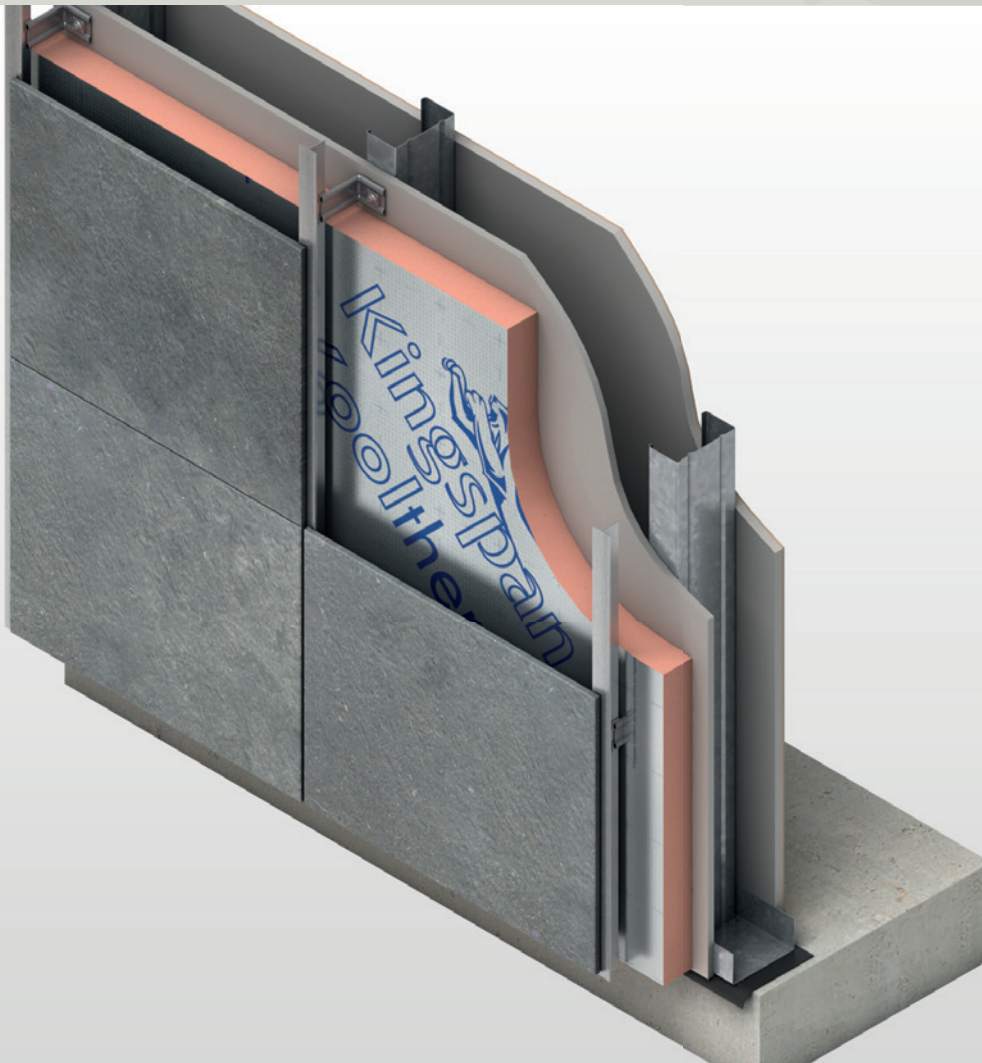




Kooltherm® K15 Rainscreen Board

INSULATION FOR USE BEHIND RAINSCREEN FAÇADES



- Premium performance rigid thermoset phenolic insulation – thermal conductivity as low as 0.020 W/m·K
- First insulation board for use in rainscreen cladding applications to achieve LABC Registered Detail status
- Successfully tested in differing façade systems to BS 8414-1: 2002 & BS 8414-2: 2005, in accordance with the performance criteria set out in BR 135
- Unaffected by air infiltration
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for new build and refurbishment
- Non-deleterious material
- Manufactured with a blowing agent that has zero ODP and low GWP

Fibre-free
Core



Kingspan®

*Low Energy –
Low Carbon Buildings*

Typical Constructions & U-values

Assumptions

Rainscreen façade systems are proprietary, resulting in a wide variation of possible system build-ups, material combinations and mechanisms that are used to fix and support the external cladding to the wall structure.

Fixings and supports penetrating the insulation through to the structure form point thermal bridges. The effect on the thermal performance of the overall façade system can be significant. Whilst the use of thermal isolators can assist in mitigating the impact of thermal bridging, the type and placement of fixings and supports can exacerbate heat flow through the façade assembly affecting the U-value.

For these reasons, it is advised that the Kingspan Insulation Technical Service Department is contacted for specific U-value calculations.

All calculations are undertaken using the method detailed in BS EN ISO 6946: 2017 (Building components & building elements. Thermal resistance & thermal transmittance. Calculation methods), and using the conventions set out in BR 443 (Conventions for U-value calculations).

Tested Constructions

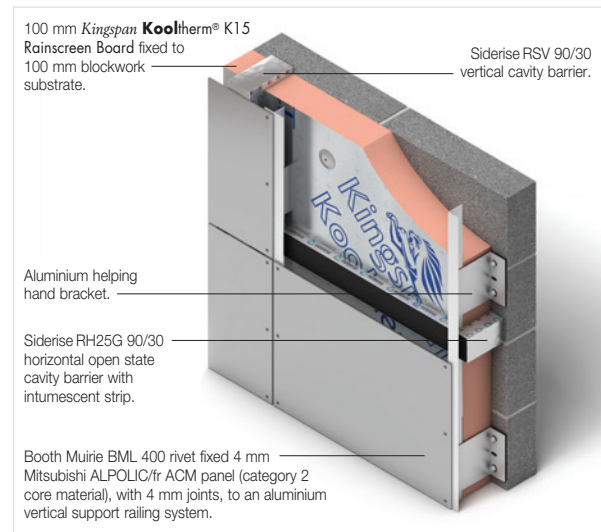


Figure 1 – FR ACM panel & Masonry Blockwork

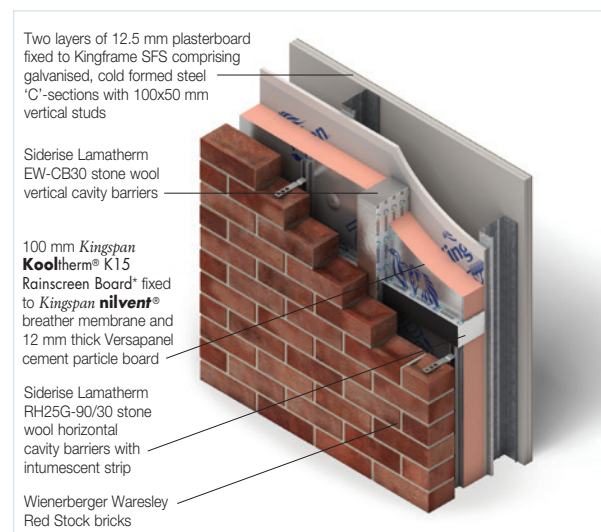


Figure 2 – Brickwork Facing & Kingspan Kingframe® SFS

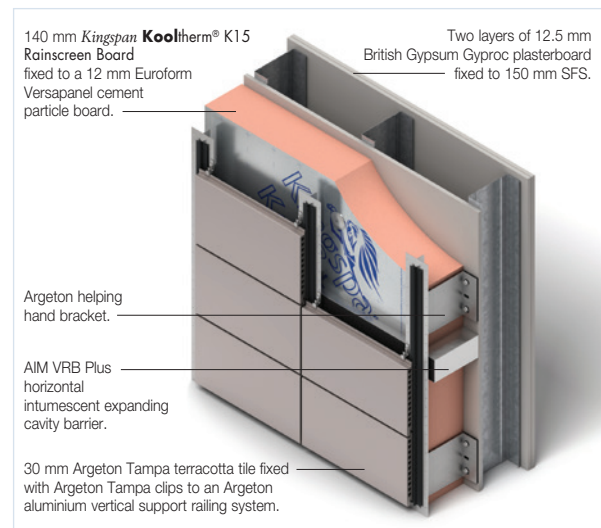


Figure 3 – Terracotta Tile Cladding & SFS

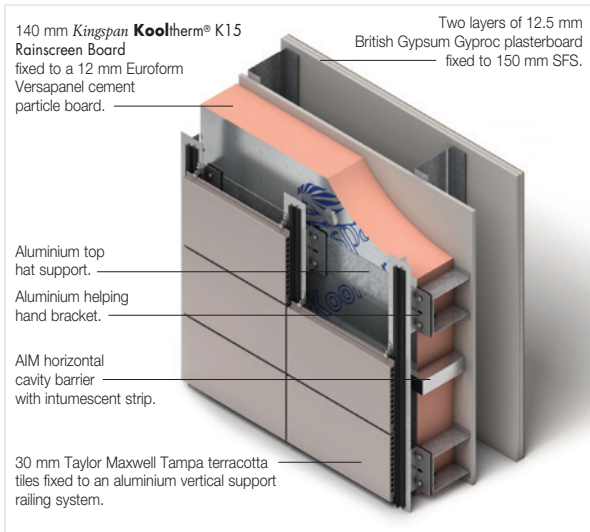


Figure 4 – Terracotta Tiles & SFS

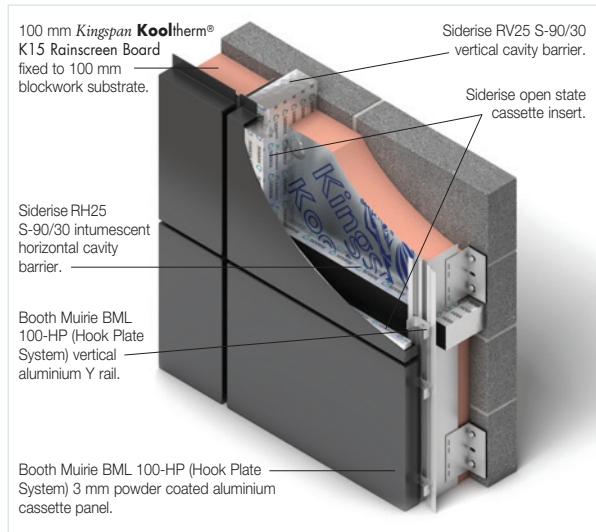


Figure 7 – Aluminium Cassette Panel & Masonry Blockwork

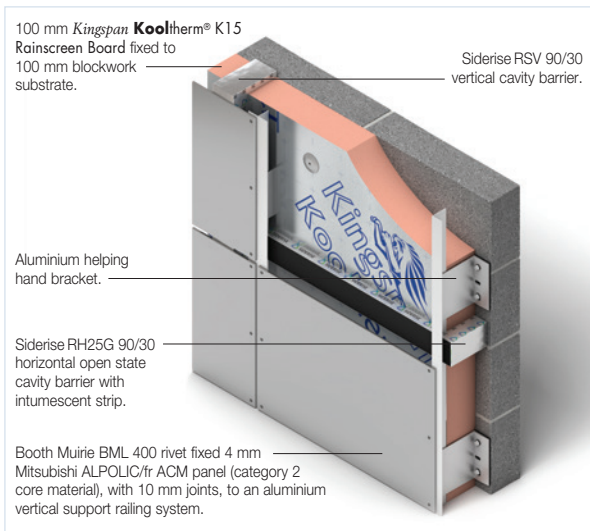


Figure 5 – FR ACM & Masonry Blockwork

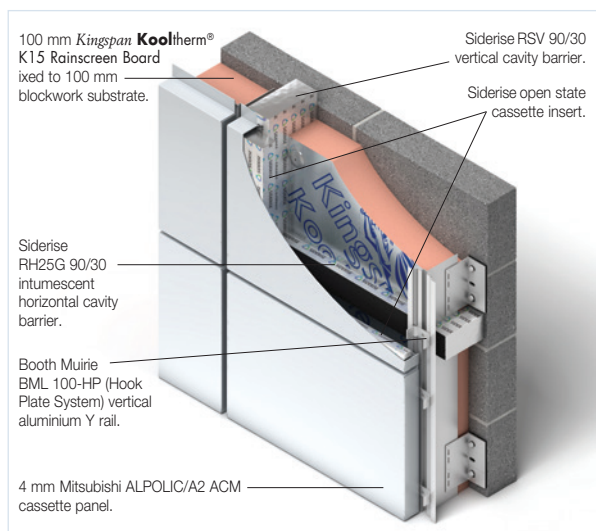


Figure 8 – A2 ACM & Masonry Blockwork

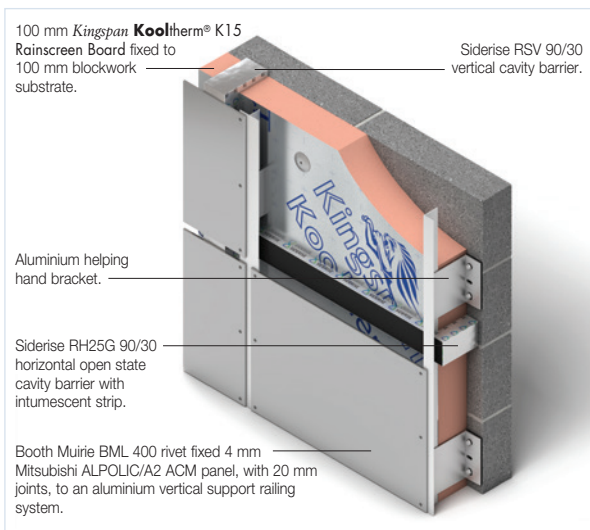


Figure 6 – A2 ACM & Masonry Blockwork

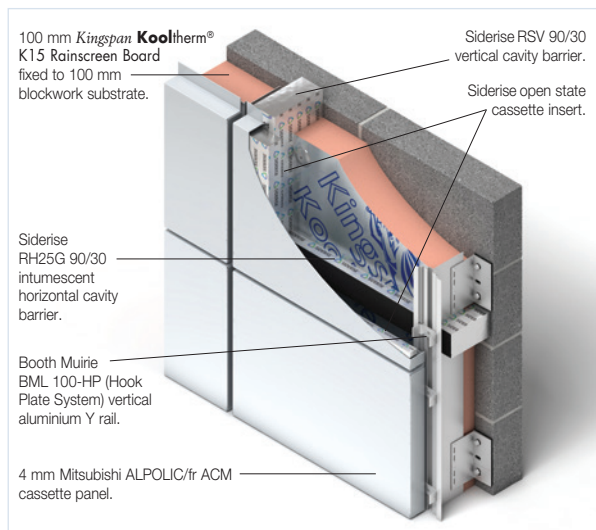


Figure 9 – FR ACM & Masonry Blockwork

Typical Constructions & U-values

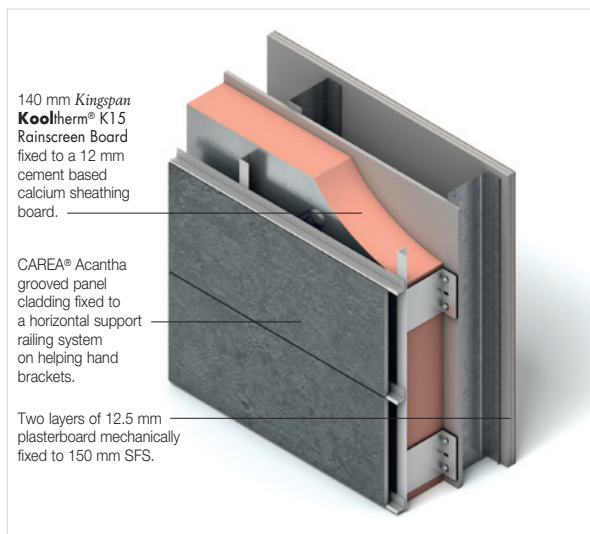


Figure 10 – Acantha Grooved Panel & SFS

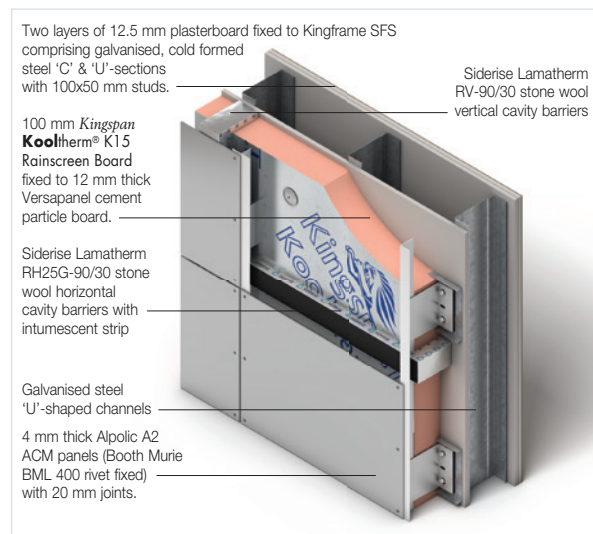


Figure 13 – A2 ACM & Kingspan Kingframe® SFS

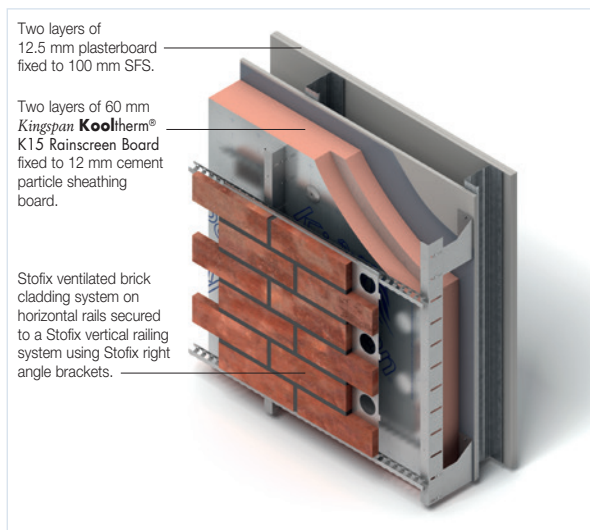


Figure 11 – Ventilated Brick Cladding System & SFS

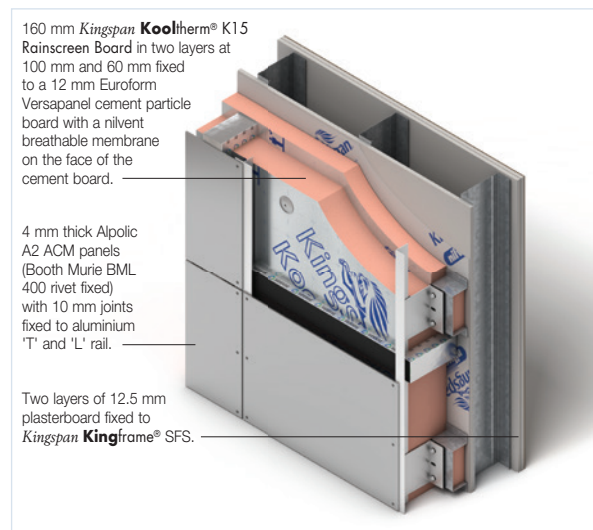


Figure 14 – A2 ACM & Kingspan Kingframe® SFS

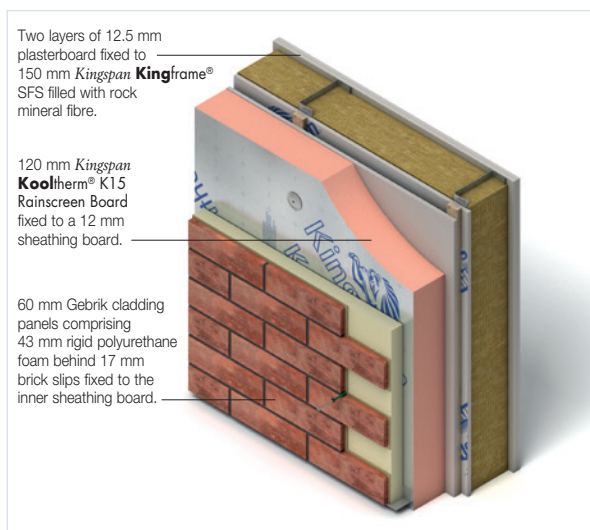


Figure 12 – Gebrick Cladding Panel & Kingspan Kingframe® SFS Filled with Rock Mineral Fibre

Design Considerations

Linear Thermal Bridging at Junctions & Point thermal bridging

Basic Principles

Linear thermal bridging describes the heat loss / gain that occurs at junctions between elements e.g. where an external wall meets the roof, 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 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 $W/m\cdot K$; 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_2 emissions and, where applicable, the fabric energy efficiency of new buildings.

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

Existing building junction losses are not typically accounted for in whole building heat loss calculations and only the risks of surface condensation and mould growth are considered.

Point thermal bridging describes the heat loss associated with penetrating an insulation layer at discrete points. Point thermal bridging is typically used as an adjustment to a U-value for an element, taking account of the number of brackets, fixings or fasteners (n) and their associated point thermal losses; these losses are measured in $W/m\cdot K$; referred to as a ' χ -values'; and expressed as a ' χ -values'.

The U-value of a rainscreen wall is adjusted to account for point thermal bridging by adding an adjustment to the U-value based on the number of penetrations per square metre of wall (n) multiplied by the calculated point thermal transmittance (χ) for brackets penetrating the insulation layer. The χ -value can be determined through 3-Dimensional numerical calculation as described in BS EN ISO 10211.

Reducing Linear & Point Thermal Bridging

Heat typically flows through the easiest path. For a wall insulated with *Kingspan Kooltherm*® K15 Rainscreen Board, the main linear thermal bridges are the reveals, exposed slab edges and balconies, the junctions between the walls and the roof and where the external wall and ground floor meet. In addition, point linear transmittance will occur through the rainscreen fixing system chosen, where the rainscreen supports penetrate the insulation layer.

Whilst there are some 'approved' details available for insulation installed to the outer face of the construction, these are largely targeted at new build constructions. However, where applicable, they are also considered good practice for refurbishment.

Continuity of insulation is the best approach to limiting losses from junctions or from losses associated with fixing the rainscreen façade; failing continuity, overlap of insulation layers and use of lower conductivity materials represents a good practice approach; however where neither option is possible, the risk of condensation will require particular consideration in determining an appropriate approach. Details and designs should be considered in the context of the building, its construction, characteristics, condition and ventilation provisions.

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

- The reveal linear thermal bridge can be avoided either by positioning the window frame so that it overlaps the insulated cavity barrier, or if this is not possible, the linear thermal bridge can be reduced by insulating the reveal at jambs, head and sill. Where existing windows or doors are not replaced as part of renovation works, design and detailing of the rainscreen façade should consider the potential for future window replacement works.
- One of the largest thermal bridging losses for buildings is the heat lost through junctions between balconies and the external wall / intermediate floor. Good practice for new buildings is to isolate the external balcony from the building structure, using an appropriate thermal break, combined with consideration of the reinforcement material used to connect the balcony back to the main structure (e.g. stainless steel has a much lower thermal conductivity than mild steel).

Design Considerations

For existing buildings, the option to use an appropriate thermal break may not be available and the effect of heat loss from balconies through the external rainscreen façade needs careful consideration; wrapping the external balcony in appropriate insulation can assist in this circumstance to reduce the effects of heat lost through this junction.

- For a new build construction, where *Kingspan Kooltherm*® K15 Rainscreen Board is used to sheath a frame construction 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 mm for a concrete floor and 200 mm for a suspended timber floor. The further appropriate wall insulation extends past the floor insulation, the better the thermal performance of the junction between the wall and the floor.

For existing building's junctions between walls and ground floor, good practice wherever possible is to extend the insulation below ground level, so that wall and floor insulation layers overlap; best practice would be to excavate and extend appropriate external insulation below ground level (ideally by at least 300 mm below finished floor level) to increase the heat flow path and therefore reduce junction losses.

- Where the rainscreen system is used at roof level as part of a parapet detail, insulation continuity should be maintained using an appropriate insulated upstand to reduce cold bridging. A minimum 25 mm thick insulated upstand should be used around the perimeter of the roof on the internal façade of parapets. The upstand should extend a minimum of 150 mm above the roof insulation and achieve a minimum distance of 300 mm between the top of the insulation upstand and the bottom of the horizontal roof insulation. Insulation should be carried up into parapets at least as high as the flat roof insulation upstand.

Where Insulating as part of a rainscreen system, there are also some simple design considerations that can be adopted to reduce point thermal transmittance.

- Point thermal bridges cause increased flow of heat and should be taken into consideration when designing a façade / façade system. The first priority should be to eliminate continuous conductive elements and instead use discontinuous supports to make required connections back to structure. When the thermal bridge is a necessity, such as when the structure must penetrate uninterrupted through the insulation, look for materials with the lowest possible thermal conductivity or that allows for a reduction in the amount that the insulation layer is bridged. Thermal decoupling of the substructure from the ventilated façade can be achieved through thermal separation layers. The use of a neoprene / plastic gasket, between the 'helping hand' bracket and the structure, can help to mitigate the effects of cold bridging.
- Support system suppliers should be able to calculate the thermal value of their brackets and isolators, and ensure that the installation minimises the overall impact of thermal bridging. However, in most instances a detailed three-dimensional U-value is required to assess the impact of the chosen design on the framing system. Please contact the Kingspan Insulation Technical Service Department (see rear cover) for further information.

For further advice on reducing linear and point thermal bridging, please contact the Kingspan Insulation Technical Service Department (see rear cover for details).

Environmental Impact

An Ecoprofile, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, has been created for *Kingspan Kooltherm*® K15 Rainscreen Board produced at Kingspan Insulation's Pembrige and Castleblayney manufacturing facilities. The BRE has assigned the product a 2008 Green Guide Summary Rating of A+.



Environmental Profiles Scheme
Certificate Number ENP 500

Responsible Sourcing

Kingspan Kooltherm[®] K15 Rainscreen Board produced at Kingspan Insulation's Pembridge manufacturing is certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Excellent'.



Kingspan Kooltherm[®] K15 Rainscreen Board produced at Kingspan Insulation's Pembridge and Castleblayney manufacturing facilities is manufactured under a management system certified to ISO 14001: 2015.

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 copies of Kingspan Insulation's certificates can be obtained.

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.

Specification Clause

Kingspan Kooltherm[®] K15 Rainscreen Board should be described in specifications as:-

The wall insulation shall be *Kingspan Kooltherm*[®] K15 Rainscreen Board ____ mm thick: comprising a premium performance rigid thermoset fibre-free phenolic insulation core faced on both sides with a low emissivity composite foil facing. 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 / I.S. OHSAS 18001: 2007 and ISO 50001: 2011; by Kingspan Insulation Limited; and installed in accordance with the instructions issued by them.

NBS Specifications

Details also available in NBS Plus.
NBS users should refer to clause(s):
H92 776 (Standard and Intermediate)



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.

Fire Safety

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/RisingHigh.

For those interested in receiving detailed fire test data for *Kingspan Kooltherm*[®] K15 Rainscreen Board, it may be obtained by contacting the Kingspan Insulation Technical Service Department at highrisetechnical@kingspan.com.

Fire Stop & Cavity Barrier Strategy

Current guidance to the Building Regulations / Standards should be considered with regard to the performance requirements for, and the provision of fire stops and cavity barriers. For specialist advice, including configuration and installation, refer to:

Aim Ltd	
www.aimlimited.co.uk	+ 44 (0) 1342 893 381
Siderise	
www.siderise.com	+44 (0) 1656 730 833
Tenmat	
www.tenmat.com	+44 (0) 161 872 2181

Water Vapour Control / Condensation

Consideration should be given to the risk of condensation, when designing thermal elements.

A condensation risk analysis should be carried out following the procedures set out in BS 5250: 2011 + A1: 2016 (Code of practice for the control of condensation in buildings). The Kingspan Insulation Technical Service Department can provide this service.

Glazed Façade Systems

Contact the Kingspan Insulation Technical Service Department for advice regarding the use of *Kingspan Kooltherm*[®] K15 Rainscreen Board in glazed applications.

Lightning Protection

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

Sitework

Installation

The installation guidance for *Kingspan Kooltherm*® K15 Rainscreen Board outlined in this section must only be followed after considering the below.

Kingspan Kooltherm® K15 Rainscreen Board is not suitable for use on the following buildings above 18 m in England:

- a building which contains one or more dwellings;
 - an institution; and
 - a room for residential purposes (excluding any room in a hostel, hotel or a boarding house). This includes student accommodation, care homes, sheltered housing, hospitals, dormitories in boarding schools.
 - To ensure compliance with the latest Building Regulations / Standards please consult your system supplier, the current guidance to the Building Regulations / Standards or Local Building Control for more information.
 - Since rainscreen façade systems are proprietary and use differing mechanisms to fix and support the external cladding to the wall structure, installation guidance should be sought from the system manufacturer or supplier.
 - Nevertheless, in the absence of any other guidance the instructions set out below may be followed.
 - Insulation boards should be installed break-bonded with board edges lightly butted and in such a manner to achieve a close fit between the board and substrate interface so as to avoid gaps behind or between the boards.
 - Boards should be cut neatly around fixings and brackets, so as to avoid gaps. Where small gaps are unavoidable, fill gaps with fire rated expanding sealant.
 - 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 3.13 fixings per m² are required to secure the insulation board to the wall structure.
 - The requirement for additional fixings should be assessed in accordance with BS / I.S. EN 1991-1-4: 2005 + A1: 2010 Eurocode 1. Actions on structures. General Actions. Wind Actions).
 - The fixings should be evenly distributed over the whole area of the board.
 - Refer to the column on page 9 for recommended fixing patterns.
- Fixings at board edges must be located > 50 mm and < 150 mm from edges and corners of the board and not overlap board joints.

Refer to:

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

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

MAK Fasteners +353 (0) 1 451 99 00
www.makfasteners.com

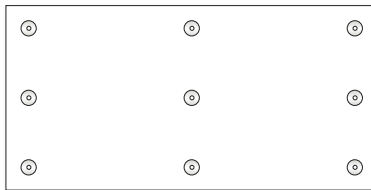
SFS Intec +44 (0) 1132 085 500
www.sfsintec.biz/uk

- The joints of *Kingspan Kooltherm*® K15 Rainscreen Board should always be taped using a 75 mm min. wide suitable self-adhesive aluminium foil 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.
- For advice on the specification of self-adhesive aluminium foil tape and application guidelines, refer to:

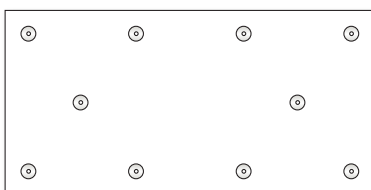
Bostik Limited +44 (0) 1785 272 727
www.bostik.co.uk

Recommended Fixing Patterns

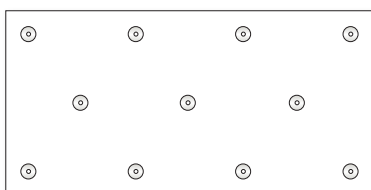
- The images below show recommended fixing patterns, the number of fixings used and the resulting fixing density (number of fixings per m²).



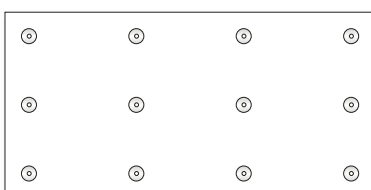
9 No. per board
(2.4 x 1.2 m board – 3.13 fixings / m²)



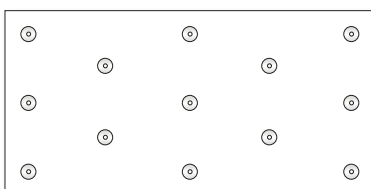
10 No. per board
(2.4 x 1.2 m board – 3.47 fixings / m²)



11 No. per board
(2.4 x 1.2 m board – 3.82 fixings / m²)



12 No. per board
(2.4 x 1.2 m board – 4.17 fixings / m²)



13 No. per board
(2.4 x 1.2 m board – 4.51 fixings / m²)

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*[®] K15 Rainscreen Board is available through specialist insulation distributors and selected builders' merchants throughout the UK.

Packaging & Storage

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

Health & Safety

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

Kingspan Kooltherm® K15 Rainscreen Board is faced on both sides with a low emissivity composite foil, autohesively bonded to the insulation core during manufacture.

The Core

The core of *Kingspan Kooltherm*® K15 Rainscreen Board 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® K15 Rainscreen Board 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 & Safety Management Systems. Requirements) and ISO 50001: 2011 (Energy Management Systems. Requirements with guidance for use).

The use of *Kingspan Kooltherm*® K15 Rainscreen Board, produced at Kingspan Insulation's Pembridge manufacturing facility, is covered by BBA Certificate 14/5134, and that produced at Kingspan Insulation's Castleblayney manufacturing facility by NSAI Agrément Certificate 08/0321.



Certified as LABC Registered Detail EWWS165, *Kingspan Kooltherm*® K15 Rainscreen Board is the first insulation board to achieve LABC Registered Detail status as a thermal insulation layer in rainscreen cladding systems. An LABC Registered Detail can significantly reduce the time and costs associated with a construction project. Contact the Kingspan Insulation Technical Service Department for further information.



Standard Dimensions

Kingspan Kooltherm® K15 Rainscreen Board is available in the following standard size(s):

Nominal Dimension		Availability
Length	(m)	2.4
Width	(m)	1.2
Insulant Thickness	(mm)	Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

Compressive Strength

The compressive strength of *Kingspan Kooltherm*® K15 Rainscreen Board typically exceeds 100 kPa when tested to BS / I.S. EN 826: 2013 (Thermal insulating products for building applications. Determination of compression behaviour).

Water Vapour Resistance

Adjusted for the effect of board joints, the product typically achieves a resistance far greater than 100 MN-s/g, when tested in accordance with BS / I.S. EN 12086: 2013 (Thermal insulating products for building applications. Determination of water vapour transmission properties).

Durability

If correctly installed, *Kingspan Kooltherm*® K15 Rainscreen Board 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 the suppliers of the spilt liquid. The insulation core is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with this product. Damaged boards or boards that have been in contact with harsh solvents or acids should not be used.

The insulation core and facings used in the manufacture of *Kingspan Kooltherm*® K15 Rainscreen Board resist attack by mould and microbial growth, and do not provide any food value to vermin.

Thermal Properties

The λ -values and R-values detailed below are quoted in accordance with BS / I.S. 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 (λ -value) of:
0.023 W/m·K (insulant thickness 15–24 mm);
0.021 W/m·K (insulant thickness 25–44 mm); and
0.020 W/m·K (insulant thickness \geq 45 mm).

Thermal Resistance

Thermal resistance (R-value) varies with thickness and is calculated by dividing the thickness of the board (expressed in metres) by its thermal conductivity. The resulting number is rounded down to the nearest 0.05 ($\text{m}^2\cdot\text{K}/\text{W}$).

Insulant Thickness (mm)	Thermal Resistance ($\text{m}^2\cdot\text{K}/\text{W}$)
25	1.15
30	1.40
40	1.90
50	2.50
60	3.00
70	3.50
75	3.75
80	4.00
90	4.50
100	5.00
110	5.50
120	6.00
125	6.25
130	6.50
130	6.50
140	7.00
150	7.50

NB Kingspan Insulation's maximum available single insulation thickness is subject to alteration without notice. Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

Fire Performance

Kingspan Kooltherm[®] K15 Rainscreen Board achieves European Classification (Euroclass) C-s1,d0 when classified to EN 13501-1: 2018 (Fire classification of construction products and building elements. Classification using data from reaction to fire tests).

Kingspan Kooltherm[®] K15 Rainscreen Board, in the constructions specified in the table below, has been successfully tested to BS 8414-1: 2002 (Fire performance of external cladding systems. Test methods for non-loadbearing external cladding systems applied to the face of a building) and BS 8414-2: 2005 (Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame), in accordance with the performance criteria set out in BR 135 (Fire performance of external thermal insulation for walls of multi-storey buildings).

Product Details

Build-up	Description		Description
			BS 8414-1: 2015 + A1 2017
			100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 100 mm blockwork substrate, Booth Murie BML 400 rivet fixed Mitsubishi ALPOLIC/fr ACM panel with 10 mm joints fixed to an aluminum vertical support railing system on helping hand brackets.
			100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 100 mm blockwork substrate, Booth Murie BML 400 rivet fixed Mitsubishi ALPOLIC/fr ACM panel with 4 mm joints fixed to an aluminum vertical support railing system on helping hand brackets.
			100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 100 mm blockwork substrate, Booth Murie BML 400 rivet fixed Mitsubishi ALPOLIC/fr ACM panel with 20 mm joints fixed to an aluminum vertical support railing system on helping hand brackets.
			100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 100 mm blockwork substrate, Booth Murie 3 mm powder coated aluminium cassette panel fixed to a vertical aluminium Y rail.
			100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 100 mm blockwork substrate, 4 mm Mitsubishi ALPOLIC/fr ACM cassette panel fixed to vertical aluminium Y rail.
			100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 100 mm blockwork substrate, 4 mm Mitsubishi ALPOLIC/A2 ACM cassette panel fixed to vertical aluminium Y rail.
			BS 8414-2: 2015 + A1 2017
			Two layers of 12.5 mm plasterboard fixed to <i>Kingspan Kingframe</i> ® SFS, 100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to nilvent breather membrane and 12 mm cement particle board, Wienerberger Waresley Red Stock bricks.
			Two layers of 12.5 mm plasterboard fixed to <i>Kingspan Kingframe</i> ® SFS, 100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to nilvent breather membrane and 12 mm cement particle board, 4 mm Booth Murie BML 400 rivet fixed ALPOLIC/A2 ACM panels with 10 mm joints fixed to aluminium 'T' and 'L' rails on helping hand brackets.
			Two layers of 12.5 mm plasterboard fixed to <i>Kingspan Kingframe</i> ® SFS, 100 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to a 12 mm cement particle board, Booth Murie BML 400 rivet fixed Mitsubishi ALPOLIC/fr ACM panel with 20 mm joints fixed to galvanised steel 'U'-shaped channels.
ArGeTon terracotta tile cladding & SFS	Two layers of 12.5 mm plasterboard fixed to 150 mm SFS, 140 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to a 12 mm cement based calcium sheathing board, ArGeTon 30 mm non-combustible terracotta tile cladding fixed to an aluminium vertical support railing system on helping hand brackets.	Booth Murie rivet fixed ALPOLIC/fr ACM panel & blockwork	
	Two layers of 12.5 mm plasterboard fixed to 150 mm SFS, 140 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to a 12 mm cement bonded particle board, ArGeTon 30 mm non-combustible terracotta tile cladding fixed to an aluminium vertical support railing system on helping hand brackets.		
Stofix ventilated brick slip cladding & SFS	Two layers of 12.5 mm plasterboard fixed to 100 mm SFS, two layers of 60 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to 12 mm cement particle sheathing board, Stofix ventilated brick cladding system on horizontal rails secured to a Stofix vertical railing system using Stofix right angle brackets.	Booth Murie rivet fixed ALPOLIC/A2 ACM panel & blockwork	
		Booth Murie aluminum cassette panel & blockwork	
Gebrik insulated brick cladding system on <i>Kingspan Kingframe</i> ® SFS	Two layers of 12.5 mm plasterboard fixed to 150 mm <i>Kingspan Kingframe</i> ® SFS filled with rock mineral fibre, 120 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to a 12 mm sheathing board, 60 mm Gebrik cladding panels comprising 43 mm rigid polyurethane foam behind 17 mm brick slips fixed to the inner sheathing board.	Mitsubishi ALPOLIC/fr ACM cassette panel & blockwork	
CAREA® Acantha grooved panel cladding & SFS	Two layers of 12.5 mm plasterboard mechanically fixed to 150 mm SFS, 140 mm <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board fixed to a 12 mm cement based calcium sheathing board, CAREA® Acantha grooved panel cladding fixed to a horizontal support railing system on helping hand brackets.	Mitsubishi ALPOLIC/A2 ACM cassette panel & blockwork	

Full details of the tested façade system build-ups can be found in the relevant Technical Bulletins for each region at www.kingspaninsulation.co.uk/RisingHigh.

Contact Details

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Kingspan Insulation produces a comprehensive range of technical literature for specifiers, contractors, stockists and end users. The literature contains clear user friendly advice on typical design; design considerations; thermal properties; sitework and product data.

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U-value calculations can also be carried out on the Kingspan Insulation U-value Calculator, available for free online at www.uvalue-calculator.co.uk or downloaded as an App.



The Kingspan Insulation Technical Service Department can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

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