



MULTI-PLY FASTENING SOLUTION WITH SPAX[®] POWERLAGS[®] XF

SPAX[®] PowerLags[®] XF have been evaluated for single-side fastening of sawn lumber and engineered wood beams. When installed per this technical bulletin, SPAX PowerLags XF can be used to confidently join and secure LVL, PSL, LSL, and Sawn Lumber multi-ply beams that can be loaded on both the head and point side of the fastener.

PRODUCT FEATURES

- Code listed per DrJ TER No. 2410-103.
- Patented thread technology requires no pre-drilling, and drives faster and easier than conventional lag screws.
- T-STAR Pancake Head for a slim, low revealing head option.
- Hex Head for easy insertion and removal.
- Two coatings types to choose from:
 - Yellow Zinc - for use in interior applications
 - HCR[®] - for use in exterior sawn lumber beams when pressure treated or fire retardant treated (FRT) lumber is specified.
- Fastener length and diameter on head provides easy identification.

INSTALLATION INSTRUCTIONS

- 1) Select the proper length fastener according to Tables 2 & 3 for the given multi-ply assembly. Ensure the fastener has a minimum of 1" penetration into the last ply (main member) of the assembly.
- 2) Install using an impact driver or low rpm/high torque electric drill. Pre-drilling is typically not required but can be used when lumber is prone to splitting. When pre-drilling, use a maximum 3/16" bit for 1/4" diameter, 7/32" for 5/16" diameter, or 1/4" for 3/8" diameter fastener.
- 3) Drive the fastener until the head is drawn firm and flush and all plies are drawn tightly together. Do not overdrive.
- 4) Install fasteners in either 2 or 3 rows (staggered or in-line) per Tables 2 & 3. For top loaded beams, refer to Figures 3 & 5. Individual screw locations may be adjusted up to 3" to avoid hardware or lumber defects.

FIGURE 1: SPAX T-STAR PANCAKE HEAD FASTENER

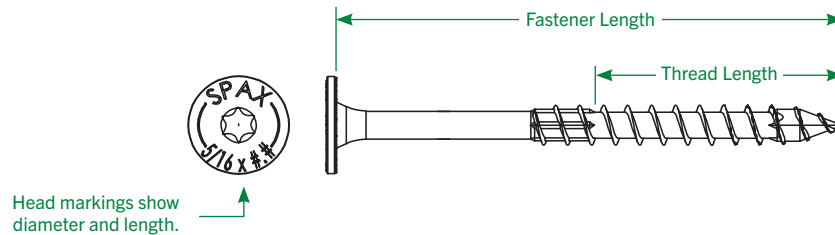


FIGURE 2: MINIMUM SPACING REQUIREMENTS

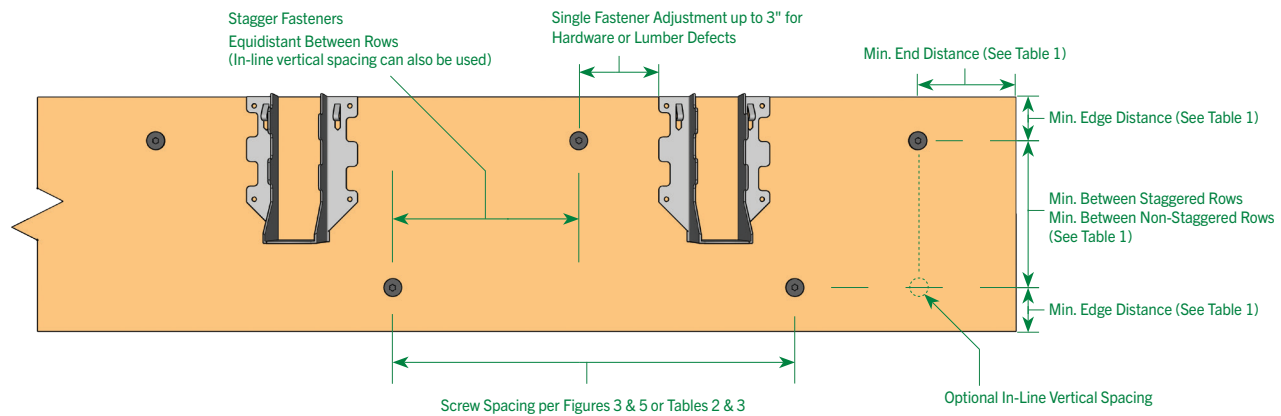


TABLE 1: SPAX® POWERLAGS® XF FASTENER SPECIFICATIONS AND STRENGTH DETAILS

FASTENER NAME	HEAD	DIAMETER ² (IN)			BENDING YIELD ¹ , (PSI)	MINIMUM DISTANCES			
		SHANK	MINOR	MAJOR		MIN. END	MIN. EDGE	MIN. BETWEEN STAGGERED ROWS	MIN. BETWEEN NON-STAGGERED ROWS
1/4"	Hex	0.199	0.183	0.276	150,000	3"	1/2"	1/2"	1"
	Pancake								
5/16"	Hex	0.220	0.200	0.315	160,000	3 3/8"	5/8"	5/8"	1 1/8"
	Pancake								
3/8"	Hex	0.271	0.240	0.394	150,000	4 1/8"	3/4"	3/4"	1 3/8"
	Pancake								

For SI: 1" = 25.4mm, 1 lbf = 4.45 N, 1 psi = 6.895 kPa.

1. Determine in accordance with methods specified in ASTM F1575, based on minor thread diameter using a 5% offset of the load displacement curves developed from bending tests.
2. Fastener dimensions are as measured on uncoated fasteners.

MULTI-PLY SAWN LUMBER ASSEMBLIES

FIGURE 3: TOP LOADED BEAMS

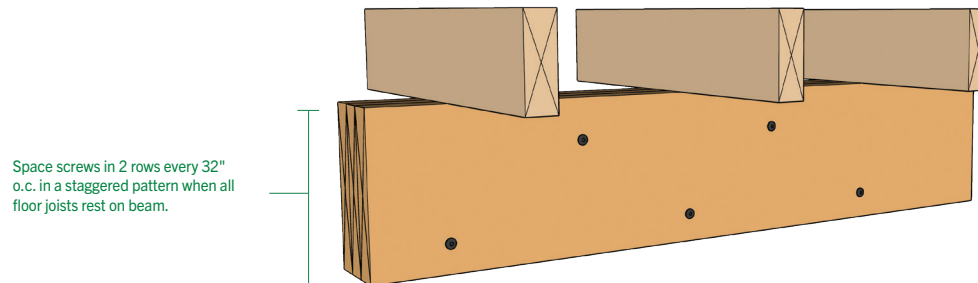


FIGURE 4: SPAX® POWERLAGS® XF FASTENER ASSEMBLIES FOR TRUSS AND SAWN LUMBER

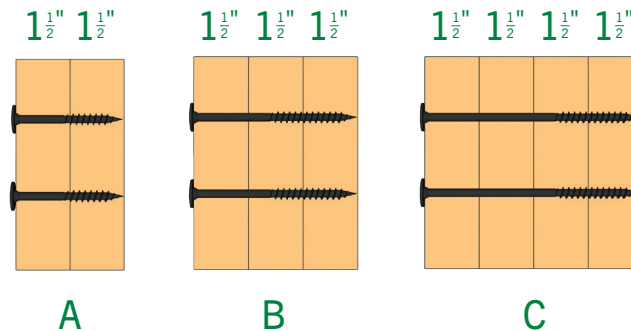


TABLE 2: SPAX® POWERLAGS® XF FASTENER ALLOWABLE DESIGN VALUES [PLF] FOR MULTI-PLY TRUSS AND SAWN LUMBER ASSEMBLIES

Multiple Members		Diameter	Fastener Length ^{1,2} (in.)	Loaded Side	SPF/HF (0.42)						DF/SP (0.50)					
					12" O.C.		16" O.C.		24" O.C.		12" O.C.		16" O.C.		24" O.C.	
Assembly	Components				2 Rows	3 Rows	2 Rows	3 Rows	2 Rows	3 Rows	2 Rows	3 Rows	2 Rows	3 Rows	2 Rows	3 Rows
A	2-ply 1½"	1/4"	3"	Either	480	715	360	540	240	360	630	940	470	705	315	470
B	3-ply 1½"		4"	Head	415	620	310	465	205	310	525	790	395	590	265	395
				Point	320	485	240	360	160	240	390	580	290	435	195	290
C	4-ply 1½"		6"	Head	370	555	275	415	185	275	465	700	350	525	235	350
				Point	330	495	250	370	165	250	420	630	315	470	210	315
A	2-ply 1½"	5/16"	3"	Either	480	725	360	545	240	360	665	995	500	750	330	500
B	3-ply 1½"		4"	Head	445	670	335	505	225	335	575	860	430	645	285	430
				Point	365	550	275	410	185	275	435	650	325	490	215	325
C	4-ply 1½"		6"	Head	400	595	300	445	200	300	510	765	380	575	255	380
				Point	360	540	270	405	180	270	450	675	335	505	225	335
C	4-ply 1½"	3/8"	6"	Head	445	670	335	505	225	335	565	845	425	635	280	425
				Point	410	610	305	460	205	305	500	750	375	560	250	375

For SI: 1" = 25.4mm, 1 lbf = 4.45 N, 1 psi = 6.895 kPa.

1. Fastener length is measured from the underside of the head to the tip.

2. Thread length includes tip; see Figure 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 greater than 0.50, use the tabulated values for specific gravity of 0.50. DF-L = Douglas Fir-Larch, SP = Southern Pine, SPF = Spruce-Pine-Fir, HF = Hem-Fir.

4. Allowable loads are based on a load duration factor $C_D = 1.0$ and shall be multiplied by all applicable adjustment factors per the NDS.

MULTI-PLY ENGINEERED WOOD ASSEMBLIES

FIGURE 5 : TOP LOADED BEAMS

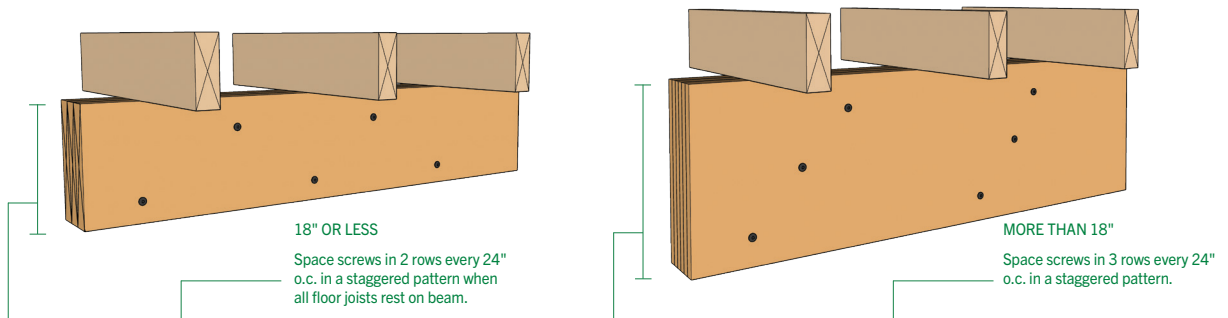
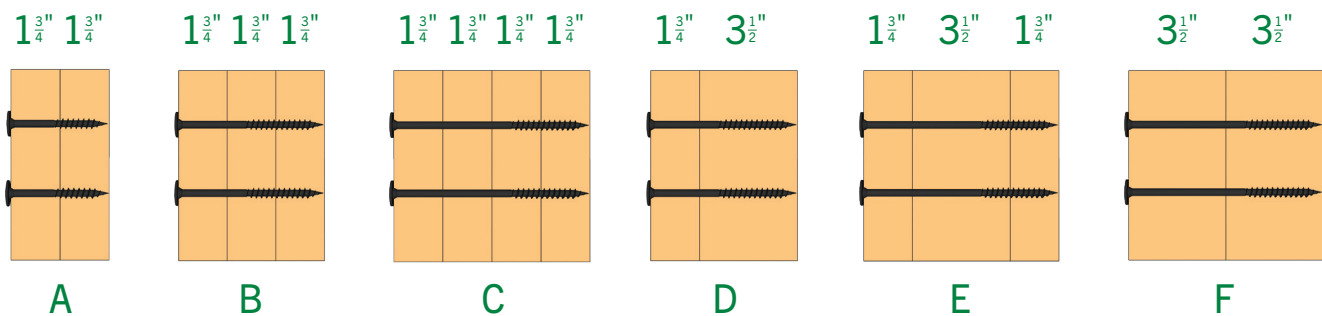


FIGURE 6: SPAX® POWERLAGS® XF FASTENER ASSEMBLIES FOR ENGINEERED WOOD



MULTI-PLY TECHNICAL BULLETIN



POWERLAGS® XF

STRUCTURAL APPLICATIONS

TABLE 3: SPAX® POWERLAGS® XF FASTENER ALLOWABLE DESIGN VALUES (PLF) FOR MULTI-PLY ENGINEERED WOOD [LVL, PSL, LSL] ASSEMBLIES

MULTIPLE MEMBER		DIAMETER	FASTENER LENGTH ^{1,2} (IN.)	LOADED SIDE	12" O.C.		16" O.C.		24" O.C.	
ASSEMBLY	COMPONENTS				2 ROWS	3 ROWS	2 ROWS	3 ROWS	2 ROWS	3 ROWS
A	2-ply 1¾"	1/4"	3"	Either	700	1,050	525	790	350	525
B	3-ply 1¾"		5"	Head	525	790	395	590	265	395
				Point	470	705	355	530	235	355
C	4-ply 1¾"		6"	Head	465	700	350	525	235	350
				Point	330	495	250	370	165	250
D	2-ply 1¾" & 3½"		5"	Head	700	1,050	525	790	350	525
				Point	630	940	470	705	315	470
E	3-ply 1¾" & 3½"		6"	Head	525	790	395	590	265	395
				Point	370	555	280	420	185	280
F	2-ply 3½"		6"	Either	700	1,050	525	790	350	525
A	2-ply 1¾"	5/16"	3"	Either	740	1,110	555	835	370	555
B	3-ply 1¾"		5"	Head	605	905	455	680	300	455
				Point	505	755	380	565	250	380
C	4-ply 1¾"		6"	Head	535	805	405	605	270	405
				Point	450	675	335	505	225	335
D	2-ply 1¾" & 3½"		5"	Head	805	1,210	605	905	405	605
				Point	675	1,010	505	755	335	505
E	3-ply 1¾" & 3½"		6"	Head	605	905	455	680	300	455
				Point	505	755	380	565	250	380
F	2-ply 3½"		6"	Either	805	1,210	605	905	405	605
B	3-ply 1¾"	3/8"	5"	Head	690	1,035	515	775	345	515
				Point	560	840	420	630	280	420
C	4-ply 1¾"		6"*	Head	615	920	460	690	305	460
D	2-ply 1¾" & 3½"		5"	Head	920	1,380	690	1,035	460	690
				Point	750	1,120	560	840	375	560
E	3-ply 1¾" & 3½"		6"*	Head	690	1,035	515	775	345	515
F	2-ply 3½"		6"	Either	970	1,450	725	1,090	485	725

For SI: 1" = 25.4mm, 1 lbf = 4.45 N, 1 psi = 6.895 kPa.

1. Fastener length is measured from the underside of the head to the tip.

2. Thread length includes tip; see Figure 1.

3. Wood members shall have an equivalent specific gravity of 0.50 or greater.

4. Allowable loads are based on a load duration factor $C_D = 1.0$ and shall be multiplied by all applicable adjustment factors per the NDS.

* Loading on point-side lamination is not permitted.



ALTENLOH, BRINCK & CO. US, INC.

2105 County Road 12C

• Bryan, OH 43506

• 419-630-2490

• info@spax.us

• www.spax.us



TER No. 2410-103