

Performance Characteristics of SIPTP and SIPLD

CBI Listing



CL 2302-08

Issue Date: July 18, 2023

Revision Date: July 18, 2023

Subject to Renewal: July 1, 2024

Trade Secret Owner:

Altenloh, Brinck & Co. US, Inc.

Website: www.trufast.com

Telephone: 419-636-6715

DIVISION: 04 00 00 - MASONRY

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

DIVISION: 05 00 00 - METALS

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

SECTION: 05 05 23 - Metal Fastenings

1 Innovative Products Evaluated^{1,2}

1.1 SIPTP and SIPLD

1.2 The innovative products evaluated in this Listing are shown in Figure 1 and Figure 2.

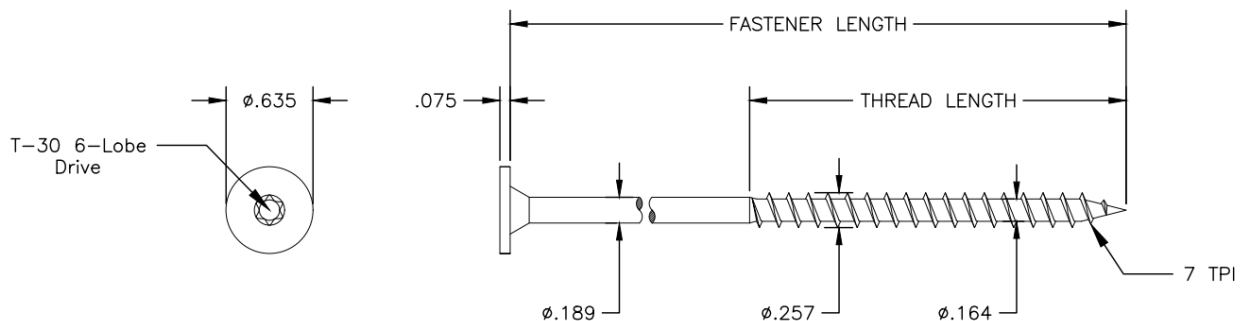


Figure 1. SIPTP Fastener

¹ For more information, visit cbitest.com or call us at 608-310-6739.

² **Federal Regulation Definition.** 24 CFR 3280.2 "Listed or certified" means included in a list published by a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection 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. **International Building Code (IBC) Definition of Listed.** Equipment, materials, products or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose Listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. **IBC Definition of Labeled.** Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

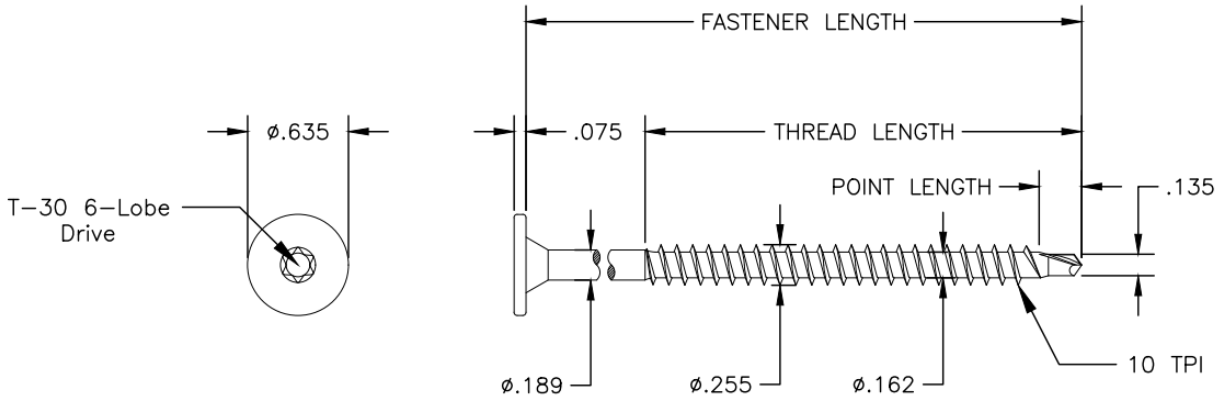


Figure 2. SIPLD Fastener

1.3 Fasteners

- 1.3.1 SIPTP (Thread Point) fasteners are size No. 14 fasteners with a pancake head and a T-30 drive. The point is a threaded drill point. The SIPTP fastener is shown in Figure 1.
- 1.3.2 SIPLD (Light-Duty) fasteners are size No. 14 fasteners with a pancake head and a T-30 drive. The point is a two-flute formed drill tip. The SIPLD fastener is shown in Figure 2.

1.4 SIP fasteners are coated with TRUFAST® Tru-Kote™ coating.

- 1.4.1 SIP fasteners coated with TRUFAST® Tru-Kote™ were tested and passed ASTM D6294 with less than 15% red rust after 15 cycles, in accordance with FM 4470.

1.5 The fasteners evaluated in this listing are set forth in Table 1 and Table 2.

Table 1. SIPTP Fastener Specifications

Fastener Name	Fastener Part Number	Head (in)		Nominal Length ¹ (in)	Thread Length ¹ (in)	Shank Diameter ² (in)	Thread Diameter (in)		Nominal Bending Yield, ³ f _{yb} (psi)	Allowable Fastener Strength (lb)		
		Diameter	Drive Type				Minor	Major		Tensile	Shear at Shank Diameter	Shear at Minor Diameter
SIPTP	SIPTP-2000	0.635	T-30	2.00	1.75	0.189	0.164	0.257	185,000	1,185	975	860
	SIPTP-2500			2.50								
	SIPTP-3000			3.00	2.00							
	SIPTP-3500			3.50								
	SIPTP-4000			4.00	2.75							
	SIPTP-4500			4.50								
	SIPTP-5000			5.00								
	SIPTP-5500			5.50								
	SIPTP-6000			6.00								
	SIPTP-6500			6.50								
	SIPTP-7000			7.00								
	SIPTP-7500			7.50								
	SIPTP-8000			8.00								
	SIPTP-8500			8.50								
	SIPTP-9000			9.00								
	SIPTP-10000			10.00								
	SIPTP-11000			11.00								
	SIPTP-12000			12.00								
	SIPTP-13000			13.00								
	SIPTP-14000			14.00								
SIPTP-15000	15.00											
SIPTP-16000	16.00											
SIPTP-18000	18.00											

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

1. Fastener length is measured from the underside of the head to the tip. Thread length includes tapered tip (see Figure 1).
2. Shank diameter based on manufactured thickness. Finished dimensions are larger, due to the proprietary coatings added.
3. Nominal bending yield, F_y, is measured along the threaded portion of the fastener. For the nominal bending yield of the fastener along the shank, take a 10% reduction.

Table 2. SIPLD Fastener Specifications

Fastener Name	Fastener Part Number	Head (in)		Nominal Length ¹ (in)	Thread Length ¹ (in)	Point Length (in)	Shank Diameter ² (in)	Thread Diameter (in)		Nominal Bending Yield, ³ f _{yb} (psi)	Allowable Fastener Strength (lb)		
		Diameter	Drive Type					Minor	Major		Tensile	Shear at Shank Diameter	Shear at Minor Diameter
SIPLD	SIPLD-2250	0.635	T-30	2.25	1.00	0.125	0.189	0.162	0.255	185,000	1,130	945	830
	SIPLD-3000			3.00	2.75	0.275							
	SIPLD-3250			3.25	1.50	0.125							
	SIPLD-3500			3.50	2.75	0.275							
	SIPLD-4000			4.00									
	SIPLD-4250			4.25	2.00	0.125							
	SIPLD-4500			4.50	2.75	0.275							
	SIPLD-5000			5.00									
	SIPLD-5250			5.25	2.50	0.125							
	SIPLD-5500			5.50	2.75	0.275							
	SIPLD-6000			6.00									
	SIPLD-6500			6.50									
	SIPLD-7000			7.00									
	SIPLD-7500			7.50									
	SIPLD-8000			8.00									
	SIPLD-8500			8.50									
	SIPLD-9000			9.00									
	SIPLD-9500			9.50									
	SIPLD-10000			10.00									
	SIPLD-11000			11.00									
SIPLD-12000	12.00												
SIPLD-13000	13.00												
SIPLD-14000	14.00												
SIPLD-15000	15.00												
SIPLD-16000	16.00												
SIPLD-18000	18.00												

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

1. Fastener length is measured from the underside of the head to the tip. Thread length includes tapered tip (see Figure 2).
2. Shank diameter based on manufactured thickness. Finished dimensions are larger, due to the proprietary coatings added.
3. Nominal bending yield, F_{yb}, is measured along the threaded portion of the fastener. For the nominal bending yield of the fastener along the shank, take a 10% reduction.



1.6 *Vented and Non-Vented Nailable Insulation Panels*

1.6.1 Vented nailable insulation panels are a composite of single layer of Oriented Strand Board (OSB) or plywood material, vent spacer, and a rigid insulation board(s). Vented nailable insulation panels have an air space, formed by blocking, between the wood facer and foam insulation.

1.6.2 Non-Vented nailable insulation panels are a composite of a single layer of OSB or plywood material and a rigid insulation board(s).

1.6.3 *Rigid Insulation Board*

1.6.3.1 Expanded polystyrene (EPS) shall be ASTM C578 Type 1, at a minimum.

1.6.3.2 Polyisocyanurate (Polyiso) insulation shall be ASTM C1289, Type II Class 1 Grade 2 minimum, or Type II Class 2 Grade 2 minimum.

1.6.3.3 EPS and Polyiso products with greater density and compressive strength than the types listed above are also allowed.

1.6.4 *Vent Spacers*

1.6.4.1 Vent spacers shall be constructed of either EPS or wood blocking per manufacturer specifications.

1.6.5 *Nailable Surface*

1.6.5.1 Facing material shall be a minimum:

1.6.5.1.1 $7/16$ " thick OSB with a specific gravity of at least 0.50 and comply with DOC PS 2.

1.6.5.1.2 $19/32$ " thick plywood with a specific gravity of at least 0.50 and comply with DOC PS 1.

1.7 *Field Fabricated Nailable Insulation Panels*

1.7.1 Nailable insulation panels may also consist of OSB or plywood, over layer(s) of foam insulation, with or without a vent space.

1.7.2 Where fire retardant treated (FRT) plywood is used as a nail base, the appropriate reduction factors shall be taken per the FRT manufacturer.

1.8 *Substrate Materials*

1.8.1 *Wood Roof Deck*

1.8.1.1 Wood roof decks must meet the requirements of the nailable insulation panel manufacturer, or one of the following, whichever is most restrictive:

1.8.1.1.1 Solid sawn wood (plank or tongue and groove) shall be a minimum 1" thick and have a specific gravity of at least 0.42.

1.8.1.1.2 Plywood shall be a minimum $1/2$ " thick with a specific gravity of at least 0.39 and comply with DOC PS 1.

1.8.1.1.3 OSB shall be a minimum $7/16$ " thick with a specific gravity of at least 0.50 and comply with DOC PS 2.

1.8.2 *Steel Roof Deck*

1.8.2.1 Steel must comply with one of the material standards provided in Section A3.1 of AISI S100.

1.8.2.1.1 The steel deck shall be minimum 22 gauge and have a minimum tensile strength of 45 ksi (i.e., ASTM A653 Gr. 33, ASTM A1063 Gr. 33, etc.).



2 Scope of Listing^{3,4}

- 2.1 SIPTP and SIPLD have been tested and/or evaluated in accordance with the following Standards and Referenced Documents for use as specified herein:
 - 2.1.1 *AISI S100: North American Specification for the Design of Cold-formed Steel Structural Members*
 - 2.1.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
 - 2.1.3 *ASTM A370: Standard Test Methods and Definitions for Mechanical Testing of Steel Products*
 - 2.1.4 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*
 - 2.1.5 *ASTM D6294: Standard Test Method for Corrosion Resistance of Ferrous Metal Fastener Assemblies Used in Roofing and Waterproofing*
 - 2.1.6 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*
 - 2.1.7 *DOC PS 1: Structural Plywood*
 - 2.1.8 *DOC PS 2: Performance Standard for Wood-based Structural-Use Panels*
 - 2.1.9 *FM 4470: Approval Standard for Single-Ply Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction*

3 Performance Evaluation

- 3.1 Tests, testing, test reports, research reports, duly authenticated reports and related engineering evaluations are defined as intellectual property and/or trade secrets and protected by Defend Trade Secrets Act 2016 (DTSA).⁵
- 3.2 Testing and/or inspections conducted for this Listing were performed by CBI, ISO/IEC 17025 accredited testing laboratory,⁶ and ISO/IEC 17020 accredited inspection body,⁷ which are internationally recognized accreditations through International Accreditation Forum (IAF).
- 3.3 Independent testing and/or inspections conducted for this Listing were performed by an ISO/IEC 17025 accredited testing laboratory, ISO/IEC 17020 accredited inspection body, and/or a licensed Registered Design Professional (RDP).
- 3.4 Unless otherwise noted, adjustment of the design stresses for load duration shall be in accordance with the applicable code.

³ This Listing is a code defined research report, which is also known as a duly authenticated report, provided by an approved agency (see IBC Section 1703.1) and/or an approved source (see IBC Section 1703.4.2). An approved agency is "approved" as an approved agency when it is ANAB accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory. A professional engineer is "approved" as an approved source when that professional engineer is properly licensed to transact engineering commerce. Where sealed by a professional engineer, it is also a duly authenticated report certified by an approved source. (i.e., Registered Design Professional). DrJ is an ANAB accredited product certification body.

⁴ 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.

⁵ <https://www.law.cornell.edu/uscode/text/18/part-II/chapter-90>. Given our professional duty to inform, please be aware that whoever, with intent to convert a trade secret (TS), that is related to a product or service used in or intended for use in interstate or foreign commerce, to the economic benefit of anyone other than the owner thereof, and intending or knowing that the offense will, injure any owner of that trade secret, knowingly without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys such information; shall be fined under this title or imprisoned not more than 10 years, or both. 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. As the National Society of Professional Engineers states, "Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve." Therefore, to protect intellectual property (IP) and TS, and to achieve 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. For more information, please review this website: Intellectual Property and Trade Secrets.

⁶ Internationally recognized accreditations are performed by members of the International Accreditation Forum (IAF). Accreditation Body and Regional Accreditation Group Members of IAF are admitted to the IAF MLA only after a stringent evaluation of their operations by a peer evaluation team, which is charged to ensure that the applicant complies fully with both international standards and IAF requirements. Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.

⁷ Ibid.



3.5 Connections in Wood Roof Deck

- 3.5.1 SIPTP and SIPLD fasteners are approved for attaching vented nailable insulation panels in roof assemblies with a maximum 2" vent space plus a maximum of 8.5" of foam insulation (total of 10.5" space between nailable insulation panels face and roof deck) to wood decking, or a non-vented nailable insulation panel with a total of 10.5" space between the nailable insulation panel face and roof deck.
 - 3.5.1.1 The total foam insulation thickness may be comprised of multiple layers of foam or a single piece of foam.
- 3.5.2 Design of SIPTP and SIPLD fasteners is governed by the applicable code and the provisions for dowel type fasteners in NDS.
- 3.5.3 The required number of fasteners per nailable insulation panels is selected by choosing the largest value for the applicable wind speed and snow/seismic load from Section 3.5.8 or Section 3.5.9 and Section 3.5.10, respectively.
- 3.5.4 The tabulated fastener requirements for SIPTP and SIPLD fasteners in Section 3.5 are based on fastener properties from testing. The allowable lateral design values for the various roof decking materials, with a load duration factor of 1.0, are as follows:
 - 3.5.4.1 36 pounds for $7/16$ " OSB.
 - 3.5.4.2 62 pounds for $1/2$ " plywood, $19/32$ " plywood, and 1" thick SPF (Spruce-Pine-Fir).
- 3.5.5 Nailable insulation panels shall be attached through the foam insulation to the roof deck or wood framing (if approved by the nailable insulation panel manufacturer) spaced a maximum of 24" on-center, per the nailable insulation panel manufacturer specifications and installation instructions.
- 3.5.6 Fastener thread shall penetrate a minimum 1" into sawn lumber decks (plank or tongue and groove) and achieve full thickness penetration and extend $3/4$ " beyond the underside of the board where driven into OSB and Plywood decks.
- 3.5.7 Where FRT plywood nailable insulation panels are used, the tabulated allowable minimum number of fasteners shall be divided by the FRT manufacturer strength reduction factor for screw connections.
 - 3.5.7.1 For example, where $1/2$ " FRT plywood is used and the FRT manufacture specifies a strength design factor of 0.90 for wood screws:
 - 3.5.7.1.1 Table 3 requires 20 fasteners to resist a 120 mph wind load on Roof Zone 3 of a 3:12 roof pitch sheathed with standard $1/2$ " plywood. If $1/2$ " FRT plywood is used in place of $1/2$ " standard plywood, the required number of fasteners is $20 \div 0.90 = 22.2$. Therefore, 23 fasteners are required.



3.5.8 ASCE 7-10 Wind Loading

3.5.8.1 The required number of fasteners per 4'x8' nailable insulation panel to resist wind loads on gable, hip, and monoslope roofs per ASCE 7-10 are provided in Table 3.

Table 3. Connection to Wood Roof Deck: Fastener Requirements to Resist ASCE 7-10 Wind Loads

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{5,6,7,8,9}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
7/16" OSB¹												
Roof Zone 1	15	15	16	15	20	16	24	20	28	24	36	28
Roof Zone 2	15	15	20	15	24	16	32	24	40	28	48	32
Roof Zone 3	20	15	28	15	40	16	52	24	64	28	80	32
1/2" Plywood²												
Roof Zone 1	15	15	15	15	16	15	16	16	24	16	28	20
Roof Zone 2	15	15	16	15	20	15	24	16	28	20	36	24
Roof Zone 3	16	15	20	15	28	15	36	16	48	20	56	24
19/32" Plywood³ or SPF⁴												
Roof Zone 1	15	15	15	15	15	15	15	15	16	15	20	16
Roof Zone 2	15	15	15	15	16	15	20	15	24	16	28	20
Roof Zone 3	15	15	16	15	20	15	28	15	36	16	44	20

SI: 1 mph = 1.61 km/h

- Minimum 7/16" OSB with a specific gravity of at least 0.50 that complies with DOC PS 2.
- Minimum 1/2" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
- Minimum 19/32" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
- Minimum 1" thick SPF (specific gravity 0.42).
- Table based on ASCE 7-10 wind components and cladding part 1 low-rise rise (h ≤ 60 ft).
- Tabulated values apply to hip, gable, and monoslope roofs only for wind exposure B or C.
- Tabulated values assume K_z = 1.13, K_{zt} = 1.0, and K_d = 0.85. Tabulated values may be adjusted to account for site-specific conditions.
- See ASCE 7-10 Chapter 30 for roof zone locations.
- Tabulated values are based on a load duration factor CD = 1.6. No further increases are permitted.

3.5.9 ASCE 7-16 Wind Loading

3.5.9.1 The required number of fasteners per 4'x8' nailable insulation panel to resist wind loads on gable, monoslope, and hip roofs per ASCE 7-16 are provided in Table 4, Table 5, and Table 6, respectively.

Table 4. Connection to Wood Roof Deck: Fastener Requirements to Resist ASCE 7-16 Wind Loads - Gable Roofs

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{5,6,7,8,9}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
7/16" OSB¹												
Roof Zone 1	16	15	20	20	28	24	36	32	44	40	56	48
Roof Zone 2	20	16	32	20	40	28	52	36	68	44	80	56
Roof Zone 3	24	20	36	24	48	36	64	44	80	56	96	68
1/2" Plywood²												
Roof Zone 1	15	15	16	16	20	20	28	24	32	28	40	36
Roof Zone 2	16	15	24	16	32	20	40	28	48	32	60	40
Roof Zone 3	20	15	28	20	36	24	48	32	56	40	72	48
19/32" Plywood³ or SPF⁴												
Roof Zone 1	15	15	15	15	16	16	20	20	24	24	28	28
Roof Zone 2	15	15	16	15	24	16	28	20	36	24	44	28
Roof Zone 3	16	15	20	16	28	20	36	24	44	32	52	36

SI: 1 mph = 1.61 km/h

- Minimum 7/16" OSB with a specific gravity of at least 0.50 that complies with DOC PS 2.
- Minimum 1/2" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
- Minimum 19/32" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
- Minimum 1" thick SPF (specific gravity 0.42).
- Table based on ASCE 7-16 wind components and cladding part 1 low-rise (h ≤ 60 ft).
- Tabulated values apply to gable roofs only for wind exposure B or C.
- Tabulated values assume K_z = 1.13, K_{zt} = 1.0, K_d = 0.85, and K_e = 1.0. Tabulated values may be adjusted to account for site-specific conditions.
- See ASCE 7-16 Chapter 30 for roof zone locations.
- Tabulated values are based on a load duration factor C_D = 1.6. No further increases are permitted.

Table 5. Connection to Wood Roof Deck: Fastener Requirements to Resist ASCE 7-16 Wind Loads – Monoslope Roofs

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{5,6,7,8,9}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
7/16" OSB¹												
Roof Zone 1	15	15	16	20	20	24	24	32	28	40	36	48
Roof Zone 2	15	16	16	20	24	28	28	36	36	44	44	56
Roof Zone 3	20	20	28	24	40	36	52	44	64	56	80	68
1/2" Plywood²												
Roof Zone 1	15	15	15	16	16	20	16	24	24	28	28	36
Roof Zone 2	15	15	15	16	16	20	20	28	28	32	32	40
Roof Zone 3	16	15	20	20	28	24	36	32	48	40	56	48
19/32" Plywood³ or SPF⁴												
Roof Zone 1	15	15	15	15	15	16	15	20	16	24	20	28
Roof Zone 2	15	15	15	15	15	16	16	20	20	24	24	28
Roof Zone 3	15	15	16	16	20	20	28	24	36	32	44	36

SI: 1 mph = 1.61 km/h

1. Minimum 7/16" OSB with a specific gravity of at least 0.50 that complies with DOC PS 2.
2. Minimum 1/2" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
3. Minimum 19/32" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
4. Minimum 1" thick SPF (specific gravity 0.42).
5. Table based on ASCE 7-16 wind components and cladding part 1 low-rise rise (h ≤ 60 ft).
6. Tabulated values apply to monoslope roofs only for wind exposure B or C.
7. Tabulated values assume $K_z = 1.13$, $K_{zt} = 1.0$, $K_d = 0.85$, and $K_e = 1.0$. Tabulated values may be adjusted to account for site-specific conditions.
8. See ASCE 7-16 Chapter 30 for roof zone locations.
9. Tabulated values are based on a load duration factor $C_D = 1.6$. No further increases are permitted.



Table 6. Connection to Wood Roof Deck: Fastener Requirements to Resist ASCE 7-16 Wind Loads - Hip Roofs

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{5,6,7,8,9}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
7/16" OSB¹												
Roof Zone 1	15	15	20	16	24	20	32	28	40	36	48	40
Roof Zone 2	20	16	28	24	36	32	44	44	56	52	72	64
Roof Zone 3	20	20	28	24	36	36	44	44	56	56	72	68
1/2" Plywood²												
Roof Zone 1	15	15	16	15	20	16	24	20	28	24	36	32
Roof Zone 2	16	15	20	20	28	24	32	32	44	40	52	48
Roof Zone 3	16	15	20	20	28	24	32	32	44	40	52	48
19/32" Plywood³ or SPF⁴												
Roof Zone 1	15	15	15	15	16	15	20	16	24	20	28	24
Roof Zone 2	15	15	16	16	20	20	24	24	32	28	40	36
Roof Zone 3	15	15	16	16	20	20	24	24	32	32	40	36

- SI: 1 mph = 1.61 km/h
1. Minimum 7/16" OSB with a specific gravity of at least 0.50 that complies with DOC PS 2.
 2. Minimum 1/2" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
 3. Minimum 19/32" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
 4. Minimum 1" thick SPF (specific gravity 0.42).
 5. Table based on ASCE 7-16 wind components and cladding part 1 low-rise rise (h ≤ 60 ft).
 6. Tabulated values apply to hip roofs only for wind exposure B or C.
 7. Tabulated values assume $K_z = 1.13$, $K_{zt} = 1.0$, $K_d = 0.85$, and $K_e = 1.0$. Tabulated values may be adjusted to account for site-specific conditions.
 8. See ASCE 7-16 Chapter 30 for roof zone locations.
 9. Tabulated values are based on a load duration factor $C_D = 1.6$. No further increases are permitted.



3.5.10 Snow and Seismic Loading

3.5.10.1 The required number of fasteners per 4'x8' nailable insulation panel to resist snow and seismic loads are provided in Table 7 and Table 8.

3.5.10.2 The tables in this section may be used with ASCE 7-10 or ASCE 7-16.

Table 7. Connection to Wood Deck: Fastener Requirements to Resist Snow Loads up to 60 psf

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{4,5,6,7}								
Snow Load (psf)	30		40		50		60	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
7/16" OSB¹								
Roof Zone – All	15	16	15	20	20	24	20	28
S _{DS} Max	1.154	1.121	0.811	1.375	1.161	1.591	0.873	1.779
1/2" Plywood² or SPF³								
Roof Zone – All	15	15	15	15	15	16	15	16
S _{DS} Max	2.819	3.015	2.314	2.411	1.898	2.178	1.550	1.711

SI: 1 psf = 0.0479 kN/m²

- Minimum 7/16" OSB with a specific gravity of at least 0.50 that complies with DOC PS 2.
- Minimum 1/2" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
- Minimum 1" thick SPF (specific gravity 0.42).
- Tabulated snow load is a design snow load.
- 10 psf dead load is assumed to act concurrently with snow load.
- S_{DS} max per ASCE 7 Section 13.5.3 for W_p assuming 10 psf dead load plus 0.2 snow load (sloped roof).
- Tabulated values are based on a load duration factor C_D = 1.15 for the snow load case and 1.6 for the seismic load case. No further increases are permitted.

Table 8. Connection to Wood Deck: Fastener Requirements to Resist Snow Loads up to 100 psf

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{4,5,6,7}								
Snow Load (psf)	70		80		90		100	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
7/16" OSB¹								
Roof Zone – All	24	28	24	32	28	36	32	40
S _{DS} Max	1.058	1.367	0.817	1.546	0.982	1.704	1.126	1.846
1/2" Plywood² or SPF³								
Roof Zone – All	15	20	15	20	16	20	16	24
S _{DS} Max	1.255	2.295	1.001	1.877	0.940	1.505	0.737	2.008

SI: 1 psf = 0.0479 kN/m²

- Minimum 7/16" OSB with a specific gravity of at least 0.50 that complies with DOC PS 2.
- Minimum 1/2" plywood with a specific gravity of at least 0.39 that complies with DOC PS 1.
- Minimum 1" thick SPF (specific gravity 0.42).
- Tabulated snow load is a design snow load.
- 10 psf dead load is assumed to act concurrently with snow load.
- S_{DS} max per ASCE 7 Section 13.5.3 for W_p assuming 10 psf dead load plus 0.2 snow load (sloped roof).
- Tabulated values are based on a load duration factor C_D = 1.15 for the snow load case and 1.6 for the seismic load case. No further increases are permitted.



3.6 Connections in Steel Roof Deck

3.6.1 SIPLD fasteners are approved for attaching nailable insulation panels with a maximum 2" vent space plus a maximum of 12" of foam insulation to steel decking (total of 14" space between nailable insulation panel face and roof deck) or a non-vented nailable insulation panel with a total of 14" space between the nailable insulation panel face and roof deck.

3.6.1.1 The total foam insulation thickness may be comprised of multiple layers of foam or a single piece of foam.

3.6.2 The required number of fasteners per nailable insulation panel is selected by choosing the largest value for the applicable wind speed and snow load from Section 3.6.5 or Section 3.6.6 and Section 3.6.7, respectively.

3.6.3 The tabulated fastener requirements in Section 3.6 are based on fastener properties from testing. The allowable lateral design value for SIPLD fasteners in minimum 22 gauge steel decking ($F_u = 45$ ksi, min) is 42 pounds.

3.6.4 Fastener length shall provide a minimum of $3/4$ " penetration through steel deck.

3.6.5 ASCE 7-10 Wind Loading

3.6.5.1 The required number of fasteners per 4'x8' nailable insulation panel to resist wind loads on gable, hip, and monoslope roofs per ASCE 7-10 are provided in Table 9.

Table 9. Connection to Steel Deck: Fastener Requirements to Resist ASCE 7-10 Wind Loads

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{1,2,3,4,5}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
Roof Zone 1	15	15	15	15	15	15	20	15	25	20	30	20
Roof Zone 2	15	15	15	15	20	15	25	20	30	20	40	25
Roof Zone 3	15	15	25	15	30	15	40	20	50	20	60	25

SI: 1 mph = 1.61 km/h

- Steel decking shall be minimum 22 gauge and have a minimum ultimate tensile strength of 45 ksi.
- Table based on ASCE 7-10 wind components and cladding part 1 low-rise rise ($h \leq 60$ ft).
- Tabulated values apply to hip, gable, and monoslope roofs only for wind exposure B or C.
- Tabulated values assume $K_z = 1.13$, $K_{zt} = 1.0$, and $K_d = 0.85$. Tabulated values may be adjusted to account for site-specific conditions.
- See ASCE 7-10 Chapter 30 for roof zone locations.

3.6.6 ASCE 7-16 Wind Loading

3.6.6.1 The required number of fasteners per 4'x8' nailable insulation panel to resist wind loads on gable, monoslope, and hip roofs per ASCE 7-16 are provided in Table 10, Table 11, and Table 12, respectively.

Table 10. Connection to Steel Deck: Fastener Requirements to Resist ASCE 7-16 Wind Loads – Gable Roofs

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{1,2,3,4,5}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
Roof Zone 1	15	15	15	15	20	20	30	25	35	30	40	40
Roof Zone 2	15	15	25	15	30	20	40	30	50	35	60	40
Roof Zone 3	20	15	30	20	40	25	50	35	60	45	75	50

SI: 1 mph = 1.61 km/h

- Steel decking shall be minimum 22 gauge and have a minimum ultimate tensile strength of 45 ksi.
- Table based on ASCE 7-16 wind components and cladding part 1 low-rise rise (h ≤ 60 ft).
- Tabulated values apply to gable roofs only for wind exposure B or C.
- Tabulated values assume $K_z = 1.13$, $K_{zt} = 1.0$, $K_d = 0.85$, and $K_e = 1.0$. Tabulated values may be adjusted to account for site-specific conditions.
- See ASCE 7-16 Chapter 30 for roof zone locations.

Table 11. Connection to Steel Deck: Fastener Requirements to Resist ASCE 7-16 Wind Loads – Monoslope Roofs

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{1,2,3,4,5}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
Roof Zone 1	15	15	15	15	15	20	20	25	25	30	30	40
Roof Zone 2	15	15	15	15	20	20	25	30	30	35	35	40
Roof Zone 3	15	15	25	20	30	25	40	35	50	45	60	50

SI: 1 mph = 1.61 km/h

- Steel decking shall be minimum 22 gauge and have a minimum ultimate tensile strength of 45 ksi.
- Table based on ASCE 7-16 wind components and cladding part 1 low-rise rise (h ≤ 60 ft).
- Tabulated values apply to monoslope roofs only for wind exposure B or C.
- Tabulated values assume $K_z = 1.13$, $K_{zt} = 1.0$, $K_d = 0.85$, and $K_e = 1.0$. Tabulated values may be adjusted to account for site-specific conditions.
- See ASCE 7-16 Chapter 30 for roof zone locations.

Table 12. Connection to Steel Deck: Fastener Requirements to Resist ASCE 7-16 Wind Loads – Hip Roofs

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{1,2,3,4,5}												
Wind Speed (mph)	100		120		140		160		180		200	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
Roof Zone 1	15	15	15	15	20	15	25	20	30	25	40	30
Roof Zone 2	15	15	20	20	30	25	35	35	45	40	55	50
Roof Zone 3	15	15	20	20	30	25	35	35	45	45	55	50

SI: 1 mph = 1.61 km/h

- Steel decking shall be minimum 22 gauge and have a minimum ultimate tensile strength of 45 ksi.
- Table based on ASCE 7-16 wind components and cladding part 1 low-rise rise ($h \leq 60$ ft).
- Tabulated values apply to hip roofs only for wind exposure B or C.
- Tabulated values assume $K_z = 1.13$, $K_{zt} = 1.0$, $K_d = 0.85$, and $K_e = 1.0$. Tabulated values may be adjusted to account for site-specific conditions.
- See ASCE 7-16 Chapter 30 for roof zone locations.

3.6.7 Snow and Seismic Loading

3.6.7.1 The required number of fasteners per 4'x8' nailable insulation panel to resist snow loads are provided in Table 13 and Table 14.

3.6.7.2 The tables in this section may be used with ASCE 7-10 or ASCE 7-16.

Table 13. Connection to Steel Deck: Fastener Requirements to Resist Snow Loads up to 60 psf

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{1,2,3,4}								
Snow Load (psf)	30		40		50		60	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
Roof Zone – All	15	20	20	25	25	25	25	30
S_{DS} Max	0.510	0.815	0.729	1.022	0.910	0.604	0.642	0.797

SI: 1 psf = 0.0479 kN/m²

- Steel decking shall be minimum 22 gauge and have a minimum ultimate tensile strength of 45 ksi.
- Tabulated snow load is a design snow load.
- 10 psf dead load is assumed to act concurrently with snow load.
- S_{DS} max per ASCE 7 Section 13.5.3 for W_p assuming 10 psf dead load plus 0.2 snow load (sloped roof).

Table 14. Connection to Steel Deck: Fastener Requirements to Resist Snow Loads up to 100 psf

Minimum Number of Fasteners per 4'x8' Nailable Insulation Panel ^{1,2,3,4}								
Snow Load (psf)	70		80		90		100	
Roof Pitch	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12	3:12 to 6:12	7:12 to 12:12
Roof Zone – All	30	35	30	35	35	40	35	45
S_{DS} Max	0.802	0.966	0.579	0.626	0.722	0.786	0.532	0.928

SI: 1 psf = 0.0479 kN/m²

- Steel decking shall be minimum 22 gauge and have a minimum ultimate tensile strength of 45 ksi.
- Tabulated snow load is a design snow load.
- 10 psf dead load is assumed to act concurrently with snow load.
- S_{DS} max per ASCE 7 Section 13.5.3 for W_p assuming 10 psf dead load plus 0.2 snow load (sloped roof).



- 3.7 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.
- 3.8 Any building code 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 RDPs / approved sources. DrJ is qualified⁸ to practice product and code compliance services within its scope of accreditation and engineering expertise, respectively.

4 Installation

- 4.1 Installation shall comply with the manufacturer installation instructions, this Listing, the approved construction documents, and the applicable building code.
- 4.2 Fasteners shall be installed with the appropriate rotating powered driver, per the manufacturer instructions.
- 4.3 Fasteners shall not be struck with a hammer during installation.
- 4.4 TRUFAST® SIP fasteners shall be evenly spaced in equal rows along the nailable insulation panel, spaced 24" on center maximum. Depending on the deck framing spacing, additional fasteners from the minimum required per the tables in this Listing may be required to achieve equal rows across the entire panel. In all cases, the installation shall comply with the nailable insulation manufacturer specifications and installation recommendations.
- 4.5 Fasteners shall not be installed closer than $\frac{5}{8}$ " from any perimeter edge (edge distance) of the nailable surface of the vented or non-vented nailable insulation panel, subject to the panel manufacturer instructions, whichever is more restrictive.
- 4.6 *Installation into Wood Substrates*
- 4.6.1 Fastener thread shall penetrate a minimum of 1" (including the tip) into solid sawn lumber decking with a specific gravity of at least 0.42 (plank or tongue and groove).
- 4.6.2 Fastener thread shall fully penetrate the thickness of OSB or plywood decking and extend beyond the underside by a minimum of $\frac{3}{4}$ ".
- 4.6.3 Lead holes are not required.
- 4.6.4 The underside of the fastener head shall be installed flush to the surface of the nailable insulation panel. Fasteners shall not be overdriven or underdriven.

⁸ 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.

4.6.5 Minimum requirements for attaching to wood joists/rafters shall be in accordance with Table 15. The nailable insulation panel manufacturer must approve this application. The requirements in Table 15 do not apply to continuous wood decking.

Table 15. SIPTP and SIPLD Minimum Spacing, Edge Distance and End Distance Requirements in Wood Joists and Rafters

Label ³	Connection Geometry ^{1,2}	SIPTP and SIPLD (in)
A	Edge Distance – Load in any direction	$\frac{5}{8}$
B	End Distance – Load parallel to grain, towards end	$\frac{3}{8}$
	End Distance – Load parallel to grain, away from end	$2\frac{5}{8}$
	End Distance – Load perpendicular to grain	$2\frac{5}{8}$
C	Spacing between Fasteners in a Row – Parallel to grain	$\frac{3}{8}$
D	Spacing between Fasteners in a Row – Perpendicular to grain	$2\frac{5}{8}$
E	Spacing between Rows of Fasteners – In-line	$1\frac{1}{4}$
F	Spacing between Rows of Fasteners – Staggered	$\frac{5}{8}$

SI: 1 in. = 25.4 mm

1. 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.
2. Values for "Spacing between Rows of Fasteners-Staggered" apply where the fasteners in adjacent rows are offset by one-half of the "Spacing between Fasteners in a Row."
3. See Figure 3 for spacing requirement labels.

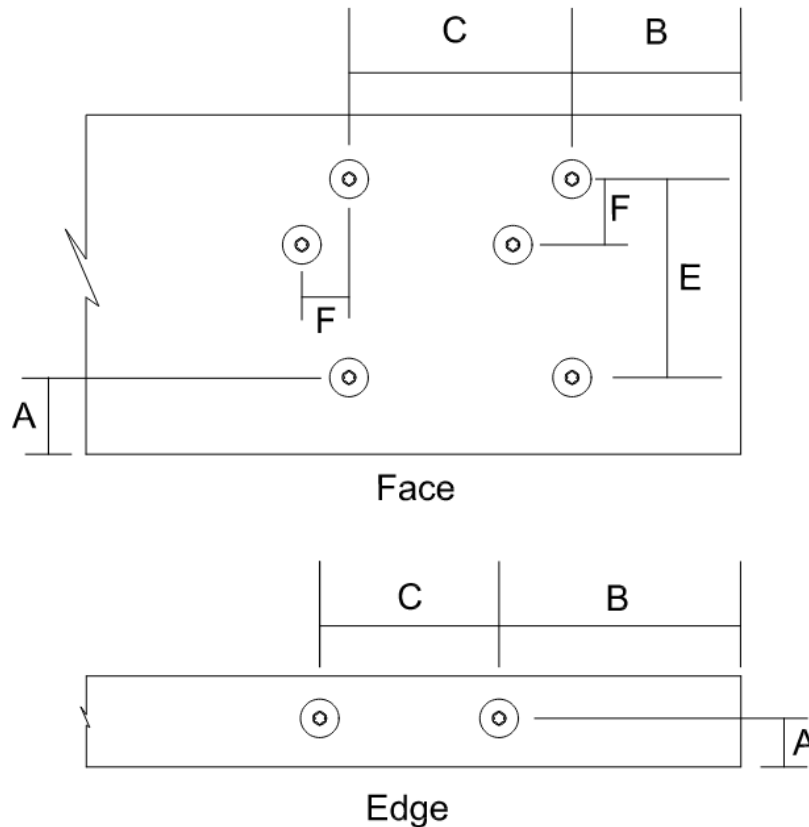


Figure 3. Example of Fastener Spacing in Wood



4.7 Installation into Steel Substrates

- 4.7.1 Install using a maximum 2,000-rpm screw gun.
- 4.7.2 Minimum requirements for fastener spacing, edge distance, and end distance shall be in accordance with Table 16.
- 4.7.3 The fastener shall penetrate a minimum of 3/4" through the steel deck.

Table 16. SIPLD Minimum Spacing, Edge Distance, and End Distance Requirements in Steel

Connection Geometry	SIPLD (in)
Spacing Between Fastener	5/8
Edge Distance	3/8
End Distance	5/8

SI: 1 in. = 25.4 mm

- 4.8 In the event of a conflict between the manufacturer installation instructions, this Listing, the approved construction documents and the applicable building code, the most restrictive shall govern.

5 Findings

- 5.1 As described in Section 3, SIPTP and SIPLD have performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.
- 5.2 When used and installed in accordance with this Listing and the manufacturer installation instructions, SIPTP and SIPLD shall be approved for:
 - 5.2.1 Use in attaching vented or non-vented nailable insulation panels to approved decks to resist uplift due to wind loads and shear loads due to dead, snow, and seismic loads.
- 5.3 If SIPTP and SIPLD are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.
 - 5.3.1 Assistance with building design is available from Altenloh, Brinck & Co. US, Inc.
 - 5.3.2 If not, section 5.3 does not apply.
- 5.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Altenloh, Brinck & Co. US, Inc.
- 5.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10⁹ 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.

⁹ 2018 IFC Section 104.9



- 5.6 **Approved:**¹⁰ Building codes require that the building official shall accept duly authenticated reports¹¹ or research reports¹² from approved agencies and/or approved sources (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies, or methods of construction.
- 5.6.1 Acceptability of an approved agency, by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the International Accreditation Forum (IAF).
- 5.6.2 Acceptability of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.
- 5.7 CBI is an approved agency through its ISO/IEC 17025 testing and an ISO/IEC 17020 inspection accreditation. CBI employs RDPs and is accredited by ANAB.¹³ DrJ employs RDPs and is ANAB-Accredited.
- 5.8 Through ANAB accreditation and the IAF Multilateral Agreements, this Listing can be used to obtain product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – “*certified once, accepted everywhere.*” IAF specifically says, “*Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.*”¹⁴

6 Conditions of Use

- 6.1 Performance characteristics are specified in Section 3.
- 6.2 As defined in Section 3, 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.
- 6.3 As listed herein, SIPTP and SIPLD shall be used:
- 6.3.1 TRUFAST® SIP fasteners shall be installed in dry lumber with a moisture content less than or equal to nineteen percent (19%).
- 6.3.2 TRUFAST® SIP fasteners shall be installed in in minimum 22 gauge steel substrates.
- 6.4 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this listing.
- 6.5 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ)¹⁵ in which the project is to be constructed:
- 6.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice, and, when prepared by an approved source, shall be approved when requirements of adopted legislation are met.
- 6.5.2 This Listing and the installation instructions shall be submitted at the time of permit application.
- 6.5.3 These innovative products have an internal quality control program and a third-party quality assurance program.
- 6.5.4 At a minimum, these innovative products shall be installed per Section 4 of this Listing.
- 6.5.5 The approval of this Listing by the AHJ shall comply with IBC Section 1707.1, where legislation states in pertinent part, “*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 Section 104.11*”, all of IBC Section 104, and IBC Section 105.4.

¹⁰ 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.

¹¹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

¹² <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>

¹³ Please see the ANAB directories and search for Center for Building Innovation - <https://anab.ansi.org/laboratory-accreditation> and <https://anab.ansi.org/inspection-body-accreditation>

¹⁴ <https://iaf.nu/en/about-iaf-mla/#:~:text=required%20to%20recognise>

¹⁵ Also known as the Authority Having Jurisdiction (AHJ)



- 6.5.6 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.
- 6.5.7 The application of these innovative products in the context of this Listing 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.
- 6.6 The actual design, suitability, and use of this Listing for any particular building is the responsibility of the owner or the owner's authorized agent.
- 6.7 Any required design loads shall be provided by the building designer (i.e., owner or RDP) and/or determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.
- 6.8 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e., ANAB accredited agencies), approved sources (i.e., RDPs), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon.
- 6.9 Where pertinent, testing and/or engineering analysis is based upon state or local code and/or standard provisions that have been codified into law through legislation. The developers of the codes and standards are legally responsible for the accuracy of any legislatively adopted material properties and/or analytical methods. Any testing and/or engineering mechanics-based analysis may use legislatively and/or code adopted provisions as the control condition. The use of a control condition to compare to a test condition establishes equivalency to that prescribed in the adopted legislation with respect to quality, strength, effectiveness, fire resistance, durability, and safety.
- 6.10 The reliability of the attributes provided herein may be dependent upon published design properties by others. These properties are defined by the grade mark, grade stamp, mill certificate, Listings, certified reports, duly authenticated reports, and/or research reports prepared by approved agencies and/or approved sources furnished by suppliers of products, materials, designs, assemblies, and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate.
- 6.11 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.¹⁶
- 6.12 Where additional condition of use and/or code compliance information is required, please search for SIPTP and SIPLD on the DrJ Engineering website.

7 Identification

- 7.1 Labeling^{17,18} shall include, but not be limited to, the manufacturer name, manufacturing location/identifier, and the CBI Listing number.
- 7.2 Labeling may include, but not be limited to, the CBI mark and any other numerical designations related to layout locations for a given project.

8 Review Schedule

- 8.1 This Listing is subject to periodic review and revision. For the most recent version, visit cbitest.com.
- 8.2 For information on the status of this Listing, contact CBI.

¹⁶ See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

¹⁷ LABEL: An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material and the name and identification of an approved agency, and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see IBC Section 1703.5, "Manufacturer designation" and "Mark").

¹⁸ LABELED: Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.



9 Approved for Use Pursuant to US and International Legislation Defined in Appendix A

- 9.1 SIPTP and SIPLD are included in this [list](#) 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, and whose Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This Listing 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, and
 - 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 SIPTP and SIPLD 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)¹⁹ where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than 10 years²⁰ and/or a \$5,000,000 fine or 3 times the value of²¹ 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 materials²² that are not specifically provided for in any building code, 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.²³
 - 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 has 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 104.11.²⁴

¹⁹ <http://www.drjengineering.org/AppendixC> and <https://www.law.cornell.edu/uscode/text/18/1832>

²⁰ <https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years>

²¹ <https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided>

²² <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

²³ [IBC 2021, Section 1706.1 Conformance to Standards](#)

²⁴ [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#)

- 1.3 **Approved²⁵ 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, which 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.²⁶ The Superintendent of Building roster of approved testing agencies 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 CBI 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 1707.1.²⁷
- 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 NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed²⁸ 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 agreement²⁹ (i.e., ANAB, International Accreditation Forum (IAF), etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. 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) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 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; 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; 5) A statewide product approval issued by the Florida Building Commission. 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).

²⁵ See Section 5 for the distilled building code definition of **Approved**.

²⁶ Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

²⁷ <https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1>

²⁸ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

²⁹ New York City, The Rules of the City of New York, § 101-07 Approved Agencies



- 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 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 Building Code 2018 of New Jersey in IBC Section 1707.1 General,³⁰ 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)”.³¹ Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) 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. 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 (a) above. 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 (a) above. 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 2 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 3282.14³² and Part 3280,³³ “*the Department encourages innovation and the use of new technology in manufactured homes*” and the design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) “*All construction methods shall be in conformance with accepted engineering practices*”, 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.*”, and 3) “*The design stresses of all materials shall conform to accepted engineering practice.*”
- 1.10 **Approved 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.³⁴
- 1.10.2 For innovative alternative products, materials, designs, services and/or methods of construction, in the absence of approved rules or other approved standards...the building official shall accept duly authenticated reports (i.e., listing and/or research report) from approved agencies with respect to the quality and manner of use of new materials or assemblies.³⁵ A building official approved agency is deemed to be approved via certification from an accreditation body that is listed by the International Accreditation Forum³⁶ or equivalent.

³⁰ https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

³¹ <https://www.nj.gov/dca/divisions/codes/codreg/ucc.html>

³² <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

³³ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>

³⁴ IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.

³⁵ IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.

³⁶ Please see the ANAB directory for building official approved agencies.



- 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.³⁷ An approved source is defined as a PE subject to professional engineering laws, where a research and/or a technical evaluation report certified by a PE, shall be approved.
- 1.11 **Approved by International Jurisdictions:** The USMCA and GATT agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the Technical Barriers to Trade agreements and the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA), where these agreements state in relevant part:
- 1.11.1 Permit participation of conformity assessment bodies located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country.
 - 1.11.2 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.
 - 1.11.3 Conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.
 - 1.11.4 **Approved:** The purpose of the IAF 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, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.

³⁷ IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.