



# 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, Crawlspace, Basements and Other Interior Applications

Trade Secret Report Holder:

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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

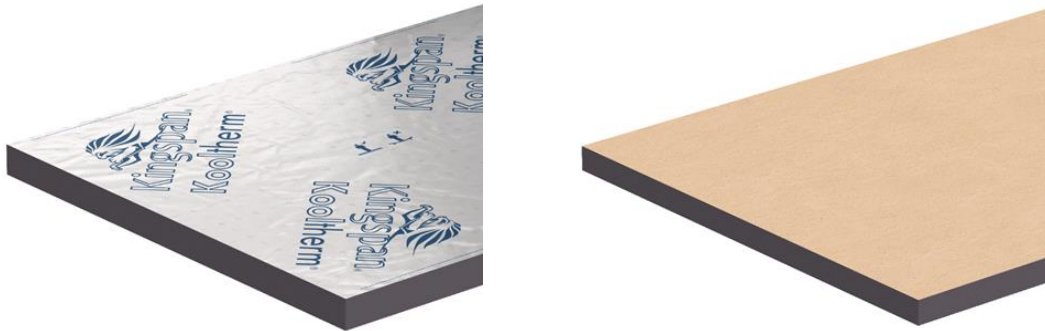
### 1 Innovative Products Evaluated<sup>1</sup>

#### 1.1 Kingspan Kooltherm Insulation Boards

- 1.1.1 K5 External Wallboard
- 1.1.2 K8 Cavity Board
- 1.1.3 K9 Internal Insulation Board
- 1.1.4 K10 Soffit Board
- 1.1.5 K12 Framing Board
- 1.1.6 K15 Rainscreen Board
- 1.1.7 K20 Concrete Sandwich Board

## 2 Product Description and Materials

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



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

**Table 1.** Kingspan Kooltherm – Product Descriptions

Product	Description	Facers	Standard Dimensions <sup>1</sup> (in)	Available Thicknesses <sup>2</sup> (in)	Application
K5 External Wallboard	Kingspan Kooltherm products 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.	Glass-tissue based facer on both sides	Width: 47 <sup>1</sup> / <sub>4</sub> Length: 16	1.00 – 3.94	Exterior Insulation (EIFS Wall System)
K8 Cavity Board		Low emissivity composite foil facing on both sides	Width: 47 <sup>1</sup> / <sub>4</sub> Length: 16	1.00 – 4.33	Partially filled cavity wall
K9 Internal Insulation Board		Glass-tissue based facer on both sides	Width: 47 <sup>1</sup> / <sub>4</sub> Length: 89 <sup>3</sup> / <sub>8</sub>	1.18 – 3.94	Interior exposed application on habitable space, basement, crawlspace, attic walls
K10 Soffit Board		Glass-tissue based facer on inside face; low emissivity composite foil on exposed face.	Width: 47 <sup>1</sup> / <sub>4</sub> Length: 89 <sup>3</sup> / <sub>8</sub>	1.00 – 5.12	Structural ceilings or floors (not below grade)
K12 Framing Board		Low emissivity composite foil facing on both sides	Width: 47 <sup>1</sup> / <sub>4</sub> Length: 96	1.00 – 5.91	Wood frame walls or steel framing systems
K15 Rainscreen Board		Low emissivity composite foil facing on both sides	Width: 47 <sup>1</sup> / <sub>4</sub> Length: 96	1.00 – 5.91	Behind rainscreen or masonry faced systems
K20 Concrete Sandwich Board		Glass-tissue based facer on both sides	Width: <sup>1</sup> 47 <sup>1</sup> / <sub>4</sub> Length: <sup>1</sup> 89 <sup>3</sup> / <sub>8</sub>	1.00 – 4.72	Precast/concrete insulated sandwich wall systems

SI: 1 in = 25.4 mm

1. Custom widths and lengths may be available.

2. Other thicknesses may be available.



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

### 3 Definitions

- 3.1 New Materials<sup>2</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>3</sup> The design strengths and permissible stresses shall be established by tests<sup>4</sup> and/or engineering analysis.<sup>5</sup>
- 3.2 Duly authenticated reports<sup>6</sup> and research reports<sup>7</sup> are test reports and related engineering evaluations, which are written by an approved agency<sup>8</sup> and/or an approved source.<sup>9</sup>
  - 3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).<sup>10</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, or RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.<sup>11</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 RDP.
  - 3.5.1 The Center for Building Innovation (CBI) is ANAB<sup>12</sup> ISO/IEC 17025 and ISO/IEC 17020 accredited.
- 3.6 The regulatory authority shall enforce<sup>13</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>14</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>15</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>16</sup> Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.<sup>17</sup>
- 3.9 Approval equity is a fundamental commercial and legal principle.<sup>18</sup>

### 4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation<sup>19</sup>

- 4.1 *Standards*
  - 4.1.1 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
  - 4.1.2 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*
  - 4.1.3 *ASTM D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics*
  - 4.1.4 *ASTM D1622: Standard Test Method for Apparent Density of Rigid Cellular Plastics*
  - 4.1.5 *ASTM D1623: Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics*
  - 4.1.6 *ASTM D2126: Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging*
  - 4.1.7 *ASTM D6226: Standard Test Method for Open Cell Content of Rigid Cellular Plastics*
  - 4.1.8 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
  - 4.1.9 *ASTM E96: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials*



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

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

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

#### 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>20</sup>

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 an 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 used in buildings of Type V construction in accordance with IBC Section 2603.4.1.4.

#### 6.2 Water Vapor Permeance

6.2.1 Per IBC Section 1404.3.2, Class III vapor retarders shall be used on the interior side of walls framed with insulation boards having <1 perm installed on the exterior side of the framed wall.

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

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

**Table 2.** Water Vapor Permeance<sup>1,2</sup>

Product	Water Vapor Permeance (perm)
Foil Facers (K8, K12, K15)	0.51
Foil-Glass Facers (K10)	0.48
Glass Facers (K5, K9, K20)	0.79
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 barrier material and meet the requirements of IRC Section N1101.10.5 and IECC Section C402.5.1.3 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.

### 6.4 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 K8, K10 (with foil facer exposed), K12, and K15 Insulation Boards up to 75 mm (3") thick, walls only or ceiling only.

6.4.1.1.1.2 Kingspan Kooltherm K5, K9, K10 (with glass facer exposed), and K20 Insulation Boards up to 120 mm (4<sup>3/4</sup>") thick, walls and ceilings.

#### 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 K5, K9, K10, and K20 Insulation Boards, up to 75 mm (3") with glass tissue facer left exposed, have been tested to NFPA 286 for use on ceilings only or walls only in accordance with IBC Section 2603.9 and IRC Section 316.6 and is approved for use without a thermal barrier.

6.4.1.2.2 Kingspan Kooltherm K15, K12, K10, and K8 Insulation Boards, up to 75 mm thick (3") with exterior foil facer left exposed, have been tested to NFPA 286 for use on ceilings only in accordance with IBC Section 2603.9 and IRC Section 316.6 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](#) 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<sup>1,2</sup>

Product	Flame Spread Index	Smoke Developed Index	Classification
Kingspan Kooltherm Products	< 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](#).
- 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](#).
  - 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 ( $\frac{3}{8}$ ").
  - 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 ( $\frac{7}{8}$ ") thickness of stucco complying with [IBC Section 2510](#).
  - 6.6.1.1.6 Minimum 6.4 mm ( $\frac{1}{4}$ ") thickness of fiber-cement lap, panel or shingle siding complying with [IBC Section 1404.16](#).
- 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>21</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>22</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>23</sup>





## 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 an air barrier material in accordance with [IRC Section N1101.10.5](#) and [IECC Section C402.5.1.2](#).
  - 8.1.4 Performance for use in buildings of Type I-IV construction in accordance with [IBC Section 2603.5](#).
    - 8.1.4.1 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](#).
    - 8.1.4.2 Performance for use without a thermal barrier in accordance with [IBC Section 2603.4](#), [IBC Section 2603.5.2](#) and [IRC Section R316.4](#).
    - 8.1.4.3 Performance with regard to vertical and lateral fire propagation in accordance with [IBC Section 2603.5.5](#).
    - 8.1.4.4 Performance with regard to ignition in accordance with [IBC Section 2603.5.7](#).
    - 8.1.4.5 Use as part of an NFPA 286 wall assembly in accordance with [IBC Section 2603.7](#).
  - 8.2 Wind pressure resistance 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>24</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 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 Material properties 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
- 10.1.9 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.<sup>25</sup>
- 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 in exterior walls without a thermal barrier in accordance with IBC Section 2603.4, IBC Section 2603.5.2 and IRC Section R316.4.
  - 11.2.2 Kingspan Kooltherm Insulation Boards are approved for use in exterior walls of buildings of Type I-IV construction in accordance with IBC Section 2603.5.
  - 11.2.3 For use in attics and 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**.
- 11.3 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<sup>26</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>27</sup> Building regulations require that the building official shall accept duly authenticated reports.<sup>28</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>29</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 When the insulation boards are used on exterior walls of buildings of Type I, II, III or IV construction 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** of this report.
- 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 The innovative products listed in **Section 1.1** are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.
- 13.2 Additional technical information can be found at [www.kingspan.com](http://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](http://www.drjcertification.org).
- 14.2 For information on the status of this report, please contact [DrJ Certification](#).

### 15 Approved for Use Pursuant to United States and International Legislation Defined in Appendix A

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



## Appendix A

### 1 Legislation that Authorizes AHJ Approval

- 1.1 **Fair Competition:** State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies, and/or methods of construction that:
  - 1.1.1 Advance innovation.
  - 1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints.
  - 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 products to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
  - 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies, and/or methods of construction. The goal is to *“protect economic freedom and opportunity by promoting free and fair competition in the marketplace”*.
  - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies, and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
  - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA),<sup>30</sup> where providing test reports, engineering analysis, and/or other related IP/TS is subject to prison of not more than ten years<sup>31</sup> and/or a \$5,000,000 fine or 3 times the value of<sup>32</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>33</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>34</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>35</sup>



- 1.3 **Approved<sup>36</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>37</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>38</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>39</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>40</sup> (i.e., ANAB, International Accreditation Forum also known as 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
  - 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>41</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>42</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>43</sup> and [Part 3280](#),<sup>44</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>45</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>46</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>47</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>48</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>49</sup>
  - 1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.<sup>50</sup>
- 1.12 Approval equity is a fundamental commercial and legal principle.<sup>51</sup>



## Notes

- 1 For more information, visit [drjcertification.org](http://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](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](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](https://www.intellectualpropertyandtradesecrets.com/).
- 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.cbiteest.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.eu/en/about-iaf-mia/#>:-: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 <https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4>
- 22 <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
- 23 <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
- 24 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.
- 25 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.
- 26 2018 IFC Section 104.9
- 27 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.
- 28 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>
- 29 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- 30 <http://www.drjengineering.org/AppendixC> AND <https://www.drjcertification.org/cornell-2016-protection-trade-secrets>



<https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years>  
<https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided>  
<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>  
IBC 2021, Section 1706.1 Conformance to Standards  
IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General  
**See Section 11** for the distilled building code definition of Approved.  
Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES  
<https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1>  
New York City, The Rules of the City of New York, § 101-07 Approved Agencies  
New York City, The Rules of the City of New York, § 101-07 Approved Agencies  
<https://up.codes/viewer/new-jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1>  
<https://www.nj.gov/dca/divisions/codes/codreg/ucc.html>  
<https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>  
<https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>  
IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.  
IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.  
<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/>  
IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.  
<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>  
True for all ANAB accredited product evaluation agencies and all International Trade Agreements.  
<https://www.justice.gov/crt/deprivation-rights-under-color-law> AND <https://www.justice.gov/atr/mission>