

Strong-Drive[®]
SDWS™ **TIMBER SS** Screw



The Ultimate Stainless-Steel Structural Screw

The perfect screw where strength and premium corrosion resistance are critical.

Introducing the Strong-Drive® SDWS Timber SS heavy-duty structural fastener in severe-corrosion-resistant Type 316 stainless steel. Its heavy-duty 0.275"-diameter shank, SawTooth® point and flat washer head make the SDWS Timber SS the ideal choice for use in applications such as docks, wharfs, piers, boardwalks and ledgers where strength, ductility and premium corrosion resistance are critical.

Codes/Standards

IAPMO UES ER-192, City of Los Angeles Building Code, City of Los Angeles Residential Code, State of Florida FL13975

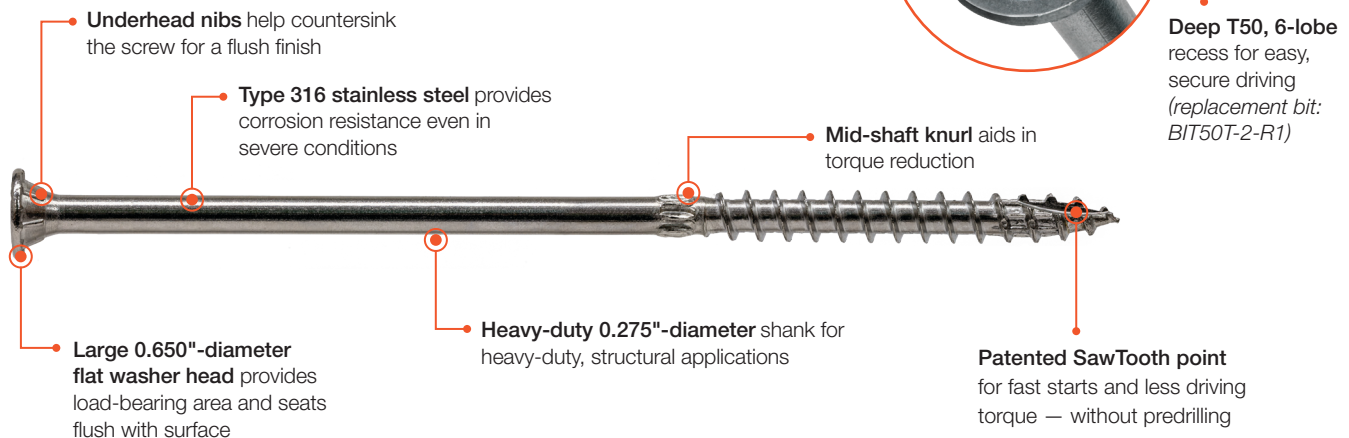
Available in 3", 4", 5", 6", 8", 10" and 12" lengths

Patented; see strongtie.com/patents



The Type 316 stainless-steel SDWS Timber SS is ideal for use in coastal environments.

Features



“We tested the 316 stainless-steel screws in the deck planks around a commercial pier hoist that soaks deck planks in salt water daily — replacing traditional galvanized spikes. They have been in place for over a year now and still look new. Typically, in a year, the galvanization on spikes is already gone and rust is present. The SDWS Timber SS install quickly, and we can use our cordless drills to install and remove as needed...We also like the ability of screw adjustment with deck plank wear down. Thank you, Simpson Strong-Tie, for dedication in development to create the best fastener possible...Great product!”

Bill Gaalswyk, Tyler Kritz, Aaron Herrera, Jake Reilly
The Heavy Construction Crew at Port San Luis Harbor District

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Why use the SDWS TIMBER SS?

... instead of spikes?

- Greater withdrawal resistance than spikes
- No pop-ups that create tripping hazards
- Removal and reinstallation without damage to boards or supports
- No extra heavy-duty equipment — power generators, compressors, hoses, cords or hole-boring drills

... instead of lags?

- Faster installation — no predrilling or counterboring needed
- Flush installation — no countersinking required
- No post treatment of boards required
- No additional washers needed
- No expensive auger drill bits

Saves Time — Saves Money

What about cost of installation?

Due to the simplicity of installing a Strong-Drive SDWS Timber SS screw, your time on the job and labor costs are reduced. The following time and cost savings were computed from an actual jobsite:



Watch how quickly the SDWS Timber SS screw can be installed compared to traditional lag screws at strongtie.com/sdwssVideo.



The SDWS Timber SS screw does not require costly predrilling.

Time Savings — Typical Installation Time per Pier Board Using Spikes vs. SDWS Timber SS Screws

Tasks Using Spikes	Hours per Board	Tasks Using SDWS Timber SS	Hours per Board
Set board	0.17	Set board	0.17
Predrill	0.25	Drive SDWS Timber SS screw	0.25
Set spike	0.25		
Drive with air hammer	0.25		
Final spike set using sledge hammer	0.25		
Total install time	1.17		0.42
Total per board SDWS Timber SS installation time savings			0.75 hours
Total time savings for a pier with 1,100 boards		= 825 hours	
		= 103 (8-hr.) work days	

... and maintenance?

Inherently, spikes tend to loosen over time due to numerous factors including corrosion and lower withdrawal resistance. As a result, to avoid tripping hazards, additional labor is required to inspect and reseal spikes that may have popped up. Studies have shown that this maintenance can occur on a weekly basis over the life of a pier or wharf. Because of the Type 316 stainless steel and greater withdrawal resistance of the SDWS Timber SS screws, these maintenance costs can be avoided.

Estimated Additional Maintenance Labor and Materials Cost (for Spikes) per Week: \$100 (2 hr. @ \$50/hr.)

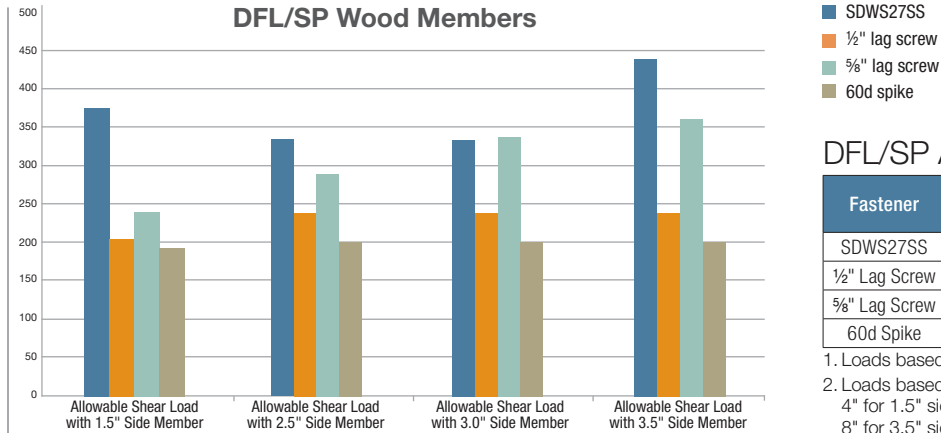
Cost over 30 years: \$156,000 (52 wks. x 30 yrs.)

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Strength in Numbers

Testing shows that Strong-Drive SDWS Timber SS screws are stronger than many alternative fastener types.

Allowable Shear Loads (lb.) for Douglas Fir–Larch, Southern Pine

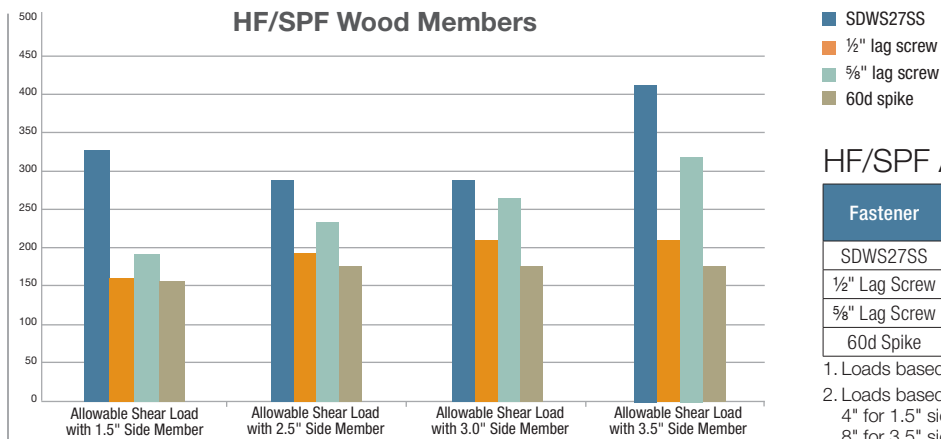


DFL/SP Allowable Shear Load (lb.)

Fastener	1.5" Side Member	2.5" Side Member	3.0" Side Member	3.5" Side Member
SDWS27SS	375	335	335	440
1/2" Lag Screw	205	235	235	235
5/8" Lag Screw	240	290	340	360
60d Spike	190	200	200	200

1. Loads based on perpendicular to grain loading.
2. Loads based on minimum fastener lengths are as follows:
4" for 1.5" side, 5" for 2.5" side, 6" for 3" side, and 8" for 3.5" side members.

Allowable Shear Loads (lb.) for Hem-Fir, Spruce-Pine-Fir



HF/SPF Allowable Shear Load (lb.)

Fastener	1.5" Side Member	2.5" Side Member	3.0" Side Member	3.5" Side Member
SDWS27SS	325	285	285	465
1/2" Lag Screw	160	195	210	210
5/8" Lag Screw	190	230	270	320
60d Spike	155	175	175	175

1. Loads based on perpendicular to grain loading.
2. Loads based on minimum fastener lengths are as follows:
4" for 1.5" side, 5" for 2.5" side, 6" for 3" side, and 8" for 3.5" side members.

Common Issues with Alternative Solutions



Spike pop-up hazard.



The effect of corrosion on HDG spikes.



More shear strength than lag screws.

General Load Information

Strong-Drive®

SDWS TIMBER SS Screw

Structural Wood and Engineered Wood Connections including Docks, Piers, Boardwalks and Ledgers

Allowable Shear Loads — Douglas Fir-Larch, Southern Pine Lumber

Fastener	Size (dia. x length) (in.)	Thread Length (in.)	DFL/SP Reference Allowable Shear Loads (lb.)								Reference Withdrawal Design Value, W (lb./in.)	Reference Withdrawal Design Value, Wmax (lb.)
			Wood Side Member Thickness (in.)									
			1.5	2.5	3	3.5	4.5	6	8	10		
SDWS27300SS	0.275 x 3	2	225	—	—	—	—	—	—	—	222	410
SDWS27400SS	0.275 x 4	3	375	225	—	—	—	—	—	—	204	410
SDWS27500SS	0.275 x 5	3	375	335	310	210	—	—	—	—	204	410
SDWS27600SS	0.275 x 6	3	375	335	335	335	210	—	—	—	204	410
SDWS27800SS	0.275 x 8	3	375	415	485	440	335	275	—	—	204	410
SDWS271000SS	0.275 x 10	3	375	415	485	440	335	275	275	—	204	410
SDWS271200SS	0.275 x 12	3	375	415	485	440	335	275	275	275	204	410

See footnotes below.

Allowable Shear Loads — Hem-Fir, Spruce-Pine-Fir Lumber

Fastener	Size (dia. x length) (in.)	Thread Length (in.)	HF/SPF Reference Allowable Shear Loads (lb.)								Reference Withdrawal Design Value, W (lb./in.)	Reference Withdrawal Design Value, Wmax (lb.)
			Wood Side Member Thickness (in.)									
			1.5	2.5	3	3.5	4.5	6	8	10		
SDWS27300SS	0.275 x 3	2	210	—	—	—	—	—	—	—	182	365
SDWS27400SS	0.275 x 4	3	325	180	—	—	—	—	—	—	200	385
SDWS27500SS	0.275 x 5	3	325	285	235	175	—	—	—	—	200	385
SDWS27600SS	0.275 x 6	3	325	285	285	285	175	—	—	—	200	385
SDWS27800SS	0.275 x 8	3	325	350	390	465	280	240	—	—	200	385
SDWS271000SS	0.275 x 10	3	325	350	390	465	280	240	240	—	200	385
SDWS271200SS	0.275 x 12	3	325	350	390	465	280	240	240	240	200	385

- All applications are based on full penetration into the main member. Full penetration is the screw length minus the side member thickness.
- Allowable loads are shown at the wood load duration factor of $C_D = 1.0$. Loads may be increased for load duration per the building code up to a $C_D = 1.6$. Tabulated values must be multiplied by all applicable adjustment factors per the NDS.
- Minimum fastener spacing requirements to achieve table loads: 6" end distance, 1 1/2" edge distance, 3/4" between staggered rows of fasteners, 4" between non-staggered rows of fasteners and 6" between fasteners in a row.
- For in-service moisture content greater than 19%, use $C_M = 0.7$.
- Loads are based on installation into the side grain of the wood with the screw axis perpendicular to the face of the member.
- The tabulated reference withdrawal design value, W, is in pounds per inch of the thread penetration into the side grain of the main member.
- The tabulated reference withdrawal design value, W_{max} , is in pounds where the entire thread length is embedded in the side grain of the main member.
- Embedded thread length is that portion held in the main member including the screw point.
- Values are based on the lesser of withdrawal from the main member or pull-through of a 1 1/2" side member.



The SDWS Timber SS screw is ideal for a variety of applications, is easy to install and requires no heavy-duty equipment.

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2018 and 2021 IRC-compliant Spacing for a Sawn Lumber Deck Ledger-to-Rim Board

Loading Condition	Nominal Ledger Size	Model No.	Band Joist Material and Size	Maximum Deck Joist Span						
				Up to 6 ft.	Up to 8 ft.	Up to 10 ft.	Up to 12 ft.	Up to 14 ft.	Up to 16 ft.	Up to 18 ft.
				Maximum On-Center Spacing of Fasteners (in.)						
40 psf Live 10 psf Dead	2x	SDWS27400SS (4")	1" OSB	13	10	8	6	6	5	4
			1" LVL							
			1 1/8" OSB							
			1 5/16" LVL	18	14	11	9	8	7	6
			1 1/4" OSB							
			1 1/2" LVL							
			1 1/4" LSL							
			1 3/4" LVL							
			2x SP, DFL, SPF, HF	18	14	11	9	8	7	6
60 psf Live 10 psf Dead	2x	SDWS27400SS (4")	1" OSB	9	7	6	5	4	3	3
			1" LVL							
			1 1/8" OSB							
			1 5/16" LVL	13	10	8	7	6	5	4
			1 1/4" OSB							
			1 1/2" LVL							
			1 1/4" LSL							
			1 3/4" LVL							
			2x SP, DFL, SPF, HF	13	10	8	7	6	5	4
40 psf Live 10 psf Dead	(2) 2x	SDWS27500SS (5")	1" OSB	15	12	9	8	7	6	5
			1" LVL							
			1 1/8" OSB							
			1 5/16" LVL	15	12	9	8	7	6	5
			1 1/4" OSB							
			1 1/2" LVL							
			1 1/4" LSL							
			1 3/4" LVL							
			2x SP, DFL, SPF, HF	15	12	9	8	7	6	5
60 psf Live 10 psf Dead	(2) 2x	SDWS27500SS (5")	1" OSB	11	8	7	6	5	4	4
			1" LVL							
			1 1/8" OSB							
			1 5/16" LVL	11	8	7	6	5	4	4
			1 1/4" OSB							
			1 1/2" LVL							
			1 1/4" LSL							
			1 3/4" LVL							
			2x SP, DFL, SPF, HF	11	8	7	6	5	4	4

- SDWS27SS screw spacing values are equivalent to 2015 IRC table R507.2. The table above also provides SDWS27SS screw spacing for a wider range of materials commonly used for rim board, and an alternate loading condition as required by some jurisdictions.
- Solid-sawn rim board shall be spruce-pine-fir, hem-fir, Douglas fir-larch, or southern pine species. Ledger shall be hem-fir, Douglas fir-larch, or southern pine species.
- Fastener spacings are based on the lesser of single fastener ICC-ES AC233 testing of the Strong-Drive SDWS27SS screw with a safety factor of 5.0 or ICC-ES AC13 assembly testing with a factor of safety of 5.0. Spacing includes NDS wet service factor adjustment.

- Rows of screws shall be vertically offset and evenly staggered. Screws shall be placed 1 1/2" to 2" from the top and bottom of the ledger or rim board with 3" minimum and 6" maximum between rows and spaced per the table. End screws shall be located 6" from the end and at 1 1/2" to 2" from the bottom of the ledger. For screws located at least 2" but less than 6" from the end, use 50% of the load per screw and 50% of the table spacing between the end screw and the adjacent screw, and for screws located between 2" and 4" from the end, predrill using a 1.8" drill.
- Structural sheathing between the ledger and rim board shall be a maximum of 1/2" thick and fastened per code.

Case Study

Project: Restoration of the Pismo Pier

Pismo Beach, California

“For more than 37 years in active professional engineering practice, I have relied on Simpson Strong-Tie products and their technical support. During the development of an innovative dock screw that has revolutionized timber pier board-to-stringer applications, working with Simpson’s technical support to hone the product’s development was a truly remarkable and rewarding experience.

Their new Strong-Drive SDWS Timber SS Type 316 stainless structural screw has allowed the attachment of timber pier decking to be done in much, much less time than with traditional spikes and lag screws. The design of the screw is stronger, more durable, and corrosion resistant. The use of the Timber SS screw is a superior alternative over conventional connections and can be expected to last the lifetime of the project.”

Bruce S. Elster, P.E., SECB
Shoreline Engineering, Inc.



Pier restoration in progress.



Newly installed pier deck boards.

Challenges

Age, weather and corrosion had taken their toll on this 60,100 sq. ft. structure. Originally built in 1924, it was rebuilt in 1985 after being damaged by heavy storms. The recent \$8.7 million overhaul involved reinforcing the pier’s infrastructure and replacing its wooden deck boards, which were badly weathered, and its hot-dip galvanized spike fasteners, which had become badly corroded.

Solution

Working with the Pismo Pier Rehabilitation project engineers, Simpson Strong-Tie developed the Type 316 stainless-steel SDWS Timber SS screw to resist the corrosive marine environment and provide excellent holding power in securing the deckboards to their supports.

Results

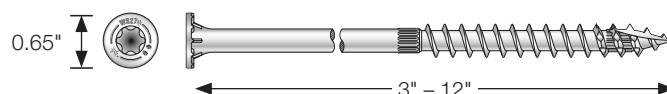
The SDWS Timber SS screw’s low cost and easy installation contributed to the pier’s completion occurring three months ahead of schedule, and saved hundreds of thousands of dollars in costs.

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T50 bit is included with clamshells, cartons and buckets.

Strong-Drive SDWS Timber SS Screw — Type 316 Stainless Steel



Length (in.)	Shank Diameter (in.)	Drive Type	Thread Length (in.)	Individually Flagged Retail Box (sold as single units)		Retail Clamshell		Carton		Bucket*	
				Fasteners per Pack	Model No.	Fasteners per Pack	Model No.	Fasteners per Pack	Model No.	Fasteners per Pack	Model No.
3	0.275	6-lobe T50	2	1	SDWS27300SS-RP1	10	SDWS27300SS-RC10	30	SDWS27300SS-R30	350	SDWS27300SS
4	0.275	6-lobe T50	3	1	SDWS27400SS-RP1	10	SDWS27400SS-RC10	30	SDWS27400SS-R30	350	SDWS27400SS
5	0.275	6-lobe T50	3	1	SDWS27500SS-RP1	10	SDWS27500SS-RC10	30	SDWS27500SS-R30	300	SDWS27500SS
6	0.275	6-lobe T50	3	1	SDWS27600SS-RP1	10	SDWS27600SS-RC10	30	SDWS27600SS-R30	300	SDWS27600SS
8	0.275	6-lobe T50	3	1	SDWS27800SS-RP1	10	SDWS27800SS-RC10	30	SDWS27800SS-R30	200	SDWS27800SS
10	0.275	6-lobe T50	3	1	SDWS271000SS-RP1	10	SDWS271000SS-RC10	30	SDWS271000SS-R30	—	—
12	0.275	6-lobe T50	3	1	SDWS271200SS-RP1	—	—	30	SDWS271200SS-R30	—	—

Flagged fasteners per master carton: 40.

Replacement bit part number: BIT50T-2-R1.

*Special order item; additional lead time required.