



# Listing and Technical Evaluation Report™

Report No: 2310-01



Issue Date: March 8, 2024

Revision Date: March 8, 2024

Subject to Renewal: April 1, 2025

## SWD Urethane Quik-Shield DRAGON Spray Polyurethane Foam (SPF) for Use in Unvented Attics and Crawlspace

Trade Secret Report Holder:

SWD Urethane

Phone: 800-828-1394

Website: [www.swdurethane.com](http://www.swdurethane.com)

Email: [marketing@swdurethane.com](mailto:marketing@swdurethane.com)

### CSI Designations:

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 21 19 - Foamed-in-Place Insulation

Section: 07 27 36 - Sprayed Foam Air Barrier

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

1.1 SWD Urethane Quik-Shield DRAGON

### 2 Product Description and Materials

2.1 The innovative product evaluated in this report is shown in **Figure 1**.

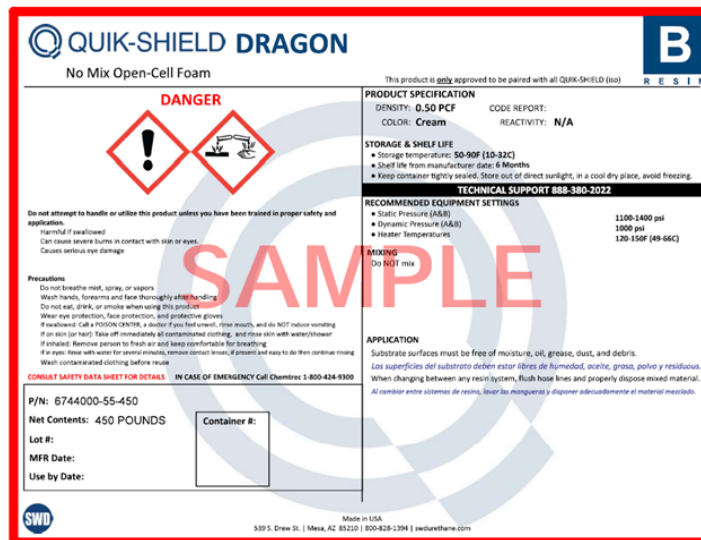


Figure 1. SWD Urethane Quik-Shield DRAGON Label



2.2 SWD Urethane Quik-Shield DRAGON is an open-cell Spray Polyurethane Foam (SPF) insulation product.

2.2.1 *Density:*

2.2.1.1 Nominal 0.5 pounds per cubic foot (pcf) (8 kg/m<sup>3</sup>)

2.3 SWD Urethane Quik-Shield DRAGON is produced in the field by combining an isocyanate (Component A) with a proprietary resin (Component B).

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

### 3 Definitions

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

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

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

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

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

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

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

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

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

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

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

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

4.1 *Standards*

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

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

4.1.3 *ASTM D1623: Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics*

4.1.4 *ASTM D2126: Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging*



- 4.1.5 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
- 4.1.6 *ASTM E2178: Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials*
- 4.1.7 *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®*
- 4.2.3 *IECC – 15, 18, 21: International Energy Conservation Code®*

5 **Listed<sup>xx</sup>**

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 SWD Urethane Quik-Shield DRAGON is used in the following applications:

- 6.1.1 Thermal insulation in buildings constructed in accordance with the IBC or IRC.
- 6.1.2 As a sealant for penetrations as part of an air barrier system.

6.2 *Thermal Resistance*

6.2.1 SWD Urethane Quik-Shield DRAGON has the thermal resistance as defined in **Table 1**.

**Table 1.** Thermal Resistance Properties

Product	Thickness (in)	Thermal Resistance (R-values) <sup>1,2</sup> (h·ft. <sup>2</sup> ·°F/Btu)
SWD Urethane Quik-Shield DRAGON	1	3.9
	3½	13.0

SI: 1 in = 25.4 mm  
 1. Tested at a mean temperature of 75° F.  
 2. R-Values are based on 90-day aged test results.

6.3 *Surface Burning Characteristics*

6.3.1 SWD Urethane Quik-Shield DRAGON has the surface burning characteristics as shown in **Table 2**.

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

Product	Flame Spread	Smoke Developed	Classification
SWD Urethane Quik-Shield DRAGON	< 25	< 450	Class A

1. Tested in accordance with ASTM E84/UL723 at a thickness of 4".



6.4 Air Permeability

- 6.4.1 SWD Urethane Quik-Shield DRAGON has the air permeability characteristics shown in **Table 3** and is considered an air impermeable insulation in accordance with IRC Sections R202 and IRC Section R806.5.
- 6.4.2 SWD Urethane Quik-Shield DRAGON is an air-barrier material in accordance with IRC Section N1102.4, IECC Section C402.5.1.3<sup>xxi</sup> and IECC Section R402.4.

**Table 3.** Air Permeance

Product	Air Permeability <sup>3</sup> [L/(s·m <sup>2</sup> )]
SWD Urethane Quik-Shield DRAGON 1,2	<0.02
1. Sprayed to a minimum thickness of 3 1/2". 2. Tested in accordance with ASTM E2178. 3. Liter per second per square meter when tested at a pressure differential of 75 Pa.	

6.5 Unvented Attic and Unvented Enclosed Rafter Assemblies

6.5.1 General:

- 6.5.1.1 SWD Urethane Quik-Shield DRAGON is approved for use in unvented attic and unvented, enclosed rafter assemblies in accordance with IBC Section 1202.3<sup>xxii</sup> provided the following conditions be met:
  - 6.5.1.1.1 For penetrating items not needing full coverage, the perimeter (annular space) of the items must be covered in the approved SPF at the minimum thickness allowed.
  - 6.5.1.1.2 For all attic volumes, steel or copper pipes penetrating the roof deck or gable do not need to be covered in SPF since these will not melt in typical unvented attic fire scenarios.
  - 6.5.1.1.3 Vinyl or other thin plastic flexible ducts/vents may not penetrate the roof deck or gable unless it is covered with SPF at a minimum thickness of 3 1/2" (89 mm).
  - 6.5.1.1.4 Other items penetrating the roof deck or gable not specifically named in this report (other than steel or copper) need to be covered with SPF at a minimum thickness of 3 1/2" (89 mm).
- 6.5.1.2 SWD Urethane Quik-Shield DRAGON shall be separated from the building interior by a thermal barrier consisting of a minimum 1/2" gypsum wallboard or equivalent in accordance with IBC Section 2603.4 or IRC Section R316.4, except in unvented attics and crawlspaces as described in Sections **6.5.2** and **6.5.3**.

6.5.2 Application in an Unvented Attic Without a Prescriptive Thermal Barrier or Ignition Barrier:

- 6.5.2.1 When SWD Urethane Quik-Shield DRAGON is applied in unvented attics conforming to IRC Section R806.5, the following apply:
  - 6.5.2.1.1 SPF shall be applied to the underside of roof sheathing at a minimum thickness of 3 1/2" (89 mm).
  - 6.5.2.1.2 Roof rafter or truss top chord member edges may be left exposed.
  - 6.5.2.1.3 SPF shall be applied to vertical wall surfaces at a minimum thickness of 3 1/2" (89 mm).
  - 6.5.2.1.4 Wall stud edges may be left exposed.
  - 6.5.2.1.5 Maximum thickness of the SPF is 18" (508 mm) on the underside of roof sheathing or on the vertical wall surfaces.



- 6.5.2.1.6 SPF insulation may be left exposed to the attic without a thermal barrier, prescriptive ignition barrier or an intumescent coating.
- 6.5.2.1.7 Attic shall have access complying with IRC Section R807, horizontally placed in the floor and shall feature one of the following:
  - 6.5.2.1.7.1 A downward-opening hatch,
  - 6.5.2.1.7.2 A pull down stair, or
  - 6.5.2.1.7.3 Access opening in accordance with IRC Section R807 using Rockfon® Pacific™ 201 Square Edge Ceiling Tile to cover the opening. The Rockfon Pacific 201 ceiling tile shall have a maximum density of 8 pcf, a maximum binder content of three percent (3%) and shall be listed as a Class A product in accordance with ASTM 1264.
- 6.5.2.1.8 Vertical access openings are not permitted unless a project specific fire analysis is conducted that justifies its use.
- 6.5.2.2 **ABS/PVC Vent Pipes:**
  - 6.5.2.2.1 For attics up to 46,080 ft<sup>3</sup> (1,305 m<sup>3</sup>), any schedule 40 (minimum) ABS or PVC vent pipe does not need to be covered in SPF.
  - 6.5.2.2.2 For attics larger than 46,080 ft<sup>3</sup> (1,305 m<sup>3</sup>), schedule 40 (minimum) ABS or PVC vent pipe penetrations shall be covered with SPF at a minimum thickness of 3½" (89 mm), or may be left uncovered but limited in number and size such that the total area of holes created in the roof deck and gable do not exceed 36 in<sup>2</sup> (23,226 mm<sup>2</sup>).
  - 6.5.2.2.3 ABS or PVC vent pipes thinner than schedule 40 (for any attic volume) must be covered with SPF at a minimum thickness of 3½" (89 mm), or may be left uncovered but limited in number and size such that the total area of holes created in the roof deck and gable do not exceed 36 in<sup>2</sup> (23,226 mm<sup>2</sup>).
- 6.5.2.3 **Flexible Metallic Ducts/Vents/Pipes Penetrating the Roof Deck or Gable:**
  - 6.5.2.3.1 For attics up to 46,080 ft<sup>3</sup> (1,305 m<sup>3</sup>), flexible metallic ducts/vents (aluminum or materials with higher melting/softening points than aluminum) or metallic vent pipes (aluminum or materials with higher melting/softening points than aluminum) penetrating the roof deck or gables do not need to be protected by SPF at a minimum thickness of 3½" (89 mm).
  - 6.5.2.3.2 For attics greater than 46,080 ft<sup>3</sup> (1,305 m<sup>3</sup>), flexible metallic ducts/vents (aluminum or materials with lower melting/softening points than aluminum) or metallic vent pipes (aluminum or materials with lower melting/softening points than aluminum), the roof deck or gables must be protected with SPF at a minimum thickness of 3½" (89 mm) or may be left uncovered but limited in number and size such that the total area of holes created in the roof deck and gable do not exceed 36 in<sup>2</sup> (23,226 mm<sup>2</sup>).
- 6.5.2.4 **Vinyl or Other Plastic HVAC Ducts/Vents Only Penetrating the Attic Floor (Supply and Return):**
  - 6.5.2.4.1 For all attic volumes, vinyl or other plastic HVAC ducts/vents that only penetrate the attic floor do not need to be protected with SPF if the HVAC unit is alarmed to switch off with smoke or heat alarm switches within the attic space. Otherwise, the plastic HVAC duct must be protected by SPF at a minimum thickness of 3½" (89 mm).



6.5.2.5 *Flexible Metallic HVAC Ducts/Vents Only Penetrating the Attic Floor (Supply and Return):*

- 6.5.2.5.1 For attics up to 46,080 ft<sup>3</sup> (1305 m<sup>3</sup>), flexible metallic ducts/vents (aluminum or materials with higher melting/softening points than aluminum) that only penetrate the attic floor do not need to be protected with SPF. The HVAC unit does not need to be alarmed to switch off with smoke or heat alarm switches within the attic space for this application.
- 6.5.2.5.2 For attics greater than 46,080 ft<sup>3</sup> (1305 m<sup>3</sup>), flexible metallic HVAC ducts or vents (aluminum or materials with higher melting/softening points than aluminum) that only penetrate the attic floor do not need to be protected with SPF if the HVAC unit is alarmed to switch off with smoke or heat alarm switches within the attic space. Otherwise, the flexible metallic HVAC duct must be protected by SPF at a minimum thickness of 3 1/2" (89 mm).

6.5.3 *Application in an Unvented Crawlspace Without a Prescriptive Thermal Barrier or Ignition Barrier:*

- 6.5.3.1 When SWD Urethane Quik-Shield DRAGON is applied in unvented crawlspaces conforming to IRC Section R408.3, the:
  - 6.5.3.1.1 SPF shall be applied to the underside of upper surface at a minimum thickness of 3 1/2" (89 mm).
  - 6.5.3.1.2 SPF shall be applied to vertical wall surfaces at a minimum thickness of 3 1/2" (89 mm).
  - 6.5.3.1.3 Wall stud edges may be left exposed.
  - 6.5.3.1.4 Maximum thickness of the SPF is 18" (356 mm) on the underside of the upper surface or on the vertical wall surfaces.
  - 6.5.3.1.5 SPF insulation may be left exposed to the crawlspace without a thermal barrier, prescriptive ignition barrier or an intumescent coating.
  - 6.5.3.1.6 Crawlspace access shall be provided in accordance with IRC Section R408.4.
  - 6.5.3.1.7 Enclosures for items penetrating the upper surface or walls, such as plumbing and venting systems, shall be covered with SWD Urethane Quik-Shield DRAGON insulation at a minimum thickness of 3 1/2" (89 mm).

6.6 *Application for Use as an Interior Finish without the Use of a Thermal Barrier or Ignition Barrier When Used with the Addition of IFTI DC315 Intumescent Coating*

- 6.6.1 SWD Urethane Quik-Shield DRAGON SPF with a covering of DC315, applied in accordance with **Table 4**, was tested to NFPA 286 and met the acceptance criteria of IBC Section 803.1.1.1.<sup>xxiii</sup>
- 6.6.2 When DC315 is applied to SWD Urethane Quik-Shield DRAGON SPF in accordance with **Table 4**, the assembly shall be permitted to be installed without a thermal barrier or ignition barrier in accordance with IBC Section 2603.9.

**Table 4.** Application of DC315 to SWD Urethane Quik-Shield DRAGON SPF

Product	IFTI Product Name	Maximum Thickness of QS DRAGON SPF on Walls and Vertical Surfaces (in) (mm)	Maximum Thickness on Ceilings, Underside of Roof Sheathing/Rafters and Floors (in) (mm)	Application of IFTI Coating
SWD Urethane Quik-Shield DRAGON	DC315	8 (203)	14 (356)	18 mils wet (12 mils dry)
SI: 1 in = 25.4 mm				



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

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

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

## 8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 SWD Urethane Quik-Shield DRAGON complies with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
- 8.1.1 Physical properties of the product listed below:
- 8.1.1.1 Tensile strength in accordance with ASTM D1623
- 8.1.1.2 Density in accordance with ASTM D1622
- 8.1.1.3 Dimensional stability in accordance with ASTM D2126
- 8.1.2 Thermal performance (R-values) complying with the provisions of IRC Section N1102, IECC Section C402 and IECC Section R402.
- 8.1.3 Surface burning characteristics complying with the provisions of IBC Section 2603.3 and IRC Section R316.3.
- 8.1.4 Air permeability in accordance with IRC Sections R202, IRC Section R806.5, IRC Section N1102.4, IECC Section C402.5.1.3<sup>xxvii</sup> and IECC Section R402.4.
- 8.1.5 Use in unvented attic spaces and crawlspaces without an ignition barrier in accordance with IBC Section 2603.4.1.6, IBC Section 2603.9, IRC Section R316.5.3 and IRC Section R316.6.
- 8.1.6 Use without a thermal barrier in accordance with IBC Section 2603.4, IBC Section 2603.9, IBC Section 803.1.1.1<sup>xxviii</sup>, IRC Section R316.4 and IRC Section R316.6 when International Fireproof Technology, Inc. (IFTI) DC315 intumescent coating is applied.
- 8.2 Use in fire-resistance rated construction is outside the scope of this report.
- 8.3 Any building code, regulation, and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified<sup>xxix</sup> to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.
- 8.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which are also its areas of professional engineering competence.
- 8.5 Any regulation specific issues not addressed in this section are outside the scope of this report.



## 9 Installation

- 9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report and the applicable building code.
- 9.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.
- 9.3 SPF insulation shall be applied by licensed dealers and installers certified by SWD Urethane.
- 9.4 SWD Urethane Quik-Shield DRAGON shall be applied to the framing using two-component spray equipment and shall be applied using a 1:1 ratio of Component A and Component B.
- 9.5 The substrate shall be dry and free of frost, ice, rust, oil, grease, dirt or any other substances that may prevent adhesion of the SPF to the substrate.
- 9.6 SWD Urethane Quik-Shield DRAGON is intended for interior use only and is not to be used where it could come in contact with water.
  - 9.6.1 Provide protection from weather during and after installation.
- 9.7 Where used as an air barrier in unventilated attics, the insulation shall be installed to the minimum thickness required and shall be installed in accordance with the provisions of [IRC Section R806](#).
- 9.8 SWD Urethane Quik-Shield DRAGON may be installed to the required thickness with one pass of the spray equipment. If installation using multiple passes is desired, no cure time is required between passes.
- 9.9 Do not use SWD Urethane Quik-Shield DRAGON inside of electrical or junction boxes.
- 9.10 SWD Urethane Quik-Shield DRAGON shall be installed only when the temperature is at or above 14°F (-10°C).
- 9.11 Insulation shall not be installed in areas where the service temperature is greater than 180°F (82°C).
- 9.12 For general SPF installation guidelines, see the American Chemistry Council's [Guidance on Best Practices for the Installation of Spray Polyurethane Foam](#).

## 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 Tensile strength testing in accordance with ASTM D1623
  - 10.1.2 Density testing in accordance with ASTM D1622
  - 10.1.3 Dimensional stability testing in accordance with ASTM D2126
  - 10.1.4 Thermal resistance testing in accordance with ASTM C518
  - 10.1.5 Surface burning characteristics testing in accordance with ASTM E84
  - 10.1.6 Air permeability testing in accordance with ASTM E2178
  - 10.1.7 Fire testing of SWD Urethane Quik-Shield DRAGON with IFTI DC315 Intumescent Coating in accordance with NFPA 286
- 10.2 Engineering analysis of cone calorimeter testing of SWD Urethane Quik-Shield DRAGON foam for use in unvented attics and equivalency to QS 106 by Priest & Associates Consulting, LLC.
- 10.3 Engineering analysis justifying omitting the requirement to cover entire length of items penetrating roof deck with 3½ inches (89 mm) of SWD QS 106 or QS 108 by Priest & Associates Consulting, LLC.
- 10.4 Engineering analysis of Rockfon® Pacific™ 201 ceiling panels by Priest & Associates Consulting, LLC.
- 10.5 Engineering analysis of use of SWD QS 106 SPF in unvented attics without an ignition barrier.





- 10.6 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.
- 10.7 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.
- 10.8 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.
- 10.9 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>xxx</sup>
- 10.10 Where additional condition of use and/or regulatory compliance information is required, please search for SWD Urethane Quik-Shield DRAGON on the DrJ Certification website.

## 11 Findings

- 11.1 As outlined in Section 6, SWD Urethane Quik-Shield DRAGON has performance characteristics that were tested and/or meet applicable regulations and is suitable for use pursuant to its specified purpose.
- 11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, SWD Urethane Quik-Shield DRAGON shall be approved for the following applications:
  - 11.2.1 Thermal performance (R-values) complying with the provisions of IRC Section N1102, IECC Section C402 and IECC Section R402.
  - 11.2.2 Surface burning characteristics complying with the provisions of IBC Section 2603.3 and IRC Section R316.3.
  - 11.2.3 Air permeability in accordance with IRC Sections R202, IRC Section R806.5, IRC Section N1102.4, IECC Section C402.5.1.3<sup>xxxii</sup> and IECC Section R402.4.
  - 11.2.4 Use in unvented attic spaces and crawlspaces without an ignition barrier in accordance with IBC Section 2603.4.1.6, IBC Section 2603.9, IRC Section R316.5.3 and IRC Section R316.6.
  - 11.2.5 Use without a thermal barrier in accordance with IBC Section 2603.4, IBC Section 2603.9, IBC Section 803.1.1.1<sup>xxxii</sup>, IRC Section R316.4 and IRC Section R316.6 when IFTI DC315 intumescent coating is applied
- 11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from SWD Urethane.
- 11.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10<sup>xxxiii</sup> are similar) in pertinent part states:

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



- 11.5 **Approved:**<sup>xxxiv</sup> Building regulations require that the building official shall accept Duly Authenticated Reports.<sup>xxxv</sup>
- 11.5.1 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited.
- 11.5.2 An approved source is “approved” when an RDP is properly licensed to transact engineering commerce.
- 11.5.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.
- 11.6 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB-Accredited Product Certification Body – Accreditation #1131.
- 11.7 Through the IAF Multilateral Agreements (MLA), this Duly Authenticated Report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 Duly Authenticated Reports are equivalent.<sup>xxxvi</sup>

## 12 Conditions of Use

- 12.1 Material properties shall not fall outside the boundaries defined in Section 6.
- 12.2 As defined in Section 6, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.
- 12.3 As listed herein, SWD Urethane Quik-Shield DRAGON insulation described in this report complies with, or is a suitable alternative to, what is specified in the codes listed in Section 4, subject to the following conditions:
- 12.3.1 The manufacturer installation instructions and this report shall be available on the jobsite for inspection.
- 12.3.2 The SPF insulation shall be installed in accordance with the manufacturer published installation instructions, this report and the applicable code. If there is a conflict between the installation instructions and this report, the more restrictive governs.
- 12.3.3 The SPF insulation shall be separated from the interior of the building by an approved 15-minute thermal barrier, except as noted in this report.
- 12.3.4 When installed in unvented attics without a code-prescribed ignition barrier or thermal barrier, the installation shall meet the conditions outlined in Section 6.5.3.
- 12.3.5 The use of vertical access openings into the unvented attic space is prohibited unless a project specific engineering analysis is conducted to permit their use.
- 12.3.6 The SPF insulation shall meet the minimum thicknesses and densities noted in this report.
- 12.3.7 The SPF insulation shall be protected from the weather during and after application.
- 12.3.8 The SPF insulation shall be applied by SWD Urethane approved dealers and installers.
- 12.3.9 Use of the SPF insulation in areas where the probability of termite infestation is “very heavy” shall be in accordance with IBC Section 2603.8 and IRC Section R318.4, as applicable.
- 12.3.10 Jobsite certification and labeling of the SPF insulation shall comply with IRC Section N1101.10.1, IRC Section N1101.10.1.1, IECC Section C303.1.1 and IECC Section C303.1.1.1.
- 12.3.11 A vapor retarder shall be installed in accordance with the applicable code.
- 12.3.12 The components used to produce SWD Urethane Quik-Shield DRAGON are manufactured in Mesa, AZ, under a quality control program with inspections in accordance with IBC Section 2603.2 and IRC Section R316.2.



- 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 This innovative product has an internal quality control program and a third-party quality assurance program.
  - 12.4.4 At a minimum, this innovative product 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 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4, and IRC Section R109.2.
  - 12.4.7 The application of this innovative product in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.
- 12.5 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 product listed in Section 1.1 is identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.
- 13.2 Additional technical information can be found at www.swdurethane.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 SWD Urethane Quik-Shield DRAGON is 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 this innovative product to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
  - 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies, and/or methods of construction. The goal is to “*protect economic freedom and opportunity by promoting free and fair competition in the marketplace.*”
  - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies, and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
  - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA),<sup>xxxvii</sup> where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years<sup>xxxviii</sup> and/or a \$5,000,000 fine or 3 times the value of<sup>xxxix</sup> the Intellectual Property (IP) and Trade Secrets (TS).
    - 1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, duly authenticated reports, and/or research reports prepared by approved agencies and/or approved sources.
  - 1.2.4 For new materials<sup>xi</sup> that are not specifically provided for in any regulation, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.
  - 1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.<sup>xii</sup>
  - 1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.
  - 1.2.7 The AHJ shall accept Duly Authenticated Reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.<sup>xiii</sup>



- 1.3 **Approved<sup>xliii</sup> by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards that apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.<sup>xliv</sup> The Superintendent of Building Approved Testing Agency Roster is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a DrJ Listing are LAMC approved. In addition, the Superintendent of Building shall accept Duly Authenticated Reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.<sup>xlv</sup>
- 1.4 **Approved by Chicago:** The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly, and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).
- 1.5 **Approved by New York City:** The 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed<sup>xlvi</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>xlvii</sup> (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](#),<sup>xlviii</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>xlix</sup> Furthermore N.J.A.C 5:23-3.7 states: “*Municipal approvals of alternative materials, equipment, or methods of construction.*”
  - 1.8.1 **Approvals:** Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability, and safety of those conforming with the requirements of the regulations.
    - 1.8.1.1 A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of the above.
    - 1.8.1.2 Reports of engineering findings issued by nationally recognized evaluation service programs such as but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of the above.
  - 1.8.2 The [New Jersey Department of Community Affairs](#) has confirmed that technical evaluation reports, from any accredited entity listed by [ANAB](#), meets the requirements of item the previous paragraph, given that the listed entities are no longer in existence and/or do not provide “*reports of engineering findings.*”
- 1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, [Part 3282.14](#)<sup>l</sup> and [Part 3280](#),<sup>li</sup> the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:
  - 1.9.1 “*All construction methods shall be in conformance with accepted engineering practices.*”
  - 1.9.2 “*The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.*”
  - 1.9.3 “*The design stresses of all materials shall conform to accepted engineering practice.*”



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



# Notes

- i For more information, visit [drjcertification.org](http://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](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](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.cbiteest.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%20design%20or%20method%20of%20construction%20is%20not%20approved%20the%20building%20official%20shall%20respond%20in%20writing%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%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%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.eu/en/about-iaf>:-: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%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 2018 IECC Section C402.5.1.2.1
- xxii 2015 IBC Section 1203.3
- xxiii 2015 IBC Section 803.1.2.1
- xxiv <https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4>
- xxv <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%20livable%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades
- xxvi <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
- xxvii 2018 IECC Section C402.5.1.2.1
- xxviii 2015 IBC Section 803.1.2.1
- xxix Qualification is performed by a legislatively defined Accreditation Body. ANS 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.





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

xxxi 2018 IECC Section C402.5.1.2.1

xxxii 2015 IBC Section 803.1.2.1

xxxiii 2018 IFC Section 104.9

xxxiv 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.

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

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

xxxvii <http://www.drjengineering.org/AppendixC> AND <https://www.dricertification.org/cornell-2016-protection-trade-secrets>

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

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

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

xli IBC 2021, Section 1706.1 Conformance to Standards

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

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

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

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

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

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

xlviii <https://up.codes/viewer/new-jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1>

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

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

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

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

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

lv <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/>

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

lvii <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>

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

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