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BRE CERTIFICATION

CERTIFICATE NUMBER
107/04
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PRODUCT

FOILTEC

SUPPLIED BY

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SUMMARY

Foiltec has been assessed to confirm its suitability for use as thermal insulation in timber suspended ground floor or concrete ground floor applications. Foiltec is comprised of a multilayer foil laminate either with one foil facing, Foiltec Single or with both faces with foil facing, Foiltec Double.

The characteristics of the product and the method of application have been reviewed with respect to the Building Regulations current in the United Kingdom. The assessment has referred to British Standards and other publications current in May 2003.

The assessment is described in the following pages which form integral parts of this certificate.

LIMITATIONS OF USE

Foiltec is intended for use in domestic applications as thermal insulation for ground floors in conjunction with timber floor joists or concrete floor bases. Foiltec must be continuously supported over a sound level base of in-situ or precast concrete, with a wood based flooring overlay providing a minimum airspace of 50mm between the decking and the Foiltec surface. Alternatively, Foiltec must be used unsupported beneath timber or other board overlay deck materials. The aluminium foil faces are to face a cavity. The minimum free cavity is to be not less than 50mm. The product is not for use as a damp proof membrane, and must be protected from ground moisture. The product must not be exposed to ketonic solvents or plasticisers.

Foiltec must be installed strictly in accordance with the manufacturer's instructions, as inspected by BRE Certification, and the requirements of this certificate.

STATEMENT

It is the opinion of BRE Certification that Foiltec is satisfactory for use within the stated limitations provided that it is used in accordance with the manufacturer's instructions and the requirements of this certificate.

CONFIRMATION

For and behalf of BRE
Certification

Date :

Technical Director



1. TECHNICAL SPECIFICATION

1.1 Description of Product

1.1.1 Foiltec comprises a multi layer foil laminate, coated to provide corrosion protection, with an overall thickness of less than 1mm. Foiltec Single has one foil facing. Foiltec Double has a foil facing on both faces. The standard dimensions of Foiltec are 1000mm and 1500mm wide in lengths of 50m.

1.1.2 Foiltec Saddle Clips are produced in polypropylene with a 54mm depth for retaining Foiltec Single and Foiltec Double at joists.

1.2 Product Performance

1.2.1 Foiltec is intended to provide a method to enhance the thermal insulation of new or existing concrete or timber ground floors. Foiltec Single is for use where the thermal performance can be provided in conjunction with an air space on one side of the product, and may be fully supported. Foiltec Double is for use where the thermal performance can be provided in conjunction with an air space above and below the product, and is suspended between supports.

1.2.2 The thermal resistance of Foiltec, in conjunction with an adjacent unventilated airspace with a minimum air gap from the foil face of 50mm, is 1.327 m²K/W for downward heat flow. For solid floor applications, where Foiltec Single is used, the U-value of the floor can be calculated in accordance with BS EN ISO 6946 and BS EN ISO 13370, taking into account the effect of the thermal bridging by the timber flooring battens. For timber suspended floors, where Foiltec Double is used, BS EN ISO 13370 does not adequately deal with the low emissivity surface to the underfloor space. The thermal bridging of the timber joists and the effect of the low emissivity surface to the underfloor space has, instead, been numerically modelled to give a Floor deck U-value of 0.437 W/m²K. The joists are 50 mm wide and at 600 mm centres giving a thermal bridging fraction for the timber of 0.083. This is then used in calculating the overall U-value of the floor in accordance with BS EN ISO 13370.

1.2.3 When installed in accordance with this certificate and the appropriate Clauses of BS 5250, Foiltec will not promote surface or interstitial condensation. Condensation is considered to be unlikely to occur with the constructions specified in this certificate. However, condensation risk calculations should be undertaken to ensure that it will not occur for the intended application. The Foiltec has a typical water vapour resistance of 250 MNs/gm but should not be considered as providing a water vapour control layer or damp-proof barrier as it is laid with unsealed joints.

1.2.4 Tests have shown that Foiltec has adequate strength and tear resistance to resist damage in normal handling and in the flooring applications. However, the products must be handled and installed with adequate care to prevent damage to the protective lacquer coating and ensure continued performance of the product.

1.2.5 Foiltec will not contribute to the fire resistance performance of the floor and is considered to be unlikely to affect the fire performance of a ground floor. Since Foiltec is considered to be combustible, it must be adequately separated from: heat-producing appliances, incinerators, hearths, fire backs, ash pit surrounds, ductwork for high temperature gases, flues, chimneys and fire places or recesses. When tested to BS 476 Part 7 Surface spread of flame Foiltec Single and Foiltec Double are designated Class 1.

1.2.6 In the opinion of BRE Certification, so long as Foiltec remains in a pristine and clean condition, its performance in ground floor applications should be maintained. This assumes the product is installed in accordance with the manufacturer's instructions and the requirements of this certificate.

1.2.7 The manufacturer must continue to provide a technical consulting service for the product.

2. BUILDING REGULATIONS

The relevant Building Regulations requirements for the product are:-

2.1 The Building Regulations (England and Wales) 2000 (as amended)

Requirement

B1 Means of escape - combustible materials are permitted in a ground floor by these Regulations.

J3 Protection of the building from heat-producing appliances - in order to comply with this Regulation the insulation must be adequately separated or shielded from a chimney, flue, fireplace recess, heat-producing appliance or hearth. The separations recommended, where appropriate, are detailed in Approved Document J supporting these Regulations, to which reference must be made.

L1 Conservation of fuel and power - For solid floors, Foiltec Single can provide sufficient insulation to give a U-value for the floor of between 0.43 W/m²K and 0.15 W/m²K, depending on the dimensions of the floor. For suspended timber floors, Foiltec Double can provide sufficient insulation to give a U-value for the floor of 0.35 to 0.17 W/m²K, depending on the dimensions of the floor.

Regulation 7

Materials and workmanship - Foiltec is manufactured from suitably safe and durable materials for their application and can be installed to give a satisfactory performance.

2.2 The Building Standards (Scotland) Regulations 1990 (as amended)

Regulation

B2.1 Selection and use of materials and components - Foiltec is manufactured from acceptable materials and is considered to be adequately resistant to deterioration and wear under normal service conditions, provided they are installed in accordance with the requirements of this certificate.

F2.5 Heat-producing, solid fuel burning or oil- or gas-fired installations - a floor, incorporating Foiltec, can be designed and constructed to comply with these Standards, provided that they are isolated from the flue of a gas-fired, or solid fuel, or oil-fired heat-

producing appliance by a separation. They must be adequately separated from a fire place opening, recess, hearth or flue pipe, or from any heat-producing appliance.

G2.5 Resistance to moisture from the ground - The finished floor must be provided with an effective continuous damp-proof membrane. Advice is given in Section 3.3 below.

G4 Condensation - a floor formed using Foiltec, in accordance with the requirements of this Certificate and of BS 5250, can be designed and constructed to comply with these Standards.

J2.2 Conservation of fuel and power: For solid floors, Foiltec Single can provide sufficient insulation to give a U-value for the floor of between 0.43 W/m²K and 0.15 W/m²K, depending on the dimensions of the floor. For suspended timber floors, Foiltec Double can provide sufficient insulation to give a U-value for the floor of 0.35 to 0.17 W/m²K, depending on the dimensions of the floor.

2.3 The Building Regulations (Northern Ireland) 2000

Regulation

B2 Fitness of materials and workmanship - Foiltec is manufactured from materials which are considered to be suitably safe and acceptable for use as an insulation system for a floor.

C7 Condensation - a floor built using Foiltec, in accordance with the requirements of this certificate and BS 5250, can be designed and constructed to prevent any harmful effect from moisture in the form of interstitial condensation.

F2 Conservation of fuel and power - For solid floors, Foiltec Single can provide sufficient insulation to give a U-value for the floor of between 0.43 W/m²K and 0.15 W/m²K, depending on the dimensions of the floor. For suspended timber floors, Foiltec Double can provide sufficient insulation to give a U-value for the floor of 0.35 to 0.17 W/m²K, depending on the dimensions of the floor.

L2 Heat-producing appliances and associated constructions - a floor, incorporating Foiltec, can be designed and constructed to comply with these Regulations, provided that it is isolated from

the flue of a gas-fired, or solid fuel or oil-fired heat-producing appliance or an incinerator. They must be adequately separated from a chimney or fireplace recess, from a flue pipe, from a hearth or from the appliance.

3. INSTALLATION/PRACTICAL APPLICATION

3.1 Identification

Foiltec is delivered to site in rolls wrapped in polyethylene. Each roll is supplied with a label marked Foiltec, the date of manufacture, and an instruction leaflet.

3.2 Storage and Handling

Foiltec rolls must be stored upright on a firm, level and dry base and protected from damage. For additional weather protection, black polyethylene sheeting or similar opaque material should be used. The Foiltec rolls are easily handled on site and they may be readily cut or trimmed with a sharp knife. However, adequate care should be taken to prevent damage before, during or subsequent to installation (see 1.2.4). The products must be handled with care and be secured if outside in windy conditions. The products must not be punctured, split or deformed before use or accidentally during installation. They must not be exposed to any plastics material incorporating plasticizers, or to volatile aggressive organic solvents.

3.3 Installation

3.3.1 Foiltec must be installed in accordance with the relevant requirements of the manufacturer's installation instructions. The handling and installation instructions have been inspected during the certificate. In the opinion of BRE Certification they provide satisfactory guidance for users of the product.

3.3.2 The finished surface of any concrete on which Foiltec is to be laid must be reasonably smooth, flat and level in accordance with the appropriate clauses of BS 8204:Part 1. A power trowelled, wood float or fine tamped finish is suitable. Foiltec is rolled out with the foil face upwards. Minimum 50mm thick battens or joists must be laid on the Foiltec, at centres to suit the particular floor, to provide an air gap.

3.3.3 For application over timber floor joists

Foiltec is rolled out with a foil face facing upwards. Foiltec Saddle Clips are placed and nailed to provide a minimum 50mm air gap, at a spacing of nominally four per square metre of floor

3.3.4 Thermal bridging should be minimised at external floor/wall junctions, and by turning up Foiltec by 75mm at the upstands, which should be subsequently protected with a skirting, or similar. This must all be in accordance with the relevant clauses of BS 5250, BS 8000:Part 4, BS 8102, BS 8215 and Clause 11 of CP 102. Reference must also be made to BRE document BR 262 2002 "Thermal insulation - avoiding risks".

3.3.5 Joints should be lapped by 100mm and left open. The work should be programmed such that the Foiltec is left exposed for the minimum time. Foiltec must not be directly trafficked, and on concrete floors should be protected with spreader boards, or similar, during subsequent operations.

3.3.7 Where a wood based flooring overlay is to be used over Foiltec, then the floor finish must be protected from residual construction moisture or moisture from the ground by a vapour control layer.

3.3.8 Foiltec must not be exposed to continuous working temperatures in-situ of in excess of 80°C, such as in direct contact with hot pipes or electric heating cables.

3.3.9 No maintenance of the Foiltec is necessary provided that it remains in pristine condition and is installed strictly in accordance with the requirements of this certificate and of the manufacturer.

4. TECHNICAL APPRAISAL

4.1 Performance Tests

Assessment and site inspections have been effected of the procedures and practicality of installation in the UK. Tests and investigations have been undertaken to determine the properties of Foiltec as follows:-

- fire performance
- mechanical properties
- thermal performance

Typical results are outlined in Table 1.

4.2 Quality Control

The manufacturer carries out quality control tests and inspections at regular intervals to ensure that the quality of Foiltec is maintained within the product specification. The quality control checks

include an inspection and measurement of physical properties of the product. Quality records are maintained on file by the manufacturer.

In the opinion of BRE Certification the specification of the materials used and the quality control procedures of the manufacturer are suitable for the product.

TABLE 1: Typical Properties of Foiltec Single and Foiltec Double

| Property | Result |
|---|--|
| Thermal Resistance of Foiltec including an adjacent unventilated airspace with minimum air gap from the foil face of 50mm | 1.327 m ² K/W. |
| U-value of numerically modelled floordeck in timber suspended floor using Foiltec Double | 0.437 W/m ² K* |
| Tear resistance BS EN 12310-1 | Foiltec Single 150 N Foiltec Double 120 N |
| Nominal thickness Microns | Foiltec Single 250 Foiltec Double 280 |
| Surface emissivity | 0.05 |
| * This U-value is for a floordeck with 50 mm joists at 600 mm centres which corresponds to a timber fraction of 0.833 | |

4.3 British Standards and other Documentation

The following British Standards and Codes of Practice have been referred to for this assessment:-

| | |
|-----------------------|---|
| BS 5250:2002 | Code of basic data for the design of buildings : the control of condensation in dwellings. |
| BS 6399:Part 1:1996 | Loading for buildings. |
| BS 8000:Part 6:1990 | Workmanship on building sites code of practice for timber floors |
| BS 8000:Part 9: 1999 | Workmanship : Code of practice for cement/sand floor screeds and toppings. |
| BS 8103: Part 3: 1996 | Code of practice for timber flooring for housing |
| BS 8204-1:2002 | Screeds, bases and in-situ floorings. Concrete bases and cement sand levelling screeds to receive floorings. Code of practice |
| CEN TC 254 | Test methods and product specifications |
| BS EN ISO 6946: 1997 | Building components and building elements. Thermal resistance and thermal transmittance. Calculation method. |
| BS EN 12310-1:2000 | Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank). Bitumen sheets for roof waterproofing |

BS EN ISO 13370: 1998

Thermal performance of buildings. Heat transfer via the ground. Calculation methods.

Product Data Sheets

NHBC Standards

Zurich Municipal

Technical Manual.

The following documents have been referred to for this assessment:-

Building Research Establishment

Thermal Insulation : Avoiding risks BR 262 2002

5. CONDITIONS OF CERTIFICATE ISSUE

5.1 Validity

This certificate will be valid for a period of three years. It will remain valid in so far as:

- a) The materials and methods of manufacture are unchanged.
- b) The designs and specifications are unaltered from those examined by BRE Certification.
- c) BSK continues to have the product checked by BRE Certification.

5.2 Health and Safety

This certificate and the recommendations herein do not purport in any way to restate the requirements of the Health and Safety at Work Act 1974 or any statutory or common law duty of care which exists now or in future; nor is compliance with these recommendations to be assumed as satisfying the requirements of the said Act or any existing or future statutory or common law duty of care.

5.3 Reference to other Documentation

Where reference is made in this certificate to any Act of Parliament, Regulation, Code of Practice, British or other Standard or other publications, it shall be construed as reference to such publication in the form in which it is in force at the date of the certificate.

5.4 Patents

BRE Certification makes no representational warranty that any patent or similar industrial property right is valid or that the manufacture, use, sale, lease or any other dealing or disposition of the products in whole or in part is not an infringement of any patent or industrial property right not owned by BSK

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