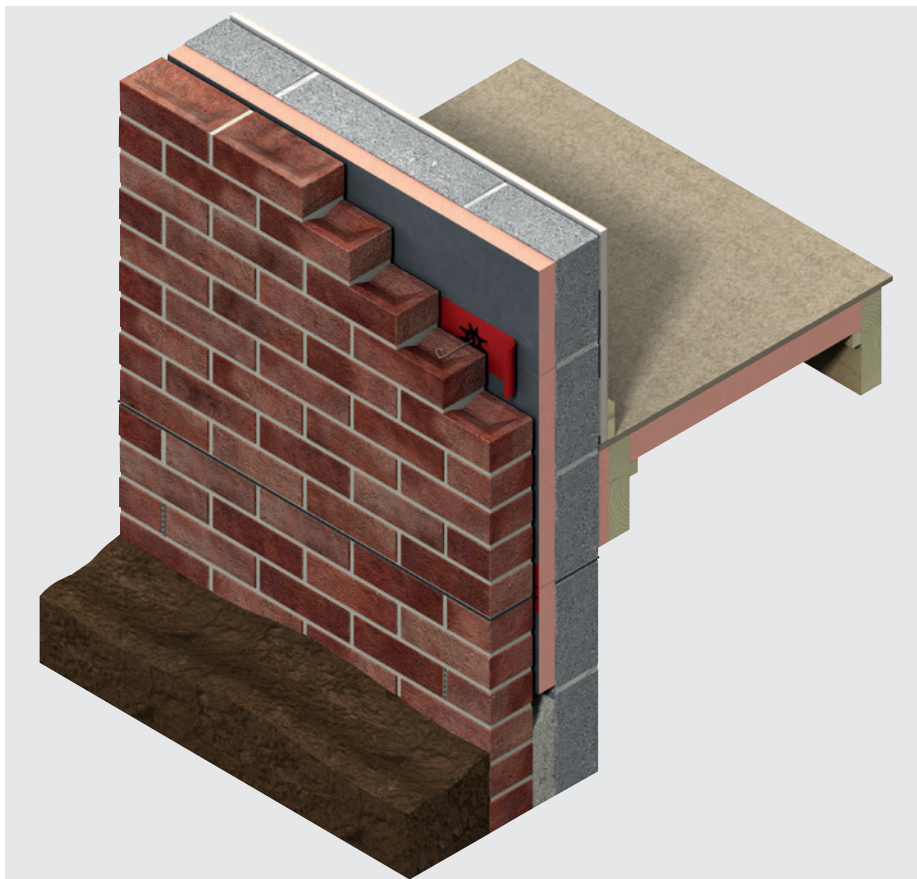


Insulation



# Kooltherm® K106 Cavity Board

Full Fill Cavity Wall Insulation



- Premium performance rigid thermoset phenolic insulation - thermal conductivity of 0.018 W/mK
- Full fill cavity insulation with a 10 mm cavity that resists moisture penetration
- The water-tight, vapour-open polypropylene fleece outer facing protects against moisture penetration
- Unaffected by air infiltration
- Easy to handle and install
- Non-deleterious material
- Manufactured with a blowing agent that has zero ODP and low GWP

Fibre-free  
Core



  
**Kingspan**®

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# Typical Constructions and U-values

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## Assumptions

The U-values in the tables that follow have been calculated, under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U-value and Condensation Risk Calculations, using the method detailed in BS EN ISO 6946: 2017 / I.S. EN ISO 6946: 2007 (Building components and building elements. Thermal resistance and thermal transmittance. Calculation method), and using the conventions set out in BR 443 (Conventions for U-value calculations). They are valid for the constructions shown in the details immediately above each table.



Unless stated otherwise, the internal wall finish is taken to be a 3 mm skim coated 12.5 mm plasterboard on dabs.

These U-values are valid for constructions with a 10 mm clear residual cavity between the outer surface of the insulation and the inner face of the outer masonry leaf.

NB When calculating U-values to BS EN ISO 6946: 2017 / I.S. EN ISO 6946: 2007, the type of wall tie used may change the thickness of insulation required. For overall cavity widths  $\leq 125$  mm, calculations assume a stainless steel flexible tie with 2.5 ties per  $m^2$  and a cross-sectional area of 12.50  $mm^2$ .

NB For the purposes of these calculations the standard of workmanship has been assumed good, and therefore the correction factor for air gaps has been ignored.

NB The figures quoted are for guidance only. A detailed U-value calculation and a condensation risk analysis should be completed for each project.

NB If your construction is different from those specified, and / or to gain a comprehensive U-value calculation along with a condensation risk analysis of your project, seek assistance from the Kingspan Insulation Technical Service Department.

## U-value Table Key

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

- 2013 editions of Approved Documents L to the Building Regulations for England;
- 2014 editions of Approved Documents L to the Building Regulations for Wales;
- 2019 editions of Technical Handbooks Section 6 to the Building Standards for Scotland;
- 2012 editions of Technical Booklets F1 & F2 to the Building Regulations for Northern Ireland; and
- 2011 edition of Technical Guidance Document L (Dwellings) and 2008 edition of Technical Guidance Document L (Buildings other than Dwellings) to the Building Regulations for the Republic of Ireland.

# Typical Constructions and U-values

## 10 mm Polymer Rendered 100 mm Dense Block Outer Leaf\* / 100 mm Block Inner Leaf

### Internal Finish - Fair Faced Blockwork

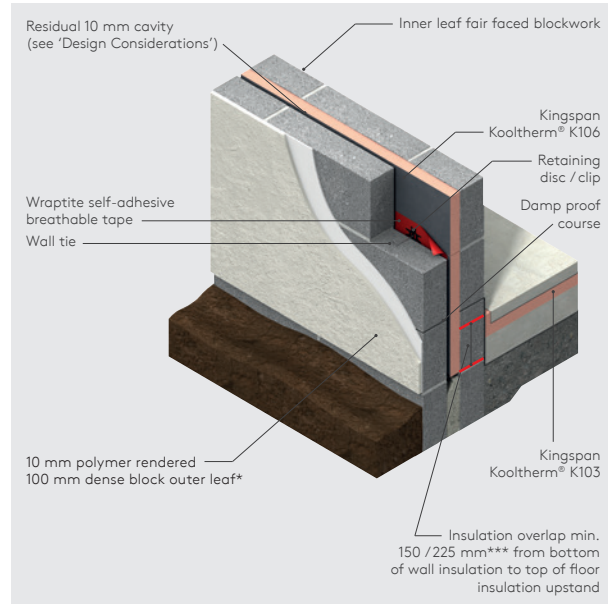


Figure 1

U-values (W/m <sup>2</sup> K) for Various Thicknesses of Kingspan Kooltherm® K106			
Insulant Thickness (mm)	Inner Leaf Fair Faced Blockwork Density and λ-value (W/mK)		
	Dense (1.13)	Medium (0.51)	Lightweight (0.15)**
90	0.18	0.18	0.17
115	0.14	0.14	0.13

\* Calculations assume dense block outer leaf of λ-value (1.13 W/mK).

\*\* A 6.6% thermal bridging factor has been assumed for the effect of mortar joints.

\*\*\* 150 mm applies to the UK and 225 mm to the Republic of Ireland.

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

### Internal Finish - 3 mm Skim Coated 12.5 mm Plasterboard

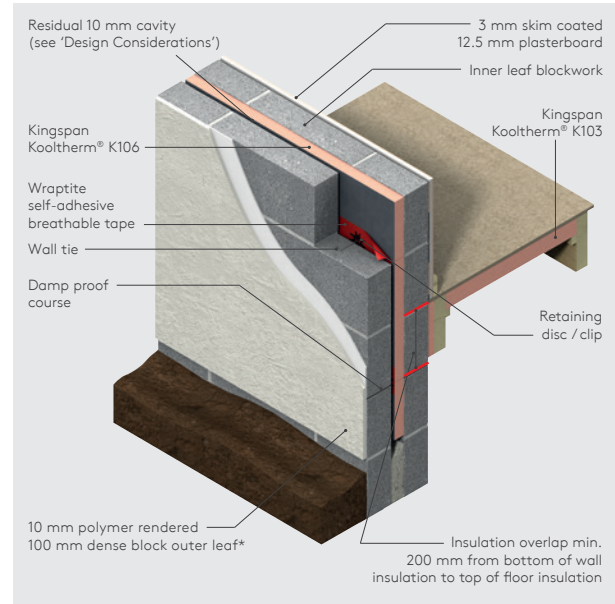


Figure 2

U-values (W/m <sup>2</sup> K) for Various Thicknesses of Kingspan Kooltherm® K106				
Insulant Thickness (mm)	Inner Leaf Blockwork Density and λ-value (W/mK)			
	Dense (1.13)	Medium (0.51)	Lightweight (0.15)**	Aerated (0.11)**
90	0.17	0.17	0.16	0.16
115	0.14	0.14	0.13	0.13

\* Calculations assume dense block outer leaf of λ-value (1.13 W/mK).

\*\* A 6.6% thermal bridging factor has been assumed for the effect of mortar joints.

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

# Typical Constructions and U-values

## 102.5 mm Brick Outer Leaf / 100 mm Block Inner Leaf

Internal Finish - Kingspan Kooltherm® K118

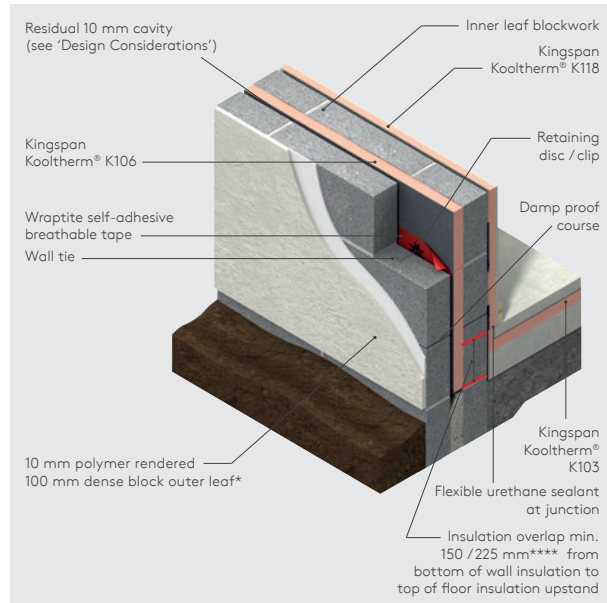


Figure 3

U-values (W/m <sup>2</sup> K) for 32.5 mm thick Kingspan Kooltherm® K118** and Various Thicknesses of Kingspan Kooltherm® K106				
Thickness of Kingspan Kooltherm® K106 (mm)	Inner Leaf Blockwork Density and λ-value (W/mK)			
	Dense (1.13)	Medium (0.51)	Lightweight (0.15)***	Aerated (0.11)***
90	0.14	0.14	0.13	0.13

\* Calculations assume dense block outer leaf of λ-value (1.13 W/mK).

\*\* Thickness shown = insulant thickness + 12.5 mm plasterboard.

\*\*\* A 6.6% thermal bridging factor has assumed for the effect of mortar joints.

\*\*\*\* 150 mm applies to the UK and 225 mm to the Republic of Ireland.

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

Internal Finish - Fair Faced Blockwork

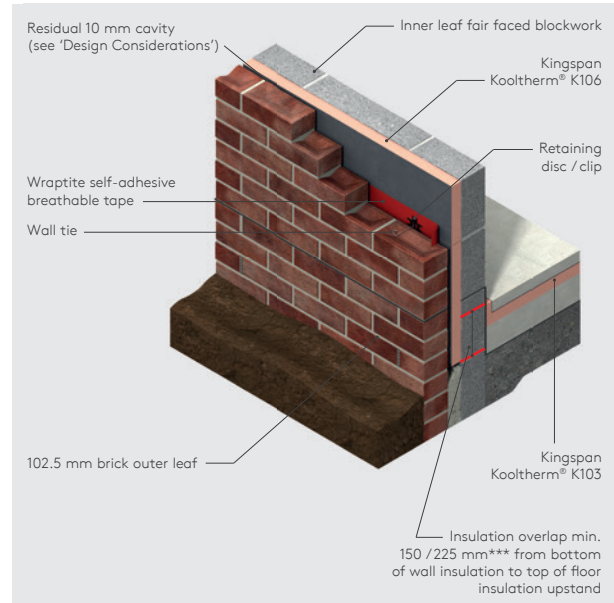


Figure 4

U-values (W/m <sup>2</sup> K) for Various Thicknesses of Kingspan Kooltherm® K106			
Insulant Thickness (mm)	Inner Leaf Fair Faced Blockwork Density and λ-value (W/mK)		
	Dense (1.13)	Medium (0.51)	Lightweight (0.15)**
90	0.18	0.18	0.17
115	0.14	0.14	0.14

\*\* A 6.6% thermal bridging factor has been assumed for the effect of mortar joints.

\*\*\* 150 mm applies to the UK and 225 mm to the Republic of Ireland.

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

# Typical Constructions and U-values

## Internal Finish - 3 mm Skim Coated 12.5 mm Plasterboard

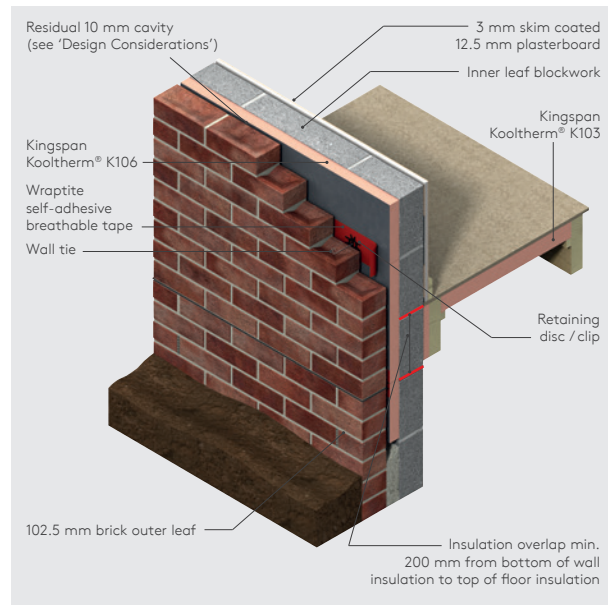


Figure 5

U-values ( $W/m^2K$ ) for Various Thicknesses of Kingspan Kooltherm® K106				
Insulant Thickness (mm)	Inner Leaf Blockwork Density and $\lambda$ -value ( $W/mK$ )			
	Dense (1.13)	Medium (0.51)	Lightweight (0.15)*	Aerated (0.11)*
90	0.17	0.17	0.16	0.16
115	0.14	0.14	0.13	0.13

\* A 6.6% thermal bridging factor has been assumed for the effect of mortar joints.  
NB Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

## Internal Finish - Kingspan Kooltherm® K118

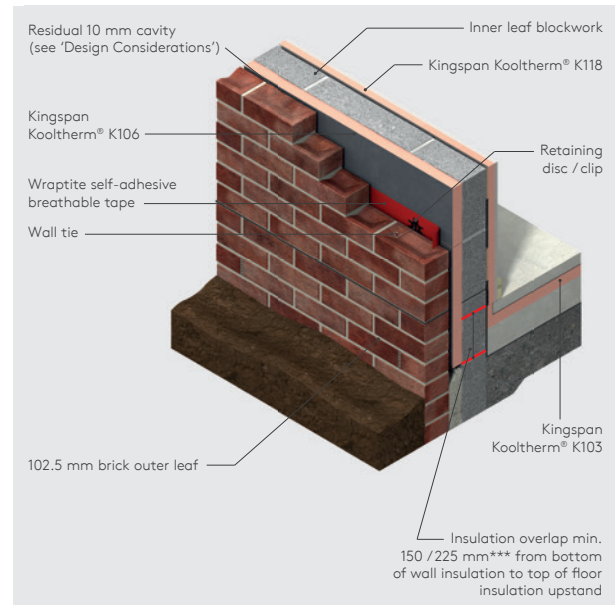


Figure 6

U-values ( $W/m^2K$ ) for 32.5 mm thick Kingspan Kooltherm® K118* and Various Thicknesses of Kingspan Kooltherm® K106				
Thickness of Kingspan Kooltherm® K106 (mm)	Inner Leaf Blockwork Density and $\lambda$ -value ( $W/mK$ )			
	Dense (1.13)	Medium (0.51)	Lightweight (0.15)**	Aerated (0.11)**
90	0.14	0.14	0.13	0.13

\* Thickness shown = insulant thickness + 12.5 mm plasterboard.  
\*\* A 6.6% thermal bridging factor has assumed for the effect of mortar joints.  
\*\*\* 150 mm applies to the UK and 225 mm to the Republic of Ireland.  
NB Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

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# Design Considerations

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## Heat Loss and Linear Thermal Bridging

### Basic Principles

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

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

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

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

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

Approved details, such as the Accredited Construction Details (England & Wales / Scotland / Northern Ireland) and Acceptable Construction Details (Republic of Ireland), collectively referred to here as ACDs, can uplift performance to provide a clear starting point towards achieving compliance, but they are limited in scope and applicability. The greatest opportunity for mitigating the impact of linear thermal bridges can come from following accurately 'modelled' details that take into account the following design considerations.

### Reducing Linear Thermal Bridging

Detailing at junctions to minimise the effects of thermal bridging and the associated risk of condensation or mould growth is important and there are some simple design considerations that can be adopted to help mitigate the risks and to reduce heat losses.

- Care is required to ensure continuation of insulation wherever possible for best thermal performance. Where this is not possible, insulation layers should be overlapped and ideally, insulation material introduced between. In a standard cavity wall-to-ground floor junction the main linear thermal bridge is the inner leaf of masonry. This linear thermal bridge can be reduced by increasing the distance that the heat has to travel through the inner leaf of masonry. This can be achieved by means of overlapping the partial fill cavity wall insulation and the floor insulation. The key factor is the distance between the bottom of the cavity wall insulation and the top of the floor insulation (including any perimeter insulation upstand).

- In order to minimise cold bridging at the edge of ground floors, the distance between the top surface of the floor insulation or perimeter insulation upstand, and the bottom of the wall insulation must be a minimum of 150 / 225\* mm for a concrete floor (see Figures 1 & 4) and 200 mm for a suspended timber floor (see Figures 2 & 5). The further appropriate wall insulation extends past the floor insulation, the better the thermal performance of the junction between the wall and the floor.

\* 150 mm applies to the UK and 225 mm to the Republic of Ireland.

- Perimeter upstand insulation is extremely important for minimising heat losses from the junction with external walls. This helps to increase the path of heat flow and therefore helps reduce losses through the junction. Omitting this, or using a poorer performance insulation for this purpose, can increase these losses.
- Using better thermal performance 'lightweight' aggregate blockwork on the inner leaf in adjacency to the junction with the floor can also assist with assuring lower heat losses from the junction.
- An internal lining of insulation on the warm side of the construction, such as Kingspan Kooltherm® K118, can also help to reduce heat losses.
- Prevention of thermal bridging should be considered when designing sills, jambs and lintels. An insulated cavity closer e.g. Kingspan Kooltherm® Cavity Closer or Kingspan Kooltherm® Cavity Closer PLUS is available from Kingspan Insulation. Please refer to the literature for these products for further information. This literature is available from the Kingspan Insulation Marketing Department or via the Kingspan Insulation website (see rear cover for details).
- Heat-loss from junctions around window or door openings can be further reduced by insulating the reveal. The key factor is the thermal resistance (R-value) of the insulation layer. Reveals should be designed to accommodate 32.5 mm (min.) of Kingspan Kooltherm® K118.
- For junctions between the external walls and roof constructions, continuity and overlap of insulation layers is the key to minimising heat losses from the junctions. Refer to Kingspan Kooltherm® K7 literature for further design considerations.

To aid in limiting thermal bridging and uncontrolled air-leakage via junctions in cavity wall constructions, Kingspan Insulation has had a number of the junctions incorporating Kingspan Kooltherm® K106 modelled and ψ-values calculated for them - many of which are significantly better than the approved ψ-values given in column 1 of Table K1 of SAP for the ACDs that comprise partial and full fill cavity wall constructions.

For further advice on details to reduce linear thermal bridging please contact the Kingspan Insulation Technical Service Department (see rear cover for details).



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# Design Considerations

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## Responsible Sourcing

Kingspan Kooltherm® K106 produced at Kingspan Insulation's Pembridge, Herefordshire manufacturing facility is certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Excellent'.



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

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## Sustainability & Responsibility

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

A report covering the sustainability and responsibility of Kingspan Insulation Ltd's British operations at its Pembridge, Herefordshire and Selby, North Yorkshire manufacturing facilities is available at [www.kingspaninsulation.co.uk/sustainabilityandresponsibility](http://www.kingspaninsulation.co.uk/sustainabilityandresponsibility).

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## Specification Clause

Kingspan Kooltherm® K106 should be described in specifications as:

The cavity wall insulation shall be Kingspan Kooltherm® K106 \_\_\_\_ mm thick: comprising a premium performance rigid thermoset fibre-free phenolic insulation core, faced on one side with a low emissivity composite foil, and faced on the other side with a water-tight, vapour-open polypropylene fleece. The product shall have a thermal conductivity of 0.018 W/mK. The product shall be manufactured: with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP); under a management system certified to ISO 9001: 2015, ISO 14001: 2015, BS OHSAS 18001: 2007 and ISO 50001: 2011; by Kingspan Insulation Limited; and installed in accordance with the instructions issued by them.

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## NBS Specifications

NBS users should refer to clause(s):  
F30 155 (Standard and Intermediate)  
F30 12 (Minor works)



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## Building Information Modelling (BIM)

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

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## Design Standards

BS EN 845-1: 2013 + A1: 2016 (Specification for ancillary components of masonry. Wall ties, tension straps, hangers and brackets), BS EN 1996-1-1: 2005 + A1: 2012 (Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures), BS EN 1996-2: 2006 (Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry), BS EN 1996-3: 2006 (Eurocode 6. Design of masonry structures. Simplified calculation methods for unreinforced masonry structures) and PD 6697: 2010 (Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2) should be consulted regarding the construction of insulated cavity walls.

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## Residual Cavity Width

A 10 mm residual cavity width is recommended between the insulation and the outer leaf for wall heights up to 25 metres. For further details please refer to current BBA Certificate 16/5299.

The NHBC accepts the use of Kingspan Kooltherm® K106 with a 10 mm residual cavity, except for fair-faced masonry applications in areas of very severe exposure.

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## Wall Ties

Wall ties should have a retaining clip / disc for securing the insulant to the masonry plane. Ideally they should be BBA / NSAI approved and conform to BS EN 845-1: 2013 + A1: 2016 (Specification for ancillary components of masonry. Wall ties, tension straps, hangers and brackets), BS EN 1996-1-1: 2005 + A1: 2012 (Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures), BS EN 1996-2: 2006 (Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry), BS EN 1996-3: 2006 (Eurocode 6. Design of masonry structures. Simplified calculation methods for unreinforced masonry structures) and PD 6697: 2010 (Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2).

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## Lightning Protection

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

# Sitework

## Fixing Details

- Kingspan Kooltherm® K106 should be held in position by the wall ties used to tie the two skins of masonry together.
- Wall ties should include a retaining disc / clip of a thickness no greater than 10 mm. For advice on the specification of retaining discs / clips, please refer to:

**Ancon Building Products** +44 (0) 1142 755 224  
[www.ancon.co.uk](http://www.ancon.co.uk)

- For a solid concrete ground floor 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 (for the UK) and 225 mm (for the Republic of Ireland) below the top surface of the ground floor perimeter insulation upstand (see 'Linear Thermal Bridging at Wall to Floor Junctions' above), 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 (see 'Linear Thermal Bridging at Wall to Floor Junctions' above).
- 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 in the UK and 750 mm horizontal centres in Ireland.
- 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 EN 845-1: 2013 + A1: 2016, BS EN 1996-1-1: 2005 + A1: 2012, BS EN 1996-2: 2006, BS EN 1996-3: 2006, PD 6697: 2010 and / or to ensure adequate retention of boards or cut pieces.
- Wraptite, a self-adhesive breathable tape, no less than 100 mm wide, should be applied to all horizontal and vertical joints, board edges and abutting junction interfaces e.g. Kingspan Kooltherm® Cavity Closer. For advice on Wraptite tape, please refer to:

**A. Proctor Group Ltd.** +44 (0) 1250 872 261  
[www.proctorgroup.com](http://www.proctorgroup.com)

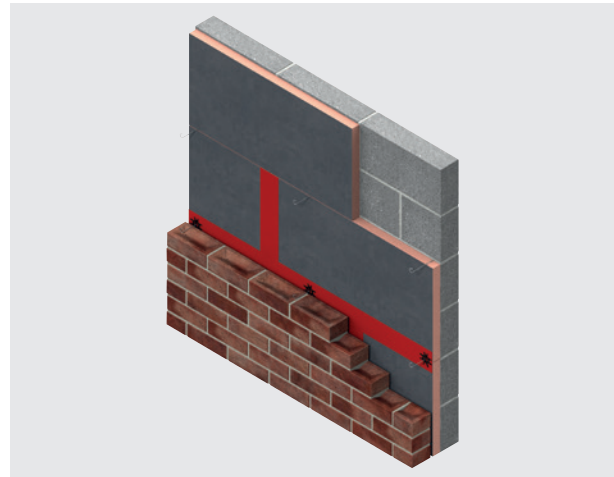


Figure 7 - Wraptite Self-adhesive Breathable Tape should be Applied

- The tape should be applied in a smooth and wrinkle-free manner and should extend no less than 50 mm either side of joints, board edges and abutting junction interfaces. If necessary, additional layers of tape may be applied. The seal must be maintained at protrusion locations e.g. wall ties.
- To ensure successful adhesion, all surfaces to receive tape should be made clean, dry and free from grease, dust, dirt and all other foreign matter prior to application. A gentle pressure may also be exerted during application.
- 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 200 mm beyond the height of the top storey ceiling and a cavity tray installed above the insulation.

## Excess Mortar

- After raising each section of inner leaf, before installation of the insulation board, excess mortar should be removed and mortar droppings cleaned from exposed edges of the installed insulation boards.
- Use of a cavity batten or cavity board is recommended to protect board edges and maintain a clear cavity (see Figures 8 & 9) or refer to BBA Certificate 16/5299.



# Sitework

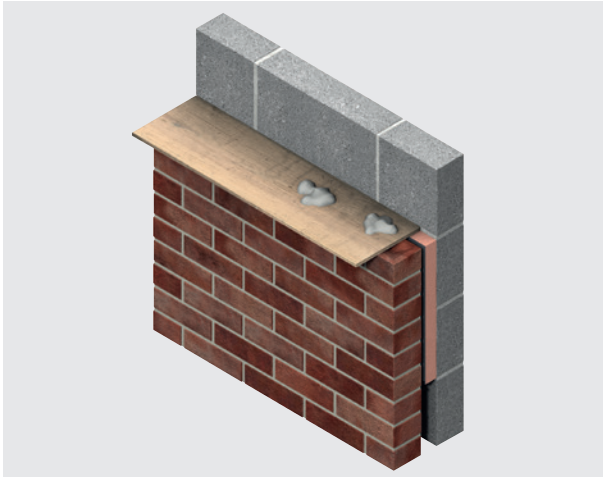


Figure 8 - Use of a Cavity Board to Protect the Cavity and Insulation Board Top Edge

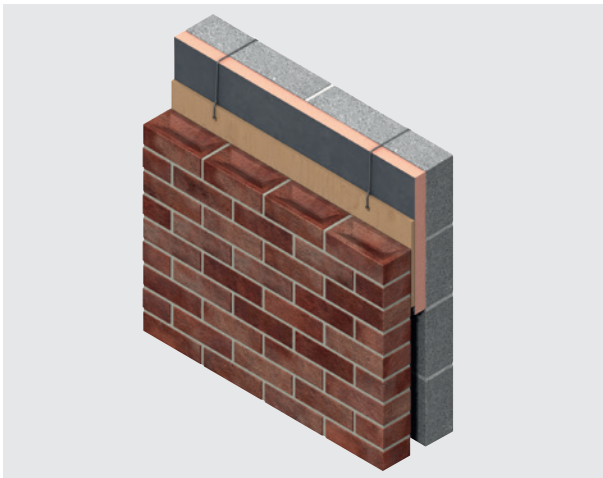


Figure 9 - Use of a Cavity Batten to Protect the Cavity

## General

### Cutting

- Cutting should be carried out either by using a fine toothed saw, or by scoring with a sharp knife, snapping the board over a straight edge and then cutting the facing on the other side.
- Ensure accurate trimming to achieve close butting joints and continuity of insulation.

### Daily Working Practice

- At the completion of each day's work, or whenever work is interrupted for extended periods of time, board edges and joints should be protected from inclement weather.

### Availability

- Kingspan Kooltherm® K106 is available through specialist insulation distributors and selected builders' merchants throughout UK and Ireland.

### Packaging and Storage

- The polyethylene packaging of Kingspan Insulation products, which is recyclable, should not be considered adequate for outdoor protection.
- Ideally, boards should be stored inside a building. If, however, outside storage cannot be avoided, then the boards should be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin. Boards that have been allowed to get wet should not be used.

### Health and Safety

- Kingspan Insulation products are chemically inert and safe to use.
- A Safety Information Data Sheet for this product is available from the Kingspan Insulation website [www.kingspaninsulation.co.uk/safety](http://www.kingspaninsulation.co.uk/safety) or [www.kingspaninsulation.ie/safety](http://www.kingspaninsulation.ie/safety).

Please note that the reflective surfaces on this product are designed to enhance its thermal performance. As such, they will reflect light as well as heat, including ultraviolet light. Therefore, if this product is being installed during very bright or sunny weather, it is advised to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream.

The reflective facings used on this product can be slippery when wet. Therefore, it is recommended that any excess material should be contained to avoid a slip hazard.

Warning - do not stand on or otherwise support your weight on this product unless it is fully supported by a load bearing surface.

# Product Details

## The Facings

The outer facing of Kingspan Kooltherm® K106 is a water-tight, vapour-open polypropylene fleece. The inner facing is a low emissivity composite foil, autohesively bonded to the insulation core during manufacture.

## The Core

The core of Kingspan Kooltherm® K106 is a premium performance rigid thermoset fibre-free phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



## Standards & Approvals

Kingspan Kooltherm® K106 is manufactured to the highest standards under a management system certified to ISO 9001: 2015 (Quality Management Systems. Requirements), ISO 14001: 2015 (Environmental Management Systems. Requirements), BS OHSAS 18001: 2007 (Occupational Health and Safety Management Systems. Requirements) and ISO 50001: 2011 (Energy Management Systems. Requirements with guidance for use).

The use of Kingspan Kooltherm® K106 is covered by BBA Certificate 16/5299 and LABC Registered Details Certificate No. EWWS545A.



## Standard Dimensions

Kingspan Kooltherm® K106 is available in the following standard size(s):

Nominal Dimension	Availability
Length (m)	1.2
Width (m)	0.45
Insulant Thickness (mm)	Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

## Compressive Strength

The compressive strength of Kingspan Kooltherm® K106 typically exceeds 100 kPa when tested to BS / I.S. EN 826: 2013 (Thermal insulating products for building applications. Determination of compression behaviour).

## Durability

If correctly installed, Kingspan Kooltherm® K106 can have an indefinite life. Its durability depends on the supporting structure and the conditions of its use.

## Resistance to Solvents, Fungi & Rodents

The insulation core is resistant to short-term contact with petrol and with most dilute acids, alkalis and mineral oils. However, it is recommended that any spills be cleaned off fully before the boards are installed. Ensure that safe methods

of cleaning are used, as recommended by suppliers of the spilt liquid. The insulation core is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with this product. Damaged boards or boards that have been in contact with harsh solvents or acids should not be used.

The insulation core and facings used in the manufacture of Kingspan Kooltherm® K106 resist attack by mould and microbial growth and do not provide any food value to vermin.

## Fire Performance

Kingspan Kooltherm® K106 will not prejudice the fire resistance properties of a wall in which it is installed. It is unlikely to become ignited within the cavity. If fire does penetrate into an unventilated cavity, the amount of air present will be insufficient to support combustion, and flame spread will be minimal.

Kingspan Kooltherm® K106, when subjected to BS EN ISO 5659-2: 2012 (Plastics. Smoke generation. Part 2: Determination of optical density by a single-chamber test), has achieved a mean maximum specific optical density of smoke < 200 in both the presence and absence of a pilot flame at irradiances of 25 and 50 kW/m<sup>2</sup>.

For guidance regarding the routes to compliance for meeting the fire safety requirements of the Building Regulations / Standards, refer to the relevant Technical Bulletins at [www.kingspaninsulation.co.uk/fireregulations](http://www.kingspaninsulation.co.uk/fireregulations).

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

## Thermal Properties

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

### Thermal Conductivity

The boards achieve a thermal conductivity ( $\lambda$ -value) of 0.018 W/mK.

### Thermal Resistance

Thermal resistance (R-value) varies with thickness and is calculated by dividing the thickness of the board (expressed in metres) by its thermal conductivity. The resulting number is rounded down to the nearest 0.05 (m<sup>2</sup>K/W).

Insulant Thickness (mm)	Thermal Resistance (m <sup>2</sup> K/W)
90	5.00
115	6.35

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

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# Kingspan Insulation

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## Company Details

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

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

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## 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. The available insulation solutions are listed below.

- 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
- The Kingspan KoolDuct® System
- Kingspan nilvent®
- Kingspan TEK® Building System

## Insulation Product Benefits

### Kingspan OPTIM-R® Vacuum Insulation Panel (VIP) Products

- With a declared value thermal conductivity of 0.007 W/mK, these products provide an insulating performance that is up to five times better than commonly used insulation materials.
- Provides high levels of thermal efficiency with minimal thickness.
- Over 90% (by weight) recyclable.

### Kingspan Kooltherm® and Kooltherm® 100 Products

- With a thermal conductivity of 0.018–0.023 W/mK these are the most thermally efficient insulation products commonly used.
- The thinnest commonly used insulation products for any specific U-value.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

### Kingspan QuadCore®

- With a thermal conductivity of 0.021 W/mK this is amongst one of the more thermally efficient insulation products commonly used.
- Offering excellent thermal and fire performance, enhanced environmental credentials and backed by an extended warranty.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

### Kingspan Therma™ Products

- With a thermal conductivity of 0.022–0.028 W/mK these are amongst the more thermally efficient insulation products commonly used.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

### Kingspan GreenGuard® Products

- 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.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

### All Products

- 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.
- Each product achieves the required fire performance for its intended application.

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