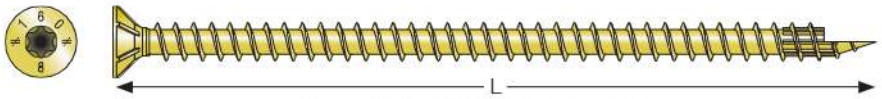
Strong-Drive®
SDCF TIMBER-CF Screw

The SDCF Timber-CF screws are self-tapping screws and are designed to be installed without predrilling.

The screws have yellow zinc coating and are designed for general interior, dry-service applications.

For more information, see p. 96, C-F-2023 *Fastening Systems* catalog



Strong-Drive SDCF TIMBER-CF Screw

SDCF TIMBER-CF Screw — Allowable Lateral Design Values for Single Shear Wood-to-Wood Connections

Fastener Designation	Reference Allowable Lateral Design Value, Z (lbf)							
	Side Member Thickness (in.)							
	1.5	2	2.5	3	3.5	4	4.5	13
0.42 ≤ SG < 0.50								
SDCF22434	325	—	—	—	—	—	—	—
SDCF22512	325	325	—	—	—	—	—	—
SDCF22614	325	325	325	—	—	—	—	—
SDCF22700	325	325	325	325	—	—	—	—
SDCF22858	325	325	325	325	325	—	—	—
SDCF221014	325	325	325	325	325	—	—	—
SDCF221134	325	325	325	325	325	325	325	—
SDCF221334	325	325	325	325	325	325	325	325
SDCF27400	325	—	—	—	—	—	—	—
SDCF27614	325	400	400	—	—	—	—	—
SDCF27778	325	400	400	400	—	—	—	—
SDCF27912	325	400	400	400	400	—	—	—
SDCF271100	325	400	400	400	400	400	400	—
SDCF271958	325	400	400	400	400	400	400	400
SDCF272358	325	400	400	400	400	400	400	400
0.50 ≤ SG								
SDCF22434	425	—	—	—	—	—	—	—
SDCF22512	425	425	—	—	—	—	—	—
SDCF22614	425	425	425	—	—	—	—	—
SDCF22700	425	425	425	550	—	—	—	—
SDCF22858	425	425	425	550	550	—	—	—
SDCF221014	425	425	425	550	550	—	—	—
SDCF221134	425	425	425	550	550	550	550	—
SDCF221334	425	425	425	550	550	550	550	550
SDCF27400	425	—	—	—	—	—	—	—
SDCF27614	425	650	650	—	—	—	—	—
SDCF27778	425	650	650	650	—	—	—	—
SDCF27912	425	650	650	650	650	—	—	—
SDCF271100	425	650	650	650	650	650	650	—
SDCF271958	425	650	650	650	650	650	650	650
SDCF272358	425	650	650	650	650	650	650	650

1. The main member and side members must be sawn lumber, glulam, or CLT with an assigned specific gravity (SG) as shown in the table above or an engineered wood product with a minimum grade of 1.3E and equivalent SG of at least 0.50.
2. Tabulated reference allowable 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 into the face or side grain of the wood main member with the screw axis at a 90-degree angle to the wood surface.
4. Minimum fastener penetration must be equal to the screw length less the thickness of the wood side member.
5. Tabulated reference lateral design values apply to combinations of parallel- and perpendicular-to-grain loading.

Strong-Drive® SDCF TIMBER-CF Screw (cont.)

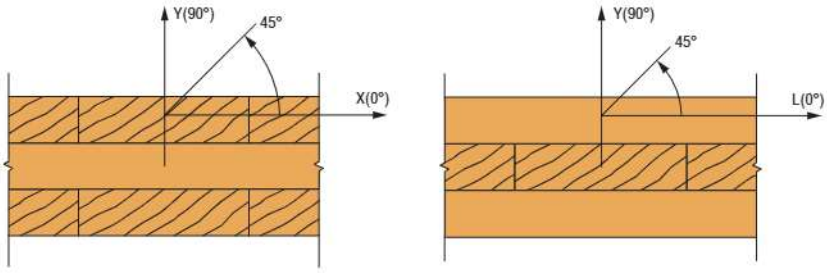
SDCF TIMBER-CF Screw — Allowable Withdrawal Design Values

Fastener Designation	Screw Length (in.)	Thread Length (in.)	Minimum Embedded Thread Length (in.)	Reference Allowable Lateral Design Value, W (lbf/in.)	
				0.42 ≤ SG < 0.50	0.50 ≤ SG
SDCF22434	4.72	4.29	3	200	265
SDCF22512	5.51	5.08			
SDCF22614	6.3	5.87			
SDCF22700	7.09	6.65			
SDCF22858	8.66	8.23			
SDCF221014	10.24	9.8			
SDCF221134	11.81	11.38			
SDCF221334	13.78	13.35			
SDCF27400	3.94	3.66	3	200	265
SDCF27614	6.3	6.02			
SDCF27778	7.87	7.6			
SDCF27912	9.45	9.17			
SDCF271100	11.02	10.75			
SDCF271958	19.69	19.41			
SDCF272358	23.62	23.35			

1. The tabulated reference allowable withdrawal design value, W, is in pounds per inch of the thread penetration into the side grain or face grain of the main member. Thread penetration is the portion of the threaded length held in the main member, including the screw point.
2. The tabulated reference withdrawal design value, W, is given for a load duration of C_D=1.0 and must be multiplied by all applicable adjustment factors from the NDS as referenced in the IBC or IRC.
3. Wood main members must have an assigned specific gravity (SG) as indicated in the table above or for engineered wood products, a minimum grade of 1.3E and equivalent SG of 0.50.
4. Reference allowable withdrawal values are for screws installed normal to the side grain of the wood members.

SDCF22 Withdrawal from CLT at 45° to the Y Surface

Withdrawal resistances from SPF and DF CLT were evaluated with the SDCF22 screws. Withdrawal resistance at 45° to the Y surface (90°) can be calculated using the reference withdrawal from the Y face (90°). The adjustments are the same for both orientations shown in the figure where the CLT orientation is based on the grain orientation of the surface laminates and follows that in ASTM D5456 for SCL. Minimum embedment length is 10D, where D is the major diameter, 0.315".



Withdrawal at 45° to YX Plane **Withdrawal at 45° to YL Plane**

Figure 1: Withdrawal in the YX and YL orientations for CLT where CLT orientation is based on the orientation of the surface laminates.

Specific Gravity (G)	Reference W (lb./in.) at 90°	45° Adjustment	Reference W at 45° (lb./in.)
0.42 ≤ G < 0.50	200	0.80	180
0.50 ≤ G	265	0.80	212

Minimum embedment length is 3.15".

Strong-Drive®
SDCF TIMBER-CF Screw (cont.)

SDCF TIMBER-CF Screw — Allowable Head Pull-Through Design Values (W_H)

Fastener Designation	Side Member Thickness (in.)	Reference Pull-Through Design Value, W_H (lb.)	
		0.42 ≤ SG < 0.50	0.50 ≤ SG
SDCF22434	1.5	320	360
SDCF22512			
SDCF22614			
SDCF22700			
SDCF22858			
SDCF221014			
SDCF221134			
SDCF221334			
SDCF27400	1.5	320	360
SDCF27614			
SDCF27778			
SDCF27912			
SDCF271100			
SDCF271958			
SDCF272358			

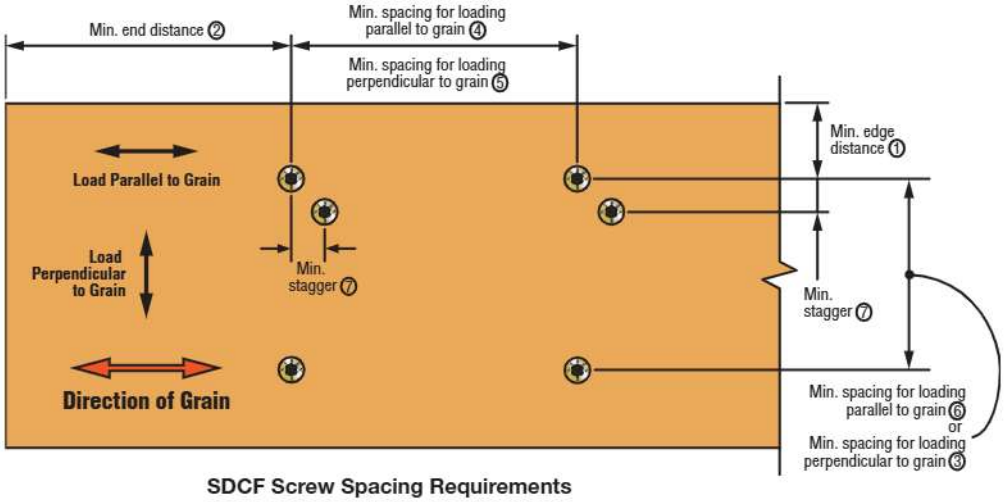
1. The side member must be solid-sawn lumber, glulam or CLT with an assigned specific gravity (SG) as indicated in the table above or for engineered wood products a minimum grade of 1.3E and equivalent SG of 0.50.
2. Tabulated reference allowable pull-through design values (W_H) must be multiplied by 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 into the face or side grain of the wood side member with the screw axis at a 90° angle to the wood surface.

Strong-Drive® SDCF TIMBER-CF Screw (cont.)

SDCF Screws Connection Geometry

Condition	Direction of Load to Grain	ID	Minimum Distance or Spacing (in.)
Edge Distance	Perpendicular	①	1¾
	Parallel	①	1¾
End Distance	Perpendicular	②	6
	Parallel	②	6
Spacing Between Fasteners in a Row	Perpendicular	③	4
	Parallel	④	8
Spacing Between Rows of Fasteners	Perpendicular	⑤	4
	Parallel	⑥	4
Spacing Between Staggered Rows	Perpendicular or Parallel	⑦	⅝

1. For SDCF22 screws subject to axial loading only, use the following minimum dimensions: end distance = 3¼", edge distance = 1⅜", spacing parallel to grain = 2¼", spacing perpendicular to grain = 1⅜".
2. For SDCF27 screws subject to axial loading only, use the following minimum dimensions: end distance = 4", edge distance = 1⅝", spacing parallel to grain = 2⅞", spacing perpendicular to grain = 2".



SDCF Screw Spacing Requirements

Compression Reinforcement

Strong-Drive SDCF TIMBER-CF Screws used for Compression Reinforcement Perpendicular to Grain in Glued-Laminated Timber (Glulam), Cross-Laminated Timber (CLT), and Heavy Timbers

Reinforcement perpendicular to grain may be needed in mass timber construction when large concentrated loads must be resisted or when there is a design need to minimize bearing area. Simpson Strong-Tie has evaluated the use of fully-threaded screws for the purpose of mechanical reinforcement perpendicular to the grain in glulam, CLT, and heavy timber. It has been shown that SDCF Timber-CF fully-threaded screws (SDCF22 and SDCF27) can be used for compression reinforcement perpendicular to grain.

The design practice for reinforcement perpendicular to grain using self-tapping, fully-threaded screws was developed in Europe for use with the Eurocode, which is a version of limit states design. Since the design practice was published, the method has been recited in many European Technical Assessments for European screw manufacturers and is being used by European engineers.

See TEB-F-SDCFCOMP for complete details and examples of the design practice that is compatible with the NDS and allowable stress methodology.

Also note, Installation Torque and Tools for Simpson Strong-Tie Strong Drive SDCF TIMBER-CF Screws and SDCP TIMBER-CP Screws (8 mm diameter).

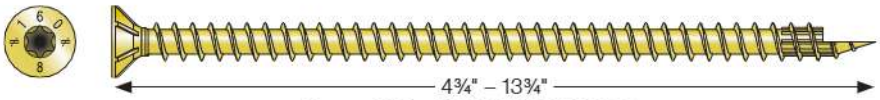
Simpson Strong-Tie evaluated the the alowable installation torque and the effect of driver tools on the SDCF Timber-CF and SDCP TIMBER-CP screws and the connections. For specifics on testing, limitations, and installation torques, see engineering letter L-F-MTINSTALL22.

Strong-Drive®
SDCF **TIMBER-CF** and SDCP **TIMBER CP** Seating Torque for Wood-to-Wood and Steel-to-Wood Connections

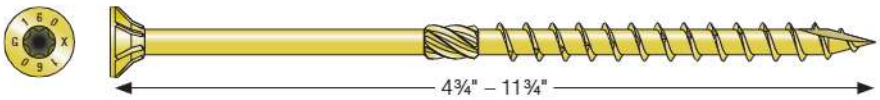
The SDCF22 and SDCP22 screws are used for wood-to-wood and steel-to-wood connections. The tightness (expressed by seating torque) and the effects of installation tool (drill motor and impact driver) were evaluated.

For the purposes of this discussion, the seating torque is the torsional load on the screw when the screw is driven tight to the side member. Seating torque is directly related to clamping force and tension force in the screw. When driven "tight," the screw head is countersunk for wood side members (top of head is flush with surface of side member). In a steel-to-wood connection, the steel member is the side member of the connection. It is predrilled and has a countersunk surface to receive the screw head in bearing when the head is driven into contact with the steel side member. For SDCF22 screws, allowable seating torque is controlled by allowable withdrawal or allowable screw tensile strength depending on wood specific gravity and screw length. Allowable seating torque is controlled by the allowable steel tensile strength for SDCF22 screws that are 10¼" and longer. For all SDCP22 screws, allowable seating torque is controlled by allowable withdrawal resistance. For softwood side members, the heads of the SDCF22 and SDCP22 should be countersunk so that the top of the head is flush to the surface of the side member. However, when driving to a steel side member, seating torques should be limited as shown in Table 1.

For more information, see p. 96 (SDCF) and p. 98 (SDCP), C-F-2023 *Fastening Systems* catalog



Strong-Drive SDCF TIMBER-CF Screw



Strong-Drive SDCP TIMBER-CP Screw

Recommended Seating Torque (lb.-in.) for SDCF22 and SDCF22 Screws Driven to Steel Side Members

Model	Screw Length (in.)	Recommended Seating Torques (lb.-in.)	
		0.42 ≤ G < 0.50	0.50 ≤ G
SDCF22434	4¾	95	125
SDCF22512	5½	110	145
SDCF22614	6¼	130	170
SDCF22700	7	150	190
SDCF22858	8⅝	180	220
SDCF221014 and longer	10¼	220	220
SDCP22434 and longer	4 ¾ and longer	70	75

1. For recommended seating torques for SDCF27, SDCP27, SDHR27, and SDHR31, see L-F-MTINSTALL22.

The effects of installation tools were evaluated by installing SDCF22 and SDCP22 screws in wood-to-wood and steel-to-wood connections with either a drill motor or an impact driver tool. The properties evaluated were withdrawal resistance, seating torque, and tensile strength of the screws. The testing used wood that was air-dry (moisture content approximately 10%) and the species combinations used for testing were spruce-pine-fir and Douglas fir–larch. The impact driver tool had a hammer frequency of 0-3,600 impacts per minute. Screws were driven at the maximum clutch settings on the tools.

Testing showed that the withdrawal resistance of the connection and the tensile strength of the screws were not affected by the driver tool. When using the impact driver tool to drive screws for wood-to-wood connections, caution must be exercised to prevent countersinking deeper than the top of head being flush to the wood side member surface. For steel-to-wood connections, the impact driver tool can seat the screw at a seating torque that exceeds the allowable seating torque for screws shorter than 8⅝", and this can strip the wood thread path and damage withdrawal resistance of the screw. As a result, the impact driver tools should have a clutch setting that is calibrated so that allowable seating torque is not exceeded.

In summary, SDCF22 and SDCP22 screws up to 10¼" can be driven to the allowable seating torques with either drill motors or impact driver tools in air-dry wood materials. The use of impact driver tools for wood-to-wood connections requires special attention to prevent overdriving, and for steel-to-wood connections, caution is needed to prevent exceeding the allowable seating torque. For SDCF22 and SDCP22 screws longer than 10¼", a drill motor should be used for installation.