



BRANZ Appraised
Appraisal No. 474 [2019]

**FLEXI-SEAL®
INTERIOR
WATERPROOFING
SYSTEMS**

Appraisal No. 474 [2019]

This Appraisal replaces BRANZ
Appraisal No. 474 [2010]

Amended 02 June 2023



BRANZ Appraisals

Technical Assessments of
products for building and
construction.

Product

- 1.1 Flexi-Seal® Interior Waterproofing Systems are liquid-applied, waterproofing membrane systems for use under ceramic and stone tiles in internal wet areas.

Scope

- 2.1 Flexi-Seal® Interior Waterproofing Systems have been appraised for use as waterproofing membranes for the internal wet areas of buildings, within the following scope:
 - on floor substrates of concrete, flooring grade particleboard, plywood, fibre cement compressed sheet and fibre cement sheet tile underlay, and on wall substrates of wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
 - when protected from physical damage by ceramic tiles or stone finishes; and,
 - where floors are designed and constructed such that deflections do not exceed 1/360th of the span.
- 2.2 The use of Flexi-Seal® Interior Waterproofing Systems on concrete slabs where hydrostatic or vapour pressure is present from below is outside the scope of this Appraisal.
- 2.3 Movement and control joints in the substrate must be carried through the membrane and tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and is therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.4 The ceramic or stone tile finishes are outside the scope of this Appraisal.
- 2.5 The membranes must be installed by trained installers, approved by DGL Bondlast Ltd.



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Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Flexi-Seal® Interior Waterproofing Systems, 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 B2 DURABILITY:** Performance B2.3.1 (b) 15 years and B2.3.2. Flexi-Seal® Interior Waterproofing Systems meet this requirement. See Paragraph 9.1.
 - Clause E3 INTERNAL MOISTURE:** Performance E3.3.6. Internal wet area floors and walls incorporating Flexi-Seal® Interior Waterproofing Systems will meet this requirement. See Paragraphs 11.1–11.7.
 - Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Flexi-Seal® Interior Waterproofing Systems meet this requirement.



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Technical Specification

4.1 Materials supplied by DGL Bondlast Ltd are as follows:

- **Flexi-Seal® 2-Part** is a two-part, flexible, acrylic, cementitious liquid waterproofing membrane. Once mixed it is coloured grey and supplied in kits of 10 L liquid (in a 20 L bucket) and a 15 kg bag of powder. *[Note: Flexi-Seal® 2-Part is a Class II as per AS/NZS 4858.]*
- **Flexi-Seal® PUD** is a single-part, water-based polyurethane modified, flexible waterproofing membrane. It is coloured blue and supplied in 4 and 15 L pails. *[Note: Flexi-Seal® PUD is a Class III as per AS/NZS 4858.]*
- **Orgo'Clean®** is an organic cleaning concentrate for the removal of moss, mould and lichen if present on existing substrates.
- **Universal Primer** is a green liquid concentrated primer for concrete and wet area plasterboard substrates.
- **RL20 Grey** is a two-part epoxy primer used to spot prime galvanised nails and screw heads, as well as PVC and steel waste traps, and to prime plywood and particle board substrates prior to the application of the Flexi-Seal®.
- **Reinforcing Bandage** is a polyester, woven bandage used in conjunction with Flexi-Seal® primers or Flexi-Seal® 2-Part as a bond breaking mechanism to reinforce wall/wall and wall/floor junctions in non-wet and semi-wet areas. For all other applications use Butylseal Tape.
- **Butylseal Tape** is a butyl rubber tape used to detail/reinforce wall/wall and wall/floor joints and all internal and external joints. It is available in a roll of 80 or 150 mm wide and 15 m long.
- **Silcoflex 590 Neutral Cure Silicone** is a siliconised compound used as a bond breaker medium at wall/wall and wall/floor junctions.
- **Aftek FlexPro50FC or NPT U-Seal 500** are polyurethane compounds designed to fill control joints such as in concrete floors.

Handling and Storage

5.1 All materials must be stored inside, away from direct sunlight, heat and flame, in a dry space, at temperatures between 10°C and 32°C. Materials must not be removed from their containers until ready to use. The membrane products have a shelf life of 12 months from the date of manufacture in the original unopened packaging. Once opened, the 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 Flexi-Seal® Interior Waterproofing Systems. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the scope of this Appraisal and the Technical Literature must be followed.

Design Information

General

- 7.1 Flexi-Seal® Interior Waterproofing Systems are for use in buildings where impervious waterproof membranes are required to floors and walls to prevent damage to building elements and adjoining areas.
- 7.2 The membranes must be protected from physical damage by the application of ceramic tiles or other stone finishes.
- 7.3 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ Good Practice Guide: Tiling.

- 7.4 For a Class I Membrane, the bond breaker consists of a 10 mm scallop bead of neutral cure silicone, followed by installation of the reinforcing bandage or Butylseal Tape to all wall/wall and wall/floor joints. For the Class III Membrane, the bond breaker consists of the same as above, but with the Butylseal Tape only; or an alternative method is to apply a 25 mm scallop of neutral cure silicone followed by a coat of the Flexi-Seal® PUD prior to the application of a minimum of two full coats of the Flexi-Seal® PUD.
- 7.5 Timber framing 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 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. Timber framing 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 a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 [CCA treated]. LOSP treated plywood must not be used.
- 8.2 The plywood must be laid with the face grain at right angles to the floor joists. The plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges and 200 mm through the body of the sheets.

Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

- 8.3 Fibre cement compressed sheet and tile underlay must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Installation must be carried out in accordance with the manufacturer's instructions.

Particleboard

- 8.4 Particleboard must be specified for the end use in accordance with NZS 3602.

Concrete and Concrete Masonry

- 8.5 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604 Concrete Slab-On-Ground Floors and Concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

- 8.6 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588 and be suitable for use in internal wet areas.
- 8.7 Fibre cement sheet must be suitable for use in wet areas and comply with AS/NZS 2908.2.
- 8.8 Installation of plasterboard or fibre cement wall linings must be carried out in accordance with the instructions of the manufacturer.

Durability

Serviceable Life

- 9.1 Flexi-Seal® Interior Waterproofing Systems, 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 tile finishes with a design serviceable life of 15-25 years.

Maintenance

- 10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tiling finish remains intact. Regular checks must be made of tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grout and sealants.
- 10.2 In the event of damage to the membrane, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.
- 10.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean.

Internal Moisture

- 11.1 Flexi-Seal® Interior Waterproofing Systems are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.
- 11.2 Flexi-Seal® Interior Waterproofing Systems are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of code compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Paragraph 2.
- 11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of code compliance to NZBC Clause E3.3.3 is given in NZBC Acceptable Solution E3/AS1, Paragraph 3.1.1 b) and 3.1.2 b).
- 11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1,500 mm out from the shower rose. Floor wastes must be provided and the floor must fall to the outlet.
- 11.5 The waterproofing membranes must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1,500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, the BRANZ Good Practice Guide: Tiling, and flooring and wallboard manufacturers.
- 11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30 mm.
- 11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber, plywood or particleboard floors are used. This is also a requirement of particleboard manufacturers.

Installation Information

Installation Skill Level Requirement

- 12.1 Installation of the membranes must be completed by approved and trained applicators that have completed the DGL Bondlast Ltd training programme.
- 12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Flexi-Seal® Interior Waterproofing Systems Technical Literature and this Appraisal.

Preparation of substrates

- 13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.
- 13.2 Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 585. The relative humidity of the concrete must be 75% or less before membrane application.
- 13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor or wall/wall junctions and control joints must use installed as set out in the Technical Literature.
- 13.4 Cement sheet substrates must be primed with Universal Primer diluted 1:1 with water and allowed to cure before the membrane is installed.
- 13.5 Use Universal Primer to prime all plastic waste traps, plywood substrates and nail heads.

Membrane Installation

- 14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.
- 14.2 Flexi-Seal® liquid and Flexi-Seal® powder must be mixed and left to stand for 5 minutes before re-mixing, then applying.
- 14.3 Flexi-Seal® PUD must be thoroughly stirred before application.
- 14.4 The membranes must be applied in a minimum of two coats at the coverage rates set out in the Technical Literature. Subsequent coats must be applied in the opposite direction to the previous coat.
- 14.5 Application can be made by roller (medium/long nap), brush (long bristle), or on floors with a rubber grouting blade.
- 14.6 Reinforcement bandage is bedded into the wet layer of the two-part system at wall/wall and wall/floor junctions. Butylseal Tape is used for this purpose when using the single pack PUD system. For joints in flooring systems and crack suppression on concrete floors the Butylseal Tape is used.
- 14.7 Clean up may be undertaken with water.

Tiling

- 15.1 The membranes must be cured for at least 24 hours in summer and 48 hours in winter 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.
- 15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide: Tiling. The compatibility of the tile adhesive must be confirmed with DGL Bondlast Ltd.

Inspections

- 16.1 Critical areas of inspection 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 membranes to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
 - Membranes curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

- 17.1 Safe use and handling procedures for the membrane are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

Basis of Appraisal

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

Tests

- 18.1 Testing has been carried out by BRANZ covering durability, water absorption, thermal stability, shear, adhesion, static water head resistance, water vapour transmission and suitability over particle board. The test results were reviewed by BRANZ experts and found to be satisfactory.
- 18.2 Testing has carried out by CSIRO to AS/NZS 4858, results of this testing has been reviewed by BRANZ technical experts and is found to be satisfactory.



Other Investigations

- 19.1 An assessment was made of the durability of the Flexi-Seal® Interior Waterproofing Systems by BRANZ technical experts.
- 19.2 Site inspections were carried out by BRANZ to examine the practicability of installation.
- 19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 20.1 The manufacture of the Flexi-Seal® Interior Waterproofing Systems has been examined by BRANZ and found to be satisfactory.
- 20.2 The quality of manufacture of Flexi-Seal® Interior Waterproofing Systems is the responsibility of RLA Polymers Pty Ltd.
- 20.3 The quality of supply to the market is the responsibility of DGL Bondlast Ltd.
- 20.4 The quality of installation on-site is the responsibility of the DGL Bondlast Ltd approved and trained applicator.

Sources of Information

- AS 3740:2021 Waterproofing of domestic wet areas.
- AS 3958.1:2007 Ceramic tiles - Guide to the installation of ceramic tiles.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2269:2012 Plywood - structural.
- BRANZ Bulletin 585 - Measuring moisture in timber and concrete.
- BRANZ Good Practice Guide: Tiling, April 2015.
- NZS 3101:2006 Concrete structures.
- NZS 3109:1997 Concrete construction.
- NZS 3602:2003 Timber and wood-based products for use in buildings.
- NZS 3603:1994 Timber structures standard.
- NZS 3604:2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 02 June 2023.

This Appraisal has been amended to update the Appraisal holder.



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13 September 2019

FLEXI-SEAL® INTERIOR
WATERPROOFING SYSTEMS



In the opinion of BRANZ, **Flexi-Seal® Interior Waterproofing Systems** 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 **DGL Manufacturing Ltd**, 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. **DGL Manufacturing Ltd:**
 - 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 **DGL Manufacturing Ltd**.
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 **DGL Manufacturing Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

13 September 2019