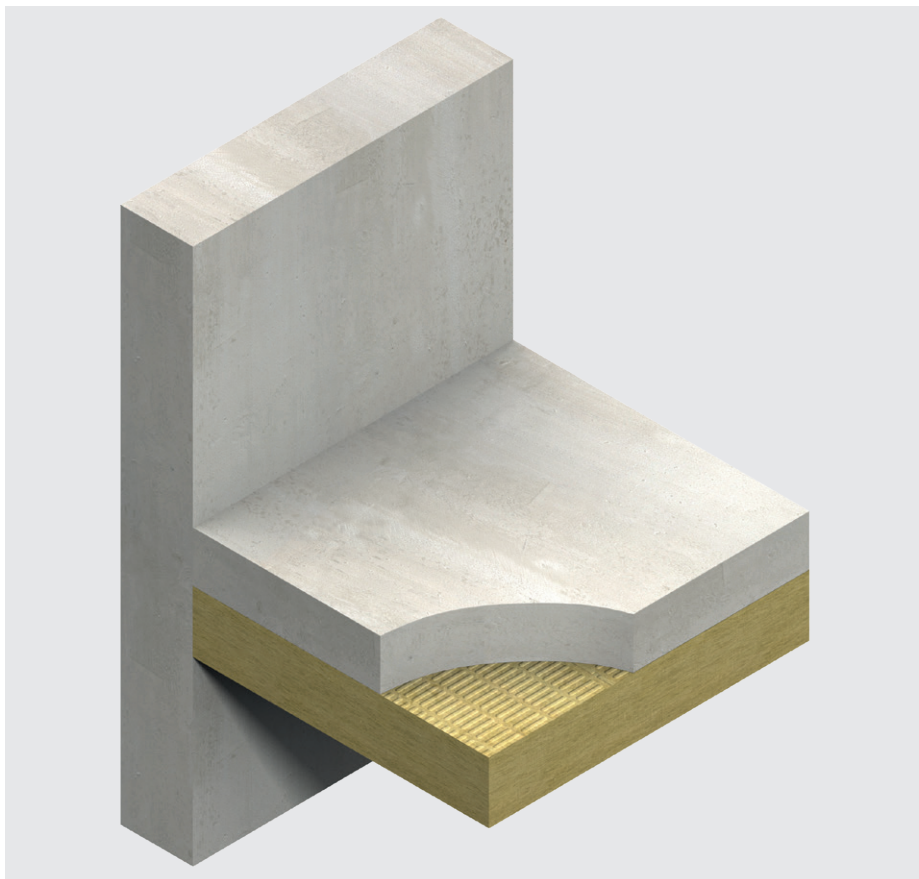


K-Roc[®] Soffit Slab

Insulation for structural ceilings (soffits)



- Rock mineral fibre insulation with a thermal conductivity of 0.036 W/mK
- European Classification (Euroclass) A1
- Ideal for new build and refurbishment

Typical constructions and U-values

Assumptions

The U-values in Table 1 have been calculated using the method detailed in BS EN ISO 6946: 2017 (Building components and building elements. Thermal resistance and 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 K-Roc® Soffit Slab mechanically fixed directly to the soffit of a 200 mm concrete deck.

Calculations assume a thermal conductivity of 1.00 W/mK or less for thermally broken fasteners, the effect of which is insignificant. Calculations assume a cross sectional area of 25.97 mm for metal fixings, with a thermal conductivity of 50 W/mK and 2.78 fixings per m².

NB When calculating U-values to BS EN ISO 6946: 2017, the type of fixing used may change the thickness of insulation required. Please contact the Kingspan Insulation Technical Service Department (see rear cover for details) 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 (see rear cover for details) for assistance.

U-value table key

Further information on the applicable notional and area weighted average limiting U-values is available in the relevant geographical documentation:

- Approved Documents L to the Building Regulations for England
- Approved Documents L to the Building Regulations for Wales
- Technical Handbooks Section 6 to the Building Standards for Scotland
- Technical Booklets F1 & F2 to the Building Regulations for Northern Ireland
- Technical Guidance Document L (Dwellings) and Technical Guidance Document L (Buildings other than Dwellings) to the Building Regulations for the Republic of Ireland.

Fixed directly to concrete soffit

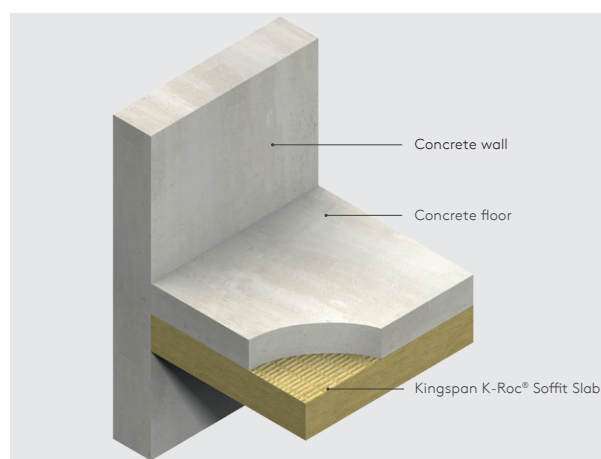


Figure 1

Insulant thickness (mm)	U-values (W/m ² K)
100	0.34
120	0.29
150	0.24
180	0.21
200	0.18
220 (100 + 120)	0.17
240 (120 + 120)	0.15
270 (120 + 150)	0.14
300 (150 + 150)	0.12
320 (200 + 120)	0.12
360 (180 + 180)	0.10

NB Calculations assume the use of six fixings (two metal fixings and four thermally broken telescopic tube fixings).

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

Design considerations

Heat loss and linear thermal bridging

Basic principles

Linear thermal bridging describes the additional heat losses or gains that occur at junctions between elements e.g. where a cavity wall meets the ground or intermediate floor, or at junctions around openings in the building fabric where the thermal insulation layer is discontinuous e.g. sills, jambs and lintels.

Interruptions within the insulation layer by materials with poorer insulating properties can result in a thermal bridge, which in turn can lead to problems of internal surface condensation and mould growth, especially if there is a drop in surface temperature.

The heat flow at these junctions and opening locations, over and above that through the adjoining plane elements, is the linear thermal transmittance of the thermal bridge. This is measured in W/mK, referred to as a 'psi-value' and expressed as a ' Ψ -value'.

The lower the ψ -value, the better the performance. ψ -values are taken into account in the calculation methodologies e.g. the Standard Assessment Procedure (SAP) that are used to assess the operational CO₂ emissions and, where applicable, the fabric energy efficiency of buildings, primary energy or delivered energy rates.

ψ -values can comprise either, or a combination of, calculated and assumed values.

Approved details, such as the Acceptable Construction Details (Republic of Ireland), can uplift performance to provide a clear starting point towards achieving compliance, but can be limited in scope and applicability. The greatest opportunity for mitigating the impact of linear thermal bridges can come from following accurately 'modelled' details that take into account the following design considerations.

Reducing linear thermal bridging

For soffit constructions, supporting beams and columns interrupting the insulation layer can represent significant thermal bridges, which can adversely affect the thermal performance of the floor if not suitably handled. Thermally, the best approach is to fully box around beams with appropriate insulation to limit these losses. For further advice on reducing linear and point thermal bridging, please contact Kingspan Insulation's Technical Service Department (see rear cover for details).

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 upon request from literature@kingspaninsulation.co.uk.

Specification clause

Kingspan K-Roc® Soffit Slab should be described in specifications as:

The soffit insulation shall be Kingspan K-Roc® Soffit Slab_____ mm thick: comprising rock mineral fibre insulation with a thermal conductivity of 0.036 W/mK. The product shall be installed in accordance with the instructions issued by Kingspan Insulation Limited.

Product classifications

Uniclass UK

Pr_25_57_06_50 Mineral fibre slab insulation

CAWS

E60/130 Precast slab
E60/140 Precast floor plate
P10/185 Soffit insulation
E60/30 Precast slab

Details also available on [NBS Source](#).

Wind loading

Where the insulation slabs may be subject to external wind pressure, wind loadings should be assessed in accordance with BS EN 1991-1-4: 2005 + A1: 2010 (Eurocode 1 Actions on structures - General actions - Wind actions) / I.S. EN 1991-1-4: 2005 (Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions (Including Irish national annex) taking into account:

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

Sitework

Fixing directly to concrete soffits

The installation guidance for Kingspan K-Roc® Soffit Slab outlined in this section must only be followed after considering the below.

- Insulation slabs should be installed break-bonded, with joints lightly butted.
- The number of mechanical fixings required to fix Kingspan K-Roc® Soffit Slab 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 six mechanical fixings, with a minimum head diameter of 70 mm, are required to secure the insulation slab to the soffit. Two of the fixings should be metal fixings; the remaining four should be thermally broken telescopic tube fixings.
- Where the insulation slabs may be subject to external wind pressure, the requirement for additional fixings should be assessed in accordance with BS EN 1991-1-4: 2005 + A1: 2010 / I.S. EN 1991-1-4: 2005.
- The fixings should be evenly distributed over the whole area of the slab, and must offer a minimum 40 mm penetration into a solid substrate.
- Please refer to the column opposite for the recommended fixing pattern.
- Fixings at slab edges must be located > 150 mm and < 150 mm from edges and corners of the board and not overlap board joints.
- For details on fixings refer to:

Ejot UK Limited +44 (0) 1977 687 040
www.ejot.co.uk

Fixfast +44 (0) 1732 882 387
www.fixfast.com

ITW Spit +44 (0) 800 731 4924
www.itwcp.co.uk/Spit/

MAK Fasteners +353 (0) 1 451 9004
www.makfasteners.com

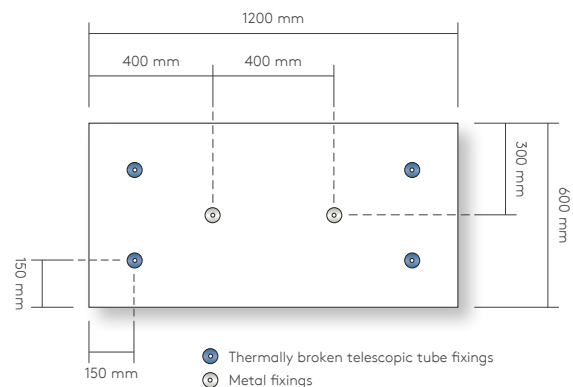
Masonry Fixings Services Ltd +353 (0) 1 642 6700
www.masonryfixings.ie

SFS Intec +44 (0) 1132 085 500
www.sfsintec.biz/uk

- When installing multiple layers of Kingspan K-Roc® Soffit Slab, all joints should be staggered. Two plastic fixings should be used in the first layer, and six fixings in the final layer (four plastic and two metal fixings). It is recommended to use two temporary thermally broken fixings during installation.

Recommended fixing patterns

- The images below shows the recommended fixing pattern, the number of fixings used and the resultant fixing density (number of fixings per m²).
- The fixing pattern shown is 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.



6 no. per slab
 (1.2 x 0.6 m board - 8.33 fixings / m²)

Sitework

General

Cutting

- Cutting should be carried out using a hard steel-bladed saw, such as a fine-toothed hand saw. For minor adjustments or notches, use a sharp knife or insulation knife.
- Ensure accurate trimming to achieve close-butting joints and continuity of insulation.
- Appropriate personal protective equipment (PPE) should be worn, including:
 - work gloves
 - loose-fitting, long-sleeved shirts and long trousers to prevent skin irritation from fibres
 - cap or hood to prevent irritation from fibres
 - safety glasses
 - disposable dust respirator - a certified dusk mask with a filter FFP2 or greater to prevent inhalation of dust particles.

Availability

- Kingspan K-Roc® Soffit Slab is available through specialist insulation distributors and selected builders' merchants throughout the UK and Ireland.

Packaging & storage

- The polyethylene packaging of Kingspan Insulation products should not be considered adequate for outdoor protection.
- Ideally, slabs should be stored inside a building. If, however, outside storage cannot be avoided, then the slabs should be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin. Slabs that have been allowed to get wet should not be used. To prevent damage, do not place any weight or objects on the insulation slabs.
- Do not stack insulation slabs more than 3 metres high.

Health & safety

- A Safety Information Data Sheet for this product is available from the Kingspan Insulation Technical Service department (see rear cover).

Product details

The product

Kingspan K-Roc® Soffit Slab is a rock mineral fibre insulation.

The exposed facing used on Kingspan K-Roc® 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's Technical Service Department (see rear cover).

Standard dimensions

Kingspan K-Roc® Soffit Slab is available in the following standard size:

Nominal dimension	Availability
Length (mm)	1200
Width (mm)	600
Insulant thickness (mm)	Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

Compressive stress

The average compressive stress of Kingspan K-Roc® Soffit Slab exceeds 20 kPa, when tested to BS EN 826: 2013 (Thermal insulating products for building applications. Determination of compression behaviour).

Density

Kingspan K-Roc® Soffit Slab has a nominal density of approximately 90 kg/m³.

Durability

If correctly installed, Kingspan K-Roc® Soffit Slab 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.

Fire performance

Kingspan K-Roc® Soffit Slab achieves European Classification (Euroclass) A1, when classified to EN 13501-1: 2018 (Fire classification of construction products and building elements - Classification using data from reaction to fire tests).

Kingspan K-Roc® Soffit Slab is assessed under Assessment and Verification of Constancy of Performance (AVCP) System 1 for Reaction to Fire.

Certificate of Constancy of Performance

0751-CPR-400.0-01

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

Thermal properties

The λ -values and R-values detailed below are quoted in accordance with BS EN 13162: 2012 + A1: 2015 (Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification).

Thermal conductivity

The slabs achieve a thermal conductivity (λ -value) of 0.036 W/mK.

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 (m²K/W).

Insulant thickness (mm)	Thermal resistance (m ² K/W)
100	2.75
120	3.30
150	4.15
180	5.00
200	5.55

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

About Kingspan Insulation

Company details

Kingspan Insulation Ltd is part of the Kingspan Group plc., one of Europe's leading construction product manufacturers. The Kingspan Group was formed in the late 1960s and is a publicly quoted group of companies headquartered in Kingscourt, County Cavan, Ireland.

Kingspan Insulation Ltd is a leading manufacturer of premium and high performance rigid insulation products and insulated systems for building fabric and building services applications.

Products & solutions

Optimum, premium and high performance rigid insulation products for building fabric applications, including roofs, walls and floors.

- Kingspan OPTIM-R® - optimum performance vacuum insulation panel (VIP) systems.
- Kingspan AlphaCore® - premium performance microporous silica-based insulation.
- Kingspan Kooltherm® - premium performance phenolic insulation.
- Kingspan Therma™ - high performance PIR insulation.
- K-Roc® - rock mineral fibre insulation.
- Kingspan GreenGuard® - extruded polystyrene insulation (XPS).
- Kingspan TEK® - structural insulated panels (SIPs).
- Cavity closers - PVC-U extrusions with an insulation core.
- Membranes - for pitched roofs and walls.

Services

Our support services provide fast and accurate advice no matter what your role is. Visit our website to access the following services.

- U-value calculations - free, quick and easy U-value calculations with our U-value Calculator.
- Help and advice on your projects, including stockists, how to guides, regulatory guidance and e-learning.
- Building Information Modelling (BIM) - download BIM objects for our products.
- Tapered roofing service - Kingspan Insulation's tapered roofing systems come with a supporting design service to ensure the most cost-effective solution for a roof is identified.
- CPDs - Kingspan Insulation offer a number of free CPD seminars for architects and specifiers covering a wide range of industry topics. CPDs can be booked or a range of online learning courses can be found online.
- Product Awareness Training - build your team's knowledge with on-site training and support with one of our experienced product technicians who cover the full range of Kingspan products and applications.

Planet Passionate

Through Planet Passionate we are determined to reduce our manufacturing carbon (CO₂e) emissions to as close to zero as technically possible, together with reducing carbon intensity in our primary supply chain. To learn more about our latest progress and targets, as well as our partnerships and global commitments, visit the global **Planet Passionate Hub**.

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