

# Technical Evaluation Report™

**TER 1910-03**

InSoFast® Insulation Panel Products

**InSoFast®, LLC**

**Product:**

**InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 Panels, InSoFast® MAX 3.75 Panels, InSoFast® CX44 Panels, and InSoFast® CX LowPro SW Studded Insert**

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COMPANY  
INFORMATION:

ADDITIONAL  
LISTEES:

InSoFast®, LLC  
PO Box 1225  
Mitchell, SD 57301-7225

P: 1-888-501-7899

[info@insofast.com](mailto:info@insofast.com)

[www.insofast.com](http://www.insofast.com)

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00 - Thermal Insulation

SECTION: 07 21 13 - Foam Board Insulation

## 1 Innovative Product Evaluated<sup>1,2</sup>

- 1.1 InSoFast® UX 2.0 Panels
- 1.2 InSoFast® EXi 2.5 Panels
- 1.3 InSoFast® EXe 2.5 Panels
- 1.4 InSoFast® MAX 3.75 Panels
- 1.5 InSoFast® CX44 Panels
- 1.6 InSoFast® CX LowPro SW Studed Insert

## 2 Applicable Codes and Standards<sup>3,4</sup>

### 2.1 Codes

- 2.1.1 *IBC—15, 18, 21: International Building Code®*
- 2.1.2 *IRC—15, 18, 21: International Residential Code®*

<sup>1</sup> For more information, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.

<sup>2</sup> 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. 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. 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.

<sup>3</sup> 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.

<sup>4</sup> 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.

## 2.2 Standards and Referenced Documents

- 2.2.1 *ASTM C203: Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation*
- 2.2.2 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*
- 2.2.3 *ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*
- 2.2.4 *ASTM D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics*
- 2.2.5 *ASTM D1622: Standard Test Method for Apparent Density of Rigid Cellular Plastics*
- 2.2.6 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*
- 2.2.7 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
- 2.2.8 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.9 *ASTM E2273: Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies*
- 2.2.10 *CAN/ULC-S701: Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering*
- 2.2.11 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*
- 2.2.12 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

## 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 2018](#) (DTSA).<sup>5</sup>
- 3.2 Testing and/or inspections conducted for this TER were performed at an [ISO/IEC 17025 accredited testing laboratory](#),<sup>6</sup> an [ISO/IEC 17020 accredited inspection body](#),<sup>7</sup> which are internationally recognized accreditations through [International Accreditation Forum](#) (IAF), and/or a licensed [Registered Design Professional](#) (RDP).
- 3.3 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5, and InSoFast® MAX 3.75 Panels were evaluated to determine the following:
  - 3.3.1 Physical properties (compressive, density, flexural, thermal transmission).
  - 3.3.2 Drainage efficiency.
  - 3.3.3 Performance in accordance with ASTM E84 for flame spread and smoke development ratings in accordance with [IBC Section 2603.3](#), [IBC Section 2603.5.4](#) and [IRC Section R302.9](#).

<sup>5</sup> <https://www.law.cornell.edu/uscode/text/18/part-11/chapter-90>. As 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.

<sup>6</sup> 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.

<sup>7</sup> Ibid.

- 3.3.4 Performance regarding vertical and lateral fire propagation in accordance with [IBC Section 2603.5.5](#).
- 3.3.5 Wind load resistance in accordance with [IBC Section 1609](#).
- 3.4 InSoFast® UX 2.0, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels were evaluated for use as an interior insulation and an exterior insulation.
- 3.5 InSoFast® CX44 Panels and InSoFast® CX LowPro SW Studded Insert were evaluated for use as an interior insulation and an exterior insulation for shipping container applications.
  - 3.5.1 Physical properties (compressive, density, flexural, thermal transmission).
  - 3.5.2 Performance in accordance with ASTM E84 for flame spread and smoke development ratings in accordance with [IBC Section 2603.3](#), [IBC Section 2603.5.4](#) and [IRC Section R302.9](#).
- 3.6 Use in fire resistance-rated construction is outside the scope of this TER.
- 3.7 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 qualified<sup>8</sup> to practice product and code compliance services within its scope of accreditation and engineering expertise, respectively.
- 3.8 Engineering evaluations are conducted with DrJ's ANAB [accredited ICS code scope](#), which are also its areas of professional engineering competence.
- 3.9 Any regulation specific issues not addressed in this section are outside the scope of this TER.

#### 4 Product Description and Materials

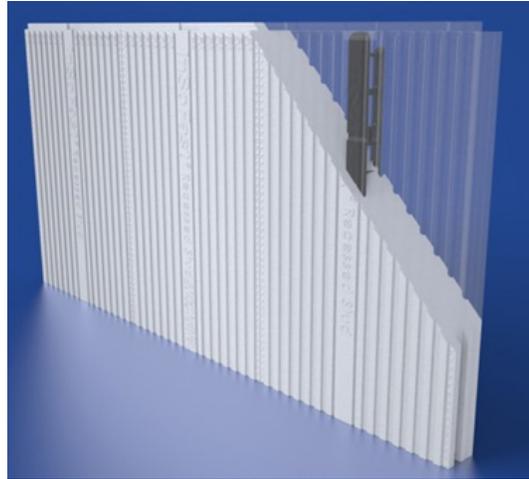
- 4.1 InSoFast® UX 2.0 Panels are formed from closed-cell, injection-molded 2-inch thick expanded polystyrene (EPS) foam with built-in polypropylene studs, tongue and groove interlocking edges, and electrical raceways (Figure 1).



**Figure 1.** InSoFast® UX 2.0 Panels

<sup>8</sup> 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](#).

- 4.2 InSoFast® EXi 2.5 Panels are formed from closed cell, injection-molded 2.5-inch thick EPS foam, respectively, with built-in polypropylene studs, tongue and groove interlocking edges, and electrical raceways (Figure 2).
- 4.3 InSoFast® EXe 2.5 Panels are formed from closed cell, injection-molded 2.5-inch thick EPS foam, respectively, with built-in polypropylene studs and tongue and groove interlocking edges.



**Figure 2.** InSoFast® EX 2.5 Panels

- 4.4 InSoFast® MAX 3.75 Panels are formed from closed cell, injection-molded 3.75-inch thick EPS foam with built-in polypropylene studs, tongue and groove interlocking edges, and electrical raceways (Figure 3).



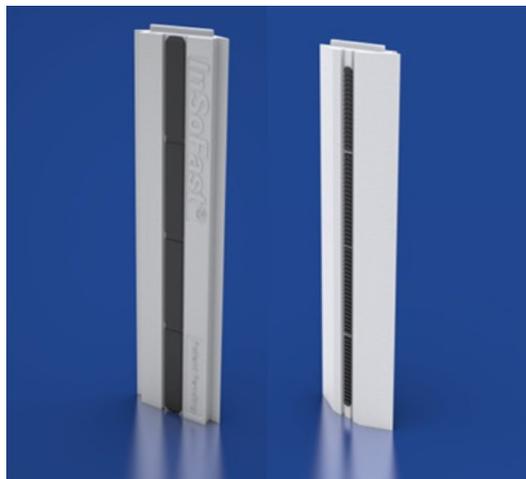
**Figure 3.** InSoFast® MAX 3.75 Panel

4.5 InSoFast® CX44 Panels are formed from closed cell, injection-molded EPS foam of varying thickness with built-in polypropylene studs, tongue and groove interlocking edges, and electrical raceways (Figure 4).



**Figure 4.** InSoFast® CX44 Panels

4.6 InSoFast® CX LowPro SW Studded Inserts are formed from closed cell, injection-molded 2-inch thick EPS foam with built-in polypropylene studs (Figure 5).



**Figure 5.** InSoFast® CX LowPro SW Studded Inserts

4.7 The closed-cell, injection-molded EPS foam complies with ASTM C578 Type VIII and CAN/ULC-S701 Type 2 and has a density of 1.35 pounds per cubic foot.

4.8 *Material Availability*

4.8.1 *Width:*

- 4.8.1.1 InSoFast® UX 2.0 Panels: 4' (1219 mm)
- 4.8.1.2 InSoFast® EXi 2.5, EXe 2.5 and MAX 3.75 Panels: 4' (1219 mm)
- 4.8.1.3 InSoFast® CX44 Panels: 3.67' (1118 mm)
- 4.8.1.4 InSoFast® CX LowPro SW Studded Insert: 7" (178 mm)



4.8.2 Standard Product Length: 2' (609 mm)

4.8.3 *Thickness:*

- 4.8.3.1 InSoFast® UX 2.0 Panels: 2" (50 mm)
- 4.8.3.2 InSoFast® EXi 2.5 and EXe 2.5 Panels: 2.5" (63 mm)
- 4.8.3.3 InSoFast® MAX 3.75 Panels: 3.75" (89 mm)
- 4.8.3.4 InSoFast® CX44 Panels: 2" (50 mm) – 3.23" (76 mm)
- 4.8.3.5 InSoFast® CX LowPro SW Studded Insert: 2" (50 mm)

## 5 Applications

- 5.1 InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® Max 3.75 Panels are used as thermal insulation on the interior or exterior walls, floors, and ceiling surfaces of buildings in Types I-V construction.
- 5.2 InSoFast® CX44 Panels and InSoFast® CX LowPro SW Studded Inserts are used on the interior or exterior of shipping container wall surfaces.
- 5.3 *Drainage Efficiency*
  - 5.3.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels have obtained a drainage efficiency rating of 96% when tested in accordance with ASTM E2273.
- 5.4 *Thermal Resistance (R-Value)*
  - 5.4.1 InSoFast® panels have the thermal resistances shown in Table 1.

**Table 1.** Thermal Resistance Values<sup>1</sup>

Product	Thickness (in)	R-Value (h <sup>2</sup> ft <sup>2</sup> °F/Btu)
InSoFast® UX 2.0 Panel	2.0	8.5
InSoFast® EXi 2.5 Panel	2.5	10.6
InSoFast® EXe 2.5 Panel	2.5	10.6
InSoFast® MAX 3.5 Panel	3.75	15.9
InSoFast® CX44 Panel <sup>2</sup>	2.0 - 3.23 (Average 2.62)	11.0
InSoFast® CX LowPro SW Studded Insert	2.0	8.5

SI: 1 in = 25.4 mm

1. Tested in accordance with ASTM C518.

2. R-Value for the CX44 Panel based on average thickness of panel.

### 5.5 Surface Burning Characteristics

5.5.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, and InSoFast® EXe 2.5 Panels have the flame spread and smoke developed ratings shown in Table 2 when tested in accordance with ASTM E84 per IBC Section 2603.3 and IRC Section R316.3.

**Table 2.** Surface Burning Characteristics<sup>1</sup>

Product	Flame Spread	Smoke Developed
InSoFast® UX 2.0 Panel	< 75	< 450
InSoFast® EXi 2.5 Panel	< 75	< 450
InSoFast® EXe 2.5 Panel	< 75	< 450
InSoFast® MAX 3.75 Panel	< 75	< 450
1. ASTM E84 results based on EPS manufacturer evaluation reports.		

### 5.6 Vertical and Lateral Fire Propagation

5.6.1 InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, and InSoFast® EXe 2.5 Panels were tested to assess performance with regard to vertical and lateral fire propagation in accordance with NFPA 285 per IBC Section 2603.5.5.

5.6.2 The wall assemblies listed in Table 3 are approved for use in buildings of Type I-IV construction.

**Table 3.** NFPA 285 Approved Exterior Wall Assemblies<sup>1,2</sup>

Wall Component	Materials
<b>Base Wall</b> Use either 1, 2, or 3	<ol style="list-style-type: none"> <li>1. Cast concrete walls</li> <li>2. CMU concrete walls</li> <li>3. 20 GA (min.) 3<sup>5</sup>/<sub>8</sub> in (min.) steel studs spaced 24 in o.c. (max.) with 5/8 in (min.) type X Special Fire Resistant Gypsum Wallboard Interior</li> </ol>
<b>Fire-Stopping in Stud Cavity at Floor Lines</b>	<ol style="list-style-type: none"> <li>1. 4 pcf mineral fiber insulation installed</li> </ol>
<b>Cavity Insulation</b> Use either 1, 2, 3, or 4	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any noncombustible insulation per ASTM E136</li> <li>3. Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)</li> <li>4. Any Fiberglass (Batt Type Class A ASTM E84 faced or unfaced)</li> </ol>
<b>Exterior Sheathing Under Exterior Insulation</b> For base wall system 3	<ol style="list-style-type: none"> <li>1. 1/2 in or thicker exterior glass matt gypsum sheathing meeting ASTM C1177</li> </ol>
<b>Water Resistive Barrier (WRB) over Sheathing</b> Any item 1-57	<ol style="list-style-type: none"> <li>1. None</li> <li>2. BASF MasterSeal AWB 660</li> <li>3. Carlisle (CCW) Fire Resist 705FR-A</li> <li>4. Carlisle (CCW) Fire Resist Barritech NP</li> <li>5. Carlisle (CCW) Fire Resist Barritech VP (or VP LT)</li> <li>6. Carlisle (CCW) 705</li> <li>7. Carlisle (CCW) 705VP</li> <li>8. GE Momentive Elemax 2600</li> <li>9. Henry Air-Bloc 32MR</li> <li>10. Henry Air-Bloc 31MR</li> <li>11. Henry EnviroCap 108</li> <li>12. Henry Air-Bloc 33MR</li> </ol>

Wall Component	Materials
	13. Henry Air-Bloc 21 FR 14. Henry Blueskin VP 160 15. Henry Air-Bloc 21S 16. Henry Air-Bloc 17MR 17. Henry BlueSkin SA 18. Henry Air-Bloc 16MR 19. Henry FoilSkin 20. Henry MetalClad 21. Polyguard Air Lok Flex 22. Polyguard Air Lok Flex VP 23. Polyguard FlexGuard 24. Polyguard Air Lok Sheet 400 NP 25. Polyguard Air Lok Sheet UV400 NP 26. Dorken Delta Vent SA 27. Dorken Delta Vent S/Plus 28. Dorken Delta Fassade S 29. Dorken Delta Foxx/Plus 30. Dorken Delta Maxx/Plus 31. Soprema Soprseal Stick VP 32. Soprema Soprasolin HD 33. Soprema LM 204 VP 34. Soprema 1100T 35. Prosoco Spraywrap MVP 36. Prosoco R-Guard VB 37. Prosoco R-Guard Cat 5 38. Prosoco R-Guard Cat 5 Rain Screen 39. Vaproshield Revealshield SA 40. Vaproshield Wrapshield SA 41. GCP (Grace) PAB NPL 10 42. GCP (Grace) PAB NPS 43. GCP (Grace) PAB NPL 44. GCP (Grace) PAB VCL 45. GCP (Grace) PAB VPL LT 46. GCP (Grace) PAB VPS 47. GCP (Grace) PAD AWM 48. GCP (Grace) VPL 50 49. WR Meadows Air-Shield LMP (Gray) 50. WR Meadows Air-Shield LMP (Black) 51. WR Meadows Air-Shield TMP 52. WR Meadows Air-Shield LSR 53. Siga Majavest 54. Siga Majavest 500 SA 55. Tremoco ExoAir 230 56. Tremoco ExoAir 130 57. DuPont™ Tyvek® CommercialWrap®
<b>Adhesive</b> Use item 1 or 2 with Base Wall 1 or 2	1. ¾ in beads of Loctite PL premium adhesive 16 in o.c. 2. NFPA 285 approved EIFS “mud”
<b>Exterior Insulation</b> Use either 1 or 2 adhered with adhesive or mechanically attached	1. InSoFast® UX 2.0 Panels (with or without raceways) 2. InSoFast® EX 2.5 Panels (with or without raceways)

Wall Component	Materials
<b>Exterior Sheathing Installed Over Exterior Insulation</b> Use either 1 or 2	<ol style="list-style-type: none"> <li>1. ½ in (min.) generic cement board mechanically attached to InSoFast® interior frame strips with screws 8 in o.c. in the field and 12 in o.c. on panel edges</li> <li>2. ½ in (min.) Glass matt board (such as Densglass) mechanically attached to InSoFast® interior frame strips with screws 8 in o.c. in the field and 12 in o.c. on panel edges</li> </ol>
<b>WRB Over Exterior Sheathing Installed Over Exterior Insulation</b>	<ol style="list-style-type: none"> <li>1. Any WRB that has been tested or approved to be used in an NFPA 285 compliant assembly paired with the outer coverings listed below</li> </ol> <p>Note: The WRB must be approved for use directly under exterior sheathing installed over exterior insulation or <u>over</u> exterior insulation. WRBs allowed <u>over</u> Exterior Sheathing Under Exterior Insulation are protected by the insulation and do not qualify as allowable WRBs for this location.</p>
<b>Outer Covering</b> Use any item 1-7  Where aluminum is listed, this means aluminum sheet metal panels – not aluminum composite panels.	<ol style="list-style-type: none"> <li>1. EIFS coatings that are NFPA 285 approved for applications over cement board</li> <li>2. Adhered thin brick (with noncombustible mortar)</li> <li>3. Adhered stone (with noncombustible mortar)</li> <li>4. Fiber cement lap or panels (or any non-combustible cladding) mechanically fastened through the cladding directly to the InSoFast® studs</li> <li>5. Fiber cement lap or panels (or any non-combustible cladding) mechanically fastened to metal hat channels or mounting element fastened through the cladding into the InSoFast® studs</li> <li>6. Vertical or horizontal steel or aluminum cladding mechanically fastened through the cladding into the InSoFast® studs</li> <li>7. Vertical or horizontal steel or aluminum cladding mechanically fastened to metal hat channels or non-combustible mounting element fastened through the cladding into the InSoFast® studs</li> </ol>
<ol style="list-style-type: none"> <li>1. The assemblies and combinations herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest &amp; Associates Consulting, LLC.</li> <li>2. Note: window headers/jambes for all constructions shall incorporate 25 Ga. L flashing and 2 in of mineral wool above the opening and on both sides.</li> </ol>	

### 5.7 Thermal Barrier Requirements

- 5.7.1 InSoFast® panels shall be separated from the interior of a building by an approved thermal barrier in accordance with [IBC Section 2603.4](#) and [IRC Section R316.4](#). Fasteners attaching the thermal barrier to the InSoFast® panels shall be installed at a maximum of 12" on center.

5.8 Attachment Methods

5.8.1 Table 4 provides the maximum allowable capacities of mechanical fasteners when fastened to the InSoFast® studs.

**Table 4.** Allowable Load Capacities for Mechanical Attachment

Application	Fastening Method <sup>5</sup>	Allowable Load Capacity (lb) per Fastener	
		Withdrawal	Lateral
Attaching wall covering or cladding to InSoFast® studs <sup>1</sup>	No. 6 by 1½" coarse type W screw	65	95
Attaching InSoFast® studs to structural wall <sup>1</sup>	No. 9 by 3½" long type W screw	95	35
Attaching InSoFast® studs to steel <sup>2</sup>	No. 10 by 3½" screw	50	70
Attaching InSoFast® studs to masonry wall <sup>3,4</sup>	Tapcon® 3/16" (dia.) by 3½" (min. length) Blue, White, and Stainless concrete screw anchors	55	100

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

- Fasteners tested in accordance with ASTM D1761.
- Fastener calculations performed in accordance with AISI Chapter E. Studs shall have a minimum thickness of 0.058" and a minimum tensile strength of 50 ksi.
- Concrete screw anchor must provide 1" minimum penetration into masonry substrate.
- Load capacities in accordance with Tapcon® evaluation reports and product specifications.
- All screws and anchors shall be countersunk into EX panels until fastener head is flush with polypropylene stud.

5.8.2 Table 5 provides the maximum allowable capacities of adhesive when applied to the InSoFast® studs.

**Table 5.** Allowable Load Capacities for Adhesive Attachment

Application	Fastening Method	Allowable Load Capacity <sup>1</sup> (psf)	
		Withdrawal	Lateral
Attaching InSoFast® studs to wood framed structural wall <sup>2</sup>	¾" bead of PL Premium 3x construction adhesive	35	50
Attaching InSoFast® studs to concrete structural wall <sup>2</sup>		40	50
Attaching InSoFast® studs to steel framed structural wall <sup>2</sup>		30	40

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

- Pounds per square foot of InSoFast® panel.
- Testing performed following a modified ASTM D1761 procedure.

5.9 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.

## 6 Installation

- 6.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this TER and the applicable building code.
- 6.2 In the event of a conflict between the manufacturer installation instructions and this TER, the more restrictive shall govern.
- 6.3 *Installation Procedure Using Mechanical Attachment*
  - 6.3.1 *Exterior Installation Over Above Grade Framed Walls:*
    - 6.3.1.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels may be installed over framed walls.
    - 6.3.1.2 Use indicator markings on the panel and attach panels with recommended fasteners 12" o.c. along InSoFast® studs.
    - 6.3.1.3 For 16" framing, install the first panel so that the built-in studs line up with the wall studs and attach using recommended fasteners.
    - 6.3.1.4 For 24" framing, a screwable structural sheathing (such as oriented strand board (OSB) or plywood) is required. The number of recommended fasteners to be used is dependent on wind load requirements.
    - 6.3.1.5 Panels may be mechanically attached to concrete, masonry walls, or framed walls with structural sheathing with recommended fasteners placed 12" o.c. along the InSoFast® studs.
    - 6.3.1.6 See manufacturer installation instructions for more information and installation procedures for surrounding openings, installing in corners, installing on non-level surfaces, etc.
  - 6.3.2 *Interior Installation over Existing Framed Walls:*
    - 6.3.2.1 Prior to installation, remove baseboard, window trim, electrical outlet covers, etc.
    - 6.3.2.2 Mark existing stud locations on the wall and align InSoFast® studs with framing.
    - 6.3.2.3 The recommended screw pattern is 12" o.c. with a fastener length sufficient to penetrate existing framing.
    - 6.3.2.4 Adhesive is used in corners for additional support.
    - 6.3.2.5 Other suitable interior or exterior substrates for the adhesive application are wood sheathing, lath and plaster, masonry, metal siding, and concrete. Use the adhesive method outlined below.
    - 6.3.2.6 See manufacturer installation instructions for more information and installation procedures for surrounding openings, installing in corners, installing on non-level surfaces, etc.
- 6.4 *Installation Procedure Using Adhesive Attachment*
  - 6.4.1 *General Procedure Using PL Premium 3X Construction Adhesive:*
    - 6.4.1.1 Surfaces must be clean and free of frost, standing water, grease, dust, and other contaminants. Pre-fit all materials and protect finished surfaces.
    - 6.4.1.2 Apply a  $\frac{3}{8}$ " bead of PL Premium 3x construction adhesive on the ribbed surface of the studs.
    - 6.4.1.3 Apply additional adhesive to the foam along any cuts.
    - 6.4.1.4 The panels/studs may be repositioned within 30 minutes after applying the adhesive.
    - 6.4.1.5 Climatic conditions during installation:
      - 6.4.1.5.1 When bonding InSoFast® panels/studs, avoid cure and surface temperatures below 40°F (4°C) and above 90°F (32°C).
      - 6.4.1.5.2 In arid (dry) conditions or non-porous surfaces (such as metal or fiberglass), add water in the form of a light mist to the adhesive extruded on the stud. This accelerates the adhesive's set time.



#### 6.4.2 *Adhesive Installation Over Below Grade Concrete or Masonry Walls:*

- 6.4.2.1 InSoFast® UX 2.0, EXi 2.5, EXe 2.5 and MAX 3.75 Panels may be installed over below grade concrete or masonry walls.
- 6.4.2.2 Prior to installation, clean and remove dirt, debris, or loose paint from walls that may affect adhesive bond.
- 6.4.2.3 Start InSoFast® Panel installation at a corner.
- 6.4.2.4 Apply a 3/8" bead of PL Premium 3x construction adhesive along the ribbed dovetailed surface of the plastic studs on the back of the wall panel. Apply a bead of adhesive directly to the foam within 2" of the corner of the wall.
- 6.4.2.5 Set panel on floor and press it against wall.
- 6.4.2.6 To start second row of panels, cut panel to create running bond pattern, ensuring that studs line up but vertical seams do not.
- 6.4.2.7 Continue installing panels to the next corner.
- 6.4.2.8 See manufacturer installation instructions for further information on completing corners, intersecting walls, surrounding windows, etc.

#### 6.4.3 *Adhesive Installation Over Exterior Above Grade Concrete or Masonry Walls:*

- 6.4.3.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels may be installed over above grade concrete or masonry walls.
- 6.4.3.2 On the back of the InSoFast® Panels, apply a 3/8" bead of PL Premium 3x construction adhesive along the dovetailed ribbing of each InSoFast® stud.
- 6.4.3.3 Press panels firmly into place against the wall. If application conditions are particularly windy, supplemental bracing or mechanical attachment may be required to secure panels until the adhesive has set.
- 6.4.3.4 See manufacturer installation instructions for further information on completing corners, intersecting walls, surrounding windows, etc.

#### 6.4.4 *Adhesive Installation Over Metal Surfaces:*

- 6.4.4.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75, InSoFast® CX44 panels, and InSoFast® CX LowPro SW studded inserts may be installed on metal surfaces such as shipping container walls.
- 6.4.4.2 Lay out first row of InSoFast® panels alongside sidewall of shipping container to determine the fit. Variations in shipping container may require panels to be trimmed or spaced out slightly.
- 6.4.4.3 Apply PL Premium 3x adhesive in a 3/8" bead on the backside of the InSoFast® studs on the backside of the studs.
  - 6.4.4.3.1 Add water in the form of a light mist to the adhesive extruded on the stud. This accelerates the adhesive's set time.
  - 6.4.4.3.2 When bonding InSoFast® panels/studs, avoid cure and surface temperatures below 40°F (4°C) and above 90°F (32°C) on non-porous metal surfaces.
- 6.4.4.4 Add an additional bead of PL Premium 3x adhesive at the start and end of each wall.
- 6.4.4.5 Apply a continuous bead of adhesive or spray foam along the bottom of the container wall.
- 6.4.4.6 Press panel into place and verify that adhesive has spread out to width of the stud.
- 6.4.4.7 To start the second row, cut panel in center with long snap off blade utility knife to start the running bond or staggered pattern.

- 6.4.4.8 At the top of second row, run a bead of spray foam on the backside of the panel or directly to the container wall.
- 6.4.4.9 See manufacturer installation instructions for further details and instructions for installing InSoFast® CX44 Panels around windows and doors.
  - 6.4.4.9.1 InSoFast® panels installed on a metal ceiling are meant for drywall finish only.

6.4.5 *InSoFast® CX LowPro SW Studded Inserts:*

- 6.4.5.1 Apply a  $\frac{3}{8}$ " bead of PL Premium 3x construction adhesive to the dovetailed ribbing of each stud, then apply a bead horizontally across the top over the backside of the stud to form a "T".
- 6.4.5.2 Apply additional horizontal adhesive along the base of the first row to secure the bottom edge of the LowPro Stud.
- 6.4.5.3 Install the LowPro inserts into container wall corrugations.
- 6.4.5.4 Apply an additional horizontal bead of adhesive along the top of the uppermost LowPro stud to secure to the top of the container.
- 6.4.5.5 For additional installation instructions and alterations to provide higher insulation R-values, see manufacturer installation instructions.

6.4.6 *Installation Over Concrete Ceilings:*

- 6.4.6.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels may be installed over concrete ceilings.
- 6.4.6.2 For mechanical attachment, install fasteners 12" o.c. into the recessed attachment points on the InSoFast® stud that penetrate the concrete 1".
- 6.4.6.3 For adhesive attachment:
  - 6.4.6.3.1 Apply a  $\frac{3}{8}$ " bead of PL Premium 3x construction adhesive on the ribbed surface of the studs. Apply additional adhesive to the foam along any cuts.
  - 6.4.6.3.2 Install one mechanical fastener in the center recessed attachment point to hold the panel in place until the adhesive has set.
- 6.4.6.4 See manufacturer installation instructions for further information on completing corners, intersecting walls, surrounding windows, etc.
  - 6.4.6.4.1 InSoFast® panels installed on a concrete ceiling are meant for drywall finish only.

6.4.7 *Installation Over Concrete Floor:*

- 6.4.7.1 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels may be installed over concrete floors.
- 6.4.7.2 If installing InSoFast® panels on both walls and floor, install panels on the wall first.
- 6.4.7.3 Floating installation method:
  - 6.4.7.3.1 This method is recommended for carpet, laminate, and wood floors.
  - 6.4.7.3.2 Place panels directly on concrete without any adhesive. Interlock panels together with tongue and grooved edges in a staggered or running-bond pattern.
- 6.4.7.4 Glue down installation method:
  - 6.4.7.4.1 This method is recommended for carpet, laminate, and wood floors.
  - 6.4.7.4.2 Apply a  $\frac{3}{8}$ " bead of PL Premium 3X construction adhesive to the dovetailed ribbing of each stud and install panels in a staggered or running-bond pattern.
- 6.4.7.5 Screw down installation method:
  - 6.4.7.5.1 This method is recommended for any flooring type.
  - 6.4.7.5.2 Attach InSoFast® panels to the concrete floor by installing concrete screws through the studs.

- 6.4.7.6 Fully adhered installation method:
  - 6.4.7.6.1 This method is recommended for tiled areas.
  - 6.4.7.6.2 InSoFast® panels should be set in a bed of thin set tile adhesive with a notched trowel.
- 6.4.7.7 See manufacturer installation instructions for more information and installation procedures for surrounding openings, installing in corners, installing on non-level surfaces, etc.

## 7 Substantiating Data

- 7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
  - 7.1.1 Wind loading testing in accordance with ASTM E330
  - 7.1.2 EPS properties testing in accordance with ASTM C578
  - 7.1.3 Drainage efficiency testing in accordance with ASTM E2273
  - 7.1.4 Compressive strength in accordance with ASTM D1621
  - 7.1.5 Density in accordance with ASTM D1622
  - 7.1.6 Flexural strength in accordance with ASTM C203
  - 7.1.7 Thermal resistance testing in accordance with ASTM C518
  - 7.1.8 Fire testing in accordance with NFPA 286
  - 7.1.9 Vertical and lateral flame propagation testing in accordance with NFPA 285
  - 7.1.10 Withdrawal and lateral load fastener testing in accordance with ASTM D1761
- 7.2 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.
- 7.3 Where pertinent, testing and/or engineering analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ's engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.
- 7.4 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, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of products, materials, designs, assemblies and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this TER, may be dependent upon published design properties by others.
- 7.5 Testing and engineering analysis: The strength, rigidity and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.<sup>9</sup>
- 7.6 Where additional condition of use and/or code compliance information is required, please search for one of InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 Panels, InSoFast® MAX 3.75 Panels, InSoFast® CX44 Panels, and InSoFast® CX LowPro SW Studded Insert on the DrJ Certification website.

<sup>9</sup> See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

## 8 Findings

- 8.1 As delineated in Section 3, InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 Panels, InSoFast® MAX 3.75 Panels, InSoFast® CX44 Panels, and InSoFast® CX LowPro SW Studded Insert have performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.
- 8.2 When used and installed in accordance with this TER and the manufacturer installation instructions, InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 Panels, InSoFast® MAX 3.75 Panels, InSoFast® CX44 Panels, and InSoFast® CX LowPro SW Studded Insert shall be approved for the following applications:
  - 8.2.1 InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels are approved for use in exterior walls of buildings Type I-IV and Type V in accordance with [IBC Section 2603.5](#).
  - 8.2.2 InSoFast® UX 2.0, InSoFast® EXi 2.5, InSoFast® EXe 2.5 and InSoFast® MAX 3.75 Panels are approved for use as part of a NFPA 285 approved wall assembly in accordance with [IBC Section 2603.5.5](#).
  - 8.2.3 InSoFast® UX 2.0, InSoFast® EXi 2.5 and InSoFast® Max 3.75 Panels are approved for use as an interior insulation.
  - 8.2.4 InSoFast® CX44 Panels and InSoFast® CX LowPro SW Studded Insert are approved for use as an interior insulation and an exterior insulation for shipping container applications.
- 8.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from InSoFast®, LLC.
- 8.4 [IBC Section 104.11](#) ([IRC Section R104.11](#) and [IFC Section 104.10](#)<sup>10</sup> are similar) in pertinent part states:

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

- 8.5 **Approved:**<sup>11</sup> Building codes require that [the building official shall accept duly authenticated reports](#)<sup>12</sup> or [research reports](#)<sup>13</sup> 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.
  - 8.5.1 [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 \(IAF\)](#).
  - 8.5.2 [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](#).
  - 8.5.3 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, as denial without written reason deprives a protected right to free and fair competition in the marketplace.

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<sup>10</sup> 2018 IFC Section 104.9

<sup>11</sup> 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.

<sup>12</sup> <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

<sup>13</sup> <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>

- 8.6 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.
- 8.7 Through ANAB accreditation and the IAF Multilateral Agreements, this TER 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.*”<sup>14</sup>

## 9 Conditions of Use

- 9.1 Material properties shall not fall outside the boundaries defined in Section 3.
- 9.2 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.
- 9.3 Use in fire resistance-rated construction is outside the scope of this TER.
- 9.4 InSoFast® panels shall be separated from the interior of a building by an approved thermal barrier in accordance with IBC Section 2603.4 and IRC Section R316.4.
- 9.5 A vapor retarder shall be installed in accordance with IBC Section 1404.3<sup>15</sup> and IRC Section R702.7 when required in the construction of walls in framed construction, above-grade. For masonry construction and shipping containers, a vapor retarder is not required.
- 9.6 In areas where the probability of termite infestation is “very heavy”, as defined by IBC Section 2603.8, installation of InSoFast® panels shall follow the requirements of IBC Section 2603.8 and IRC Section R316.7.
- 9.7 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:
- 9.7.1 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.
- 9.7.2 This TER and the installation instructions shall be submitted at the time of permit application.
- 9.7.3 These products have an internal quality control program and a third-party quality assurance program.
- 9.7.4 At a minimum, these products shall be installed per Section 6 of this TER.
- 9.7.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and IBC Section 105.4.
- 9.7.6 These 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.
- 9.7.7 The application of these products in the context of this TER 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.
- 9.8 The approval of this TER 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.*

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

<sup>15</sup> 2015 IBC Section 1405.3



- 9.9 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 9.10 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.

## 10 Identification

- 10.1 The products listed in Section 1.1 through Section 1.6 are identified by a label on the board or packaging material bearing the manufacturer name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at [www.insofast.com](http://www.insofast.com).

## 11 Review Schedule

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit [drjcertification.org](http://drjcertification.org).
- 11.2 For information on the status of this TER, contact [DrJ Certification](#).

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

- 12.1 InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 Panels, InSoFast® MAX 3.75 Panels, InSoFast® CX44 Panels, and InSoFast® CX LowPro SW Studded Insert are included in this TER 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 TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER meets the legislative intent and definition of being acceptable to the AHJ.

## Appendix A

### 13 Legislation that Authorizes AHJ Approval

- 13.1 **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:
- 13.1.1 Advance Innovation,
  - 13.1.2 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
  - 13.1.3 Benefit consumers through lower prices, better quality, and greater choice.
- 13.2 **Adopted Legislation:** The following local, state, and federal regulations affirmatively authorize InSoFast® UX 2.0 Panels, InSoFast® EXi 2.5 Panels, InSoFast® EXe 2.5 Panels, InSoFast® MAX 3.75 Panels, InSoFast® CX44 Panels, and InSoFast® CX LowPro SW Studded Insert to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
- 13.2.1 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.”
  - 13.2.2 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.
  - 13.2.3 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 2018 (DTSA).
    - 13.2.3.1 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.
  - 13.2.4 For new materials<sup>16</sup> 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.
  - 13.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.<sup>17</sup>
  - 13.2.6 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.
  - 13.2.7 The AHJ shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.<sup>18</sup>

<sup>16</sup> <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

<sup>17</sup> [IBC 2021, Section 1706.1 Conformance to Standards](#)

<sup>18</sup> [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#)

- 13.3 **Approved<sup>19</sup> by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards, 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.<sup>20</sup> 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.<sup>21</sup>
- 13.4 **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).
- 13.5 **Approved by New York City:** The NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed<sup>22</sup> an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement<sup>23</sup> (i.e., ANAB, International Accreditation Forum (IAF), etc.).
- 13.6 **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).

<sup>19</sup> See Section 8 for the distilled building code definition of **Approved**

<sup>20</sup> Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

<sup>21</sup> https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

<sup>22</sup> New York City, The Rules of the City of New York, § 101-07 Approved Agencies

<sup>23</sup> New York City, The Rules of the City of New York, § 101-07 Approved Agencies

- 13.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA]):** A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation [553.842](#) and [553.8425](#).
- 13.8 **Approved by New Jersey:** Pursuant to Building Code 2018 of New Jersey in [IBC Section 1707.1 General](#),<sup>24</sup> it states: “In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from [approved agencies](#) in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the [Uniform Construction Code \(N.J.A.C. 5:23\)](#)”.<sup>25</sup> 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”.
- 13.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, [Part 3282.14](#),<sup>26</sup> and [Part 3280](#),<sup>27</sup> the Department encourages innovation and the use of new technology in manufactured homes. 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.”
- 13.10 **Approval by US, Local, and State Jurisdictions in General:** In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:
- 13.10.1 For [new materials](#) that are not specifically provided for in this code, the [design strengths and permissible stresses](#) shall be established by tests.<sup>28</sup>
- 13.10.2 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](#).<sup>29</sup> A building official [approved agency](#) is deemed to be approved via certification from an [accreditation body](#) that is listed by the [International Accreditation Forum](#)<sup>30</sup> or equivalent.

<sup>24</sup> [https://up.codes/viewer/new\\_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1](https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1)

<sup>25</sup> <https://www.nj.gov/dca/divisions/codes/codereg/ucc.html>

<sup>26</sup> <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

<sup>27</sup> <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>

<sup>28</sup> [IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials](#). Adopted law pursuant to IBC model code language 1706.2.

<sup>29</sup> [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#). Adopted law pursuant to IBC model code language 1707.1.

<sup>30</sup> Please see the [ANAB directory](#) for building official approved agencies.

- 13.10.3 The design strengths and permissible stresses of any structural material...shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.<sup>31</sup> 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.
- 13.11 **Approval 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:
- 13.11.1 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,
  - 13.11.2 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.
  - 13.11.3 State that 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.
  - 13.11.4 **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.

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<sup>31</sup> IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.