BEAL Appraised Building Code Compliant C820

Expires 30 May 2024

BEAL Appraisal Certificate

BEAL Building Element Assessment Laboratory Limited

KAPO Board for Interior Wet/Dry Linings, Exterior RAB and Wall Use

Product

1.1 Enviro Square Ltd.'s KAPO Board is a calcium silicate board in sheet form manufactured from non-toxic minerals, which exhibits excellent fire, moisture and mould-resistant properties. It is used extensively overseas as a wall-papered lining alternative to plaster-based boards, for interior use.

1.2 The board is supplied in a range of thicknesses, nominally 6mm, 9mm and 12mm. The 6mm board is used as a ceiling lining when installed over timber or light gauge steel framing. The 9mm and 12mm boards can be used for both interior, such as a wet room lining that is tiled over, and exterior applications. Either thickness can be used for fire-resistant partition walls to a specific design from a fire engineer.

1.3 The board has also been assessed as being suitable for use as a Rigid Air Barrier when incorporating the specified air and moisture resistant sealing tape over joins and around the perimeter of the boards.

Building Regulations

2.1 In the opinion of BEAL, the Enviro Square KAPO Board, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet or contribute to the following provisions of the New Zealand Building Code:

B1 - Structure: Performance Clause B1.3.3.
B2 - Durability: Performance Clause B2.3.1 (a).
C3 - Spread of Fire: Performance Clause C3.4 (a).
E2 - External Moisture: Performance Clause E2.3.2.
F2 - Hazardous Building Materials: Performance Clause F2.3.1.
G6 - Airborne and Impact Sound: Performance Clause G6.3.1.
NOTE: Other performance clauses have been taken into account and found not applicable.

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Scope and Limitations

3.1 The Enviro Square KAPO Board has been appraised for use as described below under the following Scope and Limitations:

Framing Requirements

3.2 KAPO Board must be used in conjunction with timber framing and other components of a wall assembly which comply with NZS3604:2011 or with light gauge steel framing which complies with NASH Standards Parts 1 & 2, in all respects except as varied herein, in order to meet the Performances of the Building Code claimed in this Appraisal.

Interior Finishes

3.3 KAPO Board has been appraised to be used as an unfinished interior lining relying on 400mm or 600mm stud or ceiling joist centres for framing using either 6mm or 9mm thick board. This appraisal is limited to the boards and nominated jointing systems only and excludes any finishing system, such as plastered finishes or tiling systems, which must comply with the relevant performance clauses of the New Zealand Building Code.

Exterior Finishes

3.4 KAPO Board has been appraised as a Light Wall Cladding Substrate as defined in NZS3604:2011 relying on 400mm or 600mm stud or soffit joist centres for framing and using either 9mm or 12mm thick board. This appraisal is limited to the boards and nominated board jointing systems only and excludes any flashings to openings or penetrations, and any finishing system, which must comply with the relevant clauses of the New Zealand Building Code.

3.5 KAPO Board may be used as a rigid air barrier when incorporating the ACIS Butyl Tape in wind zones up to and including Extra high for buildings no more than 10 metres from the ground. (see section 6.4).

3.6 KAPO Board may also be used as a perimeter protection of the MAXRaft Foundation System (see section 6.4).

Installation

3.7 KAPO Board shall be installed by competent builders.

Technical Literature

4.1 The Enviro Square KAPO Board is a calcium silicate board 100% asbestos free and manufactured from a mixture of portland cement, oxidized Silicon, Lime, Sand and Cellulose through a sophisticated manufacturing process to impart durability fire and moisture resistance.

4.2 Technical Manual ESTECH 201603 v1 and ES0012 KAPO Board RAB flyer v8 must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and scope of this Appraisal Certificate must be followed.

4.3 For a copy of this Technical Literature and any subsequent updates please refer to www.envirosquare.com

Technical Specification

5.1 KAPO Board is approximately 10kg/m² (~30kg for a 1.2m x 2.4m board 9mm thick). One side of the board is smooth while the other is slightly rough. Board sizes are typically 2.4m x 1.2m in size with thicknesses being either 6, 9 or 12mm. The mineral board is easy to cut with saws and drills. Fixing is made by way of galvanized clouts into timber or fibretek screws into light gauge steel framing. As the board is made from minerals it has excellent fire resistant properties. It's low moisture absorption lends the board for tiling over in wet areas such as bathrooms and kitchens using a BEAL approved tile adhesive. When used as an interior lining the board edges are beveled to allow the use of the nominated joint filler. The KAPO Board can also be adhered to either EPS or XPS using Uroxsys Panel Laminating Adhesive.

Accessories

5.2 A list of products supplied by others to be used with the KAPO Board product is provided in the Enviro Square KAPO Board Technical Manual ESTECH 201603 v1. This includes the use of Blue Barrier Liquid Flash for the purposes of sealing joints.

Handling and Storage

5.3 The KAPO Board is supplied shrink-wrapped and stacked on pallets and can be stored indefinitely when kept dry and out of the weather and safe from accidental damage and/or external moisture.

Design Information

General

6.1 The KAPO Board must be installed over timber framing complying with NZS 3604:2011 or over light gauge steel framing complying with NASH Standards Parts 1 & 2.

6.2 The 6mm KAPO Board is limited to use for interior ceilings or, for use as a rigid air barrier when installed according to the KAPO Board RAB flyer.

6.3 The 9mm and 12mm KAPO Board is typically for use as a wall lining in either wet or dry rooms.

6.4 It is essential that only BEAL approved tile adhesives are used for tiling over the KAPO Board.

6.5 The KAPO Board can be used perimeter protection of the MAXRaft Foundation System using either EPS or XPS. It shall be installed only in accordance with the MAXRaft installation manual.

Structure - Clause B1

6.6 Enviro Square KAPO Board when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use will meet the performance requirements of B1.3.3. In other words, the building product shall withstand the combination of loads that it is likely to experience during construction or alteration and throughout it's life.

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Durability - Clause B2

6.7 Enviro Square KAPO Board when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use will meet the performance requirements of B2.3.1 (a). In other words, the building product will satisfy the requirements of NZBC Clause B2 for not less than 50 years.

Spread of Fire - Clause C3

6.8 Enviro Square KAPO Board when used as an internal lining that is designed and installed in accordance with the manufacturers instructions will meet the performance requirements of C3.4 (a). The product has been tested by BRANZ Ltd and given the Material Group Number Classification 1-S.

External Moisture - Clause E2

6.9 Enviro Square KAPO Board when used as either a rigid air barrier (RAB) or, as part of an exterior cladding that is designed and installed in accordance with a designer's instructions (approved by a LBP) must meet the performance requirements of E2.3.2. In other words, roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.

Hazardous Building Materials - Clause F2

6.10 Enviro Square Ltd.'s KAPO Board when installed according to the requirements of this appraisal meets performance requirement F2.3.1 and will not present a health hazard to people using the building.

Airborne & Impact Sound - Clause G6

6.11 Enviro Square Ltd.'s KAPO Board when installed as part of a wall assembly can contribute to meeting the performance requirements of G6.3.1.

Installation Information

Installation Skill Requirement

7.1 Enviro Square KAPO Board or as a RAB must be installed by trade qualified builders.

How to Install the Product

7.2 Fixing to timber framing shall be by way of 40mm long galvanized clouts with a local coating thickness of 45 microns of zinc, at 200mm centres.

7.3 Fixing to steel framing shall be by way of 20mm fibretek screws.

7.4 It is essential that the fixings are not closer than 12mm from the edge of the boards and not over-tightened.

7.5 All details of design and installation of the KAPO Board as an interior or exterior lining, must comply with NZS 3604:2011 except where varied by this appraisal.

7.6 Joints and fixing points are flush-filled prior to application of the finish with an Enviro Square approved jointing product, which may be applied by machine or by hand tool to a smooth finish. The joints between boards should be 4mm.

7.7 Where an external render system is to be applied, the joints may be sealed in both the vertical and horizontal directions by way of ACIS Butyl Tape. There is a technical manual describing the correct method of installation of this tape. The tape shall not be left unprotected from the weather for more than 2 days.

Health and Safety

7.8 The safe use and handling of the KAPO Board product is provided in the Enviro Square KAPO Board Technical Manual ESTECH 201603 v1. Accessory products must be used in conjunction with the relevant material's safety data sheet for each product.

Basis of Appraisal

8.1 BEAL use the compliance verification procedure to evaluate compliance with the relevant clauses of the NZBC including a risk analysis procedure. The following is a summary of the technical investigations carried out:

Tests

8.2 The following testing of the Enviro Square KAPO Board has been undertaken by BEAL to verify compliance:

- Resistance to freeze-thaw conditioning.
- Board strength (bending) to AS/NZS 2908.2.
- Moisture permeability to AS/NZS 2908.2.
- Drying shrinkage to AS/NZS 2908.2.
- Durability by way of warm water immersion to AS/NZS 2908.2.
- Fixing pull through testing (wet and dry).
- Compatibility with tile adhesives by way of tensile adhesion testing to ASTM C297-94.
- Adhesion testing of Blue Barrier Liquid Flash to KAPO board to AS/NZS 1580.408.5
- Water Vapour Transmission Rate testing of 6mm KAPO board to ASTM E96
- Tensile adhesion testing of KAPO Board to EPS and XPS using Uroxsys Panel Laminating Adhesive to ASTM C297-94.

8.3 The above test methods, results and respective laboratory test reports have been assessed by BTS and found satisfactory.

Verification of NZBC Performance Criteria

8.4 Clause B1.3.3 - Structure

The basis of BEAL's verification of the ability of the KAPO Board to support self weight and wind loadings was an assessment by an independent engineer.

8.5 Clause B2.3.1 (a) - Durability

The basis of BEAL's verification of the ability of the KAPO Board to meet the New Zealand Building Code performance requirement Clause B2.3.1 (a) is reference to known in service usage, being more than 15 years.

8.6 Clause C3.4 (a) - Spread of Fire

The basis of BEAL's verification of the ability of the KAPO Board to meet the New Zealand Building Code performance requirement Clause C3.4 (a) is reference to the products Material Group Number Classification 1-S verified by BRANZ fire testing.

8.7 Clause E2.3.2 - External Moisture

The basis of BEAL's verification of the ability of the KAPO Board to meet the New Zealand Building Code performance requirement Clause E2.3.2 was an assessment of the product using relevant sections of AS/NZS 2908.2:2000 'Cellulose-cement products Part 2: Flat boards', and weathertight testing in accordance with AS/NZ4284.

The board was also evaluated in practical building situations to assess the following:

- Ease of installing the product
- Potential risks of non performance when being installed

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- Any external factors that could effect the quality of the installed product
- Ease of repair or maintenance (where applicable)
- The impact of other building products/systems when in contact with other similar products.

8.8 Clause F2.3.1 - Hazardous Materials

The basis of BEAL's verification of the ability of the KAPO Board to meet the New Zealand Building Code performance requirement Clause F2.3.1 was a statement from the manufacturer about the absence of asbestos or any other hazardous materials.

8.9 Clause G6.3.1 - Airborne & Impact Sound

The basis of BEAL's verification of the ability of the KAPO Board to contribute to meeting the New Zealand Building Code performance requirement Clause G6.3.1 was an acoustic test report and peer review. The product can contribute to this performance requirement but cannot meet this on its own.

Other Investigations

8.10 A peer review of the acoustic testing of the Enviro Square KAPO Board was conducted by Marshall Day Acoustic Engineers.

8.11 Fire testing to ASTM E136-99 and ASTM E119 was conducted by Intertek Testing Services Ltd.

8.12 Additional fire testing was conducted in 2014 by BRANZ to NZBC verification method C/VM2 Appendix A.

8.13 The Technical Literature has been examined by BEAL and found to be satisfactory.

Quality

8.14 The quality of materials, components and accessories supplied by Enviro Square Ltd. is managed through the use of a Building Product Quality Plan.

8.15 Enviro Square Ltd.'s Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.

8.16 Enviro Square Ltd.'s Building Product Quality Plan is reviewed and audited at least annually by BEAL or an appointed agent.

Sources of Information

- AS 2908.2:2000 Cellulose-cement products—Part 2: Flat boards.
- ASTM C297-94, Standard test method for flatwise tensile strength of standard constructions.
- NZS 3604:2011 Timber framed buildings.
- NASH 3405:2006, Steel framed buildings.
- Peer review by Marshall Day Acoustic Engineers.
- Technical literature supplied by the manufacturer.
- The Building Regulations 1992.
- BEAL test report TR080829d wet & dry pull-through properties.
- BEAL test report TR080919a fixing strength properties.
- BEAL test report TR080919b water resistance properties.
- BEAL test report TR081103 compatibility with render properties.
- BEAL test report TR081208a fixing strength properties.
- BEAL test report TR090126 expansion properties.
- BEAL test report TR090213c suitability for tiling over properties.
- BEAL test report TR201215-1, weathertightness testing
- IDEAS test report dated 7th April 2016 for water vapour transmission rate of 6mm KAPO board
- BEAL test report TR160405-2 Adhesion strength of Blue Barrier Liquid Flash to KAPO Board
- BEAL test report TR150414-3 flatwise tensile strength of KAPO Board adhered to EPS and XPS with Uroxsys Panel Laminating Adhesive.
- Intertek test report 3072910(b) flammability test to ASTM E136-99 Standard test method for behavior of materials in a vertical tube furnace at 750°C.
- Intertek test report 3081872 standard fire test program to ASTM E119 Standard test methods for fire tests of building construction and materials.
- BRANZ type test FH 5551-TT Cone calorimeter test and NZBC verification method C/VM2 Appendix A performance of KAPO Board. Report number FH 5551-TT dated 10 July 2014.
- Thermal Test Report based on AS/NZS 2918 Appendix C, dated December 4, 2020.

Concluding statement

9.1 In the opinion of BEAL, the Enviro Square KAPO Board is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.

9.2 The Appraisal Certificate is issued only to Enviro Square Ltd., and is valid until further notification, subject to the conditions of this Appraisal.

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Conditions of Appraisal

10.1 The products continue to comply with the quality assurance measures of Enviro Square Ltd. These quality assurance measures have been viewed and approved by BEAL.

10.2 The products comply with the conditions of this appraisal and with the Enviro Square KAPO Board Technical Manual ESTECH 201603 v3 and ES0012 KAPO Board RAB flyer v8.

10.3 Enviro Square Ltd. continues to have the product range reviewed and quality assurance programme audited annually by BEAL.

10.4 The overall quality and performance of the products are maintained.

10.5 Enviro Square Ltd. shall notify BEAL of any changes in specification or quality assurance measures prior to them coming into effect.

10.6 BEAL staff use New Zealand or appropriate international standards or an ad hoc method (in the absence of a relevant New Zealand Standard) for carrying out testing and assessments. The evaluation of products is performed either at BEAL's facilities or at a nominated laboratory and carried out by experienced and qualified specialists.

10.7 The product has been tested against one or more of the following criteria which was applicable at the time of the appraisal:

- A measurable criteria described in the New Zealand Building Code, or;
- A relevant New Zealand or Australian Standard, or;
- An appropriate requirement set out in a document from the Ministry of Business, Innovation and Employment (MBIE), or;
- A requirement set out in a Building Quality Institute "Interim Performance Standard".

10.8 BEAL's verification of the building product or system complying with one or more abovementioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the New Zealand Building Code at the date of this appraisal. In the event that the criteria are withdrawn or amended at a later date, this appraisal may no longer remain valid.

C R Prouse - Manager
BEAL Testing Services
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