



BRANZ Appraised

Appraisal No.737 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 737 (2011)**

**PRIMAaqua™ /
PRIMALiner™ WALL
AND CEILING LININGS**

Manufactured by:
**Hume Cemboard Industries
Sdn Bhd**
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Malaysia

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Product

1.1 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings are fibre cement sheets for use as internal and external ceiling linings, soffit linings and internal wall linings in dry or wet areas that are not subjected to direct sunlight, rain or snow.

1.2 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings are suitable for use as a base for tiles, wallpaper, paint, and other interior finishes.



Scope

2.1 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings have been appraised for use as interior wall and ceiling linings in timber and steel framed buildings.

2.2 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings have also been appraised as an external ceiling / soffit lining for buildings within the following scope:

- situated in NZS 3604 Wind Zones up to, and including 'Extra High'.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings meets the requirements for loads arising from self-weight, wind and impact [i.e. B1.3.3 (a), (h) and (j)]. See Paragraphs 11.1 to 11.4.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years for substrates to shower areas and external ceiling / soffit linings, B2.3.1 (c) 5 years for interior wall and ceiling linings. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings meet these requirements. See Paragraphs 12.1 and 12.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings when used as external ceiling / soffit linings meet this requirement. See Paragraph 16.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.4, E3.3.5 and E3.3.6. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings meet these requirements. See Paragraph 17.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings meet this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 System components and accessories for PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings, which are supplied by Independent Building Supplies Ltd are:

PRIMAaqua™ / PRIMAliner™ Sheets

- PRIMAaqua™ / PRIMAliner™ sheets are manufactured by Hume Cemboard Industries Sdn Bhd from Portland cement, cellulose fibre, finely ground sand and water. The sheets are formed, cut to length and then cured by high-pressure autoclaving. They are produced in flat, smooth surfaced sheet material form, and are pink in colour.
- PRIMAaqua™ / PRIMAliner™ sheets are manufactured to conform to the requirements of AS/NZS 2908.2. The sheets have square rebated edges to the two long edges for jointing and square edges at the top and bottom of the sheet. They are available in sizes and thicknesses as given in Table 1 and Table 2.

Table 1: PRIMAaqua™ Sheet Size and Thickness

Length (mm)	Width (mm)	Thickness (mm)	
		6.0	9.0
1800	1200	✓	
2400	900	✓	
	1200	✓	✓
2700	1200	✓	✓
3000	900	✓	
	1200	✓	✓
3600	900	✓	
	1200	✓	
4200	1200	✓	

Table 2: PRIMAliner™ Sheet Size and Thickness

Length (mm)	Width (mm)	Thickness (mm)		
		6.0	7.5	9.0
2400	900	✓		
2400	1200	✓	✓	✓

4.2 Accessories used with PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings which are supplied by the building contractor are:

- PRIMAaqua™ / PRIMAliner™ fixings (external ceiling / soffit linings on timber frame) – 40 x 2.8 mm hot-dip galvanised flat head nails (for 6.0, 7.5 and 9.0 mm thick sheets in Wind Zones up to and including Very High) and 60 x 3.15 mm hot-dip galvanised flat head nails (for 6.0, 7.5 and 9.0 mm thick sheets in the Extra High Wind Zone). (Note: Hot-dip galvanising must comply with AS/NZS 4680.)
- PRIMAaqua™ / PRIMAliner™ fixings (interior wall and ceiling linings on timber frame) – 30 x 2.8 mm hot-dip galvanised flat head nails (for 6.0 and 7.5 mm thick sheets), and 40 x 2.8 mm hot-dip galvanised flat head nails (for 9.0 mm thick sheets). (Note: Hot-dip galvanising must comply with AS/NZS 4680.)

- PRIMAaqua™ / PRIMAliner™ fixings (external ceiling / soffit linings on steel frame) – 8-gauge x 20 mm (for 6.0 and 7.5 mm thick sheets in Wind Zones up to and including 'Very High') and 8-gauge x 30 mm (for 9.0 mm thick sheets in Wind Zones up to and including 'Very High') self-drilling AS 3566 Corrosion Class 4 hot-dipped galvanised screws in NZS 3604 defined Corrosion Zones, 1, 2, 3, 4 and the sea spray zone. The screw head must be 7 mm diameter minimum.
- PRIMAaqua™ / PRIMAliner™ fixings (interior wall and ceiling linings on steel frame) – 8-gauge x 20 mm (for 6.0 and 7.5 mm thick sheets) self drilling self embedding head screws and 8-gauge x 30 mm (for 9.0 mm thick sheets) self-drilling self embedding head screws.

(Note: The screw type specified above is suitable for fixing PRIMAaqua™ / PRIMAliner™ to steel frame with a 0.55 mm to 0.75 mm base metal thickness. For steel frame with 0.8 mm to 1.6 mm base metal thickness, use self drilling self embedding head Wing Tek screws.)

Handling and Storage

5.1 Handling and storage of all materials supplied by Independent Building Supplies or the building contractor, whether on site or off site, is under the control of the building contractor. PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or by providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. The sheets must always be carried on edge.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings may be used as wall and ceiling linings in the following areas:

- Wet areas - wall areas enclosing a shower compartment or shower over bath. The sheets are designed to be used in these areas as substrates for wet area membranes and ceramic tiles, and other wet area finishes.
- Semi-wet or dry areas or wall areas adjacent to sanitary fixtures such as baths, tubs and basins. The sheets are designed to be used in these areas as substrates for ceramic tiles, paint, wallpaper or other finishes.

Framing

Timber Framing

8.1 Timber framing must comply with NZS 3604, or buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Timber wall framing behind PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must be treated as required by NZS 3602. In all cases studs must be at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 1200 mm centres and additionally 25 mm above a preformed shower tray, sink, tub or other fixtures, and in any other areas to support baths, towel rails, soap holders and the like.

8.2 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must not be joined off of the framing. Timber framing where sheets are joined must be nominal 50 mm thickness (i.e. 42 mm minimum finished thickness). In tiled areas, dwangs must be provided directly behind all horizontal sheet joints.

8.3 Wall framing around bath enclosures and shower compartments may be checked a maximum of 20 mm to accommodate the bath or shower tray flange. Alternatively, furrings may be fixed to the wall to ensure the face of the PRIMAaqua™ / PRIMAliner™ sheets will finish in front of the upturn on the fixture.

8.4 Supporting framing for external ceiling / soffits must be at maximum 600 mm centres for NZS 3604 Wind Zones up to and including Very High, and at maximum 400 mm centres for Extra High Wind Zones.

8.5 Timber framing must have a maximum moisture content of 16% at the time of the PRIMAaqua™ / PRIMAliner™ sheet application. (Note: If PRIMAaqua™ or PRIMAliner™ sheets are fixed to framing with a moisture content of greater than 16% problems may occur at a later date due to excessive timber shrinkage.)

Steel Framing

8.6 Steel framing must be to a specific design meeting the requirements of the NZBC.

8.7 The minimum framing specification is 'C' section studs and nogs of overall section size of 64 mm web and 38 mm flange. Steel thickness must be minimum 0.55 mm. In all cases studs must be at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 1200 mm centres and additionally 25 mm above a preformed shower tray, sink, tub or other fixtures, and in any other areas to support baths, towel rails, soap holders and the like. Furrings must be fixed to the wall framing around bath enclosures and shower compartments to accommodate the bath or shower tray flange to ensure the face of the PRIMAaqua™ / PRIMAliner™ sheets will finish in front of the upturn on the fixture.

8.8 Supporting framing for external ceiling / soffits must be at maximum 600 mm centres.

8.9 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must not be joined off of the framing. In tiled areas, dwangs must be provided directly behind all horizontal sheet joints.

PRIMAaqua™ / PRIMAliner™ Sheet Set Out

8.10 PRIMAaqua™ / PRIMAliner™ sheets may be installed vertically or horizontally.

Control Joints

9.1 Control joints must be installed in walls to allow for structural movement. They must be positioned in both directions at 7.2 m maximum centres for non-tiled walls, and at 4.8 m maximum centres for tiled walls. Control joints must be constructed as set out in the Technical Literature.

Finishing

10.1 The sheets must be stopped and waterproofed if required. They may then be finished by tiling, painting, wallpapering or applying any other finishing suitable for use over fibre cement sheets.

10.2 Wet areas as defined by AS 3740 must be protected with a BRANZ appraised waterproof membrane system complying with AS/NZS 4858.

10.3 Tiling must be carried out in accordance with AS 3958.1, or the BRANZ publication 'Good Tiling Practice'. A flexible adhesive complying with AS 2358 and a compatible flexible waterproof membrane must be used. All tiles must be fixed in accordance with the tile adhesive manufacturer's instructions.

10.4 Waterproofing systems and wall finishes have not been assessed and are outside the scope of this Appraisal.

Structure

Impact Resistance

11.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings have adequate resistance to impact loads likely to be encountered in normal residential use.

11.2 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings 9 mm thick sheets are designed for use in applications where higher than normal residential impacts can be expected, such as may be encountered in non-residential buildings.

Wind Zones

11.3 When used as a external ceiling / soffit lining on timber framed buildings, PRIMAaqua™ / PRIMAliner™ is suitable for use in all Wind Zones of NZS 3604 up to and including 'Extra High'.

11.4 When used as a external ceiling / soffit lining on steel framed buildings, PRIMAaqua™ / PRIMAliner™ is suitable for use in all Wind Zones of NZS 3604 up to and including 'Very High'.

Sheet Fixings (For External Ceilings and Soffits)

11.5 PRIMAaqua™ / PRIMAliner™ sheets must be fixed to the soffit framing at maximum 150 mm centres along sheet edges and maximum 300 mm centres in the body of the sheet. The fixings must be positioned a minimum of 12 mm from all sheet edges, and a minimum of 50 mm from sheet corners. The fastener heads must finish proud of the sheet surface.

Durability

12.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings meet the performance requirements of NZBC Clause B2.3.1 (b), 15 years when used in accordance with this Appraisal as soffits and wall linings in 'wet areas', and the performance requirements of NZBC Clause B2.3.1 (c), 5 years when used in 'semi-wet' or dry areas.

Serviceable Life

12.2 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Lining installations are expected to have a serviceable life of at least 30 years provided the finish system is maintained in accordance with this Appraisal to ensure the PRIMAaqua™ / PRIMAliner™ sheets and fixings are continuously protected by a water resistant finishing system and remain dry in service.

Maintenance

13.1 Regular maintenance is essential for PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Lining installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.

13.2 In wet areas, annual inspections must be made to ensure that all aspects of the finishing system remain in a waterproof condition. The sheets must remain dry at all times to ensure the sheet fasteners and framing remain durable. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately as for new work.

Outbreak of Fire

14.1 When PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings are used in conjunction with, or attached to heat sensitive materials, the heat sensitive materials must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9.

Spread of Fire

15.1 PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings must be used only where the SFI and SDI for surface finishes meet the surface finish requirements for walls and ceilings in accordance with NZBC Acceptable Solution C/AS1, Part 6, Table 6.2. There are no restrictions on the products use within individual household units in purpose groups SR and SH. Where a SFI and SDI rating is to be established for surface finishes, the complete system must be tested (i.e. finish and substrate). Surface finishes have not been assessed and are outside the scope of this Appraisal.

External Moisture

16.1 PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings installed as an external ceiling / soffit in accordance with this Appraisal and the Technical Literature, prevent the penetration of moisture that could cause undue dampness or damage to building elements.

Internal Moisture

17.1 PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings can be installed and finished as wall linings to provide surfaces that are impervious and easily cleaned, and will prevent water from penetrating behind linings or to concealed spaces.

Installation Information

Installation Skill Level Requirements

17.1 Installation of PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings must be completed by tradespersons with an understanding of fibre cement sheet installation, in accordance with instructions given within the PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings Technical Literature and this Appraisal.

System Installation

PRIMAAqua™ / PRIMAliner™ Sheet Installation

18.1 PRIMAAqua™ / PRIMAliner™ sheets may be cut by scoring and snapping, hand guillotine, hand or power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

18.2 Site edge recessing of cut sheets may be carried out using a tool designed for that specific purpose. An angle grinder run down the sheet edge to produce a square taper may also be used, but will be less accurate. A dust mask must be worn when using an angle grinder. The recess depth must not exceed 1.5 mm, and should be approximately 30 mm wide.

18.3 Prior to fixing sheets, a check must be made to ensure all sheet joints will be supported by framing. The recommended method of installation for sheets is horizontal fixing, with end-joints on studs and staggered a minimum of 600 mm horizontally. Joints over door or window openings must be avoided. If vertical joints are located near the opening, they must be a minimum of 200 mm from opening studs, and must be formed on a stud. For horizontal installation, bottom sheets must be fitted first, and kept clear of the floor by a minimum of 6 mm.

18.4 In tiled areas, a silicone sealant-filled expansion gap of 6 mm must be allowed between sheets at all internal comers and around all plumbing penetrations.

18.5 When PRIMAAqua™ / PRIMAliner™ sheets are used in shower compartments using preformed shower trays, the sheets must overhang the shower tray upstand. Sheets must be sealed to the preformed shower tray upstand rebate with a 6 mm wide bead of silicone sealant. For straight sided preformed trays, the sheets and flashing must overlap inside the tray by approximately 25 mm, and a sealant bead must be placed behind the sheet to ensure no moisture can pass between the sheet and the shower tray upstand.

18.6 All sheet fasteners must be positioned a minimum of 12 mm from the sheet edge, and 50 mm from the sheet corner. Fasteners must be at maximum 200 mm centres in the body of the sheet and at all joints.

18.7 Fixing to timber framing of PRIMAAqua™ / PRIMAliner™ external ceiling / soffits is carried out using 40 x 2.8 mm hot-dip galvanised flat head nails (for 6.0, 7.5 and 9.0 mm thick sheets in Wind Zones up to and including Very High) and 60 x 3.15 mm hot-dip galvanised flat head nails (for 6.0, 7.5 and 9.0 mm thick sheets in the Extra High Wind Zone). Fixing to timber framing of PRIMAAqua™ / PRIMAliner™ interior wall and ceiling linings is carried out using 30 x 2.8 mm hot-dip galvanised flat head nails (for 6.0 and 7.5 mm thick sheets) and 40 x 2.8 mm hot-dip galvanised flat head nails (for 9.0 mm thick sheets). Fixing to steel framing is carried out with 8-gauge x 20 mm (for 6.0 and 7.5 mm thick sheets in Wind Zones up to and including 'Very High') self drilling self embedding head screws and 8-gauge x 30 mm (for 9.0 mm thick sheets in Wind Zones up to and including 'Very High') self-drilling self embedding head screws.

Finishing

18.8 Joints, corners and fastener head indentations must be stopped using two coats of bedding compound. For flat joints and internal corners, paper-reinforcing tape must be embedded in the first bedding coat. Joints in non-tiled areas may be further finished with a topping and finishing compound. Where sheets are to be a substrate for tiling, joints, fastener heads and comers must be stopped with bedding compound only, finishing compounds must not be used. Stopping compounds must be allowed to dry for at least 24 hours before sanding.

18.9 PRIMAAqua™ / PRIMAliner™ sheets may be tiled, painted, wallpapered or finished with other impervious materials such as polyvinylchloride (vinyl) sheet. Application of the selected finish must be carried out in accordance with the relevant manufacturer's instructions.

Inspections

18.10 The Technical Literature must be referred to during the inspection of PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings installations.

Health and Safety

19.1 Safe use and handling procedures for the components that make up PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings are provided in the relevant manufacturer's Technical Literature.

19.2 Cutting of PRIMAAqua™ / PRIMAliner™ sheets must be carried out in well ventilated areas, and a dust mask and eye protection must be worn. When power tools are used for cutting, grinding or forming holes, safety measures as set out in the Technical Literature must be undertaken because of the amount of dust generated.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

20.1 Wind suction tests were conducted by BRANZ to demonstrate the required soffit fixing and soffit lining pull-off strength for both steel and timber framing for Building Wind Zones of NZS 3604.

20.2 Cone Calorimeter testing of PRIMAAqua™ / PRIMAliner™ sheets has been completed by CSIRO in accordance with AS/NZS 3837.

Other Investigations

21.1 Fire and durability opinions have been given by BRANZ technical experts.

21.2 The practicability of installation has been assessed by BRANZ.

21.3 The Technical Literature for PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings has been examined by BRANZ and found to be satisfactory.

Quality

22.1 The manufacture of PRIMAAqua™ / PRIMAliner™ sheets has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

22.2 The quality management system of the PRIMAAqua™ / PRIMAliner™ sheet manufacturer, Hume Cemboard Industries Sdn Bhd, has been assessed and registered as meeting the requirements of ISO 9001: 2008 by SIRIM QAS International Sdn Bhd, Registration Number AR 0430.

22.3 Quality of installation on site of components and accessories supplied by Independent Building Supplies and the building contractor is the responsibility of the installer.

22.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and joinery, building wraps, flashing tapes, air seals, joinery head flashings, cavity battens and PRIMAAqua™ / PRIMAliner™ sheets in accordance with the instructions of Hume Cemboard Industries Sdn Bhd.

22.5 Building owners are responsible for the maintenance of PRIMAAqua™ / PRIMAliner™ Wall and Ceiling Linings in accordance with the instructions of Hume Cemboard Industries Sdn Bhd.

Sources of Information

- AS 3740:2010 Waterproofing of domestic areas.
- AS/NZS 1170: 2002 Structural design action - General principles.
- AS/NZS 2908.2:2000 Cellulose-cement products - Flat Sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter
- AS/NZS 4680: 2006 Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.
- AS/NZS 4858: 2004 Wet area membranes.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 3604: 2011 Timber-framed buildings.
- New Zealand Building Code Handbook, Department of Building and Housing, Third Edition September 2010.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, **PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Hume Cemboard Industries Sdn Bhd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Hume Cemboard Industries Sdn Bhd**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Hume Cemboard Industries Sdn Bhd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Hume Cemboard Industries Sdn Bhd** or any third party.

For BRANZ

P Burghout
Chief Executive

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