# Listing and Technical Evaluation Report™

**Report No: 1910-03**

Issue Date: January 24, 2020

Revision Date: March 16, 2024

Subject to Renewal: April 1, 2025

## InSoFast® Insulation Panel Products

### Trade Secret Report Holder:

InSoFast®, LLC

Phone: 888-501-7899 Website: www.insofast.com Email: info@insofast.com

### CSI Designations:

**DIVISION**: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 - Thermal Insulation Section: 07 21 13 - Foam Board Insulation

## 1 Innovative Products Evaluated[i]

1.1 InSoFast Insulation Panels

1.1.1 InSoFast UX 2.0 Panels

1.1.2 InSoFast EXi 2.5 Panels

1.1.3 InSoFast EXe 2.5 Panels

1.1.4 InSoFast MAX 3.75 Panels

1.1.5 InSoFast CX44 Panels

1.1.6 InSoFast CX LowPro SW Studded Insert

## 2 Product Description and Materials

2.1 InSoFast UX 2.0 Panels are formed from closed-cell, injection-molded 2″ thick Expanded Polystyrene (EPS) foam with built-in polypropylene studs, tongue and groove interlocking edges and electrical raceways, as shown in **Figure 1**.


**Figure 1**. InSoFast UX 2.0 Panels

2.2 InSoFast EXi 2.5 Panels are formed from closed cell, injection-molded 2.5″ thick EPS foam, respectively, with built-in polypropylene studs, tongue and groove interlocking edges and electrical raceways, as shown in **Figure 2**.

2.3 InSoFast EXe 2.5 Panels are formed from closed cell, injection-molded 2.5″ thick EPS foam, respectively, with built-in polypropylene studs and tongue and groove interlocking edges.

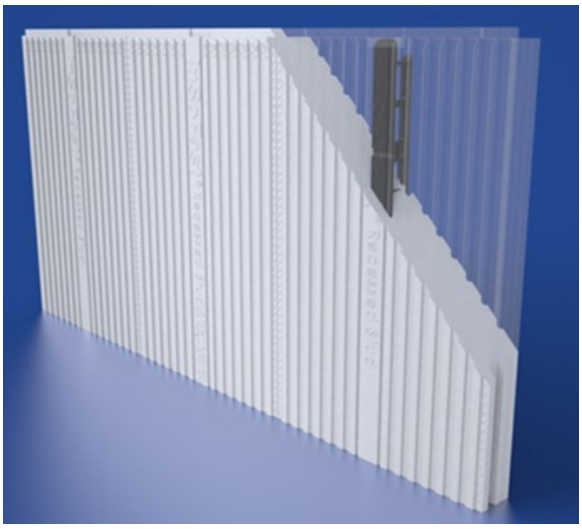

**Figure 2**. InSoFast EX 2.5 Panels

2.4 InSoFast MAX 3.75 Panels are formed from closed cell, injection-molded 3.75″ thick EPS foam with built in polypropylene studs, tongue and groove interlocking edges and electrical raceways, see **Figure 3**.

**Figure 3**. InSoFast MAX 3.75 Panel

2.5 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, as shown in **Figure 4**.


**Figure 4**. InSoFast CX44 Panels

2.6 InSoFast CX LowPro SW Studded Inserts are formed from closed cell, injection-molded 2″ thick EPS foam with built-in polypropylene studs as shown in **Figure 5**.

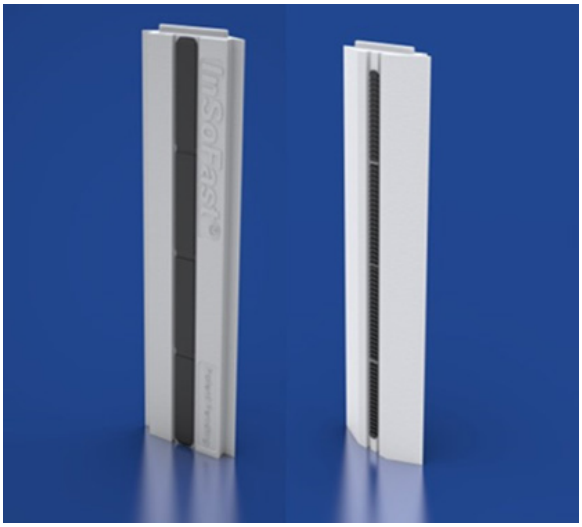

**Figure 5**. InSoFast CX LowPro SW Studded Inserts

2.7 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.

2.8 *Material Availability*

2.8.1 *Width:*

2.8.1.1 InSoFast UX 2.0 Panels: 4' (1219 mm)

2.8.1.2 InSoFast EXi 2.5, EXe 2.5 and MAX 3.75 Panels: 4' (1219 mm)

2.8.1.3 InSoFast CX44 Panels: 3.67' (1118 mm)

2.8.1.4 InSoFast CX LowPro SW Studded Insert: 7" (178 mm)

2.8.2 *Standard Product Length:*

2.8.2.1 2' (609 mm)

2.8.3 *Thickness:*

2.8.3.1 InSoFast UX 2.0 Panels: 2" (50 mm)

2.8.3.2 InSoFast EXi 2.5 and EXe 2.5 Panels: 2.5" (63 mm)

2.8.3.3 InSoFast MAX 3.75 Panels: 3.75" (89 mm)

2.8.3.4 InSoFast CX44 Panels: 2" (50 mm) – 3.23" (76 mm)

2.8.3.5 InSoFast CX LowPro SW Studded Insert: 2" (50 mm)

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

## 3 Definitions

3.1 New Materials[ii] are defined as building materials, equipment, appliances, systems, or methods of construction not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[iii] The design strengths and permissible stresses shall be established by tests[iv] and/or engineering analysis.[v]

3.2 Duly Authenticated Reports[vi] and Research Reports[vii] are test reports and related engineering evaluations, which are written by an approved agency[viii] and/or an approved source.[ix]

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

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

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

3.5 Testing and/or inspections conducted for this Duly Authenticated Report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed Registered Design Professional (RDP).

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

3.6 The regulatory authority shall enforce[xiii] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[xiv] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept Duly Authenticated Reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[xv]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope, shall be approved.[xvi] Therefore, all ANAB ISO/IEC 17065 Duly Authenticated Reports are approval equivalent.[xvii]

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

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

4.1 *Standards*

4.1.1 *ASTM C203: Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation*

4.1.2 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*

4.1.3 *ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*

4.1.4 *ASTM D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics*

4.1.5 *ASTM D1622: Standard Test Method for Apparent Density of Rigid Cellular Plastics*

4.1.6 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*

4.1.7 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

4.1.8 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

4.1.9 *ASTM E2273: Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies*

4.1.10 *CAN/ULC-S701: Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering*

4.1.11 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*

4.1.12 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

4.2 *Regulations*

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

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

## 5 Listed[xx]

5.1 A nationally recognized testing laboratory such as CBI, states that the materials, designs, methods of construction, and/or equipment have met nationally recognized standards and/or have been tested and found suitable for use in a specified manner.

## 6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 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.

6.2 InSoFast CX44 Panels and InSoFast CX LowPro SW Studded Inserts are used on the interior or exterior of shipping container wall surfaces.

6.3 *Drainage Efficiency*

6.3.1 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 ninety-six percent (96%) when tested in accordance with ASTM E2273.

6.4 *Thermal Resistance (R-Value)*

6.4.1 InSoFast Insulation Panels have the thermal resistances shown in **Table 1**.

**Table 1**. Thermal Resistance Values[1]

| Product | Thickness (in) | R-Value (h*ft²*°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[2] | 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.

6.5 *Surface Burning Characteristics*

6.5.1 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[1]

| 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.

6.6 *Vertical and Lateral Fire Propagation*

6.6.1 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.

6.6.2 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[1,2]

| Wall Component | Materials |
|---|---|
| ***Base Wall***<br>Use either 1, 2 or 3 | 1. Cast concrete walls<br>2. CMU concrete walls<br>3. 20-gauge (min.) 3 5/8" (min.) steel studs spaced 24 in o.c. (max.) with 5/8" (min.) type X Special Fire Resistant Gypsum Wallboard Interior |
| ***Fire-Stopping in Stud Cavity at Floor Lines*** | 1. 4-pcf mineral fiber insulation installed |
| ***Cavity Insulation***<br>Use either 1, 2, 3 or 4 | 1. None<br>2. Any noncombustible insulation per ASTM E136<br>3. Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)<br>4. Any Fiberglass (Batt Type Class A ASTM E84 faced or unfaced) |
| ***Exterior Sheathing Under Exterior Insulation***<br>For base wall system 3 | 1. 1/2" or thicker exterior glass matt gypsum sheathing meeting ASTM C1177 |
| ***Water Resistive Barrier (WRB) over Sheathing***<br>Any item 1-57 | 1. None<br>2. BASF MasterSeal AWB 660<br>3. Carlisle (CCW) Fire Resist 705FR-A<br>4. Carlisle (CCW) Fire Resist Barritech NP<br>5. Carlisle (CCW) Fire Resist Barritech VP (or VP LT)<br>6. Carlisle (CCW) 705<br>7. Carlisle (CCW) 705VP<br>8. GE Momentive Elemax 2600<br>9. Henry Air-Bloc 32MR<br>10. Henry Air-Bloc 31MR<br>11. Henry EnviroCap 108<br>12. Henry Air-Bloc 33MR<br>13. Henry Air-Bloc 21 FR<br>14. Henry Blueskin VP 160<br>15. Henry Air-Bloc 21S<br>16. Henry Air-Bloc 17MR<br>17. Henry BlueSkin SA<br>18. Henry Air-Bloc 16MR<br>19. Henry FoilSkin<br>20. Henry MetalClad<br>21. Polyguard Air Lok Flex<br>22. Polyguard Air Lok Flex VP<br>23. Polyguard FlexGuard<br>24. Polyguard Air Lok Sheet 400 NP<br>25. Polyguard Air Lok Sheet UV400 NP<br>26. Dorken Delta Vent SA<br>27. Dorken Delta Vent S/Plus |

**Table 3**. NFPA 285 Approved Exterior Wall Assemblies[1,2]

| Wall Component | Materials |
|---|---|
| | 28. Dorken Delta Fassade S<br>29. Dorken Delta Foxx/Plus<br>30. Dorken Delta Maxx/Plus<br>31. Soprema Sopraseal Stick VP<br>32. Soprema Soprasolin HD<br>33. Soprema LM 204 VP<br>34. Soprema 1100T<br>35. Prosoco Spraywrap MVP<br>36. Prosoco R-Guard VB<br>37. Prosoco R-Guard Cat 5<br>38. Prosoco R-Guard Cat 5 Rain Screen<br>39. Vaproshield Revealshield SA<br>40. Vaproshield Wrapshield SA<br>41. GCP (Grace) PAB NPL 10<br>42. GCP (Grace) PAB NPS<br>43. GCP (Grace) PAB NPL<br>44. GCP (Grace) PAB VCL<br>45. GCP (Grace) PAB VPL LT<br>46. GCP (Grace) PAB VPS<br>47. GCP (Grace) PAD AWM<br>48. GCP (Grace) VPL 50<br>49. WR Meadows Air-Shield LMP (Gray)<br>50. WR Meadows Air-Shield LMP (Black)<br>51. WR Meadows Air-Shield TMP<br>52. WR Meadows Air-Shield LSR<br>53. Siga Majavest<br>54. Siga Majavest 500 SA<br>55. Tremco ExoAir 230<br>56. Tremco ExoAir 130<br>57. DuPont™ Tyvek® CommercialWrap® |
| ***Adhesive***<br>Use item 1 or 2 with Base Wall 1 or 2 | 1. 3/8" beads of Loctite PL premium adhesive 16" o.c.<br>2. NFPA 285 approved EIFS "mud" |
| ***Exterior Insulation***<br>Use either 1 or 2 adhered with adhesive or mechanically attached | 1. InSoFast UX 2.0 Panels (with or without raceways)<br>2. InSoFast EX 2.5 Panels (with or without raceways) |
| ***Exterior Sheathing Installed Over Exterior Insulation***<br>Use either 1 or 2 | 1. 1/2" (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<br>2. 1/2" (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 |
| ***WRB Over Exterior Sheathing Installed Over Exterior Insulation*** | 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<br>***NOTE***: The WRB must be approved for use directly under exterior sheathing installed over exterior insulation or over exterior insulation. WRBs allowed over Exterior Sheathing Under Exterior Insulation are protected by the insulation and do not qualify as allowable WRBs for this location. |

**Table 3**. NFPA 285 Approved Exterior Wall Assemblies[1,2]

| Wall Component | Materials |
|---|---|
| ***Outer Covering***<br>Use any item 1-7<br><br>Where aluminum is listed, this means aluminum sheet metal panels – not aluminum composite panels. | 1. EIFS coatings that are NFPA 285 approved for applications over cement board<br>2. Adhered thin brick (with noncombustible mortar)<br>3. Adhered stone (with noncombustible mortar)<br>4. Fiber cement lap or panels (or any non-combustible cladding) mechanically fastened through the cladding directly to the InSoFast Studs<br>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<br>6. Vertical or horizontal steel or aluminum cladding mechanically fastened through the cladding into the InSoFast Studs<br>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 |

1. The assemblies and combinations herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest & Associates Consulting, LLC.
2. *NOTE*: window headers/jambs for all constructions shall incorporate 25-gauge L flashing and 2" of mineral wool above the opening and on both sides.

6.7 *Thermal Barrier Requirements*

6.7.1 InSoFast Insulation 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.

6.7.2 Fasteners attaching the thermal barrier to the InSoFast Insulation Panels shall be installed at a maximum of 12" on center.

6.8 *Attachment Methods*

6.8.1 **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[5] | Allowable Load Capacity (lb) per Fastener | |
|---|---|---|---|
| | | Withdrawal | Lateral |
| Attaching wall covering or cladding to InSoFast studs[1] | No. 6 by $1\frac{5}{8}$" coarse type W screw | 65 | 95 |
| Attaching InSoFast studs to structural wall[1] | No. 9 by $3\frac{1}{2}$" long type W screw | 95 | 35 |
| Attaching InSoFast studs to steel[2] | No. 10 by $3\frac{1}{2}$" screw | 50 | 70 |
| Attaching InSoFast studs to masonry wall[3,4] | Tapcon® $\frac{3}{16}$" (dia.) by $3\frac{1}{2}$" (min. length) Blue, White, and Stainless concrete screw anchors | 55 | 100 |

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

1. Fasteners tested in accordance with ASTM D1761.
2. 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.
3. Concrete screw anchor must provide 1" minimum penetration into masonry substrate.
4. Load capacities in accordance with Tapcon® evaluation reports and product specifications.
5. All screws and anchors shall be countersunk into EX panels until fastener head is flush with polypropylene stud.

6.8.2 **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[1] (psf) | |
|---|---|---|---|
| | | Withdrawal | Lateral |
| Attaching InSoFast Studs to wood framed structural wall[2] | 3/8" bead of PL Premium 3x construction adhesive | 35 | 50 |
| Attaching InSoFast Studs to concrete structural wall[2] | | 40 | 50 |
| Attaching InSoFast Studs to steel framed structural wall[2] | | 30 | 40 |

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

1. Pounds per square foot of InSoFast Insulation Panels.
2. Testing performed following a modified ASTM D1761 procedure.

6.9 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.

## 7 Certified Performance[xxi]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[xxii]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[xxiii]

## 8 Regulatory Evaluation and Accepted Engineering Practice

8.1 InSoFast Insulation Panels comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Physical properties (compressive, density, flexural, thermal transmission)

8.1.2 Drainage efficiency

8.1.3 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

8.1.4 Performance regarding vertical and lateral fire propagation in accordance with IBC Section 2603.5.5

8.1.5 Wind load resistance in accordance with IBC Section 1609

8.2 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.

8.3 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.

8.3.1 Physical properties (compressive, density, flexural, thermal transmission).

8.3.2 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.

8.4 Use in fire resistance-rated construction is outside the scope of this report.

8.5 Any building code, regulation, and/or accepted engineering evaluations (i.e., research reports, Duly Authenticated Reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified[xxiv] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.

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

8.7 Any regulation specific issues not addressed in this section are outside the scope of this report.

## 9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.

9.3 *Installation Procedure Using Mechanical Attachment*

9.3.1 *Exterior Installation Over Above Grade Framed Walls:*

9.3.1.1 InSoFast UX 2.0, InSoFast EXi 2.5, InSoFast EXe 2.5 and InSoFast MAX 3.75 Panels may be installed over framed walls.

9.3.1.2 Use indicator markings on the panel and attach panels with recommended fasteners 12" o.c. along InSoFast Studs.

9.3.1.3 For 16" framing, install the first panel so that the built-in studs line up with the wall studs and attach using recommended fasteners.

9.3.1.4 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.

9.3.1.5 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.

9.3.1.6 See manufacturer installation instructions for more information and installation procedures for surrounding openings, installing in corners, installing on non-level surfaces, etc.

9.3.2 *Interior Installation Over Existing Framed Walls:*

9.3.2.1 Prior to installation, remove baseboard, window trim, electrical outlet covers, etc.

9.3.2.2 Mark existing stud locations on the wall and align InSoFast Studs with framing.

9.3.2.3 The recommended screw pattern is 12" o.c. with a fastener length sufficient to penetrate existing framing.

9.3.2.4 Adhesive is used in corners for additional support.

9.3.2.5 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.

9.3.2.6 See manufacturer installation instructions for more information and installation procedures for surrounding openings, installing in corners, installing on non-level surfaces, etc.

9.4 *Installation Procedure Using Adhesive Attachment*

9.4.1 *General Procedure Using PL Premium 3X Construction Adhesive:*

9.4.1.1 Surfaces must be clean and free of frost, standing water, grease, dust and other contaminants. Pre-fit all materials and protect finished surfaces.

9.4.1.2 Apply a $^{3}/_{8}$" bead of PL Premium 3x construction adhesive on the ribbed surface of the studs.

9.4.1.3 Apply additional adhesive to the foam along any cuts.

9.4.1.4 The panels/studs may be repositioned within 30 minutes after applying the adhesive.

9.4.1.5 *Climatic Conditions During Installation:*

9.4.1.5.1 When bonding InSoFast Insulation Panels/Studs, avoid cure and surface temperatures below 40°F (4°C) and above 90°F (32°C).

9.4.1.5.2 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.

9.4.2 *Adhesive Installation Over Below Grade Concrete or Masonry Walls:*

9.4.2.1 InSoFast UX 2.0, InSoFast EXi 2.5, InSoFast EXe 2.5 and InSoFast MAX 3.75 Panels may be installed over below grade concrete or masonry walls.

9.4.2.2 Prior to installation, clean and remove dirt, debris, or loose paint from walls that may affect adhesive bond.

9.4.2.3 Start InSoFast Insulation Panels installation at a corner.

9.4.2.4 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.

9.4.2.5 Set panel on floor and press it against wall.

9.4.2.6 To start second row of panels, cut panel to create running bond pattern, ensuring that studs line up but vertical seams do not.

9.4.2.7 Continue installing panels to the next corner.

9.4.2.8 See manufacturer installation instructions for further information on completing corners, intersecting walls, surrounding windows, etc.

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

9.4.3.1 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.

9.4.3.2 On the back of the InSoFast Insulation Panels, apply a $^{3}/_{8}$" bead of PL Premium 3x construction adhesive along the dovetailed ribbing of each InSoFast Stud.

9.4.3.3 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.

9.4.3.4 See manufacturer installation instructions for further information on completing corners, intersecting walls, surrounding windows, etc.

9.4.4 *Adhesive Installation Over Metal Surfaces:*

9.4.4.1 InSoFast Insulation Panels studded inserts may be installed on metal surfaces such as shipping container walls.

9.4.4.2 Lay out first row of InSoFast Insulation Panels alongside sidewall of shipping container to determine the fit. Variations in shipping container may require panels to be trimmed or spaced out slightly.

9.4.4.3 Apply PL Premium 3x adhesive in a $^{3}/_{8}$" bead on the backside of the InSoFast Studs on the backside of the studs.

9.4.4.3.1 Add water in the form of a light mist to the adhesive extruded on the stud. This accelerates the adhesive's set time.

9.4.4.3.2 When bonding InSoFast Insulation Panels/Studs, avoid cure and surface temperatures below 40°F (4°C) and above 90°F (32°C) on non-porous metal surfaces.

9.4.4.4 Add an additional bead of PL Premium 3x adhesive at the start and end of each wall.

9.4.4.5 Apply a continuous bead of adhesive or spray foam along the bottom of the container wall.

9.4.4.6 Press panel into place and verify that adhesive has spread out to width of the stud.

9.4.4.7 To start the second row, cut panel in center with long snap off blade utility knife to start the running bond or staggered pattern.

9.4.4.8 At the top of second row, run a bead of spray foam on the backside of the panel or directly to the container wall.

9.4.4.9 See manufacturer installation instructions for further details and instructions for installing InSoFast CX44 Panels around windows and doors.

9.4.4.9.1 InSoFast Insulation Panels installed on a metal ceiling are meant for drywall finish only.

9.4.5 *InSoFast CX LowPro SW Studded Inserts:*

9.4.5.1 Apply a $^{3}/_{8}$" bead of PL Premium 3x construction adhesive to the dovetailed ribbing of each stud, and then apply a bead horizontally across the top over the backside of the stud to form a "T".

9.4.5.2 Apply additional horizontal adhesive along the base of the first row to secure the bottom edge of the LowPro Stud.

9.4.5.3 Install the LowPro inserts into container wall corrugations.

9.4.5.4 Apply an additional horizontal bead of adhesive along the top of the uppermost LowPro stud to secure to the top of the container.

9.4.5.5 For additional installation instructions and alterations to provide higher insulation R-values, see the manufacturer installation instructions.

9.4.6 *Installation Over Concrete Ceilings:*

9.4.6.1 InSoFast UX 2.0, InSoFast EXi 2.5, InSoFast EXe 2.5 and InSoFast MAX 3.75 Panels may be installed over concrete ceilings.

9.4.6.2 For mechanical attachment, install fasteners 12" o.c. into the recessed attachment points on the InSoFast Stud that penetrate the concrete 1".

9.4.6.3 *For Adhesive Attachment:*

9.4.6.3.1 Apply a $^{3}/_{8}$" bead of PL Premium 3x construction adhesive on the ribbed surface of the studs. Apply additional adhesive to the foam along any cuts.

9.4.6.3.2 Install one mechanical fastener in the center recessed attachment point to hold the panel in place until the adhesive has set.

9.4.6.4 See manufacturer installation instructions for further information on completing corners, intersecting walls, surrounding windows, etc.

9.4.6.5 InSoFast Insulation Panels installed on a concrete ceiling are meant for drywall finish only.

9.4.7 *Installation Over Concrete Floor:*

9.4.7.1 InSoFast UX 2.0, InSoFast EXi 2.5, InSoFast EXe 2.5 and InSoFast MAX 3.75 Panels may be installed over concrete floors.

9.4.7.2 If installing InSoFast Insulation Panels on both walls and floor, install panels on the wall first.

9.4.7.3 *Floating Installation Method:*

9.4.7.3.1 This method is recommended for carpet, laminate and wood floors.

9.4.7.3.2 Place panels directly on concrete without any adhesive. Interlock panels together with tongue and grooved edges in a staggered or running-bond pattern.

9.4.7.4 *Glue Down Installation Method:*

9.4.7.4.1 This method is recommended for carpet, laminate, and wood floors.

9.4.7.4.2 Apply a $^{3}/_{8}$" bead of PL Premium 3X construction adhesive to the dovetailed ribbing of each stud and install panels in a staggered or running-bond pattern.

9.4.7.5 *Screw Down Installation Method:*

9.4.7.5.1 This method is recommended for any flooring type.

9.4.7.5.2 Attach InSoFast Insulation Panels to the concrete floor by installing concrete screws through the studs.

9.4.7.6 *Fully Adhered Installation Method:*

9.4.7.6.1 This method is recommended for tiled areas.

9.4.7.6.2 InSoFast Insulation Panels should be set in a bed of thin set tile adhesive with a notched trowel.

9.4.7.6.3 See manufacturer installation instructions for more information and installation procedures for surrounding openings, installing in corners, installing on non-level surfaces, etc.

## 10 Substantiating Data

10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

10.1.1 Wind loading testing in accordance with ASTM E330

10.1.2 EPS properties testing in accordance with ASTM C578

10.1.3 Drainage efficiency testing in accordance with ASTM E2273

10.1.4 Compressive strength in accordance with ASTM D1621

10.1.5 Density in accordance with ASTM D1622

10.1.6 Flexural strength in accordance with ASTM C203

10.1.7 Thermal resistance testing in accordance with ASTM C518

10.1.8 Fire testing in accordance with NFPA 286

10.1.9 Vertical and lateral flame propagation testing in accordance with NFPA 285

10.1.10 Withdrawal and lateral load fastener testing in accordance with ASTM D1761

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

10.3 Where pertinent, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or Duly Authenticated Reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this Duly Authenticated Report, may be dependent upon published design properties by others.

10.5 Testing and engineering analysis: 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.[xxv]

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

## 11 Findings

11.1 As outlined in Section **6**, InSoFast Insulation Panels have performance characteristics that were tested and/or meet applicable regulations and are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this Duly Authenticated Report and the manufacturer installation instructions, InSoFast Insulation Panels shall be approved for the following applications:

11.2.1 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.

11.2.2 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.

11.2.3 InSoFast UX 2.0, InSoFast EXi 2.5 and InSoFast Max 3.75 Panels are approved for use as an interior insulation.

11.2.4 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.

11.3 Unless exempt by state statute, when InSoFast Insulation Panels 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.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from InSoFast®, LLC.

11.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[xxvi] are similar) in pertinent part states:

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

11.6 **Approved**:[xxvii] Building regulations require that the building official shall accept Duly Authenticated Reports.[xxviii]

11.6.1 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited.

11.6.2 An approved source is "approved" when an RDP is properly licensed to transact engineering commerce.

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

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

11.8 Through the IAF Multilateral Agreements (MLA), this Duly Authenticated Report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 Duly Authenticated Reports are equivalent.[xxix]

## 12 Conditions of Use

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

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

12.3 As listed herein, InSoFast Insulation Panels shall comply with the following usage guidelines:

12.3.1 Use in fire resistance-rated construction is outside the scope of this report.

12.3.2 InSoFast Insulation 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.

12.3.3 A vapor retarder shall be installed in accordance with IBC Section 1404.3[xxx] and IRC Section R702.7 when required in the above-grade construction of walls in framed construction. For masonry construction and shipping containers, a vapor retarder is not required.

12.3.4 In areas where the probability of termite infestation is "very heavy" as defined by IBC Section 2603.8, installation of InSoFast Insulation Panels shall follow the requirements of IBC Section 2603.8 and IRC Section R316.7.

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

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

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

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

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

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

12.4.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4, and IRC Section R109.2.

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

12.5 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, "*the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new material or assemblies as provided for in Section 104.11*," all of IBC Section 104, and IBC Section 105.4.

12.6 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.7 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

## 13 Identification

13.1 The innovative products listed in Section **1.1** are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.insofast.com.

## 14 Review Schedule

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

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

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

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

# Appendix A

## 1 Legislation that Authorizes AHJ Approval

1.1 **Fair Competition**: State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies, and/or methods of construction that:

1.1.1 Advance innovation,

1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints, 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 these innovative products 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),[xxxi] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years[xxxii] and/or a $5,000,000 fine or 3 times the value of[xxxiii] the Intellectual Property (IP) and Trade Secrets (TS).

1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, Duly Authenticated Reports, and/or research reports prepared by approved agencies and/or approved sources.

1.2.4 For new materials[xxxiv] that are not specifically provided for in any regulation, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.

1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.[xxxv]

1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.

1.2.7 The AHJ shall accept Duly Authenticated Reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.[xxxvi]

1.3 **Approved**[xxxvii] **by Los Angeles**: The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards that apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.[xxxviii] The Superintendent of Building Approved Testing Agency Roster is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a DrJ Listing are LAMC approved. In addition, the Superintendent of Building shall accept Duly Authenticated Reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.[xxxix]

1.4 **Approved by Chicago**: The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly, and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).

1.5 **Approved by New York City**: The 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed[xl] 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[xli] (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:

1.6.1 A certification mark or listing of an approved certification agency,

1.6.2 A test report from an approved testing laboratory,

1.6.3 A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity, or

1.6.4 A product evaluation report based upon testing, comparative or rational analysis, or a combination thereof, developed, signed and sealed by a professional engineer or architect, licensed in Florida.

1.6.5 For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods:

1.6.5.1 A certification mark, listing or label from a commission-approved certification agency indicating that the product complies with the code,

1.6.5.2 A test report from a commission-approved testing laboratory indicating that the product tested complies with the code,

1.6.5.3 A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code,

1.6.5.4 A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code, or

1.6.5.5 A statewide product approval issued by the Florida Building Commission.

1.6.6 The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).

1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA])**: A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.

1.8 **Approved by New Jersey**: Pursuant to the 2018 Building Code of New Jersey in IBC Section 1707.1 General,[xlii] 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)*".[xliii] Furthermore N.J.A.C 5:23-3.7 states: "*Municipal approvals of alternative materials, equipment, or methods of construction*."

1.8.1 **Approvals**: Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability, and safety of those conforming with the requirements of the regulations.

1.8.1.1 A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of the above.

1.8.1.2 Reports of engineering findings issued by nationally recognized evaluation service programs such as but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of the above.

1.8.2 The New Jersey Department of Community Affairs has confirmed that technical evaluation reports, from any accredited entity listed by ANAB, meets the requirements of item the previous paragraph, given that the listed entities are no longer in existence and/or do not provide "*reports of engineering findings*."

1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards**: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[xliv] and Part 3280,[xlv] the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:

1.9.1 "*All construction methods shall be in conformance with accepted engineering practices*."

1.9.2 "*The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur*."

1.9.3 "*The design stresses of all materials shall conform to accepted engineering practice*."

1.10 **Approval by US, Local and State Jurisdictions in General**: In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:

1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.[xlvi]

1.10.2 For innovative alternatives and/or methods of construction, the building official shall accept Duly Authenticated Reports from approved agencies with respect to the quality and manner of use of new materials or assemblies.[xlvii]

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

1.10.2.2 An approved source is "approved" when an RDP is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[xlviii]

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.[xlix]

1.11 **Approval by International Jurisdictions**: The USMCA and GATT agreements provide for approval of innovative materials, designs, services, and/or methods of construction through the Agreement on Technical Barriers to Trade and the IAF Multilateral Recognition Arrangement (MLA), where these agreements:

1.11.1 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.

1.11.2 **Approved**: The purpose of the MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA and subsequently, acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, designs, services, and/or methods of construction.

1.11.3 ANAB is an IAF-MLA signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope, shall be approved.[l]

1.11.4 Therefore, all ANAB ISO/IEC 17065 Duly Authenticated Reports are approval equivalent.[li]

1.12 Approval equity is a fundamental commercial and legal principle.[lii]

# Notes

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

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

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

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

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

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

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

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

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

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

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

[xii] https://www.cbitest.com/accreditation/

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

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

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

[xvi] https://iaf.nu/en/about-iaf-mla/#:~:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

[xvii] True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

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

[xix] 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.

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

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

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

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

[xxiv] 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.

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

[xxvi] 2018 IFC Section 104.9

[xxvii] 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.

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

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

xxx 2015 IBC Section 1405.3

xxxi http://www.drjengineering.org/AppendixC AND https://www.drjcertification.org/cornell-2016-protection-trade-secrets

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

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

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

xxxv IBC 2021, Section 1706.1 Conformance to Standards

xxxvi IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

xxxvii See Section 11 for the distilled building code definition of **Approved**

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

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

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

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

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

xliii https://www.nj.gov/dca/divisions/codes/codreg/ucc.html

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

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

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

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

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

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

l https://iaf.nu/en/about-iaf-mla/#:~:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

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

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