



See rear cover for applicable countries

# Kooltherm™ K10 FM Soffit Board

## INSULATION FOR STRUCTURAL CEILINGS (SOFFITS)



- Premium performance rigid thermoset insulation – thermal conductivities as low as 0.020 W/m·K
- FM approved to Class 1 fire rating Class Number 4880
- Class 0 fire rating
- Negligible smoke obscuration
- Unaffected by air infiltration
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for new build and refurbishment
- Non-deleterious material
- Manufactured with a blowing agent that has zero ODP and low GWP
- Approved by Dubai Central Laboratory
- Approved by the State of Qatar Ministry of Interior General Admin of Civil Defence



*Low Energy –  
Low Carbon Buildings*

# Typical Constructions and U-values

## Assumptions

The U-values in the tables that follow have been calculated, under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U-value and Condensation Risk Calculations, using the method detailed in BS / I.S. EN ISO 6946: 2007 (Building components and building elements. Thermal resistance and thermal transmittance. Calculation method), and using the conventions set out in BR443 (Conventions for U-value calculations). They are valid for the constructions shown in the details immediately above each table.



These examples are based on the use of *Kingspan Kooltherm™ K10 FM Soffit Board* mechanically fixed directly to the soffit of a 200 mm concrete deck.

*NB When calculating U-values to BS / I.S. EN ISO 6946: 2007, the type of fixing used may change the thickness of insulation required. These calculations assume the use of telescopic tube fasteners with a thermal conductivity of 1.00 W/m·K or less, the effect of which is insignificant.*

*NB For the purposes of these calculations the standard of workmanship has been assumed good, and therefore the correction factor for air gaps has been ignored.*

*NB The figures quoted are for guidance only. A detailed U-value calculation and a condensation risk analysis should be completed for each project.*

*NB If your construction is different from those specified, and / or to gain a comprehensive U-value calculation along with a condensation risk analysis of your project, please consult Kingspan Insulation for assistance (see rear cover).*

## U-value Table Key

Where an **X** is shown, the U-value is higher than the worst of the maximum new build area weighted average U-values allowed by the Green Building Code (Dubai), Estidama (Abu Dhabi), GSAS (Qatar) and other regulations across the Middle East.

## Fixed Directly to Concrete Soffit

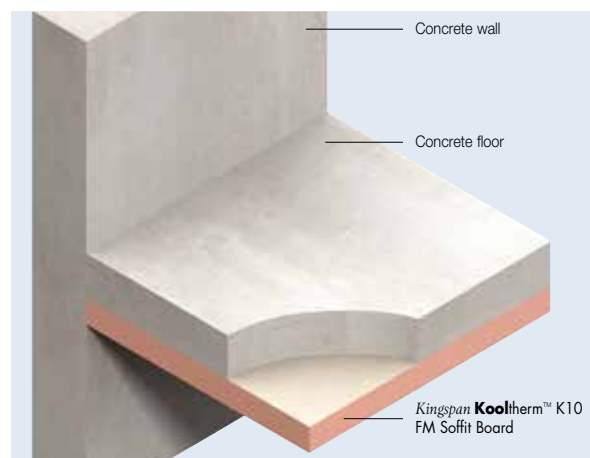


Figure 1

Insulant Thickness (mm)	U-values (W/m <sup>2</sup> ·K)
25	<b>X</b>
30	0.56
35	0.49
40	0.44
45	0.39
50	0.36
55	0.33
60	0.30
65	0.28
70	0.26
75	0.25
80	0.23
85	0.22
90	0.21
95	0.20
100	0.19
105	0.18
110	0.17
115	0.17
120	0.16
125	0.15
130	0.15
135	0.14
140	0.14

Table 1: Thicknesses of *Kingspan Kooltherm™ K10 FM Soffit Board*, installed within the construction shown in the image above, to meet the associated U-value.

# Design Considerations

## Environmental Impact & Responsible Sourcing

### Green Guide Rating

An Ecoprofile, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, has been created for **Kingspan Kooltherm™ K10 FM Soffit Board** produced at Kingspan Insulation's Pembrokeshire, UK, manufacturing facility. The BRE has assigned the product a 2008 Green Guide Summary Rating of A+.



Environmental Profiles Scheme  
Certificate Number ENP 410

### Responsible Sourcing

**Kingspan Kooltherm™ K10 FM Soffit Board** produced at Kingspan Insulation's Pembrokeshire, UK and Castleblayney, Ireland manufacturing facilities is manufactured under a management system certified to ISO 14001: 2004. The principle polymer component of the product produced at these facilities is also manufactured under a management system certified to ISO 14001: 2004.

**Kingspan Kooltherm™ K10 FM Soffit Board** manufactured at Kingspan Insulation's Pembrokeshire, UK manufacturing facility is certified to BES 6001 'Excellent'.



NB The above information is correct at the time of writing. Please confirm at the point of need by contacting Kingspan Insulation (see rear cover), from which copies of Kingspan Insulation's and its suppliers' BES 6001 certificates can be obtained, along with confirmation of Kingspan Insulation's products' Green Guide Ratings.

## Sustainability & Responsibility

Kingspan Insulation has a long-term commitment to sustainability and responsibility: as a manufacturer and supplier of insulation products; as an employer; and as a substantial landholder.

A report covering the sustainability and responsibility of Kingspan Insulation's British operations is available at [www.kingspaninsulation.co.uk/sustainabilityandresponsibility](http://www.kingspaninsulation.co.uk/sustainabilityandresponsibility).

## Specification Clause

**Kingspan Kooltherm™ K10 FM Soffit Board** should be described in specifications as:-

The soffit insulation shall be **Kingspan Kooltherm™ K10 FM Soffit Board** \_\_\_\_ mm thick: comprising a fibre-free premium performance rigid thermoset phenolic insulation core with a glass tissue based facing on its front surface and low emissivity composite foil on its reverse surface. The product shall be manufactured: with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP); under a management system certified to ISO 9001: 2008, ISO 14001: 2004 and BS / I.S. OHSAS 18001: 2007; by Kingspan Insulation and installed in accordance with the instructions issued by them.

## Wind Loading

Where the insulation boards may be subject to external wind pressure, wind loadings should be assessed in accordance with BS 6399-2: 1997 (Loading for Buildings. Code of practice for wind loads) or BS / I.S. EN 1991-1-4: 2005 (National Annex to Eurocode 1 Actions on Structures. General Actions. Wind Actions) taking into account:

- length / width / height of the building;
- orientation of the building;
- wind speed;
- aspect (i.e. on a hill side); and
- topographical value of the surrounding area.

## Lightning Protection

Building designers should give consideration to the requirements of BS / I.S. EN 62305: 2006 (Protection against lightning).

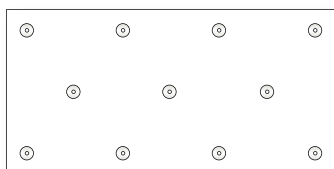
# Sitework

## Fixing Directly to Concrete Soffits

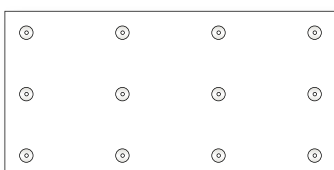
- Insulation boards should be installed break-bonded, with joints lightly butted.
- The number of mechanical fixings required to fix *Kingspan Kooltherm™ K10 FM Soffit Board* will vary with the geographical location of the building, the local topography, the height and width of the soffit concerned, and the soffit construction.
- A minimum of 11 mechanical fixings, with a minimum head diameter of 35 mm, are required to secure the insulation board to the soffit.
- Where the insulation boards may be subject to external wind pressure, the requirement for additional fixings should be assessed in accordance with BS 6399-2: 1997 (Loading for Buildings. Code of practice for wind loads) or BS / I.S. EN 1991-1-4: 2005 (National Annex to Eurocode 1 Actions on Structures. General Actions. Wind Actions).
- The fixings should be evenly distributed over the whole area of the board, and must offer a minimum 40 mm penetration into a solid substrate.
- Please refer to the column opposite for recommended fixing patterns.
- Fixings at board edges must be located > 50 mm and < 150 mm from edges and corners of the board and not overlap board joints.
- Insulation boards can also be fitted by a shot fired fixing method which can result in significantly faster installation times. All of the guidance above still applies.

## Recommended Fixing Patterns

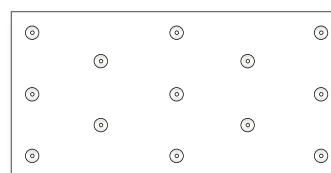
- The images below show recommended fixing patterns, the number of fixings used and the resulting fixing density (number of fixings per m<sup>2</sup>).



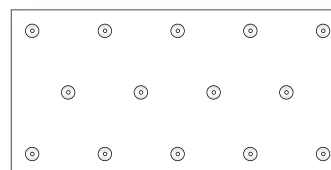
11 No. per board  
(2.4 x 1.2 m board – 3.81 fixings / m<sup>2</sup>)



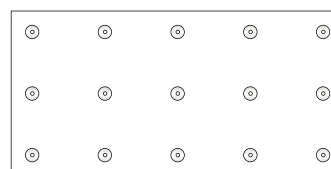
12 No. per board  
(2.4 x 1.2 m board – 4.16 fixings / m<sup>2</sup>)



13 No. per board  
(2.4 x 1.2 m board – 4.51 fixings / m<sup>2</sup>)



14 No. per board  
(2.4 x 1.2 m board – 4.86 fixings / m<sup>2</sup>)



15 No. per board  
(2.4 x 1.2 m board – 5.20 fixings / m<sup>2</sup>)

## Proprietary Grid Systems

- *Kingspan Kooltherm™ K10 FM Soffit Board* can also be fixed to a proprietary grid system comprising metal furring bars.
- For further information regarding proprietary grid system specifications, please contact Kingspan Insulation (see rear cover).

## Taping

- The joints of *Kingspan Kooltherm™ K10 FM Soffit Board* should always be taped using a 75 mm min. wide self-adhesive aluminium foil tape.
- In the absence of other protection, exposed edges of *Kingspan Kooltherm™ K10 FM Soffit Board* should be protected by a suitable self-adhesive aluminium foil tape, with a 50 mm min. wide overlap onto the insulation board face, see Figure 2.
- For advice on the specification of self-adhesive aluminium foil tape and application guidelines, please refer to a local distributor of tape.

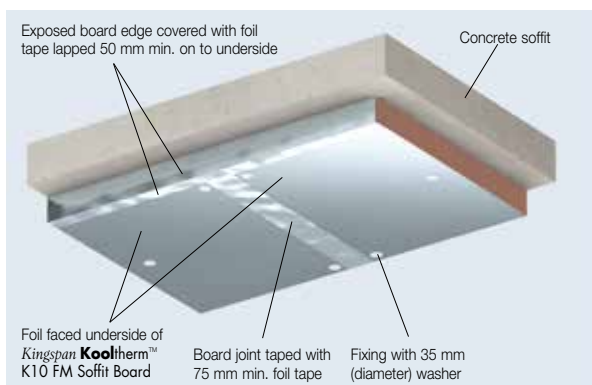


Figure 2

## General

### Cutting

- Cutting should be carried out either by using a fine toothed saw, or by scoring with a sharp knife, snapping the board over a straight edge and then cutting the facing on the other side.
- Ensure accurate trimming to achieve close-butting joints and continuity of insulation.

### Availability

- Please contact Kingspan Insulation (see rear cover) to enquire about the availability of **Kingspan Kooltherm™ K10 Soffit Board**.

### Packaging and Storage

- The polyethylene packaging of Kingspan Insulation products, which is recyclable, should not be considered adequate for outdoor protection.
- Ideally, boards should be stored inside a building. If, however, outside storage cannot be avoided, then the boards should be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin. Boards that have been allowed to get wet should not be used.

### Health and Safety

- Kingspan Insulation products are chemically inert and safe to use.
- A Safety Information Data Sheet for this product is available from the Kingspan Insulation website [www.kingspaninsulation.com](http://www.kingspaninsulation.com)

Please note that the reflective surfaces on this product are designed to enhance its thermal performance. As such, they will reflect light as well as heat, including ultraviolet light. Therefore, if this product is being installed during very bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream.

The reflective facings used on this product can be slippery when wet. Therefore, it is recommended that any excess material should be contained to avoid a slip hazard.

Warning – do not stand on or otherwise support your weight on this product unless it is fully supported by a load bearing surface.

# Product Details

## The Upper Facing

The upper facing of **Kingspan Kooltherm™ K10 FM Soffit Board** is a glass tissue based facing, autohesively bonded to the insulation core during manufacture.

## The Core

The core of **Kingspan Kooltherm™ K10 FM Soffit Board** is a fibre-free premium performance rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



The core of **Kingspan Kooltherm™ K10 FM Soffit Board** has a 90% (or greater) closed cell structure.

## The Exposed Facing

The exposed facing of **Kingspan Kooltherm™ K10 FM Soffit Board** is a low emissivity composite foil, autohesively bonded to the insulation core during manufacture. The exposed facing used on **Kingspan Kooltherm™ K10 FM Soffit Board** has not been designed with the purpose of an aesthetic finish as its primary function. Where appearance is critical, advice should be sought from Kingspan Insulation (see rear cover).

## Standards and Approvals

**Kingspan Kooltherm™ K10 FM Soffit Board** is manufactured to the highest standards under a management system certified to ISO 9001: 2008 (Quality management systems. Requirements), ISO 14001: 2004 (Environmental Management Systems. Requirements) and BS / I.S OHSAS 18001: 2007 (Health and Safety Management Systems. Requirements).

The use of **Kingspan Kooltherm™ K10 FM Soffit Board**, produced at Kingspan Insulation's Pembridge, UK, manufacturing facility, is covered by BBA Certificate 14/5134, and that produced at Kingspan Insulation's Castleblayney, Irish, manufacturing facility by NSAI Agrément Certificate 08/0321.



**Kingspan Kooltherm™ K10 FM Soffit Board** is approved for use by the State of Qatar Ministry of Interior General Admin of Civil Defence.

**Kingspan Kooltherm™ K10 FM Soffit Board**, produced at Kingspan Insulation's Pembridge, UK manufacturing facility, is approved for use by Dubai Central Laboratory.



*Kingspan Kooltherm™ K10 FM Soffit Board*, produced at Kingspan Insulation's Pembroke, UK manufacturing facility, is certified by Abu Dhabi Quality and Conformity Council.



## Standard Dimensions

*Kingspan Kooltherm™ K10 FM Soffit Board* is available in the following standard size:

Nominal Dimension		Availability
Length	(m)	2.4
Width	(m)	1.2
Insulant Thickness	(mm)	Refer to local distributor or Kingspan Insulation for current stock and non-stock sizes.

Table 2: Standard Dimensions of *Kingspan Kooltherm™ K10 FM Soffit Board*.

## Density

The apparent density of *Kingspan Kooltherm™ K10 FM Soffit Board* is 35 kg/m<sup>3</sup> when tested to BS EN 1602: 2013 (Thermal insulating products for building application. Determination of the apparent density).

## Compressive Strength

The compressive strength of *Kingspan Kooltherm™ K10 FM Soffit Board* typically exceeds 100 kPa at 10% compression, when tested to BS / I.S. EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

## Water Vapour Resistance

Adjusted for the effect of board joints, the product typically achieves a resistance far greater than 100 MN·s/g, when tested in accordance with BS EN 12086: 1997 / I.S. EN 12086: 1998 (Thermal insulating products for building applications. Determination of water vapour transmission properties).

## Durability

If correctly installed, *Kingspan Kooltherm™ K10 FM Soffit Board* can have an indefinite life. Its durability depends on the supporting structure and the conditions of its use.

*NB If the building is considered to be in an exposed location advice should be sought from Kingspan Insulation (see rear cover) to determine the product's suitability.*

## Resistance to Solvents, Fungi & Rodents

The insulation core is resistant to short-term contact with petrol and with most dilute acids, alkalis and mineral oils. However, it is recommended that any spills be cleaned off fully before the boards are installed. Ensure that safe methods of cleaning are used, as recommended by suppliers of the spilt liquid. The insulation core is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with this product. Damaged boards or boards that have been in contact with harsh solvents or acids should not be used.

The insulation core and facings used in the manufacture of *Kingspan Kooltherm™ K10 FM Soffit Board* resist attack by mould and microbial growth, and do not provide any food value to vermin.

## FM Certification

The standard Factory Mutual test for soffit lining boards is Class Number 4880 : 2005 (Insulated Wall or Wall and Roof / Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems). *Kingspan Kooltherm™ K10 FM Soffit Board* (thicknesses up to, and including, 120 mm) produced at Kingspan Insulation's Pembroke and Castleblayney, UK and Ireland, manufacturing facilities is certified as achieving Class 1 Fire Rating to Factory Mutual Class Number 4880.

For further details please contact Kingspan Insulation (see rear cover) or alternatively search for Kingspan Insulation on [www.approvalguide.com](http://www.approvalguide.com)



This approval is valid for ceiling / soffit installation only, with non-combustible walls and a floor to ceiling / soffit height restriction of 30 feet (9.1 m). This approval is valid for any fixing specification. However, for mechanical reasons, the fixing specification given on page 4 of this document and the taping specification given on page 5 must still be followed.



## Fire Performance

*Kingspan Kooltherm™ K10 FM Soffit Board*, and its rigid thermoset insulation core, are Class 0, as defined by the Building Regulations in England.

The rigid thermoset insulation core of *Kingspan Kooltherm™ K10 FM Soffit Board*, when subjected to the American Standard fire test specified in the table below, has achieved the result shown.

Test	Result
UL 723 (Surface Burning Characteristics)	< 5% Flame Spread Index of ≤25 Smoke Developed Index (SDI) of ≤50 Class 1 (A)

Table 3: UL 723 result of the insulation core of *Kingspan Kooltherm™ K10 FM Soffit Board*.

*Kingspan Kooltherm™ K10 FM Soffit Board*, and its rigid thermoset insulation core, when subjected to the American Standard fire test specified in the table below, has achieved the result shown.

Test	Result
ASTM E 84 (Surface Burning Characteristics)	Flame Spread Index (FSI) of 25, Smoke Developed Index (SDI) of 50. Class 1 (A)

Table 4: ASTM E 84 result of *Kingspan Kooltherm™ K10 FM Soffit Board*.

Further details on the fire performance of Kingspan Insulation products may be obtained from the Kingspan Insulation (see rear cover).

## Thermal Properties

The  $\lambda$ -values and R-values detailed below are quoted in accordance with ASTM C 518

### Thermal Conductivity

Thermal resistance can be expressed in either metric or imperial measurement. Using the imperial measurement, the boards achieve a thermal conductivity ( $\lambda$ -value) of 0.020 W/m·K at 23°C mean temperature.

### Thermal Resistance

Thermal resistance can be expressed in either metric or imperial measurement. Using the imperial measurement, the boards achieve a thermal resistance (R-value) per inch of thickness of 7.21 Ft<sup>2</sup>·hr·°f/Btu

The metric measurement of thermal resistance (R-value) varies with thickness and is calculated by dividing the thickness of the board (expressed in metres) by its thermal conductivity. The resulting number is rounded down to the nearest 0.05 (m<sup>2</sup>·K/W).

Insulant Thickness (mm)	Thermal Resistance (m <sup>2</sup> ·K/W)
25	1.25
30	1.50
35	1.75
40	2.00
45	2.25
50	2.50
55	2.75
60	3.00
65	3.25
70	3.50
75	3.75
80	4.00
85	4.25
90	4.50
95	4.75
100	5.00
105	5.25
110	5.50
115	5.75
120	6.00
125	6.25
130	6.50
135	6.75
140	7.00
145	7.25
150	7.50

\* *Kingspan Insulation's maximum available thickness is subject to alteration without notice. At the time of publication, this specific insulation thickness must be built up from two thinner layers, but this may have changed by the time that the information in this literature is relied upon. Please contact Kingspan Insulation for current stock and non-stock sizes (see rear cover for details). Where multiple layers of insulation of different thicknesses are used, the thickest layer should be installed as the outermost layer in the construction.*

Table 5: Thermal Resistance of Differing Thicknesses of *Kingspan Kooltherm™ K10 FM Soffit Board*.

*Kingspan Insulation LLC reserves the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and advice should be sought directly from Kingspan Insulation LLC. The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described herein. Recommendations for use should be verified as to the suitability and compliance with actual requirements, specifications and any applicable codes, laws and regulations. For other applications or conditions of use, contact Kingspan Insulation LLC. Advice should be sought for uses of Kingspan Insulation products that are not specifically described herein. The fire tests referenced in this literature and the assigned results are not intended to reflect hazards presented by the materials and products described herein under actual fire conditions. Please check that your copy of the literature is current by visiting [www.kingspaninsulation.com](http://www.kingspaninsulation.com).*



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Countries comprise: the Middle East as far North and East as (and including) Turkey, Iran and Oman and as far South and West as (and including) Saudi Arabia and Yemen

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