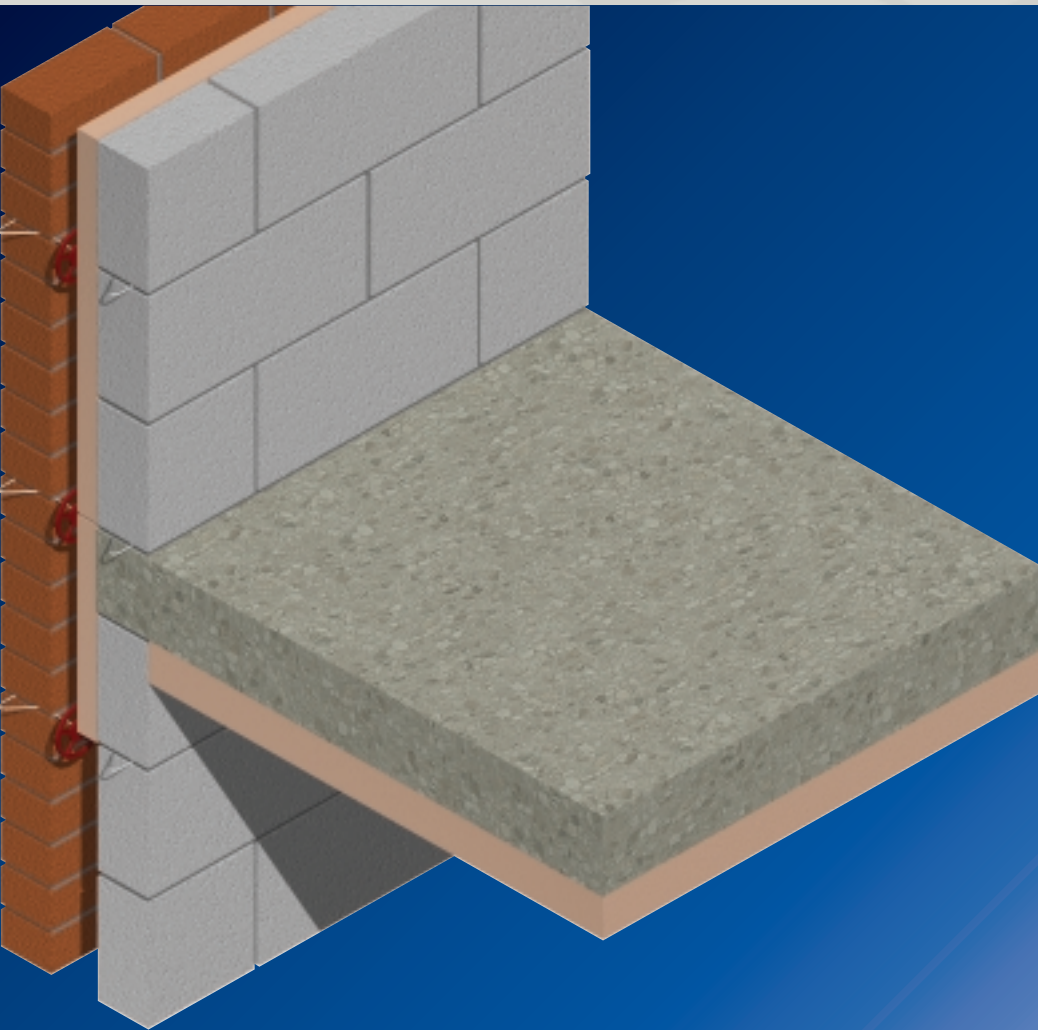


Kooltherm® K10 Soffit Board

INSULATION FOR STRUCTURAL CEILINGS (SOFFITS)



- Premium performance rigid phenolic insulation – thermal conductivity as low as 0.021 W/m-K
- Class 0 / Low Risk fire rating
- Negligible smoke obscuration
- Designed for use under structural ceilings e.g. concrete soffits
- Eliminates cold bridging
- Unaffected by air movement
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for new build and refurbishment
- Non-deleterious material
- CFC/HCFC-free with zero Ozone Depletion Potential (ODP)



Kooltherm® K10 Soffit Board

Typical Design Detail

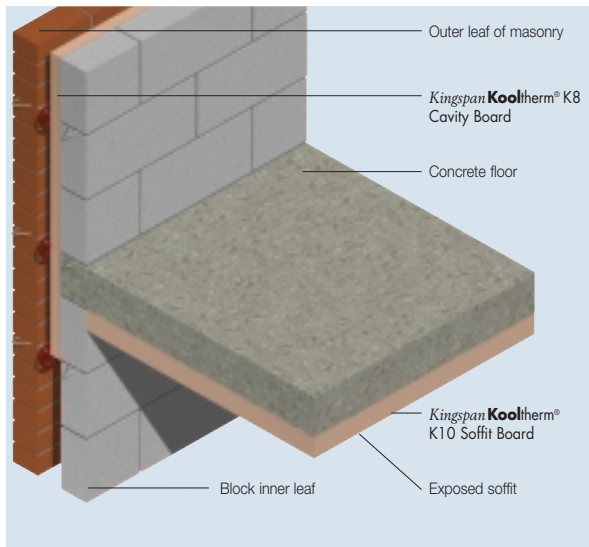


Figure 1 Directly to Concrete Soffit

Specification Clause

Kingspan Kooltherm® K10 Soffit Board should be described in specifications as:-

The soffit insulation shall be *Kingspan Kooltherm® K10 Soffit Board* ____mm thick CFC/HCFC-free rigid phenolic insulation core with autohesively bonded facings on both sides manufactured to the highest standards under quality control systems approved to BS EN ISO 9001: 2000 by Kingspan Insulation Limited and shall be applied in accordance with the instructions issued by them.

Design Considerations

Sustainability

In the past, erroneously, the relative environmental sustainability of insulation materials has been compared on the basis of embodied energy and ozone depletion potential. It is now recognised that a much wider basket of embodied environmental impacts (including those caused by their embodied energy), rather than embodied energy alone, is the only credible tool of comparison. Time has also annulled ozone depletion potential as an issue as all insulation materials are now banned from using CFC and HCFC blowing agents by law.

For buildings designed to today's Building Regulations energy use standards it is now also known that the embodied environmental impacts of all of the materials and labour used to create a building are insignificant in comparison with the lifetime operational environmental impacts of that building, and so are of very limited importance. Since it is operational energy use that creates the vast majority of operational environmental impact, saving energy by specifying the lowest U-values possible is the most environmentally sustainable action to take.

However, one of the most neglected facts about environmentally sustainable buildings is that the longevity of their standards of operational energy use, and therefore the longevity of their operational environmental impacts, is critical. The performance of some insulants, such as mineral fibre, can deteriorate rapidly if exposed to water penetration, air movement or compression. This may increase operational energy use and hence compromise the environmental sustainability of the finished building to an alarming degree. Other insulation materials, such as rigid phenolic or rigid urethane, are not vulnerable to any of these problems.

In summary, designers should:

- (a) specify the lowest possible U-value regardless of insulation type;
- (b) design out the risk of their chosen insulant not performing as specified; and
- (c) if the latter is not possible, choose an insulant that is at low risk of failure e.g. a cellular plastic insulation material.

However, manufacturers should not rest on their laurels; it is a matter of social responsibility to be open and honest about the environmental impact of the manufacture of a product, and a full Life Cycle Analysis (LCA) based on a much wider basket of environmental impacts, rather than embodied energy alone, is recognised as the preferred tool to achieve this. Kingspan Insulation was the first insulation manufacturer to openly complete and publish independently certified Ecoprofiles (a type of LCA) on its product ranges. The Ecoprofile for the **Kingspan Therma™** range of rigid urethane insulation products was performed by Building Research Establishment (BRE).

The product range comfortably achieves a BRE Green Guide A rating. Kingspan Insulation is currently completing a BRE Ecoprofile of its **Kingspan Kooltherm® K**-range of rigid phenolic insulation products.



But there is far more to sustainability than whether or not a product, process or company affects the environment in a positive or a negative way. A company can, and should, demonstrate its financial viability and social responsibility, as well as ensure that its materials and methods do not add unduly to the burden placed on the planet.

Kingspan Insulation has now put the manufacture of its products at its Pembrige facility in Herefordshire through a rigorous independent appraisal of its economic, social, environmental and natural resource impacts using Arup's SPeAR® tool.

The results show a well balanced performance in terms of sustainability, and that Kingspan Insulation is already meeting legislation or best practice in most areas, even moving beyond best practice in some. Kingspan Insulation is the first and only construction material manufacturer to have taken this bold move and openly publish the results.

Typical U-values

The following examples have been calculated using the Combined Method for compliance with Building Regulations / Standards revised after 2002. These examples are based on the use of **Kingspan Kooltherm® K10 Soffit Board** fixed directly to the soffit of a 200 mm concrete deck with 50 mm screed overlaid. If your construction is any different, please contact the Kingspan Insulation Technical Service Department (see rear cover).

Combined Method – U-values were calculated using the method which has been adopted to bring National standards in line with the European Standard calculation method, BS / I.S. EN ISO 6946: 1997 (Building components and building elements. Thermal resistance and thermal transmittance. Calculation method).

NB When calculating U-values to BS / I.S. EN ISO 6946: 1997, the type of fixing used may change the thickness of insulation required. These calculations assume the use of polypropylene insulation fasteners of thermal conductivity of 1.00 W/m·K or less, the effect of which is insignificant. Please contact the Kingspan Insulation Technical Service Department (see rear cover) for project calculations.

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 together with condensation risk analysis should be completed for each individual project. Please contact the Kingspan Insulation Technical Service Department (see rear cover) for assistance.

Fixed Directly to Concrete Soffit

Insulant Thickness (mm)	U-value (W/m ² ·K)
25	0.68
30	0.59
40	0.47
50	0.36
60	0.31
70	0.27
75	0.25
80	0.24
90	0.21

Kooltherm® K10 Soffit Board

Sitework

Depending on whether the fixing method is directly on to a concrete soffit, to timber battens or to a proprietary grid system, fixing should proceed as follows:

Fixing Directly to Concrete Soffits

Kingspan Kooltherm® K10 Soffit Board can be fully restrained to a concrete soffit by the use of 11 No. approved insulation fasteners with a minimum head diameter of 35 mm. The fasteners should be evenly distributed over the whole area of the board and must offer a minimum 40 mm penetration into a solid substrate. Board joints should preferably be staggered.

Fixing to Timber Battens / Proprietary Grid Systems

Alternatively, a treated timber batten lay-out may be adopted if there is an uneven surface or mechanical services present and direct fixing is not possible. 50 mm x 25 mm battens should be placed at 600 mm centres to coincide with the edges / centre of the boards. The battens should be fixed to the soffit by the use of a suitable fixing method e.g. shot-fire may be considered.

Kingspan Kooltherm® K10 Soffit Board should then be fixed to the treated timber battens using suitable fixings. These should be placed at maximum 300 mm centres (maximum 200 mm when using nails into timber) in rows not greater than 600 mm apart.

Kingspan Kooltherm® K10 Soffit Board can also be fixed to a proprietary grid system comprising metal furring bars. Manufacturer's advice should be sought regarding the type and required number of fixings for such applications. Please contact the Kingspan Insulation Technical Service Department (see rear cover) for further information.

Fixings should be not less than 12 mm from board edges. Exposed joints should be covered with a suitable cover strip. For aesthetic appearance, consideration may be given to the application of a PVC cover strip at board joints.

For advice on alternative fixing refer to:

EJOT UK Ltd	+44 (0) 1977 687 040
Hilti Ltd	+44 (0) 800 830 858

For advice on jointing tapes for *Kingspan Kooltherm®* K10 Soffit Board refer to:

Venture Tape Europe	+44 (0) 1327 876 555
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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

Kingspan Kooltherm® K10 Soffit Board is available through specialist insulation distributors and selected builders' merchants throughout the UK, Ireland and Europe.

Packaging

According to quantity, the boards are supplied in packs or on pallets, labelled and shrinkwrapped in polythene.

Storage

The packaging of *Kingspan Kooltherm®* K10 Soffit Board should not be considered adequate for long term outdoor protection. Ideally, boards should be stored inside a building. If, however, outdoor storage cannot be avoided then the boards should be stacked clear of the ground and covered with a 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 leaflet on this topic which satisfies the requirements set out in the Control of Substances Hazardous to Health Regulations 1988 (COSHH) is available from the Kingspan Insulation Marketing Department (see rear cover).

Please note that the reflective surfaces on these products are designed to enhance their thermal performance. As such, they will reflect light as well as heat, including ultraviolet light. Therefore, if these boards are 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 facing used on this product can be slippery underfoot 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 these boards unless they are fully supported by a load bearing surface.

Product Description

The Upper Facing

The upper facing of *Kingspan Kooltherm*[®] K10 Soffit Board is a tissue based facing bonded to the insulation core during manufacture.

The Core

The core of *Kingspan Kooltherm*[®] K10 Soffit Board is a premium performance CFC/HCFC-free rigid phenolic insulant of typical density 35 kg/m³.

The Lower Facing

The lower facing of *Kingspan Kooltherm*[®] K10 Soffit Board is a composite foil bonded to the insulation core during manufacture. The lower facing used on *Kingspan Kooltherm*[®] K10 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).

CFC/HCFC-free

Kingspan Kooltherm[®] K10 Soffit Board is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential (ODP).



Product Data

Standards and Approvals

Kingspan Kooltherm[®] K10 Soffit Board is manufactured to the highest standards under a quality control system approved to BS EN ISO 9001: 2000 (Quality management systems. Requirements).



Manufactured to BS EN ISO 9001: 2000
Certificate No. 388

Standard Dimensions

Kingspan Kooltherm[®] K10 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

Typically exceeds 100 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

Water Vapour Resistance

Modified to include board facings, the boards achieve a resistance far greater than 100 MN·s/g, when tested in accordance with BS 4370-2: 1993 (Methods of test for rigid cellular materials. Methods 7 to 9).

Durability

If correctly applied, *Kingspan Kooltherm*[®] K10 Soffit Board has 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 (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 the 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.

Kooltherm® K10 Soffit Board

Fire Performance

Kingspan Kooltherm® K10 Soffit Board will achieve the results given below, which enable it to be classified by the Building Regulations as being Class 0 and as Low Risk by the Technical Standards in Scotland.

Test	Result
BS 476-6: 1989 (Fire tests on building materials and structures. Method of test for fire propagation for products)	Fire propagation index of performance (I) not exceeding 12 and sub index (i_1) not exceeding 6 (for rigid phenolic insulation core)
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)	Class 1 rating
BS 5111-1: 1974 (Smoke Obscuration)	< 5%

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 quoted are in accordance with the principles in the Harmonised European Standard BS EN 13166: 2001 (Thermal insulation products for buildings – Factory made products of phenolic foam (PF) – Specification) using so called 90 / 90 principles. Comparison with alternative products may not be appropriate unless the same procedures have been followed.

Thermal Conductivity

The boards achieve a thermal conductivity (λ -value) of 0.024 W/m·K (insulant thickness 15–24 mm), 0.023 W/m·K (insulant thickness 25–44 mm) and 0.021 W/m·K (insulant thickness \geq 45 mm).

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.

Insulant Thickness (mm)	Thermal Resistance (m ² ·K/W)
25	1.05
30	1.30
40	1.70
50	2.35
60	2.85
65	3.05
70	3.30
75	3.55
80	3.80
90	4.25

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

Kingspan Insulation

Kingspan Insulation offers an extensive range of premium and high performance insulation products, breathable membranes and pre-insulated systems for the construction industry. Following an extensive investment programme, Kingspan Insulation is continuing to lead the insulation industry by manufacturing its insulation products with zero Ozone Depletion Potential (ODP) and quoting thermal performance data in accordance with the new harmonised European Standards.

Kingspan Insulation Limited specialises in the solution of insulation problems. The Kingspan Insulation range of insulation products meet the exacting requirements of the construction industry and are produced to the highest standards, including BS EN ISO 9001: 2000 / I.S. EN ISO 9001: 2000. Each product has been designed to fulfil a specific need and has been manufactured to precise standards and tolerances.

Insulation for:

- Pitched Roofs
- Flat Roofs
- Cavity Walls
- Timber and Steel Framing
- Externally Insulated Cladding Systems
- Floors
- Soffits

Solutions:

- Insulated Dry-Lining
- Tapered Roofing Systems
- Kingspan **KoolDuct**® Pre-Insulated Ducting
- Kingspan **nilvent**® Breathable Membranes

The Kingspan Insulation Product Range

The Kingspan **Kooltherm**® **K-range**

- With a thermal conductivity of 0.021–0.024 W/m·K CFC/HCFC-free rigid phenolic insulation is the most thermally efficient insulation product commonly available.
- Utilises the thinnest possible insulation board to achieve required U-values.
- Fire performance can be equivalent to mineral fibre.
- Achieves a Class 0 fire rating to the Building Regulations and Low Risk rating for the Technical Standards in Scotland.
- Achieves the best possible rating of < 5% smoke obscuration when tested to BS 5111: Part 1: 1974.
- CFC/HCFC-free with zero Ozone Depletion Potential (ODP).

The Kingspan **Therma**™ **Range**

- With a thermal conductivity of 0.023–0.028 W/m·K CFC/HCFC-free rigid urethane insulation is one of the most thermally efficient insulation products commonly available.
- Easily achieves required U-values with minimum board thickness.
- Achieves the required fire performance for the intended application.
- CFC/HCFC-free with zero Ozone Depletion Potential (ODP).

The Kingspan **Styrozone**® & **Purlcrete**® **Ranges**

- Rigid extruded polystyrene insulation (XPS) has the highest compressive strength of any commonly available insulant.
- Ideal for specialist applications such as inverted roofing and heavy-duty flooring.
- Easily achieves required U-values with minimum board thickness.
- Achieves the required fire performance for the intended application.
- CFC/HCFC-free with zero Ozone Depletion Potential (ODP).

All Products

- Their closed cell structure resists both moisture and water vapour ingress – problems which can be associated with open cell materials such as mineral fibre and which can result in reduced thermal performance.
- Unaffected by air movement – problems that can be experienced with mineral fibre and which can reduce thermal performance.
- Safe and easy to install – non-fibrous.
- Provide reliable long term thermal performance over the lifetime of the building.

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) 870 850 8555
– Fax: +44 (0) 870 850 8666
– email: commercial.uk@insulation.kingspan.com

Ireland – Tel: +353 (0) 42 97 54200
– Fax: +353 (0) 42 97 54299
– email: commercial.ie@insulation.kingspan.com

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.

Available as a complete Design Manual or as individual product brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact the Kingspan Insulation Marketing Department on the numbers below:

UK – Tel: +44 (0) 870 733 8333
– Fax: +44 (0) 1544 387 299
– email: literature.uk@insulation.kingspan.com

Ireland – Tel: +353 (0) 42 97 54298
– Fax: +353 (0) 42 97 54299
– email: literature.ie@insulation.kingspan.com

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) 870 761 7770
– Fax: +44 (0) 1544 387 289
– email: tapered.uk@insulation.kingspan.com

Ireland – Tel: +353 (0) 42 97 54297
– Fax: +353 (0) 42 97 54296
– email: tapered.ie@insulation.kingspan.com

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a computer-aided service designed to give fast, accurate technical advice. Simply phone the Kingspan Insulation Technical Service Department with your project specification. Calculations can be carried out to provide U-values, condensation / dew point risk, required insulation thicknesses etc... Thereafter any number of permutations can be provided to help you achieve your desired targets.

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.

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

UK – Tel: +44 (0) 870 850 8333
– Fax: +44 (0) 1544 387 278
– email: techline.uk@insulation.kingspan.com

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– Fax: +353 (0) 42 97 54296
– email: techline.ie@insulation.kingspan.com

General Enquiries

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

UK – Tel: +44 (0) 870 850 8555
– Fax: +44 (0) 870 850 8666
– email: info.uk@insulation.kingspan.com

Ireland – Tel: +353 (0) 42 97 54200
– Fax: +353 (0) 42 97 54299
– email: info.ie@insulation.kingspan.com

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 as to the 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 the literature is current by contacting the Kingspan Insulation Marketing Department (see left).



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