

# Kooltherm® K10 PLUS Soffit Board

Insulation for structural  
ceilings (soffits)



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# Introduction

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- Premium thermal performance rigid thermoset phenolic insulation - thermal conductivities as low as 0.021 W/mK
- Impact resistant building board
- Unaffected by air infiltration
- Resistant to the passage of water vapour
- Easy to handle and install compared to some other commonly available insulants
- Ideal for new build and refurbishment



Visit our **free online U-value calculator**.  
Offering free, quick and easy calculations  
for wall, floor and roof constructions.



## Useful links

### Website

[Kingspan Kooltherm® K10 PLUS webpage](#)

### Safety information

[Kingspan Kooltherm® product safety information](#)

# Product details

## The inner facing

The inner (concealed) facing of Kingspan Kooltherm® K10 PLUS is a glass tissue based facing, autohesively bonded to the insulation core during manufacture.

## The core

The core of Kingspan Kooltherm® K10 PLUS is a premium performance rigid thermoset fibre-free phenolic insulant.

## The outer facing

The outer (exposed) facing of Kingspan Kooltherm® K10 PLUS is a 6 mm Euroclass A1 building board.

## Standards & approvals

Kingspan Kooltherm® K10 PLUS is manufactured under a management system certified to ISO 9001: 2015 (Quality management systems), ISO 14001: 2015 (Environmental management systems), ISO 37301: 2021 (Compliance management systems), ISO 45001: 2018 (Occupational health & safety management systems) and ISO 50001: 2018 (Energy management systems).

The use of Kingspan Kooltherm® K10 PLUS (in thicknesses of 75 - 140 mm), produced at Kingspan Insulation's Castleblayney manufacturing facility is covered by NSAI Agreement Certificate 08/0321.



## Standard dimensions

Kingspan Kooltherm® K10 PLUS is available in the following standard size:

Nominal dimension		Availability
Length	(mm)	2400
Width	(mm)	1200
Insulant thickness	(mm)	Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

## Compressive strength

The average compressive strength of Kingspan Kooltherm® K10 PLUS exceeds 100 kPa, when tested to EN 826: 2013 (Thermal insulating products for building applications. Determination of compression behaviour).

## Durability

If correctly installed, Kingspan Kooltherm® K10 PLUS 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.

# Product details

## Fire performance

Kingspan Kooltherm® K10 PLUS achieves European Classification (Euroclass) B-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).

The inner (non-exposed) glass tissue facing of Kingspan Kooltherm® K10 PLUS achieves Euroclass C-s2,d0.

Further details on the fire performance of Kingspan Insulation products may be obtained from Kingspan Insulation's Technical Service Department.

## 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 PLUS resist attack by mould and microbial growth, and do not provide any food value to vermin.

## Thermal properties

The  $\lambda$ -values and R-values detailed below are quoted in accordance with EN 13166: 2012 + A2: 2016 (Thermal insulation products for buildings. Factory made phenolic foam (PF) products. Specification).

### Thermal conductivity

The thermal conductivity ( $\lambda$ -value) of the Euroclass A1 building board component of Kingspan Kooltherm® K10 PLUS Soffit Board is 0.307 W/mK.

The thermal conductivity of the insulation board component of Kingspan Kooltherm® K10 PLUS is:

0.022 W/mK (insulant thickness) 25 - 44 mm

0.021 W/mK (insulant thickness) 45 - 130 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. The resulting number is rounded down to the nearest 0.05 (m<sup>2</sup>K/W).

Product thickness* (mm)	Thermal resistance (m <sup>2</sup> K/W)
25	1.10
30	1.35
40	1.80
50	2.35
60	2.85
70	3.30
80	3.80
90	4.25
100	4.75
120	5.70
130	6.15

Building board component (mm)	Thermal resistance (m <sup>2</sup> K/W)
6	0.019 m <sup>2</sup> K/W

\*Product thickness = insulation thickness.

NB Kingspan Insulation's maximum available single insulation thickness is subject to alteration without notice. Please contact the Kingspan Insulation sales department for current stock and non-stock sizes.

# Typical constructions & U-values

## Assumptions

The U-values in Table 1 have been calculated using the method detailed in EN ISO 6946: 2017 (Building components & building elements. Thermal resistance & thermal transmittance. Calculation methods). They are valid for the construction shown in Figure 1.

These examples are based on the use of Kingspan Kooltherm® K10 PLUS mechanically fixed directly to the soffit of a 200 mm concrete deck using 3 metal fixings, with a cross sectional area of 12.57 mm<sup>2</sup>, with a thermal conductivity of 50 W/mK and 1.040/m<sup>2</sup>.

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 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:

- Technical Guidance Document L (Buildings other than Dwellings) to the Building Regulations for the Republic of Ireland
- Technical Booklets F1 & F2 to the Building Regulations for Northern Ireland.

## Fixed directly to concrete soffit

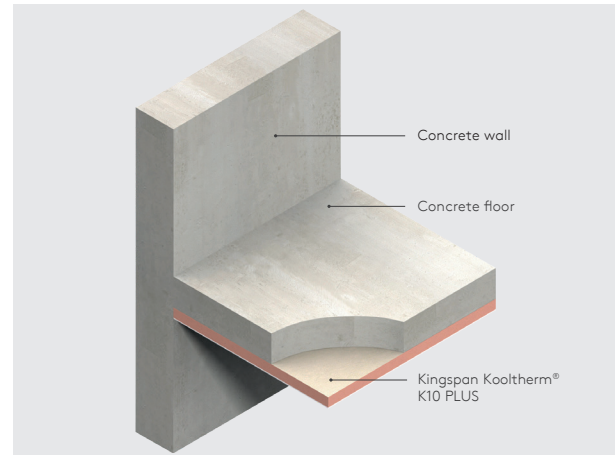


Figure 1

Insulant thickness (mm)	U-values (W/m <sup>2</sup> K)
56	0.36
66	0.31
76	0.27
86	0.24
96	0.21
106	0.19
116	0.18
126	0.16
136	0.15

\* Product thickness = insulation thickness + 6 mm Euroclass A1 building board.

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

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# Design considerations

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## 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 ' $\Psi$ -value'.

The lower the  $\Psi$ -value, the better the performance.  $\Psi$ -values are taken into account in the calculation methodologies e.g. the Standard Assessment Procedure (SAP) that are used to assess the operational CO<sub>2</sub> emissions and, where applicable, the fabric energy efficiency of buildings, primary energy or delivered energy rates.

$\psi$ -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).

## Responsible sourcing

Kingspan Kooltherm K10 PLUS is certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Good'.



For more information please contact the Kingspan Insulation Technical Service Department (see rear cover for details).

## Specification clause

Kingspan Kooltherm® K10 PLUS should be described in specifications as:

The soffit insulation shall be Kingspan Kooltherm® K10 PLUS \_\_\_\_\_ 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 Euroclass A1 building board on its outer face. The product shall be manufactured: under a management system certified to ISO 9001: 2015, ISO 14001: 2015, ISO 37301: 2021, ISO 45001: 2018 and ISO 50001: 2018; by Kingspan Insulation Limited; 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 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.

## Lightning protection

Building designers should give consideration to the requirements of BS / I.S. EN 62305: 2011 - 2012 (Protection against lightning).

# Sitework

## Fixing directly to concrete soffits

The installation guidance for Kingspan Kooltherm® K10 PLUS outlined in this section must only be followed after considering the below.

- Insulation boards should be installed break-bonded, with joints lightly butted.
- The number of mechanical fixings required to fix Kingspan Kooltherm® K10 PLUS 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 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 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 board, and must offer a minimum of 40 mm or otherwise determined by project specific site testing, by the fixing supplier.
- 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.
- For details on fixings refer to:

**MAK Fasteners** +353 (0) 1 451 9004  
[www.makfasteners.com](http://www.makfasteners.com)

**Masonry Fixings Services Ltd** +353 (0) 1 642 6700  
[www.masonryfixings.ie](http://www.masonryfixings.ie)

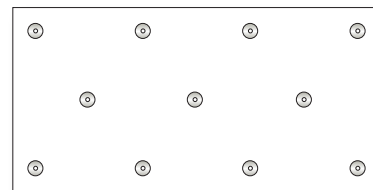
**Ejot UK limited** +44 (0) 1977 687 040  
[www.ejot.co.uk](http://www.ejot.co.uk)

**Fixfast** +44 (0) 1732 882 387  
[www.fixfast.com](http://www.fixfast.com)

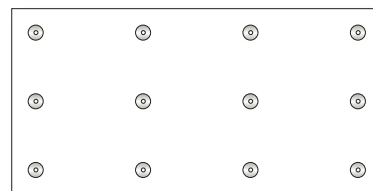
**SFS Intec** +44 (0) 1132 085 500  
[www.sfsintec.biz/uk](http://www.sfsintec.biz/uk)

## Recommended fixing patterns

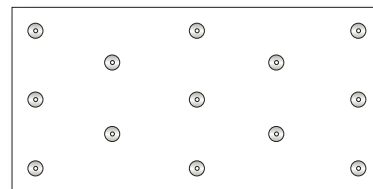
- The images below show recommended fixing patterns, the number of fixings used and the resultant fixing density (number of fixings per m<sup>2</sup>).
- The fixing patterns shown are suitable for continuous flat (even) decks only. For non-continuous decks please contact the Kingspan Insulation Technical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



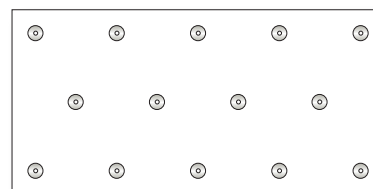
11 no. per board  
 (2.4 x 1.2 m board - 3.81 fixings / m<sup>2</sup>)



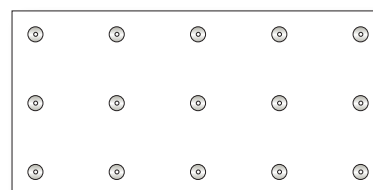
12 no. per board  
 (2.4 x 1.2 m board - 4.16 fixings / m<sup>2</sup>)



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>)

# Sitework

## Proprietary grid systems

- For information regarding proprietary grid system specifications, please contact the Kingspan Insulation Technical Service Department.

## Taping

- In the absence of other protection, exposed edges of Kingspan Kooltherm® K10 PLUS 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** 00 353 1 8624900  
**Bostik.com/ireland**

**ProTech Global Ltd:** +44 (0) 117 298 0573  
**www.protechglobal.co.uk**

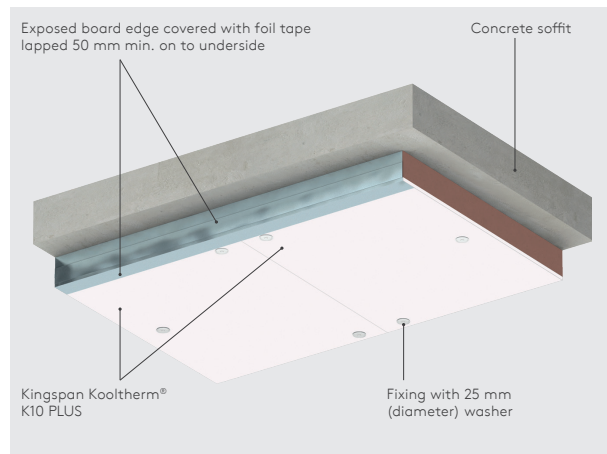


Figure 2 - Protection of exposed insulation edges of Kingspan Kooltherm® K10 PLUS

## General

### Cutting

- Cutting should be carried out either by using a fine toothed saw. The snapping of boards is not recommended.
- Ensure accurate trimming to achieve close-butting joints and continuity of insulation.

### Availability

- Kingspan Kooltherm® K10 PLUS is available through specialist insulation distributors and selected builders' merchants throughout Republic of Ireland and Northern 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.
- A Safety Information Data Sheet for this product is available from the Kingspan Insulation website [www.kingspaninsulation.ie/safety](http://www.kingspaninsulation.ie/safety).
- Do not stand on or otherwise support your weight on this product unless it is fully supported by a load bearing surface.

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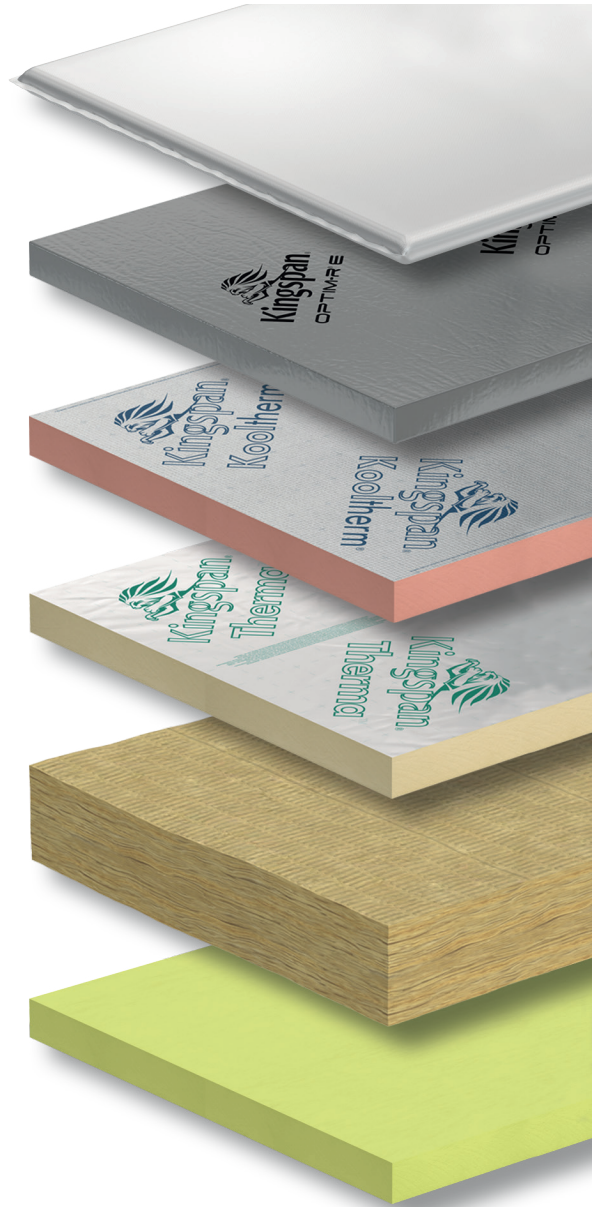
# About Kingspan Insulation

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## Products & solutions

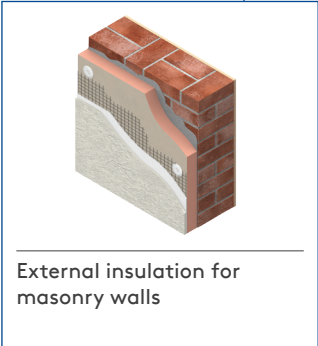
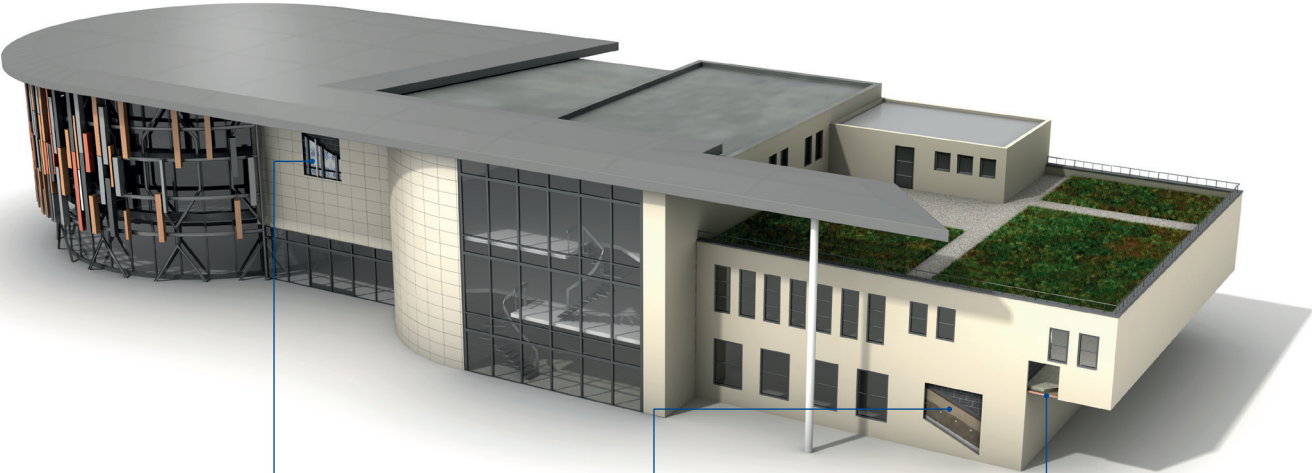
Rigid insulation products for building fabric applications, including roofs, walls and floors.

- Kingspan AlphaCore® – microporous silica-based insulation.
- Kingspan OPTIM-R® – vacuum insulation panel (VIP) systems.
- Kingspan Kooltherm® – phenolic insulation.
- Kingspan Therma™ – 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.



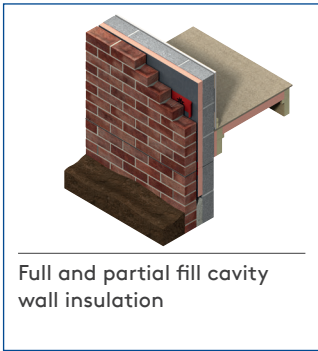
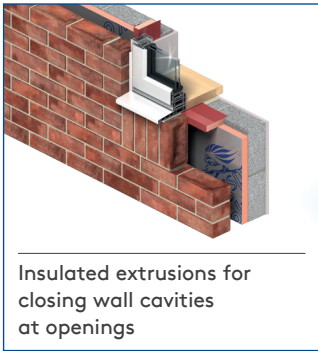
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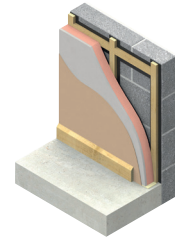
Solutions available for roofs, walls and floors of commercial buildings, from schools to retail.



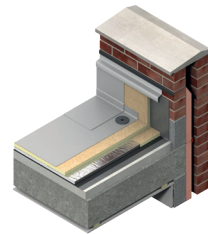
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From new housing developments to refurbishing your home, we offer a number of different solutions for roof, wall and floor applications.

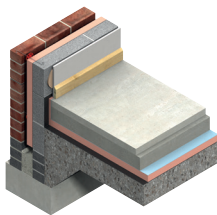




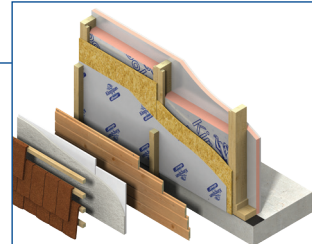
Insulation for tiled or slated pitched warm roof spaces



Insulation for flat roofs and terraces



Insulation for floors



Insulation for timber and steel framing systems

# 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 rigid insulation products and insulated systems for building fabric and building services applications.

Our site in Castleblayney, Ireland, is accredited to the independent compliance standard ISO 37301: 2021.



## 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.
- Dedicated Specification and Sales teams to support projects.
- 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 offers 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 courses can be found online.



# PLANET PASSIONATE

Planet Passionate is our group wide global sustainability programme.

Our Planet Passionate programme aims to have a positive impact on three big global challenges: climate change, circularity and protection of our natural world.



Scan for our latest progress report to learn more about our targets, partnerships and global commitments.

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# Contact details

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[www.kingspaninsulation.ie](http://www.kingspaninsulation.ie)

For individual department contact details please visit

[www.kingspaninsulation.ie/contact](http://www.kingspaninsulation.ie/contact)



Visit our free online U-value calculator.  
Offering free, quick and easy calculations  
for wall, floor and roof constructions.



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please scan or [click here](#).

To access pre-existing product information or information relating to previously sold/discontinued products please email [literature@kingspaninsulation.ie](mailto:literature@kingspaninsulation.ie).

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