

Insulation



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Ninth Issue July 2014

PITCHED ROOFS

MASONRY WALLS

TIMBER FRAME SYSTEMS

RAINSCREEN CLADDING SYSTEMS

FLOORS

# Kingspan Insulation

## Quick Guide to Pitched Roofs, Walls & Floors



Low Energy –  
Low Carbon Buildings

# Contents

	Page
<b>Introduction</b>	<b>3</b>
Kingspan Insulation	3
Products & Applications	3
Sustainability	6
Building Regulations / Standards	8
<b>Pitched Roofs</b>	<b>10</b>
Design Considerations	10
Unventilated – Full Fill Between and Under Rafter Insulation	12
Unventilated – Partial Fill Between and Under Rafter Insulation	14
Unventilated – Between and Over Rafter Insulation	16
Unventilated or Ventilated – Dwarf Wall Insulation	18
Ventilated – Partial Fill Between and Under Rafter Insulation	20
Breathable Membrane for Unvented Pitched Roofs	22
<b>Masonry Walls</b>	<b>24</b>
Partial Fill Cavity Insulation	24
Partial Fill Cavity Insulation with Insulated Plasterboard	26
Cavity Closer - Fire Performance or Wider Cavities	28
Cavity Closer – Forming Openings	30
Plaster Dab Bonded Insulated Plasterboard	32
Mechanically Fixed Insulated Plasterboard	34
Insulated Render Systems	36
Insulated Ventilated Cladding Systems	38
External Wall Insulation - Restricted Space	40
<b>Timber Frame Systems</b>	<b>42</b>
Insulation Between Studs	42
Insulation Between Studs with Insulated Plasterboard	44
Insulation Between Studs with an Insulated Sheathing	46
<b>Rainscreen Cladding Systems</b>	<b>48</b>
Rainscreen Cladding Systems	48
Rainscreen Cladding Systems with Space Restrictions	50
<b>Floors</b>	<b>52</b>
Solid Ground Floors with Insulation Below Floor Slab or Screed	52
Solid Ground Floors with Insulation Below Floor Screed with Space Restrictions	54
Beam and Block Ground Floors with Insulation below Screed	56
Suspended Timber Ground Floor with Insulation Between Joists	58
Floating Timber Ground Floor with an Insulation Composite Floor Deck	60
Structural Soffits	62

# Introduction

## Kingspan Insulation

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

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

## Products & Applications

Kingspan Insulation Ltd has a vast product range. Kingspan Insulation Ltd products are suitable for both new build and refurbishment in a variety of applications within both domestic and non-domestic buildings.

### Insulation for:

- Pitched Roofs
- Flat Roofs
- Green Roofs
- Cavity Walls
- Solid Walls
- Timber and Steel Framing
- Insulated Cladding Systems
- Insulated Render Systems
- Floors
- Soffits
- Ductwork

### Further Solutions:

- Insulated Dry Lining
- Tapered Roofing Systems
- Cavity Closers
- *Kingspan* **KoolDuct**® Pre-Insulated Ducting
- *Kingspan* **nilvent**® Breathable Membranes
- *Kingspan* **TEK** Building System

Visit [www.kingspaninsulation.co.uk](http://www.kingspaninsulation.co.uk) for further information

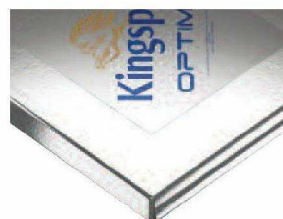
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3

## Introduction

### *Kingspan* **OPTIM-R**

- Optimum performance next generation insulation solution.
- Design (aged) thermal conductivity of 0.007 W/m-K.
- Provides an insulating performance that is up to five times better than other commonly available insulation materials.
- High levels of thermal efficiency with minimal thickness.
- Non-combustible core.
- Ideal for constructions where a lack of construction depth or space is an issue.
- Available in a range of sizes and thicknesses.
- Suitable for use in a variety of OEM applications.



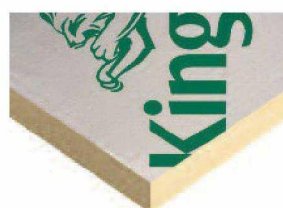
### *Kingspan* **Kooltherm** K-range Products

- With a thermal conductivity of 0.019–0.023 W/m-K these are the most thermally efficient insulation products commonly used.
- The thinnest commonly used insulation products for any specific U-value.
- Fibre-free rigid thermoset phenolic insulation core is Class 0, as defined by the Building Regulations in England, Wales & Ireland, and Low Risk, as defined by the Building Standards in Scotland.
- Fibre-free rigid thermoset phenolic insulation core achieves the best possible rating of < 5% smoke obscuration when tested to BS 5111: Part 1: 1974.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



### *Kingspan* **Therma** Range Products

- With a fibre-free rigid thermoset PIR insulation core and a thermal conductivity of 0.022–0.027 W/m-K these are amongst the more thermally efficient insulation products commonly used.
- Each product achieves the required fire performance for its intended application.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

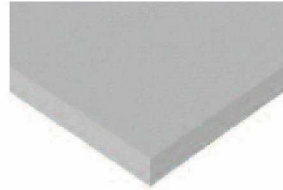


Visit [www.kingspaninsulation.co.uk](http://www.kingspaninsulation.co.uk) for further information



#### Kingspan **Stryrozone**® Range Products

- Fibre-free rigid extruded polystyrene insulation (XPS) has the necessary compressive strength to make it the product of choice for specialist applications such as heavy duty flooring, car park decks and inverted roofing.
- Each product achieves the required fire performance for its intended application
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP).



#### All Products

- Their closed structure resists both moisture and water vapour ingress – a problem which can be associated with open cell materials such as mineral fibre and which can result in reduced thermal performance.
- Unaffected by air infiltration – a problem that can be experienced with mineral fibre and which can reduce thermal performance.
- Safe and easy to install.
- If installed correctly, can provide reliable long term thermal performance over the lifetime of the building.

*Please note that the reflective surface used on some Kingspan Insulation products is designed to enhance its thermal performance. As such, it will reflect light as well as heat, including ultraviolet light. Therefore, if these products 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 some Kingspan Insulation products 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 any of these products unless it is fully supported by a load bearing surface.*

Visit [www.kingspaninsulation.co.uk](http://www.kingspaninsulation.co.uk) for further information

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5

## Sustainability

In the past, wrongly, the relative environmental sustainability of insulation materials has been compared on the basis of embodied energy / carbon and ozone depletion potential. It is now recognised that a much wider basket of embodied environmental impacts (including those caused by their embodied energy / carbon), rather than embodied energy / carbon alone, is the only credible tool of comparison. Time has also reduced 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 regulatory standards, it is known that the embodied environmental impacts of all of the materials and labour used to create a building are small in comparison with the lifetime operational environmental impacts of that building, and so are of limited importance. Since it is operational energy use that creates the vast majority of operational environmental impact, saving energy by specifying the best fabric energy efficiency possible is the most environmentally sustainable action to take.

Furthermore, 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 can deteriorate rapidly if exposed to water penetration, air-infiltration or compression. This may increase operational energy use and hence compromise the environmental sustainability of the finished building. Other insulation materials, such as *Kingspan OPTIM-R*, *Kingspan Kooltherm*® and *Kingspan Therma*™, are not as vulnerable to these problems.

In summary, designers should:

- (a) specify the lowest possible fabric energy efficiency (U-values, psi-values, air-tightness etc) 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. *Kingspan OPTIM-R*, *Kingspan Kooltherm*® and *Kingspan Therma*™.

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 / carbon alone, is recognised as the preferred tool to achieve this.

In 2002, Kingspan Insulation became the first insulation manufacturer, and the third manufacturer from any sector, to undertake a BRE certified Life Cycle Assessment (LCA) on its *Kingspan Therma*™ product range produced at its Pembroke manufacturing facility. Kingspan Insulation has maintained continuous certification of its *Therma*™ product range since then.

Visit [www.kingspaninsulation.co.uk/sustainability](http://www.kingspaninsulation.co.uk/sustainability) to download detailed guides to the Sustainability & Responsibility of Kingspan Insulation's products and their manufacture

Today, LCAs, certified by BRE Certification to the 2008 BRE Environmental Profiling Methodology, have been completed for the vast majority of the company's **Kooltherm®** and **Therma™** insulation products, produced at its Pembridge & Selby manufacturing facilities. All products profiled have been assigned a 2008 Green Guide Summary Rating of A+ or A.

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.

In 2004 Kingspan Insulation put the manufacture of its products at its Pembridge facility in Herefordshire through a rigorous independent appraisal of its economic, social, environmental and natural resource impacts using Arup's SPeAR® tool. Kingspan Insulation was the first construction material manufacturer to have taken this bold move and openly publish the results. Kingspan Insulation has maintained its reporting of its Sustainability & Responsibility since then. Its reports document performance improvements and future action plans, and now cover its Pembridge and Selby manufacturing facilities.

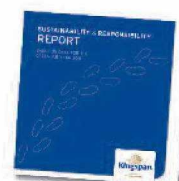
Kingspan Insulation's report for the 2008 calendar year was supplemented, for the first time, with GRI indicator data, to ensure a more comprehensive approach to reporting. The report was commensurate with GRI application level B. In 2009, this was improved to level B+ by the addition of external assurance.

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. Sustainability issues, however, extend far beyond the confines of a company's own operations. Raw material supply chains can have an all too easy to ignore impact on sustainability. The ultimate goal in this area is to source raw materials responsibly.

In 2013 Kingspan Insulation became the first insulation manufacturer to be certified to the demanding BES 6001: Responsible Sourcing of Construction Products standard. This BRE framework standard was developed to enable manufacturers to prove that their products have been made with responsibly sourced constituent materials. The standard describes the organisational governance, supply chain management and environmental and social aspects that must be addressed in order to ensure the responsible sourcing of construction products.

All *Kingspan Kooltherm®* and *Kingspan Therma™* insulation products and cavity closers manufactured at Kingspan Insulation Pembridge & Selby manufacturing facilities are now certified to BES 6001 'Very Good'.

Allied to this, Kingspan Insulation's Pembridge and Selby manufacturing facilities carry FSC® and PEFC Chain of Custody certification.



Visit [www.kingspaninsulation.co.uk/sustainability](http://www.kingspaninsulation.co.uk/sustainability) to download detailed guides to the Sustainability & Responsibility of Kingspan Insulation's products and their manufacture

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7

# Building Regulations / Standards

## England & Wales

The new 2013 Editions of Approved Documents L to the Building Regulations 2010 for England came into effect on April 6, 2014 and, from that date, all plans submitted for Building Control approval needed to comply with the new requirements.

The new 2014 Editions of Approved Documents L to the Building Regulations 2010 for Wales come into effect on July 31, 2014 and, from that date, all plans submitted for Building Control approval need to comply with the new requirements.

### New Buildings (ADL 1A & ADL 2A)

The main requirement of Approved Documents L1A and L2A, for both England & Wales, is that buildings meet defined CO<sub>2</sub> emissions targets, and a fabric energy efficiency target in the case of ADL1A. The roof, wall and floor U-values required to meet this target will depend on the design of the building, orientation, heating system etc. To ease the process, Kingspan Insulation has undertaken analysis to give the 'best starting point' U-values, for specifiers to work from in getting their designs to comply. They will be almost exactly what is required for some buildings and short of what is required for others. These 'best starting point' U-values are shown below.

### Existing Buildings (ADL 1B & ADL 2B)

Approved Documents L1B and L2B, for both England & Wales, give specific U-value requirements for newly constructed elements and retained/refurbished elements. They apply to all works, regardless of whether the works relate to an extension, conversion or renovation. These required U-values are shown below.

Suggested / Required U-values (W/m <sup>2</sup> ·K) for Different Elements in Various Scenarios					
Element	New Buildings Best Starting Point		Existing Buildings Extension, Conversion & Renovation Of All Buildings		
	Dwellings	Buildings Other Than Dwellings	New Elements England	Wales	Refurbishment / Retained Elements
Roofs	0.11	0.14	0.16	0.15 <sup>1</sup> / 0.15 <sup>2</sup>	0.16
All other roofs	0.11	0.14	0.18	0.15 <sup>1</sup> / 0.18 <sup>2</sup>	0.18
Walls	0.16	0.22	0.28	0.21 <sup>1</sup> / 0.26 <sup>2</sup>	0.30
Floors	0.11	0.18	0.22	0.18 <sup>1</sup> / 0.22 <sup>2</sup>	0.25

1 Buildings essentially domestic in character e.g. student accommodation, care homes, and similar uses where occupancy levels and internal gains are essentially domestic in character  
2 All other non-domestic buildings



Visit [www.kingspaninsulation.co.uk/knowledge-base/building-regulations](http://www.kingspaninsulation.co.uk/knowledge-base/building-regulations) to download detailed guides to meeting the requirements of the Building Regulations



## Scotland

The new 2013 Editions of Technical Handbooks: Section 6 to the Building (Scotland) Regulations 2004 came into effect on October 1, 2013. These remained unchanged from the 2011 Editions which came into effect on May 1, 2011.

### New Buildings

The main requirement of Technical Handbooks Sections 6 is that buildings meet a defined CO<sub>2</sub> emissions target. For domestic, this target is generated by a set of contemporaneous notional buildings, which also offer a simplified elemental approach to compliance. If a building is constructed in accordance with the parameter values that define the notional building, then it will automatically comply with the CO<sub>2</sub> emissions target. The 'notional' U-values for roofs, walls and floors are shown below. For non-domestic, the approach is the same as that described above for ADL2A and 'best starting point' U-values are shown below.

### Existing Buildings

Technical Handbooks Sections 6 give specific area-weighted average U-value requirements for newly constructed elements and altered/refurbished elements. They apply to most works\*, regardless of whether the works relate to an extension, renovation, or conversion e.g. of a whole unheated building, loft or garage. For existing dwellings, there are differing requirements for newly constructed elements, depending upon the thermal efficiency of the existing building\*. The required U-values are shown below.

Suggested / Required U-values (W/m <sup>2</sup> ·K) for Different Elements in Various Scenarios						
Element	New Buildings		Existing Buildings			
	Domestic	Non-Domestic	Extension, Conversion & Renovation – Most Works*			
	Notional Building	Best Starting Point	Domestic New Elements A*	Domestic New Elements *B	Domestic Altered / Refurbished Elements	Non-Domestic
Lofts	0.13	0.13	0.13	0.15	0.15	0.15
All other roofs	0.13	0.13	0.15	0.18	0.18	0.15
Walls	0.19	0.22	0.19	0.22	0.22	0.25
Floors	0.15	0.18	0.15	0.18	0.18	0.20

\*There are specific exceptions relating to, e.g. conversion of heating buildings and infilling of openings. Please consult the Technical Handbooks. Column B applies where the existing building has, or will be improved to have, wall U-values better than 0.7 W/m<sup>2</sup>·K and roof U-values better than 0.25 W/m<sup>2</sup>·K. If the U-values are worse, then column A applies.



Visit [www.kingspaninsulation.co.uk/knowledge-base/building-regulations](http://www.kingspaninsulation.co.uk/knowledge-base/building-regulations) to download detailed guides to meeting the requirements of the Building Regulations

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9



# Pitched Roofs

## INSULATION AT RAFTER LEVEL - CHOICE OF BUILD-UP

### Unventilated and Ventilated Constructions

There is generally a choice between unventilated and ventilated constructions, except in the case of refurbishment / loft conversions. In these instances, unless the whole roof is to be stripped or unless there is a breathable sarking membrane already in situ, it is impossible to use an unventilated roof, because a breathable sarking membrane cannot be installed.

### Position of Insulation

Dependent on the designed U-value of the construction and the available rafter depth and headroom, different approaches can be taken.

In most cases, approaches with layers of insulation between and over rafters are likely to yield very tall fascia boards and so, generally, between and under rafter insulation approaches are probably more desirable. The exception to the rule is when very low U-values are required, in which case headroom may become an issue for between and under rafter solutions, so between and over rafter solutions may be more practical.

### Unventilated Roof - Ventilation Considerations

Unventilated roof approaches create a warm pitched roof space which does not require cross ventilation. Research suggests that sealing an unventilated roof yields a more energy efficient roof, as the impacts of ventilation and incidental infiltrating cold air can be minimised. Therefore, if creating an unventilated roof, it is preferable to fully seal all joints in the breathable sarking membrane. Any water vapour reaching the breathable sarking membrane escapes without condensing. There is then adequate air movement beneath the tiles to dissipate this water vapour to the outside atmosphere. Tape for sealing joints in the breathable sarking membrane should be specified in accordance with the recommendations of the breathable membrane manufacturer.

The requirement for a vapour control layer and / or under-tile ventilation should be assessed to BS 5250: 2002 (Code of practice for control of condensation in buildings).

### Ventilated Roof - Ventilation Considerations

In these cases the Building Regulations / Standards require a 50 mm ventilation air gap between the insulation and the sarking felt, so as to avoid condensation.

The requirement for a vapour control layer should be assessed to BS 5250: 2002.

### Vapour Control Layer

If required, the vapour resistance of the roof lining can be increased by the use of a vapour check plasterboard\*, the use of **Kingspan Kooltherm® K18 Insulated Plasterboard**, which contains an integral vapour control layer\*, the use of a layer of polythene sheeting\*, or by the application of two coats of Gyproc Drywall Sealer.

\* With appropriate detailing at joints, penetrations and roof perimeters.

Visit [www.kingspaninsulation.co.uk/applications/application/roofs/pitched-roofs](http://www.kingspaninsulation.co.uk/applications/application/roofs/pitched-roofs) for further information

## Breathable Sarking Membrane

BS 5250: 2002 recommends that low resistance breathable sarking membranes for use in unventilated systems must not have a vapour resistance that exceeds 0.25 MN.s/g, e.g. *Kingspan nilvent®*.

## Position of Breathable Sarking Membrane

The sealing of breathable sarking membrane joints with tape is considerably easier to achieve if the membrane is installed on a continuous surface.

In these cases the breathable sarking membrane is installed under the counter-battens (which provide a channel for water drainage) or, in situations with a sarking board under a natural slated roof, the breathable sarking membrane is installed directly under the slates (as neither tile battens nor counter-battens are used).

Generally, when a continuous surface is available, it will prove easier to install the breathable sarking membrane in horizontal runs, whilst still enabling easy sealing between runs.

In roofs with no continuous surface, it is preferable, through more difficult, to install the breathable sarking membrane in vertical runs with junction between runs sealed by counter-battens placed over the laps in rafter positions. The breathable sarking membrane is installed taut as the counter-batten provides a space for water drainage.

## Recommended Solutions for New Build / Re-roofing

The ideal solution for new build or re-roofing projects is, therefore, between and under rafter insulation with a continuous surface for the breathable sarking membrane so that it can be installed in horizontal runs under counter-battens with laps sealed with tape.

The next best solution is, therefore, between and under rafter insulation with no continuous surface for the breathable sarking membrane, and the breathable sarking membrane installed in vertical runs with laps sealed under counter-battens.

Where very low U-values are required, for new build or re-roofing projects, the ideal solution is between and over rafter insulation with the breathable sarking membrane installed in horizontal runs under counter battens with laps sealed with tape.

Visit [www.kingspaninsulation.co.uk/applications/application/roofs/pitched-roofs](http://www.kingspaninsulation.co.uk/applications/application/roofs/pitched-roofs)  
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11

# Pitched Roofs - Unventilated

## FULL FILL BETWEEN AND UNDER RAFTER INSULATION

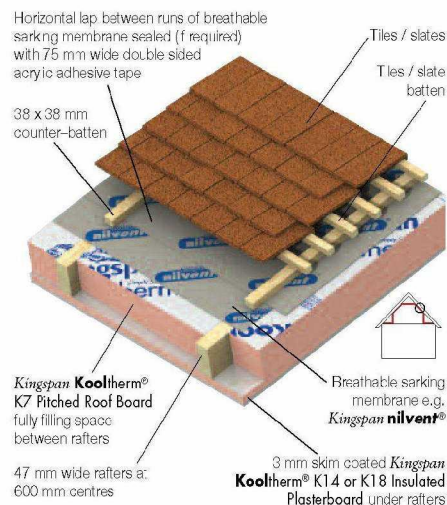
### Introduction

Full fill between and under rafter insulation is recommended for new build or re-roofing applications. **Kingspan Kooltherm® K7 Pitched Roof Board** is installed between rafters, with **Kingspan Kooltherm® K14 or K18 Insulated Plasterboard** under rafters.

**Kingspan Kooltherm® K7 Pitched Roof Board** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.

**Kingspan Kooltherm® K14 and K18 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

Product data for **Kingspan Kooltherm® K14** and **K18 Insulated Plasterboard** can be found on page 34.



### Product Data

Product	<b>Kingspan Kooltherm® K7 Pitched Roof Board</b>
Thermal Conductivity	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
Thermal Performance	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
Facings	Composite foil
Core	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
Board Size	1.2 x 2.4 m
Thickness Available	25 – 150 mm
Fire Performance	Meets the Building Regulation requirements for the applications intended
BRE 2008 Green Guide Summary Rating	A +

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

## Installation Details

### Between Rafters

- Where the insulation between rafters fully fills the rafter depth simply install the correct thickness of insulation, trimmed to suit rafter spacings, in such a manner that it is flush with the bottom and top of the rafters.
- If the between rafter insulation is to be fitted from the outside, install the insulation with the use of nailable sarking clips.
- Sarking clips should be the correct size so the insulation is flush with the top surfaces of the rafters.
- The nailable sarking clips are driven into the upper surface of each rafter at one-metre intervals up the roof slope.
- The nailable sarking clips then support lengths of insulation, trimmed to suit rafter spacings, and placed between the rafters.



### Under Rafters

- Sheets of *Kingspan Kooltherm*® K14 or K18 Insulated Plasterboard must always be placed with the long edge running across the joists or rafters, and all edges must be supported.
- Where joints between sheets of insulated plasterboard are unsupported by the timber joists / rafters, timber noggins should be installed.
- Each sheet of insulated plasterboard should lap joists / rafters / noggins by 19 mm (min.) at sheet joints.
- Sheets should be fixed using either drywall screws at 200 mm centres, or large-headed galvanised clout nails placed at 150 mm centres.
- Fixings should be located no less than 10 mm from the edges of the sheet, and be long enough to allow a minimum 25 mm penetration of the timber.
- Fixings should be driven straight, with the head embedded just below the surface of the plasterboard.
- Care should be taken not to overdrive nails / screws.

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

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13



# Pitched Roofs - Unventilated

## PARTIAL FILL BETWEEN AND UNDER RAFTER INSULATION

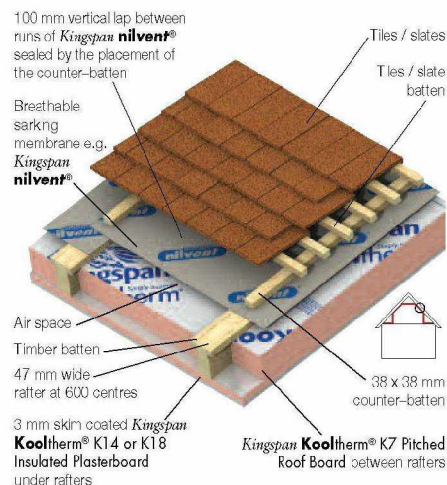
### Introduction

Partial fill between and under rafter insulation is recommended for new build or re-roofing applications. **Kingspan Kooltherm® K7 Pitched Roof Board** is installed between rafters, with **Kingspan Kooltherm® K14** or **K18 Insulated Plasterboards** under rafters.

**Kingspan Kooltherm® K7 Pitched Roof Board** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.

**Kingspan Kooltherm® K14** and **K18 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

Product data for **Kingspan Kooltherm® K14** and **K18 Insulated Plasterboard** can be found on page 34.



### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K7 Pitched Roof Board</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies



## Installation Details

### Between Rafters

- **Kooltherm® K7** Pitched Roof Board installed between rafters must be flush with the bottom of the rafters in order to prevent the risk of air movement between the board and the ceiling.
- Install the insulation, trimmed to suit rafter spacings, with the aid of treated softwood battens nailed to the side of the rafters to provide a 'stop' above the insulation.
- The battens should be in the appropriate position to ensure the insulation is flush with the bottom of the rafters.
- An additional restraint to the insulation boards will be provided by *Kingspan Kooltherm® K14* or *K18 Insulated Plasterboard* fixed to the inside face of the rafters.



### Under Rafters

- Sheets of *Kingspan Kooltherm® K14* or *K18 Insulated Plasterboard* must always be placed with the long edge running across the joists or rafters, and all edges must be supported.
- Where joints between sheets of insulated plasterboard are unsupported by the timber joists / rafters, timber noggins should be installed.
- Each sheet of insulated plasterboard should lap joists / rafters / noggins by 19 mm (min.) at sheet joints.
- Sheets should be fixed using either drywall screws at 200 mm centres, or large-headed galvanised clout nails placed at 150 mm centres.
- Fixings should be located no less than 10 mm from the edges of the sheet, and be long enough to allow a minimum 25 mm penetration of the timber.
- Fixings should be driven straight, with the head embedded just below the surfaced of the plasterboard.
- Care should be taken not to overdrive nails / screws.

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

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15

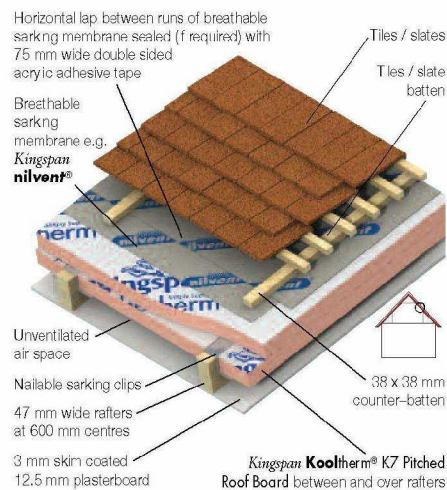
## Pitched Roofs - Unventilated

### BETWEEN AND OVER RAFTER INSULATION

#### Introduction

Between and over rafter insulation is recommended for new build or re-roofing applications. **Kingspan Kooltherm® K7 Pitched Roof Board** is installed between rafters, with an additional layer of **Kingspan Kooltherm® K7 Pitched Roof Board** over the rafters.

**Kingspan Kooltherm® K7 Pitched Roof Board** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.



#### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K7 Pitched Roof Board</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +



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## Installation Details

### Between Rafters

- If **Kooltherm® K7** Pitched Roof Board is to be installed between and over rafters, the between rafter layer must be flush with the top of the rafters in order to prevent the risk of air movement between the two layers of insulation boards.
- If between rafter layer of insulation is to be fitted from the outside, install the insulation with the use of nailable sarking clips.
- Sarking clips should be the correct size so the insulation is flush with the top surface of the rafters.
- The nailable sarking clips are driven into the upper surface of each rafter at one-metre intervals up the roof slope.
- The nailable sarking clips then support lengths of insulation, trimmed to suit rafter spacings, and placed between the rafters.
- Insulation can be installed from the inside with the use of timber 'stop' battens.
- Push insulation, trimmed to suit rafter spacings, between the rafters so they are flush with the top surface of the rafters.
- Side-nail treated softwood battens to the rafters to hold the boards in place.



### Over Rafters

- A preservative treated stop rail should be secured to the rafters at the eaves.
- **Kingspan Kooltherm® K7** Pitched Roof Board may be laid either across or down the line of the rafters and should be laid lightly butted and preferably break bonded.
- All board joints running from eaves to ridge must occur over rafters.
- Ensure continuity of insulation at the ridge of the roof.
- There is no necessity to tape board joints.
- If there is no sarking board lay 38 x 38 mm treated softwood counter-battens in line with the rafters and secure these by fixing through both the counter-battens and the insulation boards.
- If a sarking board is overlaid, secure the sarking board and insulation boards to the rafters by fixing through both the sarking board and the insulation.
- Approved fixings should be applied at centres appropriate to the design of the roof and location of the building.

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17

# Pitched Roofs - Unventilated & Ventilated

## DWARF WALL INSULATION

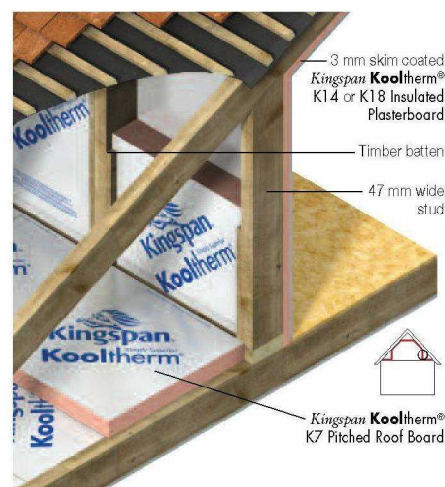
### Introduction

*Kingspan Kooltherm® K7* Pitched Roof Board is recommended for use in dwarf wall insulation in combination with *Kingspan Kooltherm® K14* or *K18* Insulated Plasterboard.

*Kingspan Kooltherm® K7* Pitched Roof Board comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.

*Kingspan Kooltherm® K14* and *K18* Insulated Plasterboard comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

Product data for *Kingspan Kooltherm® K14* and *K18* Insulated Plasterboard can be found on page 34.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K7</i> Pitched Roof Board
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies



## Installation Details

### Between Dwarf Wall Stud Insulation

- **Kingspan Kooltherm® K7 Pitched Roof Board** installed between studs must be flush with the inside surface of the studs and the plasterboard / insulated plasterboard wall finish in order to prevent the risk of air movement between the boards and the plasterboard / insulated plasterboard.
- Nail treated softwood battens to the side of the studs to provide a 'stop' and prevent the insulation boards moving within the stud cavity.
- This 'stop' should be positioned such that the insulation boards finish flush with the inside surface of the studs.
- If the insulation boards are thicker than the timber studs fix appropriately sized treated softwood battens to the back of the studs and fix timber 'stop' straps diagonally to the battens in an appropriate pattern to hold the insulation boards in place. Each board must be restrained by a minimum of two diagonal straps.
- Insulation boards may be temporarily held in place with large headed clout nails fixed through the 'stop' battens / straps.
- The boards will be further restrained by the plasterboard / insulated plasterboard lining fixed to the inside face of the timbers.



### Inside Dwarf Wall Studs Insulation

- Please see fixing details on page 45.

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19



# Pitched Roofs - Ventilated

## PARTIAL FILL BETWEEN AND UNDER RAFTER INSULATION

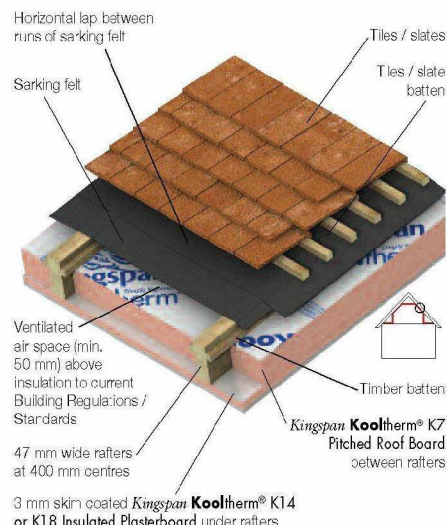
### Introduction

Partial fill between and under rafter insulation is recommended for loft conversions where re-roofing is not intended. **Kingspan Kooltherm® K7 Pitched Roof Board** is installed between rafters, with **Kingspan Kooltherm® K14** or **K18 Insulated Plasterboard** under rafters.

**Kingspan Kooltherm® K7 Pitched Roof Board** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.

**Kingspan Kooltherm® K14** and **K18 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

Product data for **Kingspan Kooltherm® K14** and **K18 Insulated Plasterboard** can be found on page 34.



### Product Data

Product	<b>Kingspan Kooltherm® K7 Pitched Roof Board</b>
Thermal Conductivity	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
Thermal Performance	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
Facings	Composite foil
Core	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
Board Size	1.2 x 2.4 m
Thickness Available	25 – 150 mm
Fire Performance	Meets the Building Regulation requirements for the applications intended
BRE 2008 Green Guide Summary Rating	A +

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

## Installation Details

### Between Rafters

- *Kingspan Kooltherm*® K7 Pitched Roof Board installed between rafters must be flush with the bottom of the rafters in order to prevent the risk of air movement between the board and the ceiling.
- Install the insulation, trimmed to suit rafter spacings, with the aid of treated softwood battens nailed to the side of the rafters to provide a 'stop' above the insulation.
- The battens should be in the appropriate position to ensure the insulation is flush with the bottom of the rafters.
- An additional restraint to the insulation boards will be provided by *Kingspan Kooltherm*® K14 or K18 Insulated Plasterboard fixed to the inside face of the rafters.



### Under Rafter

- Sheets of *Kingspan Kooltherm*® K14 or K18 Insulated Plasterboard must always be placed with the long edge running across the joists or rafters, and all edges must be supported.
- Where joints between sheets of insulated plasterboard are unsupported by the timber joists / rafters, timber noggins should be installed.
- Each sheet of insulated plasterboard should lap joists / rafters / noggins by 19 mm (min.) at sheet joints.
- Sheets should be fixed using either drywall screws at 200 mm centres, or large-headed galvanised clout nails placed at 150 mm centres.
- Fixings should be located no less than 10 mm from the edges of the sheet, and be long enough to allow a minimum 25 mm penetration of the timber.
- Fixings should be driven straight, with the head embedded just below the surfaced of the plasterboard.
- Care should be taken not to overdrive nails / screws.

Visit [www.kingspaninsulation.co.uk/k7](http://www.kingspaninsulation.co.uk/k7), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

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21

# Pitched Roofs - Membrane

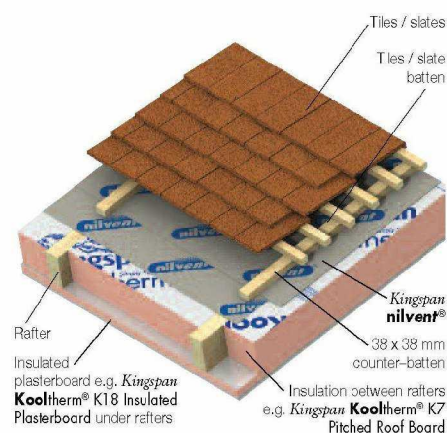
## BREATHABLE MEMBRANE FOR UNVENTILATED PITCHED ROOFS

### Introduction

*Kingspan nilvent®* is a waterproof, breathable membrane, ideal for new build applications.

*Kingspan nilvent®* can be installed on pitched roofs:

- horizontally on a continuous substrate (illustrated to right);
- vertically on a discontinuous substrate; and
- horizontally on a discontinuous substrate (not described in this guide).



### Product Data

<b>Product</b>	<i>Kingspan nilvent®</i>
<b>Water Vapour Resistance</b>	0.17 MN.s/g
<b>Liquid Water Penetration</b>	> 2 m
<b>Tensile Strength</b>	240 N longitudinal 180 N transverse
<b>Roll Length</b>	50 m
<b>Roll Width</b>	1.5 m
<b>Thickness</b>	0.5 mm
<b>Area Per Roll</b>	75 m <sup>2</sup>

### Installation Details

#### Horizontal Installation on a Continuous Substrate

- Start installation at the eaves, fixing an eaves strip, of UV-resistant material, to overhang the eaves / fascia by 50 – 60 mm.
- Lap the *Kingspan nilvent®*, logo-up, over the eaves strip, with the bottom edge in line with the top of the fascia.
- *Kingspan nilvent®* should be laid taut.
- Temporarily fix in place with clout nails, and cut to length with a sharp knife.
- The second run of *Kingspan nilvent®* should lap over the top of the first.

Visit [www.kingspaninsulation.co.uk/nilvent](http://www.kingspaninsulation.co.uk/nilvent) to download the full product brochure, order samples and learn about case studies

- Use 75 mm wide acrylic double sided adhesive tape to seal horizontal laps between runs of *Kingspan nilvent*<sup>®</sup>.
- Vertical laps between lengths of *Kingspan nilvent*<sup>®</sup> should not be less than 100 mm wide, and be positioned so as to coincide with a rafter position.
- These laps will be secured and sealed by the later fixing of the counter-battens.
- Avoid vertical laps over the same rafter position, in successive runs of *Kingspan nilvent*<sup>®</sup>.
- Continue installation up the roof, in the same manner, to the ridge. Install counter-battens in the usual manner, as proves necessary to fully fix the *Kingspan nilvent*<sup>®</sup> in place, and to provide a support for moving up the roof.
- Lap the ridge by not less than 150 mm each side.
- Complete the installation of tile / slate battens over the whole area installed.



#### Vertical Installation on a Discontinuous Substrate

- For ease of installation, thread a wood or metal bar through the core of the *Kingspan nilvent*<sup>®</sup> roll, and set it on bearers on the scaffold platform.
- The leading edge of the *Kingspan nilvent*<sup>®</sup> can then be taken up and over the ridge, and down to the opposite eaves.
- Fit an eaves strip, of a UV-resistant material, to overhang the eaves / fascia by 50 – 60 mm.
- Lap the *Kingspan nilvent*<sup>®</sup>, logo-up, over the eaves strip, with the bottom edge of the *Kingspan nilvent*<sup>®</sup> in line with the top of the fascia. *Kingspan nilvent*<sup>®</sup> should be laid such that it is taut in both horizontal and vertical directions.
- Each run of *Kingspan nilvent*<sup>®</sup> should be installed in a single piece from eaves to eaves.
- Temporarily fix in place with clout nails, cut to length with a sharp knife, move sideways and repeat the process.
- The second run of *Kingspan nilvent*<sup>®</sup> should lap over the first by not less than 100 mm, and be positioned so that the lap coincides with a rafter position.
- These laps should be secured and sealed by the fixing of counter-battens (min. 25 mm deep), as work progresses across the roof. Counter-battens should be fixed through to the rafters below, with fixings at a maximum of 300 mm centres.
- Continue installation across the roof in the same manner, then install tile/slate battens over the whole area installed.

Visit [www.kingspaninsulation.co.uk/nilvent](http://www.kingspaninsulation.co.uk/nilvent) to download the full product brochure, order samples and learn about case studies

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23



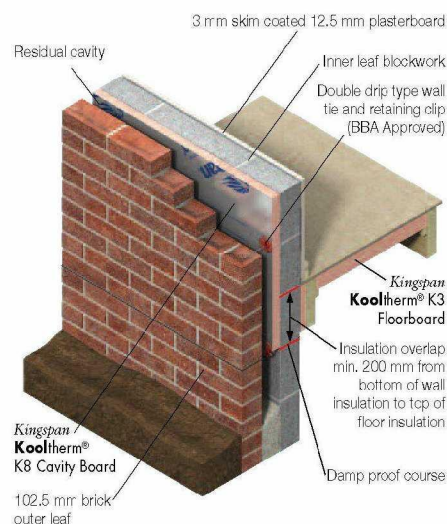
# Masonry Walls

## PARTIAL FILL CAVITY INSULATION

### Introduction

Partial fill cavity wall insulation is recommended for new build applications, providing an effective barrier to rain penetration, whilst avoiding the problems associated with full cavity fill.

**Kingspan Kooltherm® K8 Cavity Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K. **Kingspan Kooltherm® K8 Cavity Board** meets NHBC technical requirements when used with a 50 mm residual cavity.



### Product Data

Product	<i>Kingspan Kooltherm® K8 Cavity Board</i>
Thermal Conductivity	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
Thermal Performance	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
Facings	Composite foil
Core	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
Board Size	1.2 x 0.45 m
Thickness Available	25 – 120 mm
Fire Performance	Meets the Building Regulation requirements for the applications intended
BRE 2008 Green Guide Summary Rating	A +

Visit [www.kingspaninsulation.co.uk/k8](http://www.kingspaninsulation.co.uk/k8) to download the full product brochure, order samples and learn about case studies



## Installation Details

### Cavity Insulation

- *Kingspan Kooltherm® K8* Cavity Board is normally held in position by the wall ties used to tie the two skins of masonry together.
- Wall ties should include a retaining disc / clip and be of the double drip type, installed drip downward.
- For solid concrete ground floors, the first row of wall ties are installed in the inner leaf at 600 mm horizontal centres a minimum of one course of blockwork below the damp proof course or 150 mm below the top surface of the ground floor perimeter insulation upstand, whichever is the lower.
- For a suspended timber floor the first row of wall ties are installed in the inner leaf at 600 mm horizontal centres a minimum of 200 mm below the top surface of the ground floor perimeter insulation upstand.
- Continue constructing the inner leaf up to the next wall tie course (450 mm above the first – usually 2 block courses).
- The next course of wall ties is positioned at the usual 900 mm horizontal centres.
- The next course of blockwork is installed to secure the ties.
- The first row of insulation boards should now be installed between the two rows of wall ties, ensuring each insulation board is retained tight against the inner leaf and joints are lightly butted.
- Each board should be secured at a minimum of three points. Additional ties may also be required to satisfy the structural requirements of BS 5628-3: 2001 and / or to ensure adequate retention of boards or cut pieces.
- The outer leaf is then built up to the level of the top of the boards and the process is repeated.
- When insulating a gable, insulation boards should be continued 250 mm beyond the height of the top storey ceiling and a cavity tray installed above the insulation.



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25

# Masonry Walls

## PARTIAL FILL CAVITY INSULATION WITH INSULATED PLASTERBOARD

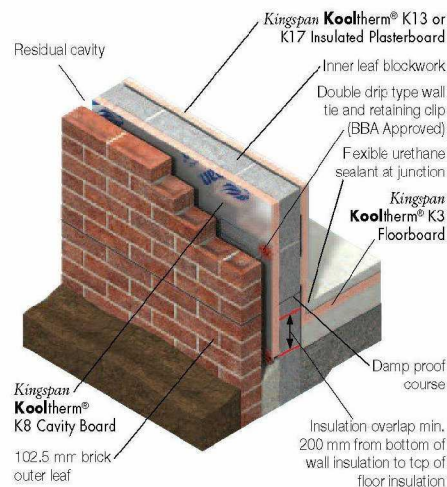
### Introduction

Partial fill cavity wall insulation is recommended for new build applications, providing an effective barrier to rain penetration, whilst avoiding the problems associated with full cavity fill. Employing an internal finish of **Kingspan Kooltherm® K13 or K17 Insulated Plasterboard** further increases the thermal performance of the cavity wall.

**Kingspan Kooltherm® K8 Cavity Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K. **Kingspan Kooltherm® K8 Cavity Board** meets NHBC technical requirements when used with a 50 mm residual cavity.

**Kingspan Kooltherm® K13 and K17 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

Product data for **Kingspan Kooltherm® K13 and K17 Insulated Plasterboard** can be found on page 32.



### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K8 Cavity Board</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 0.45 m
<b>Thickness Available</b>	25 – 120 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k8](http://www.kingspaninsulation.co.uk/k8), [www.kingspaninsulation.co.uk/k13](http://www.kingspaninsulation.co.uk/k13), and [www.kingspaninsulation.co.uk/k17](http://www.kingspaninsulation.co.uk/k17) to download the full product brochures, order samples and learn about case studies

## Installation Details

### Cavity Insulation

- Please see installation details on page 25.

### Insulated Plasterboard

- *Kingspan Kooltherm*® K13 and K17 Insulated Plasterboard should be installed to masonry cavity walls using plaster dab / drywall adhesive bonding.
- Guidelines should be marked out on the floor and ceiling to indicate where the edges of *Kingspan Kooltherm*® K13 or K17 Insulated Plasterboard should finish.
- The plaster / drywall adhesive should be appropriate for use on the intended masonry substrate. Advice should be sought from the plaster / drywall adhesive manufacturer for its recommended system.
- A continuous fillet of plaster / drywall adhesive is applied around the perimeter of each wall and around any openings, in order to provide an air-tight seal and act as a fire stop.
- Vertical dabs of the plaster / drywall adhesive are progressively applied to the background.
- The number, size and lay-out of the dabs should follow the chosen plaster / drywall adhesive manufacturer's recommendations.
- Sheets of *Kingspan Kooltherm*® K13 or K17 Insulated Plasterboard are then located against the adhesive dabs and tapped back to align with predetermined guidelines on the floor and ceiling. The use of a spirit level is recommended to provide a vertical finish.
- Nailable plugs are recommended to back up the plaster / drywall adhesive dab bond. These are normally applied at a rate of 2 No. per sheet, after the plaster / drywall adhesive dabs have set.
- It is recommended that nailable plugs are positioned in the tapered edge of the sheets so that they are covered when the board is finished (e.g. joints taped and 3 mm skim covering).



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27

# Masonry Walls

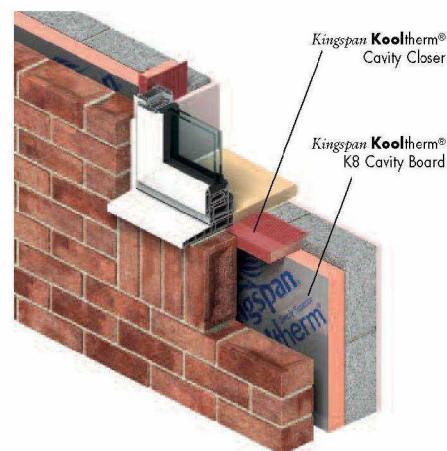
## CAVITY CLOSER - FIRE PERFORMANCE OR WIDER CAVITIES

### Introduction

Cavity closers are ideal for use in new build applications for closing cavity walls at openings. They can be used around window and door openings in traditional cavity wall constructions and avoid the need for cut bricks, blocks or special reveal blocks.

**Kingspan Kooltherm® Cavity Closer** comprises premium performance rigid thermoset phenolic insulant insert in a PVC-U J-section.

**Kingspan Kooltherm® Cavity Closer** can be used in cavity widths up to 300 mm and has enhanced fire resistance properties.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® Cavity Closer</i>
<b>Thermal Conductivity</b>	0.022 W/m·K
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Sheathing</b>	PVC-U extrusion
<b>Core</b>	 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Length</b>	2.4 m
<b>Widths Available</b>	50 – 150* mm
<b>Fire Performance</b>	1 hour fire rating for use of a single section, in cavities of up to 150 mm wide and of same width as product. 30 minute fire rating for use of two sections back to back, in cavities of up to 300 mm wide and of the same width as combined sections. Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

\* Sections can be joined together to suit cavity widths up to 300 mm

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## Installation Details

- Construct the opening as normal.
- Cut out and clear away masonry / mortar that closes / protrudes into the cavity and insert lengths of *Kingspan Kooltherm®* Cavity Closer.
- The fixing flange should always overlap the inner leaf masonry by 15 mm (min.), be tight to the masonry and securely fixed with a suitable masonry fixing to the masonry through the holes provided in the fixing flange.
- *Kingspan Kooltherm®* Cavity Closer should fit tightly into the cavity opening and no gaps should be left between the closer and either wall leaf.
- An appropriate lintel and damp proof course is incorporated at the head.
- Where an insulated lintel is used a head closer section will not be required and the jamb sections of the closer will butt up against the lintel. If required, a *Kingspan Kooltherm®* Cavity Closer section can be used at the head where a separate lintel is used for each leaf.



Visit [www.kingspaninsulation.co.uk/kkcc](http://www.kingspaninsulation.co.uk/kkcc) to download the full product brochure, order samples and learn about case studies

For Technical Advice call - [REDACTED]

29

# Masonry Walls

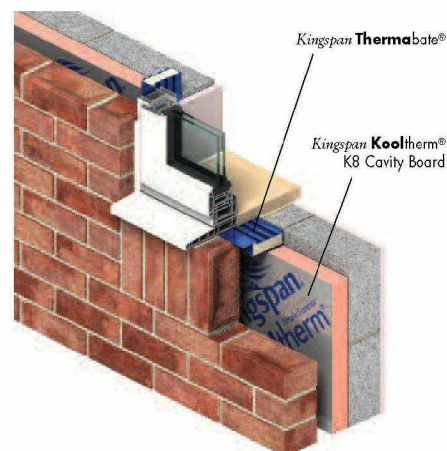
## CAVITY CLOSER - FORMING OPENINGS

### Introduction

Cavity closers are ideal for use in new build applications for closing cavity walls at openings. They can be used around window and door openings in traditional cavity wall constructions and avoid the need for cut bricks, blocks or special reveal blocks.

**Kingspan Thermabate®** comprises high performance rigid thermoset urethane insulant encased in a PVC-U box-section. This box section protects the insulation from the elements and thus lends itself to having openings built around it rather than installation after the opening has been built.

**Kingspan Thermabate®** can be used in cavity widths up to 100 mm and is available in prefabricated U-shapes, to match specified opening sizes, as **Kingspan Thermabate® PLUS**. **Kingspan Thermabate® PLUS** is particularly suited to forming openings.



### Product Data

<b>Product</b>	<i>Kingspan Thermabate® and Thermabate® PLUS</i>
<b>Thermal Conductivity</b>	0.034 W/m·K
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Sheathing</b>	PVC-U extrusion
<b>Core</b>	High performance rigid thermoset urethane insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Length</b>	3.0 m
<b>Widths Available</b>	50 – 100 mm
<b>Fire Performance</b>	30 minute fire rating for use of a single section, in cavities of up to 100 mm wide and of same width as product. Meet the Building Regulation requirements for the applications intended



Visit [www.kingspaninsulation.co.uk/thermabate](http://www.kingspaninsulation.co.uk/thermabate) to download the full product brochure, order samples and learn about case studies

## Installation Details

- *Kingspan Thermabate*® and *Kingspan Thermabate*® **PLUS** should be built-in as work proceeds.
- Mortar from bed joints keys into the grooves at each 'end' of the box section.
- The fixing flange should always be tight to the masonry and securely fixed with a suitable masonry fixing to the masonry through the holes provided in the fixing flange.
- An appropriate lintel and damp proof course is incorporated at the head.
- Where an insulated lintel is used a head closer section will not be required. If required, a *Kingspan Thermabate*® section can be used at the head where a separate lintel is used for each leaf.



Visit [www.kingspaninsulation.co.uk/thermabate](http://www.kingspaninsulation.co.uk/thermabate) to download the full product brochure, order samples and learn about case studies

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31

# Masonry Walls

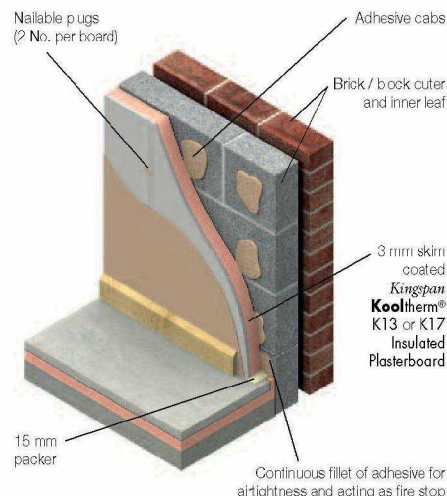
## PLASTER DAB BONDED INSULATED PLASTERBOARD

### Introduction


Plaster dab bonded insulated plasterboard is recommended for use on masonry cavity walls, or rendered solid masonry walls which are free from moisture penetration. This method is not suitable for use on non-rendered solid masonry walls where there is a risk of moisture penetration, or on timber framed walls.

**Kingspan Kooltherm® K13** and **Kooltherm® K17 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

**Kingspan Kooltherm® K13** and **Kooltherm® K17 Insulated Plasterboard** achieve thermal conductivities as low as 0.019 W/m·K and 0.020 W/m·K respectively.



### Product Data

Product		Kingspan Kooltherm® K13 Insulated Plasterboard	Kingspan Kooltherm® K17 Insulated Plasterboard
<b>Thermal Conductivity</b>	(Insulant thickness < 25 mm)	0.022 W/m·K	0.023 W/m·K
	(Insulant thickness 25 – 44 mm)	0.020 W/m·K	0.021 W/m·K
	(Insulant thickness ≥ 45 mm)	0.019 W/m·K	0.020 W/m·K
	(Plasterboard)	0.190 W/m·K	0.190 W/m·K
<b>Thermal Performance</b>		Please contact Kingspan Insulation Technical Department for a detailed U-value calculation	
<b>Front Facing</b>		9.5 mm plasterboard	12.5 mm plasterboard
<b>Core</b>		 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)	
<b>Reverse Facing</b>		Glass tissue	
<b>Board Size</b>		1.2 x 2.4 m	
<b>Thickness Available</b> (Insulation thickness only)		20 – 120 mm	25 – 120 mm
<b>Fire Performance</b>		Meet the Building Regulation requirements for the applications intended	
<b>BRE 2008 Green Guide Summary Rating</b>		n/a	A +

Visit [www.kingspaninsulation.co.uk/k13](http://www.kingspaninsulation.co.uk/k13), and [www.kingspaninsulation.co.uk/k17](http://www.kingspaninsulation.co.uk/k17) to download the full product brochures, order samples and learn about case studies



## Installation Details

- *Kingspan Kooltherm*® K13 and K17 Insulated Plasterboard should be installed to masonry cavity walls using plaster dab / drywall adhesive bonding.
- Guidelines should be marked out on the floor and ceiling to indicate where the edges of *Kingspan Kooltherm*® K13 or K17 Insulated Plasterboard should finish.
- The plaster / drywall adhesive should be appropriate for use on the intended masonry substrate. Advice should be sought from the plaster / drywall adhesive manufacturer for its recommended system.
- A continuous fillet of plaster / drywall adhesive is applied around the perimeter of each wall and around any openings, in order to provide an air-tight seal and act as a fire stop.
- Vertical dabs of the plaster / drywall adhesive are progressively applied to the background.
- The number, size and lay-out of the dabs should follow the chosen plaster / drywall adhesive manufacturer's recommendations.
- Sheets of *Kingspan Kooltherm*® K13 or K17 Insulated Plasterboard are then located against the adhesive dabs and tapped back to align with predetermined guidelines on the floor and ceiling. The use of a spirit level is recommended to provide a vertical finish.
- Nailable plugs are recommended to back up the plaster / drywall adhesive dab bond. These are normally applied at a rate of 2 No. per sheet, after the plaster / drywall adhesive dabs have set.
- It is recommended that nailable plugs are positioned in the tapered edge of the sheets so that they are covered when the board is finished (e.g. joints taped and 3 mm skim covering).



Visit [www.kingspaninsulation.co.uk/k13](http://www.kingspaninsulation.co.uk/k13), and [www.kingspaninsulation.co.uk/k17](http://www.kingspaninsulation.co.uk/k17) to download the full product brochures, order samples and learn about case studies

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33

# Masonry Walls

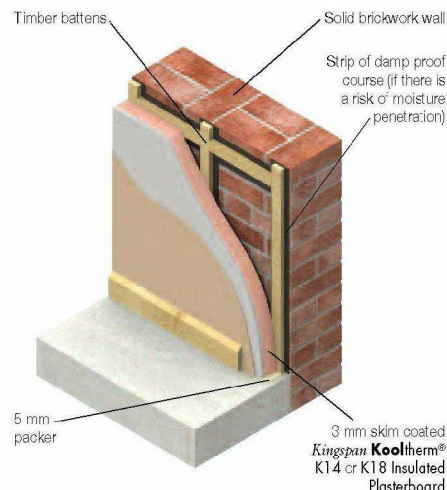
## MECHANICALLY FIXED INSULATED PLASTERBOARD

### Introduction


Mechanically fixed insulated plasterboard is recommended for use on solid masonry and timber framed walls in both new build and refurbishment applications.

**Kingspan Kooltherm® K14 and K18 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

**Kingspan Kooltherm® K14 and K18 Insulated Plasterboard** achieve thermal conductivities as low as 0.019 W/m·K and 0.020 W/m·K respectively.



### Product Data

Product		Kingspan Kooltherm® K14 Insulated Plasterboard	Kingspan Kooltherm® K18 Insulated Plasterboard
<b>Thermal Conductivity</b>	(Insulant thickness < 25 mm)	0.022 W/m·K	0.023 W/m·K
	(Insulant thickness 25 – 44 mm)	0.020 W/m·K	0.021 W/m·K
	(Insulant thickness ≥ 45 mm)	0.019 W/m·K	0.020 W/m·K
	(Plasterboard)	0.19 W/m·K	0.190 W/m·K
<b>Thermal Performance</b>		Please contact Kingspan Insulation Technical Department for a detailed U-value calculation	
<b>Front Facing</b>		9.5 mm plasterboard	12.5 mm plasterboard
<b>Core</b>		 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)	
<b>Reverse Facing</b>		Glass tissue	
<b>Board Size</b>		1.2 x 2.4 m	
<b>Thickness Available</b> (Insulation thickness only)		20 – 120 mm	25 – 120 mm
<b>Fire Performance</b>		Meet the Building Regulation requirements for the applications intended	
<b>BRE 2008 Green Guide Summary Rating</b>		n/a	A +

Visit [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

## Installation Details

- For masonry walls which will support and retain battens and associated fixings, *Kingspan Kooltherm® K14 and K18 Insulated Plasterboard* should be mechanically fixed using timber battens.
- Vertical timber battens should be set at maximum 600 mm horizontal centres, and timber noggins should be positioned horizontally at floor and ceiling level and at max. 1200 mm vertical centres.
- Battens should be mechanically fixed to the wall, and comprise 25 x 47 mm (min.) treated softwood, backed with a strip of damp proof course (DPC).
- Where joints between sheets of insulated plasterboard are unsupported by the timber battens, noggins should be installed.
- Each sheet of insulated plasterboard should lap timber battens / noggins by 19 mm (min.) at sheet joints.
- Sheets of *Kingspan Kooltherm® K14 or K18 Insulated Plasterboard* should be fixed using either drywall screws at 300 mm centres, or large headed galvanised clout nails at 150 mm centres.
- Fixings should be located no less than 10 mm from the edges of the sheets, and be long enough to allow minimum 22.5 mm penetration of the timber. Fixings should not penetrate through the battens.
- Fixings should be driven straight, with the heads embedded just below the surface of the plasterboard.
- Care should be taken not to overdrive nails / screws.



Visit [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies

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35

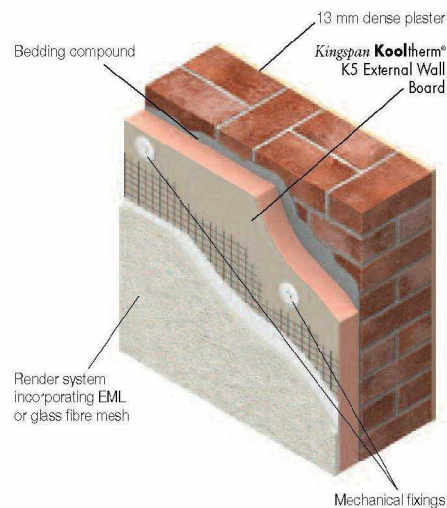
# Masonry Walls

## INSULATED RENDER SYSTEMS

### Introduction

External wall insulation is recommended for use in new build and refurbishment applications, under a suitable render system.

*Kingspan Kooltherm® K5 External Wall Board* comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K5 External Wall Board</i>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Glass tissue based
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 0.6 m
<b>Thickness Available</b>	20 – 120 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +



Visit [www.kingspaninsulation.co.uk/k5](http://www.kingspaninsulation.co.uk/k5) to download the full product brochure, order samples and learn about case studies



## Installation Details

- Because insulated render systems are proprietary and utilise different mechanisms for attaching insulation to the wall structure, sitework guidance should be sought from the render system manufacturer. However, in the absence of any other guidance, the instructions laid out below may be followed.
- The external masonry wall should be clean, flat, and free from protrusions.
- Where an uneven surface remains, it is recommended that a bedding compound can be applied prior to fixing the insulation boards.
- External wall insulation should start 150 mm below the top surface of the ground floor insulation / perimeter insulation upstand (whichever is higher) for a concrete floor, or 200 mm below the top surface of the ground floor insulation / perimeter insulation upstand (whichever is higher) for a suspended timber floor.  
*\*150 mm applies to the UK, 200 mm applies to the Republic of Ireland if a row of insulating blockwork (thermal conductivity < 0.20 W/m.K) is used, otherwise 600 mm applies*
- Insulation boards should be installed break-bonded, with joints lightly butted.
- Care should be taken to install the specified thickness of insulation around reveals.
- Boards of **Kingspan Kooltherm® K5 External Wall Board** are mechanically fixed to the exterior of masonry external walls, preferably using thermally broken telescopic tube fasteners.
- A minimum of 5 fixings are required to secure an insulation board to the masonry wall.
- Board edges at openings and external corners should be fixed with fasteners at minimum 300 mm centres.
- Fasteners at board edges must be located > 50 mm, and < 150 mm, from edges and corners of the board, and not overlap board joints.
- The requirement for additional fixings is dependent on the render system being applied and the type of fixing being used.
- Wherever possible, care should be taken to avoid cold bridging when attaching services and ancillaries to the exterior of the building.
- Depending on the render finish being applied, advice must be sought from the render manufacturer on the EML / glass fibre mesh and bedding mortar to be applied.
- In refurbishment projects, sill extenders and flashings should be used around openings, with care taken to avoid cold bridging.



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37

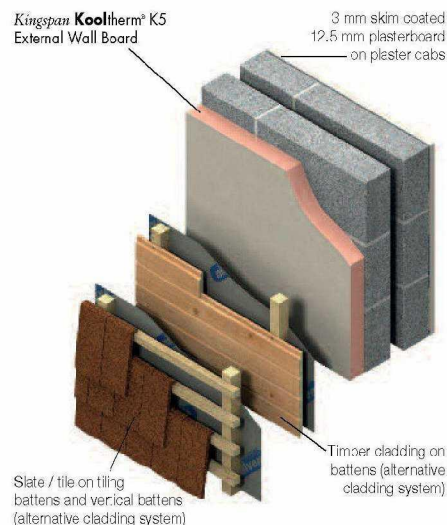
# Masonry Walls

## INSULATED VENTILATED CLADDING SYSTEMS


### Introduction

External wall insulation is recommended for use in new build and refurbishment applications, as part of a ventilated cladding system.

**Kingspan Kooltherm® K5 External Wall Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K5 External Wall Board</i>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Glass tissue based
<b>Core</b>	 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 0.6 m
<b>Thickness Available</b>	20 – 100 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k5](http://www.kingspaninsulation.co.uk/k5) to download the full product brochure, order samples and learn about case studies

## Installation Details

- Boards of **Kingspan Kooltherm® K5 External Wall Board** should be temporarily fastened to the external masonry wall using mechanical fixings or a bedding compound.
- External wall insulation should start 150 / 200 / 600\* mm below the top surface of the ground floor insulation / perimeter insulation upstand (whichever is higher) for a concrete floor, or 200 mm below the top surface of the ground floor insulation / perimeter insulation upstand (whichever is higher) for a suspended timber floor.

\*150 mm applies to the UK, 200 mm applies to the Republic of Ireland if a row of insulating blockwork (thermal conductivity < 0.20 W/m·K) is used, otherwise 600 mm applies



- Insulation boards should be installed break-bonded, with joints lightly butted.
- Care should be taken to install the specified thickness of insulation around reveals.
- A breathable membrane e.g. **Kingspan nilvent®**, is installed over the insulation and temporarily stapled or pinned in place.
- Minimum 38 mm x 38 mm vertical treated softwood timber battens are fixed, through the breathable membrane and insulation, to the masonry wall.
- When selecting the type of fixing and fixing frequency for the vertical battens, consideration must be given to the weight of cladding to be fixed to them, the design of the wall, and wind loading.
- **If the cladding system is to be tile / slate hanging**, horizontal tiling battens can then be fixed to the vertical battens.
- Horizontal tiling battens and the tile / slate cladding that is to be fixed to them should be installed in accordance with the tile / slate cladding manufacturers recommendations.
- Alternatively, timber cladding can be fixed directly to the vertical battens.
- **If the cladding system is to be finished with render**, the render carrier (e.g. calcium silicate board, expanded metal lath) can be fixed directly to the vertical battens.
- The dry cladding system should be secured in accordance with the manufacturer's recommendations.
- Wherever possible, care should be taken to avoid cold bridging when attaching services and ancillaries to the exterior of the building.
- In refurbishment projects, sill extenders and flashings should be used around openings, with care taken to avoid cold bridging.

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39

# Masonry Walls

## EXTERNAL WALL INSULATION - RESTRICTED SPACE

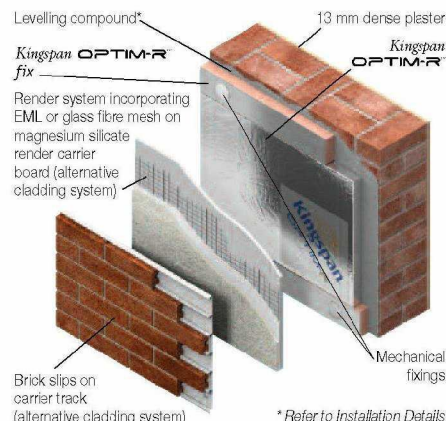
### Introduction

External wall insulation is recommended for use in new build and refurbishment applications, as part of a ventilated cladding or insulated render system.

Where space is an issue, the **Kingspan OPTIM-R™ External Wall System** is recommended.

The **Kingspan OPTIM-R™ External Wall System** comprises 3 elements: **Kingspan OPTIM-R™** panels, **flex** strips and **fix** strips.

**Kingspan OPTIM-R™** is an optimum performance rigid vacuum insulation panel with a thermal conductivity of 0.007 W/m·K. **Kingspan OPTIM-R™** provides an insulating performance up to five times better than other commonly available insulation materials.



### Product Data

	<b>Kingspan OPTIM-R™ External Wall System</b>
<b>Thermal Conductivity</b>	0.007 W/m·K (aged design value)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Core</b>	Optimum performance rigid vacuum insulation panel with a microporous core which is evacuated, encased and sealed in a thin, gas-tight envelope.
<b>Product Width</b>	0.3 – 0.6 m*
<b>Product Length</b>	0.3 – 1.2 m*
<b>Thickness Available</b>	20 – 60 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended

\* Other sizes may be available dependent on order quantity. Please contact Kingspan Insulation for more details.

### Installation Details

- The external masonry wall should be clean, flat, and free from protrusions. Where an uneven surface remains, it is recommended that a levelling compound is applied.
- External wall insulation should start 150 mm below the top surface of the ground floor insulation / perimeter insulation upstand (whichever is higher) for a concrete floor, or 200 mm below the top surface of the ground floor insulation / perimeter insulation upstand (whichever is higher) for a suspended timber floor.

Visit [www.kingspaninsulation.co.uk/optim-r](http://www.kingspaninsulation.co.uk/optim-r) to download the full product brochure, order samples and learn about case studies



- *fix* strips, minimum 100 mm wide, should be installed horizontally at maximum 600 mm vertical centres. This will provide a fixing point for the subsequent attachment of the render carrier board or the brick-slip carrier track. In ventilated cladding systems this provides a fixing point for the subsequent attachment of the timber battens which will accept the ventilated cladding system.
- *fix* strips should be the same thickness as the specified **Kingspan OPTIM-R** panels. *fix* strips should be mechanically fixed back to the substrate using appropriate mechanical fasteners, preferably thermally broken.
- **Kingspan OPTIM-R** panels should be installed between the *fix* strips with board edges lightly butted. Remaining areas of wall around openings and other details which can not be insulated with **Kingspan OPTIM-R** panels should be in-filled with an equal thickness of *flex* strips.
- **Kingspan OPTIM-R** panels should be restrained to the substrate using a suitable proprietary adhesive. For further advice on the specification of the proprietary adhesive and application guidance please contact the Kingspan Insulation Technical Services Department.
- *fix* strips should be mechanically fixed back to the substrate using appropriate mechanical fasteners, preferably thermally broken.
- In insulated render systems, once **Kingspan OPTIM-R** panels, *fix* and *flex* strips have been installed, a render carrier board is installed in a continuous layer over the assembly and fixed back to the substrate through the *fix* strips. Alternatively a brick-slip carrier track can be installed.
- In ventilated cladding systems, once **Kingspan OPTIM-R** panels, *fix* and *flex* strips have been installed, a breathable membrane e.g. **Kingspan nilvent**®, is installed and temporarily stapled or pinned in place to the *fix* strips. Minimum 38 mm x 38 mm vertical treated softwood timber battens are fixed through the breathable membrane and the *fix* strips to the substrate.
- When selecting the type of fixing and fixing frequency, consideration must be given to the weight of the cladding, the design of the wall and wind loading. For details on suitable fixings please consult the appropriate fixing and cladding manufacturer. Care must be taken to ensure fasteners do not penetrate **Kingspan OPTIM-R** panels.
- When installing the cladding system, please refer to the manufacturers recommendations for installation details.



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41

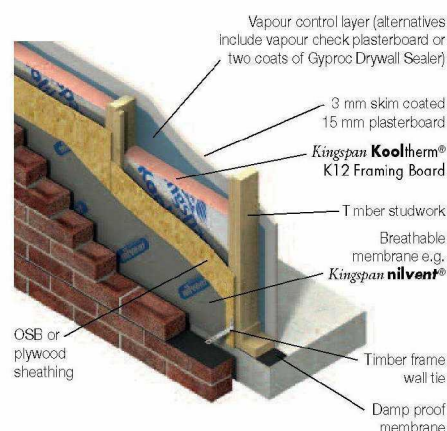
# Timber Frame Systems

## INSULATION BETWEEN STUDS

### Introduction

Insulating between studs in a timber frame system wall is ideal for new build applications. For this application, **Kingspan Kooltherm® K12 Framing Board** is recommended.

**Kingspan Kooltherm® K12 Framing Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K12 Framing Board</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	20 – 150 mm
<b>Fire Performance</b>	1 hour or 30 minute fire rating depending on construction. Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +



Visit [www.kingspaninsulation.co.uk/k12](http://www.kingspaninsulation.co.uk/k12) to download the full product brochure, order samples and learn about case studies

## Installation Details

- *If the insulation boards are to be fitted so that they are flush with the inside surface of the timber studs*, nail treated softwood battens to the side of the studs, to provide a 'stop' to prevent the insulation boards from moving within the stud cavity.
- This 'stop' should be positioned to allow the insulation boards to finish flush with the inside surface of the studs.
- Insulation boards may be temporarily held to the 'stop' battens with large headed clout nails.
- The boards will be further restrained by the plasterboard lining, fixed to the inside face of the studs.
- *If the insulation boards are to be fitted so that they are flush with the outside surface of the timber studs*, tight up against the pre-installed OSB or plywood sheathing, insulation boards must be cut and fitted in the spaces between the studs.
- Once the boards are fitted in place, nail treated softwood battens to the side of the studs, to provide a 'stop' to prevent the insulation boards from moving within the stud cavity.
- In all cases, measure the distance between studs before cutting **Kingspan Kooltherm® K12 Framing Board** to size, as spacings can vary.
- Ensure there is a tight fit between the boards and adjoining studs and other timbers, and fill all gaps with expanding urethane sealant.
- Ensure that the boards are lightly butted, and continuity of insulation is maintained.



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43

# Timber Frame Systems

## INSULATION BETWEEN STUDS WITH INSULATED PLASTERBOARD

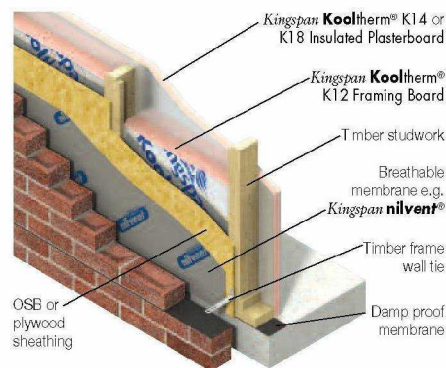
### Introduction

Insulating between studs in a timber frame wall, with an additional insulated lining, is ideal for new build applications where a low U-value is required. For this application, **Kingspan Kooltherm® K12 Framing Board** between studs, with a layer of **Kingspan Kooltherm® K14 or K18 Insulated Plasterboard** lining the timber frame, is recommended.

**Kingspan Kooltherm® K12 Framing Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K.

**Kingspan Kooltherm® K14 and K18 Insulated Plasterboard** comprise a premium performance rigid thermoset phenolic insulant bonded to 9.5 mm and 12.5 mm plasterboard respectively, providing insulation, dry lining and vapour control in one board.

Product data for **Kingspan Kooltherm® K14 and K18 Insulated Plasterboard** can be found on page 34.



### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K12 Framing Board</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	20 – 150 mm
<b>Fire Performance</b>	1 hour or 30 minute fire rating depending on construction. Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k12](http://www.kingspaninsulation.co.uk/k12), [www.kingspaninsulation.co.uk/k14](http://www.kingspaninsulation.co.uk/k14), and [www.kingspaninsulation.co.uk/k18](http://www.kingspaninsulation.co.uk/k18) to download the full product brochures, order samples and learn about case studies



## Installation Details

### Between Studs

- Please see installation details on page 42.

### Insulated Plasterboard

- Studs should be set at maximum 600 mm horizontal centres and noggins should be positioned at max. 1200 mm vertical centres.
- Where joints between sheets of insulated plasterboard are unsupported by the timber framing studs, noggins should be installed.
- Each sheet of insulated plasterboard should lap timber framing studs / noggins by 19 mm (min.) at sheet joints.
- Sheets of *Kingspan Kooltherm*® K14 or K18 Insulated Plasterboard should be fixed using either drywall screws at 300 mm centres, (or large headed galvanised clout nails at 150 mm centres in timber systems).
- Fixings should be located no less than 10 mm from the edges of the sheets, and be long enough to allow a minimum 25 mm penetration of the timber.
- Fixings should be driven straight, with the heads embedded just below the surface of the plasterboard.
- Care should be taken not to overdrive nails / screws.



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45

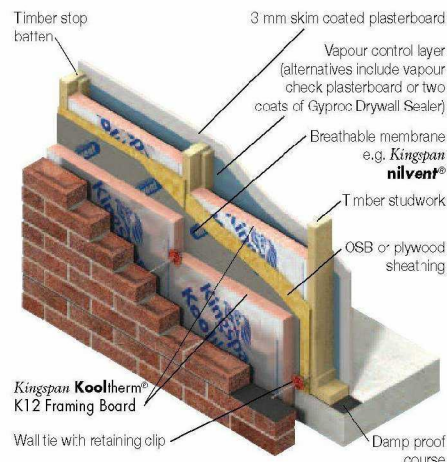
# Timber Frame Systems

## INSULATION BETWEEN STUDS WITH INSULATED SHEATHING

### Introduction

Insulating between and outside studs in a timber frame wall is ideal for new build applications where a low U-value is required. For this application, **Kingspan Kooltherm® K12 Framing Board** is recommended.

**Kingspan Kooltherm® K12 Framing Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K12 Framing Board</i>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	20 – 150 mm
<b>Fire Performance</b>	1 hour or 30 minute fire rating depending on construction. Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +



Visit [www.kingspaninsulation.co.uk/k12](http://www.kingspaninsulation.co.uk/k12) to download the full product brochure, order samples and learn about case studies

## Installation Details

### Between Studs

- Please see installation details on page 42.

### Insulated Sheathing

- *Kingspan Kooltherm*® K12 Framing Board should be fixed to the external surface of the timber or steel frame construction (outside of any breathable membrane, OSB or plywood sheeting), and restrained in accordance with the frame manufacturers recommendations. However, in the absence of any other guidance please note the following.
- Ensure the boards are lightly butted and continuity of insulation is maintained.
- Large headed galvanised clout nails may be used as temporary fixings prior to the insulation boards being tied into the masonry leaf with an appropriate timber frame wall tie.
- Always ensure that fixings are coincident with the underlying timber studs, head rails and sole plates.
- *For ventilated cladding systems*, a breathable membrane, e.g. *Kingspan nilvent*®, is fitted over the insulation, and temporarily stapled or pinned in place.
- Preservative treated softwood battens are fixed vertically to the wall structure, through the insulation sheathing, and breathable membrane, ensuring that the battens and fixings are coincident with the underlying timber studs, head rails and sole plates.
- When selecting the type of fixing and fixing frequency for the battens, consideration must be given to the weight of the cladding to be fixed to them.
- Installation advice should be sought from the breathable membrane manufacturer, and the ventilated cladding system should be secured in accordance with its manufacturer's recommendations.
- *For external masonry cladding*, the outer leaf of masonry may be constructed in the conventional manner, using appropriate wall ties to hold the two wall leaves together.



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47

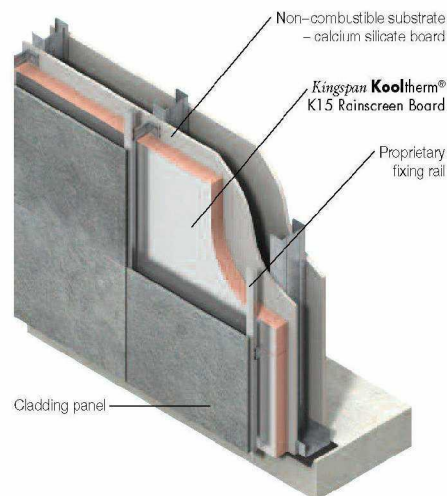
# Rainscreen Cladding Systems

## INSULATION FOR RAINSCREEN CLADDING SYSTEMS

### Introduction

Rainscreen cladding systems can be used in both new build and refurbishment applications. **Kingspan Kooltherm® K15 Rainscreen Board** is ideal for these applications.

**Kingspan Kooltherm® K15 Rainscreen Board** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K. It is the first insulation board for use in rainscreen cladding applications to achieve LABC System Approval.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K15 Rainscreen Board</i>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	20 – 140 mm
<b>Fire Performance</b>	When tested to BS 8414-1: 2002*, meets the criteria stated in BR 135 and is therefore acceptable for use above 18 metres.
<b>BRE 2008 Green Guide Summary Rating</b>	A +

\* Details of the tested construction are given in the full product brochure for the product.

Visit [www.kingspaninsulation.co.uk/k15](http://www.kingspaninsulation.co.uk/k15) to download the full product brochure, order samples and learn about case studies



## Installation Details

- Insulation boards should be installed break-bonded with board edges lightly butted.
- Boards should be cut neatly around fixings and brackets, so as to avoid gaps.
- The number and type of mechanical fixings required to fix *Kingspan Kooltherm® K15 Rainscreen Board* will vary with the geographical location of the building, the local topography, the height and width of the wall concerned, the wall structure, and the type of mechanism being used to attach the cladding system.
- A minimum of 9 fixings are required to secure the insulation board to the wall structure.
- The requirement for additional fixings should be assessed in accordance with BS 6399-2: 1997 (Loadings 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.
- Fasteners at board edges must be located > 50 mm and < 150 mm from the edges and corners of the board and not overlap board joints.
- The joints of *Kingspan Kooltherm® K15 Rainscreen Board* should always be taped using a 75 mm min. wide self-adhesive aluminium foil rainscreen cladding tape.
- In the absence of other protection, exposed edges of *Kingspan Kooltherm® K15 Rainscreen Board* should be protected by a suitable self-adhesive aluminium foil tape, with a 50 mm min. wide overlap onto the insulation board face.



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49

# Rainscreen Cladding Systems

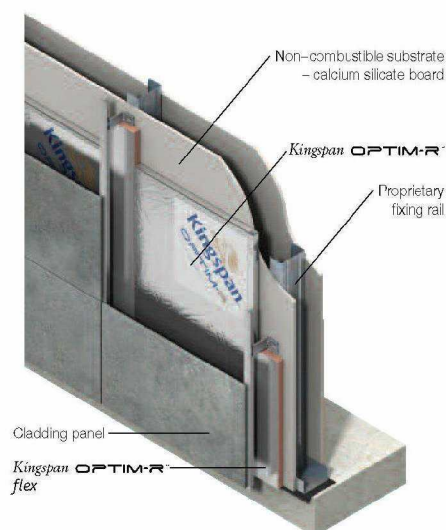
## INSULATION FOR RAINSCREEN CLADDING SYSTEMS WITH SPACE RESTRICTIONS

### Introduction

Rainscreen cladding systems can be used in both new build and refurbishment applications. Where space is an issue, the **Kingspan OPTIM-R<sup>™</sup> Rainscreen System** is recommended.

The **Kingspan OPTIM-R<sup>™</sup> Rainscreen System** comprises 2 elements: **Kingspan OPTIM-R<sup>™</sup>** panels and **flex** strips.

**Kingspan OPTIM-R<sup>™</sup>** is an optimum performance rigid vacuum insulation panel with a thermal conductivity of 0.007 W/m·K. **Kingspan OPTIM-R<sup>™</sup>** provides an insulating performance up to five times better than other commonly available insulation materials.



### Product Data

<b>Product</b>	<b>Kingspan OPTIM-R<sup>™</sup> External Wall System</b>
<b>Thermal Conductivity</b>	0.007 W/m·K (aged design value)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Core</b>	Optimum performance rigid vacuum insulation panel with a microporous core which is evacuated, encased and sealed in a thin, gas-tight envelope.
<b>Product Width</b>	0.3 – 0.6 m*
<b>Product Length</b>	0.3 – 1.2 m*
<b>Thickness Available</b>	20 – 60 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended

\* Other sizes may be available dependant on order quantity. Please contact Kingspan Insulation for more details.

Visit [www.kingspaninsulation.co.uk/optim-r](http://www.kingspaninsulation.co.uk/optim-r) to download the full product brochure, order samples and learn about case studies

## Installation Details

- The substrate against which *Kingspan OPTIM-R* panels are installed should be clean, dry and free from protrusions.
- *Kingspan OPTIM-R* panels should be installed with board edges lightly butted. Remaining areas of wall around brackets, openings, and other details which can not be insulated with *Kingspan OPTIM-R* panels should be in-filled with *flex* strips. Each *flex* strip is to be the same thickness as the *Kingspan OPTIM-R* panels.
- *flex* strips should be cut neatly around fixings and brackets to avoid gaps.
- *Kingspan OPTIM-R* panels should be restrained to the substrate using a suitable proprietary adhesive. For further guidance on the specification of the proprietary adhesive please consult the Kingspan Insulation Technical Service Department for assistance. *flex* strips should be restrained using mechanical fixings.
- The adhesive specification, and fixing rate, will potentially vary with the geographical location of the building, the local topography, the height and width of the wall structure, and the type of mechanisms being used to attach the cladding system.
- *flex* strips less than 300 mm in width should utilise a single row of insulation fasteners (with a suitable head or washer plate) along the centre line of the strip. Fixings within the row should be evenly distributed along the strip and located at centres no greater than 1200 mm, with a fixing located within 150 mm of each end of the strip. The requirement for additional fixings would need to be assessed on an individual project basis in accordance with BS EN 1991-1-4: 2005 (National annex to Eurocode 1, Actions on structures, General Actions, Wind Actions).
- Mechanical fixings for *flex* strips should be located greater than 50 mm, but no more than 150 mm from the strip edge.
- Joints between *Kingspan OPTIM-R* panels, and at junctions between the *Kingspan OPTIM-R* panels and *flex* strips, should be taped using a minimum 75 mm wide self adhesive aluminium foil rainscreen cladding tape. In the absence of other protection, exposed edges of the *Kingspan OPTIM-R* Rainscreen System should be protected by a self adhesive aluminium foil tape, with a minimum 50 mm wide overlap onto the insulation board face.



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51

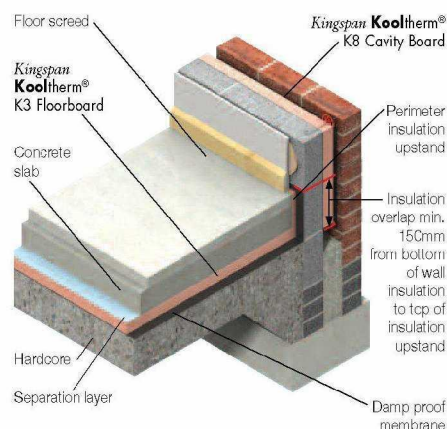
# Floors

## SOLID GROUND FLOORS - INSULATION BELOW FLOOR SLAB OR SCREED


### Introduction

Insulating below floor slab or screed in solid ground floor constructions is ideal for new build and refurbishment applications. For this application, **Kingspan Kooltherm® K3 Floorboard** is recommended.

**Kingspan Kooltherm® K3 Floorboard** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K3 Floorboard</i>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Glass tissue based
<b>Core</b>	 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

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## Installation Details

### Below Slab

- The site should be prepared and foundations, where appropriate, built to damp proof course (DPC) level.
- A thin sand blinding may be used to achieve a continuous level surface free from projections over rolled hardcore.



### Below Screed

- Concrete slabs should be allowed to dry out fully prior to the installation of the insulation boards (average 1 day per mm of slab thickness).
- The surface of the slab should be smooth, flat and free from projections. Rough cast slabs should be levelled using a thin sand blinding to ensure boards are continuously supported.

### All Floors

- The damp proof membrane (minimum 300 micron / 1200 gauge polythene) should be laid with joints well lapped and folded, to prevent the passage of ground water, over well compacted hardcore or the concrete floor slab, prior to laying the insulation boards.
- The membrane should be brought up the surrounding foundation walls until it is sufficiently above the height of the wall DPC so that it will connect with or form the DPC.
- The insulation boards should always be loose-laid break-bonded, with joints lightly butted.
- If two layers of insulation are required, they should be horizontally offset relative to each other so that, as far as possible, the board joints in the two adjacent layers do not coincide with each other.
- A strip of insulation board (minimum 20 mm thick) should be placed vertically around the perimeter of the floor in order to prevent cold bridging. The bottom of the strip of insulation board should be level with the top of the floor screed and the bottom should be level with the bottom of the horizontal floor insulation, and closely butted up to it.
- Insulation boards should be overlaid with a polythene sheet (not less than 125 micron / 500 gauge), to prevent the wet screed / concrete penetrating the joints between the boards, and to act as a vapour control layer. Ensure the polythene sheet has 150 mm overlaps, taped at the joints, and is turned up 100 mm at the walls.
- *For insulation below slab*, the subsequent installation of the concrete slab and screed or other flooring material is carried out in a manner similar to that for an un-insulated floor. The concrete slab and screed should be allowed to dry out prior to the installation of the floor finish.
- *For insulation below screed*, use sand and cement screed laid to a minimum thickness of 65 mm for domestic construction and 75 mm elsewhere.

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## Floors

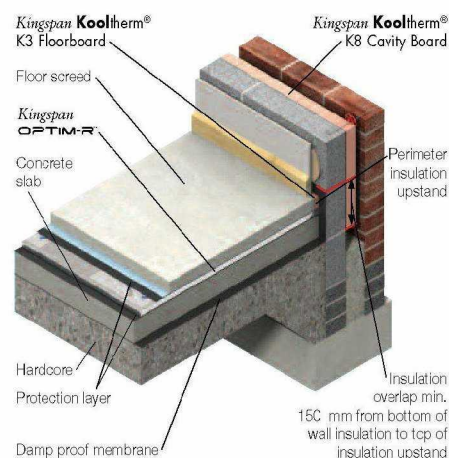
### SOLID GROUND FLOORS WITH SPACE RESTRICTIONS - INSULATION BELOW FLOOR SCREED

#### Introduction

Insulating below floor screed in solid ground floor constructions, is ideal for new build and refurbishment applications. Where space is an issue, the *Kingspan OPTIM-R* Flooring System is recommended.

The *Kingspan OPTIM-R* Flooring System comprises 2 elements: *Kingspan OPTIM-R* panels and *flex* strips.

*Kingspan OPTIM-R* is an optimum performance rigid vacuum insulation panel with a thermal conductivity of 0.007 W/m·K. *Kingspan OPTIM-R* provides an insulating performance of up to five times better than other commonly available insulation materials.



#### Product Data

<b>Product</b>	<i>Kingspan OPTIM-R</i> Flooring System
<b>Thermal Conductivity</b>	0.007 W/m·K (aged design value)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Core</b>	Optimum performance rigid vacuum insulation panel with a microporous core which is evacuated, encased and sealed in a thin, gas-tight envelope.
<b>Product Width</b>	0.3 – 0.6 m*
<b>Product Length</b>	0.3– 1.2 m*
<b>Thickness Available</b>	20 – 60 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended

\* Other sizes may be available dependant on order quantity. Please contact Kingspan Insulation for more details.

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## Installation Details

- Concrete slabs should be allowed to dry out fully prior to the installation of the **Kingspan OPTIM-R™ Flooring System** (average 1 day per mm slab thickness).
- The surface of the slab should be smooth, flat and free from projections. Thorough cleaning of the floor and removal of all projections is essential.
- If a damp proof membrane (minimum 300 micron / 1200 gauge polythene) is required, it should be laid with joints well lapped and folded, to prevent the passage of ground water, over the concrete slab prior to laying **Kingspan OPTIM-R™** panels.
- The membrane should be brought up the surrounding foundation walls until it is sufficiently above the height of the wall DPC so that it will connect with or form the DPC.
- An optional protection layer may be used under the **Kingspan OPTIM-R™ Flooring System**.
- **Kingspan OPTIM-R™** panels should be loose-laid, break bonded where practical with all joints lightly butted.
- Starting at each external corner of the floor lay **Kingspan OPTIM-R™** panels across the floor area in a break bond pattern with all panel joints lightly butted.
- Where runs of **Kingspan OPTIM-R™** panels do not accurately fit the dimension of the floor *flex* strips are required to fill the gap.
- *flex* strips should be the same thickness as the **Kingspan OPTIM-R™** panels.
- A *flex* strip (min 25 mm thickness) should be placed vertically around the perimeter of the floor slab in order to reduce cold bridging.
- The top of the vertical *flex* strip should be level with the top of the floor screed and the bottom should be level with the bottom of the horizontal floor insulation and closely butted up to it.
- An optional protection layer may also be used over the insulation.
- All insulation panels should be overlaid with a separation layer (not less than 125 micron / 500 gauge) to prevent the wet screed penetrating the joints between the boards. Ensure the separation layer has 150 mm overlaps, taped joints and is turned up 100 mm at the walls.
- Use sand and cement screed laid to a minimum thickness of 65 mm for domestic constructions and 75 mm in all other constructions.



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55

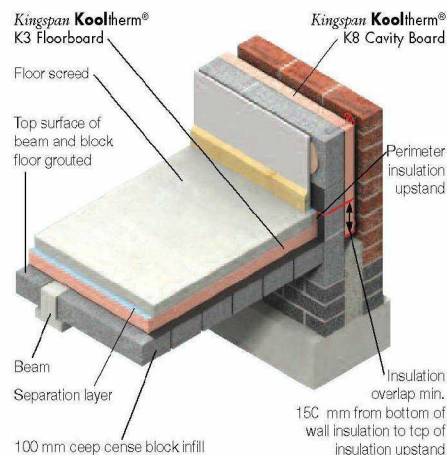
## Floors

### BEAM AND BLOCK GROUND FLOORS - INSULATION BELOW SCREED


#### Introduction

Insulating below floor screed in beam and block ground floor constructions is ideal for new build applications. For this application, **Kingspan Kooltherm® K3 Floorboard** is recommended.

**Kingspan Kooltherm® K3 Floorboard** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.



#### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K3 Floorboard</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Glass tissue based
<b>Core</b>	 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

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## Installation Details

- Beam and block floors should be level and grouted.
- The damp proof membrane (minimum 300 micron / 1200 gauge polythene) should be laid with joints well lapped and folded, to prevent the passage of ground water, over the concrete floor slab, prior to laying the insulation boards.
- The membrane should be brought up the surrounding foundation walls until it is sufficiently above the height of the wall DPC so that it will connect with or form the DPC.
- The insulation boards should always be loose-laid break-bonded, with joints lightly butted.
- If two layers of insulation are required, they should be horizontally offset relative to each other so that, as far as possible, the board joints in the two adjacent layers do not coincide with each other.
- A strip of insulation board (minimum 20 mm thick) should be placed vertically around the perimeter of the floor in order to prevent cold bridging. The bottom of the strip of insulation board should be level with the top of the floor screed and the bottom should be level with the bottom of the horizontal floor insulation, and closely butted up to it.
- Insulation boards should be overlaid with a polythene sheet (not less than 125 micron / 500 gauge), to prevent the wet screed penetrating the joints between the boards, and to act as a vapour control layer. Ensure the polythene sheet has 150 mm overlaps, taped at the joints, and is turned up 100 mm at the walls.
- Use sand and cement screed laid to a minimum thickness of 65 mm for domestic construction and 75 mm elsewhere.



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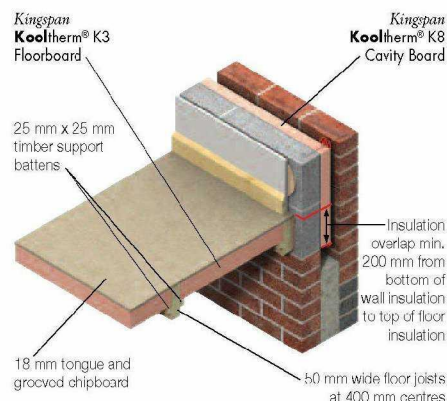
# Floors

## SUSPENDED TIMBER GROUND FLOORS - INSULATION BETWEEN JOISTS


### Introduction

Insulating between joists in suspended timber ground floor constructions is ideal for new build and refurbishment applications. For this application, **Kingspan Kooltherm® K3 Floorboard** is recommended.

**Kingspan Kooltherm® K3 Floorboard** comprises a premium performance rigid thermoset phenolic insulant, with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<b>Kingspan Kooltherm® K3 Floorboard</b>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Glass tissue based
<b>Core</b>	 Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k3](http://www.kingspaninsulation.co.uk/k3) to download the full product brochure, order samples and learn about case studies

## Installation Details

### Installation from Above the Floor Joists

- The installation of *Kingspan Kooltherm*® K3 Floorboard in suspended floor constructions should be carried out before commencement of floor boarding.
- The insulation boards should be cut to fit snugly between the floor joists. Measure the distance between the joists prior to cutting the boards as spacings can vary.
- In order to ensure insulation boards are flush with the top surface of the joists, they should be supported on minimum 25 mm x 25 mm treated softwood timber battens, proprietary galvanised steel saddle clips, or galvanised nails partially driven into the side of the joists.
- Battens / nails should be placed at an appropriate height to suit the thickness of board being fitted, and nails should remain 40 mm proud of the joist.
- The insulation boards should then be fitted between the joists so that they are supported by the battens / saddle clips or nails.



### Installation from Below the Floor Joists

- Floor boards should be fixed over joists prior to fitting *Kingspan Kooltherm*® K3 Floorboard from below.
- The insulation boards should be cut to fit snugly between the floor joists. Measure the distance between the joists prior to cutting the boards as spacings can vary.
- Push the cut insulation boards between the joists so they are flush with the underside of the floor boards.
- Side-nail 25 mm x 25 mm timber battens to the joists or partially drive galvanised nails into the side of the joists in the appropriate position to hold the boards in place.

### All methods of installation

- If two layers of insulation are required, they should be horizontally offset relative to each other so that, as far as possible, the board joints in the two adjacent layers do not coincide with each other.
- All board joints should be tightly butted.
- Ensure that insulation boards are fitted tightly between joists, and any gaps are filled with expanding urethane sealant.
- Any narrow gaps between a joist and perimeter wall should be insulated by specially cut pieces of board which in turn should be supported on blocks nailed to the underside of the joists. Gaps less than 25 mm wide should be filled with expanding urethane sealant.

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59

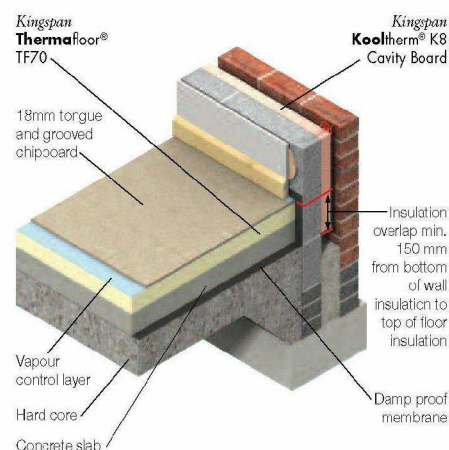
# Floors

## FLOATING TIMBER GROUND FLOOR

### Introduction

Insulating below floating timber ground floor constructions is ideal for new build and refurbishment applications. For this application, **Kingspan Thermalfloor® TF70** is recommended.

**Kingspan Thermalfloor® TF70** comprises a high performance rigid thermoset PIR insulant with a thermal conductivity of 0.022 W/m·K.



### Product Data

<b>Product</b>	<b>Kingspan Thermalfloor® TF70</b>
<b>Thermal Conductivity</b>	0.022 W/m·K
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Facings</b>	Composite foil
<b>Core</b>	High performance fibre-free rigid thermoset polyisocyanurate (PIR) insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	20 – 150 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

### Installation Details

- Concrete slabs should be allowed to dry out fully prior to the installation of the insulation boards (average 1 day per mm of slab thickness).
- The surface of the slab should be smooth, flat and free from projections. In accordance with BRE Good Building Guide 28 Part 1 (Domestic floors: construction insulation and damp-proofing), irregularities should not exceed 5 mm when measured with a 3 metre straight edge.

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- A thin layer of cement / sand mortar, a levelling screed, or a proprietary levelling compound can be used to achieve a level surface, and prevent the boards of **Kingspan Thermalfloor® TF70** from slipping under the timber floor boards, if required. This should be allowed to set, harden and dry (approximately 1 day per mm) before proceeding further.
- If there is no damp proof membrane in the concrete floor, one (minimum 300 micron / 1200 gauge polythene) should be laid with joints well lapped and folded, to prevent the passage of ground water, over the concrete floor slab.
- The membrane should be brought up the surrounding foundation walls until it is sufficiently above the height of the wall DPC so that it will connect with or form the DPC.
- To comply with NHBC recommendations, preservative treated softwood timber battens should be positioned at doorways, access panels and to support partitions. The size of the battens selected should ensure that, when installed, the top surface of the insulation boards are flush with the top of the battens.
- The insulation boards should always be loose-laid break-bonded, with joints lightly butted.
- Insulation boards should be overlaid with a polythene sheet (not less than 250 micron / 1000 gauge), to act as a slip layer, and a vapour control layer. Ensure the polythene sheet has 150 mm overlaps, taped at the joints, and is turned up 100 mm at the walls.
- Timber floors should then be laid over the insulation and battens with staggered cross-joints in accordance with DD ENV 12872: 2000.
- An expansion gap of 2 mm per metre run of floor, or a minimum of 10 mm overall, whichever is greater, should be provided between the floor boards and the perimeter walls.
- Where there are long (over 5 metres), uninterrupted lengths of timber floor boards, proprietary intermediate expansion joints should be installed on the basis of a 2 mm gap per metre run.
- Before the timber floor boards are interlocked, apply a continuous bead of waterproof wood grade PVA adhesive to the top and bottom of the tongue and groove joints.
- Once timber floor boards have been laid, temporary wedges should be inserted between the walls and the floor, to maintain tight joints, until the adhesive has set.
- Once the wedges are removed, they are replaced with strips of cork or polyethylene foam to act as a compressible filler and to help prevent cold bridging. Skirtings may then be fixed.



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For Technical Advice call

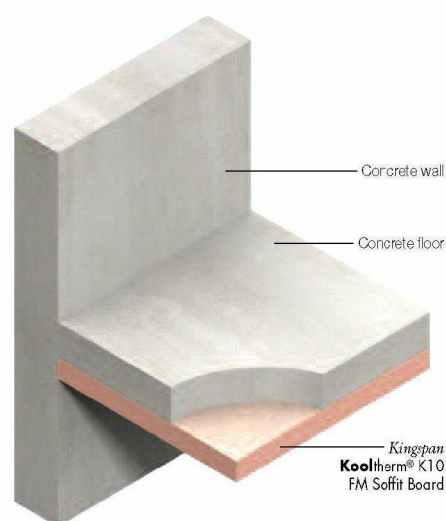
# Floors

## STRUCTURAL SOFFITS


### Introduction

Insulation for structural ceilings (soffits) is suitable for use in both new build and refurbishment applications. For this application, **Kingspan Kooltherm® K10 FM Soffit Board** is recommended.

**Kingspan Kooltherm® K10 FM Soffit Board** comprises a premium performance rigid thermoset phenolic insulant with thermal conductivities as low as 0.020 W/m·K.



### Product Data

<b>Product</b>	<i>Kingspan Kooltherm® K10 FM Soffit Board</i>
<b>Thermal Conductivity</b>	0.023 W/m·K (insulant thickness < 25 mm) 0.021 W/m·K (insulant thickness 25 – 44 mm) 0.020 W/m·K (insulant thickness ≥ 45 mm)
<b>Thermal Performance</b>	Please contact Kingspan Insulation Technical Department for a detailed U-value calculation
<b>Upper Facings</b>	Glass tissue based
<b>Core</b>	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">  </div> <div>                     Premium performance fibre-free rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP)                 </div> </div>
<b>Exposed Facing</b>	Composite foil
<b>Board Size</b>	1.2 x 2.4 m
<b>Thickness Available</b>	25 – 100 mm
<b>Fire Performance</b>	Meets the Building Regulation requirements for the applications intended
<b>BRE 2008 Green Guide Summary Rating</b>	A +

Visit [www.kingspaninsulation.co.uk/k10](http://www.kingspaninsulation.co.uk/k10) to download the full product brochure, order samples and learn about case studies

## Installation Details

- 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 boards 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 adequate penetration into a solid substrate.
- 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.



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