



ICC-ES Listing Report ELC-3046

Reissued August 2023

This listing is subject to renewal August 2024.

CSI: DIVISION: 06 00 00—WOOD, PLASTIC AND COMPOSITES
Section: 06 05 23—Wood, Plastic and Composite Fastenings

Product Certification System:

The ICC-ES product-certification system includes evaluating reports of tests of standard manufactured product, prepared by accredited testing laboratories and provided by the listee, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the listee's quality system.

Product: Simpson Strong-Tie® Strong-Drive® SDCF, SDCP and SDHR Screws

Listee: SIMPSON STRONG-TIE COMPANY INC.

Compliance with the following standards:

The Simpson Strong-Tie® Strong-Drive® SDCF, SDCP and SDHR Screws, when applied in accordance with the manufacturer's instructions, conform to the following standard:

- Clause 12.6 of CSA O86 (2019 and 2014), Engineering Design in Wood, CSA Group.

Compliance with the following codes:

The Simpson Strong-Tie® Strong-Drive® SDCF, SDCP and SDHR Screws, as described in this listing report, are alternative dowel-type self-drilling fasteners as described under the Note of Clause 12.6.1.1 of CSA O86 (2019 and 2014). The fasteners have met the testing requirements for fastener shear, tension, bending yield strength, withdrawal resistance, lateral resistance and head pull-through / head pull-over resistance as noted in Table 1.2 of AC233, dated February 2020. The fasteners were evaluated using the test results as determined under Table 1.2 of AC233, dated February 2020 and analyzed to derive corresponding Limit States Design (LSD) values detailed in Tables 1 through 8 to meet the requirements noted in Clause 12.6 of CSA O86 (2019 and 2014), as referenced in the applicable sections of the following code editions:

- *National Building Code of Canada*® 2015

Applicable Section: Volume 1 - Division B: 4.3.1.1.(1)

Volume 2 - Division B: 9.4.1.1.(1)

Description of fasteners:

The Simpson Strong-Tie® Strong-Drive® SDCF, SDCP and SDHR Screws are manufactured using a standard cold-forming process and are heat-treated.

The SDCF screws are fully threaded with rolled threads, spaced 3.8 mm for SDCF22### screws and 4.5 mm for SDCF27### screws. The SDCF screws have a ribbed countersinking head with a six-lobe drive recess, and a proprietary point. See Table 1 and Figure 1 for screw descriptions, including dimensions, fastener strength and factored resistance values for the SDCF screws.

The SDCP screws have rolled threads, spaced 5.5 mm for the SDCP22#### screws and 6.6 mm for the SDCP271400 screw. The SDCP screws have a ribbed countersinking head with a star-shaped drive recess, and a Type-17 point with notched threads. The screws are partially threaded and have a knurl between the primary threads and the smooth shank. See Table 1 and Figure 2 for screw descriptions, including dimensions, fastener strength and factored resistance values for the SDCP screws.

The SDHR screws are partially threaded, with rolled threads spaced 4.5 mm for SDHR27#### screws and 6 mm for SDHR31#### screws and a knurl between the primary threads and the smooth shank. The SDHR screws have a large hex head with a six-lobe drive recess, and a type-17 point. See Table 1 and Figure 3 for screw descriptions, including dimensions, fastener strength and factored resistance values for the SDHR screws.

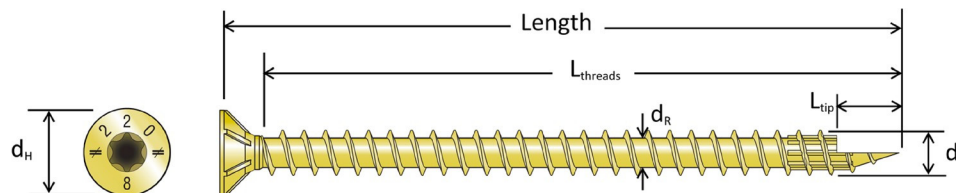


Figure 1—SDCF Screw

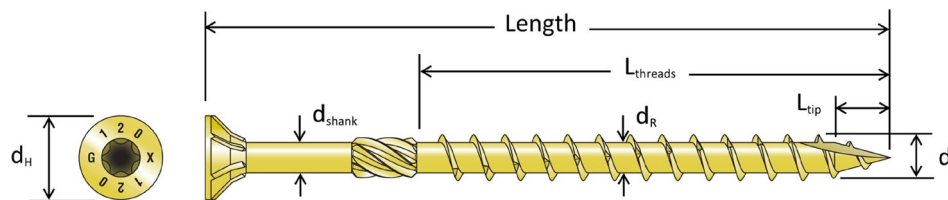


Figure 2—SDCP Screw

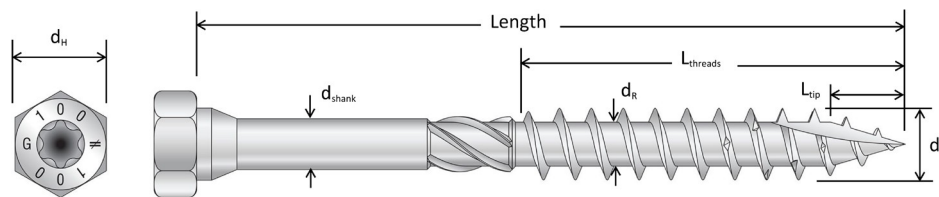


Figure 3—SDHR Screw

Identification:

- Each SDCF screw head is marked with the not-equal-to symbol (\neq), and numbers designating the screw size and length in mm, as shown in Table 1. Each SDCP screw head is marked with a "G" and an "X" and numbers designating the screw length in mm as shown in Table 1. Each SDHR screw head is marked with a "G", the not-equal-to symbol (\neq), and the numbers designating the screw length in mm as shown in Table 1. The packaging is labeled with the fastener designation, the Simpson Strong-Tie Company name and address, the fastener size, the ICC-ES evaluation report number (ESR-3046) and / or the ICC-ES listing report number (ELC-3046), and the ICC-ES listing mark, when applicable.
- The report holder's contact information is the following:

SIMPSON STRONG-TIE COMPANY INC.
5956 WEST LAS POSITAS BOULEVARD
PLEASANTON, CALIFORNIA 94588
(925) 560-9000
www.strongtie.com

Installation:

The Strong-Drive SDCF, SDCP and SDHR screws must be installed in accordance with Simpson Strong-Tie Company's published installation instructions and all applicable codes.

Installation may be performed with or without predrilling wood members. If predrilling is performed, the hole diameter must be $0.7d_f$. Edge distances, end distances and spacing of the screws must be sufficient to prevent splitting of the wood, or as required by Table 9 and Figure 4, whichever is more restrictive. When used in engineered wood products, the minimum fastener end and edge distances and spacing must be in accordance with Table 9 and Figure 4, or in accordance with the engineered wood product manufacturer's recommended installation instructions, whichever is more restrictive.

The SDCF22 and SDCP22 screws must be installed using a 6-lobe T40 bit, and the SDCP27 and SDCF27 must be installed using a 6-lobe T50 bit. The SDHR must be installed using either a 6-lobe T40 bit or a 15 mm metric nut driver for SDHR27 or a 17 mm metric nut driver for SDHR31.

When installing SDCF or SDCP screws, the top of the screw head must be flush with the surface of the member being connected. The screws must not be over driven. For SDCF screws, the portion of the screw length less the side member thickness must be fully embedded into the main member. For SDCP screws, the threaded portion of the screw must be fully embedded into the main member.

When installing SDHR screws, the bottom of the screw head must be flush with the surface of the steel side member.

Limit States Design:

See Table 2 for factored withdrawal, head pull-through, and pull-over resistance values.

See Tables 3 through 8 for factored lateral resistance values based on specific wood-to-wood or steel-to-wood connections. The factored lateral resistance values of wood-to-wood or steel-to-wood connections using Strong-Drive SDCF, SDCP or SDHR screws for applications not listed in the tables below must be calculated using Clause 12.6 CSA O86:19 and the information provided in Table 1. When calculating the unit lateral strength resistance value, use d_{shank} for SDCP and SDHR screws and d_R for SDCF screws in lieu of d_f .

TABLE 1—FASTENER DIMENSIONS AND FACTORED RESISTANCE VALUES

Model No.	Dimension (mm)							Bending Yield Strength ² (MPa)	Factored Resistance ¹ (kN)	
	Screw Length L	Thread Length L _{threads}	Tip Length L _{tip}	Thread diameter d _F	Shank Diameter d _{shank}	Minor Diameter d _R	Head ³ Diameter d _H		Tension	Shear
SDCF22434	120	109	11.0	8.0	-	5.2	15.0	1242	12.05	8.41
SDCF22512	140	129								
SDCF22614	160	149								
SDCF22700	180	169								
SDCF22858	220	209								
SDCF221014	260	249								
SDCF221134	300	289								
SDCF221334	350	339	13.0	10.0	-	6.1	18.5	1380	19.02	13.53
SDCF271958	500	483								
SDCF272358	600	583	9.8	7.9	5.8	5.3	14.7	1276	11.74	7.67
SDCP22434	120									
SDCP22512	140									
SDCP22614	160									
SDCP22700	180									
SDCP22858	220									
SDCP22912	240									
SDCP221100	280									
SDCP221134	300		11.7	10.0	7.0	6.3	17.8	1344	16.54	10.68
SDCP271400	360	80								
SDHR27400	100	55	11.5	9.9	7.1	6.2	14.9	1310	14.35	9.66
SDHR27614	160	110								
SDHR31400	100	55	12.8	11.9	8.1	6.9	16.9	1380	17.64	12.36
SDHR31614	160	110								

¹ The factored resistance values shown include a resistance factor $\phi = 0.43$ per Sections J4.3.2, J4.4.3 and K2.1.1 of CSA S136-16 and are based on the steel properties of the screw.

² Bending yield strength values determined in accordance with ASTM F1575 using the minor thread (root) diameter, d_R

³ For SDHR, the head diameter shown is measured across the flats.

TABLE 2—FACTORED WITHDRAWAL, HEAD PULL-THROUGH AND PULL-OVER RESISTANCE VALUES^{1,2,3,4,5}

Model	Factored Resistance (kN)					
	Withdrawal, ϕY_W (N/mm)		Head Pull-through (kN)		Pull-Over (kN)	
	D.Fir-L	S-P-F	D.Fir-L	S-P-F	Steel Thickness (ga)	
					16	10
SDCF22	94	76	2.48	2.06	-	-
SDCF27			2.28	1.74	-	-
SDCP22	76	69	2.05	1.29	-	-
SDCP27			2.57	1.57	-	-
SDHR27	78	70	-	-	4.10	13.24
SDHR31			-	-	4.67	

¹ Tabulated values assume dry service condition ($K_{SF}=1.00$) under standard term loading ($K_D=1.00$). Adjust the values per Clause 12.6.6.1 CSA O86-19 where other conditions or loading exists.

² Factored withdrawal resistance values shown require a minimum thread penetration into the main member, including the tip, of 55 mm for SDCP and SDHR and 76 mm for SDCF. Include the length of the tip when calculating the total factored withdrawal resistance (P_{TW}).

³ For installation into the end grain (J_E), multiply the tabulated withdrawal values for SDCP and SDHR x 0.45 for D.Fir-L. and 0.62 for S-P-F and 0.6 for both D.Fir-L and S-P-F for SDCF.

⁴ Head pull-through resistance values shown are based on a 38 mm thick side member. For SDCF with thicker side members, the factored resistance value must be taken as the greater of the value shown or the factored withdrawal resistance value calculated using the thickness of the side member less the unthreaded portion of the screw as the penetration length (11 mm for SDCF22 and 17 mm for SDCF27).

⁵ For Pull-Over resistance values, tabulated values are based on Manufacturers Standard Gauge (MSG) design thicknesses and are taken as: 10 ga = 3.42 mm and 16 ga = 1.52 mm.

TABLE 3—FACTORED LATERAL RESISTANCE VALUES FOR WOOD-TO-WOOD CONNECTIONS WITH S-P-F^{1,2,3,4,5,6}

Model No.	Factored Lateral Resistance for S-P-F (kN)															
	Side Member Thickness (mm)															
	38				76				89				140			
	P_r	Q_r	Q_{r1}	Q_{r2}	P_r	Q_r	Q_{r1}	Q_{r2}	P_r	Q_r	Q_{r1}	Q_{r2}	P_r	Q_r	Q_{r1}	Q_{r2}
SDCF22434	1.20	0.60	0.87	0.78	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22512	1.20	0.69	0.98	0.78	1.40	0.71	1.16	0.87	-	-	-	-	-	-	-	-
SDCF22614	1.20	0.69	1.05	0.78	1.47	0.82	1.16	0.98	1.47	0.82	1.16	0.91	-	-	-	-
SDCF22700	1.20	0.69	1.05	0.78	1.47	0.91	1.16	1.00	1.47	0.93	1.16	1.02	-	-	-	-
SDCF22858	1.20	0.69	1.05	0.78	1.47	0.91	1.16	1.00	1.47	0.98	1.16	1.07	1.47	0.87	1.16	0.96
SDCF221014	1.20	0.69	1.05	0.78	1.47	0.91	1.16	1.00	1.47	0.98	1.16	1.07	1.47	0.98	1.16	1.16
SDCF221134	1.20	0.69	1.05	0.78	1.47	0.91	1.16	1.00	1.47	0.98	1.16	1.07	1.47	0.98	1.16	1.16
SDCF221334	1.20	0.69	1.05	0.78	1.47	0.91	1.16	1.00	1.47	0.98	1.16	1.07	1.47	0.98	1.16	1.16
SDCP22434	1.45	0.67	0.96	0.95	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22512	1.45	0.79	1.08	0.95	1.66	0.79	1.37	1.05	-	-	-	-	-	-	-	-
SDCP22614	1.45	0.84	1.20	0.95	1.84	0.91	1.44	1.17	1.76	0.91	1.44	1.09	-	-	-	-
SDCP22700	1.45	0.84	1.24	0.95	1.84	1.03	1.44	1.18	1.84	1.03	1.44	1.21	-	-	-	-
SDCP22858	1.45	0.84	1.24	0.95	1.84	1.07	1.44	1.18	1.84	1.15	1.44	1.26	1.84	1.04	1.44	1.15
SDCP22912	1.45	0.84	1.24	0.95	1.84	1.07	1.44	1.18	1.84	1.15	1.44	1.26	1.84	1.16	1.44	1.27
SDCP221134	1.45	0.84	1.24	0.95	1.84	1.07	1.44	1.18	1.84	1.15	1.44	1.26	1.84	1.22	1.44	1.44
SDCP271400	2.00	1.19	1.70	1.35	2.63	1.46	2.16	1.63	2.76	1.56	2.16	1.72	2.76	1.83	2.16	2.09

¹ P_r = both side and main member loaded parallel to grain.

² Q_r = both side and main member loaded perpendicular-to-grain.

³ Q_{r1} = main member loaded perpendicular-to-grain, side member loaded parallel-to-grain.

⁴ Q_{r2} = side member loaded perpendicular-to-grain, main member loaded parallel-to-grain.

⁵ Tabulated values are for dry service condition ($K_{SF}=1.00$) under standard term loading ($K_D=1.00$). Adjust the values per Clause 12.6.5.1.1 CSA O86:19 for other durations of load.

⁶ Values shown are for single fastener. For design of connections with multiple screws, see Clause 12.2.2.3 CSA O86:19.

TABLE 4—FACTORED LATERAL RESISTANCE VALUES FOR WOOD-TO-WOOD CONNECTIONS WITH D.FIR-L^{1,2,3,4,5,6}

Model No.	Factored Lateral Resistance for D.Fir-L (kN)															
	Side Member Thickness (mm)															
	38				76				89				140			
	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}
SDCF22434	1.36	0.69	1.00	0.87	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22512	1.36	0.78	1.13	0.87	1.56	0.82	1.25	0.96	-	-	-	-	-	-	-	-
SDCF22614	1.36	0.78	1.18	0.87	1.60	0.96	1.25	1.09	1.60	0.91	1.25	1.00	-	-	-	-
SDCF22700	1.36	0.78	1.18	0.87	1.60	1.02	1.25	1.11	1.60	1.05	1.25	1.13	-	-	-	-
SDCF22858	1.36	0.78	1.18	0.87	1.60	1.02	1.25	1.11	1.60	1.07	1.25	1.20	1.60	0.98	1.25	1.07
SDCF221014	1.36	0.78	1.18	0.87	1.60	1.02	1.25	1.11	1.60	1.07	1.25	1.20	1.60	1.07	1.25	1.25
SDCF221134	1.36	0.78	1.18	0.87	1.60	1.02	1.25	1.11	1.60	1.07	1.25	1.20	1.60	1.07	1.25	1.25
SDCF221334	1.36	0.78	1.18	0.87	1.60	1.02	1.25	1.11	1.60	1.07	1.25	1.20	1.60	1.07	1.25	1.25
SDCP22434	1.61	0.78	1.12	1.05	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22512	1.61	0.92	1.26	1.05	1.86	0.92	1.56	1.16	-	-	-	-	-	-	-	-
SDCP22614	1.61	0.93	1.39	1.05	1.99	1.06	1.56	1.30	1.98	1.06	1.56	1.21	-	-	-	-
SDCP22700	1.61	0.93	1.39	1.05	1.99	1.20	1.56	1.32	1.99	1.20	1.56	1.35	-	-	-	-
SDCP22858	1.61	0.93	1.39	1.05	1.99	1.20	1.56	1.32	1.99	1.20	1.56	1.41	1.99	1.16	1.56	1.28
SDCP22912	1.61	0.93	1.39	1.05	1.99	1.20	1.56	1.32	1.99	1.20	1.56	1.41	1.99	1.30	1.56	1.42
SDCP221134	1.61	0.93	1.39	1.05	1.99	1.20	1.56	1.32	1.99	1.20	1.56	1.41	1.99	1.32	1.56	1.56
SDCP271400	2.22	1.31	1.89	1.49	2.95	1.63	2.33	1.81	2.98	1.74	2.33	1.91	2.98	1.98	2.33	2.33

¹ P_r = both side and main member loaded parallel to grain.² Q_r = both side and main member loaded perpendicular-to-grain.³ Q_{r1} = main member loaded perpendicular-to-grain, side member loaded parallel-to-grain.⁴ Q_{r2} = side member loaded perpendicular-to-grain, main member loaded parallel-to-grain.⁵ Tabulated values are for dry service condition (K_{SE}=1.00) under standard term loading (K_D=1.00). Adjust the values per Clause 12.6.5.1.1 CSA O86:19 for other durations of load.⁶ Values shown are for single fastener. For design of connections with multiple screws, see Clause 12.2.2.3 CSA O86:19.

**TABLE 5—FACTORED LATERAL RESISTANCE VALUES FOR
WOOD-TO-WOOD CONNECTIONS WITH SPRUCE-PINE GLULAM** ^{1,2,3,4,5,6,7}

Model No.	Factored Lateral Resistance for Spruce-Pine Glulam (kN)															
	Side Member Thickness (mm)															
	80				130				175				215			
	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}
SDCF22512	1.40	0.73	1.18	0.87	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22614	1.51	0.85	1.18	0.98	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22700	1.51	0.96	1.18	1.05	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22858	1.51	0.96	1.18	1.05	1.51	0.96	1.18	1.05	-	-	-	-	-	-	-	-
SDCF221014	1.51	0.96	1.18	1.05	1.51	1.00	1.18	1.18	1.51	0.93	1.18	1.02	-	-	-	-
SDCF221134	1.51	0.96	1.18	1.05	1.51	1.00	1.18	1.18	1.51	1.00	1.18	1.18	1.51	0.91	1.18	1.00
SDCF221334	1.51	0.96	1.18	1.05	1.51	1.00	1.18	1.18	1.51	1.00	1.18	1.18	1.51	1.00	1.18	1.18
SDCF271958	2.18	1.25	1.69	1.38	2.18	1.45	1.69	1.69	2.18	1.45	1.69	1.69	2.18	1.45	1.69	1.69
SDCF272358	2.18	1.25	1.69	1.38	2.18	1.45	1.69	1.69	2.18	1.45	1.69	1.69	2.18	1.45	1.69	1.69
SDCP22512	1.67	0.82	1.46	1.06	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22614	1.89	0.95	1.48	1.19	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22700	1.89	1.08	1.48	1.24	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22858	1.89	1.13	1.48	1.24	1.89	1.13	1.48	1.24	-	-	-	-	-	-	-	-
SDCP22912	1.89	1.13	1.48	1.24	1.89	1.25	1.48	1.37	1.74	0.98	1.48	1.09	-	-	-	-
SDCP221134	1.89	1.13	1.48	1.24	1.89	1.25	1.48	1.48	1.89	1.25	1.48	1.47	1.89	1.10	1.48	1.21
SDCP271400	2.78	1.54	2.21	1.70	2.82	1.87	2.21	2.09	2.82	1.87	2.21	2.21	2.82	1.87	2.21	2.11

¹ P_r = both side and main member loaded parallel to grain.

² Q_r = both side and main member loaded perpendicular-to-grain.

³ Q_{r1} = main member loaded perpendicular-to-grain, side member loaded parallel-to-grain.

⁴ Q_{r2} = side member loaded perpendicular-to-grain, main member loaded parallel-to-grain.

⁵ Tabulated values are for dry service condition (K_{SE}=1.00) under standard term loading (K_D=1.00). Adjust the values per Clause 12.6.5.1.1 CSA O86:19 for other durations of load.

⁶ Values shown are for single fastener. For design of connections with multiple screws, see Clause 12.2.2.3 CSA O86:19.

⁷ Glulam members shall comply with CAN/CSA-O122 [R2016 and -2006 (R2011)].

**TABLE 6—FACTORED LATERAL RESISTANCE VALUES FOR
WOOD-TO-WOOD CONNECTIONS WITH D.FIR-L GLULAM^{1,2,3,4,5,6,7}**

Model No.	Factored Lateral Resistance for D.Fir-L Glulam (kN)															
	Side Member Thickness (mm)															
	80				130				175				215			
	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}
SDCF22512	1.51	0.82	1.25	0.93	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22614	1.60	0.96	1.25	1.07	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22700	1.60	1.05	1.25	1.13	-	-	-	-	-	-	-	-	-	-	-	-
SDCF22858	1.60	1.05	1.25	1.13	1.60	1.02	1.25	1.13	-	-	-	-	-	-	-	-
SDCF221014	1.60	1.05	1.25	1.13	1.60	1.07	1.25	1.25	1.60	1.00	1.25	1.09	-	-	-	-
SDCF221134	1.60	1.05	1.25	1.13	1.60	1.07	1.25	1.25	1.60	1.07	1.25	1.25	1.60	1.00	1.25	1.09
SDCF221334	1.60	1.05	1.25	1.13	1.60	1.07	1.25	1.25	1.60	1.07	1.25	1.25	1.60	1.07	1.25	1.25
SDCF271958	2.29	1.36	1.80	1.49	2.29	1.51	1.80	1.80	2.29	1.51	1.80	1.80	2.29	1.51	1.80	1.80
SDCF272358	2.29	1.36	1.80	1.49	2.29	1.51	1.80	1.80	2.29	1.51	1.80	1.80	2.29	1.51	1.80	1.80
SDCP22512	1.81	0.92	1.56	1.14	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22614	1.99	1.06	1.56	1.28	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22700	1.99	1.20	1.56	1.34	-	-	-	-	-	-	-	-	-	-	-	-
SDCP22858	1.99	1.22	1.56	1.34	1.99	1.22	1.56	1.34	-	-	-	-	-	-	-	-
SDCP22912	1.99	1.22	1.56	1.34	1.99	1.32	1.56	1.48	1.89	1.05	1.56	1.17	-	-	-	-
SDCP221134	1.99	1.22	1.56	1.34	1.99	1.32	1.56	1.56	1.99	1.32	1.56	1.56	1.99	1.18	1.56	1.30
SDCP271400	2.98	1.66	2.33	1.83	2.98	1.98	2.33	2.26	2.98	1.98	2.33	2.33	2.98	1.98	2.33	2.28

¹ P_r = both side and main member loaded parallel to grain.

² Q_r = both side and main member loaded perpendicular-to-grain.

³ Q_{r1} = main member loaded perpendicular-to-grain, side member loaded parallel-to-grain.

⁴ Q_{r2} = side member loaded perpendicular-to-grain, main member loaded parallel-to-grain.

⁵ Tabulated values are for dry service condition (K_{SE}=1.00) under standard term loading (K_D=1.00). Adjust the values per Clause 12.6.5.1.1 CSA O86-19 for other durations of load.

⁶ Values shown are for single fastener. For design of connections with multiple screws, see Clause 12.2.2.3 CSA O86:19.

⁷ Glulam members shall comply with CSA-O122 [-2016 and -2006(R2011)].

**TABLE 7—FACTORED LATERAL RESISTANCE VALUES FOR
WOOD-TO-WOOD CONNECTIONS WITH S-P-F CLT MEMBERS^{1,2,3,4,5,6,7,8}**

Model No.	Factored Lateral Resistance for S-P-F CLT Members (kN)											
	Side Member Thickness (mm)											
	105				175				245			
	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}	P _r	Q _r	Q _{r1}	Q _{r2}
SDCF22700	1.40	0.85	1.13	0.91	-	-	-	-	-	-	-	-
SDCF22858	1.40	0.98	1.13	1.13	-	-	-	-	-	-	-	-
SDCF221014	1.40	0.98	1.13	1.13	1.40	0.89	1.13	0.98	-	-	-	-
SDCF221134	1.40	0.98	1.13	1.13	1.40	0.98	1.13	1.13	-	-	-	-
SDCF221334	1.40	0.98	1.13	1.13	1.40	0.98	1.13	1.13	1.40	0.98	1.13	1.09
SDCF271958	2.02	1.38	1.62	1.49	2.02	1.40	1.62	1.62	2.02	1.40	1.62	1.62
SDCF272358	2.02	1.38	1.62	1.49	2.02	1.40	1.62	1.62	2.02	1.40	1.62	1.62
SDCP22700	1.68	1.01	1.42	1.10	-	-	-	-	-	-	-	-
SDCP22858	1.75	1.22	1.42	1.34	-	-	-	-	-	-	-	-
SDCP22912	1.75	1.22	1.42	1.34	1.56	0.95	1.40	1.04	-	-	-	-
SDCP221134	1.75	1.22	1.42	1.34	1.75	1.22	1.42	1.41	1.44	0.89	1.27	0.99
SDCP271400	2.62	1.67	2.12	1.82	2.62	1.83	2.12	2.12	2.62	1.66	2.12	1.81

¹ P_r = both side and main member loaded parallel to grain.

² Q_r = both side and main member loaded perpendicular-to-grain.

³ Q_{r1} = main member loaded perpendicular-to-grain, side member loaded parallel-to-grain.

⁴ Q_{r2} = side member loaded perpendicular-to-grain, main member loaded parallel-to-grain.

⁵ For installations into the panel edge of CLT, the factored lateral resistance value for all directions of load is Q_r x 2/3. See Clause 12.6.5.3 CSA O86:19.

⁶ Tabulated values are for dry service condition (K_{sf}=1.00) under standard term loading (K_D=1.00). Adjust the values per Clause 12.6.5.1.1 CSA O86:19 for other durations of load.

⁷ Values shown are for single fastener. For design of connections with multiple screws, see Clause 12.2.2.3 CSA O86:19.

⁸ CLT members shall comply with ANSI/APA PRG 320 (-17 and -12).

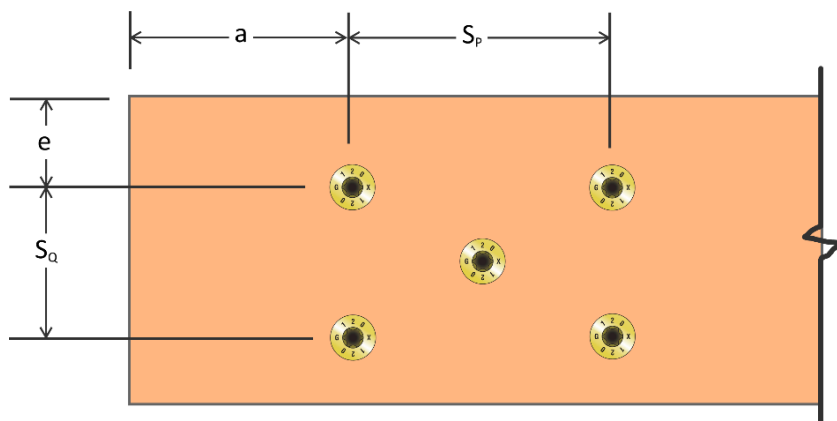
TABLE 8—FACTORED LATERAL RESISTANCE VALUES FOR STEEL-TO-WOOD CONNECTIONS^{1,2,3,4,5,6,7}

Model No.	Factored Lateral Resistance (kN)											
	Side Member Thickness (ga)											
	16		14		12		10		7		3	
	P _r	Q _r	P _r	Q _r	P _r	Q _r	P _r	Q _r	P _r	Q _r	P _r	Q _r
S-P-F												
SDHR27400	2.18	1.37	2.35	1.54	2.72	1.92	3.10	2.31	3.92	2.61	3.92	2.61
SDHR27614	2.68	1.81	2.85	1.98	3.23	2.36	3.63	2.60	3.92	2.61	3.92	2.61
SDHR31400	2.45	1.55	2.64	1.74	3.06	2.17	3.50	2.62	5.21	3.41	5.21	3.35
SDHR31614	3.42	2.04	3.62	2.24	4.05	2.67	4.51	3.11	5.21	3.47	5.21	3.47
D.Fir-L or D.Fir-L Glulam												
SDHR27400	2.42	1.48	2.59	1.65	2.96	2.02	3.34	2.42	4.23	2.82	4.23	2.82
SDHR27614	2.83	1.99	3.00	2.16	3.38	2.54	3.78	2.80	4.23	2.82	4.23	2.82
SDHR31400	2.71	1.66	2.90	1.86	3.33	2.29	3.76	2.73	5.62	3.74	5.62	3.74
SDHR31614	3.62	2.24	3.82	2.44	4.25	2.87	4.71	3.31	5.62	3.74	5.62	3.74
Spruce-Pine Glulam												
SDHR27400	2.25	1.40	2.42	1.57	2.79	1.95	3.17	2.34	4.01	2.67	4.01	2.67
SDHR27614	2.72	1.86	2.89	2.03	3.28	2.41	3.67	2.66	4.01	2.67	4.01	2.67
SDHR31400	2.52	1.58	2.71	1.77	3.14	2.21	3.57	2.65	5.33	3.55	5.33	3.51
SDHR31614	3.48	2.10	3.67	2.29	4.11	2.72	4.57	3.17	5.33	3.55	5.33	3.55
S-P-F CLT												
SDHR27400	2.04	1.37	2.20	1.54	2.58	1.92	2.96	2.31	3.72	2.61	3.72	2.61
SDHR27614	2.58	1.81	2.75	1.98	3.14	2.36	3.53	2.60	3.72	2.61	3.72	2.61
SDHR31400	2.29	1.55	2.48	1.74	2.90	2.17	3.34	2.62	4.95	3.41	4.95	3.35
SDHR31614	3.29	2.04	3.49	2.24	3.91	2.67	4.36	3.11	4.95	3.47	4.95	3.47
D.Fir-L CLT												
SDHR27400	2.25	1.48	2.42	1.65	2.79	2.02	3.17	2.42	4.01	2.82	4.01	2.82
SDHR27614	2.72	1.99	2.89	2.16	3.28	2.54	3.68	2.80	4.01	2.82	4.01	2.82
SDHR31400	2.53	1.66	2.72	1.86	3.14	2.29	3.58	2.73	5.34	3.74	5.34	3.74
SDHR31614	3.48	2.24	3.68	2.44	4.12	2.87	4.57	3.31	5.34	3.74	5.34	3.74

¹ P_r = main member parallel-to-grain.² Q_r = main member perpendicular-to-grain.³ For installation into the edge grain of CLT, use Q_r values x 0.50 for either parallel-to-grain or perpendicular-to-grain loading per Clause 12.6.5.3 CSA O86:19.⁴ Values assume ASTM A653 Grade 33 (F_u=310 MPa) for 16, 14, 12 and 10 ga and ASTM A1011 Grade 33 (F_u=358 MPa) for 7 and 3 ga steel side plates.⁵ Tabulated values are for dry service condition (K_{SF}=1.00) under standard term loading (K_D=1.00). Adjust the values per Clause 12.6.5.1.1 CSA O86:19 for other durations of load.⁶ Values shown are for single fastener. For design of connections with multiple screws, see Clause 12.2.2.3.4 CSA O86-14.⁷ Tabulated values are based on Manufacturers Standard Gauge (MSG) design thicknesses and are taken as: 3 ga = 6.07 mm, 7 ga = 4.55 mm, 10 ga = 3.42 mm, 12 ga = 2.66 mm, 14 ga = 1.90 mm, 16 ga = 1.52 mm.

TABLE 9—MINIMUM SPACING, END AND EDGE DISTANCE REQUIREMENTS^{1,2,3,4,5,6,7}

Model	Dimensions (mm)											
	D.Fir-L						S-P-F					
	S _P	S _Q	a	a'	e	e'	S _P	S _Q	a	a'	e	e'
SDCF22	160	80	160	120	96	56	128	64	120	96	80	40
SDCP22												
SDCF27	200	100	200	150	120	70	160	80	150	120	100	50
SDCP27												
SDHR27												
SHDR31	240	120	240	180	144	84	192	96	180	144	120	60

¹ S_P = minimum fastener spacing parallel-to-grain.² S_Q = minimum fastener spacing perpendicular-to-grain.³ a = minimum loaded end distance.⁴ a' = minimum unloaded end distance.⁵ e = minimum loaded edge distance.⁶ e' = minimum unloaded edge distance.⁷ See Figure 4 for additional information.**FIGURE 4—MINIMUM SPACING, END AND EDGE DISTANCE REQUIREMENTS****Conditions of listing:**

The Simpson Strong-Drive SDCF, SDCP and SHDR screws described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in this report, subject to the following conditions:

1. Approval of the Simpson Strong-Drive screws use is the sole responsibility of the local code official.
2. The listing report applies to the materials as submitted for review by ICC-ES.
3. The Simpson Strong-Drive screws must be installed in accordance with the manufacturer's published installation instructions, this listing report and the applicable code. The most restrictive governs if there are any conflicts between the manufacturer's published installation instructions and this listing report.
4. The Simpson Strong-Drive screws must be limited to use in dry conditions, with solid-sawn wood having a moisture content of 19 percent or less, both at the time of screw installation and in service or engineered wood complying with the applicable ICC-ES evaluation report.
5. The use of Simpson Strong-Drive screws in locations exposed to saltwater or saltwater spray is outside the scope of this listing report.
6. The Simpson Strong-Drive screws are manufactured under a quality control program with inspections by ICC-ES.