DrJ Research Report

Report No: DRR 1202-04

Issue Date: May 7, 2012

Revision Date: January 19, 2026

Foam Plastic Insulating Sheathing Products in Exterior Walls of Type I, II, III, or IV Construction

Trade Secret Report Holder:

Foam Sheathing Committee (FSC) Members

americanchemistry.com/industry-groups/foam-sheathing-committee-fsc

continuousinsulation.org

CSI Designations:

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION Section: 07 21 00 - Thermal Insulation

1 Innovative Products Evaluated[1]

1.1 Foam Plastic Insulating Sheathing (FPIS) products from the following manufacturers are recognized in this report. Products are listed in **Table 1.**

1.1.1 Atlas Roofing Corporation

1.1.2 BASF Corporation

1.1.3 DuPont de Nemours, Inc.

1.1.4 Hunter Panels

1.1.5 Kingspan Insulation, LLC

1.1.6 Owens Corning

1.1.7 Progressive Foam Technologies Inc.

1.1.8 Rmax, a Business Unit of Sika Corporation

2 Evaluation Scope

2.1 This research report provides a central location for the identification of products that have been approved for use in buildings of Types I, II, III, and IV construction.

2.1.1 The products listed in this report are those that have been listed in code evaluation reports as approved for use in buildings of Types I, II, III, and IV construction. These reports are shown in **Table 1**.

2.2 This research report supplements existing product certifications and is intended only to provide information on the products approved for the manufacturers listed in **Section 1.1**. For the purposes of this report, DrJ is not certifying the products, but rather is providing the user with direction on where they can obtain specific information for the products shown. For details on the products found in **Table 1**, see the manufacturer code evaluation reports or listings.

2.3 Any code compliance issues not specifically addressed in this section are outside the scope of this DRR.

2.4 Any engineering evaluation conducted for this DRR was performed within DrJ's professional scope of work on the dates provided herein.

3 Definitions

3.1 New Materials[2] are defined as building materials, equipment, appliances, systems, or methods of construction not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[3] The design strengths and permissible stresses shall be established by tests[4] and/or engineering analysis.[5]

3.2 Duly Authenticated Reports[6] and Research Reports[7] are test reports and related engineering evaluations, which are written by an approved agency[8] and/or an approved source.[9]

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

3.3 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is 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.[11]

3.5 The regulatory authority shall enforce[12] 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[13] stating the nonconformance and the path to its cure.

3.6 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.[14]

3.7 Approval equity is a fundamental commercial and legal principle.[15]

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation[16]

4.1 *Standards*

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

4.1.2 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

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

4.1.4 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

4.1.5 *NFPA 259: Standard Test Method for Potential Heat of Building Materials*

4.1.6 *NFPA 268: Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source*

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

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

4.1.9 *UL 723: Test for Surface Burning Characteristics of Building Materials*

4.2 *Regulations*

4.2.1 *IBC – 18, 21, 24: International Building Code®*

4.2.2 *IRC – 18, 21, 24: International Residential Code®*

5 Regulatory Compliance Assessment for Use in Type I – IV Construction

5.1 This research report covers the use of FPIS when used as exterior wall sheathing or in exterior walls in Type I, II, III, and IV construction as defined by the IBC and detailed in IBC Section 2603.5.

5.2 The requirements for use in Type I, II, III, or IV construction are given in the first sentence (emphasis added).

> **2603.5 Exterior walls of buildings of any height.** Exterior walls of buildings of Type I, II, III or IV construction of any height shall comply with Sections 2603.5.1 through 2603.5.7. Exterior walls of cold storage buildings required to be constructed of noncombustible materials, where the building is more than one story in height, shall comply with the provisions of Sections 2603.5.1 through 2603.5.7. Exterior walls of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4. Fireblocking shall be in accordance with Section 718.2.

5.3 **Table 1** shows the FPIS products from the listed manufacturers in **Section 1.1** that meet the listed requirements in IBC Section 2603.5.1 through Section 2603.5.7 for use in Type I, II, III, or IV construction.

5.4 The use of FPIS as a water-resistive barrier (WRB) or air barrier as defined by the IBC is outside the scope of this research report.

5.5 It is the responsibility of the user to apply the requirements of the specific edition used in the jurisdiction where the structure is to be built.

5.6 It is also the responsibility of the user to verify the certifications listed in code evaluation reports.

5.7 The referenced code sections require specific labeling and physical properties.

5.8 The specific requirements of these sections are found in **Section 6.2** and **Table 2**.

5.8.1 Consult the manufacturer installation instructions and associated evaluation report for details specific to the intended application.

Table 1. Product Code Compliance

Manufacturer	Product	Evaluation Report	2603.5.1 ASTM E119[1]	2603.5.2 Thermal Barrier Req.	2603.5.3 NFPA 259	2603.5.4 FSI / SDI[2]	2603.5.5 NFPA 285	2603.5.6 Label	2603.5.7 NFPA 268[3]
Atlas Roofing Corporation	Atlas Geofoam	ESR-1962	N	N	Y	Y	Y	Y	N
	Duratherm		N	N	Y	Y	Y	Y	N
	ThermalStar GPS T&G II		Y	Y	Y	Y	Y	Y	N
	ThermalStar Intergrade Board EPS		Y	N	Y	Y	Y	Y	N
	ThermalStar EIFS		Y	N	Y	Y	Y	Y	N
	TalonGuard Treated EPS		Y	N	Y	Y	Y	Y	N
	Atlas OEM (Molded Polystyrene)	ESR-1962 ULEX.R16529	N	N	Y	Y	Y	Y	N
	ThermalStar		Y	N	Y	Y	Y	Y	N
	ThermalStar Insulation Board		Y	N	Y	Y	Y	Y	N
	ThermalStar LCi		Y	N	Y	Y	Y	Y	N
	ThermalStar T&G		Y	N	Y	Y	Y	Y	N
	Elevation Geofoam	ULEX.R16529	N	Y	Y	Y	Y	Y	N
	ThermalStar GPS		Y	Y	Y	Y	Y	Y	N
	ThermalStar LCi GPS		Y	Y	Y	Y	Y	Y	N
	ThermalStar LWi GPS		Y	Y	Y	Y	Y	Y	N
	ThermalStar SWi GPS		Y	Y	Y	Y	Y	Y	N
	ThermalStar SWi	ESR-1962 TER 1905-02	Y	N	Y	Y	Y	Y	N
	ThermalStar LWi	ULEX.R16529	Y	N	Y	Y	Y	Y	N
	EnergyShield® XR	ESR-1375 TER 1306-03	Y	N	Y	Y	Y	Y	N
	EnergyShield® Pro		Y	N	Y	Y	Y	Y	N
	EnergyShield® CGF Pro		Y	N	Y	Y	Y	Y	N
	EnergyShield® Ply Pro	TER 1306-03	Y	Y	Y	Y	Y	Y	N
BASF Corporation	Neopor®	ESR-2784	N	Y	N	Y	N	Y	N
	Neopor® Thermaplus	ESR-4431	N	Y	N	Y	N	Y	N
	Neopor® GPS	ULEX.R5817	Y	N	N	Y	Y	Y	N

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DuPont de Nemours, Inc.	Thermax™ Sheathing	CCRR-0435	Y	N	Y	Y	Y	Y	N
	Thermax™ White Finish		Y	N	Y	Y	Y	Y	N
	Thermax™ Heavy Duty		Y	N	Y	Y	Y	Y	N
	Thermax™ Light Duty		Y	N	Y	Y	Y	Y	N
	Thermax™ Metal Building		Y	N	Y	Y	Y	Y	N
	Thermax™ XARMOR (ci) Exterior		Y	N	Y	Y	Y	Y	N
	Thermax™ ci Exterior Insulation		Y	N	Y	Y	Y	Y	N
	Thermax™ Metal Building Board NH Insulation	CCRR-0440	N	N	Y	Y	Y	Y	N
	Thermax™ White Finish NH Insulation		N	N	Y	Y	Y	Y	N
	Thermax™ Heavy Duty NH Insulation		N	N	Y	Y	Y	Y	N
	Thermax™ Light Duty NH Insulation		N	N	Y	Y	Y	Y	N
	Thermax™ Basic NH Insulation		N	N	Y	Y	Y	Y	N
	Styrofoam™ Brand Insulation	ESR-4755	Y	N	Y	Y	Y	Y	N
Hunter Panels	Xci Foil (Class A)	TER 1402-01	Y	N	Y	Y	Y	Y	N
	Xci Foil (Class A) PLUS		Y	N	Y	Y	Y	Y	N
	Xci CG (Class A)		Y	Y	Y	Y	Y	Y	N
	Xci 286		Y	N	Y	Y	Y	Y	N
	Xci Ply (Class A)		Y	Y	Y	Y	Y	Y	N
	Xci Foil	TER 1402-02	Y	Y	Y	N	Y	Y	N
	Xci CG								
	Xci Ply		Y	Y	Y	N	Y	Y	N

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Kingspan	GreenGuard® CM	TER 1407-05	Y	Y[7]	Y	Y	Y	Y	N
	GreenGuard® LG CM								
	GreenGuard® SL								
	GreenGuard® LG SL								
	GreenGuard® SB								
	GreenGuard® LG SB								
Owens Corning	FOAMULAR®	ULEX.R8811	Y	N	Y	Y	Y	Y	N
	FOAMULAR® NGX™								
Progressive Foam Technologies	Chrome® GPS	ULEX.R18532	Y	Y	Y	Y	Y	Y	Y
	Contoured Expanded Polystyrene Insulation		N	Y	N	Y	N	Y	N
	Contoured Graphite Polystyrene Insulation		N	Y	N	Y	Y	Y	Y
	Proboard®		N	Y	Y	Y	Y	Y	Y
	Proboard® Core		N	N	N	Y	Y	Y	N
	Proboard® Insulating Sheathing		N	Y	N	Y	N	Y	N
	Proboard® FR		N	N	Y	Y	Y	Y	Y
	Proboard® Original		N	Y	N	Y	N	Y	N
	Proboard® Premium		N	Y	N	Y	Y	Y	N
	Proboard® Ultra™		N	Y	N	Y	Y	Y	N
	Proboard® Versa™		N	Y	Y	Y	Y	Y	Y
	Proboard® Versa™ VP		N	Y	N	Y	Y	Y	N
	ProFold®		N	Y	N	Y	N	Y	Y
	ProFold® (GPS)		N	Y	N	Y	Y	Y	Y
	ProFold® Original		N	Y	N	Y	N	Y	N
	ProFold® Premium		N	Y	N	Y	Y	Y	N
	Progressive Foam® Rigid Foam Plastic Insulating Sheathing		N	Y	N	Y	N	Y	N
	Halo®		N	Y	N	Y	Y	Y	N
	Halo® Exterra®		N	Y	Y	Y	Y	Y	Y
	Halo® Interra® Plus		N	Y	N	Y	Y	Y	N
	Halo® Subterra®		N	Y	N	Y	Y	Y	N

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Rmax, a Business Unit of Sika Corporation	ECOMAXci® FR Air Barrier	TER 1212-03	Y	Y	Y	Y	Y	Y	N
	EVOMAXci™		Y	Y	Y	Y	Y	Y	N
	Durasheath®	TER 2202-02	Y	Y	Y	Y	Y	Y	N
	Thermasheath®	TER 1309-03	Y	N	Y	N	Y	Y	N
	ECOMAXci® FR		Y	N	Y	Y	Y	Y	N
	ECOMAXci® FR White		Y	N	Y	Y	Y	Y	N
	TSX-8500		Y	N	N	Y	Y	Y	N
	TSX-8510		Y	N	N	Y	Y	Y	N
	ECOMAXci® Ply	TER 1504-04	Y	Y	Y	Y	Y	Y	N
	ECOMAXci® FR Ply	TER 1811-02	Y	Y	Y	Y	Y	Y	N
	ThermaBase-CI™	TER 1504-05	Y	Y	N	N	N	Y	N
	Thermasheath®-SI	TER 1207-01	Y	N	N	N	N	Y	N

1. For products indicating that ASTM E119 approval has been granted, contact manufacturer for assembly details. To contact a manufacturer, see company websites.
2. Flame Spread Index / Smoke Developed Index
3. These products comply with IBC Section 2603.5.7 when installed in assemblies protected on the outside with one of the listed materials.

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

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

6 Regulatory Evaluation and Accepted Engineering Practice

6.1 Foam Plastic Insulating Sheathing (FPIS) products comply with requirements for use as exterior wall sheathing or in exterior walls in Type I, II, III, and IV construction as detailed in IBC Section 2603.5.

6.2 **Table 2** summarizes the code requirements for foam plastic insulation used in or on exterior walls in Type I, II, III, or IV construction.

Table 2. Code Requirements

Code Section	Section Title	Summary of Requirements
2603.5.1	Fire-Resistance-Rated Walls	Where the wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.
2603.5.2	Thermal Barrier	Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4, unless special approval is obtained on the basis of Section 2603.9. **Exception:** One-story buildings complying with Section 2603.4.1.4.

Table 2. Code Requirements

Code Section	Section Title	Summary of Requirements
2603.5.3	Potential Heat	The potential heat of foam plastic insulation in any portion of the wall or panel shall not exceed the potential heat expressed in Btu per square feet (mJ/m^2) of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.5. The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (mJ/m^2). **Exception:** One-story buildings complying with Section 2603.4.1.4.
2603.5.4	Flame Spread and Smoke-Developed Indices	Foam plastic insulation, exterior coatings, and facings shall be tested separately in the thickness intended for use, but not to exceed 4" (102 mm), and shall each have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723. **Exception:** Prefabricated or factory-manufactured panels having minimum 0.020" (0.51 mm) aluminum facings and a total thickness of 1/4" (6.4 mm) or less are permitted to be tested as an assembly where the foam plastic core is not exposed in the course of construction.
2603.5.5	Vertical and Lateral Fire Propagation	The exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. **Exceptions:** 1. One-story buildings complying with Section 2603.4.1.4. 2. Wall assemblies where the foam plastic insulation is covered on each face by not less than 1" (25 mm) thickness of masonry or concrete and meeting one of the following: 2.1. There is no airspace between the insulation and the concrete or masonry. 2.2. The insulation has a flame spread index of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete or masonry is not more than 1" (25 mm).
2603.5.6	Label Required	The edge or face of each piece, package, or container of foam plastic insulation shall bear the label of an approved agency. The label shall contain the manufacturer's or distributor's identification, model number, serial number, or definitive information describing the product or materials' performance characteristics and approved agency's identification.
2603.5.7	Ignition	Exterior walls shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed. **Exception:** Assemblies protected on the outside with one of the following: 1. A thermal barrier complying with Section 2603.4. 2. A minimum 1" (25 mm) thickness of concrete or masonry. 3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8" (9.5 mm). 4. Metal-faced panels having minimum 0.019"-thick (0.48 mm) aluminum or 0.016"-thick (0.41 mm) corrosion-resistant steel outer facings. 5. A minimum 7/8" (22.2 mm) thickness of stucco complying with Section 2510. 6. A minimum 1/4" (6.4 mm) thickness of fiber-cement lap, panel or shingle siding complying with Section 1404.17 and Section 1404.17.1 or 1404.17.2.

Table 2. Code Requirements

Code Section	Section Title	Summary of Requirements
2603.9	Special Approval	Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on one of the following large-scale tests: 1. NFPA 286 2. FM 4880 3. UL 1040 4. UL 1715 Such testing shall be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of these tests shall also conform to the flame spread and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints, and other typical details used in the installation of the assembly and shall be tested in the manner intended for use. Foam plastic insulation is not required to comply with the prescriptive thermal barrier requirements of Section 2603.4 when it is specifically approved based on large-scale tests such as NFPA 286. Such testing must be performed on the finished foam plastic assembly in the maximum thickness intended for use and be related to the actual end-use configuration.

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

7 Installation

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

7.2 In the event of a conflict between the manufacturer installation instructions and the manufacturer code compliance report, the more restrictive shall govern.

7.3 For applications outside the scope of this research report or the referenced research reports, an alternate means of code compliance is required.

8 Substantiating Data

8.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as indicated in the manufacturer research reports listed in **Table 1**.

8.2 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.

8.3 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[17] to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

8.4 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 Duly Authenticated Reports, may be dependent upon published design properties by others.

8.5 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.[18]

8.6 Where additional condition of use and/or regulatory compliance information is required, please search for Foam Plastic Insulating Sheathing (FPIS) products on the DrJ Certification website.

9 Findings

9.1 As outlined in **Section 6**, Foam Plastic Insulating Sheathing (FPIS) products have performance characteristics that were tested and/or meet applicable regulations and are suitable for use pursuant to its specified purpose.

9.2 When used and installed in accordance with the code compliance reports listed in **Table 1** and the manufacturer installation instructions, Foam Plastic Insulating Sheathing (FPIS) products listed herein are approved for use and are compliant with the requirements of IBC Section 2603.5.

9.3 Any application specific issues not addressed herein can be engineered by an RDP.

9.4 IBC Section 104.2.3[19] (IRC Section R104.2.2[20] and IFC Section 104.2.3[21] are similar) in pertinent part states:

> **104.2.3 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, provided that any such alternative has been approved.

9.5 **Approved**:[22] Building regulations require that the building official shall accept Duly Authenticated Reports.[23]

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

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

9.5.3 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.

10 Conditions of Use

10.1 At a minimum, this product shall be installed per **Section 7** of this DRR.

10.2 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:

10.2.1 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.

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

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

10.2.4 These Foam Plastic Insulating Sheathing (FPIS) products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 110.4, IBC Section 104.7.2,[24] IBC Section 1703, IRC Section R109,[25] and IRC Section R109.2.

10.2.5 The application of these Foam Plastic Insulating Sheathing (FPIS) 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.

10.3 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 104.2.3,"[26] all of IBC Section 104 and IBC Section 105.4. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[27] stating the nonconformance.

10.4 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.

11 Identification

11.1 The Foam Plastic Insulating Sheathing (FPIS) products from the manufacturers listed in **Section 1.1** are identified by a label on the board or packaging material bearing the manufacturer name, product name, label of the third-party inspection agency, and other information to confirm code compliance.

11.2 Additional technical information can be found at the respective FSC member websites provided at americanchemistry.com/industry-groups/foam-sheathing-committee-fsc.

12 Review Schedule

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

12.2 For information on the status of this report, please contact DrJ Engineering.

Notes

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

[2] 2021 IBC Section 1702

[3] Alternative Materials, Design, and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission AND 2021 IBC Section 104.11.

[4] 2021 IBC Section 1706

[5] The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice: 2021 IBC Section 1706.1.

[6] 2021 IBC Section 1707.1

[7] 2021 IBC Section 1703.4.2

[8] 2021 IBC Definitions: Approved Agency

[9] 2021 IBC Definitions: Approved Source

[10] All ideas, engineering analysis, and test data are proprietary intellectual property (IP) and trade secrets (TS) and should not be provided to anyone. In particular, public regulatory officials are subject to freedom of information act requests – federal and state public records acts. This means that IP and TS will be in the public domain when any information is provided. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA), where providing test reports, engineering analysis, and/or other related IP/TS is subject to prison of not more than 10 years and/or a $5,000,000 fine or 3 times the value of the IP and TS. To follow DTSA and to comply with state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please visit http://www.drjengineering.org/AppendixC and https://www.drjcertification.org/cornell-2016-protection-trade-secrets.

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

[12] 2021 IBC Section 104

[13] 2021 IBC Section 104.11 AND 2021 IBC Section 105.3.1

[14] 2021 IBC Section 1707.1

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

[16] Unless otherwise noted, all references in this Listing are from the 2024 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.

[17] 2021 IBC Section 104.11

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

[19] 2021 IBC Section 104.11

[20] 2021 IRC Section R104.11

[21] 2021 IFC Section 104.10, 2018 IFC Section 104.9

[22] 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.

[23] 2021 IBC Section 1707.1

[24] 2021 IBC Section 110.4

[25] 2021 IRC Section R104.4

[26] 2021 IBC Section 104.11

[27] 2021 IBC Section 104.11 AND 2021 IBC Section 105.3.1