BRANZ Appraised
Appraisal No.580 [2007]

BRANZ Appraisals

Technical Assessments of products for building and construction

BRANZ APPRAISAL No. 580 (2007)

Amended 22 December 2010

DAMPFIX 2 AND DAMPFIX 3 EXTERNAL WATERPROOFING MEMBRANES

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WFTAO

Product

1.1 Dampfix 2 and Dampfix 3 External Waterproofing Membranes are liquid applied waterproofing membranes for use under ceramic or stone tile finishes on external decks and balconies.

Scope

2.1 Dampfix 2 and Dampfix 3 External Waterproofing Membranes have been appraised for use as waterproofing membranes for buildings within the following scope:

- scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with timber supporting structures designed and constructed in accordance with the NZBC; and,
- with substrates of plywood and fibre cement compressed sheet; and,
- with decks that have a maximum size of 40m^2.

2.2 Dampfix 2 and Dampfix 3 External Waterproofing Membranes have also been appraised for use as waterproofing membranes for external reinforced concrete pedestrian decks and balconies for buildings within the following scope:

- up to 3 storeys with a maximum height from ground to eaves of 10m and with a floor plan area limited only by seismic and structural control joints; and,
- with the reinforced concrete structure designed and constructed in accordance with the NZBC.

2.3 This Appraisal is limited to decks and balconies within the following scope:

- constructed to suitable falls (Refer Paragraph 13.1 – 13.9); and,
- with the membranes continually protected from exposure to UV (ultra violet) light and from physical damage by ceramic or stone tile finishes; and,
- with decks and balconies designed and constructed such that deflections do not exceed 1/360th of the span; and,
- with no steps within the deck level, no integral roof gardens and no down pipe discharging directly onto the deck.

2.4 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.5 Ceramic or stone tile finishes are outside the scope of this Appraisal.

2.6 The membranes must be installed by Bostik New Zealand Limited Trained and Approved Applicators.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Dampfix 2 and Dampfix 3 External Waterproofing Membranes, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Dampfix 2 and Dampfix 3 External Waterproofing Membranes meet this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Decks and balconies incorporating Dampfix 2 and Dampfix 3 External Waterproofing Membranes meet these requirements. See Paragraphs 13.1 – 13.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Dampfix 2 and Dampfix 3 External Waterproofing Membranes meet this requirement and will not present a health hazard to people.

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

Technical Specification

4.1 Materials supplied by Bostik New Zealand Limited are as follows:

Dampfix 2

- A single component, acrylic, fibre reinforced, ready-to-use, liquid applied membrane. It is supplied as a white paste in 4, 10 and 20 litre pails.

Dampfix 3

- A two-component, cementitious, acrylic modified, fibre reinforced waterproofing membrane. It is supplied as a powder in 10kg multi-wall bags and a liquid in 10kg plastic pails. When dry, the membrane is grey in colour.

ASA Multiprime

- A synthetic latex based primer for a variety of porous substrates. It is supplied as an opaque pink liquid in 1, 5 and 20 litre cans.

Bostik N40 Primer

- A solvent based etching primer for priming PVC wastes. It is supplied in 1 litre cans.

Dampfix Moisture Seal

- A two part water based epoxy for sealing against rising damp, seepage, grease, oil, detergent and mild chemicals. It is supplied as 4, 8, 20 and 40 litre kits.

ASA Neutral Cure Silicone

- A flexible, neutral cure silicone for use as expansion joint filler and bond breaker for wall/wall and wall/floor junctions. It is supplied as a white or coloured paste in 300 ml cartridges.

ASA Epoxy Prime

- A 2 component water based epoxy primer for non porous substrates. It is supplied in 4 and 8 litre kits.

Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The materials in the original unopened packaging have a shelf life of 12 months from date of manufacture. Once opened, products must be used within 3 months.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Dampfix 2 and Dampfix 3 External Waterproofing Membranes. 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 Dampfix 2 and Dampfix 3 External Waterproofing Membranes are for use on decks and balconies where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.

7.2 The Dampfix 3 products are designed to be used where a quicker curing time is required, such as in cool or humid conditions.

7.3 The membranes must be protected from exposure to UV light and from physical damage by ceramic or stone tile finishes.

7.4 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ publication "Good Practice Guide to Membrane Roofing".

7.5 Movement and control joints may be required depending on the shape and size of the deck, and the finish specified. Design guidelines for control joints for tiles can be found in the BRANZ Good Practice Guide to Tiling.

7.6 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of NZS 4203 (AS/NZS 1170). In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and that all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

8.1 Plywood must be treated to H3.2 (CCA treated). **LOSP treated plywood must not be used.** Plywood must comply with NZBC Acceptable Solution E2/AS1 Paragraph 8.5.3 and 8.5.5. Where specific design is used (i.e. outside the scope of E2/AS1) the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings.

Fibre Cement Compressed Sheet

8.4 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS 2908.2 and must be specified by the manufacturer as being suitable for use as an external decking substrate. The fibre cement sheet must be of a thickness to meet specific structural design requirements and must be secured to the structure to resist wind uplift and all other forces acting on the deck or balcony, such as deflection from gravity and live loads. Installation must be in accordance with instructions of the manufacturer.

Concrete

8.5 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

Durability

Serviceable Life

10.1 Dampfix 2 and Dampfix 3 External Waterproofing Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tiling finishes with a design service life of 15-25 years.

Maintenance

11.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiling to ensure it is sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiling and any grout or sealant.

11.2 In the event of damage to the membranes, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.

11.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean. Cleaning materials that may affect polymer based membranes must not be used.

Outbreak of Fire

12.1 The membranes must be protected from heat sources such as flues and chimneys in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

External Moisture

13.1 Decks and balconies must be designed and constructed to shed precipitated moisture. They must also take account of snowfalls in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 is given by the Technical Literature which gives details aligned with NZBC Acceptable Solution E2/AS1.

13.2 When installed in accordance with this Appraisal and the Technical Literature, Dampfix 2 and Dampfix 3 membranes will prevent the penetration of water and will therefore meet code compliance with Clause E2.3.2. The membranes are impervious to water and will give a weathertight deck or balcony.

13.3 The minimum fall to decks, balconies and gutters must be 1 in 60 and all falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane and tiling finish.

13.4 Dampfix 2 and Dampfix 3 membranes are impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with Clause E2.3.6.

13.5 Deck and balcony falls must be built into the substrate and not created with mortar screeds applied over the membrane.

13.6 Allowance for deflection and settlement of the substrate must be made in the design of the deck or balcony to ensure falls are maintained and no ponding of water can occur.

13.7 Drainage flanges must be used for any outlet and must be fitted with a grate or cage to reduce potential sources of blockages. An overflow must be provided where the deck or balcony does not drain to an external gutter or spouting.

13.8 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by blockage of deck and balcony drainage.

13.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

14.1 Installation of the membranes must be completed by Bostik New Zealand Limited Trained and Approved Applicators that have experience in the application of waterproofing membranes and understand waterproofing principles.

14.2 Installation of substrates must be completed by tradespersons with an understanding of deck and balcony construction, in accordance with instructions given within the Bostik New Zealand Limited Technical Literature and this Appraisal.

Preparation of Substrates

15.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve an even and uniform surface.

15.2 Concrete substrates can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 424. The relative humidity of the concrete must be 75% or less before membrane application.

15.3 The moisture content of a timber substructure must be a maximum of 20% and fibre cement and plywood sheet must be dry at time of membrane application. This will generally require plywood and fibre cement sheets to be covered until just before the membrane is laid, to prevent rain wetting.

15.4 Substrates must be primed and allowed to cure before the membrane is installed.

Membrane Installation

16.1 Installation must not be undertaken where the substrate surface temperature is below 10ºC or above 35ºC.

16.2 Dampfix 3 powder and liquid must be mixed and left to stand for 5 minutes before re-mixing, then applying. Dampfix 2 must be thoroughly stirred before application.

16.3 The membrane must be applied in a minimum of two coats at the rates set out in the Technical Literature. Subsequent coats must be applied in an opposite direction to the previous coat. The total finished system thickness of the Dampfix 2 membrane must be a minimum of 1.0 mm and the Dampfix 3 must be a minimum of 1.2 mm.

16.4 Application can be made by roller (medium/long nap), brush (long bristle), or a notched steel trowel (finished with a flat steel trowel).

16.5 A reinforcement fabric may be embedded into the wet coats to provide movement protection at wall/wall and wall/floor junctions, or any other areas such as joints in the flooring substrate, floor cracks, or around penetrations in the membrane. In all other situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.

16.6 It is strongly recommended that the membrane is protected with temporary covers until it is fully cured in case of mechanical damage or rain wetting.

16.7 Clean up may be undertaken with water.

Tiling

17.1 The membranes must be fully cured before tiling. The cured membranes must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

17.2 Tiling must be undertaken in accordance with AS 3958.1 and the 'BRANZ Good Tiling Practice Guide'. The compatibility of tile adhesive must be confirmed with the adhesive manufacturer or Bostik New Zealand Limited.

Inspections

18.1 Critical areas of inspection for waterproofing systems are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membrane curing and integrity prior to the installation of tiles, including protection from moisture, frost and mechanical damage during curing.

Health and Safety

19.1 Safe use and handling procedures for the membrane systems is provided in the Technical Literature. The products must be used in conjunction with the relevant Materials Safety Data Sheet for each membrane.

Basis of Appraisal

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

Tests

20.1 The testing on Dampfix 2 and 3 has been undertaken by various organisations:

- Testing to AS/NZS 4858, Water Vapour Transmission to ASTM E96-92 and Water absorption.
- Adhesion to various substrates, low temperature flexibility to AC148: 2001 and cyclic movement.

Test methods and results were reviewed by BRANZ and found to be satisfactory.

Other Investigations

21.1 An assessment was made of the durability of the Dampfix 2 and Dampfix 3 External Waterproofing Membranes by BRANZ technical experts.

21.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

21.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

22.1 The manufacture of the membranes has been examined by BRANZ, and 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 membranes manufacturer has been assessed by BRANZ and found to be satisfactory.

22.3 The quality of supply of the membrane system materials to the market is the responsibility of Bostik New Zealand Limited.

22.4 Quality on site is the responsibility of the Bostik New Zealand Limited trained and approved applicators.

22.5 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Bostik New Zealand Limited and this Appraisal.

22.6 Building owners are responsible for the maintenance of the tiling systems in accordance with the instructions of Bostik New Zealand Limited.

Sources of Information

- AS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS/NZS 2269: 1994 Plywood-Structural.
- AS 3958.1 Guide to the installation of ceramic tiles.
- AS/NZS 4858: 2004 Wet area membranes.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3604: 1999 Timber framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition May 2007.
- The Building Regulations 1992, up to, and including June 2007 Amendment.
- Good Practice Guide to Tiling, BRANZ, March 2004.
- Good Practice Guide to Membrane Roofing, BRANZ, November 1999.

In the opinion of BRANZ, Dampfix 2 and Dampfix 3 External Wateproofing Membranes 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 Bostik New Zealand Limited, 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. Bostik New Zealand Limited:
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.
3. 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.
4. 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 Bostik New Zealand Limited.
5. 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.
6. BRANZ provides no certification, guarantee, indemnity or warranty, to Bostik New Zealand Limited or any third party.

For BRANZ

C Preston
Chief Executive

Date of issue: 17 December 2007

Amendment No. 1, dated 22 December 2010.
This Appraisal has been amended to update the Appraisal Holder details.