CI/SfB (45) Rn7 M2
Fourth Issue September 2019

Kooltherm® K110 FM Soffit Board

INSULATION FOR STRUCTURAL CEILINGS (SOFFITS)

- Premium performance rigid thermoset phenolic insulation – thermal conductivity of 0.018 W/m·K
- FM approved to Class 1 fire rating Class Number 4880
- Unaffected by air infiltration
- Resistant to the passage of water vapour
- Easy to handle
- Quick to install
- Ideal for new build and refurbishment
- Non–deleterious material
- Manufactured with a blowing agent that has zero ODP and low GWP

Fibre-free Core

EVEN THINNER EVEN BETTER LOWER λ

FM APPROVED

Kingspan®

Low Energy – Low Carbon Buildings

Typical Constructions & U-values

Assumptions

CERTIFICATE CS/1004-4
U Value Competency Scheme

The U–values in Table 1 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 EN ISO 6946: 2017 / I.S. EN ISO 6946: 2007 (Building components & building elements. Thermal resistance & thermal transmittance. Calculation methods), and using the conventions set out in BR 443 (Conventions for U–value calculations). They are valid for the construction shown in Figure 1.

These examples are based on the use of *Kingspan* **Kool**therm® K110 FM Soffit Board mechanically fixed directly to the soffit of a 200 mm concrete deck using thermally broken fasteners with a thermal conductivity of 1.00 W/m·K or less, the effect of which is insignificant.

NB When calculating U–values to BS EN ISO 6946: 2017 / I.S. EN ISO 6946: 2007, the type of fixing used may change the thickness of insulation required. If metal fixings are to be used, contact the Kingspan Insulation Technical Service Department for a comprehensive U–value calculation, which will take account of the correction factor specific to the fixing.

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, contact the Kingspan Insulation Technical Service Department for assistance.

U-value Table Key

Where an ✗ is shown, the U–value is higher than the worst of the maximum new build area weighted average U–values allowed by the:

- 2013 editions of Approved Documents L to the Building Regulations for England;
- 2014 editions of Approved Documents L to the Building Regulations for Wales;
- 2015 editions of Technical Handbooks Section 6 to the Building Standards for Scotland;
- 2012 editions of Technical Booklets F1 & F2 to the Building Regulations for Northern Ireland; and
- 2011 edition of Technical Guidance Document L (Dwellings) and 2008 edition of Technical Guidance Document L (Buildings other than Dwellings) to the Building Regulations for the Republic of Ireland.

Fixed Directly to Concrete Soffit

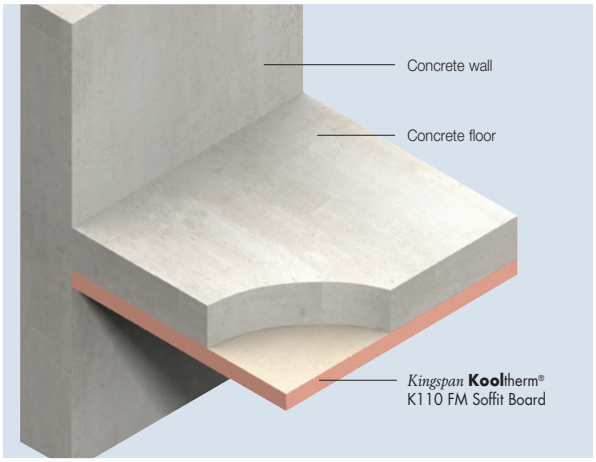


Figure 1

Insulant Thickness (mm)	U–values (W/m²·K)
60	✗
65	0.25
70	0.24
75	0.22
80	0.21
85	0.20
90	0.19
100	0.17
110	0.15
120	0.14
60 + 70	0.13
70 + 70	0.12
80 + 80	0.11
90 + 90	0.10
100 + 100	0.09

NB Refer to local distributor or Kingspan Insulation price list for current stock and non–stock sizes.

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* **Kool**therm® K110 FM Soffit Board produced at Kingspan Insulation's Pembridge, Herefordshire manufacturing facilities. The BRE has assigned the product a 2008 Green Guide Summary Rating of A+.

Environmental Profiles Scheme
Certificate Number ENP 500

Responsible Sourcing

Kingspan **Kool**therm® K110 FM Soffit Board produced at Kingspan Insulation's Pembridge manufacturing facility is certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Excellent'.

NB The above information is correct at the time of writing. Confirm at the point of need by contacting Kingspan Insulation's Technical Service Department, from which a copy of Kingspan Insulation's BES 6001 certificate can be obtained.

BES 6001
Responsible Sourcing
www.greenbooklive.com

Sustainability & Responsibility

Kingspan Insulation has a long–term commitment to sustainability and responsibility: as a manufacturer and supplier of insulation products; as an employer; as a substantial landholder; and as a key member of its neighbouring communities.

A report covering the sustainability and responsibility of Kingspan Insulation Ltd's British operations at its Pembridge, Herefordshire and Selby, North Yorkshire manufacturing facilities is available at

www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Specification Clause

Kingspan **Kool**therm® K110 FM Soffit Board should be described in specifications as:–

The soffit insulation shall be *Kingspan* **Kool**therm® K110 FM Soffit Board ____ mm thick: comprising a premium performance fibre–free rigid thermoset phenolic insulation core with a glass tissue based facing on its inner face and a low emissivity composite foil on its outer face. The product shall have a thermal conductivity of 0.018 W/m·K. 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: 2015, ISO 14001: 2015, BS OHSAS 18001: 2007 and ISO 50001: 2011; by Kingspan Insulation Limited; and installed in accordance with the instructions issued by them.

NBS Specifications

Details also available in NBS Plus.
NBS users should refer to clause(s):
E60–110, 130 and 140 (Standard)

Building Information Modelling (BIM)

Kingspan Insulation's BIM objects can be downloaded in Revit and in IFC formats. For more information please visit www.kingspaninsulation.co.uk/bim.

Kingspan **Kool**therm® K110 FM Soffit Board is also available as part of various system families for typical construction build–ups, to be used within a Building Information Model. To download the objects, please visit www.uvalue-calculator.co.uk.

Wind Loading

Where the insulation boards may be subject to external wind pressure, wind loadings should be assessed in accordance with BS / I.S. EN 1991–1–4: 2005 + A1: 2010 (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: 2011 (Protection against lightning).

Sitework

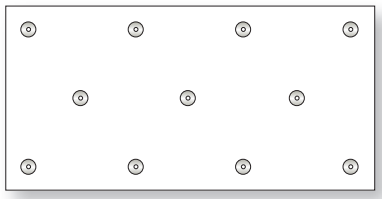
Fixing Directly to Concrete Soffits

- Insulation boards should be installed break–bonded, with joints lightly butted.
- The number of mechanical fixings required to fix *Kingspan* **Kool**therm® K110 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 25 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 / I.S. EN 1991–1–4: 2005 + A1: 2010 (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.
- Depending upon the fixing type, 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.
- For details on fixings refer to:

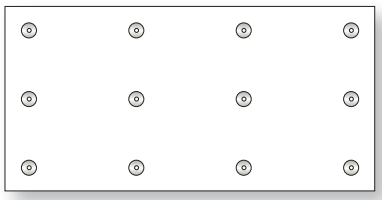
Ejot UK Limited www.ejot.co.uk	+44 (0) 1977 687 040
Fixfast www.fixfast.com	+44 (0) 1732 882 387
ITW Spit www.itwcp.co.uk/Spit/	+44 (0) 800 731 4924
MAK Fasteners www.makfasteners.com	+353 (0) 1 451 9004
Masonry Fixings Services Ltd www.masonryfixings.ie	+353 (0) 1 642 6700
SFS Intec www.sfsintec.biz/uk	+44 (0) 1132 085 500

Recommended Fixing Patterns

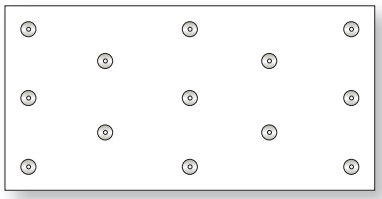
- The images below show recommended fixing patterns, the number of fixings used and the resultant fixing density (number of fixings per m^2).
- The fixing patterns shown are suitable for continuous flat (even) decks only. For non–continuous decks please contact the Kingspan Insulation Technical Service Department (see rear cover) for further guidance.



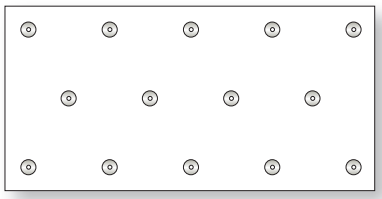
11 No. per board
(2.4 x 1.2 m board – 3.81 fixings / m^2)



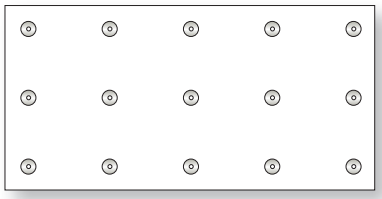
12 No. per board
(2.4 x 1.2 m board – 4.16 fixings / m^2)



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



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



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

Proprietary Grid Systems

- *Kingspan* **Kool**therm® K110 FM Soffit Board can also be fixed to a proprietary grid system comprising metal furring bars or timber battens.
- For further information regarding proprietary grid system specifications, please contact the Kingspan Insulation Technical Service Department (see rear cover).

Taping

- The joints of *Kingspan* **Kool**therm® K110 FM Soffit Board should always be taped using a suitable 75 mm min. wide self–adhesive aluminium foil tape.
- In the absence of other protection, exposed edges of *Kingspan* **Kool**therm® K110 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 (Figure 2).
- For advice on the specification of self–adhesive aluminium foil tape and application guidelines, refer to:

  Bostik Limited +44 (0) 1785 272 727
  www.bostik.co.uk

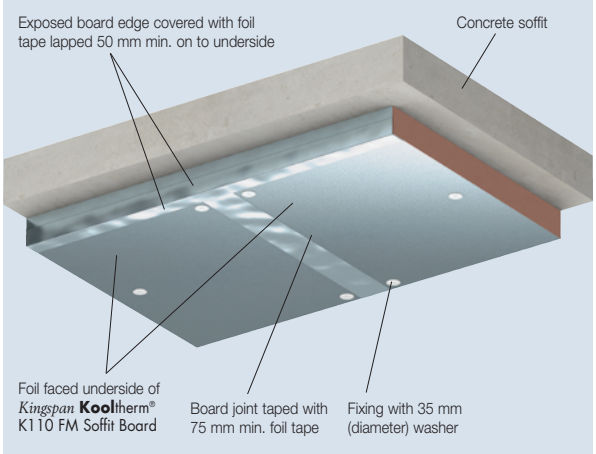


Figure 2 – Protection of Exposed Insulation Edges of *Kingspan* **Kool**therm® K110 FM Soffit Board.

General

Cutting

- Cutting should be carried out either by using a fine toothed saw or 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

- *Kingspan* **Kool**therm® K110 FM Soffit Board is available through specialist insulation distributors and selected builders' merchants throughout the UK and Ireland.

Packaging & 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 & 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.co.uk/safety or www.kingspaninsulation.ie/safety.

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 Inner Facing

The inner (concealed) facing of *Kingspan* **Kool**therm® K110 FM Soffit Board is a glass tissue based facing, autohesively bonded to the insulation core during manufacture.

The Core

The core of *Kingspan* **Kool**therm® K110 FM Soffit Board is a premium performance rigid thermoset fibre–free phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

The Outer Facing

The outer (exposed) facing of *Kingspan* **Kool**therm® K110 FM Soffit Board is a low emissivity composite foil, autohesively bonded to the insulation core during manufacture. The exposed facing used on *Kingspan* **Kool**therm® K110 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 the Kingspan Insulation Technical Service Department (see rear cover).

Standards & Approvals

Kingspan **Kool**therm® K110 FM Soffit Board is manufactured to the highest standards under a management system certified to ISO 9001: 2015 (Quality Management Systems. Requirements), ISO 14001: 2015 (Environmental Management Systems. Requirements), BS / I.S. OHSAS 18001: 2007 (Occupational Health & Safety Management Systems. Requirements) and ISO 50001: 2011 (Energy Management Systems. Requirements with guidance for use).

The use of *Kingspan* **Kool**therm® K110 FM Soffit Board is covered by BBA Certificate 16/5299 and by LABC Registered Details Certificate No. EWWS545F2.

Standard Dimensions

Kingspan **Kool**therm® K110 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 price list for current stock and non–stock sizes.

Compressive Strength

The compressive strength of *Kingspan* **Kool**therm® K110 FM Soffit Board typically exceeds 100 kPa, when tested to BS / I.S. EN 826: 2013 (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 41.6 MN·s/g, when tested in accordance with BS / I.S. EN 12086: 2013 (Thermal insulating products for building applications. Determination of water vapour transmission properties).

Durability

If correctly installed, *Kingspan* **Kool**therm® K110 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 the Kingspan Insulation Technical Service Department 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* **Kool**therm® K110 FM Soffit Board resist attack by mould and microbial growth, and do not provide any food value to vermin.

FM Certification

The Factory Mutual Approval standard for soffit lining boards is Class Number 4880: 2015 (Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials). *Kingspan* **Kool**therm® K110 FM Soffit Board (thicknesses up to, and including, 120 mm) produced at Kingspan Insulation's Pembridge manufacturing facility is certified as achieving Class 1 Fire Rating to Factory Mutual Class Number 4880.

For further details please contact the Kingspan Insulation Technical Service Department (see rear cover) or alternatively search for Kingspan Insulation on www.approvalguide.com.

FM
APPROVED

This approval is valid for ceiling / soffit insulation only, with non–combustible walls with no height restriction. 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 **Kool**therm® K110 FM Soffit Board achieves European Classification (Euroclass) C-s1,d0 when classified to EN 13501-1: 2018 (Fire classification of construction products and building elements. Classification using data from reaction to fire tests).

Kingspan **Kool**therm® K110 FM Soffit Board, when subjected to EN ISO 5659-2: 2012 (Plastics. Smoke generation. Part 2: Determination of optical density by a single–chamber test), has achieved a mean maximum specific optical density of smoke < 200 in both the presence and absence of a pilot flame at irradiances of 25 and 50 kW/m^2.

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

Thermal Properties

The λ–values and R–values detailed below are quoted in accordance with BS / I.S. EN 13166: 2012 + A2: 2016 (Thermal insulation products for buildings. Factory made phenolic foam (PF) products. Specification).

Thermal Conductivity

The boards achieve a thermal conductivity (λ–value) of 0.018 W/m·K.

Thermal Resistance

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^2·K/W).

Insulant Thickness (mm)	Thermal Resistance (m^2·K/W)
60	3.30
65	3.60
70	3.85
75	4.15
80	4.40
85	4.70
90	5.00
100	5.55
110	6.10
120	6.65
130	7.20
140	7.75
160	8.85
180	10.00
200	11.10

NB Kingspan Insulation's maximum available single insulation 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 the Kingspan Insulation Technical Service Department 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.

Contact Details

Customer Service

For quotations, order placement and details of despatches please contact the Kingspan Insulation Customer Service Department on the numbers below:

UK – Tel: +44 (0) 1544 388 601
– email: customerservice@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 5000
– email: info@kingspaninsulation.ie

Literature & Samples

Kingspan Insulation produces a comprehensive range of technical literature for specifiers, contractors, stockists and end users. The literature contains clear user friendly advice on typical design; design considerations; thermal properties; sitework and product data.

For copies please contact the Kingspan Insulation Marketing Department, or visit the Kingspan Insulation website, using the details below:

UK – Tel: +44 (0) 1544 387 384
– email: literature@kingspaninsulation.co.uk
– www.kingspaninsulation.co.uk/literature

Ireland – Tel: +353 (0) 42 979 5000
– email: info@kingspaninsulation.ie
– www.kingspaninsulation.ie/literature

Tapered Roofing

For technical guidance, quotations, order placement and details of despatches please contact the Kingspan Insulation Tapered Roofing Department on the numbers below:

UK – Tel: +44 (0) 1544 387 383
– email: tapered@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 975 4297
– email: tapered@kingspaninsulation.ie

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service. Calculations can be carried out to provide U–values, condensation / dew point risk, required insulation thicknesses etc…

U–value calculations can also be carried out on the Kingspan Insulation U–value Calculator, available for free online at www.uvalue-calculator.co.uk or downloaded as an App.

The Kingspan Insulation Technical Service Department can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

The Kingspan Insulation British Technical Service Department operates under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U–value and Condensation Risk Calculations.

BBA CERTIFICATE CS/1004-4 U Value Competency Scheme

Please contact the Kingspan Insulation Technical Service Department on the numbers below:

UK – Tel: +44 (0) 1544 387 382
– email: technical@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 975 4297
– email: technical@kingspaninsulation.ie

General Enquiries

For all other enquiries contact Kingspan Insulation on the numbers below:

UK – Tel: +44 (0) 1544 388 601
– email: info@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 5000
– email: info@kingspaninsulation.ie

Kingspan Insulation Ltd 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 reference should be made to the current Kingspan Insulation price–list or advice sought from Kingspan Insulation's Customer Service Department (see above left). The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described. Recommendations for use should be verified for suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a Technical Advisory Service (see above), the advice of which should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of this literature is current by contacting the Kingspan Insulation Marketing Department (see left).

Kingspan®

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