

# ER-0192

Used for Florida State Wide Product Approval #

# FL13975

Products on this Report which are approved:

<u>Product</u>	<u>FL#</u>
SDW22300	13975.1
SDW22338	13975.1
SDW22438	13975.1
SDW22458	13975.1
SDW22500	13975.1
SDW22600	13975.1
SDW22634	13975.1
SDW22638	13975.1



**SIMPSON STRONG-TIE COMPANY, INC.**

**DIVISION: 06 – WOOD AND PLASTICS**  
**Section: 06090 – Wood and Plastic Fastenings**

**REPORT HOLDER:**  
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**EVALUATION SUBJECT:**

**SIMPSON STRONG-DRIVE® SDW SERIES**  
**WOOD SCREWS**

## 1.0 EVALUATION SCOPE

### 1.1 Compliance with the following codes:

- 2009 International Building Code® (IBC)
- 2009 International Residential Code® (IRC)
- 2006 International Building Code® (IBC)
- 2006 International Residential Code® (IRC)

### 1.2 Evaluated in accordance with:

- ICC-ES AC 233, Acceptance Criteria for Alternate Dowel-Type Threaded Fasteners, approved October 2009

### Properties evaluated:

Structural

## 2.0 USES

The Simpson Strong-Drive® SDW Series fasteners described in this report are dowel-type threaded and self-drilling fasteners used for wood-to-wood connections.

## 3.0 DESCRIPTION

### 3.1 General

The SDW wood screws are manufactured using a standard cold-forming process and consist of heat treated carbon steel. The screws have rolled

threads, spaced approximately 5 threads per inch, a flat head with a T-40 recess, serrated threads and a proprietary four-cut (square-shank) point. There are 8 lengths of the screw ranging from 2 15/16 inches to 6 3/4 inches. The length of the screw threads is either 1 7/16 or 1 9/16 inches in length. The screws have a proprietary coating and are acceptable for interior use conditions only. Table 1 provides a description of the screws recognized in this report, and specifies the screws' allowable bending yield strength as well as allowable tensile and shear loads.

## 3.2 Materials

### 3.2.1 SDW Wood Screws

The SDW wood screws are manufactured from C10B21 carbon steel wire complying with ASTM A510.

### 3.2.2 Wood Members

Wood side and main members may consist of solid-sawn lumber species with a specific gravity of 0.42 to 0.55 or structural composite (e.g: LVL, PSL and LSL) with a specific gravity of 0.50 or better as designed in the NDS. See Table 2 for design values. Wood side members shall be either 1 1/2, 1 3/4 or 3 1/2 inches with penetrations as specified in Table 2.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

#### 4.1.1 General:

Reference lateral and withdrawal design values in the report are for allowable stress design, and shall be multiplied by all applicable adjustment factors specified in the NDS to determine adjusted design values, including wet service condition specified in Section 10.3.3 of the NDS. Local stresses in connections using multiple fasteners must be checked in accordance with Section 10.1.2 of the NDS. Structural members forming the connection must be designed in accordance with the code.

Report Number: 0192

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#### 4.1.2 Lateral Design Values:

Reference lateral (Z) design values for SDW series wood screws for single shear wood-to-wood connections loaded perpendicular and parallel to grain are shown in Table 2. Minimum connection geometries shall comply with Table 3.

#### 4.1.3 Reference Withdrawal Design Values:

Reference withdrawal (W) design values for SDW series wood screws are shown in Table 2 and are given in pounds per inch of thread penetration into the main member.

#### 4.1.4 Pull-through Design Values:

Pull-through design values are limited by the reference withdrawal design values shown in Table 2.

#### 4.2 Installation:

The SDW wood screws shall be installed in accordance with the manufacturer's installation instruction, the evaluation report and the codes listed in Section 1, using a low speed drill. Installation may be performed without predrilling wood members. Edge distances, end distances and spacing of the screws must be sufficient to prevent splitting of the wood, or as required by Table 3 of this report, whichever is more restrictive. The bottom of the screw head must be installed flush to the surface of the member being connected.

#### 5.0 CONDITIONS OF USE

The Simpson Strong-Drive® SDW series wood screws described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 When designing a connection, the connection must be checked against Section 10.1.2 in the NDS to ensure the capacity of the connection and fastener group.

5.2 This evaluation report does not address fastener corrosion when the fastener is installed in chemically treated wood or outdoor application.


5.3 The SDW series wood screws are manufactured under a quality control program with inspections by Professional Service Industries (AA-660).

#### 6.0 EVIDENCE SUBMITTED

Data and test reports submitted are from laboratories in compliance with ISO/IEC 17025 and in accordance with the ICC-ES Acceptance Criteria for Alternate Dowel-type Threaded Fasteners (AC233), approved October 2009.

#### 7.0 IDENTIFICATION

The packaging for the SDW series wood screws is labeled with designation "Simpson Strong-Drive® SDW", the Simpson Strong-Tie Co. name and address, the fastener size, the name of the inspection agency (Professional Service Industries), IAPMO ES Mark of Conformity and the evaluation report number (ER-0192). Each screw head is marked with the No-Equal to symbol (≠) and the alpha-numeric letter "W22" indicating diameter and followed by a number designating screw length, as shown in Table 1.

A handwritten signature in black ink, appearing to read "Amir" followed by a stylized flourish.

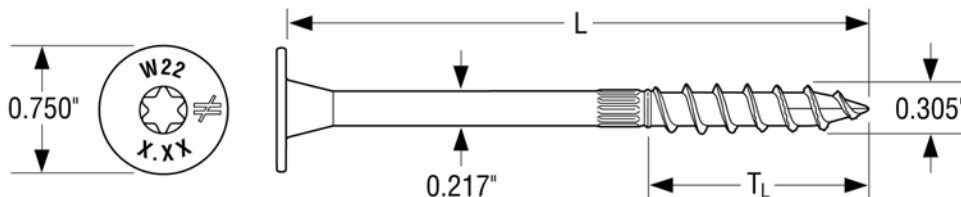
Director of Evaluation Services

**TABLE 1 – SDW SERIES WOOD SCREW SPECIFICATIONS, ALLOWABLE BENDING YIELD STRENGTH, AND FASTENER ALLOWABLE STEEL STRENGTH**

FASTENER DESIGNATION	HEAD MARKING ###	SCREW LENGTH <sup>1</sup> L (in)	LENGTH OF THREAD <sup>2</sup> TL (in)	UNTHREADED SHANK DIAMETER (in)	MAJOR THREAD DIAMETER (in)	MINOR THREAD (ROOT) DIAMETER (in)	FASTENER ALLOWABLE STEEL STRENGTH <sup>4</sup>		
							Bending Yield Strength <sup>3</sup> (Fyb) (psi)	Tension (lbs)	Shear (lbs)
SDW22300	3.00	2.940	1 7/16	0.217	0.305	0.192	180,000	1,550	1,125
SDW22338	3.37	3.340	1 9/16						
SDW22438	4.37	4.375	1 7/16						
SDW22458	4.62	4.585	1 7/16						
SDW22500	5.00	5.040	1 9/16						
SDW22600	6.00	5.940	1 7/16						
SDW22638	6.37	6.315	1 7/16						
SDW22634	6.75	6.740	1 9/16						

For SI: 1 inch=25.4 mm, 1 psi=6.89 kPa, 1 lbf=4.45N

1. For purposes of measuring overall fastener length, fasteners must be measured from the underside of head to bottom of tip.
2. Length of thread includes tip. See Figure 1.
3. Bending yield strength determined per methods specified in ASTM D 1575 and based on the minor thread (root) diameter.
4. Allowable fastener loads are based on steel properties of the screw. Refer to Table 2 for allowable reference lateral (Z) and withdrawal (W) design values for using the screws in wood-to-wood connections.



**FIGURE 1 – SDW SCREW**

**TABLE 2 – REFERENCE LATERAL (Z) AND WITHDRAWAL (W) DESIGN VALUES FOR WOOD-TO-WOOD CONNECTIONS WITH SDW SERIES WOOD SCREWS<sup>1,2</sup>**

FASTENER DESIGNATION	SIDE MEMBER THICKNESS (in)	MAIN MEMBER PENETRATION (in)	LATERAL DESIGN VALUE (Z) FOR SINGLE SHEAR (TWO-MEMBER) CONNECTIONS <sup>3,4,5</sup> (lbs)		WITHDRAWAL DESIGN VALUE (W) <sup>3,5,6</sup> (lbs/in)	
			DFL and SP Members	HF and SPF Members	DFL and SP Members	HF and SPF Members
SDW22300	1 ½	1 3/8	325	255	200	150
SDW22338	1 ¾	1 5/8	400	-		
SDW22438	1 ½	2 7/8	400	325		
SDW22458	1 ½	2 7/8	400	325		
SDW22500	1 ¾	3 1/4	400	-		
SDW22600	1 ½	4 1/2	400	340		
SDW22638	1 ½	4 1/2	400	340		
SDW22634	1 ¾	5	400	-		
	3 ½	3 1/4	400	-		

For SI: 1 inch = 25.4 mm, 1 ksi = 6.89 MPa, 1 lbf = 4.45 N

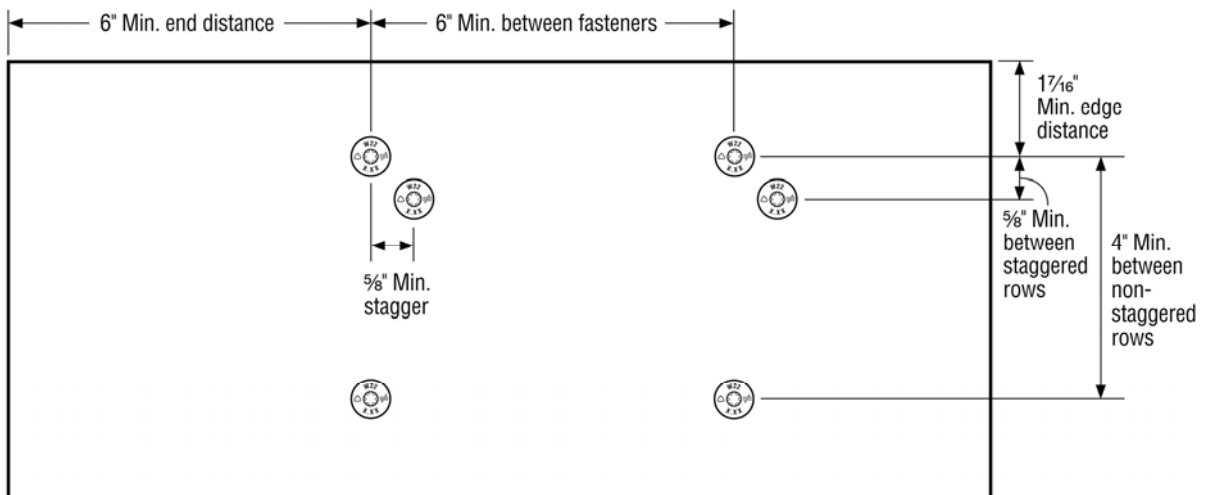
1. The main and side members must be wood having a minimum NDS referenced specific gravity of 0.50 for DFL, 0.55 for SP, and 0.42 for SPF and HF. DFL and SP values are applicable to structural composite lumber (e.g., LVL, PSL, and LSL) with specific gravity values of 0.50 or better.
2. Tabulated lateral design values (Z) must be multiplied by all applicable adjustment factors, including the load duration factor,  $C_D$ , from the NDS as referenced in the IBC or IRC.
3. Screws must be installed straight into the side grain of the wood main member with the screw axis at a 90 degree angle to the wood fibers.
4. Minimum fastener penetration must be equal to the screw length less the thickness of the wood side plate.
5. DFL is Douglas Fir-Larch. SP is Southern Pine. SPF is Spruce-Pine-Fir. HF is Hem-Fir.
6. Total allowable withdrawal load is based on actual thread penetration into the main member.

**TABLE 3 – CONNECTION GEOMETRY**

CONDITION <sup>1</sup>		MINIMUM DISTANCE OR SPACING (in.)
Edge Distance	Perpendicular to grain loading	1 7/16
	Parallel to grain loading	1 7/16
End Distance	Perpendicular to grain loading	6
	Parallel to grain loading	6
Spacing	Between fasteners in a row	6
	Between non-staggered rows	4
	Between staggered rows	5/8

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N

- Edge distances, end distances and spacing of the screws must be sufficient to prevent splitting of the wood, or as required by this table, whichever is the more restrictive.



**FIGURE 2 – CONNECTION GEOMETRY**



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## SUPPLEMENT

**DIVISION: 06—METALS**  
**Section: 06090—Wood and Plastic Fastenings**

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### EVALUATION SUBJECT:

#### **SIMPSON STRONG-DRIVE® SDW SERIES WOOD SCREWS**

This supplement is issued to indicate that SIMPSON STRONG-DRIVE® SDW Series Wood Screws used for wood-to-wood connections, described in the master report, comply with the codes listed in Section 1.1 of this supplement when designed and installed in accordance with the master evaluation report and the amendments of the report as shown below.

### 1.0 EVALUATION SCOPE

#### 1.1 Compliance with the following codes:

- 2007 Florida Building Code- Building (FBC-B)
- 2007 Florida Building Code- Residential (FBC-R)

### 6.0 EVIDENCE SUBMITTED

Signed and sealed test reports by Testing Engineers Inc. (shown below) performed in accordance with the ICC-ES Acceptance Criteria for Alternate Dowel-type Threaded Fasteners (AC233), including testing to ASTM D1761.

Product	Test Number	Date Tested
SDW22300	Q926	11/30/2009
	Q961	12/7/2009
	Q963	12/10/2009
	R070	1/6/2010
	R078	1/22/2010
SDW22338	R002	12/3/2009

# EVALUATION REPORT



Report Number: 0192  
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SDW22438	Q960 Q928 R079 R310	12/18/2009 11/30/2009 and 12/2/2009 1/21/2010 3/31/2010
SDW22458	Q929 R147	12/18/2009 2/12/2010
SDW22500	Q930	12/17/2009
SDW22600	Q931	12/18/2009
SDW22638	R080 R123 R124 R175 R302	1/15/2010 and 1/19/2010 2/9/2010 1/29/2010 3/16/2010, 3/24-25/2010 3/25/2010
SDW22634	Q933 R148	12/22/2009 2/11/2010