

# STRONG-DRIVE® SDS SCREW For Deck Ledgers



## Code-Equivalent Fastening Solution for Deck Ledger-to-Band Joist Connections

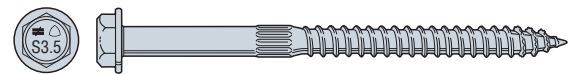
Correct ledger attachment is crucial when building a deck that is attached to another structure, such as a house. Separation of the ledger from the primary structure is one of the most common causes of complete deck failure.

### Simpson Strong-Tie® Strong-Drive® SDS Screw

The Simpson Strong-Tie® Strong-Drive® SDS screw is a versatile 1/4"-diameter structural wood screw that can be used to easily install deck ledgers to band joists and meet the requirements of the building codes.

Features of the patented SDS screw include:

- Faster and easier to install than bolts or lag screws
- No pre-drilling required due to straight knurl/reamer features
- Only ledger fastener with solutions provided for various engineered wood product band joist materials
- Equivalent alternate to 2009 IRC Table R502.2.2.1 for ledger applications provided on page 2
- Code report: ICC-ES ESR-2236
- Available with a double-barrier coating (*corrosion resistance equivalent to hot-dip galvanized finish*) or in Type 316 stainless steel
- 3/8" Hex washer head is stamped with the Simpson Strong-Tie® "No-Equal" ≠ sign and fastener length for easy identification after installation. Additional washers not required.



Identification stamped on all SDS screw heads

### Product Information and Allowable Shear Loads

Model No.	Finish/Material	Screw Length (in)	Thread Length (in)	Quantity		Shear (100) <sup>3</sup>	
				Master Carton	Pack	1 1/2" Wood Side Plate <sup>2</sup>	
						DF/SP <sup>1</sup>	SPF/HF
SDS25312	Double-Barrier Coating	3 1/2	2 1/4	10	25	340	245
SDS25312SS	Type 316 Stainless Steel	3 1/2	2 1/4	10	25	340	245
SDS25500	Double-Barrier Coating	5	2 3/4	6	25	350	250

1. Allowable loads for the SDS screws are based on ICC-ES ESR-2236 evaluation report.
2. All allowable shear loads assume a minimum main member thickness of the screw length minus the side member thickness.
3. Loads reflect a load duration factor of  $C_D = 1.00$  and may be increased up to a  $C_D = 1.60$ .

### Corrosion Information:

The double-barrier-coated SDS screw is suitable for outdoor and some preservative-treated wood applications. The stainless-steel SDS screw is suitable for higher-exposure environments where maximum corrosion resistance is required. Several examples of more corrosive environments include exposure to ocean-salt air, large bodies of water, some preservative-treated woods, and other chloride environments such as the use of de-icing salts. For more information on corrosion and guidelines for selecting the appropriate finish, visit [www.strongtie.com/corrosion](http://www.strongtie.com/corrosion).

# CODE-EQUIVALENT DECK LEDGER-TO-BAND JOIST CONNECTIONS

## Code Requirements

✓ Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal.

IRC 2009

Section R502.2.2

✓ Attachment of a deck ledger to a nominal 2x lumber band joist is permitted in accordance with Table R502.2.2.1 for decks supporting a 40 psf live load and 10 psf dead load.

IRC 2009

Section R502.2.2.1

✓ Deck ledger connections not conforming to Table R502.2.2.1 shall be designed in accordance with accepted engineering practice. Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck ledgers shall not be supported on stone or masonry veneer.

IRC 2009

Section R502.2.2.2

\* **Note:** This flier addresses deck ledger connections only. For a complete overview of all code-required deck connections, including critical lateral load attachment to the structure, see our Deck Framing Connection Guide. Table R502.2.2.1 in the 2009 IRC was developed using shear design values for lag screws and through bolts that were derived from application testing. Application testing consisted of fastening a ledger over wood structural panel sheathing into a band joist. The tested shear design values are significantly higher than values calculated by the NDS. When using alternate fasteners to replace those prescribed in IRC Table R502.2.2.1, it is important to space them to support the design loads on the deck and not space them to provide equivalence to calculated NDS lateral design values. See "Comparison of Shear Performance of Common 2x Ledger Fasteners" chart.

The 2009 International Residential Code® (2009 IRC) provides prescriptive fastener spacing for the attachment of a deck ledger to a band joist with ½" diameter lag screws or through bolts. The 2009 IRC Table R502.2.2.1 applies to 2-inch nominal solid-sawn lumber or minimum 1x9½" DF LVL band joist material, and 40 psf live load/10 psf dead load applications. Other conditions are to be designed according to accepted engineering practice.\*

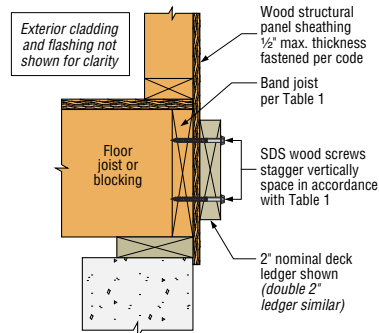
Table 1 SDS screw spacing values (below) are equivalent to 2009 IRC Table R502.2.2.1, based on testing of the Strong-Drive® SDS screw with a factor of safety of 5.0. Table 1 also provides SDS screw spacing for a wider range of materials commonly used for band joists, and an alternate loading condition as required by some jurisdictions.

**Table 1 – SDS Screw Spacing for a Sawn Lumber Deck Ledger to Band Joist**

Loading Condition	Ledger Nominal Size (in.)	SDS Screw Length (in.)	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	3½	2" Nominal Sawn Lumber	13"	10"	8"	6"	5"	5"	4"
	2-2x <sup>s</sup>	5		12"	9"	7"	6"	5"	4"	4"
	2x	3½	1½" Min. Oriented Strand Board (OSB) Rim Board or 1¼" Min. Structural Composite Lumber	15"	11"	9"	7"	6"	5"	5"
60 psf Live 10 psf Dead	2x	3½	2" Nominal Sawn Lumber	9"	7"	5"	4"	4"	3"	3"
	2-2x <sup>s</sup>	5		8"	6"	5"	4"	3"	3"	2"
	2x	3½	1½" Min. Oriented Strand Board (OSB) Rim Board or 1¼" Min. Structural Composite Lumber	10"	8"	6"	5"	4"	4"	3"

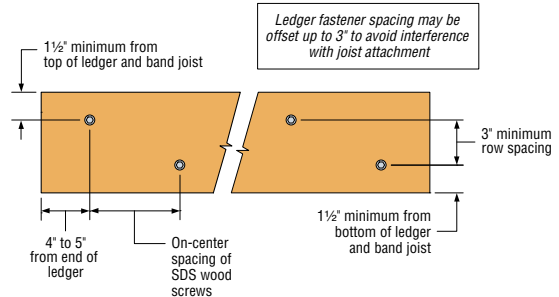
1. Solid-sawn band joists shall be Spruce-Pine-Fir, Hem-Fir, Douglas Fir-Larch, or Southern Pine species. Ledger shall be Hem-Fir, Douglas Fir-Larch, or Southern Pine species.

2. Fastener spacings are based on single fastener testing of the Strong-Drive® SDS screw with a safety factor of 5.0 and include NDS wet service adjustment factor.  
3. Multiple ledger plies shall be fastened together per code independent of the SDS screws.



**Ledger-to-Band Joist Assembly**

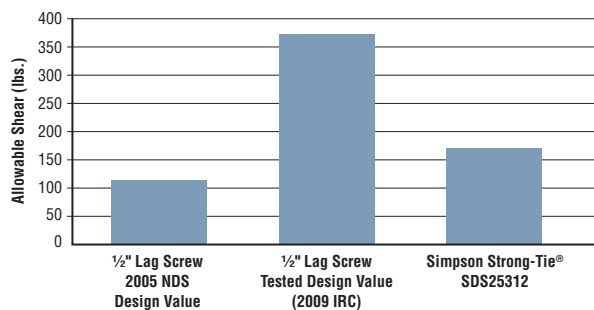
(Wood-framed lower floor acceptable, concrete wall shown for illustration purposes)



**SDS Screw Spacing Detail**

## Comparison of Shear Performance of Common 2x Ledger Fasteners Spruce-Pine-Fir Lumber – Perpendicular to Grain Loading

The figure below compares the NDS lag screw value, the tested lag screw value used in the 2009 IRC (source: 2009 IRC spacing values) and the Simpson Strong-Tie® SDS Screw.



1. ½" Lag screw shear design value based on Z perp per 2005 NDS. Minimum main member penetration = 2" (4D).
2. ½" Lag screw shear tested design value based on engineering calculation of IRC Table R502.2.2.1.
3. SDS screw value based on Simpson Strong-Tie® Wood Construction Connectors catalog, page 20 and verified per application testing.
4. Assumption: Spruce-Pine-Fir lumber with perpendicular to grain loading in wet service.

This flier is effective until June 30, 2012, and reflects information available as of March 1, 2010. This information is updated periodically and should not be relied upon after June 30, 2012; contact Simpson Strong-Tie for current information and limited warranty or see [www.strongtie.com](http://www.strongtie.com).