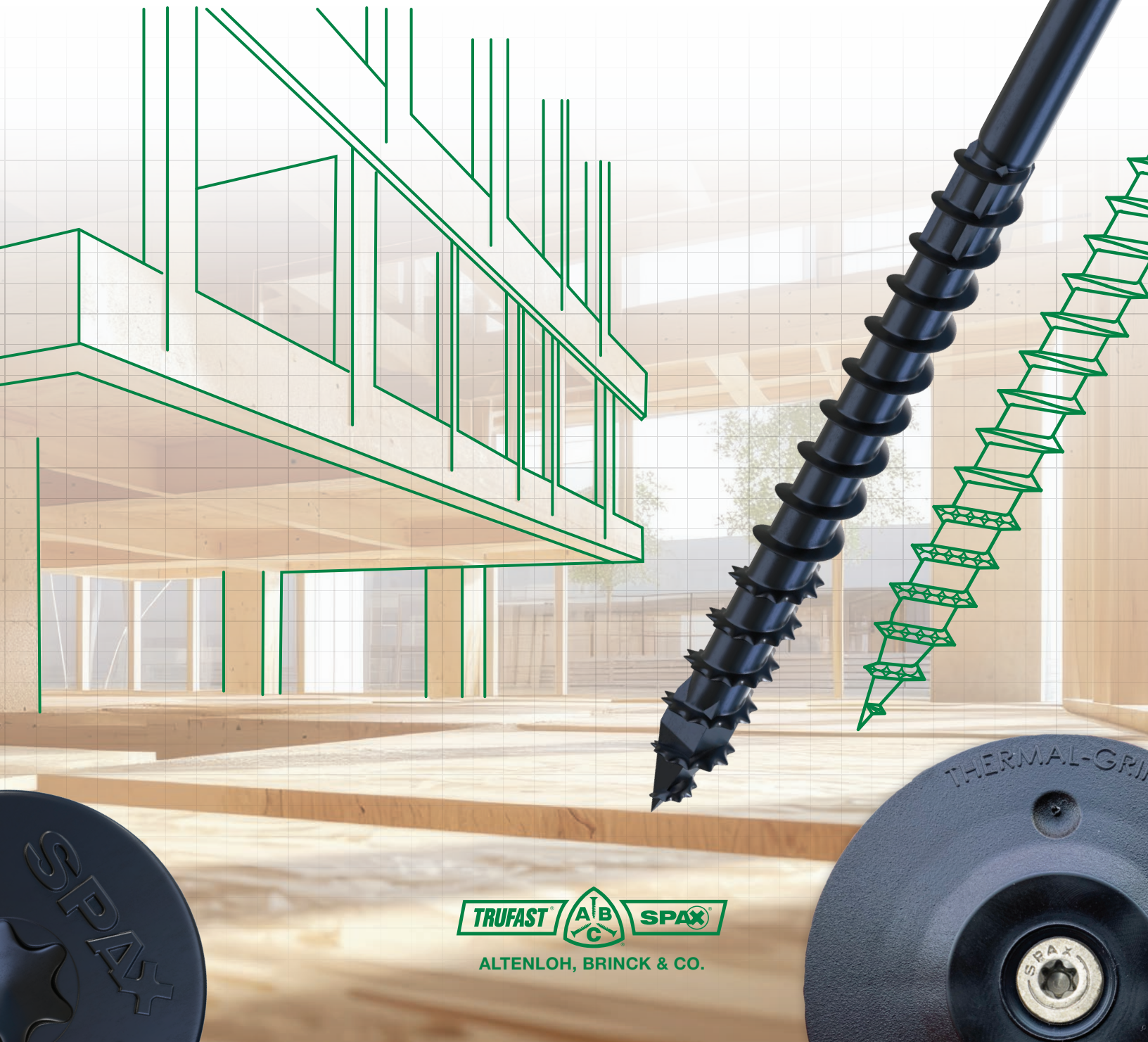
SPAX®

Engineering & Design Catalog

VOL. 1.1



TRUFAST® A B C SPAX®

ALTENLOH, BRINCK & CO.


MANUFACTURING LOCATIONS
U.S.A. AND GERMANY

200 YEARS OF FASTENING SOLUTIONS

For over 200 years, Altenloh, Brinck & Co. has been creating opportunities through growth. We support our dedicated team members who proudly make our products and the craftsmen who fasten the framework of our communities. Together, we drive connections that build homes, protect families, and strengthen neighborhoods.

We proudly manufacture some of the industry's strongest and most efficient engineered fasteners under the SPAX® brand for the construction market, and TRUFAST® brand for the commercial roofing industry and exterior building envelopes and facades. Founded in 1823 in the town now known as Ennepetal in South Westphalia, Germany, Altenloh, Brinck & Co. was the first in that country to produce screws on an industrial scale and looks back on a long tradition dedicated to progress. The most well-known product manufactured by the global, family-run company is the SPAX screw, which revolutionized the fastener sector. Altenloh, Brinck & Co is an international business with strategically located manufacturing and warehouse facilities located across the globe in 8 countries and 4 continents.

Altenloh, Brinck & Co. US, Inc. is located in the northwest of Ohio where more than 330 dedicated employees operate a 200,000 sq. ft. complex comprising of product development, engineering, testing and training, manufacturing, administration, and warehousing in Bryan and a 100,000 sq. ft. heat treat and packaging facility in Pioneer. In our location in Grand Rapids, MI, we develop and service the TRUFAST Walls branded products.

ABC is truly international!

Table of Contents

General Notes

GENERAL

- Altenloh, Brinck & Co. reserves the right to alter values, specifications, and models without notice or liability for alterations.
- In this catalog, "designer" is defined as a licensed professional engineer, licensed architect, or a licensed or certified building design professional.
- The information and data provided in this catalog are correct as of this date of publication. For the most recent catalog, visit www.spax.us/applications/mass-timber-construction.
- For terms & conditions and warranty, visit www.spax.us/applications/mass-timber-construction.
- SPAX fasteners 1/4" and greater in diameter are sold as PowerLags in the retail market. Reference series and item codes to identify appropriate ICC-ESR or DrJ code reports and technical data.

DESIGN

- All applicable adjustment factors for dowel-type fasteners from the NDS shall be applied. The Wet Service Factor (C_M) and End Grain Factor (C_{eg}) provided in this catalog shall be used when applicable.
- All connection elements, including geometry, members, and capacities shall be determined by the designer.
- The designer is responsible for the consideration of the environment exposure of the fasteners. Select a fastener with the appropriate coating and rating for the application.
- The type, diameter, head style, length, thread length, coating, and tip of the fastener has an impact upon performance. Use the correct fastener for the application.
- Minimum wood side member thickness is 1½" (38.1mm).
- Minimum main member thickness is 1½" (38.1mm) for the #14 (6mm), ¼" (7mm), and 5⁄16" (8mm), 2" (50.8mm) for the ⅜" (10mm), and 3" (76.2mm) for the ½" (12mm) and ⅝" (16mm) diameter fasteners.
- Metal side plates shall be a minimum of A36 steel and ⅛" (3mm) in thickness.

INSTALLATION

- Follow all installation instructions provided by SPAX® and other applicable material manufacturers.
- Follow all safety and operating instructions for tools and equipment.
- Use all appropriate safety equipment.
- Install fasteners with an impact wrench or low rpm/high torque electric drill. Do not drive with a hammer.
- Do not overdrive fasteners. Overdriven fasteners may have reduced capacity. Do not over-torque fasteners.
- Do not split the wood. Fasteners used in split wood may not have the published design capacity. SPAX fasteners less than a half inch in diameter are designed to not require pre-drilling in wood with a specific gravity of 0.55 or less. If splitting or torsion is an issue, pre-drill a hole approximately the size of the minor diameter.

CAPACITY

- Allowable loads in this catalog are for ASD loads. See Appendix N in the NDS for conversion into LRFD values.
- Do not exceed the published design capacity.
- Allowable shear values are based upon yield limit equations in Table 12.3.1A of the 2018 edition of the National Design Specification for Wood Construction. Applicability of the yield limit equations and validity of the values were proven through testing at an ANAB/ANSI/ISO 17025 accredited, third-party testing facility. Testing was done in accordance with ICC Evaluation Service's AC233 – Dowel-type Threaded Fasteners Used in Wood.
- Allowable withdrawal and head pull-through values were found per ICC Evaluation Service's AC233 – Dowel-type Threaded Fasteners Used in Wood in an ANAB/ANSI/ISO 17025 accredited third-party testing facility.

Determination of Allowable Loads

Both the International Building Code and the International Residential Code allow for proprietary products where approved by the building official. Recognized test standards are used by accredited testing labs to show code compliance. Often, a report or listing is produced so that the building official can evaluate the product's applicability.

SPAX products are proprietary and follow the above methodology. Products have been tested by an ANAB/ANSI/ISO 17025 accredited, third-party testing agency per ICC – Evaluation Service's Acceptance Criteria. For structural strength, AC233 - Dowel-type Threaded Fasteners Used in Wood was followed. There are two paths allowed for lateral load determination in AC233: applicability of the yield limit equations or empirical values. The empirical method is not as flexible as the yield limit equations in that the allowable capacities are tied to the exact assembly tested. Since the yield limit equations were proven to be applicable to SPAX fasteners, designers can use them for a large variety of applications. Precalculated values for common assemblies are provided in this catalog.

For withdrawal, an empirical capacity per inch of thread was found. The minimum penetration depth required for the fastener diameter was tested and then normalized to a per inch basis. This penetration includes the tip of the fastener, which does not provide as much withdrawal strength as the fully-developed threads, so the capacity per inch is a lower bound.

To achieve more realistic values where there is more penetration, a maximum withdrawal strength was also found through testing. Typically, partially threaded fasteners start to have a maximum thread length after a sufficient overall length. The allowable maximum withdrawal capacity is based upon embedment of that maximum thread length. The value given is either a precalculated value based upon the thread length and capacity per inch for the shorter fasteners or the tested capacity where the fastener is long enough to have the maximum thread length. Per AC233, withdrawal capacity is found by dividing the average ultimate test value divided by 5.0.

Head pull-through was similarly found by dividing the average ultimate test value divided by 5.0 per AC233. Testing was done with a member thickness of 1.5 inches, regardless of the minimum embedment required by the diameter of the fastener.

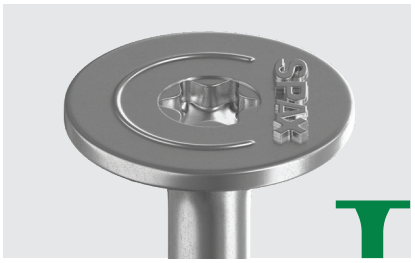
Corrosion resistance was found per ICC- Evaluation Service's AC257 – Corrosion-resistant Fasteners and Evaluation of Corrosion Effects of Wood Treatments.

Product Features

HEAD STYLES

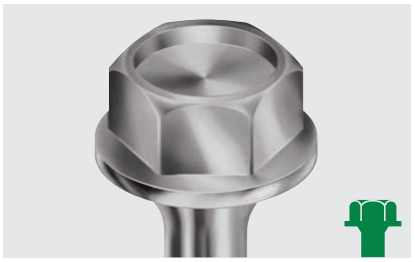
Pancake Head

Offers a flush installation to ensure a tight connection and increased clamping force. It offers a large bearing area for improved head pull-through capacity.



Hex Head

Eliminates the need and cost of a separate washer. The hex head shape allows for easy insertion and removal without fear of stripping.



Flat / Countersunk Head

Provides flush countersinking. It mills in wood and stops on metal.

Washer Head

Includes a large diameter for high clamping force. The low-profile leaves an attractive finish.

Cylinder Head

Has a compact, low-profile head that is ideal for concealed applications.

Product Features

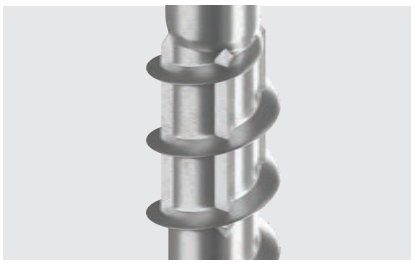
THREADS AND POINTS

Patented Serrations XF XC XS

Ensures rapid and effective fastening. The serrations cut through the fibers of the materials faster than a smooth thread.

4CUT™ at the Thread XF

Reduces the driving torque which helps increase battery life and reduce installer fatigue.



Threaded Rod XR

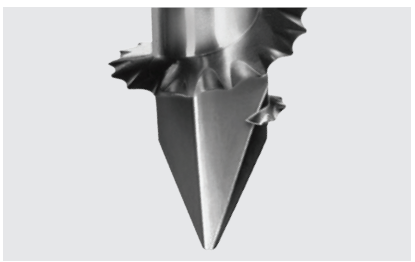
Provides additional transverse reinforcement or large withdrawal capacity. The ideal product to replace glued-in rods.

4CUT™ in the Screw Point XF

Reduces splitting. The square point pushes aside the fiber of the wood, reduces the driving torque, and eliminates pre-drilling.

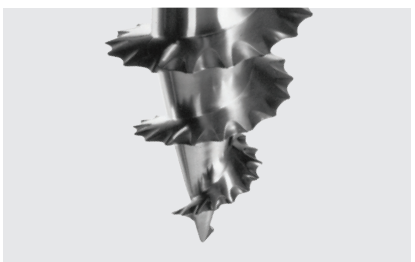
Cut Point XC

Allows precision placement and eliminates pre-drilling (wood-dependent). It effectively reduces splitting of the wood.



Sharp Point XS

Grips immediately and effortlessly pulls the screw into the wood.



Technical Support

Our knowledgeable and experienced technical team can help you find the right product and resources, including testing reports, and provide application assistance to help you create the strongest connections for the project. When you call for engineering technical support, please have the following information:

- Which SPAX or TRUFAST product are you using?
- What is your load requirement?
- What is the carried member's width and height?
- What is the supporting member's width and height?
- What is the carried and supporting members' material and application?

engineeringsupport@spax.us | **1 (616) 454-3100** | **www.spax.us** | **www.trufast.com**

We are ISO 9001:2015 registered.

Altenloh, Brinck & Co. US, Inc. is an ISO 9001:2015 registered company.
ISO 9001:2015 certification showcases our unwavering commitment to delivering consistent quality, ensuring your trust in our products/services and your satisfaction as our valued customers.

Part Name & Code Key

XFP250P400-YZ100

THREAD STYLE
- **F** *4CUT*™
- **S** Sharp Point
- **C** Cut Point
- **R** Threaded Rod

HEAD STYLE
- **P** Pancake
- **H** Hex
- **W** Washer
- **C** Cylinder
- **F** Countersunk (Flat)

DIAMETER
- **14** #14 (6mm)
- **250** 1/4" (7 mm)
- **312** 5/16" (8mm)
- **375** 3/8" (10 mm)
- **500** 1/2" (12mm)
- **625** 5/8" (16 mm)

THREAD LENGTH
- **P** Partially Threaded
- **F** Fully Threaded
- **L** Long, Partially Threaded

PART LENGTH (EXAMPLE)
- **400** 4"
- **612** 6½"
- **1034** 10¾"

COATING
- **YZ** Yellow Zinc
- **CZ** Clear Zinc
- **BX** Black Exterior
- **TX** Tan Exterior
- **WX** White Exterior
- **YX** Yellow Exterior
- **BE** Black E-Coat
- **RE** Red E-Coat
- **WE** White E-Coat

PACKAGING
- **1** 1 Count
- **25** 25 Count
- **50** 50 Count
- **100** 100 Count
- **150** 150 Count
- **250** 250 Count

Product Comparison

AVAILABILITY

NOMINAL DIA.	PARTIALLY THREADED				LONG THREADED				FULLY THREADED				
	PANCAKE	HEX	MIN. LENGTH	MAX. LENGTH	FLAT	WASHER	MIN. LENGTH	MAX. LENGTH	FLAT	CYLINDER	HEX	MIN. LENGTH	MAX. LENGTH
#14 (6mm)	-	-	-	-	-	√	4" (100mm)	11⅞" (300mm)	-	√	-	3⅛" (80mm)	7⅞" (200mm)
1/4" (7mm)	√	√	2" (51 mm)	12" (305mm)	-	-	-	-	-	-	-	-	-
5/16" (8mm)	√	√	2" (51mm)	12" (305mm)	√	√	3⅛" (80mm)	21⅝" (550mm)	√	√	-	6¼" (160mm)	23⅝" (600mm)
3/8" (10mm)	√	√	5" (127mm)	24" (610mm)	√	√	4" (100mm)	17¾" (450mm)	√	-	-	3⅛" (80mm)	31½" (800mm)
1/2" (12mm)	-	√	5" (127mm)	24" (610mm)	-	-	-		-	-	-	-	-
5/8" (16mm)	-	-	-	-	-	-	-	-	-	-	√	31½" (800mm)	78¾" (2,000mm)

FASTENER SPECIFICATIONS AND MATERIAL PROPERTIES

NOMINAL DIA.	SERIES	DIAMETER						TIP LENGTH		THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
		OUTSIDE THREAD		MINOR THREAD		SHANK							
		IN.	MM	IN.	MM	IN.	MM	IN.	MM		TENSILE	SHEAR	
#14 (6mm)	XF	0.236	6	0.154	3.9	0.169	4.3	0.25	6.4	7	980	730	160,000
1/4" (7mm)	XF	0.276	7	0.183	4.6	0.199	5.1	0.30	7.6	6	1280	930	150,000
5/16" (8mm)	XF	0.315	8	0.200	5.1	0.220	5.7	0.33	8.4	5.3	1630	1130	160,000
	XC	0.315	8	0.200	5.1	-	-	0.20	5.1	6.4	1400	1030	
3/8" (10mm)	XF	0.394	10	0.240	6.1	0.271	6.9	0.40	10.2	4.2	2300	1740	150,000
	XC	0.394	10	0.240	6.1	-	-	0.25	6.4	5	2480	1860	
1/2" (12mm)	XS	0.474	12	0.289	7.3	0.336	8.5	0.50	12.7	4.2	3420	2570	160,000
5/8" (16mm)	XR	0.630	16	0.472	12.0	-	-	0.00	0.0	4.2	5770	3930	100,000

HEAD PROPERTIES AND REFERENCE PULL-THROUGH

NOMINAL DIA.	HEAD STYLE	HEAD DIAMETER		HEAD HEIGHT		DRIVE TYPE	SPECIFIC GRAVITY		
							0.42	0.50	0.55
		IN.	MM	IN.	MM		HEAD PULL-THROUGH (lb)		
#14 (6mm)	Washer	0.535	13.6	0.122	3.1	T30 T-STAR*plus*®	300	370	420
	Cylinder	0.331	8.4	0.236	6.0	T30 T-STAR*plus*®	-	-	-
1/4" (7mm)	Pancake	0.675	17.1	0.055	1.4	T40 6-Lobe Recess	450	550	620
	Hex	0.545	13.8	0.233	5.9	3/8" Hex Driver	300	400	450
5/16" (8mm)	Pancake	0.765	19.4	0.060	1.5	T40 6-Lobe Recess	520	630	630
	Hex	0.590	15.0	0.280	7.1	7/16" Hex Driver	360	460	500
	Flat	0.594	15.1	0.330	8.4	T40 T-STAR*plus*®	230	330	340
	Washer	0.787	20.0	0.169	4.3	T40 T-STAR*plus*®	500	680	680
	Cylinder	0.394	10.0	0.315	8.0	T40 T-STAR*plus*®	-	-	-
3/8" (10mm)	Pancake	0.980	24.9	0.070	1.8	T50 6-Lobe Recess	610	760	920
	Hex	0.748	19.0	0.339	8.6	1/2" Hex Driver	510	620	620
	Flat	0.732	18.6	0.420	10.7	T50 T-STAR*plus*®	330	450	480
	Washer	0.984	25.0	0.185	4.7	T50 T-STAR*plus*®	690	790	1030
1/2" (12mm)	Hex	0.861	21.9	0.418	10.6	5/8" Hex Driver	580	660	720
5/8" (16mm)	Hex	1.024	26.0	0.512	13.0	22mm Hex Driver	-	-	-

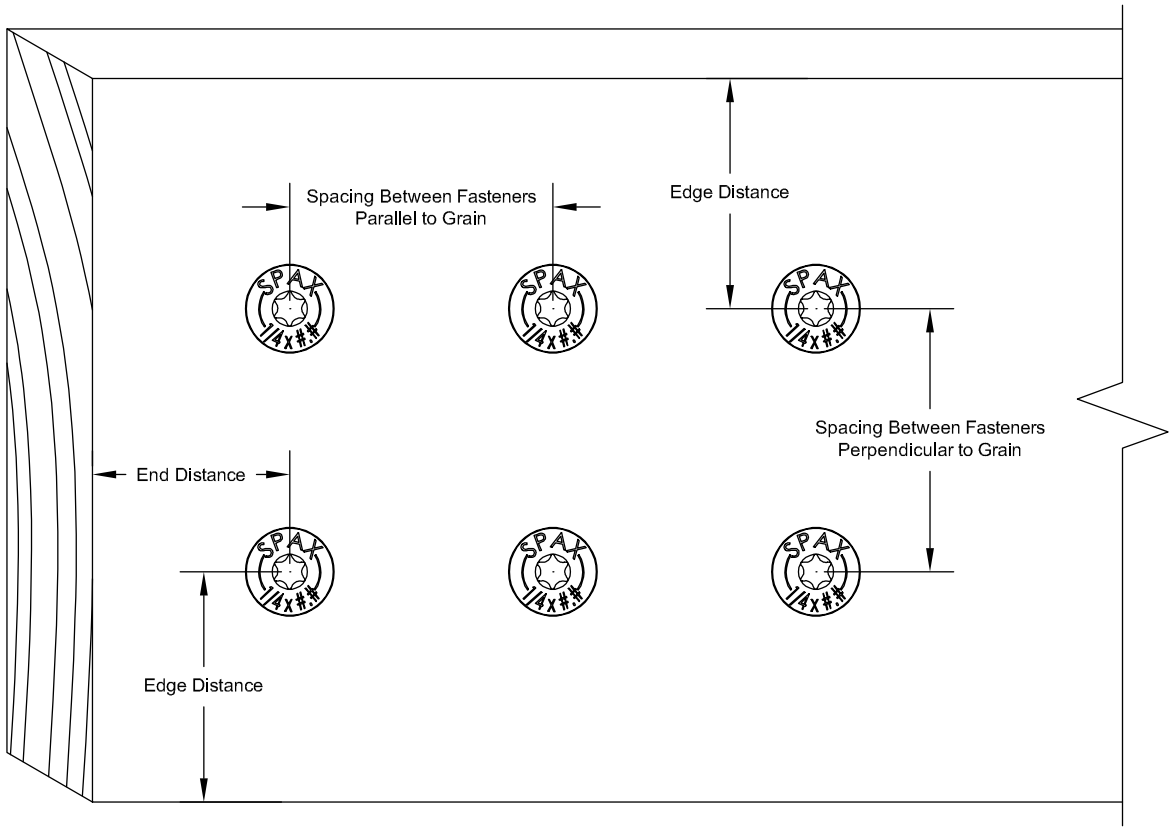
REFERENCE WITHDRAWAL – SOLID SAWN LUMBER, GLULAM, CLT

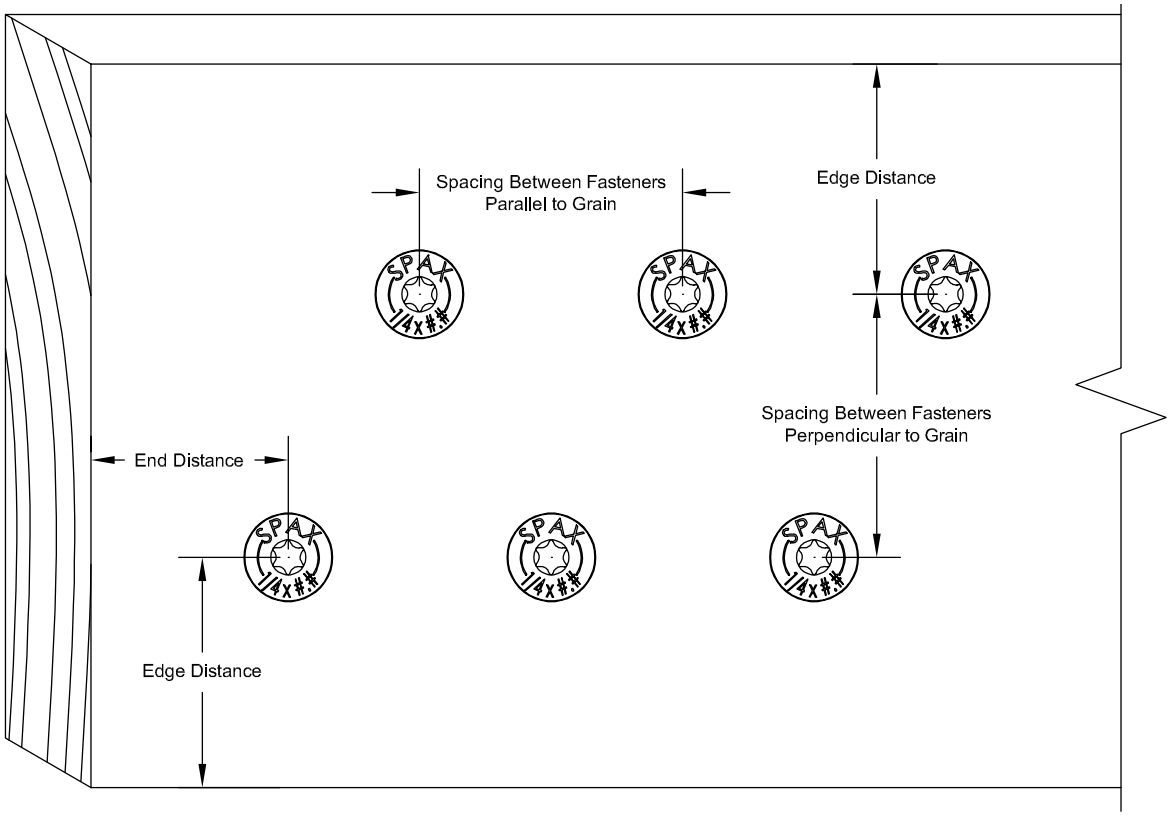
NOMINAL DIA.	SERIES	THREAD LENGTH STYLE										
		PARTIAL, LONG, AND FULLY			PARTIAL				LONG			
		ALLOWABLE PER INCH			MAXIMUM ALLOWABLE							
		SPECIFIC GRAVITY			SPECIFIC GRAVITY				SPECIFIC GRAVITY			
		0.45	0.50	0.55	0.45	0.50	0.55	MINIMUM PENETRATION IN MAIN MEMBER FOR MAX WITHDRAWAL	0.45	0.50	0.55	MINIMUM PENETRATION IN MAIN MEMBER FOR MAX WITHDRAWAL
		ALLOWABLE WITHDRAWAL PER INCH OF THREAD (lb/in.)			MAX ALLOWABLE WITH SPECIFIED PENETRATION INTO MAIN MEMBER (lb)				MAX ALLOWABLE WITH SPECIFIED PENETRATION INTO MAIN MEMBER (lb)			
#14 (6mm)	XF	131	158	194	-	-	-	-	351	423	520	2.68" (68mm)
1/4" (7mm)	XF	141	170	170	467	544	654	2.76" (70mm)	-	-	-	-
5/16" (8mm)	XF	139	167	167	432	568	593	2.68" (68mm)	542	666	756	3.15" (80mm)
	XC	146	174	210	-	-	-	-	-	-	-	-
3/8" (10mm)	XF	167	206	238	690	764	935	3.15" (80mm)	690	764	935	3.15" (80mm)
	XC	131	203	227	-	-	-	-	-	-	-	-
1/2" (12mm)	XS	210	279	292	629	839	870	3.15" (80mm)	-	-	-	-
5/8" (16mm)	XR	168	279	279	-	-	-	-	-	-	-	-

REFERENCE WITHDRAWAL – LVL, LSL

NOMINAL DIA.	SERIES	LVL		LSL
		ESG = 0.46	ESG = 0.50	ESG = 0.44
		WITHDRAWAL PER INCH OF THREAD (lb/in.)		
#14 (6mm)	XF	129	-	175
1/4" (7mm)	XF	-	150	198
5/16" (8mm)	XF	-	141	188
	XC	136	-	186
3/8" (10mm)	XF	-	172	247
	XC	171	-	225
1/2" (12mm)	XS	-	202	320
5/8" (16mm)	XR	259	-	430

Spacing Requirements

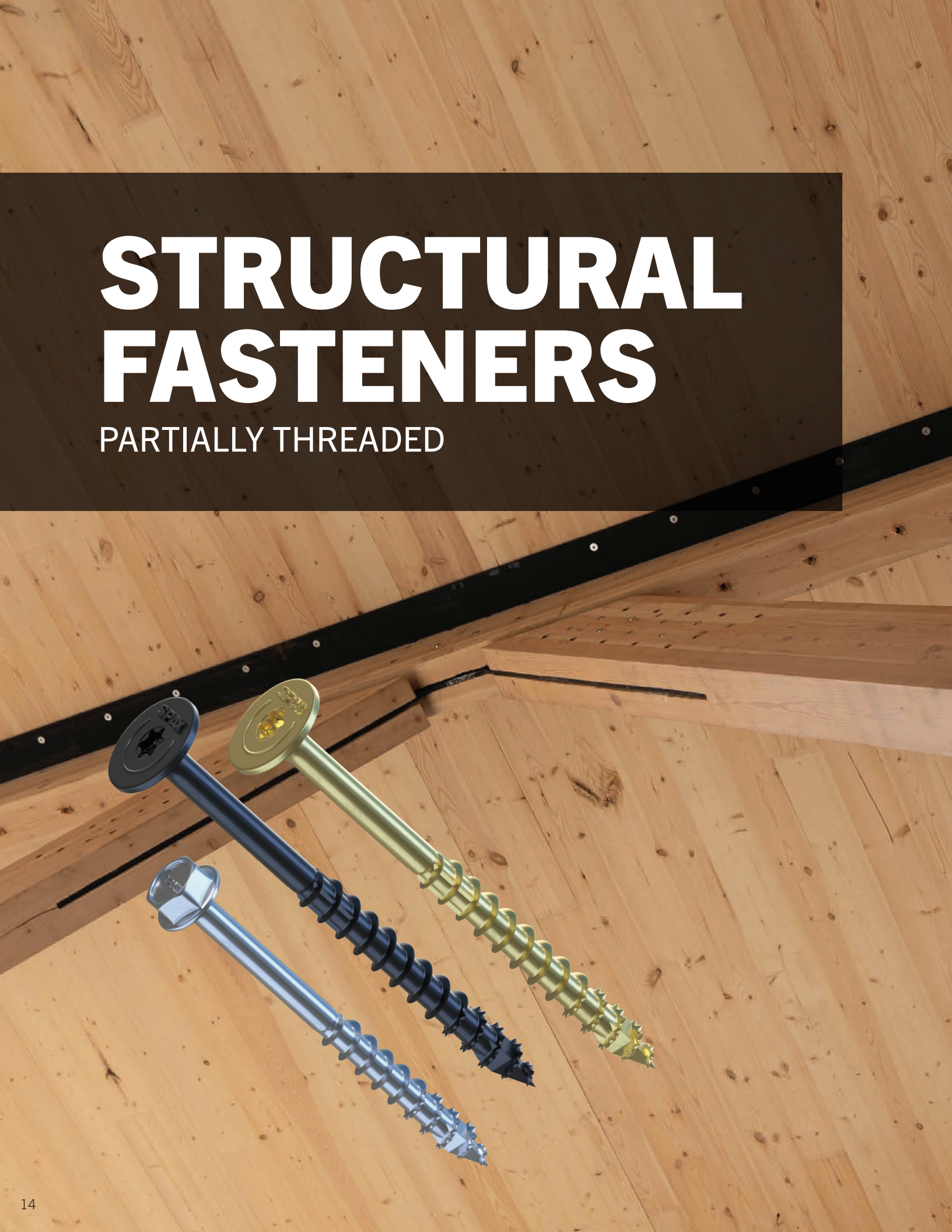




CONDITION		FASTENER SIZE														
		#14 (6mm)			1/4" (7mm)			5/16" (8mm)			3/8" (10mm)			1/2" (12mm)	5/8" (16mm)
		SELF-DRILLED		PRE-DRILLED	SELF-DRILLED		PRE-DRILLED	SELF-DRILLED		PRE-DRILLED	SELF-DRILLED		PRE-DRILLED	PRE-DRILLED	PRE-DRILLED
		G < 0.5	G ≥ 0.5		G < 0.5	G ≥ 0.5		G < 0.5	G ≥ 0.5		G < 0.5	G ≥ 0.5			
		MINIMUM DISTANCE OR SPACING													
End Distance	Loading toward end	3½" 90mm	4¾" 120mm	2⅞" 72mm	4⅛" 105mm	5½" 140mm	3⅜" 86mm	4¾" 120mm	6¼" 160mm	3¾" 96mm	5⅞" 150mm	7⅞" 200mm	2¾" 70mm	3⅜" 84mm	4⅜" 112mm
	Loading perpendicular to grain or away from end	2⅜" 60mm	3½" 90mm	1⅝" 42mm	2¾" 70mm	4⅛" 105mm	2" 50mm	3⅛" 80mm	4¾" 120mm	2¼" 56mm	4" 100mm	5⅞" 150mm	1⅝" 40mm	1⅞" 48mm	2½" 64mm
	Axial loading	2⅜" 60mm	2⅜" 60mm	1⅝" 42mm	2¾" 70mm	2¾" 70mm	2" 50mm	3⅛" 80mm	3⅛" 80mm	2¼" 56mm	4" 100mm	4" 100mm	1⅝" 40mm	1⅞" 48mm	2½" 64mm
Edge Distance	Loading toward edge	2⅜" 60mm	2⅞" 72mm	1⅝" 42mm	2¾" 70mm	3⅜" 86mm	2" 50mm	3⅛" 80mm	3¾" 96mm	2¼" 56mm	4" 100mm	4¾" 120mm	1⅝" 40mm	1⅞" 48mm	2½" 64mm
	Loading parallel to grain or away from edge	1⅛" 30mm	1⅝" 42mm	¾" 18mm	1⅜" 35mm	2" 50mm	⅞" 21mm	1⅝" 40mm	2¼" 56mm	1" 24mm	2" 50mm	2¾" 70mm	1¼" 32mm	1⅜" 36mm	1⅞" 48mm
	Axial loading	1" 24mm	1" 24mm	¾" 18mm	1⅛" 28mm	1⅛" 28mm	⅞" 21mm	1¼" 32mm	1¼" 32mm	1" 24mm	1⅝" 40mm	1⅝" 40mm	1¼" 32mm	1⅜" 36mm	1⅞" 48mm
Spacing between fasteners parallel to grain	Loading parallel to grain	3½" 90mm	3½" 90mm	2⅜" 60mm	4⅛" 105mm	4⅛" 105mm	2¾" 70mm	4¾" 120mm	4¾" 120mm	3⅛" 80mm	5⅞" 150mm	5⅞" 150mm	2" 50mm	2⅜" 60mm	3⅛" 80mm
	Loading perpendicular to grain	2⅜" 60mm	2⅜" 60mm	1⅛" 30mm	2¾" 70mm	2¾" 70mm	1⅜" 35mm	3⅛" 80mm	3⅛" 80mm	1⅝" 40mm	4" 100mm	4" 100mm	2" 50mm	2⅜" 60mm	3⅛" 80mm
	Axial loading	1⅝" 42mm	1⅝" 42mm	1⅝" 42mm	2" 50mm	2" 50mm	2" 50mm	2¼" 56mm	2¼" 56mm	2¼" 56mm	2¾" 70mm	2¾" 70mm	2" 50mm	2⅜" 60mm	3⅛" 80mm
Spacing between fasteners perpendicular to grain	Loading parallel to grain	1⅛" 30mm	1⅝" 42mm	1" 24mm	1⅜" 35mm	2" 50mm	1⅛" 28mm	1⅝" 40mm	2¼" 28mm	1¼" 32mm	2" 50mm	2¾" 70mm	2" 50mm	2⅜" 60mm	3⅛" 80mm
	Loading perpendicular to grain	1⅛" 30mm	1⅝" 42mm	1" 24mm	1⅜" 35mm	2" 50mm	1⅛" 28mm	1⅝" 40mm	2¼" 28mm	1¼" 32mm	2" 50mm	2¾" 70mm	2" 50mm	2⅜" 60mm	3⅛" 80mm
	Axial loading	1" 24mm	1" 24mm	¾" 18mm	1⅛" 28mm	1⅛" 28mm	⅞" 21mm	1¼" 32mm	1¼" 32mm	1" 24mm	2" 50mm	2" 50mm	2" 50mm	2⅜" 60mm	3⅛" 80mm

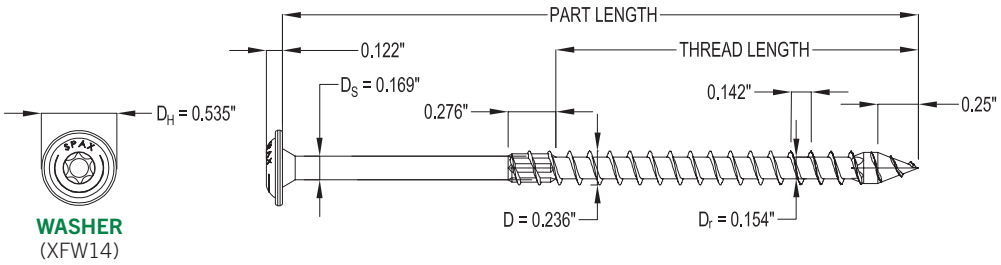
STRUCTURAL FASTENERS

PARTIALLY THREADED



XF #14 (6mm) Partially Threaded Series

#14 DIAMETER, UPPER *4CUT*™, PATENTED SERRATIONS, *4CUT*™ POINT



WASHER
(XFW14)

#14 (6mm) PARTIALLY THREADED

- Available in Washer head style.
- Unique *4CUT*™ Point reduces splitting.
- Partial thread ensures clamping action.
- No pre-drill required. If tighter spacing is desired, pre-drill with 5⁄32" (4mm) dia. drill bit.
- Minimum main and wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in Germany.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER			TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r	SHANK, D_S			TENSILE	SHEAR	
0.236" (6mm)	0.154" (3.9mm)	0.169" (4.3mm)	0.25" (6.4mm)	7	980	730	160,000

HEAD DIMENSIONS AND PULL-THROUGH

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE	SPECIFIC GRAVITY		
				0.42	0.50	0.55
				ALLOWABLE HEAD PULL-THROUGH (lb.)		
Washer	0.535" (13.6mm)	0.122" (3.1mm)	T30 T-STAR*plus*®	300	370	420

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	131	158	194
Max for Partial Thread at 2.68" (68mm) in Main Member (lb.)	351	423	520

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	3½" (90mm)	4¾" (120mm)	2⅞" (72mm)
	Loading perpendicular to grain or way from end	2⅜" (60mm)	3½" (90mm)	1⅝" (42mm)
	Axial loading	2⅜" (60mm)	2⅜" (60mm)	1⅝" (42mm)
Edge Distance	Loading toward edge	2⅜" (60mm)	2⅞" (72mm)	1⅝" (42mm)
	Loading parallel to grain or away from edge	1⅛" (30mm)	1⅝" (42mm)	¾" (18mm)
	Axial loading	1" (24mm)	1" (24mm)	¾" (18mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	3½" (90mm)	3½" (90mm)	2⅜" (60mm)
	Loading perpendicular to grain	2⅜" (60mm)	2⅜" (60mm)	1⅛" (30mm)
	Axial loading	1⅝" (42mm)	1⅝" (42mm)	1⅝" (42mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	1⅛" (30mm)	1⅝" (42mm)	1" (24mm)
	Loading perpendicular to grain	1⅛" (30mm)	1⅝" (42mm)	1" (24mm)
	Axial loading	1" (24mm)	1" (24mm)	¾" (18mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
4" (102mm)	144	-	-	-	169	-	-	-	185	-	-	-	∥
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛" (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
7⅞" (200mm)	144	144	144	-	169	169	169	-	185	185	185	-	
8⅝" (220mm)	144	144	144	130	169	169	169	168	185	185	185	185	
9⅞"+ (250mm)	144	144	144	144	169	169	169	169	185	185	185	185	
4" (102mm)	144	-	-	-	169	-	-	-	185	-	-	-	$\perp_s$
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛" (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
7⅞" (200mm)	144	144	144	-	169	169	169	-	185	185	185	-	
8⅝" (220mm)	144	144	144	130	169	169	169	168	185	185	185	185	
9⅞"+ (250mm)	144	144	144	144	169	169	169	169	185	185	185	185	
4" (102mm)	144	-	-	-	169	-	-	-	185	-	-	-	$\perp_m$
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛" (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
7⅞" (200mm)	144	144	144	-	169	169	169	-	185	185	185	-	
8⅝" (220mm)	144	144	144	130	169	169	169	168	185	185	185	185	
9⅞"+ (250mm)	144	144	144	144	169	169	169	169	185	185	185	185	
4" (102mm)	144	-	-	-	169	-	-	-	185	-	-	-	⊥
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛" (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
7⅞" (200mm)	144	144	144	-	169	169	169	-	185	185	185	-	
8⅝" (220mm)	144	144	144	130	169	169	169	168	185	185	185	185	
9⅞"+ (250mm)	144	144	144	144	169	169	169	169	185	185	185	185	

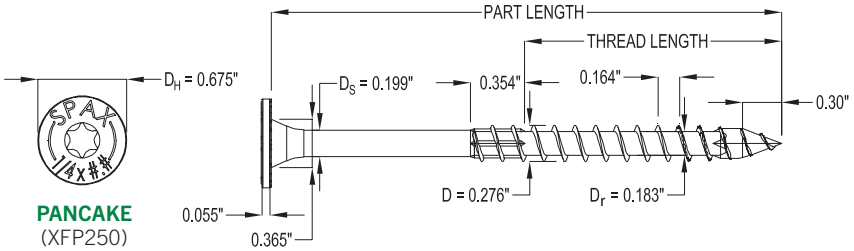
1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 1½" (38.1mm) for both side and main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in both the main and side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

THREAD LENGTH AND PART NAMES

PART LENGTH	PARTIALLY THREADED	
	HEAD STYLE / WASHER / PART NAME	THREAD LENGTH
4" (100mm)	XFW14P400	2.400" (61mm)
4¾" (120mm)	XFW14P434	2.680" (68mm)
5½" (140mm)	XFW14P512	2.680" (68mm)
6¼" (160mm)	XFW14P614	2.680" (68mm)
7⅛" (180mm)	XFW14P718	2.680" (68mm)
7⅞" (200mm)	XFW14P778	2.680" (68mm)
8⅝" (220mm)	XFW14P858	2.680" (68mm)
9⅞" (250mm)	XFW14P978	2.680" (68mm)
11" (280mm)	XFW14P1100	2.680" (68mm)
11⅞" (300mm)	XFW14P1178	2.680" (68mm)

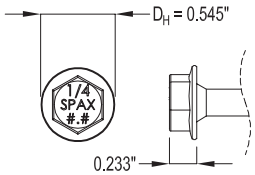
XF 1/4" (7mm) Series

1/4" DIAMETER, UPPER *4CUT*™, PATENTED SERRATIONS, *4CUT*™ POINT



PANCAKE (XFP250)

OTHER HEAD STYLES



HEX (XFH250)

1/4" (7mm) PARTIALLY THREADED

- Available in Pancake & Hex head styles.
- Unique *4CUT*™ Point reduces splitting.
- Partial thread ensures clamping action.
- No pre-drill required. If tighter spacing is desired, pre-drill with 3⁄16" (4.8mm) dia. drill.
- Minimum main and wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in USA with globally sourced materials.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER			TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r	SHANK, D_S			TENSILE	SHEAR	
0.276" (7mm)	0.183" (4.6mm)	0.199" (5.1mm)	0.30" (7.6mm)	6	1280	930	150,000

HEAD DIMENSIONS AND PULL-THROUGH

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE	SPECIFIC GRAVITY		
				0.42	0.50	0.55
				ALLOWABLE HEAD PULL-THROUGH (lb.)		
Pancake	0.675" (17.1mm)	0.055" (1.4mm)	T40 6-Lobe Recess	450	550	620
Hex	0.545" (13.8mm)	0.233" (5.9mm)	3⁄8" Hex Driver	300	400	450

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	141	170	170
Max for Partial Thread at 2.76" (70.1mm) in Main Member (lb.)	467	544	654

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	4⅛" (105mm)	5½" (140mm)	3⅜" (86mm)
	Loading perpendicular to grain or way from end	2¾" (70mm)	4⅛" (105mm)	2" (50mm)
	Axial loading	2¾" (70mm)	2¾" (70mm)	2" (50mm)
Edge Distance	Loading toward edge	2¾" (70mm)	3⅜" (86mm)	2" (50mm)
	Loading parallel to grain or away from edge	1⅜" (35mm)	2" (50mm)	⅞" (21mm)
	Axial loading	1⅛" (28mm)	1⅛" (28mm)	⅞" (21mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	4⅛" (105mm)	4⅛" (105mm)	2¾" (70mm)
	Loading perpendicular to grain	2¾" (70mm)	2¾" (70mm)	1⅜" (35mm)
	Axial loading	2" (50mm)	2" (50mm)	2" (50mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	1⅜" (35mm)	2" (50mm)	1⅛" (28mm)
	Loading perpendicular to grain	1⅜" (35mm)	2" (50mm)	1⅛" (28mm)
	Axial loading	1⅛" (28mm)	1⅛" (28mm)	⅞" (21mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
3" (76mm)	211	-	-	-	240	-	-	-	252	-	-	-	$\parallel$
3½" (89mm)	220	-	-	-	240	-	-	-	252	-	-	-	
4" (102mm)	220	-	-	-	240	-	-	-	252	-	-	-	
4½" (114mm)	220	-	-	-	240	-	-	-	252	-	-	-	
5" (127mm)	220	211	-	-	240	240	-	-	252	252	-	-	
6" (153mm)	220	220	-	-	240	240	-	-	252	252	-	-	
8" (203mm)	220	220	220	-	240	240	240	-	252	252	252	-	
10"+ (254mm)	220	220	220	220	240	240	240	240	252	252	252	252	
3" (76mm)	144	-	-	-	174	-	-	-	189	-	-	-	$\perp_s$
3½" (89mm)	144	-	-	-	174	-	-	-	189	-	-	-	
4" (102mm)	144	-	-	-	174	-	-	-	189	-	-	-	
4½" (114mm)	144	-	-	-	174	-	-	-	189	-	-	-	
5" (127mm)	144	157	-	-	174	178	-	-	189	189	-	-	
6" (153mm)	144	160	-	-	174	178	-	-	189	189	-	-	
8" (203mm)	144	160	160	-	174	178	178	-	189	189	189	-	
10"+ (254mm)	144	160	160	160	174	178	178	178	189	189	189	189	
3" (76mm)	137	-	-	-	164	-	-	-	181	-	-	-	$\perp_m$
3½" (89mm)	160	-	-	-	178	-	-	-	189	-	-	-	
4" (102mm)	160	-	-	-	178	-	-	-	189	-	-	-	
4½" (114mm)	160	-	-	-	178	-	-	-	189	-	-	-	
5" (127mm)	160	137	-	-	178	164	-	-	189	181	-	-	
6" (153mm)	160	160	-	-	178	178	-	-	189	189	-	-	
8" (203mm)	160	160	160	-	178	178	178	-	189	189	189	-	
10"+ (254mm)	160	160	160	160	178	178	178	178	189	189	189	189	
3" (76mm)	122	-	-	-	156	-	-	-	174	-	-	-	$\perp$
3½" (89mm)	136	-	-	-	166	-	-	-	179	-	-	-	
4" (102mm)	136	-	-	-	166	-	-	-	179	-	-	-	
4½" (114mm)	136	-	-	-	166	-	-	-	179	-	-	-	
5" (127mm)	136	128	-	-	166	156	-	-	179	174	-	-	
6" (153mm)	136	147	-	-	166	167	-	-	179	179	-	-	
8" (203mm)	136	147	147	-	166	167	167	-	179	179	179	-	
10"+ (254mm)	136	147	147	147	166	167	167	167	179	179	179	179	

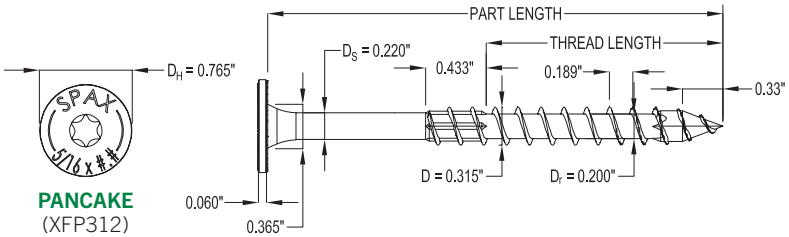
1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 1½" (38.1mm) for both side and main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in both the main and side member.
3. $\parallel$ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. $\perp$ means the load is perpendicular to the grain for both main and side members.

THREAD LENGTH AND PART NAMES

PART LENGTH	PARTIALLY THREADED		THREAD LENGTH
	HEAD STYLE		
	PANCAKE	HEX	
	PART NAME		
2" (51mm)	XFP250P200	XFH250P200	1.535" (40mm)
2½" (64mm)	XFP250P212	XFH250P212	1.535" (40mm)
3" (76mm)	XFP250P300	XFH250P300	1.535" (40mm)
3½" (89mm)	XFP250P312	XFH250P312	2.010" (51mm)
4" (102mm)	XFP250P400	XFH250P400	2.125" (54mm)
4½" (114mm)	XFP250P412	XFH250P412	2.125" (54mm)
5" (127mm)	XFP250P500	XFH250P500	2.755" (70mm)
6" (153mm)	XFP250P600	XFH250P600	2.755" (70mm)
8" (203mm)	XFP250P800	XFH250P800	2.755" (70mm)
10" (254mm)	XFP250P1000	XFH250P1000	2.755" (70mm)
12" (305mm)	XFP250P1200	XFH250P1200	2.755" (70mm)

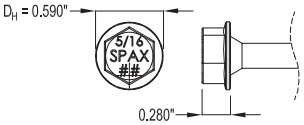
XF 5/16" (8mm) Series

5/16" DIAMETER, UPPER *4CUT*™, PATENTED SERRATIONS, *4CUT*™ POINT

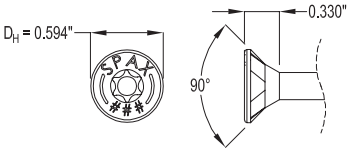


PANCAKE
(XFP312)

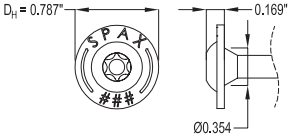
OTHER HEAD STYLES



HEX (XFH312)



FLAT / COUNTERSUNK (XFF312)



WASHER (XFW312)

5/16" (8mm) PARTIALLY THREADED

- Available in Pancake, Hex, Flat, and Washer head styles.
- Unique *4CUT*™ Point reduces splitting.
- Partial thread ensures clamping action.
- No pre-drill required. If tighter spacing is desired, pre-drill with 7⁄32" (5.6mm) dia. drill bit.
- Minimum main and wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in USA and Germany with globally sourced materials.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER			TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r	SHANK, D_S			TENSILE	SHEAR	
0.315" (8mm)	0.200" (5.1mm)	0.220" (5.6mm)	0.33" (8.4mm)	5.3	1630	1130	160,000

HEAD DIMENSIONS AND PULL-THROUGH

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE	SPECIFIC GRAVITY		
				0.42	0.50	0.55
				ALLOWABLE HEAD PULL-THROUGH (lb.)		
Pancake	0.765" (19.4mm)	0.060" (1.5mm)	T40 6-Lobe Recess	520	630	630
Hex	0.590" (15mm)	0.280" (7.1mm)	7⁄16" Hex Driver	360	460	500
Flat	0.594" (15.1mm)	0.330" (8.4mm)	T40 T-STAR*plus*®	230	330	340
Washer	0.787" (20mm)	0.169" (4.3mm)	T40 T-STAR*plus*®	500	680	680

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	139	167	167
Max for Partial Thread at 2.68" (68mm) in Main Member (lb.)	432	568	593
Max for Long Thread at 3.15" (80mm) in Main Member (lb.)	542	666	756

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	4¾" (120mm)	6¼" (160mm)	3¾" (96mm)
	Loading perpendicular to grain or way from end	3⅛" (80mm)	4¾" (120mm)	2¼" (56mm)
	Axial loading	3⅛" (80mm)	3⅛" (80mm)	2¼" (56mm)
Edge Distance	Loading toward edge	3⅛" (80mm)	3¾" (96mm)	2¼" (56mm)
	Loading parallel to grain or away from edge	1⅝" (40mm)	2¼" (56mm)	1" (24mm)
	Axial loading	1¼" (32mm)	1¼" (32mm)	1" (24mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	4¾" (120mm)	4¾" (120mm)	3⅛" (80mm)
	Loading perpendicular to grain	3⅛" (80mm)	3⅛" (80mm)	1⅝" (40mm)
	Axial loading	2¼" (56mm)	2¼" (56mm)	2¼" (56mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	1⅝" (40mm)	2¼" (28mm)	1¼" (32mm)
	Loading perpendicular to grain	1⅝" (40mm)	2¼" (28mm)	1¼" (32mm)
	Axial loading	1¼" (32mm)	1¼" (32mm)	1" (24mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
3" (76mm)	-	-	-	-	-	-	-	-	-	-	-	-	
3½" (89mm)	241	-	-	-	276	-	-	-	290	-	-	-	
4" (102mm)	241	-	-	-	276	-	-	-	290	-	-	-	
4½" (114mm)	241	-	-	-	276	-	-	-	290	-	-	-	
5" (127mm)	241	-	-	-	276	-	-	-	290	-	-	-	
5½" (140mm)	241	253	-	-	276	276	-	-	290	290	-	-	
6" (152mm)	241	253	-	-	276	276	-	-	290	290	-	-	
6¼" (160mm)	241	253	-	-	276	276	-	-	290	290	-	-	∥
6¾" (172mm)	241	253	-	-	276	276	-	-	290	290	-	-	
7⅛" (180mm)	241	253	237	-	276	276	273	-	290	290	290	-	
7⅞" (200mm)	241	253	253	-	276	276	276	-	290	290	290	-	
8" (203mm)	241	253	253	-	276	276	276	-	290	290	290	-	
10" (254mm)	241	253	253	-	276	276	276	-	290	290	290	-	
10¼"+ (260mm)	241	253	253	253	276	276	276	276	290	290	290	290	
3" (76mm)	-	-	-	-	-	-	-	-	-	-	-	-	
3½" (89mm)	150	-	-	-	179	-	-	-	198	-	-	-	
4" (102mm)	150	-	-	-	179	-	-	-	198	-	-	-	
4½" (114mm)	150	-	-	-	179	-	-	-	198	-	-	-	
5" (127mm)	150	-	-	-	179	-	-	-	198	-	-	-	
5½" (140mm)	150	180	-	-	179	201	-	-	198	214	-	-	
6" (152mm)	150	180	-	-	179	201	-	-	198	214	-	-	
6¼" (160mm)	150	180	-	-	179	201	-	-	198	214	-	-	$\perp_s$
6¾" (172mm)	150	180	-	-	179	201	-	-	198	214	-	-	
7⅛" (180mm)	150	180	173	-	179	201	201	-	198	214	214	-	
7⅞" (200mm)	150	180	180	-	179	201	201	-	198	214	214	-	
8" (203mm)	150	180	180	-	179	201	201	-	198	214	214	-	
10" (254mm)	150	180	180	-	179	201	201	-	198	214	214	-	
10¼"+ (260mm)	150	180	180	180	179	201	201	201	198	214	214	214	
3" (76mm)	-	-	-	-	-	-	-	-	-	-	-	-	
3½" (89mm)	166	-	-	-	201	-	-	-	214	-	-	-	
4" (102mm)	176	-	-	-	201	-	-	-	214	-	-	-	
4½" (114mm)	176	-	-	-	201	-	-	-	214	-	-	-	
5" (127mm)	176	-	-	-	201	-	-	-	214	-	-	-	
5½" (140mm)	176	166	-	-	201	201	-	-	214	214	-	-	
6" (152mm)	176	180	-	-	201	201	-	-	214	214	-	-	
6¼" (160mm)	176	180	-	-	201	201	-	-	214	214	-	-	$\perp_m$
6¾" (172mm)	176	180	-	-	201	201	-	-	214	214	-	-	
7⅛" (180mm)	176	180	148	-	201	201	177	-	214	214	195	-	
7⅞" (200mm)	176	180	180	-	201	201	201	-	214	214	214	-	
8" (203mm)	176	180	180	-	201	201	201	-	214	214	214	-	
10" (254mm)	176	180	180	-	201	201	201	-	214	214	214	-	
10¼"+ (260mm)	176	180	180	180	201	201	201	201	214	214	214	214	
3" (76mm)	-	-	-	-	-	-	-	-	-	-	-	-	
3½" (89mm)	137	-	-	-	169	-	-	-	188	-	-	-	
4" (102mm)	140	-	-	-	169	-	-	-	188	-	-	-	
4½" (114mm)	140	-	-	-	169	-	-	-	188	-	-	-	
5" (127mm)	140	-	-	-	169	-	-	-	188	-	-	-	
5½" (140mm)	140	155	-	-	169	186	-	-	188	199	-	-	
6" (152mm)	140	164	-	-	169	186	-	-	188	199	-	-	
6¼" (160mm)	140	164	-	-	169	186	-	-	188	199	-	-	⊥
6¾" (172mm)	140	164	-	-	169	186	-	-	188	199	-	-	
7⅛" (180mm)	140	164	138	-	169	186	166	-	188	199	185	-	
7⅞" (200mm)	140	164	164	-	169	186	186	-	188	199	199	-	
8" (203mm)	140	164	164	-	169	186	186	-	188	199	199	-	
10" (254mm)	140	164	164	-	169	186	186	-	188	199	199	-	
10¼"+ (260mm)	140	164	164	164	169	186	186	186	188	199	199	199	

1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 1½" (38.1mm) for both side and main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in both the main and side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

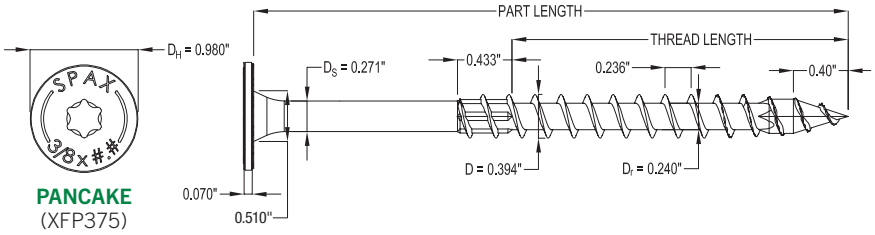
THREAD LENGTH AND PART NAMES

PART LENGTH	PARTIALLY THREADED		
	HEAD STYLE		THREAD LENGTH
	PANCAKE	HEX	
	PART NAME		
2" (51mm)	XFP312P200	XFH312P200	1.535" (40mm)
2½" (64mm)	XFP312P212	XFH312P212	1.535" (40mm)
3" (76mm)	XFP312P300	XFH312P300	1.535" (40mm)
3½" (89mm)	XFP312P312	XFH312P312	2.010" (51mm)
4" (102mm)	XFP312P400	XFH312P400	2.045" (52mm)
4½" (114mm)	XFP312P412	XFH312P412	2.045" (52mm)
5" (127mm)	XFP312P500	XFH312P500	2.675" (68mm)
6" (152mm)	XFP312P600	XFH312P600	2.675" (68mm)
6¾" (172mm)	XFP312P634	XFH312P634	2.675" (68mm)
8" (203mm)	XFP312P800	XFH312P800	2.675" (68mm)
10" (254mm)	XFP312P1000	XFH312P1000	2.675" (68mm)
12" (305mm)	XFP312P1200	XFH312P1200	2.675" (68mm)

PART LENGTH	LONG THREADED		
	HEAD STYLE		THREAD LENGTH
	FLAT	WASHER	
	PART NAME		
3⅛" (80mm)	XFF312L318	XFW312L318	2.760" (70mm)
4" (100mm)	XFF312L400	XFW312L400	3.190" (81mm)
4¾" (120mm)	XFF312L434	XFW312L434	3.190" (81mm)
5½" (140mm)	XFF312L512	XFW312L512	3.190" (81mm)
6¼" (160mm)	XFF312L614	XFW312L614	3.150" (80mm)
7⅛" (180mm)	XFF312L718	XFW312L718	3.150" (80mm)
7⅞" (200mm)	XFF312L778	XFW312L778	3.150" (80mm)
8⅝" (220mm)	XFF312L858	XFW312L858	3.150" (80mm)
9½" (240mm)	XFF312L912	XFW312L912	3.150" (80mm)
10¼" (260mm)	XFF312L1014	XFW312L1014	3.150" (80mm)
11" (280mm)	XFF312L1100	XFW312L1100	3.150" (80mm)
11¾" (300mm)	XFF312L1134	XFW312L1134	3.150" (80mm)
12⅝" (320mm)	XFF312L1258	XFW312L1258	3.150" (80mm)
13⅜" (340mm)	XFF312L1338	XFW312L1338	3.150" (80mm)
14⅛" (360mm)	XFF312L1418	XFW312L1418	3.150" (80mm)
15" (380mm)	XFF312L1500	XFW312L1500	3.150" (80mm)
15¾" (400mm)	XFF312L1534	XFW312L1534	3.150" (80mm)
17¾" (450mm)	XFF312L1734	XFW312L1734	3.150" (80mm)
19⅝" (500mm)	-	XFW312L1958	3.150" (80mm)
21⅝" (550mm)	-	XFW312L2158	3.150" (80mm)

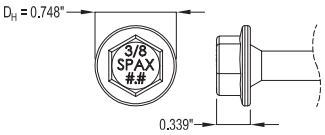
XF 3/8" (10mm) Series

3/8" DIAMETER, UPPER *4CUT*™, PATENTED SERRATIONS, *4CUT*™ POINT

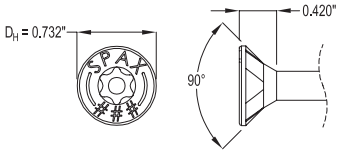


PANCAKE (XFP375)

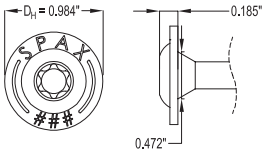
OTHER HEAD STYLES



HEX (XFH375)



FLAT / COUNTERSUNK (XFF375)



WASHER (XFW375)

3/8" (10mm) PARTIALLY THREADED

- Available in Pancake, Hex, Flat, and Washer head styles.
- Unique *4CUT*™ Point reduces splitting.
- Partial thread ensures clamping action.
- No pre-drill required. If tighter spacing is desired, pre-drill with ¼" (6.4mm) dia. drill bit.
- Minimum main member thickness is 2" (51mm). Minimum wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in USA and Germany with globally sourced materials.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER			TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r	SHANK, D_S			TENSILE	SHEAR	
0.394" (10mm)	0.240" (6.1mm)	0.271" (6.9mm)	0.40" (10.2mm)	4.2	2300	1740	150,000

HEAD DIMENSIONS AND PULL-THROUGH

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE	SPECIFIC GRAVITY		
				0.42	0.50	0.55
				ALLOWABLE HEAD PULL-THROUGH (lb.)		
Pancake	0.980" (24.9mm)	0.070" (1.8mm)	T50 6-Lobe Recess	610	760	920
Hex	0.748" (19mm)	0.339" (8.6mm)	½" Hex Driver	510	620	620
Flat	0.732" (18.6mm)	0.420" (10.7mm)	T50 T-STAR*plus*®	330	450	480
Washer	0.984" (25mm)	0.185" (4.7mm)	T50 T-STAR*plus*®	690	790	1030

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	167	206	238
Max for Partial Thread at 3.15" (80mm) in Main Member (lb.)	690	764	935

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	5⅞" (150mm)	7⅞" (200mm)	2¾" (70mm)
	Loading perpendicular to grain or way from end	4" (100mm)	5⅞" (150mm)	1⅝" (40mm)
	Axial loading	4" (100mm)	4" (100mm)	1⅝" (40mm)
Edge Distance	Loading toward edge	4" (100mm)	4¾" (120mm)	1⅝" (40mm)
	Loading parallel to grain or away from edge	2" (50mm)	2¾" (70mm)	1¼" (32mm)
	Axial loading	1⅝" (40mm)	1⅝" (40mm)	1¼" (32mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	5⅞" (150mm)	5⅞" (150mm)	2" (50mm)
	Loading perpendicular to grain	4" (100mm)	4" (100mm)	2" (50mm)
	Axial loading	2¾" (70mm)	2¾" (70mm)	2" (50mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	2" (50mm)	2¾" (70mm)	2" (50mm)
	Loading perpendicular to grain	2" (50mm)	2¾" (70mm)	2" (50mm)
	Axial loading	2" (50mm)	2" (50mm)	2" (50mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
5" (127mm)	267	-	-	-	305	-	-	-	328	-	-	-	
5½" (140mm)	267	295	-	-	305	332	-	-	328	348	-	-	
6" (152mm)	267	304	-	-	305	332	-	-	328	348	-	-	
6¼" (160mm)	267	304	-	-	305	332	-	-	328	348	-	-	
7⅛" (180mm)	267	304	-	-	305	332	-	-	328	348	-	-	∥
7⅞" (200mm)	267	304	304	-	305	332	332	-	328	348	348	-	
8" (203mm)	267	304	304	-	305	332	332	-	328	348	348	-	
8⅝" (220mm)	267	304	304	-	305	332	332	-	328	348	348	-	
10"+ (254mm)	267	304	304	304	305	332	332	332	328	348	348	348	
5" (127mm)	161	-	-	-	188	-	-	-	207	-	-	-	
5½" (140mm)	161	209	-	-	188	234	-	-	207	249	-	-	
6" (152mm)	161	209	-	-	188	234	-	-	207	249	-	-	
6¼" (160mm)	161	209	-	-	188	234	-	-	207	249	-	-	
7⅛" (180mm)	161	209	-	-	188	234	-	-	207	249	-	-	$\perp_s$
7⅞" (200mm)	161	209	209	-	188	234	234	-	207	249	249	-	
8" (203mm)	161	209	209	-	188	234	234	-	207	249	249	-	
8⅝" (220mm)	161	209	209	-	188	234	234	-	207	249	249	-	
10"+ (254mm)	161	209	209	209	188	234	234	234	207	249	249	249	
5" (127mm)	190	-	-	-	221	-	-	-	241	-	-	-	
5½" (140mm)	190	172	-	-	221	205	-	-	241	226	-	-	
6" (152mm)	190	194	-	-	221	234	-	-	241	249	-	-	
6¼" (160mm)	190	207	-	-	221	234	-	-	241	249	-	-	
7⅛" (180mm)	190	209	-	-	221	234	-	-	241	249	-	-	$\perp_m$
7⅞" (200mm)	190	209	188	-	221	234	228	-	241	249	249	-	
8" (203mm)	190	209	194	-	221	234	234	-	241	249	249	-	
8⅝" (220mm)	190	209	209	-	221	234	234	-	241	249	249	-	
10"+ (254mm)	190	209	209	207	221	234	234	234	241	249	249	249	
5" (127mm)	146	-	-	-	174	-	-	-	192	-	-	-	
5½" (140mm)	146	157	-	-	174	190	-	-	192	211	-	-	
6" (152mm)	146	178	-	-	174	211	-	-	192	227	-	-	
6¼" (160mm)	146	186	-	-	174	211	-	-	192	227	-	-	
7⅛" (180mm)	146	186	-	-	174	211	-	-	192	227	-	-	⊥
7⅞" (200mm)	146	186	173	-	174	211	211	-	192	227	227	-	
8" (203mm)	146	186	178	-	174	211	211	-	192	227	227	-	
8⅝" (220mm)	146	186	186	-	174	211	211	-	192	227	227	-	
10"+ (254mm)	146	186	186	186	174	211	211	211	192	227	227	227	

1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 2" (51mm) for the main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in the side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

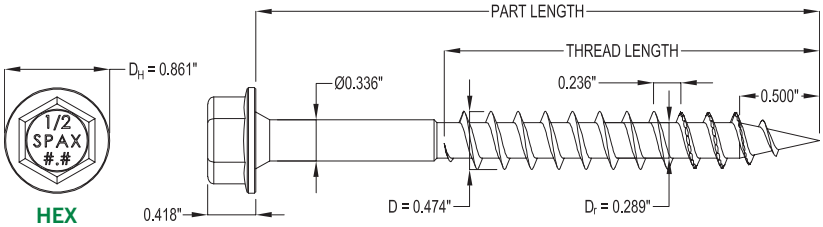
THREAD LENGTH AND PART NAMES

PART LENGTH	PARTIALLY THREADED		
	HEAD STYLE		THREAD LENGTH (INCH)
	PANCAKE	HEX	
	PART NAME		
5" (127mm)	XFP375P500	XFH375P500	3.190" (81mm)
6" (152mm)	XFP375P600	XFH375P600	3.150" (80mm)
8" (203mm)	XFP375P800	XFH375P800	3.150" (80mm)
10" (254mm)	XFP375P1000	XFH375P1000	3.150" (80mm)
12" (305mm)	XFP375P1200	XFH375P1200	3.150" (80mm)
14" (356mm)	XFP375P1400	XFH375P1400	3.150" (80mm)
16" (406mm)	XFP375P1600	XFH375P1600	3.150" (80mm)
18" (457mm)	XFP375P1800	XFH375P1800	3.150" (80mm)
20" (508mm)	XFP375P2000	XFH375P2000	3.150" (80mm)
22" (559mm)	XFP375P2200	XFH375P2200	3.150" (80mm)
24" (610mm)	XFP375P2400	XFH375P2400	3.150" (80mm)

PART LENGTH	LONG THREADED		
	HEAD STYLE		THREAD LENGTH
	FLAT	WASHER	
	PART NAME		
4" (100mm)	XFF375L400	-	3.190" (81mm)
4¾" (120mm)	XFF375L434	-	3.190" (81mm)
5½" (140mm)	XFF375L512	XFW375L512	3.190" (81mm)
6¼" (160mm)	XFF375L614	XFW375L614	3.150" (80mm)
7⅛" (180mm)	XFF375L718	XFW375L718	3.150" (80mm)
7⅞" (200mm)	XFF375L778	XFW375L778	3.150" (80mm)
8⅝" (220mm)	XFF375L858	XFW375L858	3.150" (80mm)
9½" (240mm)	XFF375L912	XFW375L912	3.150" (80mm)
10¼" (260mm)	XFF375L1014	XFW375L1014	3.150" (80mm)
11" (280mm)	XFF375L1100	XFW375L1100	3.150" (80mm)
11¾" (300mm)	XFF375L1134	XFW375L1134	3.150" (80mm)
12⅝" (320mm)	XFF375L1258	XFW375L1258	3.150" (80mm)
13⅜" (340mm)	XFF375L1338	XFW375L1338	3.150" (80mm)
14⅛" (360mm)	XFF375L1418	XFW375L1418	3.150" (80mm)
15" (380mm)	XFF375L1500	XFW375L1500	3.150" (80mm)
15¾" (400mm)	XFF375L1534	XFW375L1534	3.150" (80mm)
17¾" (450mm)	XFF375L1734	XFW375L1734	3.150" (80mm)

XS 1/2" (12mm) Series

1/2" DIAMETER, PATENTED SERRATIONS



HEX
(XSH500)

1/2" (12mm) PARTIALLY THREADED

- Available in Hex head style.
- Partial thread ensures clamping action.
- 1/4" (7mm) pre-drill required.
- Minimum main member thickness is 3" (76.2mm).
  Minimum wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in USA with globally sourced materials.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER			TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r	SHANK, D_S			TENSILE	SHEAR	
0.474" (12mm)	0.289" (7.3mm)	0.336" (8.5mm)	0.50" (12.7mm)	4.2	3,420	2,570	160,000

HEAD DIMENSIONS AND PULL-THROUGH

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE	SPECIFIC GRAVITY		
				0.42	0.50	0.55
				ALLOWABLE HEAD PULL-THROUGH (lb.)		
Hex	0.861" (21.9mm)	0.418" (10.6mm)	⅝" Hex Driver	580	660	720

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	210	279	292
Max for Partial Thread at 3.15" (80mm) in Main Member (lb.)	629	839	870

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		MINIMUM DISTANCE OR SPACING
End Distance	Loading toward end	3⅜" (84mm)
	Loading perpendicular to grain or way from end	1⅞" (48mm)
	Axial loading	1⅞" (48mm)
Edge Distance	Loading toward edge	1⅞" (48mm)
	Loading parallel to grain or away from edge	1⅜" (36mm)
	Axial loading	1⅜" (36mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	2⅜" (60mm)
	Loading perpendicular to grain	2⅜" (60mm)
	Axial loading	2⅜" (60mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	2⅜" (60mm)
	Loading perpendicular to grain	2⅜" (60mm)
	Axial loading	2⅜" (60mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
5" (127mm)	330	-	-	-	372	-	-	-	399	-	-	-	$\parallel$
6" (152mm)	330	402	-	-	372	451	-	-	399	473	-	-	
8" (203mm)	330	413	402	-	372	451	451	-	399	473	473	-	
10"+ (254mm)	330	413	413	413	372	451	451	451	399	473	473	473	
5" (127mm)	199	-	-	-	229	-	-	-	247	-	-	-	$\perp_s$
6" (152mm)	199	276	-	-	229	309	-	-	247	328	-	-	
8" (203mm)	199	276	276	-	229	309	309	-	247	328	328	-	
10"+ (254mm)	199	276	276	276	229	309	309	309	247	328	328	328	
5" (127mm)	228	-	-	-	263	-	-	-	285	-	-	-	$\perp_m$
6" (152mm)	228	222	-	-	263	263	-	-	285	291	-	-	
8" (203mm)	228	276	222	-	263	309	263	-	285	328	291	-	
10"+ (254mm)	228	276	276	232	263	309	309	278	285	328	328	308	
5" (127mm)	177	-	-	-	207	-	-	-	226	-	-	-	$\perp$
6" (152mm)	177	200	-	-	207	241	-	-	226	267	-	-	
8" (203mm)	177	241	200	-	207	274	241	-	226	294	267	-	
10"+ (254mm)	177	241	241	210	207	274	274	255	226	294	294	284	

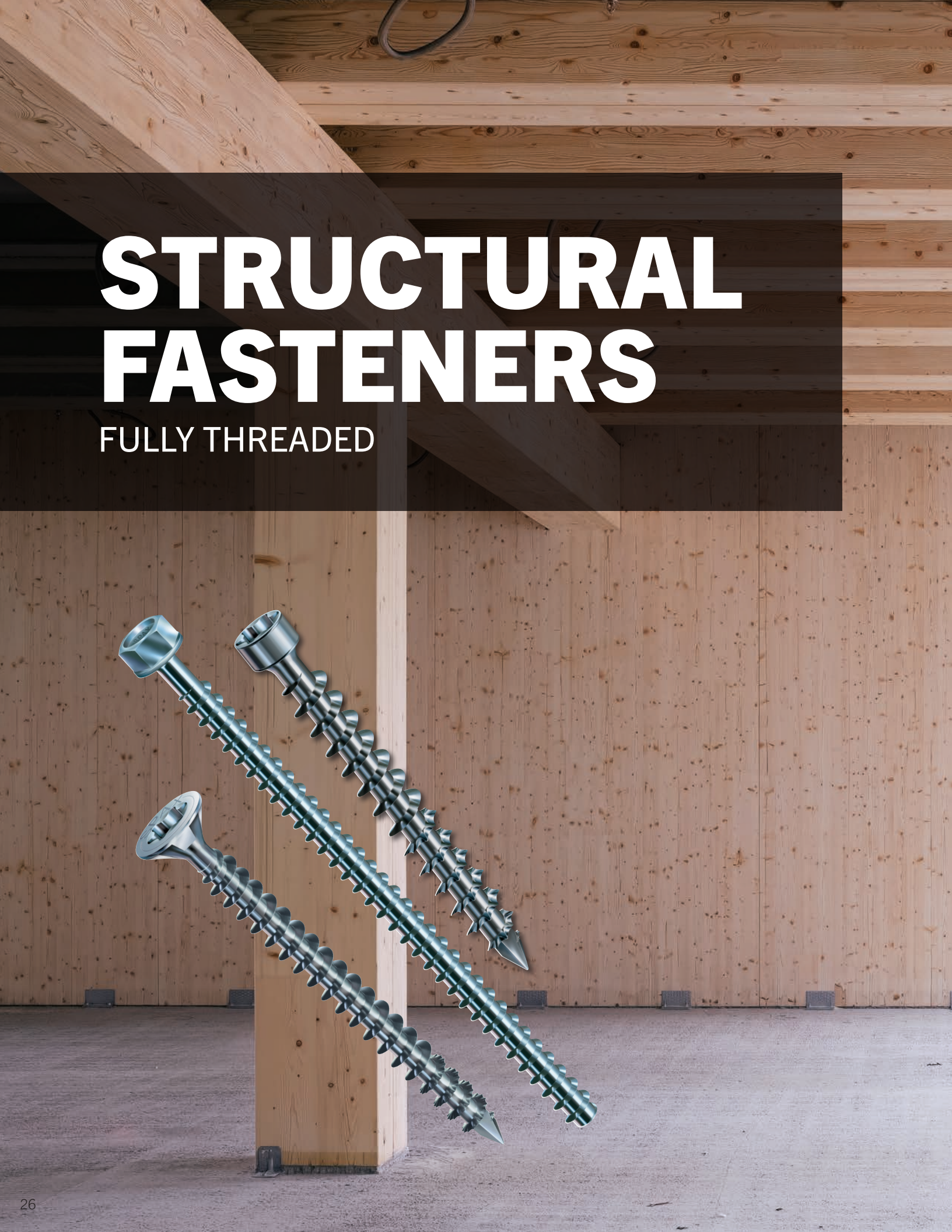
1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 3" (76.2mm) for the main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in the side member.
3. $\parallel$ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. $\perp$ means the load is perpendicular to the grain for both main and side members.

THREAD LENGTH AND PART NAMES

PART LENGTH	PARTIALLY THREADED	
	HEAD STYLE	THREAD LENGTH (INCH)
	HEX	
	PART NAME	
5" (127mm)	XSH500P500	3.150" (80mm)
6" (152mm)	XSH500P600	3.150" (80mm)
8" (203mm)	XSH500P800	3.150" (80mm)
10" (254mm)	XSH500P1000	3.150" (80mm)
12" (305mm)	XSH500P1200	3.150" (80mm)
14" (356mm)	XSH500P1400	3.150" (80mm)
16" (406mm)	XSH500P1600	3.150" (80mm)
18" (457mm)	XSH500P1800	3.150" (80mm)
20" (508mm)	XSH500P2000	3.150" (80mm)
22" (559mm)	XSH500P2200	3.150" (80mm)
24" (610mm)	XSH500P2400	3.150" (80mm)

STRUCTURAL FASTENERS

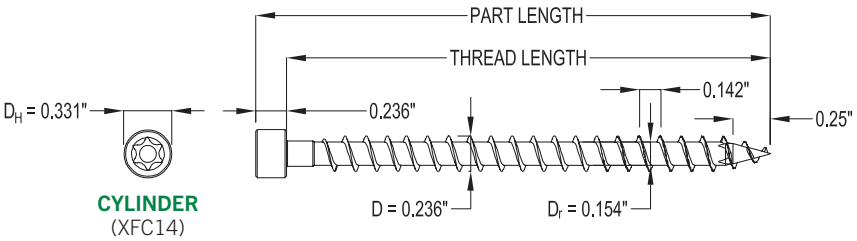
FULLY THREADED



Structural Fasteners
Fully Threaded

XF #14 (6mm) Fully Threaded Series

#14 DIAMETER, PATENTED SERRATIONS, *4CUT*™ POINT



#14 (6mm) FULLY THREADED

- Available in Cylinder head style.
- Full thread provides better grip and holding power.
- No pre-drill required. If tighter spacing is desired, pre-drill with 5⁄32" (4mm) dia. drill bit.
- Minimum main and wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in Germany.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER		TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r			TENSILE	SHEAR	
0.236" (6mm)	0.154" (3.9mm)	0.25" (6.4mm)	7	980	730	160,000

HEAD DIMENSIONS

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE
Cylinder	0.331" (8.4mm)	0.236" (6mm)	T30 T-STAR*plus*®

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	131	158	194

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	3½" (90mm)	4¾" (120mm)	2⅞" (72mm)
	Loading perpendicular to grain or way from end	2⅜" (60mm)	3½" (90mm)	1⅝" (42mm)
	Axial loading	2⅜" (60mm)	2⅜" (60mm)	1⅝" (42mm)
Edge Distance	Loading toward edge	2⅜" (60mm)	2⅞" (72mm)	1⅝" (42mm)
	Loading parallel to grain or away from edge	1⅛" (30mm)	1⅝" (42mm)	¾" (18mm)
	Axial loading	1" (24mm)	1" (24mm)	¾" (18mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	3½" (90mm)	3½" (90mm)	2⅜" (60mm)
	Loading perpendicular to grain	2⅜" (60mm)	2⅜" (60mm)	1⅛" (30mm)
	Axial loading	1⅝" (42mm)	1⅝" (42mm)	1⅝" (42mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	1⅛" (30mm)	1⅝" (42mm)	1" (24mm)
	Loading perpendicular to grain	1⅛" (30mm)	1⅝" (42mm)	1" (24mm)
	Axial loading	1" (24mm)	1" (24mm)	¾" (18mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
3⅛" (80mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4" (100mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	∥
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛"+ (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
3⅛" (80mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4" (100mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	$\perp_s$
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛"+ (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
3⅛" (80mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4" (100mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	$\perp_m$
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛"+ (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	
3⅛" (80mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4" (100mm)	144	-	-	-	169	-	-	-	185	-	-	-	
4¾" (120mm)	144	124	-	-	169	158	-	-	185	182	-	-	
5½" (140mm)	144	144	-	-	169	169	-	-	185	185	-	-	⊥
6¼" (160mm)	144	144	-	-	169	169	-	-	185	185	-	-	
7⅛"+ (180mm)	144	144	144	-	169	169	169	-	185	185	185	-	

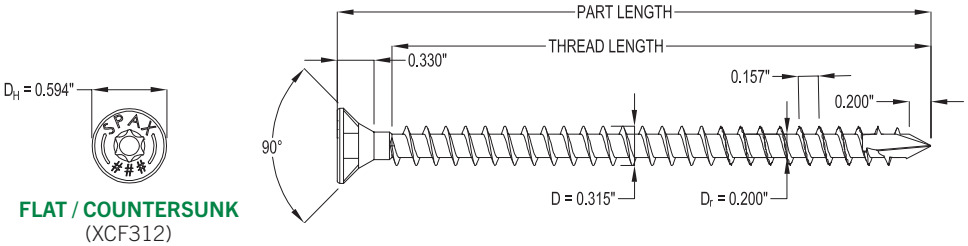
1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 1½" (38.1mm) for both side and main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in both the main and side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

PART LENGTH AND NAMES

PART LENGTH	FULLY THREADED HEAD STYLE CYLINDER PART NAME
3⅛" (80mm)	XFC14F318
4" (100mm)	XFC14F400
4¾" (120mm)	XFC14F434
5½" (140mm)	XFC14F512
6¼" (160mm)	XFC14F614
7⅛" (180mm)	XFC14F718
7⅞" (200mm)	XFC14F778

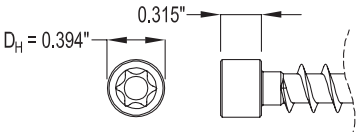
XC 5/16" (8mm) Series

5/16" DIAMETER, PATENTED SERRATIONS, *CUT*™ POINT



FLAT / COUNTERSUNK
(XCF312)

OTHER HEAD STYLES



CYLINDER (XCC312)

5/16" (8mm) FULLY THREADED

- Available in Flat and Cylinder head styles.
- Cut Point allows screwing in without pre-drilling and reduces splitting of the wood.
- Full thread provides better grip and holding power.
- No pre-drill required. If tighter spacing is desired, pre-drill with 7⁄32" (5.6mm) dia. drill bit.
- Minimum main and wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in Germany.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER		TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r			TENSILE	SHEAR	
0.315" (8mm)	0.200" (5.1mm)	0.20" (5.1mm)	6.4	1,400	1,030	160,000

HEAD DIMENSIONS

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE
Flat	0.594" (15.1mm)	0.330" (8.4mm)	T40 T-STAR*plus*®
Cylinder	0.394" (10mm)	0.315" (8mm)	T40 T-STAR*plus*®

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	146	174	210

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	4¾" (120mm)	6¼" (160mm)	3¾" (96mm)
	Loading perpendicular to grain or way from end	3⅛" (80mm)	4¾" (120mm)	2¼" (56mm)
	Axial loading	3⅛" (80mm)	3⅛" (80mm)	2¼" (56mm)
Edge Distance	Loading toward edge	3⅛" (80mm)	3¾" (96mm)	2¼" (56mm)
	Loading parallel to grain or away from edge	1⅝" (40mm)	2¼" (56mm)	1" (24mm)
	Axial loading	1¼" (32mm)	1¼" (32mm)	1" (24mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	4¾" (120mm)	4¾" (120mm)	3⅛" (80mm)
	Loading perpendicular to grain	3⅛" (80mm)	3⅛" (80mm)	1⅝" (40mm)
	Axial loading	2¼" (56mm)	2¼" (56mm)	2¼" (56mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	1⅝" (40mm)	2¼" (28mm)	1¼" (32mm)
	Loading perpendicular to grain	1⅝" (40mm)	2¼" (28mm)	1¼" (32mm)
	Axial loading	1¼" (32mm)	1¼" (32mm)	1" (24mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
6¼" (160mm)	241	253	-	-	276	276	-	-	290	290	-	-	
7⅛" (180mm)	241	253	237	-	276	276	273	-	290	290	290	-	
7⅞" (200mm)	241	253	253	-	276	276	276	-	290	290	290	-	∥
8⅝" (220mm)	241	253	253	-	276	276	276	-	290	290	290	-	
9½"+ (240mm)	241	253	253	253	276	276	276	276	290	290	290	290	
6¼" (160mm)	150	180	-	-	179	201	-	-	198	214	-	-	
7⅛" (180mm)	150	180	173	-	179	201	201	-	198	214	214	-	
7⅞" (200mm)	150	180	180	-	179	201	201	-	198	214	214	-	$\perp_s$
8⅝" (220mm)	150	180	180	-	179	201	201	-	198	214	214	-	
9½"+ (240mm)	150	180	180	180	179	201	201	201	198	214	214	214	
6¼" (160mm)	176	180	-	-	201	201	-	-	214	214	-	-	
7⅛" (180mm)	176	180	148	-	201	201	177	-	214	214	195	-	
7⅞" (200mm)	176	180	180	-	201	201	201	-	214	214	214	-	$\perp_m$
8⅝" (220mm)	176	180	180	-	201	201	201	-	214	214	214	-	
9½"+ (240mm)	176	180	180	180	201	201	201	201	214	214	214	214	
6¼" (160mm)	140	164	-	-	169	186	-	-	188	199	-	-	
7⅛" (180mm)	140	164	138	-	169	186	166	-	188	199	185	-	
7⅞" (200mm)	140	164	164	-	169	186	186	-	188	199	199	-	⊥
8⅝" (220mm)	140	164	164	-	169	186	186	-	188	199	199	-	
9½"+ (240mm)	140	164	164	164	169	186	186	186	188	199	199	199	

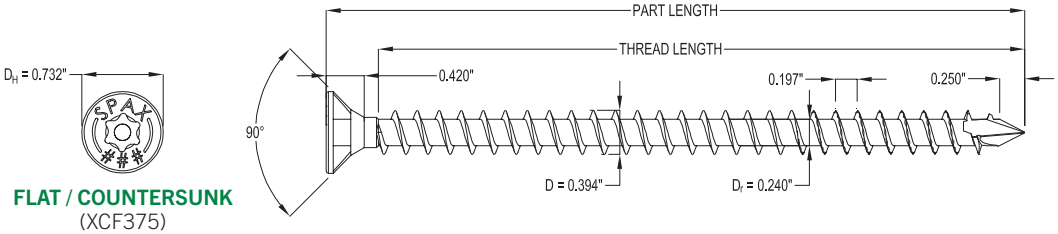
1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 1½" (38.1mm) for both side and main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in both the main and side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

PART LENGTH AND NAMES

PART LENGTH	FULLY THREADED	
	HEAD STYLE	
	FLAT	CYLINDER
	PART NAME	
6¼" (160mm)	XCF312F614	XCC312F614
7⅛" (180mm)	XCF312F718	XCC312F718
7⅞" (200mm)	XCF312F778	XCC312F778
8⅝" (220mm)	XCF312F858	XCC312F858
9½" (240mm)	XCF312F912	XCC312F912
10¼" (260mm)	XCF312F1014	XCC312F1014
11" (280mm)	XCF312F1100	XCC312F1100
11¾" (300mm)	XCF312F1134	XCC312F1134
13¾" (350mm)	XCF312F1334	XCC312F1334
14¾" (375mm)	XCF312F1434	XCC312F1434
15¾" (400mm)	XCF312F1534	XCC312F1534
17¾" (450mm)	XCF312F1734	XCC312F1734
19⅝" (500mm)	XCF312F1958	XCC312F1958
21⅝" (550mm)	XCF312F2158	XCC312F2158
23⅝" (600mm)	XCF312F2358	XCC312F2358

XC 3/8" (10mm) Series

3/8" DIAMETER, PATENTED SERRATIONS, *CUT*™ POINT



FLAT / COUNTERSUNK
(XCF375)

3/8" (10mm) FULLY THREADED

- Available in Flat head style.
- Cut Point allows screwing in without pre-drilling and reduces splitting of the wood.
- Full thread provides better grip and holding power.
- No pre-drill required. If tighter spacing is desired, pre-drill with ¼" (6.4mm) dia. drill bit.
- Minimum main member thickness is 2" (51mm). Minimum wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Made in Germany.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER		TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r			TENSILE	SHEAR	
0.394" (10mm)	0.240" (6.1mm)	0.25" (6.4mm)	5	2,480	1,860	150,000

HEAD DIMENSIONS

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE
Flat	0.732" (18.6mm)	0.420" (10.7mm)	T50 T-STAR*plus*®

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	131	203	227

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		SELF-DRILLED		PRE-DRILLED
		G < 0.50	G ≥ 0.50	
		MINIMUM DISTANCE OR SPACING		
End Distance	Loading toward end	5⅞" (150mm)	7⅞" (200mm)	2¾" (70mm)
	Loading perpendicular to grain or way from end	4" (100mm)	5⅞" (150mm)	1⅝" (40mm)
	Axial loading	4" (100mm)	4" (100mm)	1⅝" (40mm)
Edge Distance	Loading toward edge	4" (100mm)	4¾" (120mm)	1⅝" (40mm)
	Loading parallel to grain or away from edge	2" (50mm)	2¾" (70mm)	1¼" (32mm)
	Axial loading	1⅝" (40mm)	1⅝" (40mm)	1¼" (32mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	5⅞" (150mm)	5⅞" (150mm)	2" (50mm)
	Loading perpendicular to grain	4" (100mm)	4" (100mm)	2" (50mm)
	Axial loading	2¾" (70mm)	2¾" (70mm)	2" (50mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	2" (50mm)	2¾" (70mm)	2" (50mm)
	Loading perpendicular to grain	2" (50mm)	2¾" (70mm)	2" (50mm)
	Axial loading	2" (50mm)	2" (50mm)	2" (50mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
3⅛" (80mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4" (102mm)	267	-	-	-	305	-	-	-	328	-	-	-	
4¾" (100mm)	267	-	-	-	305	-	-	-	328	-	-	-	
5½" (140mm)	267	295	-	-	305	332	-	-	328	348	-	-	
6¼" (160mm)	267	304	-	-	305	332	-	-	328	348	-	-	∥
7⅛" (180mm)	267	304	-	-	305	332	-	-	328	348	-	-	
7⅞" (200mm)	267	304	304	-	305	332	332	-	328	348	348	-	
8⅝" (220mm)	267	304	304	-	305	332	332	-	328	348	348	-	
9½"+ (240mm)	267	304	304	304	305	332	332	332	328	348	348	348	
3⅛" (80mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4" (102mm)	161	-	-	-	188	-	-	-	207	-	-	-	
4¾" (100mm)	161	-	-	-	188	-	-	-	207	-	-	-	
5½" (140mm)	161	209	-	-	188	234	-	-	207	249	-	-	
6¼" (160mm)	161	209	-	-	188	234	-	-	207	249	-	-	$\perp_s$
7⅛" (180mm)	161	209	-	-	188	234	-	-	207	249	-	-	
7⅞" (200mm)	161	209	209	-	188	234	234	-	207	249	249	-	
8⅝" (220mm)	161	209	209	-	188	234	234	-	207	249	249	-	
9½"+ (240mm)	161	209	209	209	188	234	234	234	207	249	249	249	
3⅛" (80mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4" (102mm)	190	-	-	-	221	-	-	-	241	-	-	-	
4¾" (100mm)	190	-	-	-	221	-	-	-	241	-	-	-	
5½" (140mm)	190	172	-	-	221	205	-	-	241	226	-	-	
6¼" (160mm)	190	207	-	-	221	234	-	-	241	249	-	-	$\perp_m$
7⅛" (180mm)	190	209	-	-	221	234	-	-	241	249	-	-	
7⅞" (200mm)	190	209	188	-	221	234	228	-	241	249	249	-	
8⅝" (220mm)	190	209	209	-	221	234	234	-	241	249	249	-	
9½"+ (240mm)	190	209	209	183	221	234	234	220	241	249	249	244	
3⅛" (80mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4" (102mm)	146	-	-	-	174	-	-	-	192	-	-	-	
4¾" (100mm)	146	-	-	-	174	-	-	-	192	-	-	-	
5½" (140mm)	146	157	-	-	174	190	-	-	192	211	-	-	
6¼" (160mm)	146	186	-	-	174	211	-	-	192	227	-	-	⊥
7⅛" (180mm)	146	186	-	-	174	211	-	-	192	227	-	-	
7⅞" (200mm)	146	186	173	-	174	211	211	-	192	227	227	-	
8⅝" (220mm)	146	186	186	-	174	211	211	-	192	227	227	-	
9½"+ (240mm)	146	186	186	167	174	211	211	204	192	227	227	227	

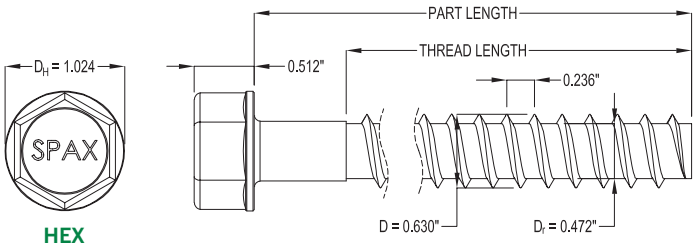
1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 2" (51mm) for the main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in the side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

PART LENGTH AND NAMES

PART LENGTH	FULLY THREADED HEAD STYLE FLAT PART NAME
4¾" (120mm)	XCF375F434
5½" (140mm)	XCF375F512
6¼" (160mm)	XCF375F614
7⅛" (180mm)	XCF375F718
7⅞" (200mm)	XCF375F778
8⅝" (220mm)	XCF375F858
9½" (240mm)	XCF375F912
10¼" (260mm)	XCF375F1014
11" (280mm)	XCF375F1100
11¾" (300mm)	XCF375F1134
13¾" (350mm)	XCF375F1334
14¾" (375mm)	XCF375F1434
15¾" (400mm)	XCF375F1534
17¾" (450mm)	XCF375F1734
19⅝" (500mm)	XCF375F1958
23⅝" (600mm)	XCF375F2358
27½" (700mm)	XCF375F2712
31½" (800mm)	XCF375F3112

XR 5/8" (16mm) Series

5/8" DIAMETER



HEX
(XRH625)

5/8" (16mm) FULLY THREADED

- Available in Hex head style.
- Full thread provides better grip and holding power.
- ½" (13mm) pre-drill required.
- Minimum main member thickness is 3" (76.2mm). Minimum wood side member thickness is 1½" (38.1mm).
- Wet service factor: C_M=0.59
- Withdrawal end grain factor: C_{eg}=0.65
- Can be cut to shorter lengths.
- Made in Germany.

ICC ES No. ESR-5358

PROPERTIES

DIAMETER		TIP LENGTH, E	THREADS PER INCH	ALLOWABLE STEEL STRENGTH (lb)		BENDING YIELD STRENGTH, F_{yb} (psi)
MAJOR, D	MINOR, D_r			TENSILE	SHEAR	
0.630" (16mm)	0.472" (12mm)	0.00"	4.2	5,770	3,930	100,000

HEAD DIMENSIONS

HEAD STYLE	HEAD DIA.	HEAD HEIGHT	DRIVE TYPE
Hex	1.024" (26mm)	0.512" (130mm)	22mm Hex Driver

WITHDRAWAL

WITHDRAWAL PROPERTY	SPECIFIC GRAVITY		
	0.42	0.50	0.55
Per Inch of Thread (lb./in.)	168	279	279

END, EDGE, AND SPACING REQUIREMENTS

CONDITION		MINIMUM DISTANCE OR SPACING
End Distance	Loading toward end	4⅜" (112mm)
	Loading perpendicular to grain or way from end	2½" (64mm)
	Axial loading	2½" (64mm)
Edge Distance	Loading toward edge	2½" (64mm)
	Loading parallel to grain or away from edge	1⅞" (48mm)
	Axial loading	1⅞" (48mm)
Spacing between fasteners parallel to grain	Loading parallel to grain	3⅛" (80mm)
	Loading perpendicular to grain	3⅛" (80mm)
	Axial loading	3⅛" (80mm)
Spacing between fasteners perpendicular to grain	Loading parallel to grain	3⅛" (80mm)
	Loading perpendicular to grain	3⅛" (80mm)
	Axial loading	3⅛" (80mm)

LATERAL

FASTENER LENGTH[1]	SPECIFIC GRAVITY												GRAIN ORIENTATION[3]
	SPF/HF 0.42				DF 0.50				SP 0.55				
	SIDE MEMBER THICKNESS[2]												
	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	1½"	3½"	5½"	7¼"	
	LATERAL CAPACITY (lbs.)												
4" (102mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4½" (114mm)	628	-	-	-	720	-	-	-	765	-	-	-	
5" (127mm)	647	-	-	-	720	-	-	-	765	-	-	-	
5½" (140mm)	647	-	-	-	720	-	-	-	765	-	-	-	
6" (152mm)	647	-	-	-	720	-	-	-	765	-	-	-	
7" (178mm)	647	871	-	-	720	951	-	-	765	997	-	-	∥
8" (203mm)	647	871	-	-	720	951	-	-	765	997	-	-	
9" (229mm)	647	871	871	-	720	951	951	-	765	997	997	-	
10" (254mm)	647	871	871	821	720	951	951	944	765	997	997	997	
11"+ (280mm)	647	871	871	871	720	951	951	951	765	997	997	997	
4" (102mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4½" (114mm)	309	-	-	-	398	-	-	-	457	-	-	-	
5" (127mm)	309	-	-	-	398	-	-	-	457	-	-	-	
5½" (140mm)	309	-	-	-	398	-	-	-	457	-	-	-	
6" (152mm)	309	-	-	-	398	-	-	-	457	-	-	-	
7" (178mm)	309	467	-	-	398	560	-	-	457	621	-	-	$\perp_s$
8" (203mm)	309	467	-	-	398	560	-	-	457	621	-	-	
9" (229mm)	309	467	555	-	398	560	622	-	457	621	661	-	
10" (254mm)	309	467	555	552	398	560	622	622	457	621	661	661	
11"+ (280mm)	309	467	555	555	398	560	622	622	457	621	661	661	
4" (102mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4½" (114mm)	364	-	-	-	457	-	-	-	518	-	-	-	
5" (127mm)	405	-	-	-	486	-	-	-	523	-	-	-	
5½" (140mm)	424				486				523				
6" (152mm)	424	-	-	-	486	-	-	-	523	-	-	-	
7" (178mm)	424	467	-	-	486	560	-	-	523	621	-	-	$\perp_m$
8" (203mm)	424	535	-	-	486	622	-	-	523	661	-	-	
9" (229mm)	424	555	467	-	486	622	560	-	523	661	621	-	
10" (254mm)	424	555	535	426	486	622	622	500	523	661	661	548	
11"+ (280mm)	424	555	555	483	486	622	622	582	523	661	661	647	
4" (102mm)	-	-	-	-	-	-	-	-	-	-	-	-	
4½" (114mm)	233	-	-	-	375	-	-	-	415	-	-	-	
5" (127mm)	269	-	-	-	385	-	-	-	415	-	-	-	
5½" (140mm)	305	-	-	-	385	-	-	-	415	-	-	-	
6" (152mm)	309	-	-	-	385	-	-	-	415	-	-	-	
7" (178mm)	309	332	-	-	385	503	-	-	415	562	-	-	⊥
8" (203mm)	309	384	-	-	385	503	-	-	415	562	-	-	
9" (229mm)	309	415	415	-	385	503	503	-	415	562	562	-	
10" (254mm)	309	415	475	375	385	503	539	446	415	562	577	493	
11"+ (280mm)	309	415	475	430	385	503	539	524	415	562	577	577	

1. Main member penetration is assumed to be the length of the fastener minus the side member thickness. Connections where fasteners penetrate through the main member are outside the scope of this table. A minimum penetration of 3" (76.2mm) for the main member is required.
2. A minimum of 1½" (38.1mm) of penetration is required in the side member.
3. ∥ means the load is parallel to the grain for both main and side members. $\perp_s$ means the load is parallel to the grain for the main member but perpendicular for the side member. $\perp_m$ means the load is perpendicular to the grain for the main member but parallel to the grain for the side member. ⊥ means the load is perpendicular to the grain for both main and side members.

PART LENGTH AND NAMES

PART LENGTH	FULLY THREADED
	HEAD STYLE
	HEX
	PART NAME
31½" (800mm)	XRH625F3112
39⅜" (1,000mm)	XRH625F3938
47¼" (1,200mm)	XRH625F4714
55⅛" (1,400mm)	XRH625F5518
63" (1,600mm)	XRH625F6300
70⅞" (1,800mm)	XRH625F7078
78¾" (2,000mm)	XRH625F7834

BUILDING ENVELOPE

PERFORMANCE FASTENERS

Energy Efficiency + Durability = True Sustainability

Mass timber structures can achieve impressive sustainability through utilization of renewable resources, reduction of waste, and reduction in both embodied and operational carbon. TRUFAST® products further contribute to sustainable design by minimizing thermal-bridging, water, and air leakage of the building envelope. Controlling moisture migration through the exterior building envelope is critical to the long-term durability in timber frame and mass timber construction. TRUFAST insulation, membrane, and cladding attachment solutions help prevent moisture and air leakage through the penetration of the air and water resistive barrier. This synergy of materials and fasteners not only reduces energy consumption for heating and cooling but also creates durable timber structures. That is true sustainability.

Grip-Deck TubeSeal®

- Reduces thermal bridging of fasteners through the layer of continuous insulation.
- TubeSeal creates a seal against the WRB/air barrier, preventing air and moisture penetration.
- Available for either wood or steel substrates and insulation thickness ranging from 1" to 4".

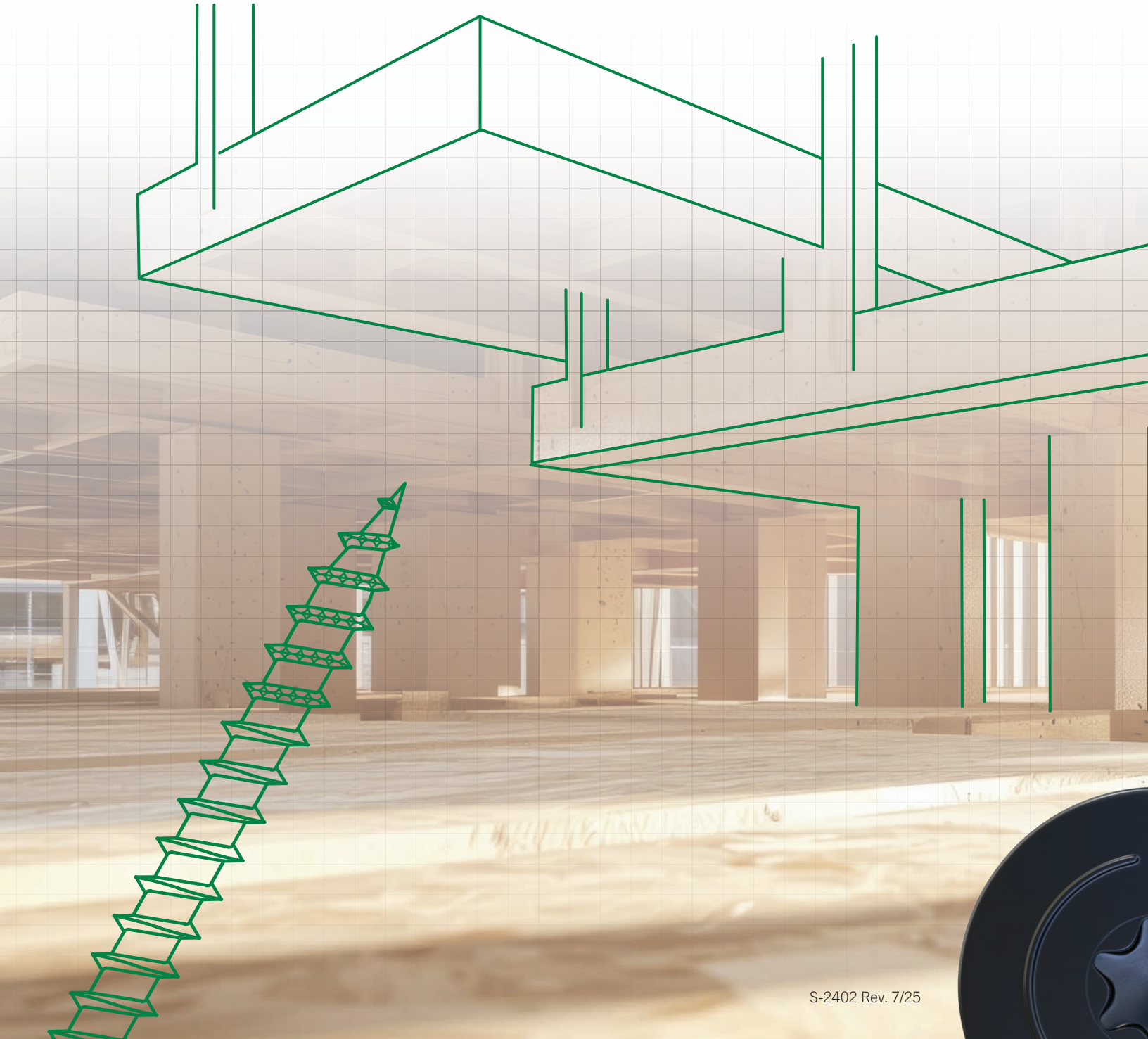
Building Envelope Cladding Attachment Solutions

- Rainscreen cladding
- Adhered masonry
- Masonry cavity wall

For more information, please visit
TRUFAST.COM

SPAX AND TRUFAST ARE BRANDS OF
ALTENLOH, BRINCK & CO. US, INC.
616-454-3100
ENGINEERINGSUPPORT@SPAX.US

Scan the QR code for
more information.



S-2402 Rev. 7/25