

## Subfloor and Sheathing Fastening

### Strong-Drive® WSV SUBFLOOR Screw

For more information, see p. 229, C-F-2023 *Fastening Systems* catalog

#### 1 3/4"–3" WSV Fasteners Meet Code Requirements

As listed in ICC-ES ESR-1472, WSV screws meet code requirements for the 2021 and 2018 International Building Code (IBC) and International Residential Code (IRC). Evaluation report recognized uses of WSV screws include the following applications:

- Substitute for 8d and 10d common nails in horizontal diaphragms per AWC SDPWS 2021 and 2015 Tables 4.2A, 4.2B and 4.2C.
- Single, diagonally-sheathed lumber diaphragms per AWC SDPWS 2021 and 2015, Table 4.2D.
- Select code prescribed framing and sheathing connections per 2021 IBC Table 2304.10.2 and 2018/2015 IBC Table 2304.10.1.
- Select code prescribed sheathing connections per 2021/2018/2015 IRC Table R602.3(1) and in structures regulated by the IRC where the engineered design is submitted in accordance with IRC R301.1.3.

#### Guidelines for Fastening Diaphragms Without Glue

The design of wood floor systems constructed with wood structural panel (WSP) sheathing fastened to framing considers the diaphragm performance of the system as presented in the codes (as affected by framing, sheathing thickness, sheathing layout and fastening) and may also consider the composite action of the sheathing with the framing system for bending performance (composite action is the combined stiffness of the joist with the sheathing in bending). The framing systems can be grouped into two classes: (1) sawn lumber and parallel-chord wood trusses, and (2) wood I-joists. WSV screws may be used as alternate fasteners to common nails in each floor class subject to certain constraints.

#### For Diaphragms with a Framing System That Is Sawn Lumber or Parallel-Chord Wood Trusses

Simpson Strong-Tie WSV screws may be used as one-for-one substitutes for 10d common and smaller nails that are specified for horizontal diaphragm design in accordance with the AWC SDPWS 2021 and 2018, and IBC and IRC 2021/2018.



#### For Diaphragms with Wood I-Joist Framing Systems

I-joist manufacturers use the extra stiffness resulting from composite action when developing allowable floor joist span tables. Therefore, I-joist floor span tables generally assume glued-nailed construction.

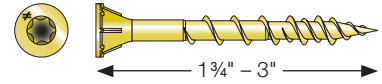
1. For floor systems designed or intended to be glued-nailed:
  - WSV screws may be substituted one-for-one for common nails, without glue, provided the maximum allowable I-joist span is reduced by 12" compared to the I-joist manufacturer's glued-nailed spans. The screws shall have at least 1 1/4" penetration into the I-joist flange (or full penetration for flanges less than 1 1/4" thick).
  - Where glue is used with the screws, no reduction in span is required.
  - Check with the I-joist manufacturer for any additional diaphragm and framing requirements.
2. For floor systems designed or intended to be nailed-only:
  - WSV screws may be substituted one-for-one for common nails, with no reduction in span, provided at least 1 1/4" penetration into the I-joist flange is achieved (or full penetration for flanges less than 1 1/4" thick).
  - Check with the I-joist manufacturer for any additional diaphragm and framing requirements.

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## Strong-Drive® WSV SUBFLOOR Screw (cont.)

Codes/Standards: ICC-ES ESR-1472 (including City of LA Supplement)

For more information, see p. 229, C-F-2023 Fastening Systems catalog



### WSV Subfloor Screw — Allowable Lateral Loads for DFL/SP and SPF/HF

Size x Length (in.)	Model No.	Thread Length (in.)	Side Member Thickness (in.)	Reference Allowable Lateral Load (lb.)	
				0.42 ≤ G < 0.50	0.50 ≤ G
#9 x 2½	WSV212, WSVF212	1.95	1½	72	92
#9 x 3	WSV300, WSVF300	2.17		87	102

- Table values are based on attachment of a 1½" side member to a 1½" main member of the same species and grade.
- Table values are based on the 2018 NDS,  $C_D = 1.0$ . Values shall be multiplied by all applicable factors, such as duration of load, etc., except where noted.
- Specific Gravities (G) assumed: DFL G = 0.50, SP G = 0.55, SPF G = 0.42.
- The spacing of applied uniform loads to a multi-ply member shall not exceed 24" on center.
- For minimum fastener spacing requirements for both side and main members, see the Spacing Requirements Figure and Table on next page.

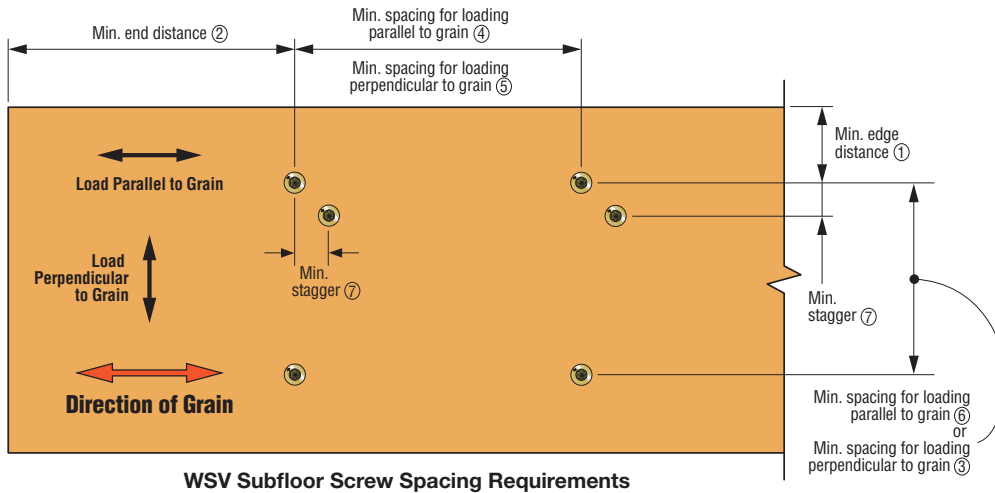
### WSV Subfloor Screw — Allowable Pull-Through and Withdrawal Loads

Size x Length (in.)	Model No.	Thread Length (in.)	Reference Allowable Pull-Through Loads (lb.)						Reference Allowable Withdrawal Loads (lb.)			
			Minimum Nominal Panel Thickness (in.)				Minimum Thickness (in.)		DFL/SP (lb./in.) W	DFL/SP (lb.) $W_{max}$	SPF/HF (lb./in.) W	SPF/HF (lb.) $W_{max}$
			OSB/Plywood Rated Sheathing, Exposure 1				DFL/SP	SPF/HF				
			7/16	15/32	19/32	23/32	1½	1½				
#9 x 1¾	WSV134	1.20	66	66	96	109	195	141	123	147	98	117
#9 x 2	WSV200	1.45							128	185	99	144
#9 x 2½	WSV212	1.95							128	256	117	233
#9 x 3	WSV300	2.17							141	311	121	266

- Use the lower of the pull-through or withdrawal values to determine axial design value.
- Screws must be installed normal to the side grain of the wood main member with the screw axis at a 90° angle to the wood fibers.
- The main framing member must be wood having a minimum specific gravity of 0.50 for DFL and SP main members, and 0.42 for SPF and HF main members. DFL is Douglas Fir-Larch. SP is Southern Pine. SPF is Spruce-Pine-Fir. HF is Hem-Fir.
- Withdrawal values, W, are in pounds per inch of the thread penetration in to the main member.  $W_{max}$  is the maximum reference withdrawal value.
- Allowable loads are shown at the wood load duration factor of  $C_D = 1.0$ . Loads may be increased for load duration up to  $C_D = 1.6$ .

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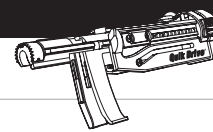
## Strong-Drive® WSV SUBFLOOR Screw (cont.)



### WSV Subfloor Screw Spacing Requirements

Condition	Direction of Load to Grain	ID	Minimum Distance or Spacing (in.)	
			G < 0.50	G ≥ 0.50
Edge Distance	Perpendicular	①	1½	1½
	Parallel	①	1	1½
End Distance	Perpendicular	②	2	2¾
	Parallel	②	2¾	3
Spacing Between Fasteners in a Row	Perpendicular	③	1	1½
	Parallel	④	2¾	2¾
Spacing Between Rows of Fasteners	Perpendicular	⑤	2	2
	Parallel	⑥	1	1½
Spacing Between Staggered Rows	Perpendicular or Parallel	⑦	½	¾

1. For axial loading only, use the following minimum dimensions: end distance = 1⅞", edge distance = ¾", spacing parallel to grain = 1⅞", spacing perpendicular to grain = ¾".



# Collated Interior Screws

## Strong-Drive® WSV SUBFLOOR Screw

Subfloor and Sheathing Projects

Now available in 1¾", 2", 2½" and 3" lengths. 2" WSV Subfloor screws are recommended for Advantech® flooring and sheathing products.

Simpson Strong-Tie has re-engineered its popular subfloor screw to reduce driving force and increase installation speed. The premium quality Strong-Drive WSV Subfloor screw has been developed for fastening subfloor sheathing using the Quik Drive® auto-feed screw driving system.

The Strong-Drive WSV Subfloor screw is the only fastener to be dual-evaluated under ICC-ES AC233 and AC120 for wood-frame subfloor fastening.

Fastening with WSV Subfloor screws provides excellent holding power, and combining the WSV Subfloor screw with adhesives can provide the ultimate subfloor solution.

This testing indicates that the WSV Subfloor screws have lateral, shear and withdrawal values that exceed those of 10d common nails, and diaphragms built with WSV Subfloor screws meet or exceed the strength and stiffness of wood frame diaphragms built with 10d nails.

### Features:

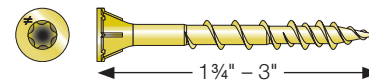
- Redesigned tip and thread pattern provides easy starts and up to 25% less torque while driving<sup>1</sup> — makes for up to 20% faster driving<sup>2</sup>
- Less installation torque also means less wear on tools and more screws driven per battery charge
- Deep 6-lobe recessed ribbed head provides clean countersinking and more secure bit retention for fewer cam-outs
- The holding power of WSV screws reduces the gaps between the joist and subfloor that cause floor squeaks
- WSV screws can be easily backed out allowing for future access to floor cavities
- 6-lobe T25 drive bit (replacement bit BITTX25; see p. 209 for more information)

1. Test data shows the Strong-Drive WSV Subfloor screw requires up to 25% less driving torque in single-material LVL.

2. Test data indicates this redesigned WSV thread pattern will result in 20% faster screw installations.

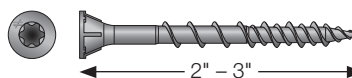
**Codes/Standards:** WSV — ICC-ES ESR 1472 (including City of LA Supplement)

**For Technical Data and Loads,** see C-F-2023TECHSUP Fastening Systems Technical Guide, pp. 122–124, 136–137



### Yellow Zinc Coating

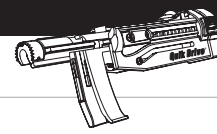
Size	Length (in.)	Retail Pack		Contractor Pack		PRO200S	PRO250G2	PRO300S
		Fasteners per Pack	Model No.	Fasteners per Pack	Model No.			
#9	1¾	1,000	HCKWSV134S	2,000	WSV134S	✓	✓	
#9	2	1,000	HCKWSV2S	2,000	WSV2S	✓	✓	✓
#9	2½	750	HCKWSV212S	1,500	WSV212S		✓	✓
#9	3	500	HCKWSV3S	1,000	WSV3S			✓



### Quik Guard Coating

Size	Length (in.)	Contractor Pack	Model No.	PRO200S	PRO250G2	PRO300S
#9	2	2,000	WSVF2S	✓	✓	✓
#9	2½	1,500	WSVF212S		✓	✓
#9	3	1,000	WSVF3S			✓

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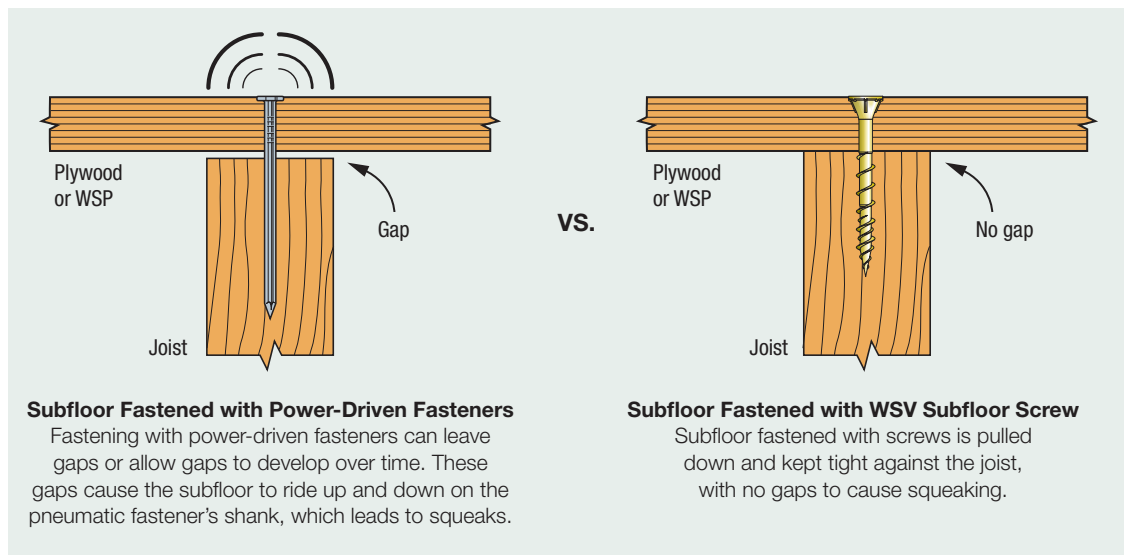


## Strong-Drive® WSVF Subfloor Screw Variant

The Strong-Drive WSVF Subfloor screw is an available variant with a gray Quik Guard® coating that is recognized for corrosion resistance in IAPMO UES ER-192 for Exposures 1 and 3 as described in ICC-ES AC257. Like the WSV Subfloor screw, the WSVF Subfloor screws are designed for dry service applications. The coating system on the WSVF screws will provide corrosion resistance for use with wood and wood-based materials in dry service where the wood and wood-based materials have treatment retentions typical of AWPA Use Categories 1 to 4A and fire-retardant-treated wood and wood-based materials that are recognized in an evaluation report where corrosion effects of the fire-retardant chemical are referenced to code prescribed protection systems for carbon steel fasteners.

## “Hear” the Difference over Time

Squeaking of newly installed floors can result in expensive (travel, labor, materials) callbacks and possibly a damaged reputation. Fastening subflooring with WSV Subfloor screws rather than power-driven fasteners provides the power necessary to pull together joists and plywood (or WSP sheathing), eliminating any gaps, holding the materials firm and therefore reducing squeaks.



## “See” the Difference on the Jobsite

The WSV Subfloor screw gives visual confirmation of a secure joist connection by countersinking, while “shot-in” power-driven fasteners look the same whether or not they hit the joist. Missed fasteners could result in floor flexing that can cause squeaking in other parts of the structure and reduced diaphragm load capacity.

