Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 1601-07

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NFPA 286 Tested Wall Assemblies Using Kingspan® Kooltherm® Insulation Boards in Attics, Crawlspaces, Basements, and Other Interior Applications

Trade Secret Report Holder:

Kingspan® Insulation LLC

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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 27 00 - Air Barriers

1 Innovative Products Evaluated[1]

1.1 Kingspan Kooltherm Insulation Boards

1.1.1 K8 Cavity Board

1.1.2 K9 Internal Insulation Board

1.1.3 K10 Soffit Board

1.1.4 K12 Framing Board

1.1.5 K15 Rainscreen Board

1.1.6 K20 Concrete Sandwich Board

1.1.7 K110CB Cavity Board

1.1.8 K110 Soffit Board and Continuous Insulation Board

1.1.9 K110 Framing Board

1.1.10 K110 Rainscreen Board

1.1.11 K120 Concrete Sandwich Board

1.1.12 K120 Internal Insulation Board

1.1.13 K122 Double Foil Face Board

2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1** and are described in **Table 1**.

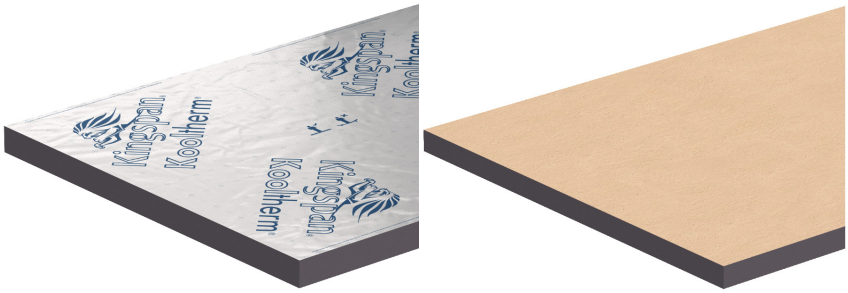

Figure 1. Kingspan Kooltherm Insulation Boards - Foil Facer (Left) and Glass Facer (Right)

2.2 Kingspan Kooltherm Insulation Boards consist of a fiber-free, thermoset phenolic core with facer materials bonded both sides, and are used for non-structural thermal insulation in all types of construction in accordance with the IBC and IRC.

Table 1. Kingspan Kooltherm Insulation Boards – Product Descriptions

Product	Facers	Standard Dimensions[1] (in)	Available Thicknesses[2](mm)	Application
K8 Cavity Board	Low emissivity composite foil facing on both sides	Width: 47 1/4 Length: 16	20 – 120	Partially filled cavity wall
K9 Internal Insulation Board	Glass-tissue based facer on both sides	Width:[1] 47 1/4 Length:[1] 89 3/8	20 – 120	Interior exposed application on habitable space
K10 Soffit Board	Glass-tissue based facer on inside face; low emissivity composite foil on exposed face	Width: 47 1/4 Length: 89 3/8	25 – 120	Structural ceilings or floors (not below grade)
K12 Framing Board	Low emissivity composite foil facing on both sides	Width: 47 1/4 Length: 96	20 – 120	Wood frame walls or steel framing systems
K15 Rainscreen Board	Low emissivity composite foil facing on both sides	Width: 47 1/4 Length: 96	20 – 120	Behind rainscreen or masonry faced systems
K20 Concrete Sandwich Board	Glass-tissue based facer on both sides	Width:[1] 47 1/4 Length:[1] 89 3/8	20 – 120	Precast/concrete insulated sandwich wall systems
K110 Soffit Board	Glass-tissue based facer on inside face; low emissivity composite foil on exposed face	Width: 47 1/4 Length: 94 1/2	40 – 100	Structural ceilings or floors (not below grade)
K110 Framing Board				Wood and steel framing systems
K110 Rainscreen Board				Rainscreen cladding systems
K110CB Cavity Board	Glass-tissue based facer on inside face; low emissivity composite foil on exposed face	Width: 47 1/4 Length: 16	40-100	Partially filled cavity wall

Table 1. Kingspan Kooltherm Insulation Boards – Product Descriptions

Product	Facers	Standard Dimensions[1] (in)	Available Thicknesses[2](mm)	Application
K120 Internal Insulation Board	Glass-tissue based facer on both sides	Width: 47 1/4 Length: 89 3/8	40 – 100	Habitable space, basement, crawl space, attic walls
K120 Concrete Sandwich Board				Precast/concrete insulated sandwich wall systems
K122 Double Foil Face Board	Low emissivity composite foil facing on both sides	Width: 47 1/4 Length: 96	40 – 100	Behind rainscreen or masonry faced systems

SI: 1 in = 25.4 mm

1. Custom widths and lengths may be available.
2. Other thicknesses may be available.

2.3 Kingspan Kooltherm Insulation Boards K8, K9, K10, K12, K15, and K20 have a nominal core design of 2.0 pcf (32 kg/m^3).

2.4 Kingspan Kooltherm Insulation Boards K110, K110CB, K120, and K122 have a nominal core design of 2.4 pcf (38 kg/m^3).

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

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, or RDP) 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 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 RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[12] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[13] 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[14] 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.[15]

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.[16] Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.[17]

3.9 Approval equity is a fundamental commercial and legal principle.[18]

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation[19]

4.1 *Regulations*

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

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

4.1.3 *IECC – 15, 18, 21; International Energy Conservation Code®*

4.2 *Standards*

4.2.1 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*

4.2.2 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*

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

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

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

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

4.2.7 *ASTM D6226: Standard Test Method for Open Cell Content of Rigid Cellular Plastics*

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

4.2.9 *ASTM E96: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials*

4.2.10 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

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

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

5 Listed[20]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), an approved agency (i.e., CBI and DrJ), and/or and approved source (i.e., DrJ), or other organization concerned with product evaluation (i.e., DrJ), that maintains periodic inspection (i.e., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *General*

6.1.1 Kingspan Kooltherm Insulation Boards are rigid thermoset closed cell phenolic thermal insulation complying with IBC Section 2603 and IRC Section R316.

6.1.2 Kingspan Kooltherm Insulation Boards are used in buildings of Type I-IV construction in accordance with IBC Section 2603.5.

6.1.3 Kingspan Kooltherm Insulation Boards are permitted to be used in in one or two-family residential structures in accordance with the IRC.

6.2 *Water Vapor Permeance*

6.2.1 Kingspan Kooltherm Insulation Boards are classified as Class II and Class III vapor retarders in accordance with IBC Section 1404.3 and IRC Section R702.7.

6.2.2 Water vapor permeance values are listed in **Table 2**.

Table 2. Water Vapor Permeance[1,2]

Product	Water Vapor Permeance (perm)	Classification
Foil Facers (K8, K12, K15, and K108RF)	0.51	Class II
Foil-Glass Facers (K10)	0.48	Class II
Glass Facers (K5, K9, K20)	0.79	Class II
Foil-Glass Facers (K110, K110CB)	2.96	Class III
Glass Facers (K120)	0.80	Class II
Foil Facers (K122)	0.45	Class II

SI: 1 perm = 57.2 ng/(Pa·s·m^2)

1. Tested in accordance with ASTM E96 A, Desiccant Method
2. Results for 25 mm (1") thick board

6.3 *Air Barrier*

6.3.1 Kingspan Kooltherm Insulation Boards are an air-impermeable insulation and an air barrier material meeting the requirements of IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.5.1.3[21] for use as part of an air barrier assembly when installed in accordance with the manufacturer installation instructions and this report.

6.3.1.1 All seams, including the top and bottom edges, shall be taped.

6.3.2 Kingspan Kooltherm Insulation Boards K8, K9, K10, K12, K15, and K20 were evaluated in accordance with ASTM E2178 at a thickness of 1" (25.4 mm).

6.3.3 Kingspan Kooltherm Insulation Boards K110, K110CB, K120, and K122 were evaluated in accordance with ASTM E2178 at a thickness of 1" (25.4 mm).

6.4 *Thermal Barrier*

6.4.1 Kingspan Kooltherm Insulation Boards shall be fully protected from the interior of the building by an approved thermal barrier or ignition barrier as required by IBC Section 2603.4 and IRC Section R316.4, except as follows:

6.4.1.1 *Use Without an Ignition Barrier*:

6.4.1.1.1 The following Kingspan Kooltherm Insulation Boards have been approved for use without an ignition barrier on walls and/or ceilings in attics and crawl spaces based on NFPA 286 testing in accordance with IBC Section 2603.9 and IRC Section R316.6. This includes, but is not limited to, knee and gable end walls.

6.4.1.1.1.1 Kingspan Kooltherm K10 Insulation Boards up to 75 mm (3") were evaluated to walls and ceiling applications.

6.4.1.1.1.2 Kingspan Kooltherm K8, K9, K12, and K15 Insulation Boards up to 75 mm (3") are limited to wall or ceiling applications only.

6.4.1.1.1.3 Kingspan Kooltherm K110, K110CB, K120, and K122 Insulation Boards up to 75 mm (3") thick are limited to wall or ceiling applications only.

6.4.1.1.2 Use without an approved ignition barrier is limited to areas where:

6.4.1.1.2.1 Access to the space is required by IRC Section R807.1 or IRC Section R408.4.

6.4.1.1.2.2 Entry is made only for the purposes of repairs or maintenance.

6.4.1.1.2.3 Combustion air is provided in accordance with IMC Section 701.

6.4.1.1.2.4 For vented attics, ventilation is provided when required by IBC Section 1202.2 or IRC Section R806.

6.4.1.1.2.5 For unvented attics, ventilation is not required where permitted in accordance with IRC Section R806.5.

6.4.1.1.2.6 For vented crawlspaces, ventilation is provided when required by IBC Section 1202.4 or IRC Section R408.1.

6.4.1.1.2.7 For unvented crawlspaces, ventilation is not required where permitted in accordance with IRC Section R408.3.

6.4.1.2 *Use Without a Thermal Barrier:*

6.4.1.2.1 Kingspan Kooltherm K10 Insulation Boards, up to 75 mm thick (3") with exterior foil facer left exposed, have been tested to NFPA 286 for use on walls and ceilings in accordance with IBC Section 2603.9 and IRC Section R316.6, and is approved for use without a thermal barrier.

6.4.1.2.2 Kingspan Kooltherm K8, K9, K12, and K15 Insulation Boards are limited to wall or ceiling applications only in accordance with IBC Section 2603.9 and IRC Section R316.6, and is approved for use without a thermal barrier.

6.4.1.2.3 Kingspan Kooltherm K110, K110CB, K120, and K122 Insulation Boards are limited to wall or ceiling applications only in accordance with IBC Section 2603.9 and IRC Section R316.6, and is approved for use without a thermal barrier.

6.5 *Surface Burning Characteristics*

6.5.1 Kingspan Kooltherm Insulation Boards were evaluated for surface burning characteristics in accordance with ASTM E84 per IBC Section 2603.03, IBC Section 2603.5.4, and IRC Section R316.3.

6.5.2 Flame spread index and smoke developed index are shown in **Table 3**.

Table 3. Surface Burning Characteristics[1,2]

Product	Flame Spread Index	Smoke Developed Index	Classification
Kingspan Kooltherm Products, as listed in **Table 1**	< 25	< 450	Class A

1. Tested in accordance with UL 723 /ASTM E84.
2. Flame spread and smoke-developed indexes are shown for comparison purposes only and are not intended to represent the performance under actual fire conditions.

6.6 *Ignition*

6.6.1 Kingspan Kooltherm Insulation Boards were evaluated to assess performance with regard to ignition in accordance with IBC Section 2603.5.7 (refer to Report Number 1601-06).

6.6.1.1 Kingspan Kooltherm Insulation Boards comply with this section when the exterior side of the sheathing is protected with one of the following materials:

6.6.1.1.1 Thermal barrier complying with IBC Section 2603.4 and IRC Section R316.4.

6.6.1.1.2 Minimum 25 mm (1") thickness of concrete or masonry.

6.6.1.1.3 Glass-fiber-reinforced concrete panels of a minimum thickness of 9.5 mm ($^3/_8$").

6.6.1.1.4 Metal-faced panels having a minimum 0.48 mm (0.019") thick aluminum or 0.41 mm (0.016") thick corrosion-resistant steel outer facings.

6.6.1.1.5 Minimum 22 mm ($^7/_8$") thickness of stucco complying with IBC Section 2510.

6.6.1.1.6 Minimum 6.4 mm ($^1/_4$") thickness of fiber-cement lap, panel or shingle siding complying with IBC Section 1404.16 and IBC Section 1404.16.1 (IRC Section R703.10.1) or IBC Section 1404.16.2 (IRC Section R703.10.2).

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[22]

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.[23]

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.[24]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Kingspan Kooltherm Insulation Boards comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Material properties in accordance with ASTM C209.

8.1.2 Thermal resistance properties in accordance with IECC Section R402 and IECC Section C402.

8.1.3 Use as a vapor retarder in accordance with IBC Section 1404.3 and IRC Section R702.7.

8.1.4 Use as an air barrier material in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.5.1.3.[25]

8.1.5 Use without a thermal barrier or an ignition barrier in accordance with IBC Section 2603.9, per IBC Section 2603.4 and IBC Section 2603.5.2, and in accordance with IRC Section R316.6, per IRC Section R316.4 and IRC Section R316.5.

8.1.6 Performance in accordance with ASTM E84/UL 723 for flame spread and smoke development ratings in accordance with IBC Section 2603.3, IBC Section 2603.5.4, IRC Section R302.10.1, and IRC Section R316.3.

8.1.7 Performance with regard to ignition in accordance with IBC Section 2603.5.7.

8.2 Wind pressure resistance is outside the scope of this report.

8.3 Performance for use in buildings of Type I-IV construction of any height is outside the scope of this report.

8.3.1 Refer to Report Number 1601-06 for approved NFPA 285 assemblies.

8.4 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[26] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.

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

8.6 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 For applications outside the scope of this report, an engineered design is required.

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 Water absorption in accordance with ASTM C209

10.1.2 Compressive strength properties in accordance with ASTM D1621

10.1.3 Apparent core density properties in accordance with ASTM D1622

10.1.4 Tensile strength in accordance with ASTM D1622

10.1.5 Flame spread and smoke developed ratings in accordance with ASTM E84/UL 723

10.1.6 Water vapor transmission and permeance properties in accordance with ASTM E96

10.1.7 Air barrier material performance of Kingspan Kooltherm Insulation Boards in accordance with ASTM E2178

10.1.8 NFPA 286 room corner testing

10.1.8.1 Exclusion of thermal and ignition barriers in attics and crawlspaces in accordance with NFPA 286

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

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

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

10.5 Testing and engineering analysis: The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[27]

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

11 Findings

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

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, Kingspan Kooltherm Insulation Boards shall be approved for the following applications:

11.2.1 Kingspan Kooltherm Insulation Boards are approved for use as Class II or Class III vapor retarder in accordance with IBC Section 1404.3 and IRC Section R702.7.

11.2.2 Kingspan Kooltherm Insulation Boards are approved for use as an air impermeable insulation (air barrier material) in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.5.1.3[28]

11.2.3 Kingspan Kooltherm Insulation Boards are approved for use in exterior walls without a thermal barrier in accordance with IBC Section 2603.9, per IBC Section 2603.4, and IBC Section 2603.5.2 and IRC Section R316.6, per IRC Section R316.4 and IRC Section R316.5.

11.2.3.1 For use in attics, crawlspaces, walls, and ceilings without a thermal or ignition barrier when constructed in accordance with **Section 6.4**.

11.2.4 To comply with, or as a suitable alternative to, the applicable sections of the codes listed in **Section 4**.

11.2.5 Kingspan Kooltherm Insulation Boards achieved ASTM E84 Class A.

11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Kingspan Insulation, LLC.

11.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[29] 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**:[30] Building regulations require that the building official shall accept duly authenticated reports.[31]

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.[32]

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 When the insulation boards are used on exterior walls of buildings of Type I, II, III, or IV construction, they must be as described in **Section 6.6**.

12.4 In areas where the probability of termite infestation is very heavy and the building is wood-framed construction, the product must not be placed on exterior walls located within 152 mm (6") of the ground and shall meet the requirements of IBC Section 2603.8.

12.5 Kingspan Kooltherm Insulation Boards shall be separated from the interior of the building by an approved thermal barrier except as provided for in **Section 6.4**.

12.6 As listed herein, Kingspan Kooltherm Insulation Boards shall not be used as a nailing base for cladding.

12.7 The insulation boards shall not be used to resist lateral loads. Walls shall be braced by other materials in accordance with the applicable code, and the exterior wall covering shall be capable of resisting the full design wind pressure.

12.8 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:

12.8.1 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.

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

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

12.8.4 At a minimum, these innovative products shall be installed per **Section 9**.

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

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

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

12.9 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.

12.10 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).

12.11 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 Kingspan Kooltherm Insulation Boards, as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

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

14 Review Schedule

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

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

Notes

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

2 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#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 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11

4 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

5 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

6 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

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

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

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

10 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.

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 https://www.cbitest.com/accreditation/

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

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

15 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

16 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

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

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

19 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.

20 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

21 2018 IECC Section C402.5.1.2.1

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

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

24 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

25 2018 IECC Section C402.5.1.2.1

26 Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

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

28 2018 IECC Section C402.5.1.2.1

29 2018 IFC Section 104.9

30 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.

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

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