Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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Starborn® Structural Screws: Fastener Properties and Design Values

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 Products Evaluated[1]

1.1 Starborn Structural Screws:

- 1.1.1 Starborn Structural H19 Screws
- 1.1.2 Starborn Structural F19 Screws
- 1.1.3 Starborn Structural H23 Screws
- 1.1.4 Starborn Structural F23 Screws
- 1.1.5 Starborn Structural F23-E Screws
- 1.1.6 Starborn Structural F23-W Screws
- 1.1.7 Starborn Structural F23 Stainless Screws

2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1** through **Figure 7**.

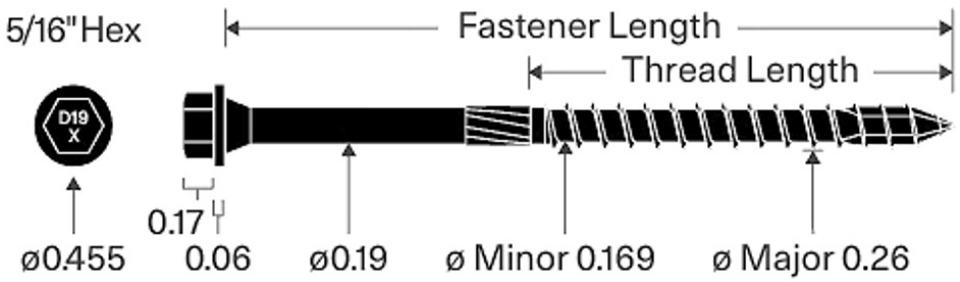

Figure 1. Starborn Structural H19 Screw

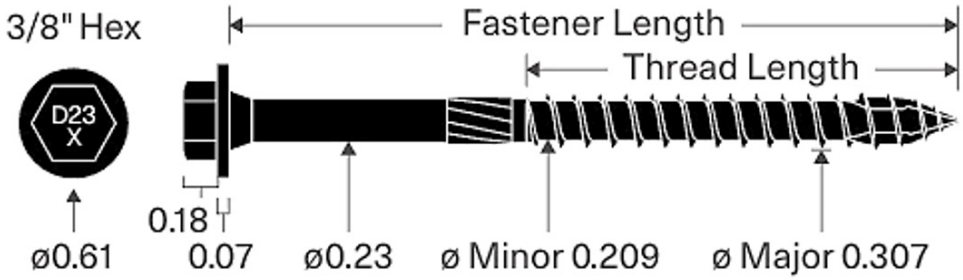

Figure 2. Starborn Structural H23 Screw

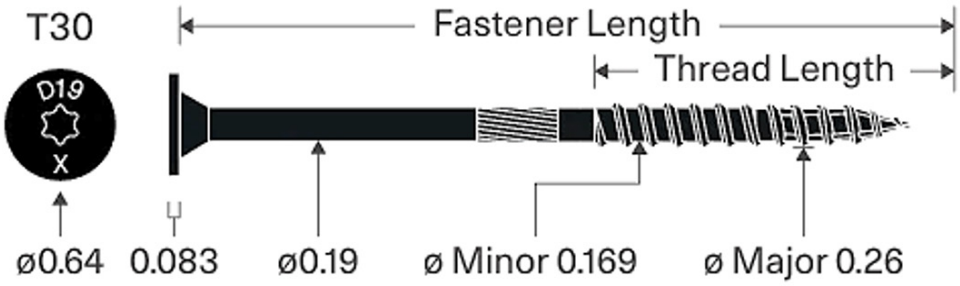

Figure 3. Starborn Structural F19 Screw

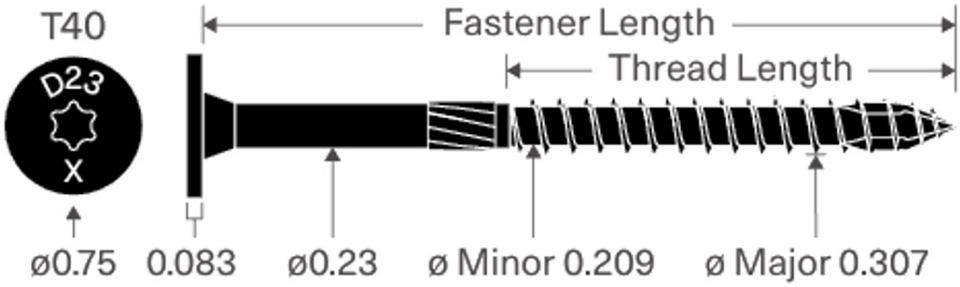

Figure 4. Starborn Structural F23 Screw

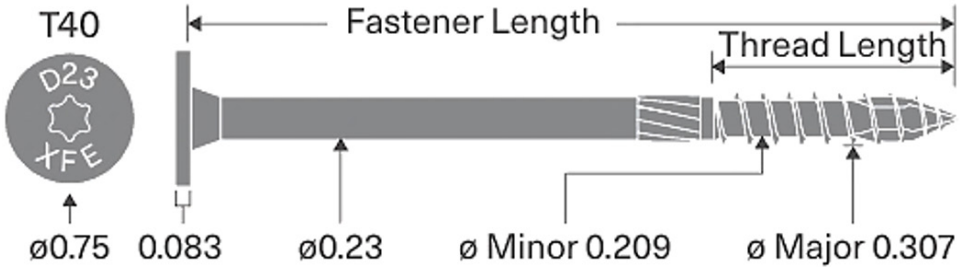

Figure 5. Starborn Structural F23-E Screw

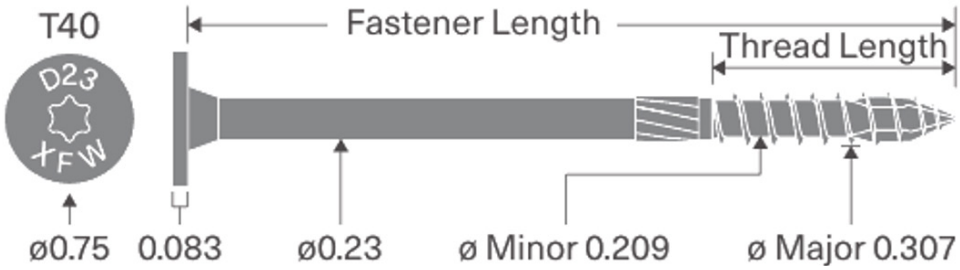

Figure 6. Starborn Structural F23-W Screw

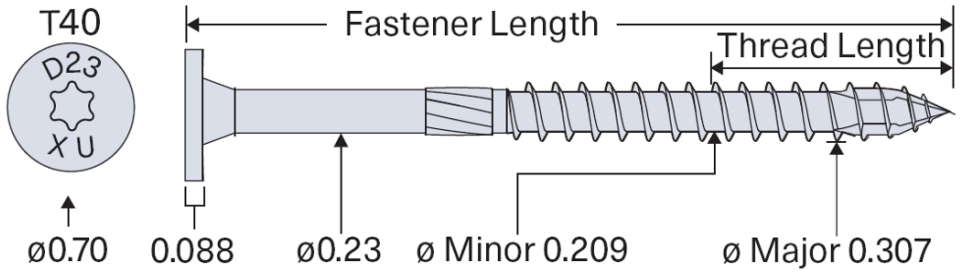

Figure 7. Starborn Structural F23 Stainless Screw

Table 1. Starborn Structural Fastener Designation and Product Name

Product Name	Unthreaded Shank Diameter[1] (in)	Head Type	Coating Type (Application)
Structural H19	0.19	Hex ($^5/_{16}$")	Exterior Use
Structural F19		Flat (T-30)	
Structural H23	0.23	Hex ($^3/_8$")	
Structural F23		Flat (T-40)	
Structural F23 Stainless			
Structural F23-E			Interior Use
Structural F23-W			

SI: 1 in = 25.4 mm

1. Unthreaded shank diameter is measured on uncoated parts. Finished part dimensions are larger due to the thickness of the proprietary coating.

2.2 *General*

2.2.1 Starborn Structural Screws are partially threaded, self-drilling, dowel-type fasteners designed for use in wood-to-wood connections.

2.2.1.1 Starborn Structural H19 Screws are hex-driven ($^5/_{16}$") screws with an integrated washer

2.2.1.2 Starborn Structural F19 Screws are Torx-driven flat head screws

2.2.1.3 Starborn Structural H23 Screws are hex-driven ($^3/_8$") screws with an integrated washer

2.2.1.4 Starborn Structural F23 Screws are Torx-driven flat head screws

2.2.1.5 Starborn Structural F23-E Screws are Torx-driven flat head screws

2.2.1.6 Starborn Structural F23-W Screws are Torx-driven flat head screws

2.2.1.7 Starborn Structural F23 Stainless Screws are Torx-driven flat head screws

2.3 *Fastener Material*

2.3.1 With the exception of Starborn Structural F23 Stainless Screws, Starborn Structural Screws are manufactured with heat-treated carbon steel grade 10B21 wire using a standard cold-forming process.

2.3.1.1 Starborn Structural H19, F19, H23, and F23 Screws are coated with a proprietary black exterior coating.

2.3.1.2 Starborn Structural F23-E and F23-W screws are coated with a proprietary gray epoxy coat finish with lubricated topcoat for interior-use.

2.3.2 Starborn Structural F23 Stainless Screws are manufactured with Grade 316 Stainless Steel (SS).

2.3.3 All fasteners are produced in accordance with the approved quality control procedures referred to in **Section 12**.

2.4 *Corrosion Resistance*

2.4.1 Starborn Structural Screws are zinc plated and overcoated with a proprietary epoxy coating.

2.4.1.1 Starborn H19, F19, H23, F23, and F23 Stainless Screws 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 12**.

2.4.1.1.1 Starborn H19, F19, H23, and F23 Screws were evaluated for use in wood that is chemically treated with waterborne Alkaline Copper/Quaternary, type D (ACQ-D).

2.4.1.1.2 These fasteners may be used as alternatives to hot-dipped, zinc galvanized fasteners.

2.4.1.1.3 The proprietary coating system 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.

2.4.1.1.4 Starborn F23 Stainless Screws meets the material requirements in ASTM F1667 per IBC Section 2304.10.6 and IRC Section R317.3, and are recognized for use in untreated, preservative-treated, and fire-retardant treated wood in interior and exterior applications.

2.4.1.2 Starborn F23-E and F23-W Screws are designed for interior, dry use only.

2.4.1.2.1 Starborn F23-E Screws are designed for use in Engineered Wood Products (EWP).

2.4.1.2.2 Starborn F23-W Screws are designed for use in solid-sawn lumber.

2.5 *Pressure Preservative Treated (PPT) Wood Applications*

2.5.1 Starborn Structural Screws, having the proprietary coating or that are manufactured from stainless steel, are recognized for use in PPT lumber, provided the conditions set forth by the PPT lumber manufacturer be met, including appropriate strength reductions.

2.6 *Fire-Retardant Treated (FRT) Wood Applications*

2.6.1 Starborn Structural Screws, having the proprietary coating or that are manufactured from stainless steel, are recognized for use in FRT lumber, provided the conditions set forth by the FRT lumber manufacturer be met, including appropriate strength reductions.

2.7 *Wood Members*

2.7.1 Solid sawn wood members connected with Starborn Structural Screws shall consist of lumber species or species combinations having a specific gravity of 0.42 to 0.55.

2.7.2 Structural composite lumber (e.g., LVL, LSL, PSL, etc.) connected with Starborn Structural Screws shall be recognized in evaluation reports having published equivalent specific gravities for lateral and withdrawal resistance. Equivalent specific gravities for structural composite lumber may be used in the design of connections using the specific gravities of the sawn lumber shown in **Table 3** through **Table 8**.

2.8 *Fastener Specifications*

2.8.1 **Table 2** lists the dimensions and mechanical properties of Starborn Structural Screws that are evaluated in this report.

Table 2. Starborn Structural Screws Specifications

Product Name	Head Marking	Fastener Length[1] (in)	Thread Length[2] (in)	Unthreaded Shank Diameter[3] (in)	Thread Diameter (in)		Nominal Bending Yield,[5] F_{yb} (psi)	Allowable Fastener Strength (lb)	
					Minor[4]	Major		Tensile	Shear
Structural H19	D19, 2.9	2 7/8	1.4	0.19	0.169	0.260	196,700	1,280	1,085
	D19, 4	4	2 1/4						
	D19, 6	6	2 1/2						
	D19, 8	8							
	D19, 10	10							
Structural F19	D19, 2.9	2 7/8	2	0.19	0.169	0.260	192,880	1,495	1,015
	D19, 4	4 1/2							
	D19, 6	6							
	D19, 8	8							
	D19, 10	10							
	D19, 12	12							
	D19, 14	14							
	D19, 16	16							
Structural H23	D23, 4	4	0.23	0.209	0.307	183,155	1,980	1,490	0.23
	D23, 5	5							
Structural F23	D23, 2.9	2 7/8	1.4	0.23	0.209	0.307	183,155	1,980	1,490
	D23, 4	4	2 3/8						
	D23, 5	5	3						
	D23, 6	6	2 3/4						
	D23, 8	8							
	D23, 10	10							

Table 2. Starborn Structural Screws Specifications

Product Name	Head Marking	Fastener Length[1] (in)	Thread Length[2] (in)	Unthreaded Shank Diameter[3] (in)	Thread Diameter (in)		Nominal Bending Yield,[5] F_{yb} (psi)	Allowable Fastener Strength (lb)	
					Minor[4]	Major		Tensile	Shear
Structural F23-E	D23, 3.4 XFE	3 3/8	1 1/2	0.23	0.209	0.307	183,155	1,980	1,490
	D23, 5 XFE	5							
	D23, 6.8 XFE	6 3/4							
Structural F23-W	D23, 2.9 XFW	2 7/8	1.4	0.23	0.209	0.307	183,155	1,980	1,490
	D23, 4.4 XFW	4 3/8							
	D23, 5.9 XFW	5 7/8							
Structural F23 Stainless	D23, 2.9 XU	2 7/8	1.4	0.23	0.209	0.307	107,000	695	970
	D23, 4 XU	4	2 3/8						
	D23, 5 XU	5	3						
	D23, 6 XU	6	2 3/4						

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

1. Measured from the underside of the head to the tip.
2. Includes tip.
3. Unthreaded Shank Diameter is measured on uncoated parts. Finished part dimensions are larger due to the thickness of the proprietary coating.
4. Minor thread diameter is calculated as the average value of upper and lower manufacturing tolerances.
5. Bending yield strength is determined in accordance with ASTM F1575 and is based on the minor diameter.

2.9 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions

3.1 New Materials[2] 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.[3] The design strengths and permissible stresses shall be established by tests[4] and/or engineering analysis.[5]

3.2 Duly authenticated reports[6] and research reports[7] are test reports and related engineering evaluations that are written by an approved agency[8] and/or an approved source.[9]

3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).[10]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional or RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[11]

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 RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[12] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[13] 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[14] 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.[15]

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

3.9 Approval equity is a fundamental commercial and legal principle.[18]

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation[19]

4.1 *Standards*

4.1.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strengths 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*

4.1.6 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*

4.2 *Regulations*

4.2.1 *IBC – 15, 18, 21: International Building Code®*

4.2.2 *IRC – 15, 18, 21: International Residential Code®*

4.2.3 *FBC-B—20, 23: Florida Building Code[20] – Building (FL 30525)*

4.2.4 *FBC-R—20, 23: Florida Building Code[20] – Residential (FL 30525)*

4.2.5 *LABC—20, 23: City of Los Angeles Building Code[21]*

4.2.6 *LARC—20, 23: City of Los Angeles Residential Code[21]*

5 Listed[22]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), an approved agency (i.e., CBI and DrJ), and/or and approved source (i.e., DrJ), or other organization(s) 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 Starborn Structural Screws are self-tapping fasteners for wood-to-wood connections in conventional light frame construction. They provide resistance against withdrawal, head pull-through, axial, and shear loads. See **Section 9** for installation requirements.

6.1.2 Starborn Structural Screws can be used in applications including structural and general timber construction work. Typical uses include deck ledger attachment, interior framing, staircase, and multi-ply beam construction as well as on rafter insulation and façade attachment.

6.1.3 Starborn Structural Screws are installed without lead holes, as prescribed in the NDS.

6.2 *Design*

6.2.1 The design of Starborn Structural Screws 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 *Starborn Structural Screws Reference Lateral Design Values*

6.3.1 Reference lateral design values for shear load perpendicular and parallel to grain for Starborn Structural Screws are specified in **Table 3**.

6.3.1.1 Design loads are applicable for flush installation.

Table 3. Starborn Structural Screws Reference Lateral Design Values[1,2] (Z) – Flush Installation

Product Name	Fastener Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Main Member Penetration (in)	Lateral Design Values (lb) by Species (Specific Gravity) and Load Orientation					
					HF/SPF (0.42)		DF/SP (0.50)		SCL (0.50)	
					Z_{Perp}	Z_{Para}	Z_{Perp}	Z_{Para}	Z_{Perp}	Z_{Para}
Structural H19	2 7/8	1.4	1 1/2	1 3/8	300	375	375	440	375	440
	4	2 1/4		2 1/2	305	270	435	415	435	415
	6	2 1/2		4 1/2						
	8			6 1/2						
	10			8 1/2						
Structural F19	2 7/8	2	1 1/2	1 3/8	290	315	380	335	380	335
	4 1/2			2 1/2	290	315	380	335	380	335
	6			4 1/2	315	350	425	370	425	370
	8			6 1/2	340	305	425	375	425	375
	10			8 1/2	370	325	465	365	465	365
	12			10 1/2						
	14			12 1/2						
	16			14 1/2						

Table 3. Starborn Structural Screws Reference Lateral Design Values[1,2] (Z) – Flush Installation

Product Name	Fastener Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Main Member Penetration (in)	Lateral Design Values (lb) by Species (Specific Gravity) and Load Orientation					
					HF/SPF (0.42)		DF/SP (0.50)		SCL (0.50)	
					Z_{Perp}	Z_{Para}	Z_{Perp}	Z_{Para}	Z_{Perp}	Z_{Para}
Structural H23	4	2 3/8	1 1/2	2 1/2	420	420	560	560	560	560
	5	3		3 1/2						
Structural F23	2 7/8	1.4	1 1/2	1 3/8	365	415	405	540	405	540
	4	2 3/8		2 1/2	420	420	560	560	560	560
	5	3		3 1/2						
	6	2 3/4		4 1/2						
	8			6 1/2						
	10			8 1/2						
Structural F23-E	3 3/8	1 1/2	1 3/4	1 5/8	-	-	-	-	405	540
	5			3 1/4					560	560
	6 3/4			5						
			3 1/2	3 1/4						
Structural F23-W	2 7/8	1.4	1 1/2	1 3/8	365	415	405	540	-	-
	4 3/8			2 7/8	420	420	560	560	-	-
	5 7/8			4 1/2						
Structural F23 Stainless	2 7/8	1.4	1 1/2	1 3/8	330	370	425	350	425	350
	4	2 3/8		2 1/2	390	450	470	600	470	600
	5	3		3 1/2						
	6	2 3/4		4 1/2						

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

HF = Hemlock-Fir, SPF = Spruce-Pine-Fir, DF = Douglas Fir, SP = Southern Pine, SCL = Structural Composite Lumber, Z_{Perp} = lateral design value for connection with wood members loaded perpendicular to grain, Z_{Para} = lateral design value for connection with wood members loaded parallel to grain.

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 the NDS.

6.3.2 Reference lateral design loads for countersunk fasteners are provided in **Table 4**.

6.3.2.1 Countersunk depth shall not exceed 1/2".

Table 4. Starborn Structural Screws Reference Lateral Design Values[1,2] (Z) – Countersunk Installation

Product Name	Fastener Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Main Member Penetration (in)	Lateral Design Values (lb) by Species (Specific Gravity) and Load Orientation					
					HF/SPF (0.42)		DF/SP (0.50)		SCL (0.50)	
					Z_{Perp}	Z_{Para}	Z_{Perp}	Z_{Para}	Z_{Perp}	Z_{Para}
Structural F23	2 7/8	1.4	1 1/2	1 7/8	285	290	395	455	395	455
	4	2 3/8		3	380	330	490	465	490	465
	5	3		4						
	6	2 3/4		5						
	8			7						
	10			9						
Structural F23 Stainless	2 7/8	1.4	1 1/2	1 7/8	285	290	395	455	395	455
	4	2 3/8		3	380	330	490	465	490	465
	5	3		4						
	6	2 3/4		5						

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

HF = Hemlock-Fir, SPF = Spruce-Pine-Fir, DF = Douglas Fir, SP = Southern Pine, SCL = Structural Composite Lumber, Z_{Perp} = lateral design value for connection with wood members loaded perpendicular to grain, Z_{Para} = lateral design value for connection with wood members loaded parallel to grain.

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 the NDS.

6.4 *Starborn Structural Screws Reference Withdrawal Design Values (W)*

6.4.1 Design provisions for withdrawal noted in NDS Table 12.2B apply to Starborn Structural Screws, unless otherwise noted in this report.

6.4.2 Reference withdrawal design values for Starborn Structural Screws in select lumber species are specified in **Table 5**.

6.4.3 Maximum withdrawal design values for Starborn Structural Screws in select lumber species are specified in **Table 6**.

Table 5. Starborn Structural Screws Reference Withdrawal Design Values (W) in Side Grain Applications[1,2,3,4]

Product Name	Fastener Length (in)	Thread Length (in)	Allowable Withdrawal Design Values by Species (Specific Gravity), (lb/in)					
			HF/SPF (0.42)		DF/SP (0.50)		SCL (0.50)	
			1" Penetration	2" Penetration	1" Penetration	2" Penetration	1" Penetration	2" Penetration
Structural H19	2 7/8	1.4	255	-	340	-	340	-
	4	2 1/4	255	300	340	395	340	395
	6	2 1/2						
	8							
	10							
Structural F19	2 7/8	2	255	300	340	395	340	395
	4 1/2							
	6							
	8							
	10							
	12							
	14							
	16							
Structural H23	4	2 3/8	280	380	360	445	360	445
	5	3						
Structural F23	2 7/8	1.4	280	-	360	-	360	-
	4	2 3/8	280	380	360	445	360	445
	5	3						
	6	2 3/4						
	8							
	10							
Structural F23-E	3 3/8	1.5	280	-	360	-	360	-
	5							
	6 3/4							
Structural F23-W	2 7/8	1.4	280	-	360	-	360	-
	4 3/8							
	5 7/8							

Table 5. Starborn Structural Screws Reference Withdrawal Design Values (W) in Side Grain Applications[1,2,3,4]

Product Name	Fastener Length (in)	Thread Length (in)	Allowable Withdrawal Design Values by Species (Specific Gravity), (lb/in)					
			HF/SPF (0.42)		DF/SP (0.50)		SCL (0.50)	
			1" Penetration	2" Penetration	1" Penetration	2" Penetration	1" Penetration	2" Penetration
Structural F23 Stainless	2 7/8	1.4	190	-	225	-	225	-
	4	2 3/8		285		335		335
	5	3						
	6	2 3/4						

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.
2. Fastener penetration is the threaded length embedded in the main member, including the tip.
3. For Maximum Allowable Withdrawal Design Values, see **Table 6**.
4. Total Allowable Withdrawal Design Value as a function of penetration is determined as follows:

   For penetration ≤1"

   $$W_{total}\ (lb) = W_{1''}(p)$$

   For penetration >1"

   $$W_{total}\ (lb) = W_{1''}(1) + (2W_{2''} - W_{1''})(p - 1)$$

   where:

   $W_{1''}$ = value for withdrawal resistance at 1" penetration from this table [lb/in]

   $W_{2''}$ = value for withdrawal resistance at 2" penetration from this table [lb/in]

   p = penetration [in], value shall be limited to the threaded length if penetration into substrate exceeds fastener thread length.

Table 6. Starborn Structural Screws Maximum Withdrawal Design Values (W_{max}) in Side Grain Applications

Product Name	Fastener Length (in)	Thread Length (in)	Allowable Maximum Withdrawal Design Values by Species[1,2] (Specific Gravity), (lb)		
			HF/SPF (0.42)	DF/SP (0.50)	SCL (0.50)
Structural H19	2 7/8	1.4	395	520	520
	4	2 1/4	685	905	905
	6	2 1/2	775	1,015	1,015
	8				
	10				

Table 6. Starborn Structural Screws Maximum Withdrawal Design Values (W_{max}) in Side Grain Applications

Product Name	Fastener Length (in)	Thread Length (in)	Allowable Maximum Withdrawal Design Values by Species[1,2] (Specific Gravity), (lb)		
			HF/SPF (0.42)	DF/SP (0.50)	SCL (0.50)
Structural F19	2 7/8	2	395	520	520
	4 1/2		685	905	905
	6		775	1,015	1,015
	8				
	10				
	12				
	14				
	16				
Structural H23	4	2 3/8	940	1,090	1,090
	5	3	1,240	1,420	1,420
Structural F23	2 7/8	1.4	470	570	570
	4	2 3/8	940	1,090	1,090
	5	3	1,240	1,420	1,420
	6	2 3/4	1,120	1,290	1,290
	8				
	10				
Structural F23-E	3 3/8	1 1/2	520	625	625
	5				
	6 3/4				
Structural F23-W	2 7/8	1.4	470	570	570
	4 3/8				
	5 7/8				
Structural F23 Stainless	2 7/8	1.4	265	315	315
	4	2 3/8	450	535	535
	5	3	570	675	675
	6	2 3/4	525	620	620

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.
2. Maximum Withdrawal Design Values are based on full thread engagement, including the tip.

6.5 *Starborn Structural Screws Head Pull-Through Design Values*

6.5.1 Reference design values for head-pull-through for Starborn Structural Screws are specified in **Table 7**.

6.5.1.1 Design loads are applicable for flush installation.

Table 7. Starborn Structural Screws Reference Head Pull-Through Design Values (P) – Flush Installation

Side Member Thickness	Fastener Type									
	Structural H19		Structural H23		Structural F19		Structural F23		Structural F23 Stainless	
	HF/SPF (0.42)	DF/SP (0.50)	HF/SPF (0.42)	DF/SP (0.50)	HF/SPF (0.42)	DF/SP (0.50)	HF/SPF (0.42)	DF/SP (0.50)	HF/SPF (0.42)	DF/SP (0.50)
1 1/2"	405	600	775	1,075	855	975	970	1,210	445	630
1 1/8"	400	595	580	805	640	730	730	905	400	565
1"	355	525	515	715	570	650	645	805	385	545
3/4"	265	395	385	540	430	490	485	605	270	385
23/32"	255	380	370	515	410	465	465	580	255	365
5/8"	225	330	325	450	355	405	405	505	215	300
19/32"	210	315	305	425	340	385	385	480	200	280
1/2"	180	265	260	360	285	325	325	405	155	220
15/32"	165	245	240	335	265	305	305	380	145	200
7/16"	155	230	225	315	250	285	285	355	130	180
3/8"	135	200	195	270	215	245	245	305	100	140

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

1. Tabulated values are for a standard load duration. Values shall be factored by all applicable modification factors per the NDS for wood screws.
2. For structural composite lumber and wood structural panels, use the assigned specific gravity for the product and use the corresponding lumber design value shown above.

6.5.2 Reference head-pull-through design loads for countersunk fasteners are provided in **Table 8**.

6.5.2.1 Countersunk depth shall not exceed 1/2".

Table 8. Starborn Structural Screws Reference Head Pull-Through Design Values (P) – Countersunk Installation

Side Member Thickness	Fastener Type			
	Structural F23		Structural F23 Stainless	
	HF/SPF (0.42)	DF/SP (0.50)	HF/SPF (0.42)	DF/SP (0.50)
1 1/2"	645	805	385	545

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

1. Tabulated values are for a standard load duration. Values shall be factored by all applicable modification factors per the NDS for wood screws.
2. For structural composite lumber and wood structural panels, use the assigned specific gravity for the product and use the corresponding lumber design value shown above.

6.6 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[23]

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.[24]

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.[25]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Starborn Structural Screws comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Bending yield in accordance with ASTM F1575

8.1.2 Tensile strength in accordance with AISI S904

8.1.3 Shear strength in accordance with AISI S904

8.1.4 Lateral strength in accordance with ASTM D1761

8.1.5 Withdrawal strength in accordance with ASTM D1761

8.1.6 Head pull-through strength in accordance with ASTM D1761

8.1.7 Corrosion resistance of fasteners with the proprietary black exterior coating meeting or exceeding the protection afforded hot-dipped galvanized fasteners in accordance with ASTM A153

8.2 Use of fasteners with the proprietary coatings, (i.e., the black exterior coating and the gray e-coat) in locations exposed to saltwater or saltwater spray, is outside the scope of this report.

8.3 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), which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified[26] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.

8.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

8.5 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 Starborn Structural Screws shall be installed using a high-torque, low-speed drill in accordance with the manufacturer installation instructions.

9.3.2 The fasteners must be installed using a $^{5}/_{16}$" hex, $^{3}/_{8}$" hex, T-30 Torx®, or T-40 Torx® driver bit depending on the fastener used.

9.3.3 Pre-drilling of pilot holes is not required but may be used where lumber is prone to splitting.

9.3.4 All fastener spacing, edge distance, and end distance shall be per **Table 9** and **Table 10**.

9.3.4.1 Location of the distances are shown in **Figure 8**.

Table 9. Starborn Structural Screw Edge and End Distance Requirements for 0.19" Screw

Figure 8 Number	Installed Condition	Minimum Distance or Spacing[1,2] (in)		
		Face	Edge	End
1	Minimum End Distance	6	3	$1^{3}/_{4}$
2	Minimum Edge Distance	$1^{3}/_{4}$	$^{3}/_{4}$	$^{3}/_{4}$
3	Minimum Spacing Between Fasteners in a Row	$2^{7}/_{8}$	$2^{7}/_{8}$	$2^{7}/_{8}$
4	Minimum Spacing Between Non-Staggered Rows	$2^{7}/_{8}$	N/A	N/A
5	Minimum Spacing Between Staggered Rows	$^{1}/_{2}$	N/A	N/A
6	Minimum Stagger Between Fasteners in Adjacent Rows	$^{1}/_{2}$	N/A	N/A

SI: 1 in = 25.4 mm

1. Table values based on 0.19" screw.
2. Edge distances, end distances, and spacing of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is the more restrictive.

Table 10. Starborn Structural Screw Edge & End Distance Requirements for 0.23" Diameter Screw

Figure 8 Number	Installed Condition	Minimum Distance or Spacing[1,2] (in)		
		Face	Edge	End
1	Minimum End Distance	6	3	1¾
2	Minimum Edge Distance	1¾	¾	¾
3	Minimum Spacing Between Fasteners in a Row	3½	3½	3½
4	Minimum Spacing Between Non-Staggered Rows	3½	N/A	N/A
5	Minimum Spacing Between Staggered Rows	⅝	N/A	N/A
6	Minimum Stagger Between Fasteners in Adjacent Rows	⅝	N/A	N/A

SI: 1 in = 25.4 mm

3. Table values based on 0.23" screw.
4. Edge distances, end distances, and spacing of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is the more restrictive.

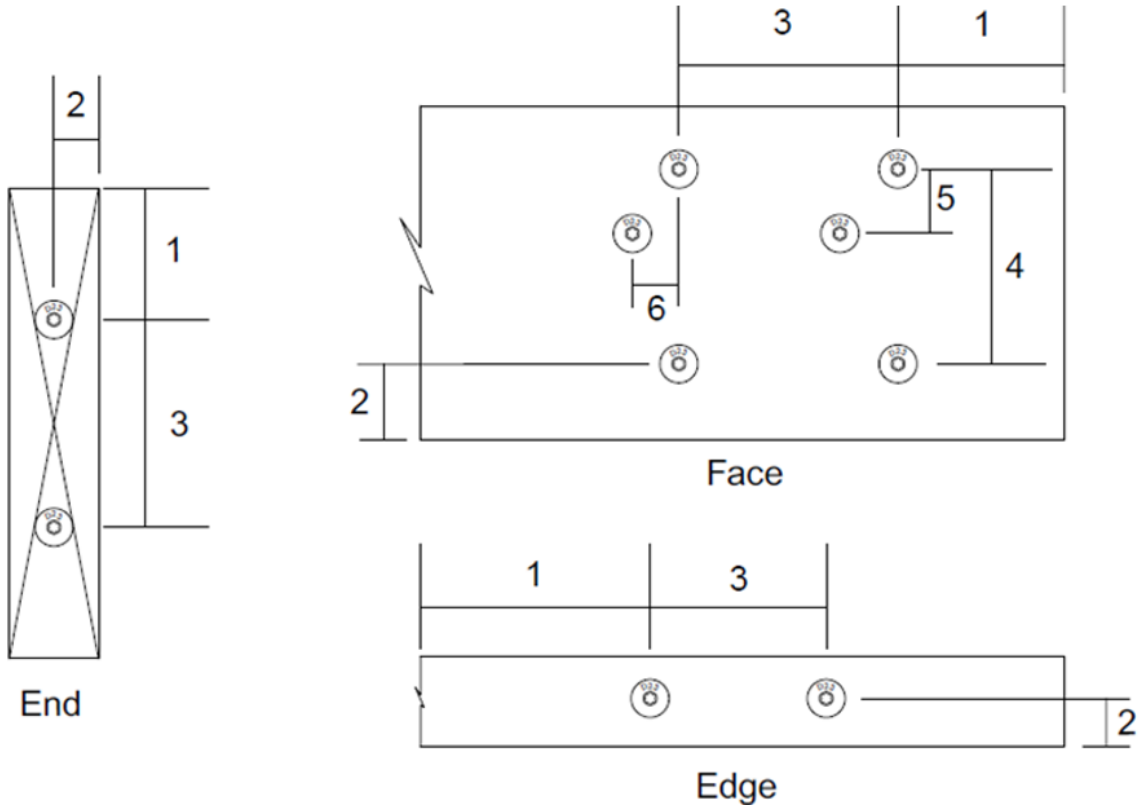

Figure 8. Starborn Structural Screw Spacing Diagram

9.3.5 Minimum penetration is 1" unless otherwise stated in this report. Install fasteners with head flush to the surface of the wood member.

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 Bending yield testing in accordance with ASTM F1575

10.1.2 Tensile strength testing in accordance with AISI S904

10.1.3 Shear strength testing in accordance with AISI S904

10.1.4 Lateral strength testing in accordance with ASTM D1761

10.1.5 Withdrawal strength testing in accordance with ASTM D1761

10.1.6 Head pull-through strength testing in accordance with ASTM D1761

10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.3 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.

10.4 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.

10.5 *Testing and Engineering Analysis:*

10.5.1 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.[27]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Starborn Structural Screws on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Starborn Structural Screws have performance characteristics that were tested and/or meet applicable regulations and are 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, Starborn Structural Screws shall be approved for the following applications:

11.2.1 Starborn Structural Screws are a suitable alternative to the requirements of IBC Section 1604.8.3 and IRC Section R507.9.[28]

11.2.2 These products have been evaluated in the context of the codes listed in **Section 4** and are compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this report, they are listed here:

11.2.2.1 No known variations

11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Starborn Industries, Inc.

11.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[29] are similar) in pertinent part state:

> **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:**[30] Building regulations require that the building official shall accept duly authenticated reports.[31]

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 Arrangement (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.[32]

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, Starborn Structural Screws shall be:

12.3.1 Installed in accordance with this report and the manufacturer installation instructions.

12.4 For conditions not covered in this report, connections shall be designed in accordance with generally accepted engineering practice. When the capacity of a connection is controlled by fastener metal strength rather than wood strength, the metal strength must not be multiplied by the adjustment factors specified in the NDS.

12.5 With the exception of Starborn F23 Stainless Structural Screws, use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this evaluation report.

12.6 Manufacturer installation instructions shall be followed as provided in **Section 9**.

12.7 Starborn Structural Screws are produced by Starborn Industries, Inc. at its facilities located in Edison, New Jersey.

12.8 Starborn Structural Screws are produced under a quality control program subject to periodic inspections performed by an approved agency in accordance with IBC Section 1703.5.2.

12.9 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:

12.9.1 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.

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

12.9.3 These innovative products have an internal quality control program and a third-party quality assurance program.

12.9.4 At a minimum, these innovative products shall be installed per **Section 9** of this report.

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

12.9.6 These innovative products have 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.

12.9.7 The application of these innovative products 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.

12.10 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.

12.11 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).

12.12 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 products listed in **Section 1.1** are 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 www.starbornindustries.com.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

Issue Date: January 11, 2021
Subject to Renewal: January 1, 2026

FBC Supplement to Report Number 1703-05

REPORT HOLDER: Starborn® Industries, Inc.

1 Evaluation Subject

1.1 Starborn Structural Screws:

1.1.1 Starborn Structural H19 Screws

1.1.2 Starborn Structural F19 Screws

1.1.3 Starborn Structural H23 Screws

1.1.4 Starborn Structural F23 Screws

1.1.5 Starborn Structural F23-E Screws

1.1.6 Starborn Structural F23-W Screws

1.1.7 Starborn Structural F23 Stainless Screws

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Starborn Structural Screws, recognized in Report Number 1703-05, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

2.2.1 *FBC-B—20, 23: Florida Building Code – Building (FL 30525)*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential (FL 30525)*

3 Conclusions

3.1 Starborn Structural Screws, described in Report Number 1703-05, comply with the FBC-B and FBC-R and are subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this report, they are listed here:

3.2.1 FBC-B Section 104.4 and Section 110.4 are reserved.

3.2.2 FBC-R Section R104 and Section R109 are reserved.

4 Conditions of Use

4.1 Starborn Structural Screws, described in Report Number 1703-05, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1703-05.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.

Issue Date: November 8, 2021
Subject to Renewal: January 1, 2026

LABC and LARC Supplement to Report Number 1703-05

REPORT HOLDER: Starborn® Industries, Inc.

1 Evaluation Subject

1.1 Starborn Structural Screws:

1.1.1 Starborn Structural H19 Screws

1.1.2 Starborn Structural F19 Screws

1.1.3 Starborn Structural H23 Screws

1.1.4 Starborn Structural F23 Screws

1.1.5 Starborn Structural F23-E Screws

1.1.6 Starborn Structural F23-W Screws

1.1.7 Starborn Structural F23 Stainless Screws

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Starborn Structural Screws, recognized in Report Number 1703-05 have also been evaluated for compliance with the codes listed below as adopted by the Los Angeles Department of Building and Safety (LADBS).

2.2 *Applicable Code Editions*

2.2.1 *LABC—20, 23: Los Angeles Building Code*

2.2.2 *LARC—20, 23: Los Angeles Residential Code*

3 Conclusions

3.1 Starborn Structural Screws, described in Report Number 1703-05, comply with the LABC and LARC and are subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the LABC and LARC applicable to this report, they are listed here:

3.2.1 LABC Section 104.2.6 replaces IBC Section 104.11

3.2.2 LABC Section 104.2.2 replaces IBC Section 104.4

3.2.3 LABC Section 108 replaces IBC Section 110.4

3.2.4 LABC Section 108.5 replaces IBC Section 110.3

3.2.5 LARC Section 104.2.6 replaces IRC Section R104.11

3.2.6 LARC Section 104.2.2 replaces IRC Section R104.4

3.2.7 LARC Section 108 replaces IRC Section R109.2

3.2.8 LARC Section 108.5 replaces IRC Section R109.1

4 Conditions of Use

4.1 Starborn Structural Screws, described in Report Number 1703-05, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1703-05.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of LABC Chapter 16 and Chapter 17, as applicable.

Notes

1 For more information, visit drjcertification.org or call us at 608-310-6748.

2 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1702

3 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11

4 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests%20as

5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706:~:text=shall%20conform%20to%20the%20specifications%20and%20methods%20of%20design%20of%20accepted%20engineering%20practice

6 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies

7 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2

8 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_agency

9 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_source

10 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets

11 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

12 https://www.cbitest.com/accreditation/

13 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104:~:text=to%20enforce%20the%20provisions%20of%20this%20code

14 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11:~:text=Where%20the%20alternative%20material%2C%20design%20or%20method%20of%20construction%20is%20not%20approved%2C%20the%20building%20official%20shall%20respond%20in%20writing%2C%20stating%20the%20reasons%20why%20the%20alternative%20was%20not%20approved AND https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#105.3.1:~:text=If%20the%20application%20or%20the%20construction%20documents%20do%20not%20conform%20to%20the%20requirements%20of%20pertinent%20laws%2C%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%2C%20stating%20the%20reasons%20therefore

15 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.11

16 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

17 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

18 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

19 Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service, and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.

20 All references to the FBC-B and FBC-R are the same as the 2021 IBC and 2021 IRC unless otherwise noted in the Florida Supplement at the end of this report.

21 All references to the LABC and LARC are the same as the 2021 IBC and 2021 IRC unless otherwise noted in the California Supplement at the end of this report.

22 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#listed AND https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#labeled

23 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4

24 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

25 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

26 Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

27 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

28 2015 IRC Section R507.2

29 2018 IFC Section 104.9

[30] Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[31] https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1

[32] Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.