

# Appraisal of a Building Product



## KAPO Board for interior wet/dry lining and exterior wall use



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# KAPO BOARD

## General Information

### Specific Requirements of the NZ Building Code

#### Clause B1.3.3 - Structure

The KAPO Board when used as part of an exterior cladding that is designed and installed in accordance with the manufacturer's instructions must meet Performance **B1** of the NZBC. In other words, the building and building elements shall withstand the combination of loads that they are likely to experience during construction

or alteration and throughout their lives.

#### Clause B2.3.1 (a) - Durability

The KAPO Board, when used as part of an interior lining or interior cladding that is designed and installed in accordance with the manufacturer's instructions must meet Performance **B2** of the NZBC. In other words, the building system will satisfy the performance requirements of the code for not less than 50 years.



C820 Completed November 2008, Updated August 2009

Verification of Clauses B1, B2, C3, E2, F2 and G6 of the New Zealand Building Code



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### Clause C3.3.5 - Spread of fire

The wall system, when used as part of an exterior cladding that is designed and installed in accordance with the manufacturer's instructions must meet Performance **C3** of the NZBC. In other words, External walls and roofs shall have resistance to the spread of fire, appropriate to the fire load within the building and to the proximity of other household units, other residential units and other property.

### Clause E2.3.2 – External Moisture

The wall system, when used as part of an exterior cladding that is designed and installed in accordance with the manufacturer's instructions must meet Performance **E2** of the NZBC. In other words, roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.

### Clause F2.3.2 – Hazardous Building Materials

Building products must not contain hazardous materials, to comply with clause F2.3.2 of the Building Code.

### Clause G6.3.1 – Airborne and Impact Sound

Walls, floors and ceilings must not have transmission class of less than 55.

## Description of Product

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

The board is supplied in a range of thicknesses, nominally 6mm, 9mm and 12mm. The 6mm board is used as a ceiling lining. 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.

The boards are fixed to timber or light-weight steel framing using either galvanised clouts or fibretek screws with a joint between the boards of 4mm.

Joints and fixing points are flush-filled prior to application of the finish with an Enviro Square approved jointing product. Where KAPO Board is used as a substrate for exterior render based finishes, the joints may be sealed using ACIS Butyl Tape. The tape shall not be left unprotected from

the weather for more than 2 days.

## Trade Literature

The *Enviro Square Ltd. KAPO Board Technical Manual* dated December 2008 describes the correct method of installation. The ACIS Butyl Tape Technical Manual describes the method of use for the tape onto the KAPO Board.

## Applicant

The applicant is Enviro Square Ltd.

## Scope & Limitations

### FRAMING:

KAPO Board must be used in conjunction with timber framing and other components of a wall assembly that comply with NZS3604 or in place of timber framing, with lightweight steel framing that complies with NASH 3405, in all respects except as varied herein, in order to meet the Performances of the Building Code claimed in this Appraisal.

### INTERIOR FINISHES:

KAPO Board has been appraised to be used as an interior lining relying on 400mm or 600mm stud centres or ceiling joist centres for framing and using either 6 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 clauses of the New Zealand Building Code.

### EXTERIOR FINISHES:

KAPO Board has been appraised as a Light Wall Cladding as defined in NZS3604 relying on 400mm or 600mm stud centres or soffit joist centres for framing and using either 9 or 12mm thick board.

This appraisal is limited to the boards and nominated jointing systems only and excludes any finishing system, which must comply with the relevant clauses of the New Zealand Building Code.

The KAPO Board is to be installed by trade qualified builders.

# Detailed Information

## Technical Description

KAPO Board is approximately 10 Kg / m<sup>2</sup> (~30kg for a 1.2m x 2.4m board 9mm thick).



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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. With a density of 1.03 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 lightweight steel framing. As the board is made from minerals it has excellent fire resistant and sound resistance properties, lending it to use for internal partition walls. Its 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.

## Storage & Handling

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

## How to install the product

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.

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

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

All details of the construction and installation of the KAPO Board as an interior or exterior lining, must comply with NZS3604 except where varied by this Appraisal.

Joints between boards are to be filled using Enviro Square approved jointing product, which may be applied by machine or by hand tool to a smooth finish.

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.

# Basis of Appraisal

[BEAL use the Compliance Verification Procedure to demonstrate compliance

with the relevant clauses of the NZ Building Code based on a risk-analysis procedure.]

### 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.

### Clause B2.3.1 (a) - Durability

The basis of BEAL's verification of the wall system to meet the performance requirement of the NZBC, is reference to known in service usage, being more than 10 years.

### Clause C3.3.5 - Spread of fire

The basis of BEAL's verification of the board to meet the performance requirement of the NZBC, is reference to fire test reports, indicating an ignitability index of zero, as the product is a non-combustible mineral material.

### Clause E2.3.2 - External moisture

The basis of BEAL's verification of the board to meet the performance requirement of the NZBC, was an assessment of the product using relevant sections of AS/NZS2908.2 'Cellulose-cement products Part 2: Flat boards'. See Verification of Compliance on page 4.

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

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

### Clause F2 - Hazardous Building Materials

The basis of BEAL's verification of the board to meet the performance requirement of the NZBC, was a statement from the manufacturer about the absence of asbestos or any hazardous materials.

### Clause G6.3.1 - Airborne and Impact Sound

The basis of BEAL's verification of the board to meet the performance requirement of the NZBC, was a test



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report and a peer review commissioned by BEAL, of the testing of a sample of the 12mm thick product, which indicated that it met the requirement of G6.3.1. The 12mm thick product has a STC of 49, complying with clause G6.3.1 of the Building Code.

### Product QA Information

Potential risks associated with the design and construction of the Enviro Square Ltd. KAPO Board and Joint Filler is subject to the manufacturer's Quality Assurance Programme which has been reviewed by BEAL.

### Design Considerations

The KAPO Board can be installed over timber framing complying with NZS 3604 and over light-weight steel framing complying with NASH 3405:2006 Steel Framed Buildings.

The use of 6mm thick board is limited to the use for interior ceilings only.

The use of 9mm or 12mm is for use as a wall lining in either wet or dry rooms. In dry rooms the board should be wall papered as the decorative finish.

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



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## Verification of Compliance

### Methods Used for Verification

- Testing and assessment by a laboratory or testing facility (BEAL)
- In service history - over 10 years overseas.

This appraisal uses the in service history provided by the manufacturer, together with The Compliance Verification Procedure – a method for demonstrating Compliance with the performance requirements of the NZ Building Code, as the 'methods' for demonstrating compliance with the relevant clauses of the Building Code. [Methods suggested by the Department of Building and Housing]

TEST	METHOD	CRITERIA	RESULT
Board strength (bending)	AS/NZS 2908.2	< 0.5% w/w	Pass
Moisture Permeability	AS/NZS 2908.2	< 0.5% w/w	Pass
Drying Shrinkage	AS/NZS 2908.2	< 0.5% l/l	Pass
Warm Water	AS/NZS 2908.2	< 0.5% w/w	Pass
Freeze-Thaw conditioning of board	Ad hoc method	No deterioration	Pass
Wet & Dry Fixing Pull-through testing	Ad hoc method	<10% reduction	Pass
Compatibility with tile adhesives (tensile adhesion test)	ASTM C297 (mod)	>0.5MPa	Pass

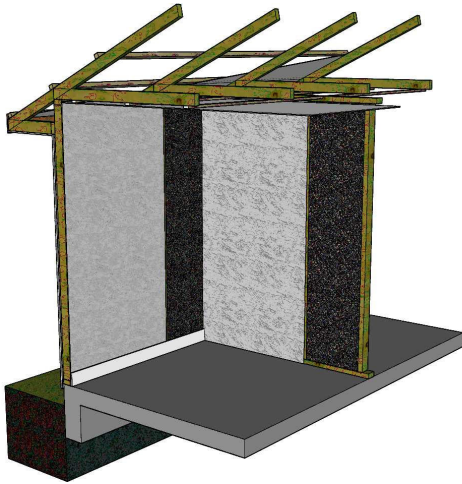
NOTE: For information about AS/NZS Test Methods, refer to [www.standards.co.nz](http://www.standards.co.nz)

## Reference Information

- AS/NZS 2908.2, Cellulose-cement products Part 2: Flat boards
- ASTM C297-94, Standard Test Method for Flatwise Tensile Strength of Standard Constructions
- NZS3604, Timber Framed Buildings
- NASH 3405:2006, Steel Framed Buildings
- Peer review report from Redco Chartered Professional Engineers
- Peer review by Marshall Day Acoustic Engineers
- Technical literature provided by the manufacturer
- 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



# Conditions of this Appraisal



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.
2. The products comply with the conditions of this appraisal and with the Enviro Square KAPO Board Technical Manual dated November 2008.
3. Enviro Square Ltd continues to have the product range reviewed and quality assurance programme audited annually by BEAL.
4. The overall quality and performance of the products are maintained.
5. Enviro Square Ltd. shall notify BEAL of any changes in specification or quality assurance measures prior to them coming into effect.
6. BEAL staff use New Zealand or appropriate international Standards or a 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.
7. The system 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 Building Code, or
  - a relevant New Zealand or Australian Standard, or
  - an appropriate requirement set out in a New Zealand Department of Building & Housing document, or
  - a requirement set out in a Building Quality Institute "Interim Performance Standard"
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 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.

Authorised Signatory -



22 June 2009

C R Prouse - Director

Date of Issue



## BEAL's new approval logo is the assurance that a building product complies with the requirements of the New Zealand Building Code.

Using the latest in Australasian and overseas testing and assessment methods and criteria, BEAL's logo is a sign of confidence -

- ◆ Confidence for the architect or designer that the product literature and details will meet their specific needs;
- ◆ Confidence for the Building Certifying Authority that the product has been evaluated in a rigorous manner to demonstrate or otherwise, compliance with the relevant Clauses of the NZ Building Code;
- ◆ Confidence for the builder and installer that the Technical Manuals are clear and easy to understand.

BEAL's new 'Approval Logo' is being promoted throughout the building industry thus ensuring maximum exposure for all products that carry this logo. For further information contact Colin Prouse at BEAL on (+64) 4 233 6661 or e-mail at [sales@beal.co.nz](mailto:sales@beal.co.nz)

# Contact Details



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