DrJ Research Report

Report No: DRR 1202-01

Issue Date: May 7, 2012

Revision Date: November 26, 2024

NFPA 285 Tested Assemblies Using Foam Plastic Insulating Sheathing Products

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

Section: 07 24 00 - Exterior Insulation and Finish Systems

Section: 07 25 00 - Water-Resistive Barriers/Weather Barriers

Section: 07 27 00 - Air Barriers

1 Innovative Products Evaluated[i]

1.1 Foam plastic insulating sheathing (FPIS) products from the following manufacturers, when used as insulating material in exterior wall assemblies, are recognized in this report.

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 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 NFPA 285 compliant assemblies.

2.2 The products listed in this report are those that have been listed in code evaluation reports as approved for use in NFPA 285 compliant assemblies. These reports are shown in **Table 1**.

2.3 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.

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

2.5 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[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 The regulatory authority shall enforce[xii] 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[xiii] 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.[xiv]

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

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

4.1 *Standards*

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

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 NFPA 285 Compliant Assemblies

5.1 Pursuant to IBC Section 2603.5, exterior walls of buildings of Type I, II, III, or IV construction of any height shall comply with Section 2603.5.1 through Section 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 Section 2603.5.1 through Section 2603.5.7. Exterior walls of buildings of Type V construction shall comply with Section 2603.2, Section 2603.3, and Section 2603.4. Fireblocking shall be in accordance with Section 718.2.

5.2 As specified in IBC Section 2603.5.5, exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. However,

5.2.1 One-story buildings are an exception and must comply with IBC Section 2603.4.1.4.

5.2.2 Wall assemblies where the foam plastic insulation is covered on each face by not less than 1-inch thickness of masonry or concrete are an exception when meeting one of the following:

5.2.2.1 There is no airspace between the insulation and the concrete or masonry.

5.2.2.2 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 inch.

5.3 The companies listed in **Table 1** have evaluation reports for the products listed.

5.4 The products in **Table 1** are approved for use in exterior walls of buildings of Type I, II, III, or IV construction of any height and can be used in assemblies requiring NFPA 285 tests as specified in the individual reports.

5.5 *NFPA 285 Testing Assemblies*

5.5.1 The following is a list of manufacturers who have assemblies that are compliant with the provisions of IBC Section 2603.5.5.

5.5.2 In all cases, consult the manufacturer for the specific tested or approved assembly types and installation requirements.

Table 1. FPIS Manufacturers and Products

Manufacturer	Report Number	Product(s)
Atlas Roofing Corporation	TER 1306-03	EnergyShield® Pro EnergyShield® CGF Pro EnergyShield® Ply Pro EnergyShield® XR
	ULEX.R16529-01	ThermalStar® ThermalStar® GPS ThermalStar® LWI ThermalStar® LWI GPS ThermalStar® SWI ThermalStar® SWI GPS ThermalStar® LCI ThermalStar® LCI GPS
BASF Corporation	ULEX.R5817-02	Neopor® GPS Insulation Boards
DuPont de Nemours, Inc.	ESR-2142	Styrofoam™ Brand Insulation Boards
	CCRR-0435	Thermax™ Sheathing Thermax™ Light Duty Thermax™ Heavy Duty Thermax™ Metal Building Thermax™ White Finish Thermax™ ci Exterior Insulation Thermax XARMOR™ ci Exterior Insulation
	CCRR-0440	Thermax™ Metal Building Board NH Insulation Thermax™ White Finish NH Insulation Thermax™ Light Duty NH Insulation (interior/exterior) Thermax™ Heavy Duty NH Insulation Thermax™ Basic NH Insulation
Hunter Panels	TER 1402-01	Xci Foil (Class A) Xci Foil (Class A) PLUS Xci 286 Xci CG (Class A) Xci Ply (Class A)

Table 1. FPIS Manufacturers and Products

Manufacturer	Report Number	Product(s)
Hunter Panels	TER 1402-02	Xci Foil Xci CG Xci Ply
Kingspan Insulation, LLC	TER 1407-05	GreenGuard® CM GreenGuard® LG CM GreenGuard® SL GreenGuard® LG SL GreenGuard® SB GreenGuard® LG SB
Owens Corning	ULEX.R8811	FOAMULAR® FOAMULAR® NGX™
Rmax, a Business Unit of Sika Corporation	TER 1212-03	EVOMAXci® ECOMAXci® FR Air Barrier
	TER 2202-02 (Durasheath) ROL/BI 30-06	Durasheath® Thermasheath®
	TER 1309-03	Thermasheath® TSX-8500 TSX-8510 ECOMAXci® FR ECOMAXci® FR White
	TER 1504-04	ECOMAXci® Ply
	TER 1811-02	ECOMAXci™ FR Ply

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

6 Installation

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

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

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

7 Substantiating Data

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

7.1.1 Fire performance criteria testing in accordance with NFPA 285.

7.1.2 Testing and compliance found in manufacturer research reports as listed in **Table 1**.

7.2 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.

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

7.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, 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.

7.5 Testing and engineering analysis: The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[xviii]

7.6 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.

8 Findings

8.1 As outlined in **Section 5**, 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.

8.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, Foam plastic insulating sheathing (FPIS) products shall be approved for the following applications:

8.2.1 Use in NFPA 285 compliant assemblies in accordance with the requirements of IBC Section 2603.5.

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

8.4 IBC Section 104.2.3[xix] (IRC Section R104.2.2[xx] and IFC Section 104.2.3[xxi] 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.

8.5 **Approved**:[xxii] Building regulations require that the building official shall accept Duly Authenticated Reports.[xxiii]

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

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

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

9 Conditions of Use

9.1 At a minimum, this product shall be installed per **Section 6** of this DRR.

9.2 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:

9.2.1 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.

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

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

9.2.4 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,[xxiv] IBC Section 1703, IRC Section R109,[xxv] and IRC Section R109.2.

9.2.5 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.

9.3 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,"[xxvi] 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[xxvii] stating the nonconformance.

9.4 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.

10 Identification

10.1 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.

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

11 Review Schedule

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

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

Notes

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

[ii] 2021 IBC Section 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 2021 IBC Section 104.11.

[iv] 2021 IBC Section 1706

[v] 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.

[vi] 2021 IBC Section 1707.1

[vii] 2021 IBC Section 1703.4.2

[viii] 2021 IBC Definitions: Approved Agency

[ix] 2021 IBC 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] 2021 IBC Section 104

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

[xiv] 2021 IBC Section 1707.1

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

[xvi] 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.

[xvii] 2021 IBC Section 104.11

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

[xix] 2021 IBC Section 104.11

[xx] 2021 IRC Section R104.11

[xxi] 2018 IFC Section 104.9

[xxii] 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.

[xxiii] 2021 IBC Section 1707.1

[xxiv] 2021 IBC Section 110.4

[xxv] 2021 IRC Section R104.4

[xxvi] 2021 IBC Section 104.11

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