in Tables 2 and 3 of this report, respectively. The minimum width of the supporting steel members must be as prescribed for the wood members.

Pneutek SDL fasteners are used for installation into ledger members and other diaphragm boundary members having a minimum thickness of $^{1}/_{4}$ inch (6.4 mm). The Pneutek 32xxx, H32xxx, H34xxx, and HL44xxx fasteners are used for installation into steel members in the field of the diaphragm, such as bracing members, framing to support concentrated loads, etc., which have a minimum thickness of $^{3}/_{16}$ inch (4.8 mm). Selection of an appropriate fastener must take into consideration the wood structural panel thickness and the supporting steel thickness. The minimum

effective shank length shown in Table 1 must equal or exceed the sum of the thickness of the wood structural panel, the thickness of the steel support and the required point penetration as prescribed in Section 4.2 of this evaluation report.

The connections of the steel members in a horizontal diaphragm to the supporting elements of the building structure and the ability of the steel members in a horizontal diaphragm and the supporting structural elements to resist the load effects of the applied in-plane shear loads and other superimposed loads must be investigated in accordance with applicable code provisions. Structural calculations and construction details must be furnished to the code official for approval.

4.2 Installation:

The Pneutek fasteners must be installed in accordance with this report, the approved plans and the manufacturer's published installation instructions. A copy of these instructions must be available on the jobsite at all times during installation. Fastener placement requires the use of a pneumatically powered tool in accordance with Pneutek installation instructions.

The wood structural panels must be fastened to the steel members at the spacing indicated in the approved plans, based on the applicable diaphragm design provisions prescribed in the SDPWS. In the field of the diaphragm, the minimum distance from the centerline of the fasteners to the edge of the wood structural panel must be $^3/_8$ inch (9.5 mm). At the perimeter of the diaphragm, the minimum distance from the centerline of the fasteners to the edge of the wood structural panel must be $^3/_4$ inch (19.1 mm). The remainder of the diaphragm must be constructed in accordance with the code and the approved plans.

Fasteners must be installed a minimum of $^1/_2$ inch (12.7 mm) from the edge of the steel member. The full point of the fastener must protrude through the supporting steel member, or the fastener must be embedded a minimum of $^1/_4$ inch (6.4 mm), exclusive of the point, in the supporting steel member.

Fasteners must not be overdriven to avoid damage to the wood structural panel sheathing. To minimize the potential for such damage, a galvanized steel strap may be used on top of the sheathing panel, under the heads of the fasteners. When used, this optional strap must be galvanized steel complying with the requirements of ASTM A653 SS Grade 33, minimum, and must be a minimum of $1^1/_2$ inches (38 mm) wide and a minimum of 0.0428 inches (1.09 mm) thick.

5.0 CONDITIONS OF USE

The Pneutek 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 are manufactured and identified in accordance with this report.

5.2 Fastener installation complies with this report, the approved plans and the Pneutek, Inc., instructions. In the event of conflict, the most restrictive requirements govern.

5.3 Allowable diaphragm shear values are as described in this report.

5.4 Calculations and construction details demonstrating that the applied diaphragm loads are less than the allowable diaphragm loads referenced in this report must be submitted to the code official for approval. The design of the diaphragm, the steel members and their connection to the building structure must be in accordance with the applicable code and this evaluation report. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is constructed.

5.5 Use of fasteners in contact with preservative-treated or fire-retardant-treated wood is not permitted.

5.6 The wood structural panel sheathing must be covered by an approved roof covering.

5.7 The fasteners are manufactured under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the applicable sections of the ICC-ES Acceptance Criteria for Power-actuated Fasteners Driven into Concrete, Steel and Masonry Elements (AC70), dated December 2019 (editorially revised January 2021).

7.0 IDENTIFICATION

7.1 The fasteners are identified in the field by means of the company's name (Pneutek), the evaluation report number (ESR-2902) on the cartons, and the following symbol stamped on the head of each fastener:

7.2 The report holder's contact information is the following:

PNEUTEK, INC.
17 FRIARS DRIVE
HUDSON, NEW HAMPSHIRE 03051-4926
(603) 883-1660
www.pneutek.com
techinfo@pneutek.com

TABLE 1—FASTENER DESCRIPTIONS

FASTENER[1]	SHANK TYPE	SHANK DIAMETER (inch)	HEAD DIAMETER (inch)	MAXIMUM POINT LENGTH (inch)	MINIMUM EFFECTIVE SHANK LENGTH[2] (inches)
32xxx	Straight, smooth	0.147	0.321	0.31	xxx - 0.31
H32xxx	Straight, knurled	0.152	0.317	0.31	xxx - 0.31
H34xxx	Straight, knurled	0.170	0.317	0.35	xxx - 0.35
HL44xxx	Straight, knurled	0.173	0.373	0.36	xxx - 0.36
SDL-45xxx	Stepped, smooth	0.188 / 0.172	0.373	0.41	xxx - 0.41
SDL-66xxx	Stepped, smooth	0.197 / 0.177	0.496	0.41	xxx - 0.41

For **SI:** 1 inch = 25.4 mm.

[1]The last three digits of the part number (xxx) designate the length of the fastener from the underside of the fastener head to the fastener point, in inches.
[2]The minimum effective shank length of a fastener is the portion of the shank length that excludes its maximum point length.

TABLE 2—ALLOWABLE SHEAR VALUES IN POUNDS PER FOOT FOR HORIZONTAL WOOD STRUCTURAL PANEL DIAPHRAGMS WITH PERIMETER AND INCIDENTAL STEEL FRAMING AND PNEUTEK FASTENERS[1,2]

WOOD STRUCTURAL PANEL		MINIMUM WIDTH OF STEEL FRAMING MEMBERS (inches)	SEISMIC				WIND			
			Fastener spacing (inches) at boundaries (all cases) at continuous panel edges parallel to load (Cases 3, 4) and at all panel edges (Cases 5, 6)				Fastener spacing (inches) at boundaries (all cases) at continuous panel edges parallel to load (Cases 3, 4) and at all panel edges (Cases 5, 6)			
Grade	Minimum Nominal Panel Thickness (inch)		6	4	2½	2	6	4	2½	2
			Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4)				Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4)			
			6	6	4	3	6	6	4	3
Structural I	15/32	1½ 2½	320 360	425 480	640 720	730 820	448 505	595 673	895 1008	1023 1148
Other Rated Sheathing	15/32	1½ 2½	290 325	385 430	575 650	655 735	405 455	540 603	805 910	918 1030
	19/32	1½ 2½	320 360	425 480	640 720	730 820	448 505	595 673	895 1008	1023 1148

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

[1]Allowable loads are based on nominal values in Table 4.2A of SDPWS. Cases are described in Table 4.2A of SDPWS.
[2]These values are for short-time loads due to wind or earthquake. For shear loads of normal or permanent load duration as defined in the AWC National Design Specification for Wood Construction (NDS), these values must be multiplied by 0.63 or 0.56, respectively.

TABLE 3—ALLOWABLE SHEAR VALUES IN POUNDS PER FOOT FOR HIGH-LOAD HORIZONTAL WOOD STRUCTURAL PANEL DIAPHRAGMS WITH PERIMETER AND INCIDENTAL STEEL FRAMING AND PNEUTEK FASTENERS[1,2]

WOOD STRUCTURAL PANEL		MINIMUM WIDTH OF STEEL FRAMING MEMBERS (inches)	NUMBER OF LINES OF FASTENERS	SEISMIC				WIND			
				Fastener spacing (inches) at boundaries (all cases) at continuous panel edges parallel to load (Cases 3, 4) and at all panel edges (Cases 5, 6)				Fastener spacing (inches) at boundaries (all cases) at continuous panel edges parallel to load (Cases 3, 4) and at all panel edges (Cases 5, 6)			
Grade	Minimum Nominal Panel Thickness (inch)			4	4	$2^1/_2$	$2^1/_2$	4	4	$2^1/_2$	$2^1/_2$
				Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4)				Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4)			
				6	4	4	3	6	4	4	3
Structural I	$^{15}/_{32}$	3	2	605	815	875	1150	848	1140	1225	1610
		4	2	700	915	1005	1290	980	1280	1408	1805
		4	3	875	1220	1285	1395	1225	1708	1800	1953
	$^{19}/_{32}$	3	2	670	880	965	1255	938	1233	1350	1758
		4	2	780	990	1110	1440	1093	1385	1555	2015
		4	3	965	1320	1405	1790	1350	1848	1968	2505
	$^{23}/_{32}$	3	2	730	955	1050	1365	1023	1338	1470	1910
		4	2	855	1070	1210	1565	1198	1498	1695	2190
		4	3	1050	1430	1525	1800	1470	2003	2135	2520
Other Rated Sheathing	$^{15}/_{32}$	3	2	525	725	765	1010	735	1015	1070	1415
		4	2	605	815	875	1105	848	1140	1225	1548
		4	3	765	1085	1130	1195	1070	1520	1583	1673
	$^{19}/_{32}$	3	2	650	860	935	1225	910	1205	1310	1715
		4	2	755	965	1080	1370	1058	1350	1513	1918
		4	3	935	1290	1365	1485	1310	1805	1910	2080
	$^{23}/_{32}$	3	2	710	935	1020	1335	995	1310	1428	1870
		4	2	825	1050	1175	1445	1155	1470	1645	2023
		4	3	1020	1400	1480	1565	1428	1960	2073	2190

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

[1]Allowable loads are based on nominal values in Table 4.2B of SDPWS. Cases are described in Table 4.2B of SDPWS.
[2]These values are for short-time loads due to wind or earthquake. For shear loads of normal or permanent load duration as defined in the NDS, these values must be multiplied by 0.63 or 0.56, respectively.

FIGURE 1—PNEUTEK 32xxx FASTENER

FIGURE 2—PNEUTEK H32xxx FASTENER

FIGURE 3—PNEUTEK H34xxx FASTENER

FIGURE 4—PNEUTEK HL44xxx FASTENER

FIGURE 5—PNEUTEK SDL-45xxx FASTENER

FIGURE 6—PNEUTEK SDL-66xxx FASTENER

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REPORT HOLDER:

PNEUTEK, INC.

EVALUATION SUBJECT:

PNEUTEK FASTENERS USED WITH WOOD STRUCTURAL PANEL DIAPHRAGMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Pneutek fasteners described in ICC-ES evaluation report ESR-2902, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Pneutek fasteners described in Sections 2.0 through 7.0 of the evaluation report ESR-2902, comply with LABC Chapters 22 and 23, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Pneutek fasteners described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-2902.
- The design, installation, conditions of use and identification of the Pneutek fasteners are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report ESR-2902.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued February 2023.

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1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Pneutek fasteners, described in ICC-ES evaluation report ESR-2902, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 and 2019 *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 Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 and 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Pneutek fasteners, described in Sections 2.0 through 7.0 of the evaluation report ESR-2902, comply with CBC Chapters 22 and 23, provided the design and installation are in accordance with the 2021 and 2018 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD:

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

2.1.2 DSA:

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

2.2 CRC:

The Pneutek fasteners, described in Sections 2.0 through 7.0 of the evaluation report ESR-2902, comply with the CRC, provided the design and installation are in accordance with the 2021 and 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued February 2023.