



BRANZ Appraised

Appraisal No. 411 [2023]

VIKING DEC-K-ING PVC WATERPROOFING MEMBRANE

Appraisal No. 411 [2023]

This Appraisal replaces BRANZ
Appraisal No. 411 [2018]



BRANZ Appraisals

Technical Assessments of products
for building and construction.



Viking Roofspec

A division of Viking Group Ltd

PO Box 14 541
Panmure
Auckland

Freephone: 0800 729 799

Freefax: 0800 729 788

Email: info@vikingroofspec.co.nz

Web: www.vikingroofspec.co.nz



BRANZ

BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 Viking Dec-K-ing PVC Waterproofing Membrane is a reinforced polyvinyl chloride (PVC), adhesive-fixed sheet waterproofing membrane designed to be used on pedestrian decks and balconies.
- 1.2 The product is a coloured, laminated, multi-layered, flexible PVC sheet in roll form. The product is installed as a single layer system.

Scope

- 2.1 Viking Dec-K-ing PVC Waterproofing Membrane has been appraised for use as a waterproofing membrane for buildings within the following scope:
 - on pedestrian decks and balconies; and,
 - the 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 sheet and fibre cement compressed sheet; and,
 - with decks that have a maximum size of 40 m².
- 2.2 Viking Dec-K-ing PVC Waterproofing Membrane has also been appraised for use as a waterproofing membrane for external reinforced concrete pedestrian decks and balconies for buildings within the following scope:
 - subject to specific structural and weathertightness design; and,
 - with a substrate of concrete slab; and,
 - situated in specific design wind pressures (refer to Paragraph 8.1); and,
 - with the weathertightness design of junctions for each specific structure being the responsibility of the building designer.
- 2.3 This Appraisal is limited to pedestrian decks and balconies within the following scope:
 - constructed to suitable falls (refer to Paragraphs 13.4 and 13.5); and,
 - with no steps within the deck level, no integral roof gardens and no downpipes discharging directly onto the deck.
- 2.4 The design and construction of the substrate and movement and control joints are specific to each building, and are therefore the responsibility of the building designer and building contractor, and are outside the scope of this Appraisal.
- 2.5 The membrane must be installed by Viking Roofspec trained and approved applicators.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Viking Dec-K-ing PVC Waterproofing Membrane, 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. Viking Dec-K-ing PVC Waterproofing Membrane meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Decks and balconies incorporating Viking Dec-K-ing PVC Waterproofing Membrane meet these requirements. See Paragraphs 13.1–13.8.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1 Viking Dec-K-ing PVC Waterproofing Membrane meets this requirement.

Technical Specification

4.1 Materials supplied by Viking Roofspec are as follows:

- **Viking Dec-K-ing PVC Waterproofing Membrane** - a PVC waterproof sheet membrane reinforced with a polyester fabric mat. The product is supplied as a 1.5 mm thick sheet with a width of 1.8 m and length of 23 m or 115 m. The Viking Dec-K-ing PVC Waterproofing Membrane is available in 6 colours.
- **Dec-K-ing Contact Adhesive** - a specially formulated solvent-based adhesive for all Viking Dec-K-ing PVC Waterproofing Membrane applications. It has been designed to withstand the plasticizers in PVC sheeting. Supplied in 18.9 L containers.
- **Dec-K-ing Floor Patch and Floor Patch Additive** - a two-part, cement-based concrete patching compound to rapidly repair rough or damaged concrete prior to the installation of floor coverings. The floor patch is supplied in 10 kg bags and the additive is supplied in 3.7 and 18.9 L containers.
- **Dec-K-ing Deck Cleaning Conditioner** - a cleaning conditioner for maintaining completed Viking Dec-K-ing PVC Waterproofing Membrane decks. It is supplied in 947 ml plastic containers.
- **Dec-K-ing Scupper Drain** - a one piece PVC scupper drain with baked-on plastisol coating. It is used to provide adequate drainage in Viking Dec-K-ing PVC Waterproofing Membrane decks by way of wall or overflow drainage.
- **Dec-K-ing Fastening Bar** - an anodized, extruded aluminium, pre-drilled channelled bar with tape sealant installed on the back. It is used for mechanically fixing Viking Dec-K-ing PVC Waterproofing Membrane under doorways, on wall surfaces, step risers, wheelchair ramps and deck edges.
- **Dec-K-ing Deck Edge Flashing** - a deck edge flashing for use with Viking Dec-K-ing PVC Waterproofing Membrane to provide a formed drip edge at the deck edge.
- **Dec-K-ing PVC Drain** - a PVC floor-waste deck drain with a clamp-ring system for use with Viking Dec-K-ing PVC Waterproofing Membrane to ensure a water-tight seal. It is available in various drain and grill sizes.

Handling and Storage

5.1 Handling and storage of all materials, whether on-site or off-site, is under the control of the Viking Roofspec trained and approved applicators. Dry storage must be provided for all products.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Viking Roofspec Dec-K-ing Architect CAD Details No. DK01 – DK17, dated 29/4/2015.
- Substrate Checklist – Dec-K-ing Plywood, Version 1.1, dated December 2015.

6.2 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 Viking Dec-K-ing PVC Waterproofing Membrane is for use on pedestrian decks and balconies where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to the BRANZ Good Practice Guide: Membrane Roofing.
- 7.3 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 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.
- 7.4 The fully adhered membrane is suitable for use on decks and balconies of buildings within all NZS 3604 Building Wind Zones up to, and including, Extra High.
- 7.5 The membrane is designed for use on trafficable decks and balcony areas; however, contact with sharp objects that may damage the membrane surface must be avoided.

Structure

- 8.1 Viking Dec-K-ing PVC Waterproofing Membrane, using the standard method of fully bonded with heat welded seams, is suitable for use in areas subject to a maximum design differential Ultimate Limit State (ULS) wind pressure of 6 kPa, subject to the limitations of the substrate.

Substrates

Plywood

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

[Note: Movement of the plywood substrate, caused by various factors, can produce a membrane wrinkle at the movement points. This is known as 'tenting'. The Dec-K-ing substrate specification has been written to prevent substrate movement, however on rare occasions tenting has still occurred due to certain seasonal conditions. The performance and long term durability of the Dec-K-ing membrane will not be adversely affected if tenting occurs.]

Fibre Cement Compressed Sheet

- 9.2 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 deck substrate. The fibre cement sheet must be of a thickness to meet the 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.

Concrete

- 9.3 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 or NZS 3109.

Durability

Serviceable Life

- 10.1 Viking Dec-K-ing PVC Waterproofing Membrane, when subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years.

Maintenance

- 11.1 No maintenance of the membrane is normally required provided significant substrate movement does not occur.
- 11.2 In the event of damage to the membrane, the membrane must be repaired by removing the damaged portion and applying a patch as for new work.
- 11.3 Drainage outlets must be maintained to operate effectively.

Prevention of Fire Occurring

- 12.1 Separation or protection must be provided to the Viking Dec-K-ing PVC Waterproofing Membrane from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 13.1 Pedestrian 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 the performance requirements of NZBC Clause E2.3.1 is given by the Technical Literature which is aligned with details in NZBC Acceptable Solution E2/AS1.
- 13.2 When installed in accordance with this Appraisal and the Technical Literature, Viking Dec-K-ing PVC Waterproofing Membrane will prevent the penetration of water and will therefore meet the performance requirements of NZBC Clause E2.3.2. The membrane is impervious to water and will give a weathertight deck or balcony.
- 13.3 Viking Dec-K-ing PVC Waterproofing Membrane is impermeable, therefore a means of dissipating construction moisture must be provided in the building design and construction to meet the performance requirements of NZBC Clause E2.3.6.
- 13.4 The minimum fall to decks and balconies must be 1 in 40 and gutters is 1 in 60. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane.
- 13.5 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.
- 13.6 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.
- 13.7 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by blockage of deck and balcony drainage.
- 13.8 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 membrane must be completed by trained applicators, approved by Viking Roofspec.
- 14.2 Installation of substrates must always be carried out in accordance with the Viking Dec-K-ing PVC Waterproofing Membrane Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

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 The relative humidity of the concrete must be 75% or less before membrane application. Concrete substrates can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 585.
- 15.3 The moisture content of the timber substructure must be a maximum of 20% and plywood and fibre cement compressed sheet must be dry at time of membrane application. This will generally require plywood and fibre cement compressed sheets to be covered until just before the membrane is laid to prevent rain wetting.
- 15.4 All plywood edges must be glued with a continuous bead of Gorilla Grip Construction Adhesive. The plywood is laid with the face grain at right angles to the framing in a brick bond pattern with tight, butted joints. Refer to Masterspec 4432V, Section 3.7, or Substrate Checklist - Plywood in the Dec-K-ing section of www.vikingroofspec.co.nz for further specific plywood preparation instructions for Dec-K-ing.

Membrane Installation

- 16.1 The membrane must be installed in accordance with the Technical Literature.
- 16.2 The membrane should be unrolled without tension onto the prepared substrate. On plywood substrates the seams can be stapled to temporarily hold the membrane in place. These staples are removed later when the seams are welded.
- 16.3 Joints must be overlapped by a minimum of 20 mm at the ends and sides, with side overlapping in the direction of the fall. A minimum allowance of approximately 75 mm of membrane is required at deck edges, and 150 mm to turn up walls or upstands.
- 16.4 Adhesion of the membrane to the substrate is carried out by using a contact adhesive. The contact adhesive may be used in temperatures as low as 0°C.
- 16.5 Installation of the membrane is carried out by folding back half of the sheet at a time, applying the adhesive and folding back the sheet over to adhere it to the decking. Contact adhesive is applied to both the membrane and the substrate.
- 16.6 After all detailing work such as internal and external corners, deck edges and flashings have been completed, the joint seams can be welded using a hot air welder.

Inspections

- 17.1 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.

Health and Safety

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

Basis of Appraisal

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

Tests

- 19.1 Tests have been carried out on Viking Dec-K-ing PVC Waterproofing Membrane in Canada by Intertek Testing Services for compliance with CAN/CGSB 37.54-95 Test Standard for Polyvinyl Chloride Roofing and Waterproofing Membrane, and from ICBO-ES Acceptance Criteria for Walking Decks [AC39].
- 19.2 The CAN/CGSB 37.54-95 testing covered thickness, breaking strength, elongation at break, lap joint strength, low temperature impact, resistance to heat ageing, low temperature flexibility, resistance to accelerated weathering, water vapour transmission, effect of water absorption, dimensional change and chemical resistance.
- 19.3 The ICBO testing covered tensile strength, elongation at break, bond strength (using both latex and contact adhesive), low temperature flexibility, accelerated ageing, weatherometer testing, effect of water absorption, percolation, concentrated load, abrasion resistance and chemical resistance.
- 19.4 This testing showed that the Viking Dec-K-ing PVC Waterproofing Membrane passed all of the requirements of these standards.

Other Investigations

- 20.1 An assessment was made of the durability of the Viking Dec-K-ing PVC Waterproofing Membrane by BRANZ technical experts, partially based on the inspection and assessment of decks in the USA and by examination and testing of samples taken from the decks.
- 20.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 20.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 The manufacture of the membrane has not been examined by BRANZ, but the membrane manufacturer, Canadian General-Tower Limited is the subject of IATF 16949 and ISO 9001 Certification.
- 21.2 The quality of supply of the product to the market is the responsibility of Viking Roofspec.
- 21.3 Quality on-site is the responsibility of the Viking Roofspec trained and approved applicator.
- 21.4 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, Viking Roofspec and this Appraisal.

Sources of Information

- AS/NZS 2908.2:2000 Cellulose-cement products - Flat sheets.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2269:2012 Plywood - Structural.
- BRANZ Bulletin No. 585 Measuring Moisture in Timber and Concrete, June 2015.
- BRANZ Good Practice Guide: Membrane Roofing, October 2015.
- NZS 3101:2006 Concrete structures standard.
- NZS 3109:1997 Concrete construction.
- 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.



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14 April 2023

VIKING DEC-K-ING PVC
WATERPROOFING MEMBRANE



In the opinion of BRANZ, **Viking Dec-K-ing PVC Waterproofing Membrane** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Viking Roofspec**, 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. **Viking Roofspec**:
 - 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 **Viking Roofspec**.
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 **Viking Roofspec** or any third party.

For BRANZ

Claire Falck
Acting Chief Executive

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14 April 2023