



BRANZ Appraised

Appraisal No. 608 [2017]

DAVCO K10 PLUS, K10 RAPID AND DAVCO K12 EXTERNAL WATERPROOFING MEMBRANES

Appraisal No. 608 [2017]

This Appraisal replaces BRANZ
Appraisal No. 608 [2008]

Amended 22 September 2020



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Davco K10 Plus, K10 Rapid and Davco K12 are liquid-applied waterproofing membranes for use under ceramic or stone tile finishes on external decks and balconies.

Scope

- 2.1 Davco K10 Plus, K10 Rapid and Davco K12 have been appraised for use as waterproofing membranes for buildings within the following scope:
- 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 and fibre cement compressed sheet; and,
 - with decks that have a maximum size of 40 m²; and,
 - situated in NZS 3604 Wind Zones, up to, and including, Extra High.
- 2.2 Davco K10 Plus, K10 Rapid and Davco K12 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 10 m 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; and,
 - subjected to unrestricted wind pressures [Refer Paragraph 8.1]; and,
 - with the weathertightness design of all junctions being the subject of specific design by the designer. [Note: The design of these junctions have not been assessed by BRANZ and are outside the scope of this Appraisal.]
- 2.3 This Appraisal is limited to decks and balconies within the following scope:
- constructed to suitable falls [Refer Paragraph 12.1 – 12.9]; and,
 - with the membranes continually protected from exposure to ultraviolet (UV) 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 pipes 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 membrane must be installed by Sika Australia Pty Ltd approved and trained applicators.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Davco K10 Plus, K10 Rapid and Davco K12, 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. Davco K10 Plus, K10 Rapid and Davco K12 meet this requirement. See Paragraph 10.1.
 - Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1 and E2.3.2. Decks and balconies incorporating Davco K10 Plus, K10 Rapid and Davco K12 meet these requirements. See Paragraphs 12.1–12.9.
 - Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Davco K10 Plus, K10 Rapid and Davco K12 meet this requirement and will not present a health hazard to people.

Technical Specification

- 4.1 Materials supplied by Sika Australia Pty Ltd are as follows:
 - **Davco K10 Plus** - a flexible [Class III as defined in AS/NZS 4858], single-pack, water-based polyurethane waterproofing membrane. It is supplied as a grey paste in 4 and 20 L pails or green paste in 4 and 20 L pails.
 - **Davco K10 Rapid** - a flexible [Class III as defined in AS/NZS 4858], single-pack, water-based polyurethane waterproofing membrane. It is supplied as a yellow paste in 5 and 15 L pails.
 - **Davco K12** - a flexible, [Class III as defined in AS/NZS 4858] single-part, ready-to-use, water-based polyurethane waterproofing membrane. It is supplied as a blue liquid in 17 L containers.
 - **Ultraprime** - an acrylic-based multipurpose primer for all porous substrates. It is supplied as a blue liquid in 1, 5 and 20 L containers.
 - **Ultrabond** - a grey, flexible, two-part primer/bond enhancer for use over difficult or non-porous substrates. It is supplied as a kit made up of a 20 kg bag and a 5 L pail.

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, the materials 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 Davco K10 Plus, K10 Rapid and Davco K12. 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 Davco K10 Plus, K10 Rapid and Davco K12 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 membranes must be protected from exposure to UV light and from physical damage by ceramic or stone tile finishes.
- 7.3 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membranes. Refer to the BRANZ Good Practice Guide to Membrane Roofing.
- 7.4 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.
- 7.5 Timber floor 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. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed $1/360^{\text{th}}$ of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Structure

- 8.1 The Davco K10 Plus, K10 Rapid and Davco K12 Waterproofing Membranes are a fully bonded system. When they are used as waterproofing membranes for reinforced concrete pedestrian decks and balconies, there is no restriction on the design wind pressure the membrane can be subjected to.

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, Paragraph 8.5.3 and 8.5.5.

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 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

- 9.3 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 Davco K10 Plus, K10 Rapid and Davco K12, 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 membrane, 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.

External Moisture

- 12.1 Decks and balconies must be designed and constructed to shed precipitated moisture. They must also take account of snowfalls in snow prone areas.
- 12.2 The Technical Literature contains information on the installation of Davco K10 Plus, K10 Rapid and Davco K12. For the dimensional requirements of the membrane installation, NZBC Acceptable Solution E2/AS1, Section 8.5 must be consulted. The design of details not covered by Acceptable Solution E2/AS1 are the subject of specific design and are outside the scope of this Appraisal.
- 12.3 When installed in accordance with this Appraisal and NZBC Acceptable Solution E2/AS1 membrane dimensional details, Davco K10 Plus, K10 Rapid and Davco K12 will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membranes are impervious to water and will give a weathertight deck or balcony.
- 12.4 The minimum fall to decks and balconies is 1 in 40 and gutters 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.
- 12.5 Davco K10 Plus, K10 Rapid and Davco K12 are impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with NZBC Clause E2.3.6.
- 12.6 Deck and balcony falls must be built into the substrate and not created with mortar screeds applied over the membrane. Where a reinforced concrete substrate is used, a mortar screed may be used to create the falls prior to membrane application.
- 12.7 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.
- 12.8 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.
- 12.9 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by blockage of deck and balcony drainage.

Installation Information

Installation Skill Level Requirement

- 13.1 Installation must always be carried out in accordance with the Davco K10 Plus, K10 Rapid and Davco K12 Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class and an understanding of deck and balcony construction.
- 13.2 Installation and finishing of components and accessories supplied by Sika Australia Pty Ltd and its approved applicators must be completed by trained applicators, approved by Sika Australia Pty Ltd.

Preparation of Substrates

- 14.1 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.
- 14.2 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.
- 14.3 The moisture content of a timber substructure must be a maximum of 20% and fibre cement and plywood sheet must be dry at the 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.
- 14.4 Non-porous substrates must be primed with appropriate primer and allowed to cure before the membrane is installed.

Membrane Installation

- 15.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.
- 15.2 The membrane must be applied in two coats at the rates set out in the Technical Literature. The total finished system thickness of the Davco K10 Plus, K10 Rapid and Davco K12 must be a minimum of 1.6 mm.
- 15.3 Application can be made by roller [medium/long nap] or brush [long bristle].
- 15.4 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.
- 15.5 Clean up may be undertaken with water while the membrane is still wet.

Tiling

- 16.1 The membrane 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.
- 16.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide to Tiling. The compatibility of tile adhesive must be confirmed with the adhesive manufacturer or Sika Australia Pty Ltd.

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, particularly installation to the correct thickness.
 - Membrane curing and integrity prior to the installation of tiles, including protection from moisture, frost and mechanical damage during curing.

Basis of Appraisal

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

Tests

- 18.1 The testing on Davco K10 Plus, K10 Rapid and Davco K12 has been undertaken by various organisations:
- Testing to AS/NZS 4858: 2004 Appendix A including effect of heat aging, bleach, detergent and water on tensile and elongation, Water Vapour Transmission to ASTM E96-92 and cyclic movement.
 - Adhesion to various substrates and low temperature flexibility.
- Test methods and results were reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 19.1 An assessment was made of the durability of Davco K10 Plus, K10 Rapid and Davco K12 by BRANZ technical experts.
- 19.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 20.1 The manufacture of the membrane has been examined by BRANZ, details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 20.2 The quality management system of the membrane manufacturer has been assessed by BRANZ and found to be satisfactory.
- 20.3 The quality of supply of the membrane system materials to the market is the responsibility of Sika Australia Pty Ltd.
- 20.4 Quality on site is the responsibility of the Sika Australia Pty Limited approved and trained applicators.
- 20.5 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, Sika Australia Pty Ltd and this Appraisal.
- 20.6 Building owners are responsible for the maintenance of the tiling systems in accordance with the instructions of Sika Australia Pty Ltd.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS 2908.2: 2010 Cellulose-cement products – Flat sheet.
- AS 3958.1: 2007 Guide to the installation of ceramic tiles.
- AS/NZS 2269: 2012 Plywood-Structural.
- AS/NZS 4858: 2004 Wet area membranes.
- BRANZ Good Practice Guide to Tiling, 2015.
- BRANZ Good Practice Guide to Membrane Roofing, 2015.
- NZS 3101: 2006 Concrete 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.



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WATERPROOFING MEMBRANES



BRANZ

Amendments

Amendment No.1, dated 24 May 2018

This Appraisal has been amended to include Davco K10 Rapid membrane.

Amendment No.2, dated 22 September 2020

This Appraisal has been amended to include Davco K12 membrane.



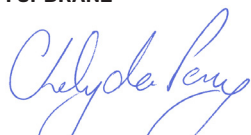
In the opinion of BRANZ, **Davco K10 Plus, Davco K10 Rapid and Davco K12 External Waterproofing Membranes** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Sika Australia Pty 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. **Sika Australia Pty 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 **Sika Australia Pty 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 **Sika Australia Pty Ltd** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

17 January 2017