



BRANZ Appraised
Appraisal No. 1174 [2022]

TEMA EXTERNAL MEMBRANES

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BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 TeMa No-Crack, T-K NW, T-K Net and TH2 Stop for balconies and terraces are multi-layer exterior waterproofing membranes for use under ceramic or stone tiles on external decks and balconies.

Scope

- 2.1 TeMa No-Crack, T-K NW, T-K Net and TH2 Stop 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.
- 2.2 TeMa No-Crack, T-K NW, T-K Net and TH2 Stop 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.
- 2.3 This Appraisal is limited to decks and balconies within the following scope:
 - constructed to suitable falls; and,
 - with the membrane 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 downpipes 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

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, TeMa External Membranes, 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. TeMa External Membranes meet these requirements. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Roofs and decks incorporating TeMa External Membranes meet these requirements. See Paragraphs 13.1–13.8.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. TeMa External Membranes meet this requirement.

Technical Specification

4.1 Materials supplied by TeMa Technologies and Materials S.r.l are as follows:

- **TeMa No-Crack** – a disconnecting membrane comprising an HDPE dimpled membrane layer, with a roughed surface and a spun bonded polypropylene fabric.
- **T-K NW** – a draining geo-composite comprising a polyethylene membrane with truncated conical relief details, coupled with a filtering fabric.
- **T-K Net** – a draining geo-composite comprising a polyethylene membrane with truncated conical relief details, with a heat-bonded HDPE mesh.
- **TH2 Stop** – a three-ply waterproof sealing membrane for application under tiles to protect walls and floors from humidity and vapour transmission.
- **T-Bandel** – a three-layer waterproof band with internal polyethylene core, coupled on both sides with felted polypropylene fabric.
- **T-Fix** – a single-component hygro-hardening ST polymer adhesive.

Handling and Storage

5.1 Handling and storage of all materials, whether on-site or off-site, is under the control of the trained applicators, approved by TeMa Technologies and Materials S.r.l. Dry storage and protection from direct sunlight and UV light must be provided for all products and the rolls of membrane must be lying down on pallets.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for TeMa External 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 TeMa External Membranes are for use on roofs and decks where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 TeMa External Membranes can be adversely affected by contact with bituminous materials or polystyrene insulation. TeMa Technologies and Materials S.r.l should be contacted for advice in either of these situations.
- 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: Membrane Roofing.
- 7.4 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 and that all sheet edges are fully supported.
- 7.5 Roofs where regular foot traffic is envisaged i.e. maintenance of lift equipment, a walkway over the membrane should be used to ensure the membrane is protected. TeMa External Membranes are designed for limited, irregular pedestrian access only.
- 7.6 Decks must always be protected by a pedestal protection system.

Structure

- 8.1 TeMa External Membranes fully bonded are suitable for use in areas subject to maximum wind pressure of 3 kPa Ultimate Limit State [ULS] 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. 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.

Concrete

- 9.2 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 TeMa External Membrane when subjected to normal conditions of environment and with proper maintenance can expect to have a serviceable life of at least 15 years.

Maintenance

- 11.1 Maintenance requirements of the membrane are provided by the membrane supplier.
- 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 TeMa External Membrane from heat sources such as fireplaces, heating appliances, flues 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 Roofs and decks 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.
- 13.2 When installed in accordance with this Appraisal and the Technical Literature, TeMa External Membranes 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 roof or deck.
- 13.3 TeMa External Membranes 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.
- 13.4 The minimum fall for roofs is 1 in 30. The minimum fall for plywood decks is 1 in 40, suspended concrete slab 1 in 60, and gutters 1 in 100. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane. *[Note: Where possible, BRANZ recommends falls in gutter to be 1 in 60.]*
- 13.5 Falls must be built into the plywood or substrate.
- 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 roof or deck does not drain to an external gutter or spouting.
- 13.7 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof 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 membranes must be completed by trained installers, approved by TeMa Technologies and Materials S.r.l.
- 14.2 Installation of substrates must always be carried out in accordance with the TeMa External Membranes 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 concrete substrates must be 75% or less before membrane application. The concrete can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 585.
- 15.3 The moisture content of a timber substructure must be a maximum of 20% and the plywood must be dry at time of membrane application. This will generally require plywood to be covered until just before the membrane is laid, to prevent rain wetting.

Membrane Installation

- 16.1 The installation of these membrane systems is very complex and limited to trained installers only. The TeMa Technologies and Materials S.r.l Technical Literature should be referred in all instances for the correct procedures.

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 Technical Literature 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 Testing has been carried out on the membranes by various organisations for tensile strength, elongation, joint peel and shear strength, cold bending after UV aging, static load resistance, water pressure resistance, water vapour permeability, shear/joint strength, adhesion to plywood, peel adhesion, resistance to aging, resistance to impact, resistance to frost, resistance to freeze/thaw, elongation, seam strength, breaking strength, low temperature brittleness point, water absorption and resistance to UV.
- 19.2 Results and test methods have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 20.1 A durability opinion has been given on TeMa External Membranes by BRANZ technical experts.
- 20.2 Site inspections have been carried out by BRANZ to examine 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 TeMa External Membranes 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.
- 21.2 The quality of supply of the product to the market is the responsibility of TeMa Technologies and Materials S.r.l.
- 21.3 Quality on-site is the responsibility of trained installers, approved by TeMa Technologies and Materials S.r.l.
- 21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, TeMa Technologies and Materials S.r.l and this Appraisal.

Sources of Information

- AS/NZS 1170:2002 Structural Design action – general principles.
- AS/NZS 2269:2012 Plywood – Structural.
- BRANZ Good Practice Guide: Membrane Roofing, October 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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01 June 2022

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In the opinion of BRANZ, **TeMa External 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 **TeMa Technologies and Materials S.r.l.**, 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. **TeMa Technologies and Materials S.r.l.:**
 - 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 **TeMa Technologies and Materials S.r.l.**
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 **TeMa Technologies and Materials S.r.l.** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

01 June 2022