



BRANZ Appraised
Appraisal No. 961 [2017]

THERMOFILL



Appraisal No. 961 (2017)

BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Thermofill is a pumped foam-concrete ground cover used to seal damp or wet ground in the sub-floor space under buildings. The purpose of its application is to reduce moisture vapour rising up through the building, thus reducing indoor relative humidity.

Scope

- 2.1 Thermofill has been appraised for use as a ground cover vapour barrier for use in the sub-floor space of buildings to reduce the moisture evaporating from the ground under the floor within the following scope:
 - as a vapour barrier for use in existing buildings; and,
 - as an alternative to the vapour barrier specified in NZS 3604, Paragraph 6.14.3.
- 2.2 The installation of Thermofill must be carried out only by personnel authorised by Canterbury Foam Concrete Ltd.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Thermofill, if used, designed, 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. Thermofill meets this requirement. See Paragraph 8.1.
 - Clause E2 EXTERNAL MOISTURE:** Performance E2.3.4. Thermofill meets this requirement. See Paragraphs 9.1 and 9.2.
 - Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Thermofill meets this requirement and will not present a health hazard to people.

Technical Specification

- 4.1 Thermofill is produced using a sand/cement slurry mix, which is delivered to site from a conventional concrete batching plant in a concrete delivery truck. A mobile portable foaming generator is used on site to generate the foam using water and a protein foaming agent. Depending on the volume of slurry ordered, the correct quantity of foam needed is calculated, generated and pumped into the slurry mix while still in the bowl of the concrete truck. Once mixing is complete, the slurry/foam mix is delivered into a concrete pump and pumped via a delivery pipe to the point of placement. The foamed concrete retains the air within it during the time that it takes to set. Thermofill is placed at a thickness of approximately 80 mm. Curing time is dependent on ambient air-temperature, and is similar to conventional concrete.



Handling and Storage

- 5.1 There are minimal handling and storage requirements for the constituent components of Thermofill.
- 5.2 The cement/sand slurry mix is delivered to site to order in a conventional ready-mix concrete truck. The protein foaming agent is delivered to site in the containers in which it is supplied by the manufacturer. The foam producing machinery and associated containers and pipe-work must be maintained and thoroughly cleaned after each use.

Technical Literature

- 6.1 Refer to the Appraisals listings on the BRANZ website for details of the current Technical Literature for Thermofill. The Technical Literature must be read in conjunction with this Appraisal. All aspects of use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Thermofill is a ground cover vapour barrier for suspended timber floor subfloor spaces for both existing and new buildings.

Durability

Serviceable Life

- 8.1 Thermofill correctly produced and installed as a ground cover vapour barrier can be expected to have a serviceable life of 15 years and can be expected to show a durability similar to conventional low-strength concrete.
- 8.2 Care must be taken not to install Thermofill (as with conventional concrete) in areas where soils are known to have high sulphate concentrations or high soil acidity as these soil conditions can compromise the integrity of cement based products over time.

External Moisture

- 9.1 Thermofill is an alternative to the vapour barriers in subfloor spaces specified in NZS 3604, Paragraph 6.14.3.
- 9.2 Thermofill correctly produced and installed as a ground cover vapour barrier will prevent moisture entering the space below suspended floors by containing the water-vapour normally evaporating from damp or wet soil. The application is suitable for both new and existing buildings.
- 9.3 Thermofill must be installed so that water cannot pond on the surfaces.

Ventilation

- 10.1 Wherever possible, free air-movement and associated ventilation must be maintained in the sub-floor space even after the Thermofill vapour barrier has been installed. Refer to NZS 3604, Paragraph 6.14.3.

Maintenance

- 11.1 Once installed, Thermofill does not have any maintenance requirement. Over time some small cracks may appear in the Thermofill due to ground settlement. This will not impair its continued overall effectiveness as a moisture barrier.



Installation Information

Installation Skill Level Requirements

- 12.1 The production and installation of Thermofill must be carried out only by personnel trained and authorised by Canterbury Foam Concrete Ltd.

Thermofill Installation

- 13.1 The ground must be checked to establish that it is sound, and any debris must be cleared.
- 13.2 Services must be checked, be clear of the ground, and where necessary attached to the under-side of the floor.
- 13.3 Thermofill can be poured around timber piles but must be installed so that there is still clearance between sub-floor bearing timbers and the foamed concrete surface.
- 13.4 Thermofill must be installed so that water will not pond on the surface, either by providing a fall to the building exterior, or by providing a barrier to water running under the building.
- 13.5 Pipes and services exiting the ground and running vertically up through the sub-floor space need to be protected to allow some movement and to ensure they can be serviced if necessary. This may require some minor boxing work, wrapping or sleeving to keep Thermofill clear of pipe-work and cables.

Basis of Appraisal

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

Tests

- 14.1 On-site testing of a building was conducted by BRANZ to test the effect on indoor relative humidity by covering the ground in the sub-floor cavity with Thermofill. Data was collected in the May to September period over two years being before and after the Thermofill was installed. Results show that Thermofill is fit for purpose, and effective, and can be used as an alternative moisture barrier for sealing damp or wet ground under buildings, and as an alternative to polythene sheet.

Other Investigations

- 15.1 Assessment of the durability of Thermofill has been completed by BRANZ experts.
- 15.2 Site inspections have been carried out by BRANZ to assess the ease of installation of Thermofill, and to examine completed installations.

Quality

- 16.1 An assessment of the quality control system put in place by Canterbury Foam Concrete Ltd for the production and installation of Thermofill has been examined by BRANZ. Details of the quality and composition of the materials used, were also obtained and found to be satisfactory.
- 16.2 Canterbury Foam Concrete Ltd is responsible for both the quality of the Thermofill supplied and its installation.

Sources of Information

- NZS 3604:2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Building, Innovation and Employment, Third Edition July 2005 [Amendment 7, 1 January 2017].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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In the opinion of BRANZ, **Thermofill** 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 **Canterbury Foam Concrete 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. **Canterbury Foam Concrete 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 **Canterbury Foam Concrete 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 **Canterbury Foam Concrete Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

14 July 2017