

LTT/HTT

Tension Ties

Tension ties offer a solution for resisting tension loads that are fastened with nails or Strong-Drive® SD Connector screws. The new LTT2 light tension tie, designed for wood joist attachments to concrete or masonry walls, features two separate nailing patterns: obround holes spaced 3" apart for I-joist purlins and square holes spaced to accommodate the narrow face of 2x solid-sawn purlins. LTT2 may also be installed vertically on the wide face of a minimum 2x4 stud for holdown application. It features an extruded anchor bolt hole to accommodate $\frac{3}{4}$ ", $\frac{5}{8}$ " and $\frac{1}{2}$ " bolt diameters.

The LTT131 is designed for wood chord open-web truss attachments to concrete or masonry walls.

The HTT4 and HTT5 tension ties feature an optimized nailing pattern which results in better performance with less deflection. HTT5KT is sold as a kit with the holdown, bearing plate washer and Strong-Drive SD Connector screws.

The HTT5- $\frac{3}{4}$ is designed to use a $\frac{3}{4}$ "-diameter anchor bolt.

When using LTT or HTT tension ties with unreinforced concrete masonry, $\frac{3}{4}$ " post-installed anchor bolts are commonly used.

Material: See table

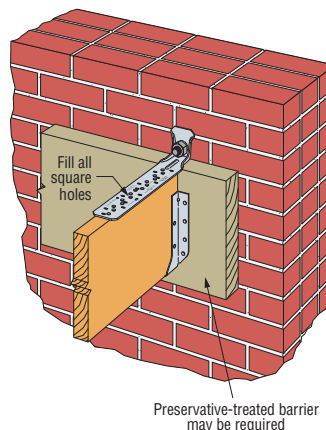
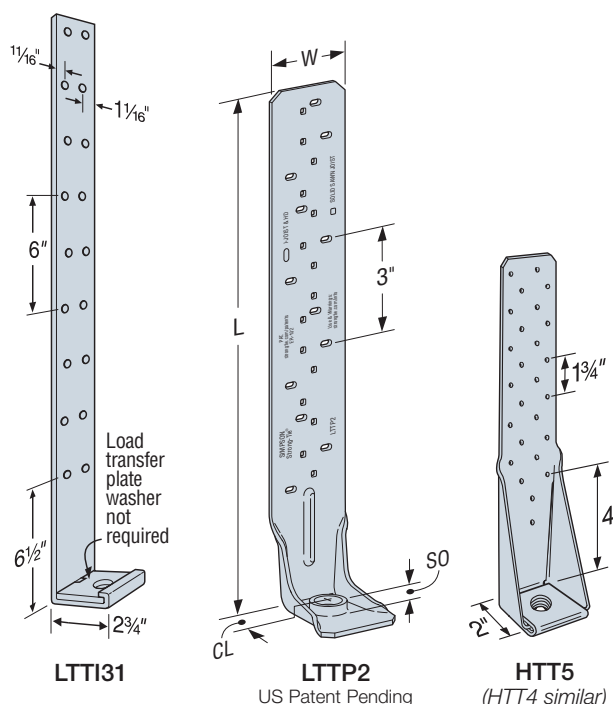
Finish: Galvanized. May be ordered HDG.

Installation:

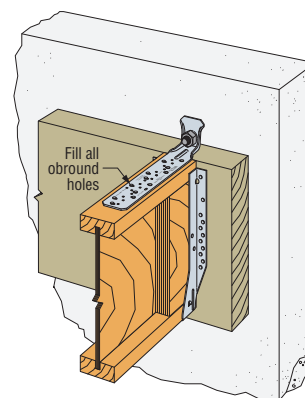
- See Holdown and Tension Tie General Notes on pp. 51–52.
- LTT2 — one standard cut-washer is required when using $\frac{1}{2}$ " and $\frac{5}{8}$ " anchor bolts; and no additional washer is required for $\frac{3}{4}$ " anchor bolts.
- LTT2 — For installations on narrow edge of solid sawn (2x, 3x) joists use (15) square holes; for all other installations use (12) obround holes.
- For tension ties installed over wood structural panel sheathing, use a 2½"-long fastener minimum.
- For information about marriage strap at panelized roof applications, see strongtie.com.
- HTT5-KT requires BP 5/8-2 bearing plate and #10 x 2½" SD Strong-Drive screws (included in kit).

Codes: Codes: See p. 13 for Code Reference Key Chart

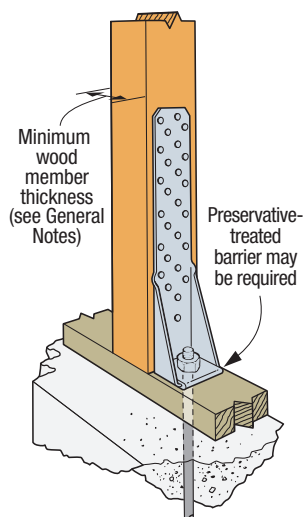
Web Applications: Visit app.strongtie.com/pfd to access our Post-to-Foundation Designer web application.



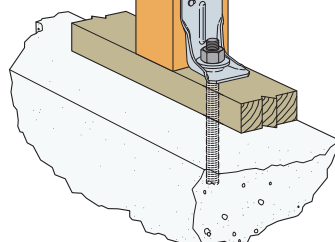
Typical LTT2 Installation for Solid Sawn Joist



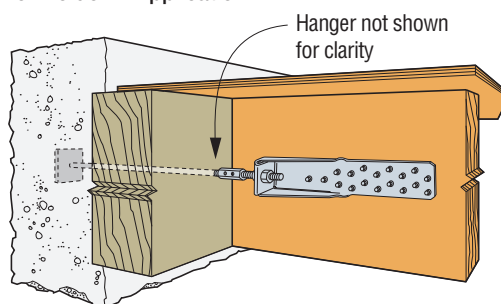
Typical LTT2 Installation for I-joist



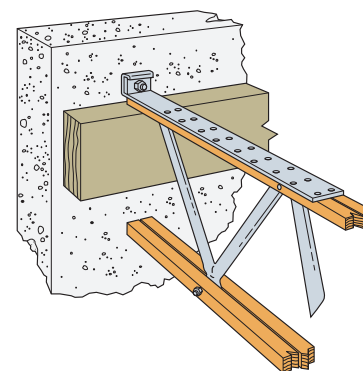
Vertical HTT5 Installation (HTT4 similar)



Typical LTT2 Installation for Holdown Application



Horizontal HTT Installation



Horizontal LTT131 Installation

LTT/HTT

Tension Ties (cont.)

These products are available with additional corrosion protection. For more information, see p. 16.



Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 362–366 for more information.

Model No.	Ga.	Dimensions (in.)			SO (in.)	Fasteners (in.)		Minimum Wood Member Size (in.)	Allowable Tension Loads (160)		Deflection at Highest Allowable Load (in.)	Code Ref.
		W	L	CL		Anchor Rod Diameter	Wood Fasteners		DF/SP	SPF/HF		
LTPP2	10	2 5/16	14 15/16	1 5/8	7/16	1/2, 5/8, 3/4	(15) 0.148 x 2 1/2	1 1/2 x 3 1/2 (narrow edge) ^{4,5}	1,845	1,695	0.104	IBC®, FL, LA
						1/2	(12) 0.148 x 1 1/2	1 1/2 x 3 1/2	1,680 ⁶	1,545 ⁶	0.138	
						5/8, 3/4	(12) #9 x 1 1/2" SD	1 1/2 x 3 1/2	2,135	1,965	0.112	
						1/2	(12) #9 x 1 1/2" SD	1 1/2 x 3 1/2	2,320	1,970	0.112	
						5/8, 3/4	(12) #9 x 1 1/2" SD	1 1/2 x 3 1/2	2,570	2,045	0.136	
LTTI31	18	3 3/4	31	1 3/8	1/4	5/8	(18) 0.148 x 1 1/2	3 x 3 1/2	1,350	1,160	0.193	IBC®, FL, LA
						5/8	(18) 0.148 x 1 1/2	1 1/2 x 3 1/2	3,000	2,580	0.090	
						5/8	(18) 0.148 x 1 1/2	3 x 3 1/2	3,610	3,105	0.086	
						5/8	(18) 0.162 x 2 1/2	3 x 3 1/2	4,235	3,640	0.123	
						5/8	(18) #10 x 1 1/2" SD	1 1/2 x 5 1/2	4,455	3,830	0.112	
HTT4	11	2 1/2	12 3/8	1 5/8	7/16	5/8	(18) #10 x 1 1/2" SD	3 x 3 1/2	4,455	3,830	0.112	IBC, FL, LA
						5/8	(18) #10 x 1 1/2" SD	3 x 3 1/2	4,455	3,830	0.112	
						5/8	(26) 0.148 x 1 1/2	3 x 3 1/2	4,350	3,740	0.120	
						5/8	(26) 0.148 x 3	3 x 3 1/2	4,670	4,015	0.116	
						5/8	(26) 0.162 x 2 1/2	3 x 3 1/2	5,090	4,375	0.135	
HTT5	11	2 1/2	16	1 3/8	7/16	5/8	(26) #10 x 1 1/2" SD	1 1/2 x 5 1/2	4,555	3,915	0.114	IBC, FL, LA
						5/8	(26) #10 x 1 1/2" SD	1 1/2 x 5 1/2	4,555	3,915	0.114	
						5/8	(26) #10 x 1 1/2" SD	1 1/2 x 5 1/2	4,555	3,915	0.114	
						5/8	(26) #10 x 1 1/2" SD	1 1/2 x 5 1/2	4,555	3,915	0.114	
						5/8	(26) #10 x 1 1/2" SD	1 1/2 x 5 1/2	4,555	3,915	0.114	
HTT5KT	11	2 1/2	16	1 3/8	7/16	5/8	(26) #10 x 1 1/2" SD	3 x 3 1/2	5,445	5,360	0.103	IBC, FL
						5/8	(26) #10 x 1 1/2" SD	3 x 3 1/2	5,445	5,360	0.103	
						5/8	(26) #10 x 1 1/2" SD	3 x 3 1/2	5,445	5,360	0.103	
						5/8	(26) #10 x 1 1/2" SD	3 x 3 1/2	5,445	5,360	0.103	
						5/8	(26) #10 x 1 1/2" SD	3 x 3 1/2	5,445	5,360	0.103	
HTT5-3/4	11	2 1/2	16	1 3/8	7/16	3/4	(26) 0.148 x 1 1/2	1 1/2 x 5 1/2	4,065	3,495	0.103	IBC, FL
						3/4	(26) 0.162 x 2 1/2	3 x 3 1/2	5,090	4,375	0.121	
						3/4	(26) 0.162 x 2 1/2	3 x 3 1/2	5,090	4,375	0.121	
						3/4	(26) #10 x 1 1/2" SD	1 1/2 x 7 1/4	4,830	4,155	0.100	
						3/4	(26) #10 x 1 1/2" SD	1 1/2 x 7 1/4	4,830	4,155	0.100	

- LTTI31 installed flush with concrete or masonry has an allowable load of 2,285 lb.
- Allowable load for HTT5 with a BP5/8-2 bearing-plate washer installed in the seat of the holdown is 5,295 lb. for DF/SP and 4,555 lb. for SPF/HF.
- For LTPP2, standard cut washer is required when using 1/2" and 5/8" anchor rods.
- For (15) nail installations on narrow edge of 2x4 (minimum) joist, LTPP2 installed flush with concrete or masonry has an allowable load of 2,560 lb. for DF/SP and 2,355 lb. for SPF/HF.
- LTPP2 installed with (15) #9 x 1 1/2" SD screws on narrow edge of 2x joist has an allowable load of 2,105 lb. for DF/SP and 1,935 lb. for SPF/HF.
- For (12) nail installations on I-joist or wide face of 2x member, LTPP2 installed flush with concrete or masonry has an allowable load of 1,950 lb. for DF/SP and 1,795 lb. for SPF/HF.
- Fasteners:** Nail dimensions are listed diameter by length. SD screws are Simpson Strong-Tie Strong-Drive SD Connector screws. See pp. 23–24 for fastener information.

Table 1 — Anchorage Selection Guide for Holdowns Attached to DF/SP Lumber

Holdown on DF/SP Lumber	Stemwall						Slab on Grade			
	Stemwall Width (in.)	Wind and Seismic Design Category A&B		Seismic Design Category C-F		End Wall	Wind and Seismic Design Category A&B		Seismic Design Category C-F	
		Midwall/Corner	End Wall	Midwall/Corner	End Wall		Midwall/Corner	Garage Curb	Midwall/Corner	Garage Curb
HDU2	6	SSTB16		SSTB24			SSTB16		SSTB16	SSTB20* (2,960)
HDU4	6	SB5/8X24		SB5/8X24			SSTB16	SB5/8X24	SSTB20	SB5/8X24
HDU5	6	SB5/8X24		SB5/8X24			SSTB20	SB5/8X24	SSTB24	SB5/8X24

Table 2 — Anchorage Selection Guide for Holdowns Attached to SPF/HF Lumber

Holdown on SPF/HF Lumber	Stemwall						Slab on Grade			
	Stemwall Width (in.)	Wind and Seismic Design Category A&B		Seismic Design Category C-F		End Wall	Wind and Seismic Design Category A&B		Seismic Design Category C-F	
		Midwall/Corner	End Wall	Midwall/Corner	End Wall		Midwall/Corner	Garage Curb	Midwall/Corner	Garage Curb
LTPP2	6	SSTB16		SSTB16			SSTB16		SSTB16	
HDU4	6	SSTB16		SSTB24			SSTB16		SSTB16	SSTB24
HTI4	6	SSTB24* (4,295)		SB5/8X24			SSTB16	SSTB24* (4,295)	SSTB20	SB5/8X24
HTT5	8	SSTB28		SSTB28			SSTB28		SSTB28	SSTB28
HD08	8	SSTB28		SSTB28			SSTB28		SSTB28	SSTB28
HD5B	8	SSTB28		SSTB28			SSTB28		SSTB28	SSTB28
HDU11	8	SB1X30* (9,505)	PAB8	PAB8		PAB8	SB1X30		SB1X30	
HDQ11	8	SB1X30	PAB8	PAB8		PAB8	SB1X30		SB1X30	
HDU14	—						SB1X30		SB1X30	
HDQ14	—						SB1X30		SB1X30	
LTPP2	6	SSTB16		SSTB16			SSTB16		SSTB16	
LTTI31	6	SSTB16		SSTB16			SSTB16		SSTB16	
HTT4	6	SSTB20		SB5/8X24			SSTB16	SSTB20	SSTB16* (3,780)	SB5/8X24
HTT5	6	SB5/8X24		SB5/8X24			SSTB20	SB5/8X24	SSTB24	SB5/8X24
HTT5KT	6	SSTB16		SSTB24			SSTB16		SSTB16	SSTB20* (2,960)

We've made selecting the right anchor bolt for the holdown easier; check out our Holdown Anchorage Solutions table on p. 46 or visit app.strongtie.com/pfd to access the Post-to-Foundation Designer web application.



S/LTT, S/DTT and HTT Tension Ties

The HTT is a single-piece formed tension tie — no rivets, and a four-ply formed seat. No washers are required.

S/DTT2Z tension tie is suitable for lighter-duty holdown applications on single or back-to-back studs, and installed easily with #14 self-drilling screws.

The HTT, S/DTT and S/LTT tension ties are ideal for retrofit or new construction projects. They provide high-strength, post-pour, concrete-to-steel connections.

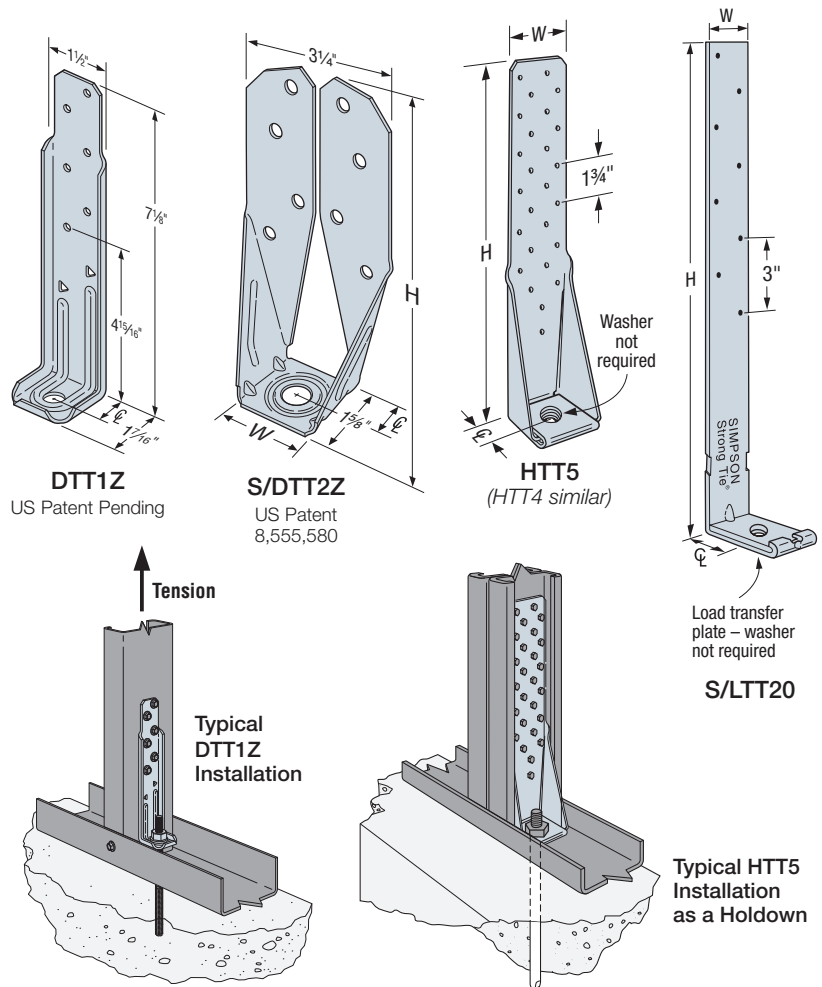
Material: HTT — 111 mil (11 ga.)
DTT1Z, S/DTT2Z — 68 mil (14 ga.)
S/LTT20 — Strap: 97 mil (12 ga.);
Plate: 229 mil (3 ga.)

Finish: HTT, S/LTT — Galvanized (G90);
DTT1Z, S/DTT2Z — ZMAX® coating

Installation:

- Use all specified fasteners.
- Use the specified number of type of screws to attach the strap portion to the steel stud. Bolt the base to the wall or foundation with a suitable anchor; see table for the required bolt diameter.
- S/DTT2Z requires a standard cut washer (included) be installed between the nut and the seat.
- Do not install S/LTT20 raised off of the bottom track.
- See SB and SSTB Anchor Bolts on p. 183 for anchorage options.
- See SET-3G™ and AT-XP® adhesive products at strongtie.com for anchor bolt retrofit options.

Codes: See p. 13 for Code Reference Key Chart



These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

Model	Dimensions (in.)			Fasteners		Stud Member Thickness mil (ga.)	ASD		LRFD		Nominal Tension Load ⁴ (lb.)	Code Ref.
	W	H	℄	Anchor Bolt Diameter ¹ (in.)	Stud Fasteners ⁵		Tension Load (lb.)	Deflection at ASD Load ³ (in.)	Tension Load (lb.)	Deflection at LRFD Load ³ (in.)		
DTT1Z	1 1/2	7 1/8	3/4	3/8	(6) #10	33 (20)	905	0.156	1,270	0.250	3,485	IBC, FL, LA
S/LTT20	2	20	1 1/2	1/2	(8) #10	33 (20)	1,200	0.125	1,890	0.250	4,625	
S/DTT2Z	1 5/8	6 15/16	1 3/16	1/2	(8) #14	33 (20)	1,570	0.138	2,200	0.250	4,265	
						43 (18)	1,685	0.151	2,355	0.250	5,570	
						2-33 (2-20)	1,735	0.153	2,430	0.250	5,735	
HTT4	2 1/2	12 3/8	1 3/8	3/8	(18) #10	33 (20)	3,180	0.104	4,770	0.187	8,215	
						2-33 (2-20)	4,395	0.125	6,675	0.250	11,835	
HTT5	2 1/2	16	1 3/8	3/8	(26) #10	43 (18)	4,150	0.125	6,425	0.250	11,585	
						2-43 (2-18)	4,670	0.125	6,970	0.250	12,195	
						1-54 (1-16)	4,150	0.125	6,425	0.250	12,365	

1. The designer shall specify the foundation anchor material type, embedment and configuration.
2. Stud design by specifier. Tabulated loads are based on a minimum stud thickness for fastener connection.
3. Deflection at ASD or LRFD includes fastener slip, holdown deformation and anchor rod elongation for holdowns installed up to 4" above top of concrete. Holdowns may be installed raised, up to 18" above top of concrete, with no load reduction provided that additional elongation of the anchor rod is accounted for. See bottom of p. 191 for installation detail.
4. The Nominal Tension Load is based on the tested average ultimate (peak) load and is provided for design in accordance with section C5 of AISI S213 that requires a tension tie to have a nominal strength to resist the lesser of the amplified seismic load or the maximum force the system can deliver.
5. It is acceptable to use the capacity listed for the thickest single member or back-to-back members for thicker stud members in the same configuration. Stud design by specifier.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.