

Connector/Steel-to-Wood Fastening

Strong-Drive® SDS HEAVY-DUTY CONNECTOR Screw

Heavy-Duty Simpson Strong-Tie Connectors

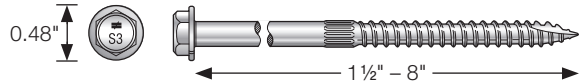
The Simpson Strong-Tie Strong-Drive SDS screw is a 1/4"-diameter high-strength structural wood screw ideal for various connector installations as well as wood-to-wood, general metal-to-wood and EWP fastening applications.

Install Tips: A low-speed 1/2" drill with a 3/8" hex driver (BITHEXR38-134) is the recommended tool for installation.

Codes/Standards: ICC-ES ESR-2236 (including City of LA Supplement); State of Florida FL9589

For more information, see p. 68, C-F-2023 Fastening Systems catalog

SDS — Allowable Shear Loads — Steel Side-Plate Applications



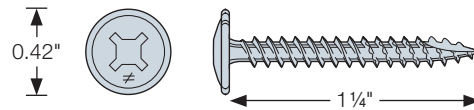
Length (in.)	Model No.	Thread Length (in.)	Fasteners per Carton	DF/SP Allowable Loads ³						SPF/HF Allowable Loads ³							
				Shear (100)					Withdrawal ⁴ (100)		Shear (100)					Withdrawal ⁴ (100)	
				Wood Side Plate ²		Steel Side Plate			Wood Side Plate	Steel Side Plate	Wood Side Plate ²		Steel Side Plate			Wood Side Plate	Steel Side Plate
				1 1/2"	1 3/4" SCL	16 ga.	14 ga. and 12 ga.	10 ga. or Greater			1 1/2"	1 3/4" SPF LVL	16 ga.	14 ga. and 12 ga.	10 ga. or Greater		
1 1/2	SDS25112	1	1,500	—	—	250	250	250	170	170	—	—	180	180	180	120	120
2	SDS25200	1 1/4	1,300	—	—	250	290	290	215	215	—	—	180	210	210	150	150
2 1/2	SDS25212	1 1/2	1,100	190	—	250	390	420	255	255	135	—	180	280	300	180	180
3	SDS25300	2	950	280	—	250	420	420	345	345	200	—	180	300	300	240	240
3 1/2	SDS25312	2 1/4	900	340	340	250	420	420	345	385	245	245	180	300	300	240	270
4 1/2	SDS25412	2 3/4	800	350	340	250	420	420	345	475	250	245	180	300	300	240	330
5	SDS25500	2 3/4	500	350	340	250	420	420	345	475	250	245	180	300	300	240	330
6	SDS25600	3 1/4	600	350	340	250	420	420	345	560	250	245	180	300	300	240	395
8	SDS25800	3 1/4	400	350	340	250	420	420	345	560	250	245	180	300	300	240	395

- Allowable loads are shown at the wood load duration factor of $C_D = 1.00$. Loads may be increased for load duration up to a $C_D = 1.60$.
- Withdrawal loads shown are in pounds (lb.) and are based on the lesser value of either head pull-through for a 1.5"-thick wood side member or withdrawal from the main member. If entire thread length is not installed into the main member, calculate withdrawal based on 172 lb./in. of thread penetration for DF/SP wood and 121 lb./in. for SPF/HF wood. Maximum withdrawal values with a steel side plate are 635 lb. for 16 ga. and 800 lb. for 14 ga. due to head pull-through.
- LSL wood-to-wood applications that require 4 1/2", 5", 6" and 8" SDS screws are limited to interior-dry use only.
- Minimum spacing requirements are listed in ICC-ES ESR-2236.

Wafer-Head Screw

General Wood-to-Wood, Metal-to-Wood Fastening

For more information, see p. 68, C-F-2023 Fastening Systems catalog



SD8 — Allowable Shear Loads — Steel Side Plate

Size x Length (in.)	Model No.	Reference Allowable Shear Loads (lb.)		Reference Allowable Withdrawal Loads (lb.)	
		Steel Side Plate Thickness in. (ga.)			
		0.054 – 0.25 (16 – 3)			
		DFL/SP	SPF/HF	DFL/SP	SPF/HF
#8 x 1 1/4	SD8x1.25	50	45	82	58

- Allowable loads are shown at the wood load duration factor of $C_D = 1.00$. Loads may be increased for load duration up to a $C_D = 1.60$.
- SD8x1.25 requires 3/4" minimum penetration into the main member.
- Do not use SD8x1.25 wood screws with structural connectors unless specified.
- Warning:** Industry studies show that hardened fasteners can experience performance problems in wet or corrosive environments. Accordingly, use this product in dry, interior, and noncorrosive environments only.

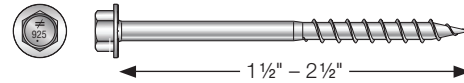
Connector/Steel-to-Wood Fastening

Strong-Drive® SD CONNECTOR and SD CONNECTOR SS Screw

Codes/Standards: ICC-ES ESR-3046 (including City of LA Supplement); State of Florida FL 9589

For more information, see pp. 69–70, C-F-2023 Fastening Systems catalog

SD/SD SS — Allowable Shear Loads — Steel/Stainless Steel Side Plate



Size x Length (in.)	Model No.	Thread Length (in.)	Reference SPF/HF Allowable Shear Loads (lb.)	
			DFL/SP	SPF/HF
#9 x 1 1/2	SD9112SS / SD9112	1.0	171	112
#9 x 2 1/2	SD9212SS / SD9212		200	112
#10 x 1 1/2	SD10112		173	138
#10 x 2 1/2	SD10212		215	165

1. Loads are given for $C_D = 1.00$ and may be increased for load duration per the building code to $C_D = 1.60$.
2. Steel/stainless steel side-plate thickness is 33 to 100 mil (20–12 ga.).

SD/SD SS — Allowable Shear Loads for Wood Connections

Size x Length (in.)	Model No.	Thread Length (in.)	Reference DFL/SP Allowable Shear Loads (lb.)			Reference SPF/HF Allowable Shear Loads (lb.)		
			Wood Side Plate Thickness (in.)			Wood Side Plate Thickness (in.)		
			1 5/32 – 1/2	2 3/32 – 3/4	1 1/2	1 5/32 – 1/2	2 1/32 – 3/4	1 1/2
#9 x 1 1/2	SD9112 / SD9112SS	1.0	105	—	—	93	—	—
#9 x 2 1/2	SD9212 / SD9212SS		118	133	130	99	94	109
#10 x 1 1/2	SD10112		127	—	—	102	—	—
#10 x 2 1/2	SD10212		147	168	152	106	126	123

SD/SD SS — Allowable Withdrawal Loads — DFL, SP, SPF, HF Lumber

Size x Length (in.)	Model No.	Thread Length (in.)	Head Diameter (in.)	Reference Withdrawal Design Value, W (lb. / in.)	
				DFL and SP Main Member	SPF and HF Main Member
#9 x 1 1/2	SD9112 / SD9112SS	1.0	0.37	173	122
#9 x 2 1/2	SD9212 / SD9212SS				
#10 x 1 1/2	SD10112			173	122
#10 x 2 1/2	SD10212				

Connector/Steel-to-Wood Fastening

Strong-Drive® SD CONNECTOR SS Screw Connector Compatibility Chart

The load-rated Strong-Drive SD Connector SS screw (SD SS) is a Type 316 stainless steel fastener designed, tested and approved for use with certain Simpson Strong-Tie stainless steel connectors. Type 316 stainless steel provides excellent protection in severe-corrosion environments.

- Shank is designed to match fastener holes in Simpson Strong-Tie connectors
- Head stamp with size for easy identification
- Packages include a ¼" hex driver bit
- Available in #9 x 1½", #9 x 2½"

Simpson Strong-Tie Stainless-Steel Connectors for SD Connector SS Screws

The following tables list stainless steel Simpson Strong-Tie Connector models, the approved Type 316 stainless steel Strong-Drive SD Connector SS screw sizes, and the quantity required. Simpson Strong-Tie is constantly testing and updating this information. See strongtie.com/ssconnectorfastening for updated information.



Connector/Steel-to-Wood Fastening

Strong-Drive® SD CONNECTOR SS Screw
Connector Compatibility Chart (cont.)

Connector Model No.	Description	SD Connector SS Quantity Needed	
		#9 x 1½" ¹ (SD9112SS)	#9 x 2½" (SD9212SS)
LUC26SS	For 2x6, 2x8 joist	10	—
LUC210SS	For 2x10, 2x12 joist	16	—
LUS26SS	For 2x6, 2x8 joist	4	4
LUS28SS	For 2x8, 2x10 joist	6	4
LUS210SS	For 2x10, 2x12, 2x14 joist	8	4
LUS26-2SS	For Double 2x6, 2x8 joist	4	4
LUS28-2SS	For Double 2x8, 2x10 joist	6	4
LUS210-2SS	For Double 2x10, 2x12 joist	8	6
HUC28-2SS ¹	For Double 2x8	—	20
HUC210-2SS ¹	For Double 2x10	—	28
SUL26SS ¹	Skewed 45° left for 2x6, 2x8 joist	6	6
SUR26SS ¹	Skewed 45° right for 2x6, 2x8 joist	6	6
SUL210SS ¹	Skewed 45° left for 2x10, 2x12 joist	10	10
SUR210SS ¹	Skewed 45° right for 2x10, 2x12 joist	10	10
LCE4SS ¹	For 4x or 6x post	24	—
AC4SS ¹	For 4x beam, 4x post	28	—
AC6SS ¹	For 6x beam, 6x post	28	—
BC4SS ¹	For 4x beam, 4x post	—	12
BC6SS ¹	For 6x beam, 6x post	—	24
BCS2-2/4SS	For Double 2x beam to 4x post	—	14
BCS2-3/6SS ¹	For Triple 2x beam to 6x post	—	18
BC40SS ¹	For 4x beam	10	—

Connector Model No.	Description	SD Connector SS Quantity Needed	
		#9 x 1½" ¹ (SD9112SS)	#9 x 2½" (SD9212SS)
ABU44SS ¹	For 4x4 post	12	—
ABU46SS ¹	For 4x6 post	12	—
ABU66SS ¹	For 6x6 post	12	—
ABU88SS ¹	For 8x8 post	18	—
H2ASS	For rafter/truss-to-wall stud	10	—
H2.5ASS	For rafter/truss-to-wall plate	10	—
H3SS	For single plate	8	—
H8SS	For rafter/truss-to-wall plate	10	—
H10ASS	For rafter/truss-to-wall plate	18	—
A34SS	Multi-purpose angle	8	—
A35SS	Multi-purpose angle	12	—
L50SS	Skewable angle	6	—
LTS12SS ²	Light twist strap	12	—
LTS18SS ²	Light twist strap	12	—
MTS12SS ²	Light twist strap	14	—
MTS20SS ²	Light twist strap	14	—
CS16SS	Coil strap	22	—
MSTA12SS	Straight strap	10	—
MSTA18SS	Straight strap	14	—
MSTA24SS	Straight strap	18	—
MSTA36SS	Straight strap	26	—
LSCSS	Stair stringer	17	—

1. Products with superscript 1 have published allowable loads based on installation with #10 SD screws. Multiply allowable loads by 0.83 to obtain allowable loads for #9 SD SS screws.

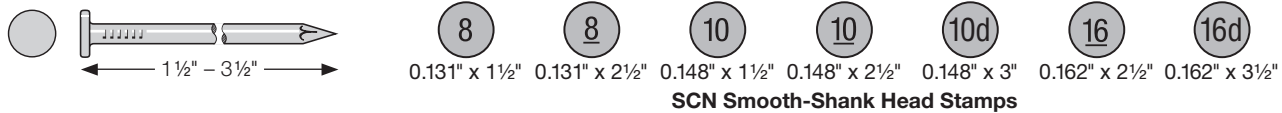
2. LTS/MTS straps installed with #9 x 1½" SD SS screws match allowable loads for installations with 0.148" x 3" nails.

Connector/Steel-to-Wood Fastening

Strong-Drive® SCN SMOOTH-SHANK CONNECTOR Nail

Simpson Strong-Tie® Connectors

For more information, see pp. 132 and 148, C-F-2023 Fastening Systems catalog



Simpson Strong-Tie connectors have been designed and tested with specific types of nails, which are generally referred to as Structural Connector Nails (SCN). The specified nail size, type and quantity must be installed in the correct holes of the connector or strap to achieve the published loads for the hardware. The dimensions and bending yield strength characteristics needed for nails used in Simpson Strong-Tie connectors and hardware are given in the table below. The designer and installer must be sure that the correct fastener is specified and installed. In cases where the installed nail matches the criteria of the nail specified for the hardware, full hardware design values result.

SCN Smooth-Shank Connector Nails and Common Nails Approved for Use with Simpson Strong-Tie Connectors^{1,2,3}

Length (in.)	Fastener	Head Style	Head Diameter (in.)	Minimum Bending Yield Strength (psi) ^{4,6}
0.131 x 1 1/2	N8	Round	0.281	100,000
0.131 x 2 1/2	8d common	Round	0.281	100,000
0.148 x 1 1/2	N10	Round	0.281	90,000
0.148 x 2 1/2	N10D	Round	0.281	90,000
0.148 x 3	10d common	Round	0.281 ⁵	90,000
0.162 x 2 1/2	N16	Round	0.281	90,000
0.162 x 3 1/2	16d common	Round	0.281 ⁵	90,000

1. Tolerance on diameter and length per ASTM F1667.
2. Tolerance on head diameter (± 0.0015 in.)
3. All dimensions are prior to coating.
4. Tested in accordance with ASTM F1575.
5. Minimum head diameter shown; actual head diameters on 10d and 16d common nails are larger.
6. Minimum bending yield strengths applicable to SCNR nails of the same diameter.

Power-driven SCNs are often used to install Simpson Strong-Tie connectors and straps. Power-driven nails must have the same dimensions and bending yield strength as hand-driven nails. Dedicated power nailers are designed to drive nails of specific lengths that may be less than the length required to achieve full design values for the connector or strap hardware. When connectors and straps are installed with power-driven nails or hand-driven nails that are a different type or size than those called out in the connector and strap specifications, adjustment factors as given on strongtie.com must be applied to the allowable loads for the connector or strap.

Overdriven Nails in Connectors and Straps

A nail that is installed such that the head deforms the steel of the connector or strap is considered overdriven. Extra care to prevent overdriven nails should be taken when installing power-driven nails. Simpson Strong-Tie has evaluated the effect of overdriven nails in connectors and straps. No load reductions for connectors or straps apply as a result of overdriven nails if all of the following conditions are met:

- Connectors and straps are 14-, 16-, or 18-gauge steel.
- The top of the nail head is not driven past flush with the face of the metal hardware.
- The nail goes through an existing fastener hole without enlarging it.
- The steel around the hole is not torn or damaged other than denting caused by the nail head.

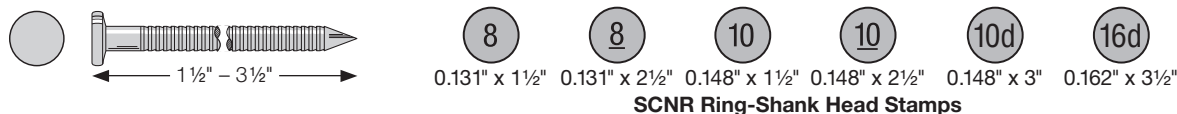
Connector/Steel-to-Wood Fastening

Strong-Drive® SCNR RING-SHANK CONNECTOR Nail

Simpson Strong-Tie Connectors

Strong Drive® SCNR Ring-Shank Connector nails are the best choice for achieving maximum load values in stainless-steel connectors.

For more information, see pp. 133 and 149, C-F-2023 *Fastening Systems* catalog



When installing galvanized connectors and straps, use an SCN that is zinc galvanized. If the connectors and straps are stainless steel, then stainless-steel SCNRs shall be used.

Stainless-Steel Nails

The USDA Forest Service, Forest Products Laboratory showed that stainless-steel nails with smooth shanks do not have the same withdrawal resistance as smooth-shank carbon steel nails (Withdrawal strength and bending yield strength of stainless-steel nails, 2015, *Journal of Structural Engineering*). In addition, Simpson Strong-Tie conducted an extensive series of withdrawal testing with stainless-steel nails made from Type 304, Type 305 and Type 316 stainless steels to assess the stainless-steel ring-shank nail withdrawal performance over a wide range of nail diameters (0.072 in. to 0.238 in.) and wood specific gravities (0.42 to 0.55). The withdrawal tests were conducted in accordance with ASTM D1761 using wood conditioned to 12-percent moisture content. Further, the reference allowable withdrawal resistance for each of the tested nails was calculated using the withdrawal calculation for post-frame ring-shank nails in NDS-12, equation 11.2-4 (NDS-15, equation 12.2-4), NDS-2015, equation 12.2-4 and NDS-2018, equation 12.4-5,

$$W = 1800 G^2 D$$

The allowable withdrawal loads for Simpson Strong-Tie stainless-steel ring-shank nails with a safety factor of 5.0 were at or above the calculated reference withdrawal resistance for deformed-shank nails. As a result, the deformed-shank nails equation for reference withdrawal design values can be safely used for Simpson Strong-Tie stainless-steel ring-shank nails of all diameters across the specific gravity range of 0.42 to 0.55. This finding and recommendation are specific to Simpson Strong-Tie stainless-steel ring-shank nails and shall not be applied to stainless-steel ring-shank nails made by other manufacturers.

The bending yield strength of Simpson Strong-Tie stainless-steel nails (smooth and ring-shank) meet the bending yield strength specifications of ASTM F1667, which are the same as those in the IBC and IRC.

Stainless Steel Nails for Connectors

Simpson Strong-Tie stainless-steel connectors are required to be installed using stainless-steel fasteners. Recent testing at Simpson Strong-Tie indicates that allowable load values for some Simpson Strong-Tie stainless-steel connectors have changed when smooth-shank stainless steel nails are used. Refer to strongtie.com/products/categories/zmax.html for a list of connectors available in stainless steel, which includes links to load tables for carbon steel and stainless-steel smooth-shank nail installations as applicable.

In cases where these load tables indicate stainless-steel smooth-shank nail installations have reduced loads, full allowable loads listed for the same carbon steel connector may be achieved if the stainless-steel connector is installed with the correct replacement stainless-steel Simpson Strong-Tie Strong Drive SCNR Ring-Shank Connector nails as shown in the following Nail Substitution Chart.

Nail Substitution Chart Replacement Ring-Shank Stainless-Steel Nails, Type 316 Stainless Steel

Catalog-Specified Carbon-Steel Smooth-Shank Nail	Replacement Stainless-Steel Strong-Drive SCNR Ring-Shank Connector Nail	
	Hand-Drive	Collated
Length (in.)		
0.131 x 1.5	SSNA8	T10A150MCN
0.131 x 2.5	SSA8D	T10A250MCN
0.148 x 1.5	SSNA10	T9A150MCN
0.148 x 2.5	—	T9A250MCN
0.148 x 3.0	SSA10D	—
0.162 x 3.5	SSA16D	—

1. Collated nails listed are available in 33° paper tape strips.

Connector/Steel-to-Wood Fastening

Outdoor Accents® Structural Wood Screw

(Strong-Drive® SDWS TIMBER Screw)

Structural Wood-to-Wood Connections for Outdoor Accents Decorative Hardware

Designed to provide an easier and significantly faster installation time compared to through-bolting. When used with the patented hex-head washer (which is code report listed in IAPMO UES ER-192), it provides a structural, decorative solution for Outdoor Accent products.

Black exterior coatings provide corrosion resistance equivalent to hot-dip galvanization (ASTM A153, Class D), making them suitable for certain exterior and preservative-treated wood applications.



SDWS22312DBB with STN22 Hex-Head Washer

Patented, see strongtie.com/patents for the most current list.

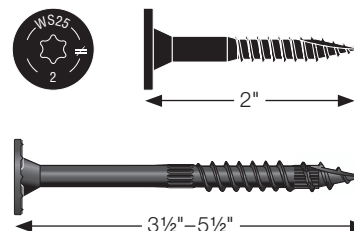
Features:

- New patented SawTooth® point on the 3½" and 5½" lengths ensures fast starts, reduces installation torque and eliminates the need for predrilling in most applications
- Deep 6-lobe T40 recess for secure and easy driving
- Underhead nibs offer greater control when seating the head

Codes/Standards: IAPMO UES ER-192 (including City of LA Supplement), State of Florida FL13975
US Patent: 9,523,383

For more information, see pp. 64–66, C-F-2023 Fastening Systems catalog

The SDWS22312DBB, SDWS22512DBB and the SDWS25200DBB can be used in conjunction with the STN22 hex-head washer. When installing SDWS22312DBB and SDWS22512DBB, the STN22 can be placed onto wood or steel side plate, and SDWS25200DBB can be placed onto steel side plate member prior to screw installation.



SDWS Outdoor Accents Structural Wood Screw with STN22 Hex-Head Washer — Wood to Wood/Steel

Model No.	Thread Length (in.)	Reference Allowable Shear Loads (lb.)					
		2x Wood Side Member			12-ga. Steel Side Member		
		DFL/SP	SPF/HF	Western Cedar	DFL/SP	SPF/HF	Western Cedar
SDWS22312DBB with STN22	2	235	192	179	470	385	320
SDWS22512DBB with STN22	3	465	430	395	640	495	425
SDWS25200DBB with STN22	1¼	—	—	—	210	170	—

See footnotes below.

SDWS Outdoor Accents Structural Wood Screw — Wood to Wood

Model No.	Thread Length (in.)	Reference Allowable Shear Loads (lb.)			Reference Allowable Withdrawal Loads (lb./in.)		
		2x Wood Side Member			DFL/SP	SPF/HF	Western Cedar
		DFL/SP	SPF/HF	Western Cedar			
SDWS22312DBB	2	255	190	225	164	151	142
SDWS22512DBB	3	405	405	230	214	187	142
SDWS25200DBB	1¼	—	—	—	172	103	—

1. Allowable loads are for connections between two members with full thread penetration into the main member.
2. 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 $C_D = 1.60$. Tabulated values must be multiplied by all applicable adjustment factors per the NDS.
3. Minimum spacing, edge and end distance requirements are per IAPMO UES ER-192.
4. Loads are based on installation into the side grain of the wood with the screw axis perpendicular to the face of the member.
5. "—" indicates conditions not tested.

Connector/Steel-to-Wood Fastening

Outdoor Accents® Connector Screw

(Strong-Drive® SD CONNECTOR Screw)

Structural Wood-to-Wood Connections for Outdoor Accents Decorative Hardware

The Outdoor Accents Connector Screw reduces installation time by driving easily without predrilling. Designed for installation with the Outdoor Accents APA21 90°-angle, APLH light joist hangers, APRT Rigid Tie® connectors and APGT gazebo ties, the screw's black finish accents any outdoor living project.

Double-barrier black coating provides corrosion resistance equivalent to hot-dip galvanization (ASTM A153, Class D), making it suitable for certain exterior and preservative-treated wood applications.

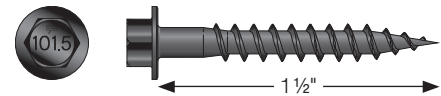
Features:

- Tested and approved for use in many of our best-selling connectors for both interior and most exterior applications
- The single-fastener steel-side-plate load capacity of the SD10 exceeds the capacity of a 16d common nail
- Optimized heat-treating for ductility and strength
- ¼" hex drive bit included
- Head identification for easy inspection

Codes/Standards: ICC-ES ESR-3046 (including City of LA Supplement); State of Florida FL 9589

For more information, see p. 67, C-F-2023 Fastening Systems catalog

For more information on Outdoor Accents connector products, please see the Wood Construction Connectors catalog, C-C-2021.



Outdoor Accents Connector Screw

Size x Length (in.)	Model No.	Thread Length (in.)	Reference DFL/SP Allowable Loads		Reference SPF/HF Allowable Loads	
			Shear Steel Side Plate 20 ga. – 12 ga. (lb.)	Withdrawal (lb./in.)	Shear Steel Side Plate 20 ga. – 12 ga. (lb.)	Withdrawal (lb./in.)
#10 x 1½	SD10112DBB	1	173	173	138	122

1. Withdrawal loads and steel-side-plate shear loads are based on testing per AC233.
2. Allowable loads are shown at the wood load duration factor of $C_D = 1.00$. Loads may be increased for load duration per the building code up to a $C_D = 1.60$.
3. Withdrawal loads are in lb./in. of thread penetration into the side grain of the main member.
4. Visit strongtie.com for wood-to-wood shear values and wood-side-plate details.

