



# Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

# Report No: 2404-10



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# Kenoteq<sup>®</sup> K-BRIQ<sup>®</sup> and K-SLIP<sup>™</sup> Masonry Veneer

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# **CSI Designations:**

DIVISION: 04 00 00 - MASONRY Section: 04 20 00 - Unit Masonry Section: 04 21 00 - Clay Unit Masonry

Section: 04 21 13.13 - Brick Veneer Masonry Section: 04 71 00 - Manufactured Brick Masonry

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

1.1 K-BRIQ and K-SLIP

# 2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1** and **Figure 2**.



Figure 1. Kenoteq K-BRIQ







Figure 2. Kenoteq K-SLIP

- 2.2 K-BRIQ and K-SLIP are specialty facing brick products that are used in interior and exterior wall covering applications.
  - 2.2.1 K-BRIQ and K-SLIP are manufactured from inert recycled materials and a patented proprietary non-toxic binder, then formed under high pressure. Following compression, products are allowed to cure in a controlled environment. Unlike traditional manufacturing of clay bricks, the innovative low carbon production process that does not require high temperature firing, virgin cement or high volumes of clay.
- 2.3 K-BRIQ is used in anchored masonry veneer, non-loadbearing applications when in installed for exterior applications in accordance with the applicable requirements of TMS 402, Sections 13.1 and 13.2, per <u>IBC</u> <u>Section 1404.7</u><sup>2</sup> and <u>IRC Section R703.8</u>.
  - 2.3.1 For interior applications, K-BRIQ installation shall be in accordance with <u>IBC Section 1404.7</u>,<sup>3</sup> IRC Section <u>R703.7.1</u>, and <u>IRC Section R703.7.4</u>, per <u>IRC Section R702.1</u>.
- 2.4 K-SLIP is an alternative to the traditional brick slip. While not directly defined in IBC or IRC, a brick slip is a thin brick that is used as a decorative facing material. K-SLIP gives the appearance of a traditional brick wall, but with significantly less volume and weight.
  - 2.4.1 K-SLIP is used in adhered masonry veneer, non-loadbearing applications when in installed in accordance with applicable requirements of TMS 402, Sections 13.1 and 13.2 per <u>IBC Section 1404.11</u><sup>4</sup> and <u>IRC Section R703.12</u>.
  - 2.4.2 For interior applications, installation shall be in accordance with <u>IBC Section 1404.11.3</u>,<sup>5</sup> <u>IRC Section R703.7.1</u>, and <u>IRC Section R703.7.4</u>, per <u>IRC Section R702.1</u>.
- 2.5 K-BRIQ and K-SLIP shall be backed by wood-framed or light-gauge cold-formed steel stud walls, masonry walls, or concrete walls as specified in <u>IBC Section 1403.4</u>.





- 2.6 Product Availability
  - 2.6.1 *K-BRIQ (Perforated or Solid Profiles):* 
    - 2.6.1.1 *Product Dimensions:* 
      - 2.6.1.1.1 215 x 102.5 x 65 mm (8<sup>15</sup>/<sub>32</sub>" x 4<sup>1</sup>/<sub>16</sub>" x 2<sup>9</sup>/<sub>16</sub>")
    - 2.6.1.2 Custom profiles may be available upon request
  - 2.6.2 K-SLIP (Solid Profile Only):
    - 2.6.2.1 *Product Dimensions:* 
      - 2.6.2.1.1 215 x 65 x 20 mm (8<sup>15</sup>/<sub>32</sub>" x 2<sup>9</sup>/<sub>16</sub>" x 2<sup>5</sup>/<sub>32</sub>")
      - 2.6.2.1.2 330 x 50 x 20 mm (13" x 1<sup>31</sup>/<sub>32</sub>" x 2<sup>5</sup>/<sub>32</sub>")
      - 2.6.2.1.3 440 x 50 x 20 mm (17<sup>5</sup>/<sub>16</sub>" x 1<sup>31</sup>/<sub>32</sub>" x 2<sup>5</sup>/<sub>32</sub>")
    - 2.6.2.2 Custom profiles may be available upon request
  - 2.6.3 K-BRIQ and K-SLIP are available in 12 stock colors:
    - 2.6.3.1 K-BRIQ and K-SLIP colors are made from recycled pigments that are presented in Figure 3.

Medero Dark Grey	Medero Light Grey	Gullane Cyan	Gullane Cyan Light	Gillespie Magenta Light
Heriot Mustard	Heriot Light Mustard	Watt Brown	Watt Light Brown	Gillespie Magenta
Chapman Burnt Orange	Chapman Burnt Orange Light			



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

# 3 Definitions<sup>6</sup>

- 3.1 <u>New Materials</u><sup>7</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>8</sup> The <u>design strength</u> and permissible stresses shall be established by tests<sup>9</sup> and/or engineering analysis.<sup>10</sup>
- 3.2 <u>Duly authenticated reports</u><sup>11</sup> and <u>research reports</u><sup>12</sup> are test reports and related engineering evaluations that are written by an <u>approved agency</u><sup>13</sup> and/or an <u>approved source</u>.<sup>14</sup>
  - 3.2.1 These reports utilize intellectual property and/or trade secrets to create public domain material properties for commercial end-use.
    - 3.2.1.1 This report protects confidential Intellectual Property and trade secretes under the regulation, <u>18.US.Code.90</u>, also known as <u>Defend Trade Secrets Act of 2016</u> (DTSA).<sup>15</sup>





- 3.3 An approved agency is *"approved"* when it is <u>ANAB ISO/IEC 17065 accredited</u>. DrJ Engineering, LLC (DrJ) is accredited and listed in the <u>ANAB directory</u>.
- 3.4 An <u>approved source</u> is *"approved"* when a professional engineer (i.e., <u>Registered Design Professional</u>, hereinafter <u>RDP</u>) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the <u>state legislature</u> via its professional engineering regulations.<sup>16</sup>
- 3.5 Testing and/or inspections conducted for this <u>duly authenticated report</u> were performed by an <u>ISO/IEC 17025</u> <u>accredited testing laboratory</u>, an <u>ISO/IEC 17020 accredited inspection body</u>, and/or a licensed <u>RDP</u>.
  - 3.5.1 The <u>Center for Building Innovation</u> (CBI) is <u>ANAB<sup>17</sup> ISO/IEC 17025</u> and <u>ISO/IEC 17020</u> accredited.
- 3.6 The regulatory authority shall <u>enforce</u><sup>18</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 <u>writing</u><sup>19</sup> stating the nonconformance and the path to its cure.
- 3.7 The regulatory authority shall accept <u>duly authenticated reports</u> from an <u>approved agency</u> and/or an <u>approved</u> <u>source</u> 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>20</sup>
- 3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.<sup>21</sup> Thus, all ANAB ISO/IEC 17065 <u>duly authenticated reports</u> are approval equivalent,<sup>22</sup> and can be used in any country that is an MLA signatory found at this link: <u>https://iaf.nu/en/recognised-abs/</u>
- 3.9 Approval equity is a fundamental commercial and legal principle.<sup>23</sup>

# 4 Applicable Local, State, and Federal Approvals; Standards; Regulations<sup>24</sup>

- 4.1 Local, State, and Federal
  - 4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 <u>duly authenticated report</u> use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, Texas Department of Insurance, and Wichita.<sup>25</sup>
  - 4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 <u>duly authenticated report</u> use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.<sup>26</sup>
  - 4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14<sup>27</sup> and Part 3280<sup>28</sup> pursuant to the use of ISO/IEC 17065 <u>duly</u> <u>authenticated reports</u>.
  - 4.1.4 Approved means complying with the requirements of local, state, or federal legislation.
- 4.2 Standards
  - 4.2.1 ASCE 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures
  - 4.2.2 ASTM C67/C67M: Test Methods for Sampling and Testing Brick and Structural Clay Tile
  - 4.2.3 ASTM C216: Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
  - 4.2.4 ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
  - 4.2.5 BS EN 772-1 Methods of Test for Masonry Units Part 1: Determination of Compressive Strength
  - 4.2.6 BS EN 772-5 Methods of Test for Masonry Units Part 5: Determination of the Active Soluble Salts Content of Clay Masonry Units





- 4.2.7 BS EN 772-11 Methods Of Test For Masonry Units Part 11: Determination Of Water Absorption Of Aggregate Concrete, Autoclaved Aerated Concrete, Manufactured Stone And Natural Stone Masonry Units Due To Capillary Action And The Initial Rate Of Water Absorption Of Clay Masonry Units
- 4.2.8 BS EN 772-13 Methods of Test for Masonry Units Part 13: Determination of Net and Gross Dry Density of Masonry Units (Except For Natural Stone)
- 4.2.9 BS EN 772-16 Methods of Test for Masonry Units Part 16: Determination of Dimensions
- 4.2.10 BS EN 772-18 Methods of Test for Masonry Units Part 18: Determination of Freeze-Thaw Resistance of Calcium Silicate Masonry Units
- 4.2.11 BS EN 772-21 Methods of Test for Masonry Units Part 21: Determination of Water Absorption of Clay and Calcium Silicate Masonry Units by Cold Water Absorption
- 4.2.12 BS EN 772-22 Methods of Test for Masonry Units Part 22: Determination of Freeze/Thaw Resistance of Clay Masonry Units
- 4.2.13 BS EN 1052-3 Methods of Test for masonry. Determination of Initial Shear Strength
- 4.2.14 BS EN 1716 Reaction To Fire Tests For Products. Determination of the Gross Heat Of Combustion (Calorific Value)
- 4.2.15 BS EN 13501-1 Part 1: Fire Classification of Construction Products and Building Elements Classification Using Data from Reaction to Fire Tests
- 4.2.16 BS EN 13823 Reaction To Fire Tests For Building Products. Building Products Excluding Floorings Exposed To the Thermal Attack by a Single Burning Item
- 4.2.17 TMS 402: Building Code Requirements for Masonry Structures
- 4.2.18 TMS 602: Specifications for Masonry Structures
- 4.3 Regulations
  - 4.3.1 IBC 18, 21, 24: International Building Code®
  - 4.3.2 IRC 18, 21, 24: International Residential Code®
- 5 Listed<sup>29</sup>
  - 5.1 Equipment, materials, products, or services included in a List published by a <u>nationally recognized testing</u> <u>laboratory</u> (i.e., CBI), an <u>approved agency</u> (i.e., CBI and DrJ), and/or and <u>approved source</u> (i.e., DrJ), or other organization(s) 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 K-BRIQ and K-SLIP were evaluated for compliance in accordance with ASTM C216 as specified in TMS 602 Article 2.3, per <u>IBC Section 2103.1</u> and <u>IRC Section R606.2.2</u>. The results are shown in **Table 1**.

Property		Results		
Compressive Strength		> 3,000 psi		
Water Absorption	24 hour Cold Water	< 8%		
Freeze/Thaw <sup>1</sup>	50 cycles	No damage had occurred: no individual bricks showed signs of bulging, cavities in excess of 5mm diameter, or cracking of the specimens.		
Initial Rate of Water Absorption (IRA) <sup>2</sup>		2.3 g/(min-30in <sup>2</sup> )		
Dimensional Tolerance <sup>3</sup> (variation to specified dimensions)	Length	+/- 5/64"		
	Width	+/- 5/64"		
	Height	+/- 5/ <sub>64</sub> "		
Density		98 lb/ft <sup>3</sup>		
Mortar Joint Shear Strength⁴	29 psi Compressive Pre-load	45 psi		
	87 psi Compressive Pre-load	105 psi		
	145 psi Compressive Pre-load	155 psi		
Mortar Compressive Strength		725 psi		

#### Table 1. Physical and Mechanical Properties of Kenoteq K-BRIQ and K-SLIP

SI: 1 in = 25.4 mm, 1 psi = 6.89 kPa

1. Freeze-thaw was tested in accordance with BS EN 772-18.

2. Tested in accordance with BS EN 772-11. Results shown is the equivalent absorption rate for a 30 in<sup>2</sup> surface area as specified in Section 10.4.2 of ASTM C67/C67M.

3. Dimensional tolerances meet the requirements for Type FBS in accordance with ASTM C216, Table 2.

4. Shear strength of the mortar joint was tested in accordance with BS EN 1052-3. Mortar tested was a prescribed M4 mortar of 1:1:6 cement:lime:sand (by volume) mixture as specified in BS EN 998-2. This is the same ratio as Type N cement lime mortar per ASTM C270.

#### 6.2 Fire Performance

- 6.2.1 K-BRIQ was evaluated for fire performance in accordance with BS EN 13823 and determination of gross heat of combustion in accordance with BS EN 1716 per BS EN 13501-1.
  - 6.2.1.1 K-BRIQ Medero Dark Grey attained Class A2-s1, d0 per BS EN 13501-1. All other colors attained Class B-s1, d0 per BS EN 13823 and EN ISO 11925-2.
    - 6.2.1.1.1 As stated in Annex A.4 of BS EN 13501-1, under the conditions of a fully developed fire, products achieving a Class A2 will not significantly contribute to the fire load and fire growth.
  - 6.2.1.2 Based on comparative testing between BS EN 13501-1 and ASTM E84/UL 723, these classifications (A2 s1, d0 for Medero Dark Grey and B-s1, d0 for the other K-BRIQ colors) indicate that K-BRIQ does not contribute to the spread of a fire and is equivalent to or better than ASTM E84/UL 723 Class A flame spread of ≤ 25 and smoke developed index of ≤ 450.





Tahlo 2	Surface Bur	h Characteristics	for Kenoter	products <sup>1,2</sup>
i abie z.	Surface Dur	T Characteristics		products

Product Colors	Expected Flame Spread	Expected Smoke Developed	ASTM E84 Classification	
Chapman Burnt Orange Chapman Burnt Orange Light Gillespie Magenta Gillespie Magenta Light Gullane Cyan Gullane Cyan Light Heriot Mustard Heriot Light Mustard Medero Dark Grey Medero Light Grey Watt Brown Watt Light Brown	≤ 25	<b>≤</b> 450	Class A	
4 Keneter K DDIO tested in accordance with DS EN 12501.1. Flame encode analysis devidered index and ACTM E04 elegetifications are based upon comparative				

1. Kenoteq K-BRIQ tested in accordance with BS EN 13501-1. Flame spread, smoke developed index and ASTM E84 classifications are based upon comparative testing.

2. K-SLIP is manufactured with the same materials as K-BRIQ. Surface burning characteristics may be extended to K-SLIP.

6.3 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>30</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>31</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>32</sup>

# 8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 K-BRIQ and K-SLIP comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
  - 8.1.1 Physical and mechanical properties of K-BRIQ and K-SLIP were evaluated in accordance with ASTM C216 as specified in TMS 602 Article 2.3B per <u>IBC Section 2103.1</u> and <u>IRC Section R606.2.2</u>.
  - 8.1.2 For use as an interior finish, K-BRIQ and K-SLIP were evaluated for fire performance in accordance with BS EN 13823 and BS EN 1716 as specified in BS EN 13501.
    - 8.1.2.1 K-SLIP is manufactured with the same materials as K-BRIQ. Surface burning characteristics may be extended to K-SLIP.
    - 8.1.2.2 Classification equivalency was determined by DrJ Engineering, LLC.
  - 8.1.3 Shear strength of mortar joint in accordance with BS EN 1052-3.
- 8.2 Any building code, regulation and/or accepted engineering evaluations (i.e., <u>research reports</u>, <u>duly</u> <u>authenticated reports</u>, etc.) that are conducted for this Listing were performed by DrJ, which is an <u>ISO/IEC</u> <u>17065 accredited certification body</u> and a professional engineering company operated by <u>RDP</u> or <u>approved</u> <u>sources</u>. DrJ is qualified<sup>33</sup> to practice product and regulatory compliance services within its <u>scope of</u> <u>accreditation and engineering expertise</u>,<sup>34</sup> respectively.





- 8.3 Engineering evaluations are conducted with DrJ's ANAB <u>accredited ICS code scope</u> of expertise, which is also its areas of professional engineering competence.
- 8.4 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, contact the manufacturer for counsel on the proper installation method.
- 9.3 Prior to installation, surfaces shall be clean, free from efflorescence,<sup>35</sup> sufficiently damp, and rough for proper bond. If the surface is insufficiently rough, approved bonding agents or a Portland cement dash-bond coat mixed in proportions of not more than two parts volume of sand to one part volume of Portland cement or plastic cement shall be applied. The dash-bond coat shall be left undisturbed and shall be moist cured not less than 24 hours.
- 9.4 Installation Procedure
  - 9.4.1 K-BRIQ shall be installed in accordance with the manufacturer installation instructions, as well as, TMS 402 Section 13.1 and 13.2 as specified in <u>IBC Section 1404.7<sup>36</sup> and IRC Section R703.8</u>, as applicable.
  - 9.4.2 K-SLIP shall be installed in accordance with the manufacturer installation instructions, as well as, TMS 402 Section 13.1 and 13.3 as specified in <u>IBC Section 1404.11</u><sup>37</sup> and <u>IRC Section R703.12</u>, as applicable.
  - 9.4.3 Where there is a conflict between the code provisions and the manufacturer installation instructions, the more restrictive shall govern.

#### **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 Compressive strength in accordance with BS EN 772-1 and ASTM C67/67M
  - 10.1.2 Freeze-thaw in accordance with BS EN 772-18
  - 10.1.3 Water absorption in accordance with BS EN 772-21 and ASTM C67/67M
  - 10.1.4 Initial rate of water absorption in accordance with BS EN 772-11 and ASTM C67/67M
  - 10.1.5 Dimensional tolerance verification in accordance with BS EN 772-16 and ASTM C67/67M
  - 10.1.6 Gross dry density in accordance with BS EN 772-13 and ASTM C67/67M
  - 10.1.7 Mortar joint shear strength in accordance with BS EN 1052-3
  - 10.1.8 Soluble salt content in accordance with BS 772-5
  - 10.1.9 Reaction to fire in accordance with BS EN 13823
  - 10.1.10 Heat of combustion in accordance with BS EN 1716
- 10.2 Information contained herein may include the result of testing and/or data analysis by sources that are <u>approved agencies</u>, <u>approved sources</u>, and/or an <u>RDP</u>. 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 <u>being equivalent</u> to the regulatory provision in terms of quality, <u>strength</u>, effectiveness, <u>fire resistance</u>, 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 <u>duly authenticated reports</u> from <u>approved</u> <u>agencies</u> and/or <u>approved sources</u> 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 <u>duly</u> <u>authenticated report</u>, may be dependent upon published design properties by others.
- 10.5 Testing and Engineering Analysis
  - 10.5.1 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>38</sup>
- 10.6 Where additional condition of use and/or regulatory compliance information is required, please search for K-BRIQ and K-SLIP on the <u>DrJ Certification website</u>.

#### **11 Findings**

- 11.1 As outlined in **Section 6**, K-BRIQ and K-SLIP have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.
- 11.2 When used and installed in accordance with this <u>duly authenticated report</u> and the manufacturer installation instructions, K-BRIQ and K-SLIP shall be approved for the following applications:
  - 11.2.1 K-BRIQ is permitted to be used as anchored, non-loadbearing exterior/interior wall coverings on walls constructed of concrete, masonry, steel framing, or wood framing.
  - 11.2.2 K-SLIP is permitted to be used as adhered, non-loadbearing exterior/interior wall coverings on walls constructed of concrete, masonry, steel framing, or wood framing.
  - 11.2.3 When used as interior wall finish, K-BRIQ and K-SLIP, achieving a Class A classification in accordance with ASTM E84 or UL 723 per <u>IBC Section 803.1.2</u>, are permitted to be used in all locations specified in <u>IBC Table 803.13</u>.
- 11.3 K-BRIQ and K-SLIP meet the criteria for ASTM C216 Grade SW and may be used where high resistance to damage caused by cyclic freezing and thawing is desired. See **Figure 4** for U.S. weathering indices.



Figure 4. Weathering Indices in the United States (ASTM C216)





- 11.4 K-BRIQ and K-SLIP meet the criteria for ASTM C216 Type FBX for dimensional tolerances and warpage tolerances.
  - 11.4.1 K-BRIQ and K-SLIP are manufactured under high pressure and steel molds with squared edges and corners.
- 11.5 Unless exempt by state statute, when K-BRIQ and K-SLIP are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an <u>RDP</u>.
- 11.6 Any application specific issues not addressed herein can be engineered by an <u>RDP</u>. Assistance with engineering is available from Kenoteq, Ltd.
- 11.7 <u>IBC Section 104.2.3<sup>39</sup> (IRC Section R104.2.2<sup>40</sup> and IFC Section 104.2.3<sup>41</sup> are similar) in pertinent part state:</u>

**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 is not specifically prohibited by this code and has been approved.

- 11.8 Approved:<sup>42</sup> Building regulations require that the building official shall accept duly authenticated reports.<sup>43</sup>
  - 11.8.1 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited.
  - 11.8.2 An <u>approved source</u> is *"approved"* when an <u>RDP</u> is properly licensed to transact engineering commerce.
  - 11.8.3 Federal law, <u>Title 18 US Code Section 242</u>, 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.
- 11.9 DrJ is a licensed engineering company, employs licensed <u>RDP</u>s and is an <u>ANAB Accredited Product</u> <u>Certification Body</u> – <u>Accreditation #1131</u>.
- 11.10 Through the <u>IAF Multilateral Arrangement</u> (MLA), this <u>duly authenticated report</u> can be used to obtain product approval in any <u>jurisdiction</u> or <u>country</u> because all ANAB ISO/IEC 17065 <u>duly authenticated reports</u> are equivalent.<sup>44</sup>

# 12 Conditions of Use

- 12.1 Material properties shall not fall outside the boundaries defined in Section 6.
- 12.2 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.
- 12.3 As listed herein, K-BRIQ and K-SLIP shall be subjected to the following conditions:
  - 12.3.1 Location and placement of expansion or control joints shall be based on movement caused by fluctuation in temperature, moisture, or applied loads.
  - 12.3.2 Structural elements supporting the masonry veneer shall be designed so that deflection does not exceed L/600 in accordance with TMS 402 Section 13.2.2.3.3, as specified in <u>IBC Section 1404.7</u>,<sup>45</sup> <u>IBC Section 1404.7</u>,<sup>45</sup> <u>IBC Section 1404.7</u>,<sup>46</sup> and <u>IRC Section R703.8.2</u>.
  - 12.3.3 When installed over exterior stud walls, the veneer units shall be installed not less than 4" above the earth, or not less than 2" above paved areas, or not less than <sup>1</sup>/<sub>2</sub>" above exterior walking surfaces that are supported by the same foundation that supports the exterior wall as specified in <u>IBC Section 1404.11.1.3</u><sup>47</sup> and <u>IRC Section R703.12.1</u>.
  - 12.3.4 An approved Water-Resistive Barrier (WRB) shall be installed in accordance with <u>IBC Section 2510.6</u>, as specified in <u>IBC Section 1404.11.1.1</u>.<sup>48</sup>





- 12.3.5 Flashing shall comply with IBC Section 1404.4.3<sup>49</sup> and IBC Section 1404.11.1.2.1.<sup>50</sup>
- 12.3.6 Weep holes shall be at least 3/16" in diameter and spaced less than 33" o.c.
- 12.3.7 When applicable, the weights of the materials provision of <u>IRC Section R301.2.2.2</u> shall apply.
  - 12.3.7.1 In the event where the average weight of the wall supporting K-BRIQ and K-SLIP wall coverings exceed the applicable limits specified in <u>IRC Section R301.2.2.2</u>, an engineered design of the wall construction shall be performed per IRC Section R301.1.3.
- 12.4 When K-BRIQ is installed using the prescriptive requirements in TMS Section 13.2.2, K-BRIQ shall not be used in areas where the velocity pressure, q<sub>z</sub>, exceeds 40 psf (1.92 kPa), as given in ASCE 7.
  - 12.4.1 *Exception:* In areas where the velocity pressure exceeds 40 psf but does not exceed 55 psf (2.63 kPa), and the mean roof height of the building is less than or equal to 60 ft (18.3 m), the following shall be applied:
    - 12.4.1.1 The maximum wall area supported by each anchor shall be reduced to seventy percent (70%) of that required.
    - 12.4.1.2 Anchors shall be spaced at a maximum of 18" horizontally and vertically.
    - 12.4.1.3 Additional anchors around openings larger than 16" (406 mm) in either direction shall be provided. Anchors shall be spaced at a maximum of 24" (610 mm) o.c. around the perimeter of the opening and shall be placed within 12" (305 mm) of the openings.
  - 12.4.2 For the given velocity pressures, see **Table 3** for the corresponding design wind pressure and wind speeds.

Velocity Pressure, q <sub>z</sub>	40 psf		50 psf	
Design Wind Pressure, p	-54 psf		-74 psf	
Exposure Category	V <sub>ult</sub> (mph)	V <sub>asd</sub> (mph)	V <sub>ult</sub> (mph)	V <sub>asd</sub> (mph)
В	177	137	208	161
С	152	118	178	138
D	141	109	165	128
SI: 1 psf = 0.049 kPa, 1 mph = 1.61 km/hr				

**Table 3**. Design Wind Pressure and Wind Speeds for the Specified Prescriptive Velocity Pressure

- 12.5 When required by adopted legislation and enforced by the <u>building official</u>, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:
  - 12.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an <u>approved source</u>, shall be approved when signed and sealed.
  - 12.5.2 This report and the installation instructions shall be submitted at the time of <u>permit</u> application.
  - 12.5.3 These innovative products have an internal quality control program and a third-party quality assurance program.
  - 12.5.4 At a minimum, these innovative products shall be installed per Section 9.
  - 12.5.5 The review of this report by the AHJ shall comply with <u>IBC Section 104.2.3.2</u> and <u>IBC Section 105.3.1</u>.





- 12.5.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.
- 12.5.7 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 <u>IBC</u> <u>Section 110.3</u>, <u>IRC Section R109.2</u>, and any other regulatory requirements that may apply.
- 12.6 The approval of this report by the AHJ shall comply with <u>IBC Section 1707.1</u>, where legislation states in part, *"the <u>building official</u> shall make, or cause to be made, the necessary tests and investigations; or the <u>building</u> <u>official</u> shall accept duly authenticated reports from <u>approved agencies</u> in respect to the quality and manner of use of new materials or assemblies as provided for in <u>Section 104.2.3</u>", all of <u>IBC Section 104</u>, and <u>IBC Section 105.3</u>.*
- 12.7 <u>Design loads</u> 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., <u>owner</u> or <u>RDP</u>).
- 12.8 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 <u>owner</u>.

# 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 <u>www.kenoteq.com</u>.

#### 14 Review Schedule

- 14.1 This report is subject to periodic review and revision. For the latest version, visit <u>www.drjcertification.org</u>.
- 14.2 For information on the status of this report, please contact DrJ Certification.





# Notes

- <sup>1</sup> For more information, visit <u>dricertification.org</u> or call us at 608-310-6748.
- <sup>2</sup> 2021 IBC Section 1404.6
- <sup>3</sup> 2021 IBC Section 1404.6
- 4 2021 IBC Section 1404.10
- 5 2021 IBC Section 1404.10.3
- <sup>6</sup> Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of <u>TPI1</u>, the <u>NDS</u>, <u>AISI S202</u>, <u>US</u> professional engineering law, <u>Canadian building code</u>, <u>Canada professional engineering law</u>, <u>Qualtim External Appendix A: Definitions/Commentary</u>, <u>Qualtim External Appendix B:</u> <u>Project/Deliverables</u>, <u>Qualtim External Appendix C: Intellectual Property and Trade Secrets</u>, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.
- 7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702
- 8 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 <u>https://www.justice.gov/atr/mission</u> and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3
- https://up.codes/viewer/mississippi/lbc-2024/chapter/17/special-inspections-andtests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests
- https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-andtests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B %20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%2 0and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.
- <sup>12</sup> https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2
- <sup>13</sup> <u>https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved\_agency</u>
- 14 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved\_source
- 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 <u>federal government</u> and each state have a <u>public records act</u>. To follow DTSA and comply state public records and trade secret legislation requires approval through <u>ANAB ISO/IEC 17065 accredited certification bodies</u> or <u>approved sources</u>. For more information, please review this website: <u>Intellectual Property and</u> Trade Secrets.
- <sup>16</sup> <u>https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineeringboards-in-each-state-archive/</u>
- 17 https://www.cbitest.com/accreditation/
- <sup>18</sup> https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code
- <sup>19</sup> https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-
- administration#105.3.1
- <sup>20</sup> <u>https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1</u>
- <sup>21</sup> https://iaf.nu/en/about-iaf-
- mlal#:-:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20 and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of %20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope
- <sup>22</sup> True for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- 23 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission
- <sup>24</sup> Unless otherwise noted, the links referenced herein use un-amended versions of the <u>2024 International Code Council (ICC)</u> 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the <u>IBC 2024</u> and the <u>IRC 2024</u> are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.
- <sup>25</sup> See <u>Adoptions by Publisher</u> for the latest adoption of a non-amended or amended model code by the local jurisdiction. <u>https://up.codes/codes/general</u>
- <sup>26</sup> See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general
- <sup>27</sup> <u>https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14</u>
- 28 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280
- <sup>29</sup> <u>https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND <u>https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled</u></u>
- <sup>30</sup> https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4
- <sup>31</sup> 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%20liv able%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the% 20various%20trades

Report Number: 2404-10 Kenoteq® K-BRIQ® and K-SLIP™ Masonry Veneer

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- <sup>32</sup> <u>https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-</u>
- 3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20 engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur
- <sup>33</sup> Qualification is performed by a legislatively defined <u>Accreditation Body</u>. <u>ANSI National Accreditation Board (ANAB)</u> is the largest independent accreditation body in North America and provides services in more than 75 countries. <u>DrJ</u> is an ANAB accredited <u>product certification body</u>.
- 34 <u>https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH</u>
- <sup>35</sup> Efflorescence is a white or grayish crystalline deposit of salts that forms on the surface of porous materials like concrete, brick, stone, stucco, and other building surfaces.
   <sup>36</sup> <u>2021 IBC Section 1404.6</u>
- <sup>37</sup> 2021 IBC Section 1404.10
- <sup>20</sup> <u>2021 IBC Section 1404.10</u>
- See Code of Federal Regulations (CFR) <u>Title 24 Subtitle B Chapter XX Part 3280</u> for definition: <u>https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280</u>
   2021 IBC Section 104.11
- 40 2021 IRC Section R104.11
- 41 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11
- <sup>42</sup> 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 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.
- <sup>43</sup> <u>https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1</u>
- 44 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- 45 2021 IBC Section 1404.6
- <sup>46</sup> 2021 IBC Section 1404.10.3
- <sup>47</sup> <u>2021 IBC Section 1404.10.1.3</u>
- 48 <u>2021 IBC Section 1404.10.1.1</u>
- 49 2021 IBC Section 1404.4.2
- <sup>50</sup> 2021 IBC Section 1404.10.1.2.1