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Agrément Certificate
09/4675
Product Sheet 1

KINGSPAN INSULATION

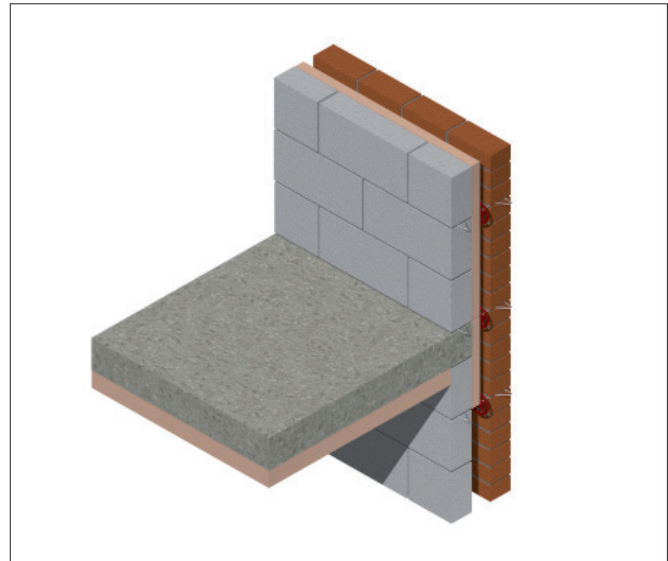
KOOLTHERM K10 SOFFIT INSULATION

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Kooltherm K10 Soffit Insulation, for use as soffit insulation to semi-exposed concrete floor decks in car parks, storage areas, loading bays and similar areas beneath habitable buildings.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Thermal performance — the product can contribute to limiting heat loss through exposed floors. The thermal conductivity ($\lambda_{90/90}$ value) of the product is declared by the Certificate holder (see section 5).

Condensation — the product can adequately limit the risk of both surface and interstitial condensation (see section 6).

Behaviour in relation to fire — the product is classified as Class 0 by the building regulations of England and Wales and Northern Ireland or Low Risk by the Scottish Technical Standard. The product is to be fixed to the underside of concrete soffits and may be exposed (see section 7).

Mechanical resistance and stability — the product has sufficient strength to resist the loads likely to be encountered in service (see section 8).

Durability — the product will remain effective as an insulating material for the life of the building providing it is not damaged during service (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 4 August 2009

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Kooltherm K10 Soffit Insulation, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



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

Requirement: B2	Internal fire spread
Comment:	The product will be used in unprotected areas and has a Class 1 Surface spread of flame. See section 7.1 of this Certificate.
Requirement: C2(c)	Resistance to moisture
Comment:	Use of the product can contribute to limiting the risk of condensation. see sections 6.1 and 6.2 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The product can contribute to a building meeting the Target Emission Rate. See sections 5.2 to 5.5 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)(2)	Fitness and durability of materials and workmanship
Comment:	Use of the product satisfies the requirements of this Regulation. See sections 9 and 10 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards — construction
Standard: 2.5	Internal linings
Comment:	The product will be used in unprotected areas. See section 7.1 of this Certificate. Soffits may be regarded as unprotected areas as defined in this Standard, with reference to 2.6.1 ⁽²⁾ , 2.6.2 ⁽²⁾ , 2.6.4 ⁽²⁾ and 2.6.6 ⁽²⁾ .
Standard: 3.15	Condensation
Comment:	Use of the product can contribute to limiting the risk of condensation with reference to clauses 3.15.1 ⁽¹⁾ and 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾ . See sections 6.1 and 6.3 of this Certificate.
Standard: 6.1(a)(b)	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	The product can contribute to satisfying clauses, or parts of, 6.1.2 ⁽¹⁾⁽²⁾ , 6.1.3 ⁽¹⁾⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾⁽²⁾ , 6.2.4 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾⁽²⁾ to 6.2.11 ⁽¹⁾⁽²⁾ and 6.2.12 ⁽²⁾ of these Standards. See sections 5.2 to 5.5 of this Certificate.
Regulation: 12	Building standards — conversions
Comment:	All comments given for the product under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾ and Schedule 6 ⁽¹⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation: B2	Fitness of materials and workmanship
Comment:	The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation: B3(2)	Suitability of certain materials
Comment:	The product is acceptable. See section 9 of this Certificate.
Regulation: C5	Condensation
Comment:	Use of the product can contribute to limiting the risk of condensation. See section 6.1 of this Certificate.
Regulation: E3	Internal fire spread — Linings
Comment:	The product will be used in unprotected areas and has a Class 0 classification. See section 7.1 of this Certificate.
Regulation: F2(a)(i)	Conservation measures.
Regulation: F3(2)	Target carbon dioxide emission rate.
Comment:	The product can contribute to a building meeting these regulations. See sections 5.2 to 5.5 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligation under these Regulations.

See section: 2 *Delivery and site handling* (2.2 and 2.3).

Non-regulatory Information

NHBC Standards 2008

In the opinion of the BBA, the use of Kooltherm K10 Soffit Insulation, in relation to this Certificate, is not subject to the requirements of these standards.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Kooltherm K10 Soffit Insulation, in relation to this Certificate, is not subject to the requirements of this Technical Manual.

General

This Certificate relates to Kooltherm K10 Soffit Insulation for use as soffit insulation to semi-exposed concrete floor decks in car parks, storage areas, loading bays and other similar areas, beneath habitable buildings. It is for use in the conversion and refurbishment of existing buildings and in new-build applications.

Technical Specification

1 Description

1.1 This Certificate relates to Kooltherm K10 Soffit Insulation, comprising rigid phenolic board with a wet-lay, coated glassfibre tissue based upper facing and a lower composite foil facing.

1.2 Boards have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics⁽¹⁾

Length (mm)	2400
Width (mm)	1200
Thickness (mm)	25 to 140
Edge profile	Square
Minimum compressive strength at 10% compression (kPa)	100
Nominal density (kgm ⁻³)	35

(1) Other dimensions available on request.

1.3 Ancillary items used include :

- edge cover strips/tape
- suitable fixings
- timber battens/proprietary grid system

2 Delivery and site handling

2.1 The product is delivered to site in polyethylene shrink-wrapped packs incorporating a label bearing the manufacturer's trade name, product description and characteristics and the BBA identification mark incorporating the number of this Certificate.

2.2 The product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polyethylene. Where possible, packs should be stored inside. If stored outside, the boards should be raised above ground level and not in contact with ground moisture.

2.3 The product must not be exposed to open flame or other ignition sources.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Kooltherm K10 Soffit Insulation.

Design Considerations

3 Use

3.1 Kooltherm K10 Soffit Insulation is effective at reducing the thermal transmittance (U value) of new or existing semi-exposed concrete floor decks.

4 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

5 Thermal performance

5.1 Calculations of the thermal transmittance (U value) of specific external soffit constructions should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE⁽¹⁾ report (BR 443 : 2006) *Conventions for U-value calculations*, using a declared thermal conductivity of 0.021 Wm⁻¹K⁻¹ for thicknesses < 45 mm and 0.020 Wm⁻¹K⁻¹ for thicknesses ≥45 mm. Alternatively the following U-values shown in Table 2, may be used for the specified construction:

(1) Building Research Establishment

Insulation thickness (mm)	Construction U value (Wm ⁻² K ⁻¹)
30	0.59
40	0.48
50	0.37
60	0.32
70	0.28
80	0.25
90	0.23
100	0.20
110	0.19
120	0.17
130	0.16
140	0.15

Note: Values include reduction due to mechanical fixings causing bridging — $\Delta U/U > 3\%$ of U value. 16.7 fixings/m². $\lambda = 50 \text{ Wm}^{-1}\text{K}^{-1}$ and cross sectional area is 4 mm².

(1) Construction (internal to external) 150 mm concrete, 25 mm airspace/steel frame, Kingspan K10 soffit board (thickness as listed).



5.2 Subject to the selection of an appropriate construction and insulation thickness, the product can contribute to a floor construction achieving the following design U-values (see Tables 3 and 4):

Table 3 Typical design U values for floors — England & Wales and Northern Ireland

Wm ⁻² K ⁻¹	Construction type
0.22	Mean for new extensions ⁽¹⁾
0.25	'Notional' mean in SAP and SBEM and limit mean for new build and non domestic consequential improvements.
0.25	Mean for replacement, renovated and retained floors ⁽¹⁾ .
0.70	Individual limit for new build and flexible approaches ⁽¹⁾

(1) Refer to relevant document supporting the national Building Regulations for alternative or flexible approaches.

Table 4 Typical design U values for floors — Scotland

Wm ⁻² K ⁻¹	Construction type
0.20	'Notional' mean for new dwellings in SAP and the 'simplified' approach: — solid fuel, packages 3 and 6
0.22	— other fuels, packages 1, 2, 4 and 5
0.22	Mean for conversion of unheated buildings, extensions ⁽¹⁾ and alterations ⁽¹⁾ and stand alone buildings of less than 50 m ² .
0.25	'Notional' mean for non domestic in SBEM and limit mean for all new build and stand alone buildings of 50 m ² or more.
0.70	Individual limit for; new build, new extensions, and alterations ⁽¹⁾ and conversions of heated buildings and stand alone buildings of less than 50 m ² .

(1) Refer to relevant document supporting the national Building Regulations for alternative or flexible approaches.

5.3 Floors with U values lower than (or the same as for Scottish dwellings) the relevant 'notional' value as specified in section 5.2 will contribute to a building meeting its target overall reduction in carbon dioxide emissions of about 20% (or 18% to 25% in Scotland) for dwellings and 23% to 28% for buildings other than dwellings. Floors with higher U values will require additional energy saving measures in the building envelope and/or services.

5.4 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the floor and the exposed walls. General guidance in this respect and on limiting heat loss by air infiltration, can be found in:

England and Wales — TSO 2002 publication *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings* and Accredited Construction Details version 1.0.

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

5.5 Compliance with the guidance referred to in section 5.4 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of *The Government's Standard Assessment Procedure for Energy rating of Dwellings* (SAP 2005), in Target Emission Rate calculations to SAP 2005 or the simplified approach in Scotland.

6 Condensation

Interstitial condensation




 6.1 Floors incorporating the product can limit the risk of interstitial condensation up to and including 'humidity class 3' (as defined in BS 5250 : 2002) (for dwellings with low occupancy) when they are designed and constructed in accordance with BS 5250 : 2002, Section 8.5 and Appendix D. When designing buildings with a higher humidity class than 'humidity class 3', an assessment will need to be made, using the values in Table 5, and the result will be construction and location specific. The calculation will be sensitive to the water vapour resistance of the concrete slab above the product and the overall floor construction.

Table 5 Material properties


Material	Thickness (mm)	Water vapour resistance (MNsg ⁻¹)	Water vapour resistivity (MNsg ⁻¹ m ⁻¹)
Glass tissue	0.37	3.4	-
Phenolic foam	50 – 120	-	439
Aluminium foil	0.26	111	-

Surface condensation

 6.2 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.7 Wm⁻²K⁻¹ at any point and the junctions with walls are designed in accordance with the relevant requirements of TSO 2002 publication, *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings*, or BRE Information Paper IP 01/06.

 6.3 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 Wm⁻²K⁻¹ at any point. Guidance may be obtained from BS 5250 : 2002, Section 8 and BRE report (BR 262 : 2002).

7 Behaviour in relation to fire

 7.1 The use of the product as soffit insulation to semi-exposed floor decks is unrestricted in relation to internal fire spread over linings.

7.2 The product, with an aluminium foil facing, has been shown to have a Class 0 surface rating, as defined in national building regulations. When the product is correctly installed, the phenolic insulation material itself will be protected and will not contribute to a fire.

7.3 If the product is painted or covered, the effectiveness of particular coatings is outside the scope of this Certificate and should be the subject of assessment and/or test by a UKAS accredited fire testing laboratory.

7.4 All fixings should be of a non-combustible type to resist the increased duty that may be required in a fire.

8 Mechanical resistance and stability

8.1 Installations incorporating the product can be designed to resist wind loads normally experienced in the UK.

8.2 The structural floor to which the board is fixed should be structurally sound and it is assumed constructed in accordance with the requirements of the relevant building regulations and national standards.

8.3 Wind loads should be calculated in accordance with BS 6399-2 : 1997, BS 8200 : 1985 and BS EN 1991-1-4 : 2005.

8.4 The maximum allowable 'pull-out' value of the fixing to be used for securing the board to the soffit should be determined by tests with a minimum safety factor of 4.0 on the characteristic value (This aspect is not covered by this Certificate).

8.5 In situations where fire performance is an important consideration, steel fasteners should be used. For advice on specific types, the Certificate holder should be consulted.

8.6 The design of the installation should be checked by a suitably qualified person.

9 Maintenance



The product may be finished to suit the application in which it is installed. Such finishes may require maintenance depending on the particular environment. Further advice should be sought from the Certificate holder. Finishes are outside the scope of this Certificate.

10 Durability



The product will remain effective as an insulating material for the life of the building providing damage does not occur to the product during service.

Installation

11 General

11.1 Installation of Kooltherm K10 Soffit Insulation must be in accordance with the Certificate holder's installation instructions and the requirements of this Certificate.

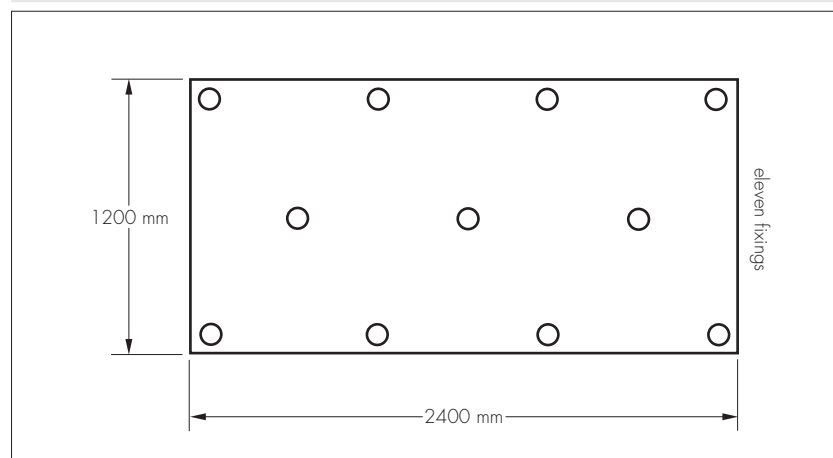
11.2 The product may be fixed directly to a concrete soffit (with or without metal shuttering), to timber battens or a proprietary grid system.

11.3 The product may be cut using a fine-toothed saw or a sharp knife, snapping the board over a straight edge and cutting the facing on the other side.

Fixing directly to concrete soffits

11.4 The product may be fully restrained to a concrete soffit by the use of eleven approved insulation fasteners with a minimum head diameter of 35 mm. The fasteners should be spaced as shown in Figure 1.

Figure 1 Diagram of fastener layout



11.5 The fasteners must penetrate into the concrete soffit to a minimum distance of 40 mm. Fixings to board edges and corners should be situated less than 150 mm but no less than 50 mm from the board edge. If an alternative fixing penetration into the concrete slab is required, guidance should be sought on suitable fixing products and installation from the fixing manufacturer.

11.6 Board joints should preferably be staggered.

Fixing to timber battens/grid system

11.7 A treated timber batten system may be used if a void is necessary due to uneven surface or services present.

11.8 Battens should be at least 50 mm by 25 mm placed at 600 mm centres to coincide with the edges/centres of the boards.

11.9 The battens should be fixed to the soffit by a suitable method.

11.10 The product should be fixed to the timber battens using suitable fixings. These should be placed at a maximum of 300 mm centres in rows not greater than 600 mm apart.

11.11 Fixings should be positioned not less than 12 mm from board edges. Exposed joints should be covered with a suitable tape or cover strip.

11.12 The product may also be fixed to a grid system comprising metal furring bars. The manufacturer's advice should be sought on each system under consideration.

Technical Investigations

12 Tests

An examination was made of test data on Kooltherm K10 Soffit Insulation in relation to:

- water permeability of the insulation
- laminate bond strength between foil and insulation and glass fibre tissue to insulation.

13 Investigations

The manufacturing process was examined, including the methods adopted for quality control and details were obtained of the quality and composition of the materials used.

Bibliography

BS 476-6 : 1989 *Fire tests on building materials and structures — Method of test for fire propagation for products*

BS 476-7 : 1997 *Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

BS 8200 : 1985 *Code of practice for design of non-loadbearing external vertical enclosures of buildings*

BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

14 Conditions

14.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

14.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

14.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

14.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

14.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.