Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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SPAX® PowerLags® Series Structural Wood Fastener Properties

Trade Secret Report Holder:

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CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 00 90 - Wood and Plastic Fastenings

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

1 Innovative Products Evaluated[1]

1.1 SPAX PowerLags Series Structural Wood Fasteners:

1.1.1 SPAX® Hex Washer Head PowerLags® Fastener

1.1.2 SPAX® T-Star Washer Head PowerLags® Fastener

1.1.3 SPAX® T-Star Pancake Head PowerLags® Fastener

1.1.4 SPAX® T-Star Plus Cylindric Head PowerLags® Fastener

2 Product Description and Materials

2.1 *General*

2.1.1 SPAX PowerLags Series Structural Wood Fasteners are threaded fasteners manufactured using a standard cold forming process and subsequently heat-treated and coated.

2.1.2 SPAX PowerLags Series Structural Wood Fasteners are available with a variety of coatings, including proprietary coating systems designated as zinc, yellow zinc, HCR™, HCR-X™ and WIROX®.

2.1.3 SPAX PowerLags Series Structural Wood Fasteners are available in five diameters and four different head types. They have lengths ranging from 1" to 24" (25 to 610 mm), inclusive of the threaded portion. The four head types are as follows:

2.1.3.1 Hex Washer Head design (**Figure 1**).

2.1.3.2 T-Star Washer Head design with 6-Lobe recess drive system (**Figure 2**).

2.1.3.3 T-Star Pancake Head design with 6-Lobe recess drive system (**Figure 3**).

2.1.3.4 T-Star plus Cylindric Head design with 6-Lobe recess drive system containing a post (**Figure 4**).

2.1.4 For fastener diameters, lengths, and head types, see **Table 1** for #14, **Table 2** for $^1/_4$", **Table 3** for $^5/_{16}$", **Table 4** for $^3/_8$", and **Table 5** for the $^1/_2$" series. All fasteners described in this report are manufactured with cold rolled threads and a gimlet point.

2.2 The innovative products evaluated in this report are shown in **Figure 1**, **Figure 2**, **Figure 3**, and **Figure 4**.

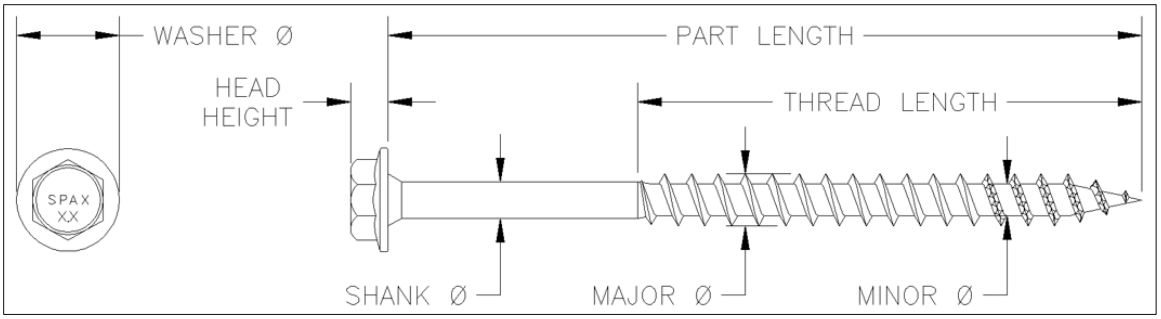

Figure 1. SPAX Hex Washer Head PowerLags Fastener

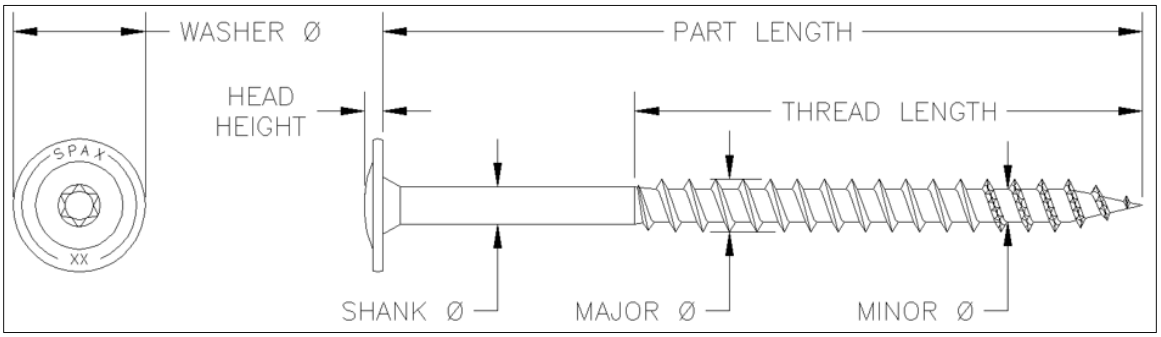

Figure 2. SPAX T-Star Washer Head PowerLags Fastener

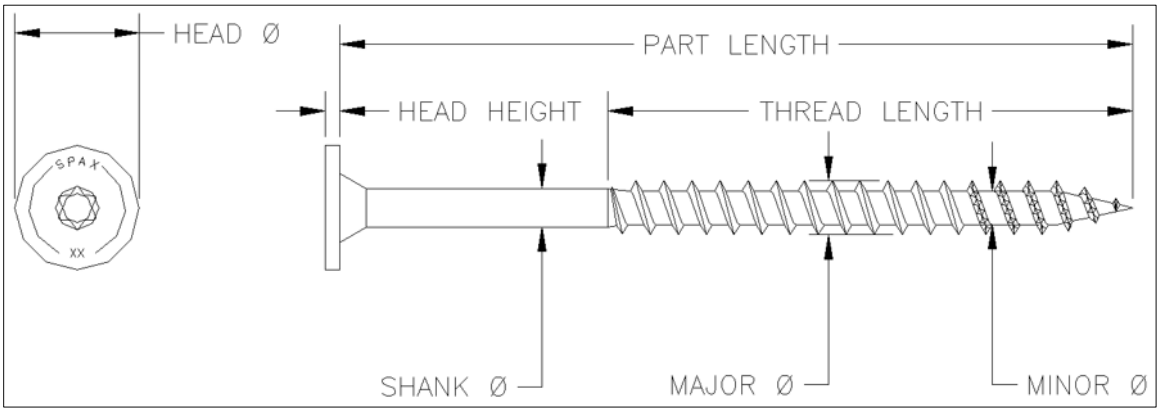

Figure 3. SPAX T-Star Pancake Head PowerLags Fastener

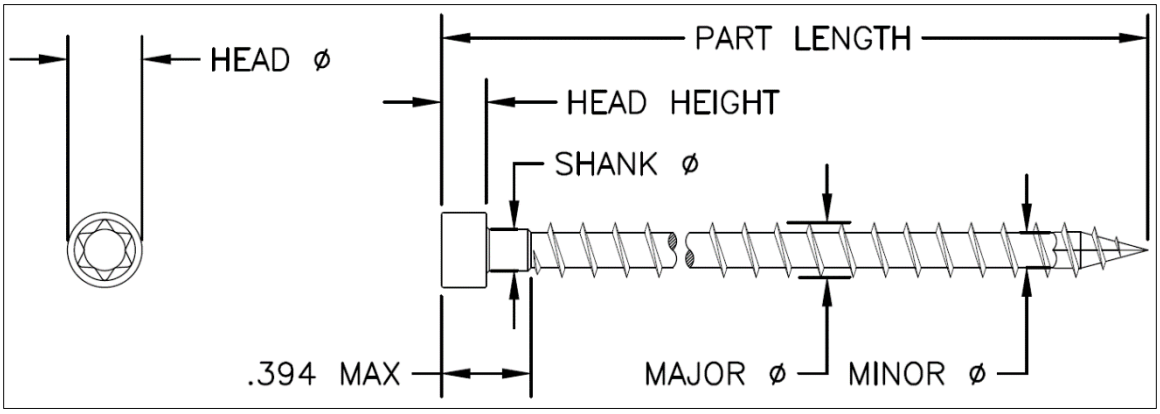

Figure 4. SPAX T-Star plus Cylindric Head PowerLags Fastener

2.3 *Fastener Material*

2.3.1 SPAX PowerLags Series Structural Wood Fasteners are made of hardened carbon steel grade 10B18, 1022, or 10B21 wire conforming to ASTM A510 or, grade 17MnB3 or 19MnB4 wire conforming to DIN 1654.

2.4 *Corrosion Resistance*

2.4.1 *Interior Wood Applications:*

2.4.1.1 SPAX PowerLags Series Structural Wood Fasteners with the proprietary zinc, yellow zinc, or WIROX coatings, are equivalent to the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D, as specified in IBC Section 2304.10.6[2] and IRC Section R304.3,[3] when recognized for use in untreated wood and above ground contact pressure-treated wood with waterborne alkaline copper quaternary, Type D (also known as ACQ-D), to a maximum retention level of 0.40-pcf (6.4 kg/m^3), interior, dry/damp general construction applications (e.g., Above Ground AWPA UC1-UC2 ACQ-D).

2.4.2 *Exterior Wood Applications:*

2.4.2.1 SPAX PowerLags Series Structural Wood Fasteners with the proprietary HCR or HCR-X coatings, are equivalent to the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D as specified in IBC Section 2304.10.6[4] and IRC Section R304.3,[5] when recognized for use in untreated wood and ground contact pressure-treated wood with waterborne alkaline copper quaternary, Type D (ACQ-D), to a minimum retention level of 0.40-pcf (6.4 kg/m^3), exterior, freshwater, general construction applications (e.g., Above Ground AWPA UC1-UC4A ACQ-D).

2.4.3 *Fire-Retardant Treated (FRT) Wood Applications:*

2.4.3.1 SPAX PowerLags Series Structural Wood Fasteners proprietary coating systems designated as zinc, yellow zinc, HCR, HCR-X, or WIROX are recognized for use in FRT lumber, provided the conditions set forth by the FRT lumber manufacturer be met, including appropriate strength reductions.

2.5 *Wood Material*

2.5.1 Wood main and side members must be solid-sawn lumber or boards having an assigned specific gravity as given in the respective tables of this report. Assigned specific gravity must be determined in accordance with NDS Table 12.3.3A.

2.6 SPAX PowerLags Series Structural Wood Fasteners that are evaluated in this report are set forth in **Table 1**, **Table 2**, **Table 3**, **Table 4**, and **Table 5**.

Table 1. #14 SPAX PowerLags Series Structural Wood Fasteners Specifications[5]

Fastener Designation	Head				Length (in)		Diameter (in)			Bending Yield Strength,[3] F_{yb} (psi)	Allowable Steel Strength (lbf)	
	Style	Drive System	Diameter (in)	Height (in)	Fastener[1]	Thread[2]	Shank	Minor	Major		Tensile	Shear
#14 x 4 3/4"	T-Star plus Cylindric Head	T-30 6 Lobe Recess	0.320	0.200	4 3/4	4.356	0.170	0.155	0.240	160,000	990	750
#14 x 6 1/4"					6 1/4	5.856						

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

1. Fastener length is measured from the topside of the head to the tip.
2. Thread length includes tapered tip (see **Figure 4**).
3. Bending yield strength, F_{yb}, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in the threaded section.
4. Shear strength is determined in accordance with AISI S904 using minor thread diameter when fastener is tested in the threaded section.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

Table 2. 1/4" SPAX PowerLags Series Structural Wood Fasteners Specifications[5]

Fastener Designation	Head				Length (in)		Diameter (in)			Bending Yield Strength,[3] F_{yb} (psi)	Allowable Steel Strength (lbf)	
	Style	Drive System	Diameter (in)	Height (in)	Fastener[1]	Thread[2]	Shank	Minor	Major		Tensile	Shear
1/4 x 2"	Hex Washer Head	3/8" Hex Driver	0.545	0.210	2	1.770	0.195	0.170	0.276	158,000	1,160	995
1/4 x 2 1/2"					2 1/2	1.375						
1/4 x 3"					3	2.360						
1/4 x 3 1/2"					3 1/2	2.360						
All Longer Lengths					-	2.375						
1/4 x 2"	T-Star Washer Head	T-30 6 Lobe Recess	0.697	0.097	2	1.375	0.195	0.170	0.276	158,000	1,160	995
1/4 x 2 1/2"					2 1/2	1.375						
1/4 x 3"					3	1.790						
1/4 x 3 1/2"					3 1/2	1.960						
All Longer Lengths					-	2.375						

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. These screws are manufactured in lengths up to 24". See **Table 9** for additional available lengths.
2. Thread length includes tapered tip (see **Figure 1** and **Figure 2**).
3. Bending yield strength, F_{yb}, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in threaded section.
4. Shear strength is determined in accordance with ASTM F1575 using shank diameter.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

Table 3. 5/16" SPAX PowerLags Series Structural Wood Fasteners Specifications[5]

Fastener Designation	Head				Length (in)		Diameter (in)			Bending Yield Strength,[3] F_{yb} (psi)	Allowable Steel Strength (lbf)	
	Style	Drive System	Diameter (in)	Height (in)	Fastener[1]	Thread[2]	Shank	Minor	Major		Tensile	Shear
5/16 x 2"	Hex Washer Head	7/16" Hex Driver	0.591	0.248	2	1.375	0.217	0.189	0.315	150,000	1,515	1,205
5/16 x 2 1/2"					2 1/2	1.375						
5/16 x 3"					3	2.360						
5/16 x 3 1/2"					3 1/2	2.993						
5/16 x 4"					4	2.993						
All Longer Lengths					-	2.375						
5/16 x 2"	T-Star Washer Head	T-40 6 Lobe Recess	0.776	0.140	2	1.375	0.217	0.189	0.315	150,000	1,515	1,205
5/16 x 2 1/2"					2 1/2	1.375						
5/16 x 3"					3	1.650						
5/16 x 3 1/2"					3 1/2	2.050						
5/16 x 4"					4	2.375						
All Longer Lengths					-	2.375						
5/16 x 2"	T-Star Pancake Head	T-40 6 Lobe Recess	0.610	0.085	2	1.375	0.217	0.189	0.315	150,000	1,515	1,205
5/16 x 2 1/2"					2 1/2	1.375						
5/16 x 3"					3	1.375						
5/16 x 3 1/2"					3 1/2	1.375						
5/16 x 4"					4	2.375						
All Longer Lengths					-	2.375						

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. These screws are manufactured in lengths up to 24". See **Table 10** for all available lengths.
2. Thread length includes tapered tip (see **Figure 1**, **Figure 2**, and **Figure 3**).
3. Bending yield strength, F_{yb}, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in the threaded section.
4. Shear strength is determined in accordance with ASTM F1575 using shank diameter.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

Table 4. 3/8" SPAX PowerLags Series Structural Wood Fasteners Specifications[5]

Fastener Designation	Head				Length (in)		Diameter (in)			Bending Yield Strength,[3] F_{yb} (psi)	Allowable Steel Strength (lbf)	
	Style	Drive System	Diameter (in)	Height (in)	Fastener[1]	Thread[2]	Shank	Minor	Major		Tensile	Shear
3/8 x 4"	Hex Washer Head	1/2" Hex Driver	0.748	0.307	4	2.375	0.270	0.236	0.394	144,000	2,430	1,855
3/8 x 4 1/2"					4 1/2	2.375						
All Longer Lengths					-	3.105						
3/8 x 4"	T-Star Washer Head	T-40 6 Lobe Recess	0.970	0.173	4	2.375	0.270	0.236	0.394	144,000	2,430	1,855
3/8 x 4 1/2"					4 1/2	2.375						
All Longer Lengths					-	3.105						

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. These screws are manufactured in lengths up to 18". See **Table 11** for all available lengths.
2. Thread length includes tapered tip (see **Figure 1** and **Figure 2**).
3. Bending yield strength, F_{yb}, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in threaded section.
4. Shear strength is determined in accordance with ASTM F1575 using shank diameter.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

Table 5. 1/2" SPAX PowerLags Series Structural Wood Fasteners Specifications[5]

Fastener Designation	Head				Length (in)		Diameter (in)			Bending Yield Strength,[3] F_{yb} (psi)	Allowable Steel Strength (lbf)	
	Style	Drive System	Diameter (in)	Height (in)	Fastener[1]	Thread[2]	Shank	Minor	Major		Tensile	Shear
1/2" x All Lengths	Hex Washer Head	5/8" Hex Driver	0.858	0.394	-	3.150	0.335	0.295	0.480	166,000	3,415	3,245

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. These screws are manufactured in lengths from 4" to 12". See **Table 12** for all available lengths.
2. Thread length includes tapered tip (see **Figure 1**).
3. Bending yield strength, F_{yb}, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in threaded section.
4. Shear strength is determined in accordance with ASTM F1575 using shank diameter.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

2.7 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions[6]

3.1 New Materials[7] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[8] The design strength and permissible stresses shall be established by tests[9] and/or engineering analysis.[10]

3.2 Duly authenticated reports[11] and research reports[12] are test reports and related engineering evaluations that are written by an approved agency[13] and/or an approved source.[14]

3.2.1 This report utilizes intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[15]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[16]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[17] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[18] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[19] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[20]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[21] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[22] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[23]

4 Applicable Local, State, and Federal Approvals; Standards; Regulations[24]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[25]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[26]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[27] and Part 3280[28] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *Regulations*

4.2.1 *IBC – 18, 21, 24: International Building Code®*

4.2.2 *IRC – 18, 21, 24: International Residential Code®*

4.2.3 *FBC-B—20, 23: Florida Building Code[29] – Building (FL 40711)*

4.2.4 *FBC-R—20, 23: Florida Building Code[29] – Residential (FL 40711)*

4.2.5 *CBC—19, 22: California Building Code[30] (Title 24, Part 2)*

4.2.6 *CRC—19, 22: California Residential Code[30] (Title 24, Part 2.5)*

4.2.7 *LABC—20, 23: Los Angeles Building Code[31]*

4.2.8 *LARC—20, 23: Los Angeles Residential Code[31]*

4.3 *Standards*

4.3.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strengths of Screws*

4.3.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*

4.3.3 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*

4.3.4 *ASTM A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*

4.3.5 *ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus*

4.3.6 *ASTM D1037: Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*

4.3.7 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*

4.3.8 *ASTM F606: Standard Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets*

4.3.9 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*

4.3.10 *ASTM G85: Standard Practice for Modified Salt Spray (Fog) Testing*

5 Listed[32]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (e.g., CBI), an approved agency (e.g., CBI and DrJ), and/or and approved source (e.g., DrJ), or other organization(s) concerned with product evaluation (e.g., DrJ), that maintains periodic inspection (e.g., CBI) 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.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 SPAX PowerLags Series Structural Wood Fasteners are used to attach wood framing members in conventional light-frame construction and provide resistance against head pull-through, withdrawal, and shear loads.

6.2 *Design*

6.2.1 Design of SPAX PowerLags Series Structural Wood Fasteners is governed by the applicable code and the provisions for dowel-type fasteners in the NDS.

6.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.

6.3 *Head Pull-Through Design Values*

6.3.1 Reference design values for head pull-through for SPAX PowerLags Series Structural Wood Fasteners are specified in **Table 6**.

Table 6. Reference Pull-Through Design Values (P) for SPAX PowerLags Series Structural Wood Fasteners

Fastener Series	Head Style	Pull-Through Design Value,[1,2] P (lbf)		
		Wood Species (Specific Gravity)[3]		
		SP (0.55)	DF-L (0.50)	SPF/HF (0.42)
#14 SPAX PowerLags	T-Star Plus Cylindric Head	285	285	235
1/4" SPAX PowerLags	Hex Washer Head	700	640	455
	T-Star Washer Head	850	785	585
5/16" SPAX PowerLags	Hex Washer Head	755	680	500
	T-Star Washer Head	965	840	665
	T-Star Pancake Head	810	735	560
3/8" SPAX PowerLags	Hex Washer Head	985	825	575
	T-Star Washer Head	1245	1085	880
1/2" SPAX PowerLags	Hex Washer Head	1185	970	865

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Minimum 1.5" wood member thickness
2. Tabulated pull-through values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.

6.4 *Reference Withdrawal Design Values in Face Grain Applications*

6.4.1 Reference withdrawal design values for SPAX PowerLags Series Structural Wood Fasteners are specified in **Table 7**.

Table 7. Reference Withdrawal Design Values (W) for SPAX PowerLags Series Structural Wood Fasteners in Face Grain

Fastener Series	Head Style	Pull-Through Design Value,[1,2] P (lbf)		
		Wood Species (Specific Gravity)[3]		
		SP (0.55)	DF-L (0.50)	SPF/HF (0.42)
#14 SPAX PowerLags	T-Star Plus Cylindric Head	205	130	130
1/4" SPAX PowerLags	Hex Washer Head	375	310	245
	T-Star Washer Head			
5/16" SPAX PowerLags	Hex Washer Head	415	300	250
	T-Star Washer Head			
	T-Star Pancake Head			
3/8" SPAX PowerLags	Hex Washer Head	465	300	280
	T-Star Washer Head			
1/2" SPAX PowerLags	Hex Washer Head	445	275	275

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 lb/ft = 0.0146 kN/m

1. Tabulated withdrawal values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
2. Full withdrawal strength is calculated by multiplying the length of thread embedded in the main member by the tabulated reference withdrawal values.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.

6.5 *Lateral Design Values*

6.5.1 Reference lateral design values for shear load parallel and perpendicular to grain for SPAX PowerLags Series Structural Wood Fasteners are specified in **Table 8**, **Table 9**, **Table 10**, **Table 11**, and **Table 12**.

Table 8. #14 SPAX PowerLags Fasteners Lateral Design Values

Fastener Designation	Minimum Main Member Penetration[1] (in)	Minimum Side Member Thickness (in)	Reference Lateral Shear Value,[4,5,6] Z (lbf)					
			Wood Species (Specific Gravity)[2,3]					
			SP (0.55)		DF-L (0.50)		SPF/HF (0.42)	
			$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$
#14 x 4 3/4"	1.5	1.5	185	185	170	170	145	145
#14 x 6 1/4"								

SI: 1 in = 25.4 mm, 1-lbf = 4.45 N

1. Penetration depth includes the length of tapered tip.
2. The species applies to both the main and side members. Where the members are different specific gravities, use the lower of the two.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.
4. The fastener shall be oriented perpendicular to grain, and the underside of the fastener head shall be installed flush with the surface of the side member.
5. $Z_{\perp}$ = Lateral Design Values Perpendicular to Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Grain.
6. Tabulated lateral design values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.

Table 9. 1/4" SPAX PowerLags Lateral Design Values

Fastener Designation	Minimum Main Member Penetration[1] (in)	Minimum Side Member Thickness (in)	Reference Lateral Shear Value,[4,5,6] Z (lbf)					
			Wood Species (Specific Gravity)[2,3]					
			SP (0.55)		DF-L (0.50)		SPF/HF (0.42)	
			$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$
1/4 x 2"	1.375	0.625	305	285	265	235	250	225
1/4 x 2 1/2"								
1/4 x 3"								
1/4 x 3 1/2"		1.5	390	370	360	340	315	285
1/4 x 4"	2.375	1.5	400	370	360	335	350	310
1/4 x 4 1/2"								
1/4 x 5"								
1/4 x 5 1/2"								
1/4 x 6"								
1/4 x 6 1/2"								
1/4 x 7"								
1/4 x 7 1/2"								
1/4 x 8"								
1/4 x 8 1/2"								
1/4 x 9"								
1/4 x 10"								
1/4 x 11"								
1/4 x 12"								
1/4 x 13"								
1/4 x 14"								
1/4 x 15"								
1/4 x 16"								
1/4 x 18"								
1/4 x 20"								
1/4 x 22"								
1/4 x 24"								

SI: 1 in = 25.4 mm, 1-lbf = 4.45 N

1. Penetration depth includes the length of tapered tip.
2. The species applies to both the main and side members. Where the members are different specific gravities, use the lower of the two.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.
4. The fastener shall be oriented perpendicular to grain, and the underside of the fastener head shall be installed flush with the surface of the side member.
5. $Z_{\perp}$ = Lateral Design Values Perpendicular to Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Grain.
6. Tabulated lateral design values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.

Table 10. $^{5}/_{16}$" SPAX PowerLags Lateral Design Values

Fastener Designation	Minimum Main Member Penetration[1] (in)	Minimum Side Member Thickness (in)	Reference Lateral Shear Value,[4,5,6] Z (lbf)					
			Wood Species (Specific Gravity)[2,3]					
			SP (0.55)		DF-L (0.50)		SPF/HF (0.42)	
			$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$
$^{5}/_{16}$ x 2"	1.375	0.625	340	305	310	280	265	230
$^{5}/_{16}$ x 2$^{1}/_{2}$"								
$^{5}/_{16}$ x 3"								
$^{5}/_{16}$ x 3$^{1}/_{2}$"		2.125	400	380	360	340	325	300
$^{5}/_{16}$ x 4"	2.375	1.5	440	405	405	375	380	355
$^{5}/_{16}$ x 4$^{1}/_{2}$"								
$^{5}/_{16}$ x 5"								
$^{5}/_{16}$ x 5$^{1}/_{2}$"								
$^{5}/_{16}$ x 6"								
$^{5}/_{16}$ x 6$^{1}/_{2}$"								
$^{5}/_{16}$ x 7"								
$^{5}/_{16}$ x 7$^{1}/_{2}$"								
$^{5}/_{16}$ x 8"								
$^{5}/_{16}$ x 8$^{1}/_{2}$"								
$^{5}/_{16}$ x 9"								
$^{5}/_{16}$ x 10"								
$^{5}/_{16}$ x 11"								
$^{5}/_{16}$ x 12"								
$^{5}/_{16}$ x 13"								
$^{5}/_{16}$ x 14"								
$^{5}/_{16}$ x 15"								
$^{5}/_{16}$ x 16"								
$^{5}/_{16}$ x 18"								
$^{5}/_{16}$ x 20"								
$^{5}/_{16}$ x 22"								
$^{5}/_{16}$ x 24"								

SI: 1 in = 25.4 mm, 1-lbf = 4.45 N

1. Penetration depth includes the length of tapered tip.
2. The species applies to both the main and side members. Where the members are different specific gravities, use the lower of the two.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.
4. The fastener shall be oriented perpendicular to grain, and the underside of the fastener head shall be installed flush with the surface of the side member.
5. $Z_{\perp}$ = Lateral Design Values Perpendicular to Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Grain.
6. Tabulated lateral design values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.

Table 11. 3/8" SPAX PowerLags Lateral Design Values

Fastener Designation	Minimum Main Member Penetration[1] (in)	Minimum Side Member Thickness (in)	Reference Lateral Shear Value,[4,5,6] Z (lbf)					
			Wood Species (Specific Gravity)[2,3]					
			SP (0.55)		DF-L (0.50)		SPF/HF (0.42)	
			$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$
3/8 x 4"	2.375	1.5	530	485	475	440	445	405
3/8 x 4 1/2"								
3/8 x 5"								
3/8 x 5 1/2"								
3/8 x 6"								
3/8 x 6 1/2"								
3/8 x 7"								
3/8 x 7 1/2"								
3/8 x 8"								
3/8 x 8 1/2"								
3/8 x 9"								
3/8 x 10"								
3/8 x 11"								
3/8 x 12"								
3/8 x 13"								
3/8 x 14"								
3/8 x 15"								
3/8 x 16"								
3/8 x 18"								

SI: 1 in = 25.4 mm, 1-lbf = 4.45 N

1. Penetration depth includes the length of tapered tip.
2. The species applies to both the main and side members. Where the members are different specific gravities, use the lower of the two.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.
4. The fastener shall be oriented perpendicular to grain, and the underside of the fastener head shall be installed flush with the surface of the side member.
5. $Z_{\perp}$ = Lateral Design Values Perpendicular to Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Grain.
6. Tabulated lateral design values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.

Table 12. 1/2" SPAX PowerLags Lateral Design Values

Fastener Designation	Minimum Main Member Penetration[1] (in)	Minimum Side Member Thickness (in)	Reference Lateral Shear Value,[4,5,6] Z (lbf)					
			Wood Species (Specific Gravity)[2,3]					
			SP (0.55)		DF-L (0.50)		SPF/HF (0.42)	
			$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$
1/2 x 4"	2.375	1.5	585	475	550	400	500	370
1/2 x 4 1/2"								
1/2 x 5"								
1/2 x 5 1/2"								
1/2 x 6"								
1/2 x 6 1/2"								
1/2 x 7"								
1/2 x 7 1/2"								
1/2 x 8"								
1/2 x 8 1/2"								
1/2 x 9"								
1/2 x 10"								
1/2 x 11"								
1/2 x 12"								

SI: 1 in = 25.4 mm, 1-lbf = 4.45 N

1. Penetration depth includes the length of tapered tip.
2. The species applies to both the main and side members. Where the members are different specific gravities, use the lower of the two.
3. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.
4. The fastener shall be oriented perpendicular to grain, and the underside of the fastener head shall be installed flush with the surface of the side member.
5. $Z_{\perp}$ = Lateral Design Values Perpendicular to Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Grain.
6. Tabulated lateral design values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.

6.6 Alternative techniques shall be permitted in accordance with accepted engineering practice and experience. These provisions for the use of alternative materials, designs, and methods of construction are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed herein. This includes, but is not limited to, the following areas of engineering: mechanics of materials, structures, building science, and fire science.

7 Certified Performance[33]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[34]

7.2 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.[35]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 SPAX PowerLags Series Structural Wood Fasteners comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 SPAX PowerLags Series Structural Wood Fasteners were tested and evaluated to determine their structural resistance properties, which are used to develop reference design values for Allowable Stress Design (ASD). The following properties were evaluated:

8.1.1.1 Bending yield in accordance with ASTM F1575

8.1.1.2 Tensile strength in accordance with ASTM F606 and AISI S904

8.1.1.3 Shear strength in accordance with ASTM F1575 and AISI S904

8.1.1.4 Head pull-through in accordance with ASTM D1037 and ASTM D1761

8.1.1.5 Withdrawal strength in accordance with ASTM D1761

8.1.1.6 Lateral resistance in accordance with ASTM D1761 and NDS

8.1.1.7 Corrosion resistance in accordance with ASTM B117 and ASTM G85

8.1.2 The use of SPAX PowerLags Series Structural Wood Fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this report.

8.1.3 For connection design values for truss/rafter/joist to walls, stud to plate, and plate to rim board connections see Report Number 1910-02.

8.2 Any building code, regulation and/or accepted engineering evaluations (e.g., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[36] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[37] respectively.

8.3 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.3 SPAX PowerLags Series Structural Wood Fasteners shall be installed using the driver bits specified in **Table 1**, **Table 2**, **Table 3**, **Table 4**, and **Table 5**, as applicable.

9.4 Fasteners shall not be struck with a hammer during installation.

9.5 *Lead Hole Requirements*

9.5.1 Lead holes are not required for #14, 1/4" and 5/16" SPAX PowerLags Series Structural Wood Fasteners.

9.5.2 Lead holes of 0.172" (4.37 mm) diameter are required for 3/8" SPAX PowerLags Series Structural Wood Fasteners.

9.5.3 Lead holes of 0.203" (5.16 mm) diameter are required for 1/2" SPAX PowerLags Series Structural Wood Fasteners.

9.6 The fastener head must be installed flush to the surface of the wood side member being connected. The fastener must not be overdriven.

9.6.1 In the event a fastener is overdriven, contact the manufacturer for counsel on steps to take and, if needed, a repair to be made.

9.7 Minimum main member penetration is 1 1/2" unless otherwise stated in this report.

9.8 Minimum requirements for fastener spacing, edge distance, and end distance shall be in accordance with **Table 13**. See **Figure 5** for additional details.

Table 13. Minimum Spacing, Edge Distance, and End Distance Requirements

Connection Geometry		Minimum Spacing/Distance[1,2,3] (in)				
		#14	1/4"	5/16"	3/8"	1/2"
Edge Distance – Load in any direction	(a)[4]	1/2	1/2	5/8	2 1/4	2 3/4
End Distance – Load parallel to grain, towards end	(b)	2 5/8	3	3 3/8	4 1/2	5 1/2
End Distance – Load parallel to grain, away from end	(b)	1 3/4	2	2 1/4	1 3/8	1 3/4
End Distance – Load perpendicular to grain	(c)	1 3/4	2	2 1/4	1 3/8	1 3/4
Spacing between Fasteners in a Row – Parallel to grain	(d)	2 5/8	3	3 3/8	2 3/4	3 3/4
Spacing between Fasteners in a Row – Perpendicular to grain	(e)	1 3/4	2	2 1/4	1 3/8	1 3/4
Spacing between Rows of Fasteners – In-line	(f)	7/8	1	1 1/8	See NDS Table 12.5.1D	
Spacing between Rows of Fasteners – Staggered	(g)	1/2	1/2	5/8		

SI: 1 in = 25.4 mm

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 more restrictive.
2. Values for *"Spacing between Rows of Fasteners – Staggered"* apply where the fasteners in adjacent rows are offset by one half of the *"Spacing between Fasteners in a Row"*.
3. 3/8" and 1/2" diameter screws require lead holes. See **Section 9.5** for lead hole requirements.
4. See **Figure 5** for labels.

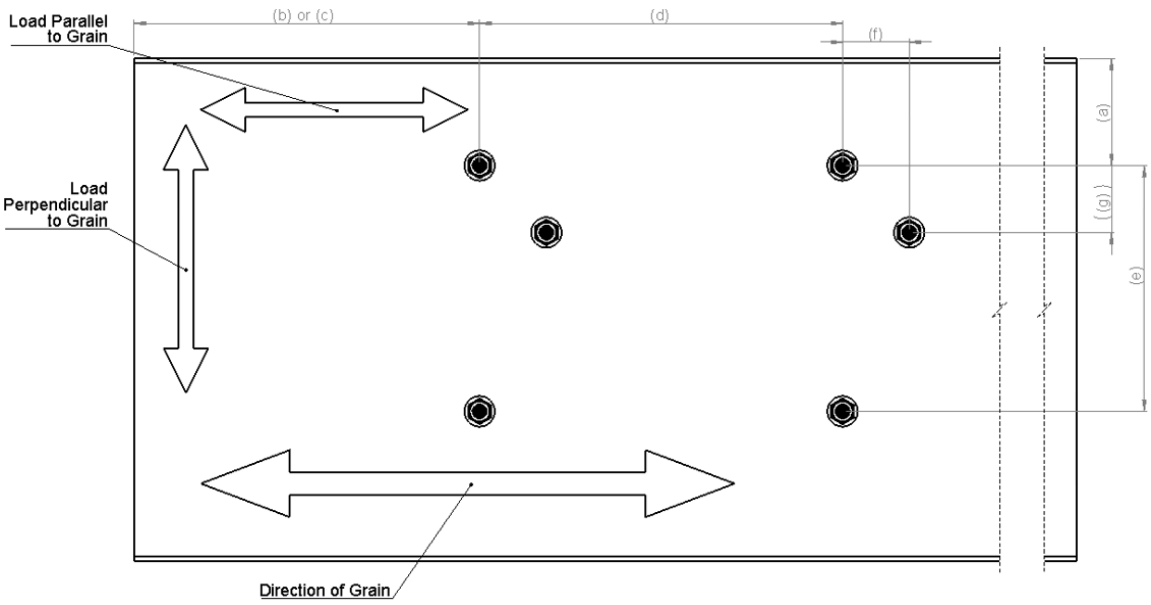

Figure 5. SPAX PowerLags Series Structural Wood Fasteners Spacing

10 Substantiating Data

10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

10.1.1 Bending yield testing in accordance with ASTM F1575

10.1.2 Tensile strength testing in accordance with AISI S904

10.1.3 Shear strength testing in accordance with AISI S904

10.1.4 Head pull-through testing in accordance with ASTM D1761

10.1.5 Withdrawal testing in accordance with ASTM D1761

10.1.6 Lateral connection testing in accordance with ASTM D1761

10.1.7 Corrosion resistance testing in accordance with ASTM B117 and ASTM G85

10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.3 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.4 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, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.5 *Testing and Engineering Analysis*

10.5.1 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.[38]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for SPAX PowerLags Series Structural Wood Fasteners on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, SPAX PowerLags Series Structural Wood Fasteners have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, SPAX PowerLags Series Structural Wood Fasteners shall be approved for the following applications:

11.2.1 Resistance to head pull-through loads as shown in **Table 6**.

11.2.2 Resistance to withdrawal loads as shown in **Table 7**.

11.2.3 Resistance to lateral loads as shown in **Table 8**, **Table 9**, **Table 10**, **Table 11**, and **Table 12**.

11.3 Unless exempt by state statute, when SPAX PowerLags Series Structural Wood Fasteners are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Altenloh, Brinck & Company U.S., Inc.

11.5 IBC Section 104.2.3[39] (IRC Section R104.2.2[40] and IFC Section 104.2.3[41] are similar) in pertinent part state:

> **104.2.3 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, provided that any such alternative is not specifically prohibited by this code and has been approved.

11.6 **Approved:**[42] Building regulations require that the building official shall accept duly authenticated reports.[43]

11.6.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.6.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.6.3 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. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.7 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[44]

12 Conditions of Use

12.1 As defined in **Section 6**, 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.

12.2 Wood main and side members must have a moisture content of less than or equal to nineteen percent (19%). Where SPAX PowerLags Series Structural Wood Fasteners are installed in a wet service condition, the appropriate reduction factors shall be applied per NDS Table 11.3.1.

12.3 The use of SPAX PowerLags Series Structural Wood Fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this report.

12.4 In cases where fastener metal capacity (instead of the wood member) controls the connection design, the allowable connection strength shall not be multiplied by the adjustment factors specified in the NDS.

12.5 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:

12.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.5.2 This report and the installation instructions shall be submitted at the time of permit application.

12.5.3 These innovative products have an internal quality control program and a third-party quality assurance program.

12.5.4 At a minimum, these innovative products shall be installed per **Section 9**.

12.5.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.5.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.5.7 The application of these innovative products in the context of this report 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.

12.6 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or 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 104.2.3"*, all of IBC Section 104, and IBC Section 105.3.

12.7 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.8 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 SPAX PowerLags Series Structural Wood Fasteners (SPAX Hex Washer Head PowerLags Fastener, SPAX T-Star Washer Head PowerLags Fastener, SPAX T-Star Pancake Head PowerLags Fastener, and SPAX T-Star Plus Cylindric Head PowerLags Fastener), as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at spax.us.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

Issue Date: January 31, 2022
Supplement Revision Date: May 6, 2026
Subject to Renewal: July 1, 2027

FBC Supplement to Report Number 1912-07

REPORT HOLDER: Altenloh, Brinck & Company U.S., Inc.

1 Evaluation Subject

1.1 SPAX PowerLags Series Structural Wood Fasteners:

1.1.1 SPAX® Hex Washer Head PowerLags® Fastener

1.1.2 SPAX® T-Star Washer Head PowerLags® Fastener

1.1.3 SPAX® T-Star Pancake Head PowerLags® Fastener

1.1.4 SPAX® T-Star Plus Cylindric Head PowerLags® Fastener

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show SPAX PowerLags Series Structural Wood Fasteners, recognized in Report Number 1912-07, 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—20, 23: Florida Building Code – Building (FL 40711)*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential (FL 40711)*

3 Conclusions

3.1 SPAX PowerLags Series Structural Wood Fasteners, described in Report Number 1912-07, 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 report, they are listed here:

3.2.1 FBC-B Section 104 is reserved.

3.2.2 FBC-B Section 110.4 is reserved and replaces IBC Section 110.4.

3.2.3 FBC-B Section 104.6 is reserved and replaces IBC Section 104.4.

3.2.4 FBC-B Section 104.11 replaces IBC Section 104.2.3 and Section 104.2.3.2.

3.2.5 FBC-B Section 105.3 replaces IBC Section 105.3.

3.2.6 FBC-B Section 105.3.1 replaces IBC Section 105.3.1.

3.2.7 FBC-B Section 110.3 replaces IBC Section 110.3.

3.2.8 FBC-B Section 1707.1 replaces IBC Section 1707.1.

3.2.9 FBC-B Section 2304.10.5 replaces IBC Section 2304.10.6.

3.2.10 FBC-B Section 2306.1 replaces IBC Section 2306.1.

3.2.11 FBC-B Section 2306.3 replaces IBC Section 2306.3.

3.2.12 FBC-R Section R104 and Section R109 are reserved.

3.2.13 FBC-R Section R317.3 replaces IRC Section R304.3.

4 Conditions of Use

4.1 SPAX PowerLags Series Structural Wood Fasteners, described in Report Number 1912-07, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1912-07.

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: July 27, 2022
Supplement Revision Date: May 6, 2026
Subject to Renewal: July 1, 2027

CBC and CRC Supplement to Report Number 1912-07

REPORT HOLDER: Altenloh, Brinck & Company U.S., Inc.

1 Evaluation Subject

1.1 SPAX PowerLags Series Structural Wood Fasteners:

1.1.1 SPAX® Hex Washer Head PowerLags® Fastener

1.1.2 SPAX® T-Star Washer Head PowerLags® Fastener

1.1.3 SPAX® T-Star Pancake Head PowerLags® Fastener

1.1.4 SPAX® T-Star Plus Cylindric Head PowerLags® Fastener

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show SPAX PowerLags Series Structural Wood Fasteners, recognized in Report Number 1912-07 have also been evaluated for compliance with the codes listed below.

2.2 *Applicable Building Codes*

2.2.1 *CBC — 22, 25: California Building Code (Title 24, Part 2)*

2.2.2 *CRC — 22, 25: California Residential Code (Title 24, Part 2.5)*

3 Conclusions

3.1 SPAX PowerLags Series Structural Wood Fasteners, described in Report Number 1912-07, comply with the CBC and CRC 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 CBC and CRC applicable to this report, they are listed here:

3.2.1 CBC Section 104.11 replaces IBC Section 104.2.3 and IBC Section 104.2.3.2.

3.2.2 CBC Section 104.7 replaces IBC Section 104.7.2.

3.2.3 CBC Section 1707.1 replaces IBC Section 1707.1.

3.2.4 CRC Section R104.4 replaces IRC Section R104.7.2.

3.2.5 CRC Section R104.11 replaces IRC Section R104.2.2.

4 Conditions of Use

4.1 SPAX PowerLags Series Structural Wood Fasteners, described in Report Number 1912-07, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1912-07.

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

Issue Date: July 27, 2022
Supplement Revision Date: May 6, 2026
Subject to Renewal: July 1, 2027

LABC and LARC Supplement to Report Number 1912-07

REPORT HOLDER: Altenloh, Brinck & Company U.S., Inc.

1 Evaluation Subject

1.1 SPAX PowerLags Series Structural Wood Fasteners:

1.1.1 SPAX® Hex Washer Head PowerLags® Fastener

1.1.2 SPAX® T-Star Washer Head PowerLags® Fastener

1.1.3 SPAX® T-Star Pancake Head PowerLags® Fastener

1.1.4 SPAX® T-Star Plus Cylindric Head PowerLags® Fastener

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show SPAX PowerLags Series Structural Wood Fasteners, recognized in Report Number 1912-07 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—20, 23: Los Angeles Building Code*

2.2.2 *LARC—20, 23: Los Angeles Residential Code*

3 Conclusions

3.1 SPAX PowerLags Series Structural Wood Fasteners, described in Report Number 1912-07, 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 report, they are listed here:

3.2.1 LABC Section 104.2 replaces IBC Section 104.

3.2.2 LABC Section 104.2.3 replaces IBC Section 104.4.

3.2.3 LABC Section 104.2.6 replaces IBC Section 104.2.3 and Section 104.2.3.2.

3.2.4 LABC Section 106.3.1 replaces IBC Section 105.3.

3.2.5 LABC Section 108.1 replaces IBC Section 110.4.

3.2.6 LABC Section 108.5 replaces IBC Section 110.3.

3.2.7 LABC Section 1707.1 replaces IBC Section 1707.1.

3.2.8 LABC Section 2306.3 replaces IBC Section 2306.3.

3.2.9 LARC Section 104.2.6 replaces IRC Section R104.2.2.

3.2.10 LARC Section 108.1 replaces IRC Section R109.2.

4 Conditions of Use

4.1 SPAX PowerLags Series Structural Wood Fasteners, described in Report Number 1912-07, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1912-07.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of LABC Chapter 16 and Chapter 17, as applicable.

Notes

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

2 2018 IBC Section 2304.10.5

3 2021 IRC Section R317.3

4 2018 IBC Section 2304.10.5

5 2021 IRC Section R317.3

6 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

8 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

10 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

11 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

12 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

13 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

14 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

15 https://www.law.cornell.edu/uscode/text/18/1832 (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. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

16 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

17 https://www.cbitest.com/accreditation/

18 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

19 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

20 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

21 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

22 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

23 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

24 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

25 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

26 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

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

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

29 All references to the FBC-B and FBC-R are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the Florida Supplement at the end of this report.

30 All references to the CBC and CRC are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the California Supplement at the end of this report.

31 All references to the LABC and LARC are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the Los Angeles Supplement at the end of this report.

32 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

33 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

[34] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

[35] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

[36] 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.

[37] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

[38] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[39] 2021 IBC Section 104.11

[40] 2021 IRC Section R104.11

[41] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

[42] 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 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[43] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

[44] Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.