www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

ICC-ES Evaluation Report
ESR-4480

Reissued June 2023

This report is subject to renewal June 2024.

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

REPORT HOLDER:

SFS GROUP USA, INC.

ADDITIONAL LISTEE:

HECO-SCHRAUBEN GMBH & CO. KG

EVALUATION SUBJECT:

CONNEXTITE HT SCREWS
CONNEXTITE WR SCREWS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012 and 2009 *International Building Code®* (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code®* (IRC)

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see ESR-4480 CBC and CRC Supplement.

Property evaluated:

Structural

2.0 USES

The ConnexTite HT and ConnexTite WR screws described in this report are alternate dowel-type, multi-purpose screws used in engineered wood-to-wood connection applications. For structures regulated under the IRC, the screws may be used where an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 General:

COMPANY NAME	PRODUCT NAME
SFS GROUP USA, INC.	ConnexTite HT Screws ConnexTite WR Screws
HECO-Schrauben GmbH & Co. KG	TOPIX Screws HECO-WR

The ConnexTite HT screws are proprietary, fully (FT) and partially (PT) threaded self-tapping fasteners with a proprietary drill point. They are available with flange (FH) and countersunk (CS) heads. The screws have a T-drive or HD (proprietary) recess. ConnexTite WR screws are proprietary, fully threaded self-tapping fasteners with a proprietary drill point and a countersunk head. The screws have a T-drive recess. See Table 1 for designations and dimensions of the screws covered in this report.

3.2 Coating:

The ConnexTite HT screws have a zinc plating, the ConnexTite WR screws have a proprietary Durocoat® finish and are intended for interior, dry use only.

3.3 Material:

3.3.1 ConnexTite HT and ConnexTite WR Screws: The screws are manufactured from carbon steel wire and are heat-treated to achieve case and core hardness in accordance with the manufacturer's specifications.

3.3.2 Wood Members: For purposes of connection design, sawn lumber members must have an assigned specific gravity as indicated in the tables in this report. Assigned specific gravity for sawn lumber must be determined in accordance with Table 12.3.3A of the ANSI/AWC National Design Specification for Wood Construction® (NDS) (Table 11.3.3A of the NDS for the 2012 IBC, Table 11.3.2 of the NDS for the 2009 IBC). Unless otherwise noted, sawn lumber members must have a moisture content of 19 percent or less.

For the purposes of connection design, structural glued laminated timber (GL) must have a Specific Gravity for Fastener Design (addressed in Tables 5A through 5D of the NDS Supplement), as indicated in the tables in this report. Unless otherwise noted, GL must have a moisture content of less than 16 percent.

When designing connections with screws installed into the face of cross-laminated timber (CLT) panels fabricated with sawn lumber laminations, all of the laminations must have a minimum assigned specific gravity in accordance with the NDS, as indicated in the tables in this report. Moisture content must be less than 16 percent.

Use of the screws in engineered wood products (EWP) other than those addressed above is outside the scope of this report.

For wood-to-wood connections, the tabulated side member thickness, t_s, is an absolute value (not a minimum or maximum value). The thickness of the wood main

member, t_m, must be equal to or greater than the screw length less the thickness of the side member.

4.0 DESIGN AND INSTALLATION

4.1 Design – General:

The design values in this report are intended to aid the designer in meeting the requirements of IBC Section 1604.2. For connections not completely described in this report, determination of the suitability of the ConnexTite HT and ConnexTite WR screws for the specific application is the responsibility of the registered design professional and is outside the scope of this report. The registered design professional is responsible for determining the available strengths for the connection, considering all applicable limit states, and for considering serviceability issues.

4.1.1 Screw Strength: For ConnexTite HT and ConnexTite WR screws the allowable tensile strength and the specified bending yield strength are shown in Table 2.

4.1.2 Adjustments to Reference Design Values: The reference design values must be adjusted in accordance with the requirements for dowel-type fasteners in Section 11.3 of the NDS (Section 10.3 of the NDS for the 2012 and 2009 IBC). The reference design values must also be adjusted in accordance with Section 12.5 of the NDS (Section 11.5 of the NDS for the 2012 and 2009 IBC), as applicable. When the capacity of a connection is controlled by the fastener strength, the allowable connection strength must not be increased by the adjustment factors specified in the NDS.

4.1.3 Capacity Requirements for Wood Members: When designing a connection, the structural members must be checked for load-carrying capacity in accordance with Section 11.1.2 of the NDS (Section 10.1.2 of the NDS for the 2012 and 2009 IBC), and local stresses within the connection must be checked against Appendix E of the NDS to ensure the capacity of the connection and fastener group.

4.1.4 Connections with Multiple Screws: Connections containing multiple screws must be designed in accordance with Sections 11.2.2 and 12.6 of the NDS (Sections 10.2.2 and 11.6 of the NDS for the 2012 and 2009 IBC).

4.1.5 Reference Withdrawal and Pull-through Design Values for ConnexTite HT screws: Reference withdrawal (W) design values in pounds per inch of thread penetration l into the side grain of the main member are shown in Table 3.1 and Table 3.2. The reference design load values are calculated using equation (1) and must be less than the allowable tensile strength of the screw.

$$W_{load} = Wl \text{ [lbs]} \quad (1)$$

Reference pull-through (W_H) design values are shown in Table 3.3, Table 3.4 and Table 3.5. For fully threaded ConnexTite HT screws pull-through design load values ($W_{load,H,t}$) for a single fastener are calculated using the reference withdrawal design value W multiplied with the side member thickness t_s as shown in equation (2). The minimum side panel thickness must be greater than NDS requirements and the reference design values pull-through must be less than the allowable tensile strength of the screw.

Pull-through load (fully threaded)

$$W_{load,H,t} = Wt_s \quad \text{[lbs]} \quad (2)$$

4.1.6 Reference Withdrawal and Pull-through Design Values for ConnexTite WR screw: Reference withdrawal and pull-through design values (W) in pounds per inch of thread penetration into the side grain of the main member are shown in Table 3.6. The minimum embedment l_m for withdrawal is 4 inches. The withdrawal load W_{loadt} for ConnexTite WR screws can be calculated as shown in equation (3).

Withdrawal load (fully threaded)

$$W_{load} = Wl_m \ ; \ l_m \geq 4\,inches \quad \text{[lbs]} \quad (3)$$

Pull-through load $W_{load,H,t}$ for a single fastener is calculated using the reference withdrawal design value W multiplied with the embedded effective screw length, neglecting the overall size of the head and the smooth shank portion of 1 inch, as shown in equation (4). The minimum side panel thickness t_s must be 4 inches and never be smaller than NDS requirements

Pull-through load (fully threaded)

$$W_{load,H,t} = W(t_s - 1) \ ; \ t_s \geq 4\,inches \quad \text{[lbs]} \quad (4)$$

The pull-through load values for withdrawal and pull-through may never by greater than the allowable tensile strength of the screw.

4.1.7 Lateral Connections in Accordance with the NDS: The reference lateral design strength for connections of two or more wood members using ConnexTite HT and ConnexTite WR screws may be designed in accordance with the NDS, subject to the following conditions:

1. The applicable specified bending yield strength from Tables 2 must be used for design.
2. The minor thread diameter, D_r, must be used to determine R_d and K_D in accordance with Table 12.3.1B of the NDS, the dowel bearing strength in accordance with Table 12.3.3 of the NDS and the reference lateral design value based on Table 12.3.1A of the NDS (Tables 11.3.1B, 11.3.3 and 11.3.1 A of the 2012 NDS for the 2015 IBC; Tables 11.3.1B, 11.3.2 and 11.3.1A of the 2005 NDS for the 2009 IBC).
3. The screw penetration into the main member must be a minimum of 6 times the major thread diameter.
4. Spacing, edge and end distance must be in accordance with Table 5, and as needed to prevent splitting of the wood.

4.1.8 Reference Lateral Design Values for ConnexTite HT: Reference lateral (Z) design values for single shear, wood-to-wood connections loaded perpendicular to the grain are shown in Table 4 and must be adjusted by all applicable adjustment factors. Design values for connections of three or more plies are outside the scope of this evaluation report.

4.1.9 Combined Loading: Where the screws are subjected to combined lateral and withdrawal loads, connections shall be designed in accordance with Section 12.4.1 of the NDS (Section 11.4.1 of the NDS for the 2012 and 2009 IBC).

4.2 Installation:

ConnexTite HT and ConnexTite WR screws must be installed in accordance with the report holder's published installation instructions and this report. The screws must be installed perpendicular to the face of the wood member (unless otherwise specified). Screws must be installed with the minimum spacing, end distances, and edge distances needed to prevent splitting of the wood or as noted in Table 5, whichever is more restrictive. For the (applicable products), the underside of the integral washer must bear against the surface of the wood side member or steel plate. For the (applicable products), the underside of the flat head must bear against the surface of the wood side member or steel plate. For the (applicable products), the top of the screw head must be flush with the surface of the wood side

member. Screws must not be overdriven. The screws must be installed by turning with a power driver, not by driving with a hammer.

5.0 CONDITIONS OF USE

The ConnexTite HT and ConnexTite WR 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 The screws must be installed in accordance with the report holder's published installation instructions and this report. In the case of a conflict between this report and the report holder's instructions, this report governs.

5.2 Design loads for the screws must not exceed the available strengths described in Section 4.1.

5.3 Calculations and details demonstrating compliance with this report must be submitted to the code official. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 The screws have only been evaluated for use in dry service applications. Use in wet service conditions is outside the scope of this report.

5.5 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this evaluation report.

5.6 Use of the ConnexTite HT and ConnexTite WR screws in contact with preservative-treated or fire-retardant-treated wood is outside the scope of this report.

5.7 The screws are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Dowel-type Threaded Fasteners Used in Wood (AC233), dated October 2020.

7.0 DENTIFICATION

7.1 Labels shall be in accordance with the product identification provisions of the ICC-ES Rules of Procedure for Evaluation Reports and shall include the following information: The screws are identified by a "H" on the head of each screw. Packages of screws are identified with the company name (SFS Group USA) and address, the brand name (ConnexTite HT), and the screw type and size (diameter and length).

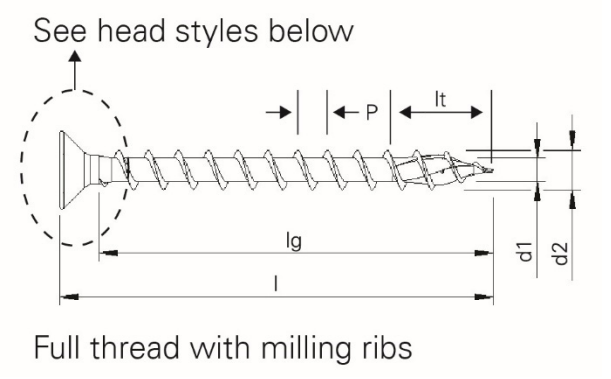
7.2 The report holder's contact information is the following:

SFS GROUP USA, INC.
1045 SPRING STREET
WYOMISSING, PENNSYLVANIA 19610
(610) 376-5751
www.sfsintecusa.com

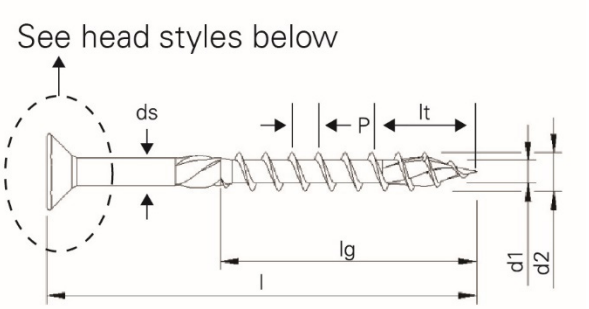
7.3 The additional listee's contact information is the following:

HECO-SCHRAUBEN GMBH & CO. KG
DR.-KURT-STEIM-STRASSE 28
78713 SCHRAMBERG
GERMANY
www.heco-schrauben.com

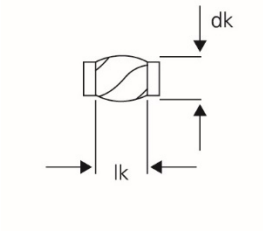
Thread Designs



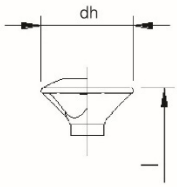
Full thread with milling ribs



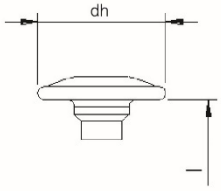
Part thread with shank ribs and milling ribs



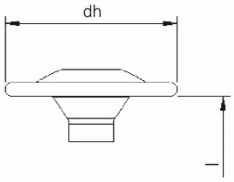
Head Styles



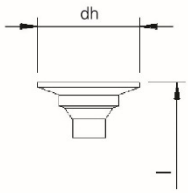
Flat countersunk head 90° with and without raised head, with and without milling pockets



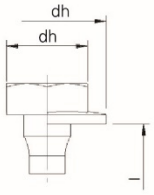
Raised flange head



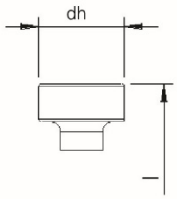
Raised flange head with big washer



Flat flange head with and without milling ribs

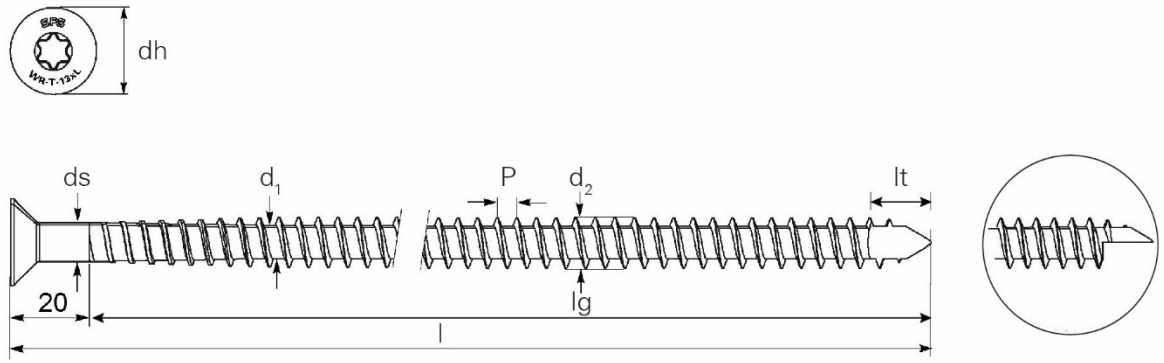


Hexagon head with and without washer



Cylindrical Head

ConnexTite™ WR Thread Design and Head Styles



alternative head geometry

300 mm ≤ L ≤ 1000 mm

TABLE 1—CONNEXTITE HT AND CONNEXTITE WR SCREWS DIMENSIONS

		Fastener Diameter							
		ConnexTite HT						ConnexTite WR	
		6	***1/4"***	**8**	***5/16"***	**10**	***3/8"***	**13**	***1/2"***
	Product Feature	mm	*in*	mm	*in*	mm	*in*	mm	*in*
	Min. Length (l)	40	*1- 5/8"*	80	*3- 1/8"*	80	*3- 1/8"*	400	*14- 15/16*
	Max. Length (l)	300	*11- 7/8"*	500	*19- 5/8"*	500	*19- 5/8"*	1000	*38- 9/16"*
	Thread Length (lg)	*See Product Catalog*							
	Tip Length (lt)	9.7	*0.381"*	13.4	*0.527"*	16.1	*0.633"*	16.5	*0.650"*
	Minor Diameter (d1)	3.75	*9/64"*	5.2	*3/16"*	6.25	*1/4"*	8.5	*5/16"*
	Major Diameter (d2)	6	*1/4"*	8	*5/16"*	10	*3/8"*	13	*1/2"*
	Shank Diameter (ds)	4.45	*11/64"*	5.8	*7/32"*	7	*1/4"*	10	*3/8"*
	Thead Pitch (p)	4.5	*11/64"*	6	*1/4"*	7.5	*1/4"*	3.2	*1/8"*
	Knurl Diameter (dk)	4.9	*3/16"*	6.3	*1/4"*	8	*5/16"*	n/a	*n/a*
	Knurl Length (lk)	8	*5/16"*	12	*3/8"*	12	*3/8"*	n/a	*n/a*
	Fastener Drive	T25		T40*		T40*		T50	
Head Diameter (d)	Flat countersunk head 90°	11.8	*1/2"*	14.8	*5/8"*	18.5	*3/4"*	22	*7/8"*
	Flat flange head	14	*9/16"*	17.5	*11/16"*	22.5	*7/8"*	n/a	*n/a*
	Raised flange head	14	*9/16"*	18	*11/16"*	22.5	*7/8"*	n/a	*n/a*
	Raised flange head, big washer	n/a	*n/a*	23	*7/8"*	n/a	*n/a*	n/a	*n/a*
	Cylinder Head	8	*5/16"*	12	*1/2"*	14	*9/16"*	12	*1/2"*
	Hexagon head, no washer*	n/a	*n/a*	13	*1/2"*	15	*5/8"*	n/a	*n/a*
	Hexagon head, with washer*	n/a	*n/a*	19	*3/4"*	21	*13/16"*	n/a	*n/a*

*Hexagon head and hexagon head with washer have 13 mm hex drive with T40 internal drive and 15 mm hex drive with T40 internal drive for diameters 8 mm and 10 mm, respectively.

TABLE 2—CONNEXTITE HT AND CONNEXTITE WR SCREW SPECIFICATIONS AND STRENGTHS

SCREW TYPE	NOMINAL DIAMETER (inch)	OUTSIDE THREAD DIAMETER (inch)	SHANK DIAMETER (inch)	MINOR THREAD DIAMETER (inch)	HEAD DIAMETER (inch)	NOMINAL BENDING YIELD STRENGTH F_{yb} (kpsi)		ALLOWABLE STEEL STRENGTH
						Transition Zone	Shank	Tensile (lbf)
ConnexTite HT Flange Head	1/4 (6mm)	0.244	0.173	0.148	0.551	201.6	237.0	972
	5/16 (8mm)	0.315	0.228	0.207	0.689	167.9	178.9	1810
	3/8 (10mm)	0.393	0.279	0.253	0.886	156.1	203.1	2546
ConnexTite HT XL Head	5/16 (8mm)	0.315	0.228	0.207	0.906	167.9	178.9	1810
ConnexTite HT Hex Head with washer	5/16 (8mm)	0.315	0.228	0.207	0.748	167.9	178.9	1810
	3/8 (10mm)	0.393	0.279	0.253	0.827	156.1	203.1	2546
ConnexTite HT Hex Head without washer	5/16 (8mm)	0.315	0.228	0.207	0.512	167.9	178.9	1810
	3/8 (10mm)	0.393	0.279	0.253	0.591	156.1	203.1	2546
ConnexTite HT Countersunk	1/4 (6mm)	0.244	0.173	0.148	0.465	201.6	237.0	972
	5/16 (8mm)	0.315	0.228	0.207	0.583	167.9	178.9	1810
	3/8 (10mm)	0.393	0.279	0.253	0.728	156.1	203.1	2546
ConnexTite HT Cylindrical Head	1/4 (6mm)	0.244	0.173	0.148	0.313	201.6	237.0	972
	5/16 (8mm)	0.315	0.228	0.207	0.500	167.9	178.9	1810
	3/8 (10mm)	0.393	0.279	0.253	0.563	156.1	203.1	2546
ConnexTite WR 13	1/2 (13mm)	0.512	NA	0.335	0.866	161.2	NA	4547

For **SI:** 1 inch = 25.4 mm; 1 psi = 6.89 kPa; 1 lbf = 4.45 N.

TABLE 3.1—REFERENCE WITHDRAWAL (*W*) VALUES[1] FOR CONNEXTITE HT

SCREW TYPE	NOMINAL DIAMETER inch (mm)	WITHDRAWAL *W* (LBF/ IN.)[2]		
		FOR SPECIFIC GRAVITIES OF:		
		0.42	0.50	0.55
ConnexTite HT Flange Head	1/4 (6 mm)	130	167	190
	5/16 (8 mm)	175	221	250
	3/8 (10 mm)	188	235	265
ConnexTite HT XL Head	5/16 (8 mm)	175	221	250
ConnexTite HT Hex Head with washer	5/16 (8 mm)	175	221	250
	3/8 (10 mm)	188	235	265
ConnexTite HT Hex Head without washer	5/16 (8 mm)	175	221	250
	3/8 (10 mm)	188	235	265
ConnexTite HT Countersunk	1/4 (6 mm)	130	167	190
	5/16 (8 mm)	175	221	250
	3/8 (10 mm)	188	235	265
ConnexTite HT Cylindrical Head	1/4 (6 mm)	130	167	190
	5/16 (8 mm)	175	221	250
	3/8 (10 mm)	188	235	265

For **SI:** 1 inch = 25.4 mm; 1 psi =6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Reference withdrawal design load values W_{load} are calculated based on equation (1).

TABLE 3.2—REFERENCE WITHDRAWAL (*W*) DESIGN VALUES[1] FOR CONNEXTITE HT IN BEECH LVL

SCREW TYPE	NOMINAL DIAMETER inch (mm)	WITHDRAWAL *W* (LBF/ IN.)[2] FOR SPECIFIC GRAVITY OF: 0.79
ConnexTite HT Flange Head	1/4 (6 mm)	300
	5/16 (8 mm)	389
	3/8 (10 mm)	406
ConnexTite HT XL Head	5/16 (8 mm)	389
ConnexTite HT Hex Head with washer	5/16 (8 mm)	389
	3/8 (10 mm)	406
ConnexTite HT Hex Head without washer	5/16 (8 mm)	389
	3/8 (10 mm)	406
ConnexTite HT Countersunk	1/4 (6 mm)	300
	5/16 (8 mm)	389
	3/8 (10 mm)	406
ConnexTite HT Cylindrical Head	1/4 (6 mm)	300
	5/16 (8 mm)	389
	3/8 (10 mm)	406

For **SI:** 1 inch = 25.4 mm; 1 psi =6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Reference withdrawal design load values W_{load} are calculated based on equation (1).

TABLE 3.3—REFERENCE PULL-THROUGH (W_H) DESIGN VALUES[1] FOR CONNEXTITE HT (partially threaded)

SCREW TYPE	NOMINAL DIAMETER inch (mm)	NOMINAL HEAD DIAMETER (inch)	PARTIALLY THREADED HEAD PULL-THROUGH LOAD W_H (LBF)[2]		
			FOR SPECIFIC GRAVITIES OF:		
			0.42	0.50	0.55
ConnexTite HT Flange Head	1/4 (6 mm)	0.551	159	183	198
	5/16 (8 mm)	0.689	239	339	410
	3/8 (10 mm)	0.886	239	339	410
ConnexTite HT XL Head	5/16 (8 mm)	0.906	239	339	410
ConnexTite HT Hex Head with washer	5/16 (8 mm)	0.748	239	339	410
	3/8 (10 mm)	0.827	239	339	410
ConnexTite HT Hex Head without washer	5/16 (8 mm)	0.512	138	158	171
	3/8 (10 mm)	0.591	183	211	227
ConnexTite HT Countersunk	1/4 (6 mm)	0.465	113	130	141
	5/16 (8 mm)	0.583	178	205	221
	3/8 (10 mm)	0.728	239	339	410
ConnexTite HT Cylindrical Head	1/4 (6 mm)	0.313	*n/a*	*n/a*	*n/a*
	5/16 (8 mm)	0.500	*n/a*	*n/a*	*n/a*
	3/8 (10 mm)	0.563	*n/a*	*n/a*	*n/a*

For **SI:** 1 inch = 25.4 mm; 1 psi =6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Based on a minimum side member thickness of 1-3/8 inches (35 mm).

TABLE 3.4—REFERENCE PULL-THROUGH (*W*) DESIGN VALUES[1] FOR CONNEXTITE HT (fully threaded)

SCREW TYPE	NOMINAL DIAMETER inch (mm)	NOMINAL HEAD DIAMETER (inch)	FULLY THREADED PULL-THROUGH *W* (LBF / IN)[2]		
			FOR SPECIFIC GRAVITIES OF:		
			0.42	0.50	0.55
ConnexTite HT Flange Head	1/4 (6 mm)	0.551	130	167	190
	5/16 (8 mm)	0.689	175	221	250
	3/8 (10 mm)	0.886	188	235	265
ConnexTite HT XL Head	5/16 (8 mm)	0.906	*n/a*	*n/a*	*n/a*
ConnexTite HT Hex Head with washer	5/16 (8 mm)	0.748	*n/a*	*n/a*	*n/a*
	3/8 (10 mm)	0.827	*n/a*	*n/a*	*n/a*
ConnexTite HT Hex Head without washer	5/16 (8 mm)	0.512	*n/a*	*n/a*	*n/a*
	3/8 (10 mm)	0.591	*n/a*	*n/a*	*n/a*
ConnexTite HT Countersunk	1/4 (6 mm)	0.465	130	167	190
	5/16 (8 mm)	0.583	175	221	250
	3/8 (10 mm)	0.728	188	235	265
ConnexTite HT Cylindrical Head	1/4 (6 mm)	0.313	130	167	190
	5/16 (8 mm)	0.500	175	221	250
	3/8 (10 mm)	0.563	188	235	265

For **SI:** 1 inch = 25.4 mm; 1 psi =6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Reference pull-through design load values $W_{load,H,t}$ are calculated based on equation (2).

TABLE 3.5—REFERENCE PULL-THROUGH (W_H) DESIGN VALUES[1] FOR CONNEXTITE HT (for t_s= 1-3/8 inch) IN BEECH LVL

SCREW TYPE	NOMINAL DIAMETER inch (mm)	NOMINAL HEAD DIAMETER (inch)	PARTIALLY THREADED HEAD PULL-THROUGH LOAD W_H (LBF)[2]	FULLY THREADED PULL-THROUGH LOAD W_H (LBF)[2]
			FOR SPECIFIC GRAVITIES OF:	FOR SPECIFIC GRAVITIES OF:
			0.79	0.79
ConnexTite HT Flange Head	1/4 (6 mm)	0.551	486	486
	5/16 (8 mm)	0.689	746	746
	3/8 (10 mm)	0.886	1025	1025
ConnexTite HT XL Head	5/16 (8 mm)	0.906	746	746
ConnexTite HT Hex Head with washer	5/16 (8 mm)	0.748	746	746
	3/8 (10 mm)	0.827	1025	1025
ConnexTite HT Hex Head without washer	5/16 (8 mm)	0.512	486	486
	3/8 (10 mm)	0.591	746	746
ConnexTite HT Countersunk	1/4 (6 mm)	0.465	486	486
	5/16 (8 mm)	0.583	746	746
	3/8 (10 mm)	0.728	1025	1025
ConnexTite HT Cylindrical Head	1/4 (6 mm)	0.313	*n/a*	412
	5/16 (8 mm)	0.500	*n/a*	534
	3/8 (10 mm)	0.563	*n/a*	559

For **SI:** 1 inch = 25.4 mm; 1 psi =6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Based on a minimum side member thickness of 1-3/8 inches (35 mm).

TABLE 3.6—REFERENCE WITHDRAWAL[2] (*W*) AND PULL-THROUGH[3] (*W*) DESIGN VALUES[1] FOR CONNEXTITE WR 13

SCREW TYPE	NOMINAL DIAMETER inch (mm)	WITHDRAWAL *W* (LBF / IN.)[2]			FULLY THREADED PULL-THROUGH *W* (LBF / IN.)[3]		
		FOR SPECIFIC GRAVITIES OF:			FOR SPECIFIC GRAVITIES OF:		
		0.42	0.50	0.55	0.42	0.50	0.55
ConnexTite WR 13	1/2 (13mm) pre-drilled and non-pre-drilled	261			261		

For **SI:** 1 inch = 25.4 mm; 1 psi =6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Reference withdrawal design load values W_{load} are calculated based on equation (3).
[3]Reference pull-through design load values $W_{load,H,t}$ are calculated based on equation (4).

TABLE 4—EXAMPLE REFERENCE LATERAL DESIGN VALUES (*Z*) FOR SINGLE SHEAR (TWO-MEMBER) CONNECTIONS FOR CONNEXTITE HT
[For Sawn Lumber with Both Members of Identical Specific Gravity][1,2]

CONNEXTITE HT SCREW TYPE	NOMINAL DIAMETER d_{nom} (inch)	SIDE MEMBER THICKNESS, t_s (inches)	MINIMUM FASTENER LENGTH[3], L (inches)	REFERENCE LATERAL DESIGN VALUE, *Z* (lbf) FOR SPECIFIC GRAVITIES OF	
				G=0.42	G=0.5
				PARALLEL TO GRAIN, $Z_{\parallel}$	PARALLEL TO GRAIN, $Z_{\parallel}$
	1/4 (6mm)	1.5	3.0	132	172
	5/16 (8mm)	1.5	3.5	182	246
	3/8 (10mm)	1.5	4.0	260	302
	5/16 (8mm)	2.5	4.5	208	269
	3/8 (10mm)	3.5	6.0	313	341

For **SI:** 1 inch = 25.4 mm; 1 psi = 6.89 kPa; 1 lbf = 4.45 N.

[1]Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.
[2]Tabulated reference lateral design values, *Z*, apply to screws driven into the side grain of the main member, such that the screws are oriented perpendicular to the grain and loaded as follows: $Z_{\parallel}$: Both side and main members loaded parallel to grain.
[3]Assuming a minimum fastener penetration of $6d_{max}$.

TABLE 5—CONNECTION GEOMETRY REQUIREMENTS FOR FASTENERS INSTALLED PERPENDICULAR TO THE FACE OF WOOD MEMBERS[1,2,3,5]

CONDITION			MINIMUM DISTANCE OR SPACING		
			Self-drilled		Predrilled Hole
			G < 0.50	0.50 > G	
For alternate dowel-type threaded fasteners with a shank diameter of less than 1/4 inch, installed into sawn lumber, structural glued laminated timber (GL) and cross laminated timber (CLT) panels					
End distance (see Figure 1)	Tension loading parallel to grain (fastener bearing toward end)		15D	20D	12D
	Compression loading parallel to grain (fastener bearing away from end)		10D	15D	7D
	Loading perpendicular to grain		10D	15D	7D
	Axial loading (fastener withdrawal or pull-through)		10D	10D	7D
Edge distance (see Figure 2)	Loading parallel to grain		5D	7D	3D
	Loading perpendicular to grain	Load toward edge	10D	12D	7D
		Load away from edge	5D	7D	3D
	Axial Loading		4D	4D	3D
Spacing between fasteners in a row (parallel to grain of main member) (see Figure 3)	Loading parallel to grain		15D	15D	10D
	Loading perpendicular to grain		12D	15D	5D
	Axial loading		7D	7D	7D
Spacing between rows (perpendicular to grain of main member) (see Figure 3)	Lateral loading	In-line rows	5D	7D	4D
		Staggered rows[4]	2.5D	3D	2.5D
	Axial loading		4D	4D	3D
For alternate dowel-type threaded fasteners with a shank diameter equal to or greater than 1/4 inch, installed into sawn lumber, structural glued laminated timber (GL) and cross laminated timber (CLT) panels					
End distance (see Figure 1)	Tension loading parallel to grain (fastener bearing toward end)		15D	20D	7D
	Compression loading parallel to grain (fastener bearing away from end)		10D	15D	4D
	Loading perpendicular to grain		10D	15D	4D
	Axial loading		10D	10D	4D
Edge distance (see Figure 2)	Loading parallel to grain		5D	7D	3D
	Loading perpendicular to grain	Load toward edge	10D	12D	4D
		Load away from edge	5D	7D	3D
	Axial Loading		4D	4D	3D
Spacing between fasteners in a row (parallel to grain of main member) (see Figure 3)	Loading parallel to grain		15D	15D	5D
	Loading perpendicular to grain		12D	15D	5D
	Axial loading		7D	7D	5D
Spacing between rows (perpendicular to grain of main member) (see Figure 3)	Loading parallel to grain		5D	7D	5D
	Loading perpendicular to grain		5D	5D	5D
	Axial loading		5D	5D	5D

For **SI:** 1 inch = 25.4 mm.

[1] End distances, edge distances and fastener spacing must be sufficient to prevent splitting of the wood, or as required by this table, whichever is the more restrictive.

[2] Wood member stresses must be checked in accordance with Section 11.1.2 and Appendix E of the NDS, and end distances, edge distances and fastener spacing may need to be increased accordingly.

[3] D refers to the outside thread diameter.

~~2~~[4] Values for spacing between staggered rows apply where fasteners in adjacent rows are offset by half of the spacing between fasteners in a row.

[5] Values in Table 6 are applicable for both wood-to-wood and steel-to-wood connections, unless test data is submitted supporting alternative values.

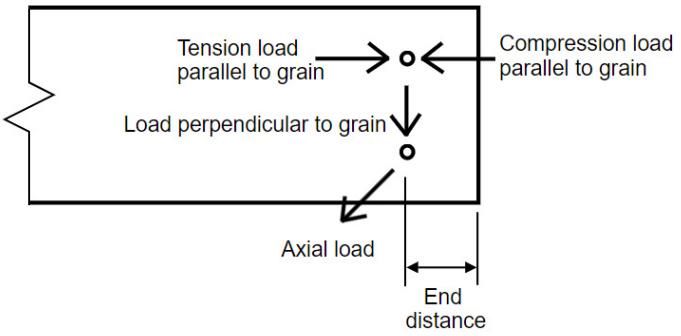


FIGURE 1—END DISTANCE DEFINITIONS

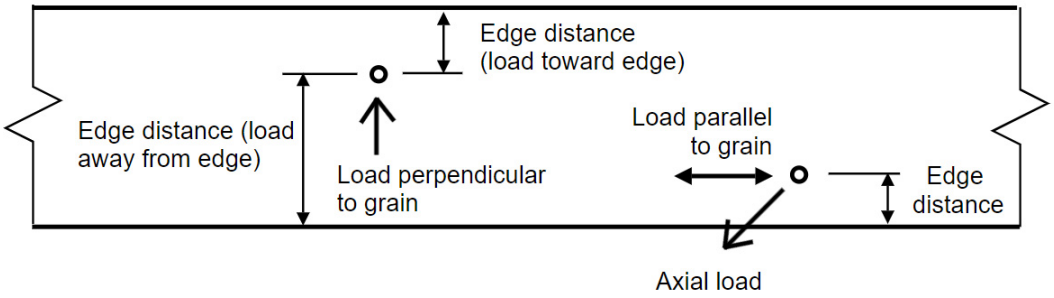


FIGURE 2—EDGE DISTANCE DEFINITIONS

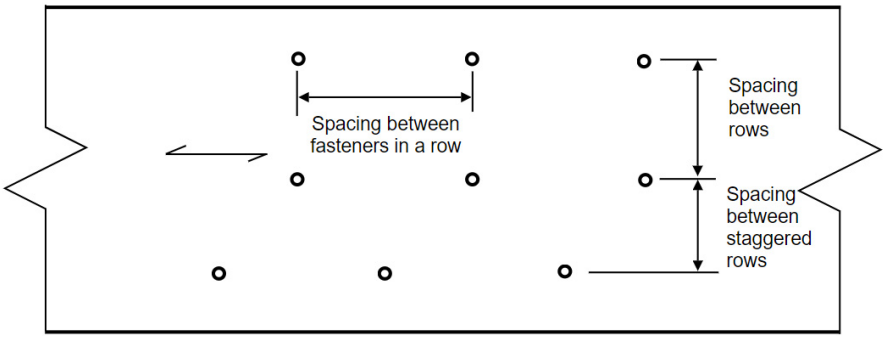
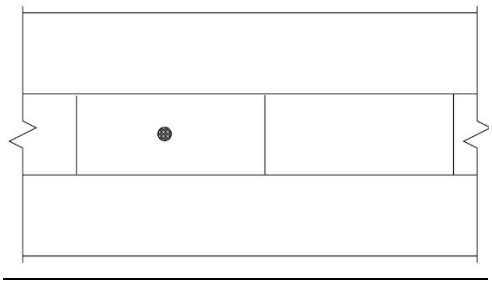
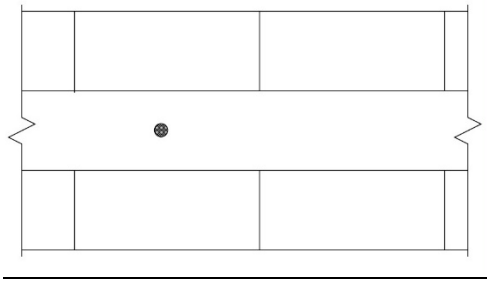


FIGURE 3—SPACING DEFINITIONS



Fastener Installed into End Grain of Lamination at CLT Edge



Fastener installed into Side Grain of Lamination at CLT Edge

FIGURE 4—CLT EDGE INSTALLATION FOR TESTING

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

REPORT HOLDER:

SFS GROUP USA, INC.

EVALUATION SUBJECT:

CONNEXTITE HT SCREWS AND CONNEXTITE WR SCREWS

COMPANY NAME	PRODUCT NAME
SFS GROUP USA, INC.	ConnexTite HT Screws ConnexTite WR Screws
HECO-Schrauben GmbH & Co. KG	TOPIX Screws HECO-WR

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the ConnexTite HT screws, described in ICC-ES evaluation report ESR-4480, have also been evaluated for compliance with the code*(s)* noted below.

Applicable code editions:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The ConnexTite HT screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-4480, comply with CBC Chapter 23, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 16, as applicable.

2.1.1 OSHPD: The ConnexTite HT screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-4480, comply with CBC amended Chapters 16 and 23, and Chapter 16A provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of this supplement: All loads applied shall be determined by the registered design professional and shall comply with applicable loads and load combinations from CBC amended sections in Chapter 16 [OSHPD 1R, 2, 3 and 5] and 16A [OSHPD 1 and 4].

2.1.2 DSA: The ConnexTite HT screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-4480, comply with CBC amended Chapters 16 and 23, and Chapter 16A provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of this supplement: All loads applied shall be determined by the registered design professional and shall comply with applicable loads and load combinations from CBC amended sections in Chapter 16 [DSA-SS/CC] and 16A [DSA/SS].

2.2 CRC:

The ConnexTite HT screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-4480, comply with CRC Chapter 3, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report reissued June 2023.