

## Listing and Technical Evaluation Report™

Report No: 1609-08



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### SFS Group USA, Inc. ConnexTite™ Fasteners

Trade Secret Report Holder:

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### CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 05 23 - Wood, Plastic, and Composite Fastenings

#### 1 Innovative Product Evaluated<sup>1</sup>

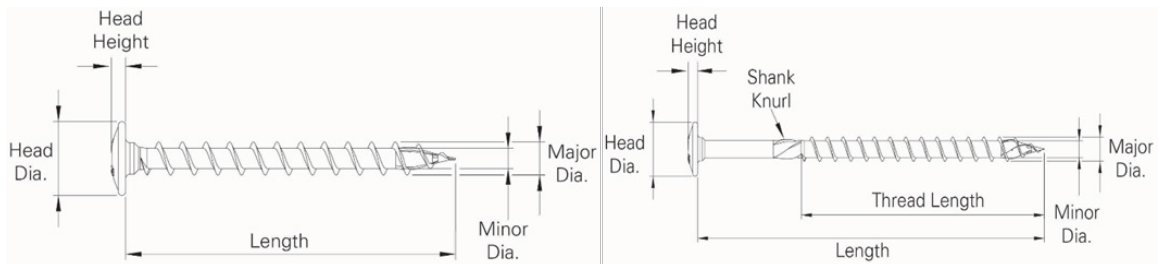
1.1 SFS Group USA, Inc. ConnexTite Fasteners

#### 2 Product Description and Materials

2.1 The innovative product evaluated in this report is shown in **Figure 1**, **Figure 2**, **Figure 3** and **Figure 4**.



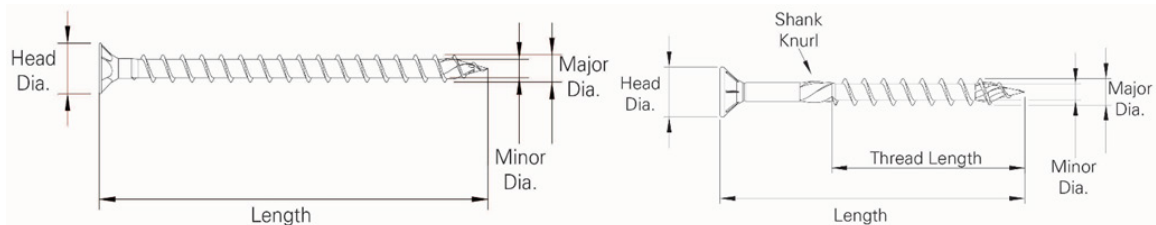
**Figure 1.** ConnexTite Fasteners Flange Head Detail



**Figure 2.** ConnexTite Fasteners Flange Head Fully Threaded and Partially Threaded Fastener Details



**Figure 3. ConnexTite Fasteners Countersink Head Detail**



**Figure 4. ConnexTite Fasteners Countersink Head Fully Threaded and Partially Threaded Fastener Details**

- 2.2 ConnexTite Fasteners are manufactured from cold-formed, heat-treated carbon steel.
- 2.3 ConnexTite Fasteners are available in lengths up to 19<sup>3</sup>/<sub>4</sub>".
- 2.4 ConnexTite Fasteners may be treated with either a proprietary corrosion resistant coating or a zinc plating.
- 2.5 *Corrosion Resistant Fasteners*
  - 2.5.1 ConnexTite Fasteners are designed for exterior use and may be used where fasteners are required to exhibit corrosion resistance when exposed to adverse environmental conditions and/or in preservative treated wood subject to the limitations of **Section 9**.
  - 2.5.2 ConnexTite Fasteners are coated with a proprietary coating system that meets or exceeds the corrosion protection of hot dipped galvanizing per ASTM A153 in accordance with IBC Section 2304.10 and IRC Section R317.3.
  - 2.5.3 ConnexTite Fasteners are alternatives to hot-dip-zinc galvanized fasteners.
  - 2.5.4 ConnexTite Fasteners are approved for use in fire-retardant treated lumber, provided the conditions set forth by the fire-retardant treated lumber manufacturer are met, including appropriate strength reductions.
- 2.6 *Zinc-Plated Fasteners*
  - 2.6.1 ConnexTite Fasteners are zinc-plated per ASTM F1941.
  - 2.6.2 Zinc-plated fasteners are approved for interior, dry use only.



- 2.7 The fasteners evaluated in this report are set forth in **Table 1**. For additional fastener sizes, please refer to **Appendix B**.

**Table 1. Fastener Specifications**

Fastener Name	Nominal Fastener Diameter (in)	Head (in)		Shank Diameter <sup>1</sup> (in)	Thread Diameter (in)		Nominal Bending Yield, F <sub>yb</sub> , (psi)		Allowable Fastener Strength (lbs)	
		Diameter	Height		Minor <sup>2</sup>	Major	Transition Zone	Shank	Tensile	Shear
ConnexTite Fastener Flange Head	1/4	0.552	0.094	0.173	0.148	0.244	202,000	237,000	970	485
	5/16	0.709	0.148	0.228	0.207	0.315	168,000	179,000	1810	905
	3/8	0.877	0.161	0.279	0.253	0.393	156,000	203,000	2545	1275
ConnexTite Fastener Countersink Head	1/4	0.457	-	0.173	0.148	0.244	202,000	237,000	970	485
	5/16	0.583	-	0.228	0.207	0.315	168,000	179,000	1810	905
	3/8	0.728	-	0.279	0.253	0.393	156,000	203,000	2545	1275

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Shank diameter based on manufactured thickness. Finished dimensions are larger in the plated condition due to the proprietary coatings added.

2. Minor thread diameter value is calculated as the average of the upper and lower tolerances.

- 2.8 As needed, review material properties for design in **Section 6** and to regulatory evaluation in **Section 8**.

### 3 Definitions

- 3.1 New Materials<sup>2</sup> are defined as building materials, equipment, appliances, systems or methods of construction not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.<sup>3</sup> The design strengths and permissible stresses shall be established by tests<sup>4</sup> and/or engineering analysis.<sup>5</sup>
- 3.2 Duly authenticated reports<sup>6</sup> and research reports<sup>7</sup> are test reports and related engineering evaluations, which are written by an approved agency<sup>8</sup> and/or an approved source.<sup>9</sup>
- 3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).<sup>10</sup>
- 3.3 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory.
- 3.4 An approved source is “approved” when a professional engineer (i.e., Registered Design Professional) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.<sup>11</sup>
- 3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body and/or a licensed Registered Design Professional (RDP).
- 3.5.1 The Center for Building Innovation (CBI) is ANAB<sup>12</sup> ISO/IEC 17025 and ISO/IEC 17020 accredited.
- 3.6 The regulatory authority shall enforce<sup>13</sup> the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing<sup>14</sup> stating the nonconformance and the path to its cure.
- 3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.<sup>15</sup>



3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory where recognition of certificates, validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope, shall be approved.<sup>16</sup> Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.<sup>17</sup>

3.9 Approval equity is a fundamental commercial and legal principle.<sup>18</sup>

## 4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation<sup>19</sup>

### 4.1 Standards

- 4.1.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strength of Screws*
- 4.1.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
- 4.1.3 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*
- 4.1.4 *ASTM A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*
- 4.1.5 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*
- 4.1.6 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*
- 4.1.7 *ASTM F1941: Standard Specification for Electrodeposited Coatings on Mechanical Fasteners*

### 4.2 Regulations

- 4.2.1 *IBC – 15, 18, 21: International Building Code®*
- 4.2.2 *IRC – 15, 18, 21: International Residential Code®*

## 5 Listed<sup>20</sup>

- 5.1 Equipment, materials, products or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), approved agency (i.e., CBI and DrJ), and/or approved source (i.e., DrJ) or other organization concerned with product evaluation (i.e., DrJ) that maintains periodic inspection (i.e., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

## 6 Tabulated Properties Generated from Nationally Recognized Standards

### 6.1 General

- 6.1.1 ConnexTite Fasteners are self-tapping fasteners used for connections in conventional light frame construction and provide resistance against withdrawal, axial and shear loads. See **Section 9** for installation requirements.
- 6.1.2 ConnexTite Fasteners can be used in applications including timber construction work (staircase construction and interior finishing), structural and general timber construction work, on rafter insulation and façade attachment.
- 6.1.3 ConnexTite Fasteners are installed without lead holes, as prescribed in the NDS.

### 6.2 Design

- 6.2.1 Design of ConnexTite Fasteners is governed by the applicable code and the provisions for dowel type fasteners in the NDS.
- 6.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.



### 6.3 ConnexTite Fasteners Reference Withdrawal Design Values

- 6.3.1 The design provisions for withdrawal noted in NDS Table 12.2B apply to ConnexTite Fasteners, unless otherwise noted in this report.
- 6.3.2 Reference withdrawal design values for ConnexTite Fasteners in select lumber species are specified in **Table 2**.

**Table 2.** ConnexTite Fasteners Reference Withdrawal Design Values for Face Grain Applications

Nominal Fastener Diameter (in)	Allowable Withdrawal Design Values by Species <sup>1,2,3</sup> (lbs/in)		
	Species (Specific Gravity)		
	SPF (0.42)	DF (0.50)	SP (0.55)
1/4	95	135	220
5/16	120	180	255
3/8	130	205	280

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Values are stated in lbf/in of thread engagement.

2. Values shall be adjusted by all applicable adjustment factors per NDS Section 11.3 for wood screws.

3. Fastener penetration is the threaded length embedded in the main member, including the tip.

### 6.4 ConnexTite Fasteners Head Pull-Through Design Values

- 6.4.1 The reference design values for head pull-through for ConnexTite Fasteners are specified in **Table 3**.

**Table 3.** ConnexTite Fasteners Reference Head Pull-Through Design Values

Minimum Side Member Thickness (in)	Nominal Fastener Diameter (in)	Head Diameter Measured (in)	Allowable Head Pull-Through by Species <sup>1</sup> (lbs)					
			Species (Specific Gravity)					
			SPF (0.42)		DF (0.50)		SP (0.55)	
			Flange	Countersink	Flange	Countersink	Flange	Countersink
3/4	1/4	0.552	155	130	220	185	265	225
	5/16	0.705	195	165	275	235	335	280
	3/8	0.877	250	205	355	290	430	355
1 1/2	1/4	0.552	310	265	440	370	535	450
	5/16	0.705	390	330	550	465	670	565
	3/8	0.877	500	410	710	585	860	705

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Values shall be adjusted by all applicable adjustment factors per NDS Section 11.3 for wood screws.



## 6.5 ConnexTite Fasteners Reference Lateral Design Values – Face Grain Applications

6.5.1 The reference lateral design values for shear load perpendicular and parallel to grain for ConnexTite Fasteners are specified in **Table 4** and **Table 5**.

**Table 4.** ConnexTite Fasteners Reference Lateral Design Values Using Dimensional Lumber

Fastener Head Type	Nominal Fastener Diameter (in)	Fastener Length (in)	Side Member Thickness (in)	Minimum Penetration into Main Member (in)	Lateral Design Values <sup>1,2</sup> (lbs)					
					Species (Specific Gravity)					
					SPF (0.42)		DF (0.50)		SP (0.55)	
					Z Para	Z Perp	Z Para	Z Perp	Z Para	Z Perp
Flange	1/4	2 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	7/8	115	90	140	110	160	125
		2 <sup>3</sup> / <sub>4</sub>		1 <sup>1</sup> / <sub>4</sub>	130	105	165	135	190	155
		3 <sup>1</sup> / <sub>8</sub>		1 <sup>1</sup> / <sub>2</sub>	145	115	175	140	190	155
		4		2 <sup>1</sup> / <sub>2</sub>						
		≥4 <sup>3</sup> / <sub>4</sub>		3 <sup>1</sup> / <sub>4</sub>						
	5/16	2 <sup>3</sup> / <sub>4</sub>		1 <sup>1</sup> / <sub>4</sub>	155	125	215	170	525	550
		3 <sup>1</sup> / <sub>8</sub>		1 <sup>5</sup> / <sub>8</sub>	175	140	245	195		
		4		2 <sup>1</sup> / <sub>2</sub>	195	155				
		4 <sup>3</sup> / <sub>4</sub>		3 <sup>1</sup> / <sub>4</sub>						
		≥5 <sup>1</sup> / <sub>2</sub>		4						
	3/8	3 <sup>1</sup> / <sub>8</sub>		1 <sup>5</sup> / <sub>8</sub>	180	145	250	200	300	240
		4		2 <sup>1</sup> / <sub>2</sub>	220	175	280		315	255
		4 <sup>3</sup> / <sub>4</sub>		3 <sup>1</sup> / <sub>4</sub>						
		≥5 <sup>1</sup> / <sub>2</sub>		4						
	Countersink	1/4		2 <sup>3</sup> / <sub>8</sub>	7/8	115	90	140	110	160
2 <sup>3</sup> / <sub>4</sub>				1 <sup>1</sup> / <sub>4</sub>	130	105	165	135	190	155
3 <sup>1</sup> / <sub>8</sub>				1 <sup>5</sup> / <sub>8</sub>	145	115	175	140		
3 <sup>1</sup> / <sub>2</sub>				2						
≥4				2 <sup>1</sup> / <sub>2</sub>						
5/16		3 <sup>1</sup> / <sub>8</sub>		1 <sup>5</sup> / <sub>8</sub>	175	140	245	195	285	225
		3 <sup>1</sup> / <sub>2</sub>		2	195	155				
		≥4		2 <sup>1</sup> / <sub>2</sub>						
3/8		3 <sup>1</sup> / <sub>8</sub>		1 <sup>5</sup> / <sub>8</sub>	180	145	250	200	300	240

**Table 4.** ConnexTite Fasteners Reference Lateral Design Values Using Dimensional Lumber

Fastener Head Type	Nominal Fastener Diameter (in)	Fastener Length (in)	Side Member Thickness (in)	Minimum Penetration into Main Member (in)	Lateral Design Values <sup>1,2</sup> (lbs)					
					Species (Specific Gravity)					
					SPF (0.42)		DF (0.50)		SP (0.55)	
					Z Para	Z Perp	Z Para	Z Perp	Z Para	Z Perp
		4		2½	220	175	280	220	315	255
		≥4¾		3¼						
SI: 1 in = 25.4 mm, 1 lb = 4.45 N										
1. Reference lateral design values apply to two-member single shear connections where both members are of the same specific gravity and the fastener is oriented perpendicular to grain. Where the members are of different specific gravities, use the lower of the two.										
2. Values shall be adjusted by all applicable adjustment factors per NDS Section 11.3 for wood screws.										

**Table 5.** ConnexTite Fasteners Reference Lateral Design Values Using Engineered Lumber

Fastener Head Type	Nominal Fastener Diameter (in)	Fastener Length (in)	Side Member Thickness (in)	Minimum Penetration into Main Member (in)	Lateral Design Values <sup>1,2</sup> (lbs)	
					Species (Specific Gravity)	
					LVL or LSL (0.50)	
					Z Para	Z Perp
Flange	¼	2	1¼	¾	135	105
		2¾		1⅛	155	125
		2¾		1½	165	135
		2¾	1½	1¼	165	135
		4		2½	175	140
		3⅛		1¾	175	140
	5/16	2¾	1¼	1½	215	170
		2¾		1¼	215	170
		4		2½	245	195
		5½	1¾	4	245	195
		3⅛		1¾	235	190
		4¾		3	270	215
	3/8	4	1½	2½	280	220
		5½		4	280	220
		4¾		3	300	240
Countersink	¼	2¾	1¼	1⅛	155	125
		2¾		1½	165	135
		2¾	1½	1¼	165	135



**Table 5.** ConnexTite Fasteners Reference Lateral Design Values Using Engineered Lumber

Fastener Head Type	Nominal Fastener Diameter (in)	Fastener Length (in)	Side Member Thickness (in)	Minimum Penetration into Main Member (in)	Lateral Design Values <sup>1,2</sup> (lbs)		
					Species (Specific Gravity)		
					LVL or LSL (0.50)		
					Z Para	Z Perp	
		3½		2	175	140	
		4¾		2⅞	175	140	
		5⅞		4¾	175	140	
		3⅛	1¾	1¾	175	140	
		3½		1¾	175	140	
	5/16	3⅛	1¼	1⅞	225	180	
		4	1½	2½	245	195	
		5½		4	245	195	
		3⅛	1¾	1¾	235	190	
		3½		1¾	270	215	
		4¾		3	270	215	
	3/8	3⅛	1¼	1⅞	260	205	
		4	1½	2½	280	220	
		5½		4	280	220	
		3½	1¾	1¾	280	225	
		4¾		3	300	240	
	SI: 1 in = 25.4 mm, 1 lb = 4.45 N						
	1. Reference lateral design values apply to two-member single shear connections where both members are of the same specific gravity and the fastener is oriented perpendicular to grain. Where the members are of different specific gravities, use the lower of the two.						
	2. Values shall be adjusted by all applicable adjustment factors per NDS Section 11.3 for wood screws.						





## 6.6 ConnexTite Fasteners Reference Lateral Design Values – Metal Side Plate

6.6.1 The reference lateral design values for shear load perpendicular and parallel to grain with a metal side plate for ConnexTite Fasteners are specified in **Table 6**.

**Table 6.** ConnexTite Fasteners Reference Lateral Design Values  
Using Dimensional Lumber and Metal Side Plate

Side Member (Metal Plate) Thickness (in)	Nominal Fastener <sup>2</sup> Diameter (in)	Lateral Design Values <sup>1,3</sup> (lbs)	
		Species (Specific Gravity)	
		DF (0.50)	
		Zpara	Zperp
0.105 (12-gauge)	5/16	565	595
0.134 (10-gauge)			
0.179 (7-gauge)			
0.239 (3-gauge)			
0.25			

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

- Reference lateral design values apply to two-member single shear connections, where the main member is wood with a specific gravity greater than or equal to 0.50, the side member is a metal side plate (ASTM A36) and the fastener is oriented perpendicular to grain.
- Minimum fastener length is 2¾".
- Values shall be adjusted by all applicable factors per NDS Section 11.3 for wood screws.

## 6.7 ConnexTite Fasteners Spacing Requirements

6.7.1 Minimum fastener spacing requirements for ConnexTite Fasteners are shown in **Table 7**.

**Table 7.** ConnexTite Fasteners Minimum Fastener Spacing Requirements<sup>1,2,3</sup>

Nominal Fastener Diameter (in)	Shank Diameter (in)	Minimum Edge Distance (in)		Minimum End Distance (in)			Minimum On-Center Spacing (in)			
		Load Parallel to Grain	Load Perp. To Grain	Between Fasteners in a Row		Load Perp. To Grain	Between Fasteners in a Row		Between Rows	
				Load Toward Fastener	Load Away From Fastener		Parallel to Grain	Perp. to Grain	Parallel to Grain	Perp. to Grain
1/4	0.173	3/8	1	1	1 3/4	1	1	NDS Table 12.5.1D	3/8	1 1/4
5/16	0.228	1/2	1 1/4	1 1/4	2 1/4	1 1/4	1 1/4		1/2	1 5/8
3/8	0.279	5/8	1 1/2	1 1/2	2 3/4	1 1/2	1 1/2		5/8	2
SI: 1 in = 25.4 mm, 1 lb = 4.45 N										
1. Fastener spacing follows requirements of NDS Section 12.5.										
2. Heavy or medium concentrated loads shall not be suspended below the neutral axis of a single sawn lumber or structural glued laminated timber beam except where mechanical or equivalent reinforcement is provided to resist tension stresses perpendicular to grain.										
3. Always space fasteners to avoid splitting of wood.										



- 6.8 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science and fire science.

## 7 Certified Performance<sup>21</sup>

- 7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.<sup>22</sup>
- 7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.<sup>23</sup>

## 8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 ConnexTite Fasteners comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
- 8.1.1 ConnexTite Carbon Steel Fasteners were tested and evaluated to determine their structural resistance properties, which are used to develop reference design values for Allowable Stress Design (ASD). The following properties were evaluated:
- 8.1.1.1 Withdrawal strength in accordance with ASTM D1761
- 8.1.1.2 Bending yield strength in accordance with ASTM F1575
- 8.1.1.3 Tensile strength in accordance with AISI S904
- 8.1.1.4 Head pull-through in accordance with NDS
- 8.1.1.5 Lateral resistance in accordance with ASTM D1761
- 8.2 Any building code, regulation and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified<sup>24</sup> to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.
- 8.3 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which are also its areas of professional engineering competence.
- 8.4 Any regulation specific issues not addressed in this section are outside the scope of this report.

## 9 Installation

- 9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report and the applicable building code.
- 9.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.
- 9.3 *Installation Procedure*
- 9.3.1 Installed using Torx® bit by turning. Pre-drilling of pilot holes is not required but may be used where lumber is prone to splitting.
- 9.3.2 Minimum penetration is 1" unless otherwise stated in this report.



## 10 Substantiating Data

- 10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
- 10.1.1 Withdrawal testing in accordance with ASTM D1761
  - 10.1.2 Bending yield testing in accordance with ASTM F1575
  - 10.1.3 Tensile strength testing in accordance with AISI S904
  - 10.1.4 Lateral strength testing in accordance with ASTM D1761
  - 10.1.5 Shear strength calculations performed by DrJ Engineering, LLC in accordance with accepted engineering principles
- 10.2 ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction
- 10.3 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources and/or RDPs. Accuracy of external test data and resulting analysis is relied upon.
- 10.4 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability and safety.
- 10.5 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.
- 10.6 Testing and engineering analysis: The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.<sup>25</sup>
- 10.7 Where additional condition of use and/or regulatory compliance information is required, please search for ConnexTite Fasteners on the DrJ Certification website.

## 11 Findings

- 11.1 As outlined in **Section 6**, ConnexTite Fasteners have performance characteristics that were tested and/or meet applicable regulations and is suitable for use pursuant to its specified purpose.
- 11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, ConnexTite Fasteners shall be approved for the following applications:
- 11.2.1 Use as an alternative to those fasteners prescribed by the applicable code using the reference design value properties defined herein.
- 11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from SFS Group USA, Inc.



11.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10<sup>26</sup> are similar) in pertinent part states:

**104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

11.5 **Approved:**<sup>27</sup> Building regulations require that the building official shall accept duly authenticated reports.<sup>28</sup>

11.5.1 An approved agency is “*approved*” when it is ANAB ISO/IEC 17065 accredited.

11.5.2 An approved source is “*approved*” when an RDP is properly licensed to transact engineering commerce.

11.5.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.6 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB-Accredited Product Certification Body – Accreditation #1131.

11.7 Through the IAF Multilateral Agreements (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.<sup>29</sup>

## 12 Conditions of Use

12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.

12.2 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.3 As listed herein, ConnexTite Fasteners shall be used:

12.3.1 For interior only. Dry use only if Zinc-plated.

12.4 Design properties shall not exceed those described in **Section 6**.

12.5 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:

12.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.5.2 This report and the installation instructions shall be submitted at the time of permit application.

12.5.3 This innovative product has an internal quality control program and a third-party quality assurance program.

12.5.4 At a minimum, this innovative product shall be installed per **Section 9** of this report.

12.5.5 The review of this report by the AHJ shall comply with IBC Section 104 and IBC Section 105.4.

12.5.6 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4 and IRC Section R109.2.

12.5.7 The application of this innovative product in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2 and any other regulatory requirements that may apply.



- 12.6 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *“the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new material or assemblies as provided for in Section 104.11,”* all of IBC Section 104, and IBC Section 105.4.
- 12.7 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 12.8 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

### 13 Identification

- 13.1 The innovative product listed in **Section 1.1** is identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number and other information to confirm code compliance.
- 13.2 Additional technical information can be found at [us.sfs.com](http://us.sfs.com).

### 14 Review Schedule

- 14.1 This report is subject to periodic review and revision. For the latest version, visit [drjcertification.org](http://drjcertification.org).
- 14.2 For information on the status of this report, please contact [DrJ Certification](#).

### 15 Approved for Use Pursuant to U.S. and International Legislation Defined in Appendix A

- 15.1 ConnexTite Fasteners are included in this report published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services. This report states either that the material, product or service meets recognized standards or has been tested and found suitable for a specified purpose. This report meets the legislative intent and definition of being acceptable to the AHJ.



## Appendix A

### 1 Legislation that Authorizes AHJ Approval

- 1.1 **Fair Competition:** State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:
  - 1.1.1 Advance innovation
  - 1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints
  - 1.1.3 Benefit consumers through lower prices, better quality, and greater choice
- 1.2 **Adopted Legislation:** The following local, state and federal regulations affirmatively authorize this innovative product to be approved by AHJs, delegates of building departments and/or delegates of an agency of the federal government:
  - 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies, and/or methods of construction. The goal is to “*protect economic freedom and opportunity by promoting free and fair competition in the marketplace.*”
  - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
  - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA),<sup>30</sup> where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years<sup>31</sup> and/or a \$5,000,000 fine or 3 times the value of<sup>32</sup> the Intellectual Property (IP) and Trade Secrets (TS).
    - 1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.
  - 1.2.4 For new materials<sup>33</sup> that are not specifically provided for in any regulation, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.
  - 1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.<sup>34</sup>
  - 1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.
  - 1.2.7 The AHJ shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.<sup>35</sup>





- 1.3 **Approved<sup>36</sup> by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards that apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.<sup>37</sup> The Superintendent of Building Approved Testing Agency Roster is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a DrJ Listing are LAMC approved. In addition, the Superintendent of Building shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.<sup>38</sup>
- 1.4 **Approved by Chicago:** The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).
- 1.5 **Approved by New York City:** The 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed<sup>39</sup> an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement<sup>40</sup> (i.e., ANAB, International Accreditation Forum also known as IAF, etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods or systems of construction shall be approved, without further evaluation by:
- 1.6.1 A certification mark or listing of an approved certification agency,
  - 1.6.2 A test report from an approved testing laboratory,
  - 1.6.3 A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity, or
  - 1.6.4 A product evaluation report based upon testing, comparative or rational analysis, or a combination thereof, developed, signed and sealed by a professional engineer or architect, licensed in Florida.
  - 1.6.5 For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods:
    - 1.6.5.1 A certification mark, listing or label from a commission-approved certification agency indicating that the product complies with the code,
    - 1.6.5.2 A test report from a commission-approved testing laboratory indicating that the product tested complies with the code,
    - 1.6.5.3 A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code,



- 1.6.5.4 A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code, or
- 1.6.5.5 A statewide product approval issued by the Florida Building Commission.
- 1.6.6 The [Florida Department of Business and Professional Regulation \(DBPR\)](#) website provides a listing of companies certified as a [Product Evaluation Agency](#) (i.e., EVLMiami 13692), a [Product Certification Agency](#) (i.e., CER10642), and as a [Florida Registered Engineer](#) (i.e., ANE13741).
- 1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA]):** A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation [553.842](#) and [553.8425](#).
- 1.8 **Approved by New Jersey:** Pursuant to the 2018 Building Code of New Jersey in [IBC Section 1707.1 General](#),<sup>41</sup> it states: “*In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from [approved agencies](#) in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the Uniform Construction Code (N.J.A.C. 5:23)*”.<sup>42</sup> Furthermore N.J.A.C 5:23-3.7 states: “*Municipal approvals of alternative materials, equipment, or methods of construction.*”
  - 1.8.1 **Approvals:** Alternative materials, equipment or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability and safety of those conforming with the requirements of the regulations.
    - 1.8.1.1 A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of the above.
    - 1.8.1.2 Reports of engineering findings issued by nationally recognized evaluation service programs such as but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of the above.
  - 1.8.2 The [New Jersey Department of Community Affairs](#) has confirmed that technical evaluation reports, from any accredited entity listed by [ANAB](#), meets the requirements of item the previous paragraph, given that the listed entities are no longer in existence and/or do not provide “*reports of engineering findings.*”
- 1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, [Part 3282.14](#)<sup>43</sup> and [Part 3280](#),<sup>44</sup> the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:
  - 1.9.1 “*All construction methods shall be in conformance with accepted engineering practices.*”
  - 1.9.2 “*The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.*”
  - 1.9.3 “*The design stresses of all materials shall conform to accepted engineering practice.*”





- 1.10 **Approval by US, Local and State Jurisdictions in General:** In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:
- 1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.<sup>45</sup>
  - 1.10.2 For innovative alternatives and/or methods of construction, the building official shall accept duly authenticated reports from approved agencies with respect to the quality and manner of use of new materials or assemblies.<sup>46</sup>
    - 1.10.2.1 An approved agency is “*approved*” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is in the ANAB directory.
    - 1.10.2.2 An approved source is “*approved*” when an RDP is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.<sup>47</sup>
  - 1.10.3 The design strengths and permissible stresses of any structural material...shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.<sup>48</sup>
- 1.11 **Approval by International Jurisdictions:** The USMCA and GATT agreements provide for approval of innovative materials, designs, services, and/or methods of construction through the Agreement on Technical Barriers to Trade and the IAF Multilateral Recognition Arrangement (MLA), where these agreements:
- 1.11.1 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.
  - 1.11.2 **Approved:** The purpose of the MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA and subsequently, acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, designs, services, and/or methods of construction.
  - 1.11.3 ANAB is an IAF-MLA signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope, shall be approved.<sup>49</sup>
  - 1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.<sup>50</sup>
- 1.12 Approval equity is a fundamental commercial and legal principle.<sup>51</sup>



## Appendix B

**Table 8.** SFS Group USA, Inc. ConnexTite Fasteners Flange Head

Fastener Name	Nominal Diameter	Head		Fastener Length (in)	Thread Length (in)	Shank Diameter (in)	Thread Diameter (in)	
		Diameter (in)	Thickness (in)				Minor	Major
ConnexTite Flange Head	1/4	0.552	0.094	1 1/2	1 1/4	0.173	0.155	0.244
				2	1 5/8			
				2 3/8	2			
				2 3/4	2 3/8			
				3 1/8	2 3/4			
				4				
				4 3/4				
				5 1/2				
				6 1/4				
				7 1/8				
				7 7/8				
				8 5/8				
				9 3/8				
				10 1/4				
				11				
				11 3/4				
	5/16	0.705	0.148	2 3/4	1 1/2	0.228	0.214	0.315
				3 1/8	2 3/4			
				4	2 3/4			
				4 3/8	4			
				5 1/2				
				6 1/4				
				7 1/8				
				7 7/8				
				8 5/8				
				9 3/8				



**Table 8.** SFS Group USA, Inc. ConnexTite Fasteners Flange Head

Fastener Name	Nominal Diameter	Head		Fastener Length (in)	Thread Length (in)	Shank Diameter (in)	Thread Diameter (in)		
		Diameter (in)	Thickness (in)				Minor	Major	
				10 <sup>1</sup> / <sub>4</sub>					
				11					
				11 <sup>3</sup> / <sub>4</sub>					
				12 <sup>5</sup> / <sub>8</sub>					
				13 <sup>3</sup> / <sub>8</sub>					
				14 <sup>1</sup> / <sub>8</sub>					
				15					
				15 <sup>3</sup> / <sub>4</sub>					
	<sup>3</sup> / <sub>8</sub>	0.877	0.161	3 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	4	0.279	0.262	0.393
				4	3 <sup>1</sup> / <sub>2</sub>				
				4 <sup>3</sup> / <sub>4</sub>					
				5 <sup>1</sup> / <sub>2</sub>					
				6 <sup>1</sup> / <sub>4</sub>					
				7 <sup>1</sup> / <sub>8</sub>					
				7 <sup>7</sup> / <sub>8</sub>					
				8 <sup>5</sup> / <sub>8</sub>					
				9 <sup>3</sup> / <sub>8</sub>					
				10 <sup>1</sup> / <sub>4</sub>					
				11					
				11 <sup>3</sup> / <sub>4</sub>					
				12 <sup>5</sup> / <sub>8</sub>					
				13 <sup>3</sup> / <sub>8</sub>					
				14 <sup>1</sup> / <sub>8</sub>					
				15					
				15 <sup>3</sup> / <sub>4</sub>					



**Table 9.** SFS Group USA, Inc. ConnexTite Fasteners Countersink Head

Fastener Name	Nominal Diameter	Head	Fastener Length (in)	Thread Length	Shank Diameter (in)	Thread Diameter (in)	
		Diameter (in)				Minor	Major
ConnexTite Countersink Head	1/4	0.457	2 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	0.173	0.155	0.244
			2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>			
			3 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>			
			3 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>8</sub>			
			4	2 <sup>3</sup> / <sub>8</sub>			
			4 <sup>3</sup> / <sub>8</sub>				
			4 <sup>3</sup> / <sub>4</sub>				
			5 <sup>1</sup> / <sub>2</sub>				
			5 <sup>7</sup> / <sub>8</sub>				
			6 <sup>1</sup> / <sub>4</sub>				
			7 <sup>1</sup> / <sub>8</sub>				
			7 <sup>7</sup> / <sub>8</sub>				
			8 <sup>5</sup> / <sub>8</sub>				
			9 <sup>3</sup> / <sub>8</sub>				
			10 <sup>1</sup> / <sub>4</sub>				
			11				
			11 <sup>3</sup> / <sub>4</sub>				
	5/16	0.583	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	0.228	0.214	0.315
			3 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>			
			3 <sup>1</sup> / <sub>2</sub>				
			4	2 <sup>3</sup> / <sub>4</sub>			
			4 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>			
			5 <sup>1</sup> / <sub>2</sub>				
			6 <sup>1</sup> / <sub>4</sub>	4			
			7 <sup>1</sup> / <sub>8</sub>				
			7 <sup>7</sup> / <sub>8</sub>				
			8 <sup>5</sup> / <sub>8</sub>				
			9 <sup>3</sup> / <sub>8</sub>				
			10 <sup>1</sup> / <sub>4</sub>				
			11				
			11 <sup>3</sup> / <sub>4</sub>				
			12 <sup>5</sup> / <sub>8</sub>				



**Table 9. SFS Group USA, Inc. ConnexTite Fasteners Countersink Head**

Fastener Name	Nominal Diameter	Head	Fastener Length (in)	Thread Length	Shank Diameter (in)	Thread Diameter (in)	
		Diameter (in)				Minor	Major
			13 <sup>3</sup> / <sub>8</sub>				
			14 <sup>1</sup> / <sub>8</sub>				
			15				
			15 <sup>3</sup> / <sub>4</sub>				
			16 <sup>1</sup> / <sub>2</sub>				
			18 <sup>1</sup> / <sub>8</sub>				
			19 <sup>3</sup> / <sub>4</sub>				
	<sup>3</sup> / <sub>8</sub>	0.728	3 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	0.279	0.262	0.393
			4	3 <sup>1</sup> / <sub>8</sub>			
			4 <sup>3</sup> / <sub>4</sub>				
			5 <sup>1</sup> / <sub>2</sub>				
			6 <sup>1</sup> / <sub>4</sub>	4			
			7 <sup>1</sup> / <sub>8</sub>				
			7 <sup>7</sup> / <sub>8</sub>				
			8 <sup>5</sup> / <sub>8</sub>				
			9 <sup>3</sup> / <sub>8</sub>				
			10 <sup>1</sup> / <sub>4</sub>				
			11				
			11 <sup>3</sup> / <sub>4</sub>				
			12 <sup>5</sup> / <sub>8</sub>				
			13 <sup>3</sup> / <sub>8</sub>				
			14 <sup>1</sup> / <sub>8</sub>				
			15				
			15 <sup>3</sup> / <sub>4</sub>				
			16 <sup>1</sup> / <sub>2</sub>				
			18 <sup>1</sup> / <sub>8</sub>				
			19 <sup>3</sup> / <sub>4</sub>				



**Table 10.** SFS Group USA, Inc. ConnexTite Fasteners Countersink Head, Fully Threaded

Fastener Name	Nominal Diameter (in)	Head	Fastener Length (in)	Thread Length (in)	Shank Diameter (in)	Thread Diameter (in)	
		Diameter (in)				Minor	Major
Countersink Head, Fully Threaded	1/4	0.457	1 1/2	1 1/4	0.173	0.155	0.244
			1 3/4	1 1/2			
			2	1 3/4			
			2 3/8	2 1/8			
			2 3/4	2 3/8			
	5/16	0.583	4 3/4	4 3/8	0.228	0.214	0.315
			6 1/4	6			
			7 1/8	6 3/4			
			7 7/8	7 1/2			
			8 5/8	8 3/8			
			9 3/8	9 1/8			
			10 1/4	9 7/8			
			11	10 3/4			
			11 3/4	11 1/2			
			13 3/8	13 1/8			
			15	14 5/8			
	3/8	0.728	4 3/4	4 3/8	0.279	0.262	0.393
			6 1/4	5 7/8			
			7 7/8	7 1/2			
			8 5/8	8 1/4			
			9 3/8	9			
			10 1/4	9 7/8			
			11	10 5/8			
			11 3/4	11 3/8			
			13 3/8	13			
			15	14 5/8			



## Notes

Subject to Renewal: 10/01/25  
Page 23 of 24



<http://www.drjengineering.org/AppendixC> AND <https://www.drjcertification.org/cornell-2016-protection-trade-secrets>  
<https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years>  
<https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided>  
<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>  
IBC 2021, Section 1706.1 Conformance to Standards  
IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General  
**See Section 11** for the distilled building code definition of **Approved**  
Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES  
<https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1>  
New York City, The Rules of the City of New York, § 101-07 Approved Agencies  
New York City, The Rules of the City of New York, § 101-07 Approved Agencies  
<https://up.codes/viewer/new-jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1>  
<https://www.nj.gov/dca/divisions/codes/codreg/ucc.html>  
<https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>  
<https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>  
IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.  
IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.  
<https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional-boards-in-each-state-archive/> AND <https://apassociation.org/list-of-engineering-boards-in-each-state-archive/>  
IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.  
<https://iaf.nu/en/about-iaf-mla/#:~:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope>  
True for all ANAB accredited product evaluation agencies and all International Trade Agreements.  
<https://www.justice.gov/crt/deprivation-rights-under-color-law> AND <https://www.justice.gov/atr/mission>