

Technical Evaluation Report™

TER 2212-01

#8, #9, #10, and #14 Axis™, Pico™, Aura™, and Epic™ Fastener Properties

Screw Products Inc.

Product:

Axis™, Pico™, Aura™, and Epic™ Fasteners

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 05 23 - Wood, Plastic, and Composite Fastenings

1 Innovative Product Evaluated^{1,2}

1.1 Axis™, Pico™, Aura™, and Epic™ Fasteners

2 Applicable Codes and Standards^{3,4}

2.1 Codes

- 2.1.1 IBC—15, 18, 21: International Building Code®
- 2.1.2 IRC—15, 18, 21: International Residential Code®
- 2.1.3 FBC-B—17, 20: Florida Building Code – Building⁵
- 2.1.4 FBC-R—17, 20: Florida Building Code – Residential⁵
- 2.1.5 CBC—16, 19: California Building Code⁶
- 2.1.6 CRC—16, 19: California Residential Code⁶
- 2.1.7 LABC—17, 20: Los Angeles Building Code⁷
- 2.1.8 LARC—17, 20: Los Angeles Residential Code⁷

¹ For more information, visit drjcertification.org or call us at 608-310-6748.

² 24 CFR 3280.2 "Listed or certified" means included in a list published by a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner. Listed. Equipment, materials, products or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose Listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. Labeled. Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

³ This Listing is a code defined research report, which is also known as a duly authenticated report, provided by an approved agency (see IBC Section 1703.1) and/or an approved source (see IBC Section 1703.4.2). An approved agency is "approved" as an approved agency when it is ANAB accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory. A professional engineer is "approved" as an approved source when that professional engineer is properly licensed to transact engineering commerce. Where sealed by a professional engineer, it is also a duly authenticated report certified by an approved source. (i.e., Registered Design Professional). DrJ is an ANAB accredited product certification body.

⁴ Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.

⁵ All references to the FBC-B and FBC-R are the same as the 2018 IBC and 2018 IRC, respectively, unless otherwise noted in the supplement at the end of this document.

⁶ All references to the CBC and CRC are the same as the 2018 IBC and 2018 IRC, respectively, unless otherwise noted in the supplement at the end of this document.

⁷ All references to the LABC and LARC are the same as the 2018 IBC and 2018 IRC, respectively, unless otherwise noted in the supplement at the end of this document.

2.2 Standards and Referenced Documents

- 2.2.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strength of Screws*
- 2.2.2 *ANSI / AWC NDS: National Design Specification (NDS) for Wood Construction*
- 2.2.3 *ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus*
- 2.2.4 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*
- 2.2.5 *ASTM D2395: Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
- 2.2.6 *ASTM D2915: Standard Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products*
- 2.2.7 *ASTM D4442: Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
- 2.2.8 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*

3 Performance Evaluation

- 3.1 Tests, testing, test reports, research reports, duly authenticated reports and related engineering evaluations are defined as intellectual property and/or trade secrets and protected by Defend Trade Secrets Act 2018 (DTSA).⁸
- 3.2 Testing and/or inspections conducted for this TER were performed at an ISO/IEC 17025 accredited testing laboratory,⁹ an ISO/IEC 17020 accredited inspection body,¹⁰ which are internationally recognized accreditations through International Accreditation Forum (IAF), and/or a licensed Registered Design Professional (RDP).
- 3.3 Axis™, Pico™, Aura™, and Epic™ Fasteners™ were tested and evaluated to determine their structural resistance properties, which were used to develop reference design values for Allowable Stress Design (ASD).
 - 3.3.1 Bending yield in accordance with ASTM F1575
 - 3.3.2 Tensile strength in accordance with AISI S904
 - 3.3.3 Shear strength in accordance with AISI S904
 - 3.3.4 Lateral shear in accordance with ASTM D1761 and NDS
 - 3.3.5 Withdrawal strength in accordance with ASTM D1761
 - 3.3.6 Head pull-through in accordance with ASTM D1761
 - 3.3.7 Corrosion resistance of fasteners meeting or exceeding the protection afforded hot-dipped galvanized fasteners in accordance with ASTM A153, Class D

⁸ <https://www.law.cornell.edu/uscode/text/18/part-11/chapter-90>. Whoever, with intent to convert a trade secret, that is related to a product or service used in or intended for use in or intended for use in interstate or foreign commerce, to the economic benefit or anyone other than the owner thereof, and intending or knowing that the offense will injure any owner of that trade secret, knowingly (1) steals, or without authorization appropriates, takes, carries away, or conceals, or by fraud, artifice, or deception obtains such information; (2) without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys such information; (3) receives, buys, or possesses such information, knowing the same to have been stolen or appropriated, obtained, or converted without authorization; (4) attempts to commit any offense described in paragraphs (1) through (3); or (5) conspires with one or more other persons to commit any offense described in paragraphs (1) through (3), and one or more of such persons do any act to effect the object of the conspiracy, shall, except as provided in subsection (b), be fined under this title or imprisoned not more than 10 years, or both. (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of \$5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided.

The federal government and each state have a public records act. As the National Society of Professional Engineers states, "Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve." Therefore, to protect intellectual property (IP) and TS, and to achieve compliance with public records and trade secret legislation, requires approval through the use of Listings, certified reports, technical evaluation reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.

⁹ Internationally recognized accreditations are performed by members of the International Accreditation Forum (IAF). Accreditation Body and Regional Accreditation Group Members of IAF are admitted to the IAF MLA only after a stringent evaluation of their operations by a peer evaluation team, which is charged to ensure that the applicant complies fully with both international standards and IAF requirements. Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.

¹⁰ Ibid.

- 3.4 Any building code and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an [ISO/IEC 17065 accredited certification body](#) and a professional engineering company operated by RDPs / [approved sources](#). DrJ is qualified¹¹ to practice product and code compliance services within its scope of accreditation and engineering expertise, respectively.
- 3.5 Engineering evaluations are conducted with DrJ's ANAB [accredited ICS code scope](#), which are also its areas of professional engineering competence.
- 3.6 Any regulation specific issues not addressed in this section are outside the scope of this TER.

4 Product Description and Materials

- 4.1 The products evaluated in this TER is shown in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, and Figure 8.



Figure 1. #8 Axis™ Fastener with Exterior Coating (top) and Interior Coating (bottom)



Figure 2. #8 Pico™ Fastener



Figure 3. #8 Aura™ Fastener



Figure 4. #9 Axis™ Fastener with Exterior Coating (top) and Interior Coating (bottom)



Figure 5. #9 Epic™ Fastener

¹¹ Qualification is performed by a legislatively defined [Accreditation Body](#). [ANSI National Accreditation Board \(ANAB\)](#) is the largest independent accreditation body in North America and provides services in more than 75 countries. [DrJ](#) is an ANAB accredited [product certification body](#).



Figure 6. #10 Axis™ Fastener with Exterior Coating (top) and Interior Coating (bottom)



Figure 7. #10 Aura™ Fastener



Figure 8. #14 Axis™ Fastener with Exterior Coating (top) and Interior Coating (bottom)

- 4.2 Axis™ fasteners are fully or partially threaded screws with a countersunk head, with milled ribs, and star drive.
- 4.3 Pico™ fasteners are partially threaded screws with a countersunk head and star drive.
- 4.4 Aura™ fasteners are partially threaded screws with a mushroom head and star drive.
- 4.5 Epic™ fasteners are partially threaded screws with a countersunk head, with milled ribs, and a star drive.
- 4.6 Pico™ and Aura™ fasteners are coated with a proprietary Zytec™ GX coating that is equivalent to the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D ([IBC Section 2304.10.6](#)¹² and [IRC Section R317.3](#)).
- 4.6.1 Zytec™ GX coating is tested and recognized for use in ground contact pressure treated lumber (MCA), exterior, freshwater, general construction applications (i.e., Ground Contact AWPA UC1-UC4A MCA).
- 4.6.2 Zytec™ GX coated fasteners are approved for use in FRT lumber, provided the conditions set forth by the FRT lumber manufacturer are met, including appropriate strength reductions.
- 4.7 Axis™ fasteners are coated with a proprietary Zytec™ + or Zytec™ XT coating that is equivalent to the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D ([IBC Section 2304.10.6](#)¹³ and [IRC Section R317.3](#)).
- 4.8 Epic™ fasteners are coated with a proprietary Zytec™ XT coating that is equivalent to the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D ([IBC Section 2304.10.6](#)¹⁴ and [IRC Section R317.3](#)).
- 4.8.1 Zytec™ XT coating is tested and recognized for use in ground contact pressure treated lumber (MCA), exterior, freshwater, general construction applications (i.e., Ground Contact AWPA UC1-UC4A MCA).
- 4.8.2 Zytec™ XT coated fasteners are approved for use in FRT lumber, provided the conditions set forth by the FRT lumber manufacturer are met, including appropriate strength reductions.

¹² [2018 IBC Section 2304.10.5](#)
¹³ [2018 IBC Section 2304.10.5](#)
¹⁴ [2018 IBC Section 2304.10.5](#)



4.9 The fasteners evaluated in this TER are set forth in Table 1, Table 2, Table 3 and Table 4.

Table 1. Fastener Specifications – Axis™

Fastener Name	Designation	Head (in)		Nominal Length ¹ (in)	Thread Length ² (in)	Shank Diameter ³ (in)	Thread Diameter (in)		Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lb)	
		Diameter	Drive Type				Minor	Major		Tensile	Shear ⁴
#8 Axis™	8 x ¾"	0.323	TX20	¾	Full	0.122	0.106	0.165	212,000	550	420
	8 x 1"			1	Full						
	8 x 1¼"			1¼	⅞						
	8 x 1½"			1½	1						
	8 x 1¾"			1¾	1⅛						
	8 x 2"			2	1¼						
	8 x 2½"			2½	1½						
#9 Axis™	9 x 1"	0.350	TX20	1	Full	0.136	0.122	0.183	203,000	740	530
	9 x 1¼"			1¼	⅞						
	9 x 1½"			1½	1						
	9 x 2"			2	1¼						
	9 x 2½"			2½	1½						
	9 x 2¾"			2¾	1½						
	9 x 3"			3	1½						
#10 Axis™	10 x 1½"	0.386	TX20	1½	1	0.154	0.136	0.211	209,000	880	690
	10 x 2"			2	1¼						
	10 x 2½"			2½	1½						
	10 x 3"			3	1½						
	10 x 3½"			3½	2						
	10 x 4"			4	2						
	10 x 5"			5	2½						
	10 x 6"			6	2½						
#14 Axis™	14 x 5"	0.488	TX30	5	2½	0.173	0.152	0.246	205,000	1110	830
	14 x 6"			6							
	14 x 7"			7							
	14 x 8"			8							

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

1. Fastener length is measured from the top of the head to the tip.
2. Thread length excludes the knurl if knurl is present. The #8 x ¾", #8 x 1", #8 x 1¼", #8 x 1½", #8 x 1¾", #9 x 1", #9 x 1¼", #9 x 1½" and #10 x 1½" screws have no knurl.
3. Shank diameter based on manufactured thickness with coating.

Table 2. Fastener Specifications – Aura™

Fastener Name	Designation	Head (in)		Nominal Length ¹ (in)	Thread Length ² (in)	Shank Diameter ³ (in) Minor	Thread Diameter (in)		Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lb)	
		Diameter	Drive Type				Minor	Major		Tensile	Shear ⁴
#8 Aura™	8 x 1"	0.362	TX20	1	3/4	0.122	0.106	0.165	212,000	550	420
	8 x 1 1/4"			1 1/4	7/8						
	8 x 1 1/2"			1 1/2	1						
	8 x 2"			2	1 1/4						
	8 x 2 1/2"			2 1/2	1 1/2						
#10 Aura™	10 x 1"	0.476	TX20	1	3/4	0.154	0.136	0.211	209,000	880	690
	10 x 1 1/4"			1 1/4	7/8						
	10 x 1 1/2"			1 1/2	1						
	10 x 2"			2	1 1/4						
	10 x 2 1/2"			2 1/2	1 1/2						
	10 x 3"			3	1 1/2						

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

1. Fastener length is measured from the underside of the head to the tip.
2. Thread length excludes the knurl if knurl is present. The #8 x 1", #8 x 1 1/4", #8 x 1 1/2", #10 x 1", #10 x 1 1/4" and #10 x 1 1/2" screws have no knurl.
3. Shank diameter based on manufactured thickness with coating.

Table 3. Fastener Specifications – Pico™

Fastener Name	Designation	Head (in)		Nominal Length ¹ (in)	Thread Length ² (in)	Shank Diameter ³ (in) Minor	Thread Diameter (in)		Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lb)	
		Diameter	Drive Type				Minor	Major		Tensile	Shear ⁴
#8 Pico™	8 x 1 5/8"	0.201	TX15	1 5/8	1	0.122	0.106	0.165	218,000	540	430
	8 x 2"			2	1 1/4						
	8 x 2 1/2"			2 1/2	1 1/2						
	8 x 3"			3	1 1/2						

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

1. Fastener length is measured from the underside of the head to the tip.
2. Thread length is the length of the lower thread
3. Shank diameter based on manufactured thickness with coating.

Table 4. Fastener Specifications – Epic™

Fastener Name	Designation	Head (in)		Nominal Length ¹ (in)	Thread Length ² (in)	Shank Diameter ³ (in) Minor	Thread Diameter (in)		Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lb)	
		Diameter	Drive Type				Minor	Major		Tensile	Shear ⁴
#9 Epic™	9 x 1 5/8"	0.260	TX20	1 5/8	1	0.136	0.122	0.183	203,000	740	530
	9 x 2"			2	1 1/4						
	9 x 2 1/2"			2 1/2	1 1/2						
	9 x 3"			3	1 1/2						
	9 x 4"			4	2						
	9 x 5"			5	2 1/2						

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

- Fastener length is measured from the underside of the head to the tip.
- Thread length excludes the knurl if knurl is present. The #9 x 1 5/8" screws have no knurl.
- Shank diameter based on manufactured thickness with coating.

5 Applications

5.1 General

- 5.1.1 Axis™, Pico™, Aura™ and Epic™ fasteners are used to attach wood framing members in conventional light-frame construction and provide resistance against withdrawal, head pull-through, axial, and shear loads. See Section 6 for installation requirements.
- 5.1.2 Axis™, Pico™, Aura™, and Epic™ Fasteners are installed without lead holes, as prescribed in NDS.

5.2 Design

- 5.2.1 The design of Axis™, Pico™, Aura™, and Epic™ Fasteners is governed by the applicable code and provisions for dowel-type fasteners in NDS.
- 5.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.

5.3 Axis™, Pico™, Aura™ and Epic™ Fasteners Reference Lateral Design Values (Z)

- 5.3.1 Reference lateral design values (lb) for shear load perpendicular to grain and parallel to grain for Axis™, Pico™, Aura™, and Epic™ Fasteners are specified in Table 5, Table 6, Table 7 and Table 8.

Table 5. No. 8 Aura™, Pico™ and Axis™ Fastener Reference Lateral Design Values (Z), lb^{1,2,3,4}

Type	Length (in)	Main Member ^{5,6} (Specific Gravity)	Side Member (Specific Gravity) ⁷								
			15/32 Plywood (0.42)	19/32 Plywood (0.42)	23/32 Plywood (0.42)	7/16 OSB (0.50)	19/32 OSB (0.50)	23/32 OSB (0.50)	2x SPF (0.42)	2x DF (0.50)	2x SP (0.55)
Aura™, Pico™ & Axis™	1 ¼	SPF (0.42)	37	37	-	42	45	-	-	-	-
		DF (0.50)	45	42	-	52	51	-	-	-	-
		SP (0.55)	51	46	-	58	55	-	-	-	-
	1 ½	SPF (0.42)	48	45	45	54	52	54	-	-	-
		DF (0.50)	61	55	52	67	62	62	-	-	-
		SP (0.55)	63	62	57	70	69	67	-	-	-
	1 ⅝	SPF (0.42)	54	50	49	60	57	58	-	-	-
		DF (0.50)	61	63	58	67	70	68	-	-	-
		SP (0.55)	63	65	65	70	75	74	-	-	-
	1 ¾	SPF (0.42)	57	56	54	62	62	62	-	-	-
		DF (0.50)	61	63	65	67	72	74	-	-	-
		SP (0.55)	63	65	68	70	75	80	-	-	-
	2	SPF (0.42)	57	59	62	62	67	72	-	-	-
		DF (0.50)	61	63	66	67	72	77	-	-	-
		SP (0.55)	63	65	68	70	75	80	-	-	-
	2 ½	SPF (0.42)	57	59	62	62	67	72	66	70	72
		DF (0.50)	61	63	66	67	72	77	78	83	86
		SP (0.55)	63	65	68	70	75	80	86	92	95
	3	SPF (0.42)	57	59	62	62	67	72	79	85	88
		DF (0.50)	61	63	66	67	72	77	85	92	96
		SP (0.55)	63	65	68	70	75	80	88	96	101

1. Reference lateral design values (Z) apply to Perpendicular and Parallel to grain load directions.
2. Cells marked with “-” indicate fastener is too short for the connection.
3. Reference lateral design values apply to two-member single shear connections and the fastener is installed in face grain.
4. Tabulated lateral design values (Z) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
5. Main member shall be a minimum 1.5" thick.
6. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for a specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for a specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated value for specific gravity of 0.55.



Table 6. No. 9 Axis™ and Epic™ Fastener Reference Lateral Design Values (Z), lb^{1,2,3,4}

Type	Length (in)	Main Member (Specific Gravity) ^{5,6}	Side Member (Specific Gravity) ⁷								
			15/32 Plywood (0.42)	19/32 Plywood (0.42)	23/32 Plywood (0.42)	7/16 OSB (0.50)	19/32 OSB (0.50)	23/32 OSB (0.50)	2x SPF (0.42)	2x DF (0.50)	2x SP (0.55)
Epic™ & Axis™	1 ¼	SPF (0.42)	42	-	-	48	-	-	-	-	-
		DF (0.50)	51	-	-	58	-	-	-	-	-
		SP (0.55)	57	-	-	66	-	-	-	-	-
	1 ½	SPF (0.42)	54	51	51	61	59	62	-	-	-
		DF (0.50)	69	62	59	77	71	71	-	-	-
		SP (0.55)	79	70	65	88	79	76	-	-	-
	1 ⅝	SPF (0.42)	61	57	56	68	65	66	-	-	-
		DF (0.50)	78	71	66	86	79	77	-	-	-
		SP (0.55)	81	80	73	89	88	84	-	-	-
	2	SPF (0.42)	73	74	73	79	84	82	-	-	-
		DF (0.50)	78	80	83	86	90	96	-	-	-
		SP (0.55)	81	82	85	89	94	99	-	-	-
	2 ½	SPF (0.42)	73	74	78	79	84	89	81	86	88
		DF (0.50)	78	80	83	86	90	96	94	101	104
		SP (0.55)	81	82	85	89	94	99	103	111	115
	2 ¾	SPF (0.42)	73	74	78	79	84	89	90	96	98
		DF (0.50)	78	80	83	86	90	96	109	116	120
		SP (0.55)	81	82	85	89	94	99	114	125	131
	3	SPF (0.42)	73	74	78	79	84	89	102	108	110
		DF (0.50)	78	80	83	86	90	96	110	120	125
		SP (0.55)	81	82	85	89	94	99	114	125	131
	4	SPF (0.42)	73	74	78	79	84	89	102	110	114
		DF (0.50)	78	80	83	86	90	96	110	120	125
		SP (0.55)	81	82	85	89	94	99	114	125	131
	5	SPF (0.42)	73	74	78	79	84	89	102	110	114
		DF (0.50)	78	80	83	86	90	96	110	120	125
		SP (0.55)	81	82	85	89	94	99	114	125	131

- Reference lateral design values (Z) apply to Perpendicular and Parallel to grain load directions.
- Cells marked with “-” indicate fastener is too short for the connection.
- Reference lateral design values apply to two-member single shear connections and the fastener is installed in face grain.
- Tabulated lateral design values (Z) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
- Main member shall be a minimum 1.5" thick.
- For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for a specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for a specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated value for specific gravity of 0.55.

Table 7. No. 10 Aura™ and Axis™ Fastener Reference Lateral Design Values (Z), lb^{1,2,3,4}

Type	Length (in)	Main Member ⁶ (Specific Gravity)	Side Member (Specific Gravity) ⁶								
			15/32 Plywood (0.42)	19/32 Plywood (0.42)	23/32 Plywood (0.42)	7/16 OSB (0.50)	19/32 OSB (0.50)	23/32 OSB (0.50)	2x SPF (0.42)	2x DF (0.50)	2x SP (0.55)
Aura™ & Axis™	1 ½	SPF (0.42)	59	56	-	66	65	-	-	-	-
		DF (0.50)	75	68	-	83	77	-	-	-	-
		SP (0.55)	85	75	-	95	85	-	-	-	-
	2	SPF (0.42)	91	84	80	99	92	89	-	-	-
		DF (0.50)	97	99	99	107	111	110	-	-	-
		SP (0.55)	97	102	105	112	115	120	-	-	-
	2 ½	SPF (0.42)	91	92	95	99	103	108	97	103	106
		DF (0.50)	97	99	101	107	111	116	111	119	124
		SP (0.55)	97	102	105	112	115	120	120	130	135
	3	SPF (0.42)	91	92	95	99	103	108	118	125	128
		DF (0.50)	97	99	101	107	111	116	136	151	157
		SP (0.55)	97	102	105	112	115	120	140	158	165
	3 ½	SPF (0.42)	91	92	95	99	103	108	129	139	144
		DF (0.50)	97	99	101	107	111	116	136	151	158
		SP (0.55)	97	102	105	112	115	120	140	158	165
	4	SPF (0.42)	91	92	95	99	103	108	129	139	144
		DF (0.50)	97	99	101	107	111	116	136	151	158
		SP (0.55)	97	102	105	112	115	120	140	158	165
	5	SPF (0.42)	91	92	95	99	103	108	129	139	144
		DF (0.50)	97	99	101	107	111	116	136	151	158
		SP (0.55)	97	102	105	112	115	120	140	158	165
	6	SPF (0.42)	91	92	95	99	103	108	129	139	144
		DF (0.50)	97	99	101	107	111	116	136	151	158
		SP (0.55)	97	102	105	112	115	120	140	158	165

- Reference lateral design values (Z) apply to Perpendicular and Parallel to grain load directions.
- Cells marked with “-” indicate fastener is too short for the connection.
- Reference lateral design values apply to two-member single shear connections and the fastener is installed in face grain.
- Tabulated lateral design values (Z) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
- Main member shall be a minimum 1.5" thick.
- For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for a specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for a specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated value for specific gravity of 0.55.



Table 8. No. 14 Axis™ Fastener Reference Lateral Design Values (Z), lb^{1,2,3,4,5}

Type	Length (in)	Main Member ^{6,7} (Specific Gravity)	Side Member (Specific Gravity) ⁷								
			15/32 Plywood (0.42)	19/32 Plywood (0.42)	23/32 Plywood (0.42)	7/16 OSB (0.50)	19/32 OSB (0.50)	23/32 OSB (0.50)	2x SPF (0.42)	2x DF (0.50)	2x SP (0.55)
Axis™	All	SPF (0.42)	109	113	116	122	125	130	150	171	178
		DF (0.50)	109	122	123	132	135	140	159	187	195
		SP (0.55)	109	126	127	138	140	145	163	195	204

1. The reference lateral design values provided in this table apply to the #14 Axis™ screw.
2. Reference lateral design values (Z) apply to Perpendicular and Parallel to grain load directions.
3. Cells marked with “-” indicate fastener is too short for the connection.
4. Reference lateral design values apply to two-member single shear connections and the fastener is installed in face grain.
5. Tabulated lateral design values (Z) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
6. Main member shall be a minimum 1.5" thick.
7. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for a specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for a specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated value for specific gravity of 0.55.



5.4 *Withdrawal Design Values*

5.4.1 The reference withdrawal design values (lb/in) in Table 9 apply to the screws listed in Table 1, Table 2, Table 3 and Table 4.

Table 9. Reference Withdrawal Design Values (W) – Side Grain Applications, lb/in^{1,2}

Fastener Designation	Fastener Name	Fastener Length (in)	Thread Length (in)	Minimum Penetration Length ³ (in)	Wood Species (Specific Gravity) ⁴	
					HF/SPF (0.42)	
No. 8	Aura™	2 ½	1 ½	1 ¾	185	
	Axis™	2 ½				
	Pico™	2 ½				
		3				
No. 9	Axis™	2 ½	1 ½	1 ½	220	
		2 ¾				
		3				
	Epic™	2 ½	1 ½			
		3				
		4				2
		5				2 ½
No. 10	Axis™	3 ½	2	1 ¾	225	
		4				
		5	2 ½			
		6				
No. 14	Axis™	5	2 ½	2	255	
		6				
		7				
		8				

1. Tabulated values are in lbs/in of penetration. The minimum penetration to achieve these values is shown above. Values may be calculated for applications where more penetration is obtained up to penetrations corresponding to the thread length.
2. Tabulated withdrawal values (W) shall be adjusted by all applicable factors per NDS Table 11.3.1.
3. Fastener penetration is the threaded length embedded in the main member, including the tip.
4. For wood species with an assigned specific gravity above 0.42, use the tabulated values for a specific gravity of 0.42.

5.5 *Head Pull-Through Design Values*

5.5.1 The reference head pull-through design values (lb) in Table 10 apply to the screws listed in Table 1, Table 2, Table 3 and Table 4.

Table 10. Reference Head Pull-Through Design Values (P), lb¹

Fastener Designation	Fastener Name	Head Diameter	Minimum Wood Member Thickness ⁴ (in)	Wood Species (Specific Gravity) ³
				HF/SPF (0.42)
No. 8	Pico™	0.201	1 ¼	45
	Axis™	0.323		215
	Aura™	0.362		290
No. 9	Epic™	0.260	1 ¼	75
	Axis™	0.350		185
No. 10	Axis™	0.386	1 ½	305
	Aura™	0.476		480
No. 14	Axis™	0.488	1 ¾	370

1. Tabulated values apply where fasteners are installed in the face grain of the wood member.
 2. Tabulated pull-through values (P) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
 3. For wood species with an assigned specific gravity above 0.42, use the tabulated values for a specific gravity of 0.42.
 4. Pull-through design values apply to connections having a minimum wood member thickness provided in the table.

5.6 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science, and fire science.

6 Installation

- 6.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this TER and the applicable building code.
- 6.2 In the event of a conflict between the manufacturer installation instructions and this TER, the more restrictive shall govern.
- 6.3 Install fasteners with head flush to the surface of the wood member.
- 6.4 Lead holes are not required.



- 6.5 Screws shall be installed with the appropriate rotating powered driver.
- 6.6 Minimum requirements for screw spacing, edge distance, and end distance shall be in accordance with Table 11.

Table 11. Axis™, Pico™, Aura™ and Epic™ Fastener Spacing, Edge Distance, and End Distance Requirements¹, Inch

Connection Geometry	#8	#9	#10	#14
Edge Distance – Load in any direction	$\frac{3}{8}$		$\frac{1}{2}$	
End Distance – Load parallel to grain, towards end	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$
End Distance – Load parallel to grain, away from end	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$
End Distance – Load perpendicular to grain	$\frac{1}{2}$	$\frac{5}{8}$		$\frac{3}{4}$
Spacing between Fasteners in a Row – Parallel to grain	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$
Spacing between Fasteners in a Row – Perpendicular to grain	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$
Spacing between Rows of Fasteners – In-line	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	
Spacing between Rows of Fasteners – Staggered ²	$\frac{3}{8}$		$\frac{1}{2}$	

1. Edge distances, end distances, and spacing of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is the more restrictive.
2. Values for "Spacing between Rows of Fasteners-Staggered" apply where the screws in adjacent rows are offset by one-half of the "Spacing between Fasteners in a Row".

7 Substantiating Data

- 7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
 - 7.1.1 Bending yield testing in accordance with ASTM F1575
 - 7.1.2 Shear and tensile testing in accordance with ASTM S904
 - 7.1.3 Lateral strength testing in accordance with ASTM D1761
 - 7.1.4 Withdrawal strength testing in accordance with ASTM D1761
 - 7.1.5 Head pull-through testing in accordance with ASTM D1761
 - 7.1.6 Corrosion resistance testing in accordance with ASTM B117
- 7.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e., ANAB accredited agencies), approved sources (i.e., RDPs), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon.
- 7.3 Where pertinent, testing and/or engineering analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ's engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.
- 7.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of products, materials, designs, assemblies and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this TER, may be dependent upon published design properties by others.

- 7.5 Testing and engineering analysis: The strength, rigidity and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.¹⁵
- 7.6 Where additional condition of use and/or code compliance information is required, please search for one of Axis™, Pico™, Aura™, and Epic™ Fasteners on the [DrJ Certification](#) website.

8 Findings

- 8.1 As outlined in Section 3, Axis™, Pico™, Aura™, and Epic™ Fasteners have performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.
- 8.2 When used and installed in accordance with this TER and the manufacturer installation instructions, Axis™, Pico™, Aura™, and Epic™ Fasteners shall be approved for the following applications:
 - 8.2.1 The reference design value properties defined herein for use in accordance with the applicable code
- 8.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Screw Products Inc.
- 8.4 [IBC Section 104.11](#) ([IRC Section R104.11](#) and [IFC Section 104.10](#)¹⁶ are similar) in pertinent part states:

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.
- 8.5 **Approved:**¹⁷ Building codes require that [the building official shall accept duly authenticated reports](#)¹⁸ or [research reports](#)¹⁹ from [approved agencies](#) and/or [approved sources](#) (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies, or methods of construction.
 - 8.5.1 [Acceptability](#) of an [approved agency](#), by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the [International Accreditation Forum](#) (IAF).
 - 8.5.2 [Acceptability](#) of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the [licensing board](#) of the relevant [jurisdiction](#).
 - 8.5.3 Federal law, [Title 18 US Code Section 242](#), requires that where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved, as denial without written reason deprives a protected right to free and fair competition in the marketplace.
- 8.6 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 [ANAB-Accredited Product Certification Body](#) – [Accreditation #1131](#).
- 8.7 Through ANAB accreditation and the [IAF Multilateral Agreements](#), this TER can be used to obtain product approval in any [jurisdiction](#) or country that has [IAF MLA Members & Signatories](#) to meet the [Purpose of the MLA](#) – “*certified once, accepted everywhere.*” IAF specifically says: “*Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.*”²⁰

¹⁵ See Code of Federal Regulations (CFR) [Title 24 Subtitle B Chapter XX Part 3280](#) for definition.

¹⁶ [2018 IFC Section 104.9](#)

¹⁷ Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC [Section 201.4](#) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

¹⁸ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

¹⁹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>

²⁰ <https://iaf.nu/en/about-iaf-mla/#:~:text=required%20to%20recognise>

9 Conditions of Use

- 9.1 Material properties shall not fall outside the boundaries defined in Section 3.
- 9.2 As defined in Section 3, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.
- 9.3 Moisture content shall be less than or equal to 19% for sawn lumber.
- 9.4 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this evaluation report.
- 9.5 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:
 - 9.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice, and, when prepared by an approved source, shall be approved when requirements of adopted legislation are met.
 - 9.5.2 This TER and the installation instructions shall be submitted at the time of permit application.
 - 9.5.3 These products have an internal quality control program and a third-party quality assurance program.
 - 9.5.4 At a minimum, these products shall be installed per Section 6 of this TER.
 - 9.5.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and IBC Section 105.4.
 - 9.5.6 These products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4 and IRC Section R109.2.
 - 9.5.7 The application of these products in the context of this TER is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2 and any other regulatory requirements that may apply.
- 9.6 The approval of this TER by the AHJ shall comply with IBC Section 1707.1, where legislation states in pertinent part, “*the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.11” , all of IBC Section 104, and IBC Section 105.4.*
- 9.7 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 9.8 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner’s authorized agent.



10 Identification

- 10.1 The products listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at [screw-products.com](https://www.screw-products.com).

11 Review Schedule

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit drjcertification.org.
- 11.2 For information on the status of this TER, contact [DrJ Certification](https://www.drjcertification.com).

12 Approved for Use Pursuant to US and International Legislation Defined in Appendix A

- 12.1 Axis™, Pico™, Aura™, and Epic™ Fasteners are included in this TER published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services, and whose TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER meets the legislative intent and definition of being acceptable to the AHJ.

Appendix A

1 Legislation that Authorizes AHJ Approval

- 1.1 **Fair Competition:** State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:
 - 1.1.1 Advance Innovation,
 - 1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints, and
 - 1.1.3 Benefit consumers through lower prices, better quality, and greater choice.
- 1.2 **Adopted Legislation:** The following local, state, and federal regulations affirmatively authorize Axis™, Pico™, Aura™, and Epic™ Fasteners to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
 - 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies and/or methods of construction. The goal is to “protect economic freedom and opportunity by promoting free and fair competition in the marketplace.”
 - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation, and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
 - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2018 (DTSA).
 - 1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of listings, certified reports, Technical Evaluation Reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.
 - 1.2.4 For new materials²¹ that are not specifically provided for in any building code, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.
 - 1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.²²
 - 1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence, provided in writing, that specific legislation has been violated by an individual registered PE.
 - 1.2.7 The AHJ shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.²³

²¹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

²² [IBC 2021, Section 1706.1 Conformance to Standards](#)

²³ [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#)

- 1.3 **Approved²⁴ by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards, which apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.²⁵ The Superintendent of Building roster of approved testing agencies is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a CBI Listing are LAMC approved. In addition, the Superintendent of Building shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.²⁶
- 1.4 **Approved by Chicago:** The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).
- 1.5 **Approved by New York City:** The NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed²⁷ an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement²⁸ (i.e., ANAB, International Accreditation Forum (IAF), etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods; 1) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 3) A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code; 4) A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code; 5) A statewide product approval issued by the Florida Building Commission. The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).

²⁴ See Section 8 for the distilled building code definition of **Approved**

²⁵ Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

²⁶ https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

²⁷ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

²⁸ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

- 1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA]):** A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation [553.842](#) and [553.8425](#).
- 1.8 **Approved by New Jersey:** Pursuant to Building Code 2018 of New Jersey in [IBC Section 1707.1 General](#),²⁹ it states: “In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from [approved agencies](#) in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the [Uniform Construction Code \(N.J.A.C. 5:23\)](#)”.³⁰ Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) Approvals:** Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability and safety of those conforming with the requirements of the regulations.
1. A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of (a) above. 2. Reports of engineering findings issued by nationally recognized evaluation service programs, such as, but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of (a) above. The [New Jersey Department of Community Affairs](#) has confirmed that technical evaluation reports, from any accredited entity listed by [ANAB](#), meets the requirements of item 2 given that the listed entities are no longer in existence and/or do not provide “reports of engineering findings”.
- 1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, [Part 3282.14](#),³¹ and [Part 3280](#),³² the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) “All construction methods shall be in conformance with accepted engineering practices”; 2) “The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.”; and 3) “The design stresses of all materials shall conform to accepted engineering practice.”
- 1.10 **Approval by US, Local, and State Jurisdictions in General:** In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:
- 1.10.1 For [new materials](#) that are not specifically provided for in this code, the [design strengths and permissible stresses](#) shall be established by tests.³³
- 1.10.2 For [innovative alternative products, materials, designs, services and/or methods of construction](#), in the absence of approved rules or other approved standards...the building official shall accept duly authenticated reports (i.e., listing and/or research report) from [approved agencies](#) with respect to the quality and manner of use of [new materials or assemblies](#).³⁴ A building official [approved agency](#) is deemed to be approved via certification from an [accreditation body](#) that is listed by the [International Accreditation Forum](#)³⁵ or equivalent.

²⁹ https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

³⁰ <https://www.nj.gov/dca/divisions/codes/codereg/ucc.html>

³¹ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

³² <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>

³³ [IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials](#). Adopted law pursuant to IBC model code language 1706.2.

³⁴ [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#). Adopted law pursuant to IBC model code language 1707.1.

³⁵ Please see the [ANAB directory](#) for building official approved agencies.

- 1.10.3 The design strengths and permissible stresses of any structural material...shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.³⁶ An approved source is defined as a PE subject to professional engineering laws, where a research and/or a technical evaluation report certified by a PE, shall be approved.
- 1.11 **Approval by International Jurisdictions:** The USMCA and GATT agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the Technical Barriers to Trade agreements and the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA), where these agreements:
- 1.11.1 Permit participation of conformity assessment bodies located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,
 - 1.11.2 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.
 - 1.11.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.
 - 1.11.4 **Approved:** The purpose of the IAF MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA, and subsequently acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.

³⁶ IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.



Issue Date: May 12, 2023
Subject to Renewal: July 1, 2024

FBC Supplement to TER 2212-01

REPORT HOLDER: Screw Products Inc.

1 Evaluation Subject

- 1.1 Axis™, Pico™, Aura™, and Epic™ Fasteners

2 Purpose and Scope

2.1 Purpose

- 2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Axis™, Pico™, Aura™, and Epic™ Fasteners, recognized in TER 2212-01, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

- 2.2.1 *FBC-B—17, 20: Florida Building Code – Building*
- 2.2.2 *FBC-R—17, 20: Florida Building Code – Residential*

3 Conclusions

- 3.1 Axis™, Pico™, Aura™, and Epic™ Fasteners, described in TER 2212-01, comply with the FBC-B and FBC-R and are subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this TER, they are listed here:
 - 3.2.1 FBC-B Section 104.4 and Section 110.4 are reserved
 - 3.2.2 FBC-R Section R104 and Section R109 are reserved
 - 3.2.3 FBC-B Section 1603.1 replaces IBC Section 1603.1

4 Conditions of Use

- 4.1 Axis™, Pico™, Aura™, and Epic™ Fasteners, described in TER 2212-01, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 2212-01.
 - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.



Issue Date: May 12, 2023
Subject to Renewal: July 1, 2024

CBC and CRC Supplement to TER 2212-01

REPORT HOLDER: Screw Products Inc.

1 Evaluation Subject

1.1 Axis™, Pico™, Aura™, and Epic™ Fasteners

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Axis™, Pico™, Aura™, and Epic™ Fasteners, recognized in TER 2212-01, has also been evaluated for compliance with the codes listed below.

2.2 *Applicable Code Editions*

2.2.1 *CBC—16, 19: California Building Code (Title 24, Part 2)*

2.2.2 *CRC—16, 19: California Residential Code (Title 24, Part 2.5)*

3 Conclusions

3.1 Axis™, Pico™, Aura™, and Epic™ Fasteners, described in TER 2212-01, complies with the CBC and CRC and is subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the CBC and CRC applicable to this TER, they are listed here:

3.2.1 No variations

4 Conditions of Use

4.1 Axis™, Pico™, Aura™, and Epic™ Fasteners, described in TER 2212-01, must comply with all of the following conditions:

4.1.1 All applicable sections in TER 2212-01

4.1.2 The design, installation, and inspections are in accordance with additional requirements of the CBC and CRC, as applicable.



Issue Date: May 12, 2023
Subject to Renewal: July 1, 2024

LABC and LARC Supplement to TER 2212-01

REPORT HOLDER: Screw Products Inc.

1 Evaluation Subject

- 1.1 Axis™, Pico™, Aura™, and Epic™ Fasteners

2 Purpose and Scope

2.1 Purpose

- 2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Axis™, Pico™, Aura™, and Epic™ Fasteners, recognized in TER 2212-01, have also been evaluated for compliance with the codes listed below as adopted by the Los Angeles Department of Building and Safety (LADBS).

2.2 Applicable Code Editions

- 2.2.1 LABC—17, 20: Los Angeles Building Code
- 2.2.2 LARC—17, 20: Los Angeles Residential Code

3 Conclusions

- 3.1 Axis™, Pico™, Aura™, and Epic™ Fasteners, described in TER 2212-01, comply with the LABC and LARC and are subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the LABC and LARC applicable to this TER, they are listed here:
 - 3.2.1 LABC Section 91.104.2.6 replaces IBC Section 104.11
 - 3.2.2 LARC Section 91.104.2.6 replaces IRC Section R104.11
 - 3.2.3 LABC Section 91.104.2.2 replaces IBC Section 104.4
 - 3.2.4 LABC Section 91.108 replaces IBC Section 110.4
 - 3.2.5 LARC Section 91.104.2.2 replaces IRC Section R104.4
 - 3.2.6 LARC Section 91.108 replaces IRC Section R109.2
 - 3.2.7 LABC Section 91.104 replaces IBC Section 104
 - 3.2.8 LABC Section 91.108.5 replaces IBC Section 110.3

4 Conditions of Use

- 4.1 Axis™, Pico™, Aura™, and Epic™ Fasteners, described in TER 2212-01, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 2212-01.
 - 4.1.2 The design, installation, conditions of use, and identification of Axis™, Pico™, Aura™, and Epic™ Fasteners are in accordance with the 2021 International Building Code (IBC) provisions noted in TER 2212-01.
 - 4.1.3 The design, installation, and inspections are in accordance with additional requirements of LABC Chapter 16 and 17, as applicable.