



See rear cover for applicable countries

# Kooltherm™ K15 Cladding Board

INSULATION FOR USE BEHIND CLADDING SYSTEMS



- Premium performance rigid thermoset insulation – thermal conductivities as low as 0.020 W/m-K
- 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
- Class 0 fire rating
- Rated Class 1 (A) under ASTM E 84
- Negligible smoke obscuration
- 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
- Approved by Dubai Central Laboratory
- Approved by the state of Qatar Ministry of Interior General Admin of Civil Defence



*Low Energy –  
Low Carbon Buildings*

# Typical Constructions and U-values

## Assumptions

Cladding 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 advisable to contact Kingspan Insulation (see rear cover) for specific U-value calculations. All calculations are performed using the method detailed in BS / 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 BR443 (Conventions for U-value calculations).

## Typical Constructions

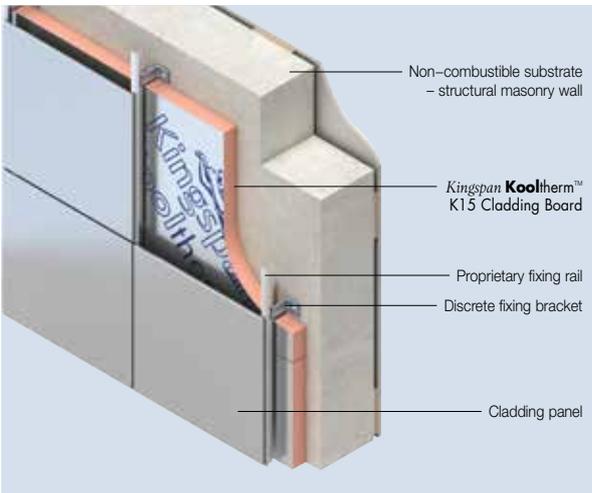


Figure 1 – Insulated Cladding Systems on Solid Reinforced Concrete

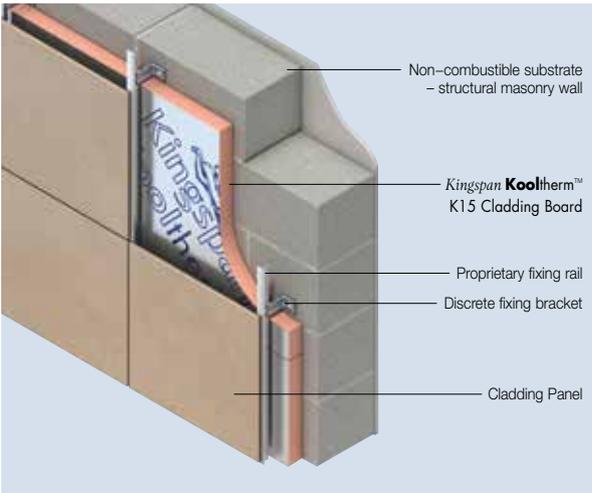


Figure 2 – Insulated Cladding Systems on Solid Concrete Blockwork

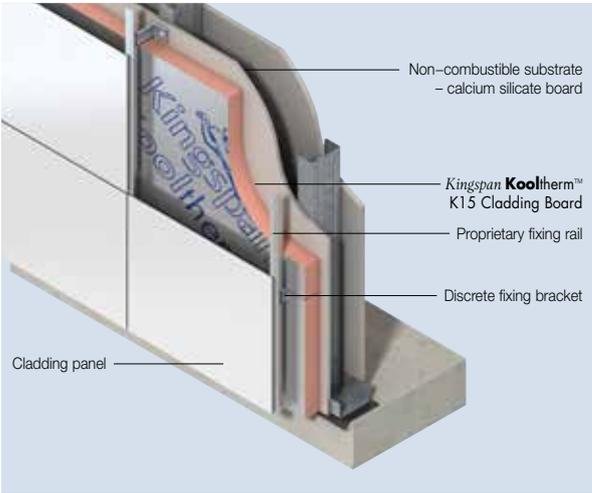


Figure 3 – Insulated Cladding Systems on Steel Frame

# Design Considerations

## Environmental Impact & Responsible Sourcing

### Green Guide Rating

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



Environmental Profiles Scheme  
Certificate Number ENP 410

### Responsible Sourcing

**Kingspan Kooltherm™ K15 Cladding Board** produced at Kingspan Insulation's Pembridge, UK and Castleblayney, Ireland manufacturing facilities is manufactured under a management system certified to ISO 14001: 2004. The principle polymer component of the product produced at these facilities are also manufactured under a management system certified to ISO 14001: 2004.

**Kingspan Kooltherm™ K15 Cladding Board** manufactured at Kingspan Insulation's Pembridge, UK 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 the Kingspan Insulation Technical Service Department (see rear cover), from which copies of Kingspan Insulation's and its suppliers' BES 6001 certificates can be obtained, along with confirmation of Kingspan Insulation's products' Green Guide Ratings.*

## Sustainability & Responsibility

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

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

## Specification Clause

**Kingspan Kooltherm™ K15 Cladding Board** should be described in specifications as:-

The wall insulation shall be **Kingspan Kooltherm™ K15 Cladding Board** \_\_\_\_ mm thick: comprising a fibre-free premium performance rigid thermoset 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: 2008, ISO 14001: 2004, BS / I.S. OHSAS 18001: 2007 and ISO 50001: 2011; by Kingspan Insulation; and installed in accordance with the instructions issued by them.

## Thermal Bridging

The use of a neoprene / plastic gasket, between the 'helping hand' bracket and the structure, will help to mitigate the effects of thermal bridging. Please contact Kingspan Insulation (see rear cover) for further information.

## 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: 2002 (Code of practice for the control of condensation in buildings). Kingspan Insulation (see rear cover) can provide this service.

## Fire Stops

Current Building Regulations / Standards should be considered with regard to the requirements for, and provision of, fire stops.

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.

Please contact Kingspan Insulation (see rear cover for details) for advice regarding the fire stopping strategy for your construction.

## Glazed Curtain Walling Systems

Please contact Kingspan Insulation (see rear cover for details) for advice regarding the suitability of **Kingspan Kooltherm™ K15 Cladding Board** in other glazed applications.

## Lightning Protection

Designers should give consideration to the requirements of BS / I.S. EN 62305: 2006 (Protection against lightning).

# Sitework

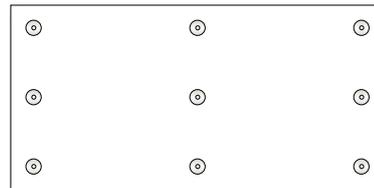
## Installation

- Since cladding systems are proprietary and utilise different mechanisms to fix and support the external cladding to the wall structure, installation guidance should be sought from the system manufacturer or supplier.
- However, in the absence of any other guidance the instructions laid 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 Cladding 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 m<sup>2</sup> 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 (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.
- Please refer to the column opposite for recommended fixing patterns.
- 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 joints of *Kingspan Kooltherm™ K15 Cladding Board* should always be taped using a 75 mm min. wide self-adhesive aluminium foil cladding tape.
- In the absence of other protection, exposed edges of *Kingspan Kooltherm™ K15 Cladding Board* should be protected by a suitable self-adhesive aluminium foil tape, with a 50 mm min. wide overlap onto the insulation board face.

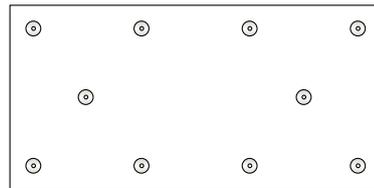
- For advice on the specification of self-adhesive aluminium foil tape and application guidelines, please refer to a local distributor of tape.

## Recommended Fixing Patterns

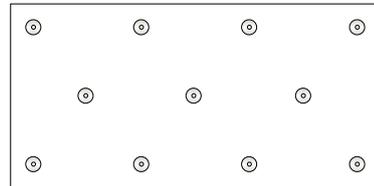
- The images below show recommended fixing patterns, the number of fixings used and the resulting fixing density (number of fixings per m<sup>2</sup>).



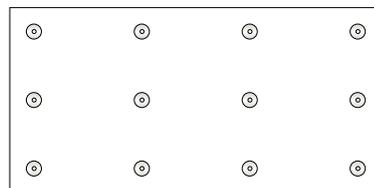
9 No. per board  
(2.4 x 1.2 m board – 3.13 fixings / m<sup>2</sup>)



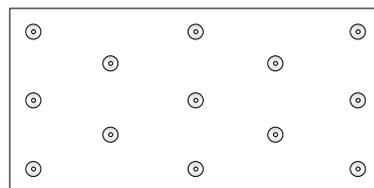
10 No. per board  
(2.4 x 1.2 m board – 3.47 fixings / m<sup>2</sup>)



11 No. per board  
(2.4 x 1.2 m board – 3.82 fixings / m<sup>2</sup>)



12 No. per board  
(2.4 x 1.2 m board – 4.17 fixings / m<sup>2</sup>)



13 No. per board  
(2.4 x 1.2 m board – 4.51 fixings / m<sup>2</sup>)

## 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

- Please contact Kingspan Insulation (see rear cover) to enquire about the availability of *Kingspan Kooltherm™ K15 Cladding Board*.

### 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.com](http://www.kingspaninsulation.com).

*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 Cladding 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 Cladding Board* is fibre-free premium performance rigid thermoset phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



The core of *Kingspan Kooltherm™ K15 Cladding Board* has a 90% (or greater) closed cell structure.

## Standards and Approvals

*Kingspan Kooltherm™ K15 Cladding Board* is manufactured to the highest standards under a management system certified to ISO 9001: 2008 (Quality management systems. Requirements), ISO 14001: 2004 (Environmental Management Systems. Requirements) and BS / I.S OHSAS 18001: 2007 (Health and Safety Management Systems. Requirements).

*Kingspan Kooltherm™ K15 Cladding Board*, produced at Kingspan Insulation's Pembroke, UK manufacturing facility, is manufactured to the highest standards under a management system certified to ISO 50001: 2011 (Energy management systems. Requirements).

The use of *Kingspan Kooltherm™ K15 Cladding Board*, produced at Kingspan Insulation's Pembroke, UK manufacturing facility, is covered by BBA Certificate 14/5134, and that produced at Kingspan Insulation's Castleblayney, Ireland manufacturing facility by NSAI Agrément Certificate.



Certified as LABC Registered Detail EWWS165, *Kingspan Kooltherm™ K15 Cladding Board* is the first insulation board to achieve LABC Registered Detail status as a thermal insulation layer in cladding systems. An LABC Registered Detail can significantly reduce the time and costs associated with a construction project. Contact Kingspan Insulation (see rear cover) for further information.



*Kingspan Kooltherm™ K15 Cladding Board*, produced at Kingspan Insulation's Pembroke, UK manufacturing facility, is approved for use by Dubai Central Laboratory.



*Kingspan Kooltherm™ K15 Cladding Board*, produced at Kingspan Insulation's Pembroke, UK manufacturing facility, is certified by Abu Dhabi Quality and Conformity Council.



## Standard Dimensions

*Kingspan Kooltherm™ K15 Cladding 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 for current stock and non-stock sizes. |

Table 1: Standard Dimensions of *Kingspan Kooltherm™ K15 Cladding Board*.

## Density

The apparent density of *Kingspan Kooltherm™ K15 Cladding Board* is 35 kg/m<sup>3</sup> when tested to BS EN 1602: 2013 (Thermal insulating products for building application. Determination of the apparent density).

## Compressive Strength

The compressive strength of *Kingspan Kooltherm™ K15 Cladding Board* typically exceeds 100 kPa at 10% compression, when tested to BS / I.S. EN 826: 1996 (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 EN 12086: 1997 / I.S. EN 12086: 1998 (Thermal insulating products for building applications. Determination of water vapour transmission properties).

## Durability

If correctly installed, *Kingspan Kooltherm™ K15 Cladding 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 Cladding Board* resist attack by mould and microbial growth, and do not provide any food value to vermin.

## FM Certification

*Kingspan Kooltherm™ K15 Cladding Board* (thicknesses up to, and including, 120 mm) produced at Kingspan Insulation's Pembroke, UK, manufacturing facility is certified as achieving Class 1 Fire Rating to Factory Mutual Class Number 4880: 2005. For further details please contact Kingspan Insulation (see rear cover) or alternatively search for Kingspan Insulation on [www.approvalguide.com](http://www.approvalguide.com).



This approval is valid for the insulation board only and not specific to any application or system. This approval is valid for any mechanical fixing specification. However, for mechanical reasons, the fixing specification given on page 4 of this document must still be followed.

## Fire Performance

*Kingspan Kooltherm™ K15 Cladding Board*, is Class O as defined by the Building Regulations in England.

The rigid thermoset insulation core of *Kingspan Kooltherm™ K15 Cladding Board*, when subjected to the American Standard fire test specified in the table below, has achieved the result shown.

| Test                                     | Result  |
|--|---|
| UL 723 (Surface Burning Characteristics) | Flame Spread Index of ≤25<br>Smoke Developed Index (SDI) of ≤50 Class 1/A |

Table 2: UL 723 result of the insulation core of *Kingspan Kooltherm™ K15 Cladding Board*.

*Kingspan Kooltherm™ K15 Cladding Board* when subjected to the American Standard fire test specified in the table below, has achieved the result shown.

| Test   | Result   |
|--|--|
| ASTM E 84<br>(Surface Burning Characteristics) | Flame Spread Index (FSI) of 25, Smoke Developed Index (SDI) of 50. Class 1 (A) |

Table 3: ASTM E 84 result of *Kingspan Kooltherm™ K15 Cladding Board*.

*Kingspan Kooltherm™ K15 Cladding Board* in the constructions specified in Table 4, 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).

| Build-up   | Description  |
|--|--|
| <b>BS 8414-1: 2002</b>   |  |
| Cement board cladding & masonry blockwork                                | 6 mm non-combustible cement board cladding fixed to an aluminium vertical support railing system at 600 mm centres. 60 mm <i>Kingspan Kooltherm™ K15 Cladding Board</i> mechanically fixed to 100 mm blockwork substrate.  |
| <b>BS 8414-2: 2005</b>   |  |
| Stofix ventilated brick slip cladding & SFS                              | Stolix ventilated brick cladding system on horizontal rails secured to a stolix vertical railing system. Two layers of 60 mm <i>Kingspan Kooltherm™ K15 Cladding Board</i> mechanically fixed to a 12 mm cement particle sheathing board. Two layers of 12.5 mm plasterboard mechanically fixed to 100 mm SFS.                       |
| CAREA® Acantha grooved panel cladding & SFS                              | CAREA Acantha grooved panel cladding fixed to a horizontal support railing system on helping hand brackets. 140 mm <i>Kingspan Kooltherm™ K15 Cladding Board</i> mechanically fixed to a 12 mm cement based calcium sheathing board. Two layers of 12.5 mm plasterboard mechanically fixed to 150 mm SFS.                            |
| Gebrik insulated brick cladding system on <i>Kingspan Kingframe®</i> SFS | 30 mm ArGeTon non-combustible terracotta tile cladding fixed to an aluminium vertical support railing system on helping hand brackets. 80 mm <i>Kingspan Kooltherm™ K15 Cladding Board</i> mechanically fixed to a 12 mm cement based calcium sheathing board. Two layers of 12.5 mm plasterboard mechanically fixed to 150 mm SFS.  |
| ArGeTon terracotta tile cladding & SFS                                   | 30 mm ArGeTon non-combustible terracotta tile cladding fixed to an aluminium vertical support railing system on helping hand brackets. 140 mm <i>Kingspan Kooltherm™ K15 Cladding Board</i> mechanically fixed to a 12 mm cement based calcium sheathing board. Two layers of 12.5 mm plasterboard mechanically fixed to 150 mm SFS. |

| Build-up                               | BS 8414-2: 2005  |
|--|--|
| ArGeTon terracotta tile cladding & SFS | 30 mm ArGeTon non-combustible terracotta tile cladding fixed to an aluminium vertical support railing system on helping hand brackets. 140 mm <i>Kingspan Kooltherm™ K15 Cladding Board</i> mechanically fixed to a 12 mm cement bonded particle board. Two layers of 12.5 mm plasterboard mechanically fixed to 150 mm SFS. |

Table 4: Façade System Build-ups Incorporating *Kingspan Kooltherm™ K15 Cladding Board* Tested to BS 8414-1: 2002 & BS 8414-2: 2005.

*NB Fire stopping was provided by a ventilated rainscreen barrier system, comprising nominal 2.5mm thick graphite-based intumescent strip bonded to nominal 0.6mm thick galvanized steel sheet, and positioned 0.5m and 4m above the fire chamber on both the main face and the wing face.*

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

## Thermal Properties

The  $\lambda$ -values and R-values detailed below are quoted in accordance with ASTM C 518.

### Thermal Conductivity

The boards achieve a thermal conductivity ( $\lambda$ -value) of: 0.020 W/m·K at 23°C mean temperature.

### Thermal Resistance

Thermal resistance can be expressed in either metric or imperial measurement. Using the imperial measurement, the boards achieve a thermal resistance (R-value) per inch of thickness of 7.21 ft<sup>2</sup>.hr.°f/Btu.

The metric measurement of 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) |
|-------------------------|--|
| 25                      | 1.25                                     |
| 30                      | 1.50                                     |
| 35                      | 1.75                                     |
| 40                      | 2.00                                     |
| 45                      | 2.25                                     |
| 50                      | 2.50                                     |
| 55                      | 2.75                                     |
| 60                      | 3.00                                     |
| 65                      | 3.25                                     |
| 70                      | 3.50                                     |
| 75                      | 3.75                                     |
| 80                      | 4.00                                     |
| 85                      | 4.25                                     |
| 90                      | 4.50                                     |
| 95                      | 4.75                                     |
| 100                     | 5.00                                     |

*NB Kingspan Insulation's maximum available single insulation thickness is subject to alteration without notice. Contact Kingspan Insulation (see rear cover) for current stock and non-stock sizes.*

Table 5: Thermal Resistance of Differing Thicknesses of *Kingspan Kooltherm™ K15 Cladding Board*.

*Kingspan Insulation LLC reserves the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and advice should be sought directly from Kingspan Insulation LLC. The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described herein. Recommendations for use should be verified as to the suitability and compliance with actual requirements, specifications and any applicable codes, laws and regulations. For other applications or conditions of use, contact Kingspan Insulation LLC. Advice should be sought for uses of Kingspan Insulation products that are not specifically described herein. The fire tests referenced in this literature and the assigned results are not intended to reflect hazards presented by the materials and products described herein under actual fire conditions. Please check that your copy of the literature is current by visiting [www.kingspaninsulation.com](http://www.kingspaninsulation.com).*



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Countries comprise: the Middle East as far North and East as (and including) Turkey, Iran and Oman and as far South and West as (and including) Saudi Arabia and Yemen

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