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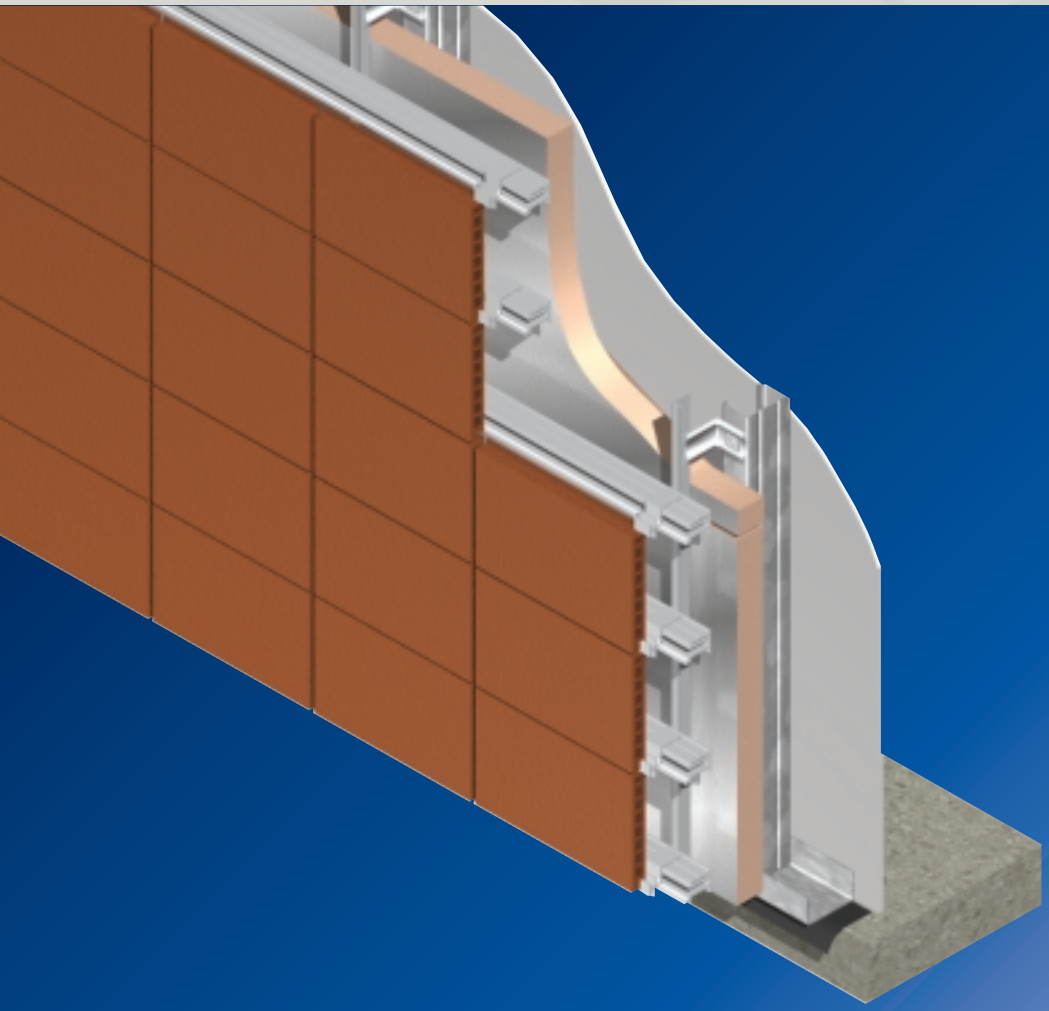
Sixth Issue June 2006

Kooltherm® K15 Rainscreen Board

INSULATION FOR USE BEHIND RAINSCREEN CLADDING SYSTEMS



- Premium performance rigid phenolic insulation – thermal conductivity as low as 0.021 W/m·K
- Class O/Low Risk fire rating
- Negligible smoke obscuration
- Suitable for use in rainscreen cladding systems
- Clear cavity is maintained – resists moisture penetration
- Unaffected by air movement
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for newbuild and refurbishment
- Non–deleterious material
- CFC/HCFC–free with zero Ozone Depletion Potential (ODP)

PREMIUM PERFORMANCE

zero O.D.P

Kingspan® Insulation Solutions

Kooltherm® K15 Rainscreen Board

Typical Design Details

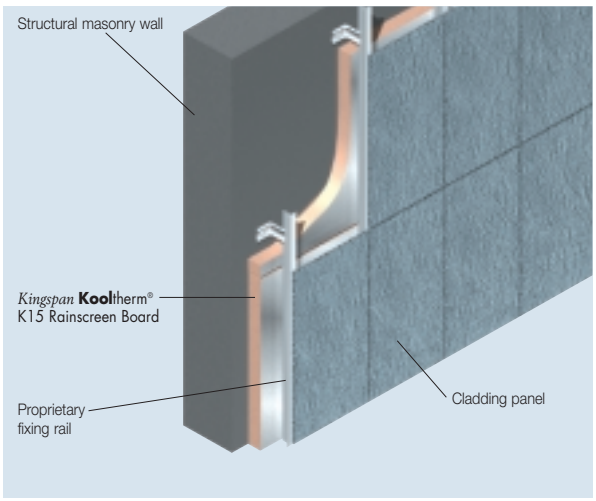


Figure 1 Insulated rainscreen cladding systems (non–proprietary external finish)

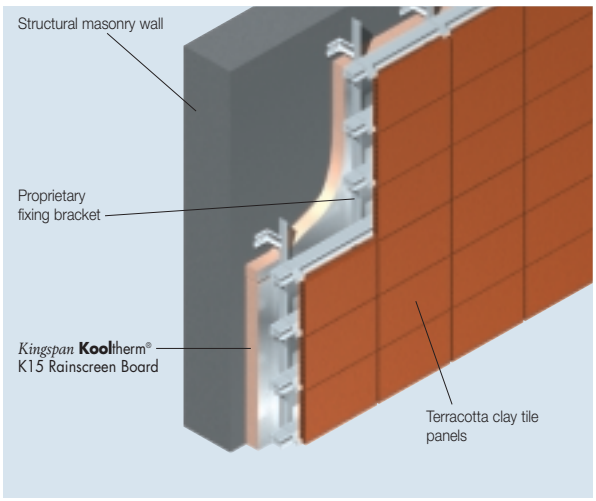


Figure 2 Insulated rainscreen cladding systems (terracotta clay tile external finish)

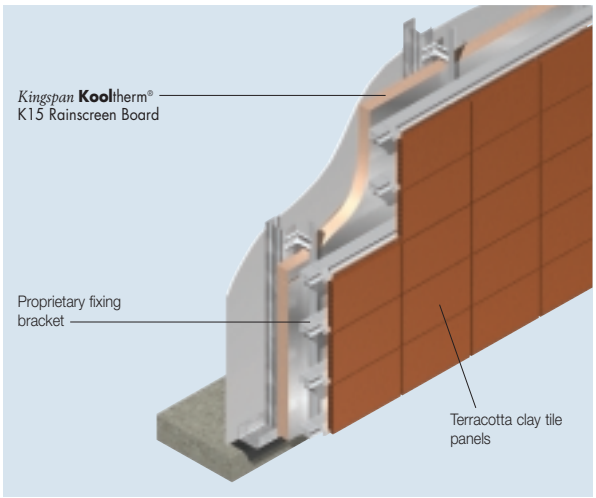


Figure 3 Insulated rainscreen cladding systems on steel frame

Specification Clause

Kingspan **Kool**therm® K15 Rainscreen Board should be described in specifications as:–

The wall insulation shall be *Kingspan* **Kool**therm® K15 Rainscreen Board ____mm thick comprising a CFC/HCFC–free rigid phenolic insulation core with composite foil facings on both sides manufactured to the highest standards under quality control systems approved to BS EN ISO 9001: 2000 by Kingspan Insulation Limited and shall be applied in accordance with the instructions issued by them.

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

Design Considerations

Sustainability

In the past, erroneously, the relative environmental sustainability of insulation materials has been compared on the basis of embodied energy and ozone depletion potential. It is now recognised that a much wider basket of embodied environmental impacts (including those caused by their embodied energy), rather than embodied energy alone, is the only credible tool of comparison. Time has also annulled ozone depletion potential as an issue as all insulation materials are now banned from using CFC and HCFC blowing agents by law.

For buildings designed to today's Building Regulations energy use standards it is now also known that the embodied environmental impacts of all of the materials and labour used to create a building are insignificant in comparison with the lifetime operational environmental impacts of that building and so are of very limited importance. Since it is operational energy use that creates the vast majority of operational environmental impact, saving energy by specifying the lowest U-values possible is the most environmentally sustainable action to take.

However, one of the most neglected facts about environmentally sustainable buildings is that the longevity of their standards of operational energy use, and therefore the longevity their operational environmental impacts, is critical. The performance of some insulants, such as mineral fibre, can deteriorate rapidly if exposed to water penetration, air movement or compression. This may increase operational energy use and hence compromise the environmental sustainability of the finished building to an alarming degree. Other insulation materials, such as rigid phenolic or rigid urethane, are not vulnerable to any of these problems.

In summary, designers should:

(a) specify the lowest possible U-value regardless of insulation type;

(b) design out the risk of their chosen insulant not performing as specified; and (c) if the latter is not possible, choose an insulant that is at low risk of failure e.g. a cellular plastic insulation material.

However, manufacturers should not rest on their laurels, it is a matter of social responsibility to be open and honest about the environmental impact of the manufacture of a product, and a full Life Cycle Analysis (LCA) based on a much wider basket of environmental impacts, rather than embodied energy alone, is recognised as the preferred tool to achieve this.

Kingspan Insulation was the first insulation manufacturer to complete and openly publish an independently certified Ecoprofile (a type of LCA) on one of its product ranges. The Ecoprofile was carried out on the Therma zero ODP range of rigid urethane insulation products by the Building Research Establishment (BRE). The product range comfortably achieves a BRE Green Guide A rating.

But there is far more to sustainability than whether or not a product, process or company affects the environment in a positive or a negative way. A company can and should demonstrate its financial viability and social responsibility, as well as ensure that its materials and methods do not add unduly to the burden placed on the planet.

Kingspan Insulation has now put the manufacture of its products at its Pembridge facility in Herefordshire through a rigorous independent appraisal of its economic, social, environmental and natural resource impacts using Arup's SPeAR® tool.

The results show a well balanced performance in terms of sustainability, and that Kingspan Insulation is already meeting legislation or best practice in most areas, even moving beyond best practice in some. Kingspan Insulation is the first and only construction material manufacturer to have taken this bold move and openly publish the results.

Kooltherm® K15 Rainscreen Board

Typical Applications

Kingspan **Kool**therm® K15 Rainscreen Board may be installed between a proprietary metal framework. The insulation boards are easily cut to individual studwork spacings. Once installed, *Kingspan* **Kool**therm® K15 Rainscreen Board can exceed Building Regulations/ Standards requirements for these applications.

Cold Bridging

The use of neoprene/plastic gasket between the 'helping hand' bracket and the structure will eliminate any cold bridging. If no gasket is used an allowance for cold bridging should be taken in to account when carrying out U–value calculations.

Water Vapour Control

Surface Condensation

Surface condensation can be controlled by the selection of the correct thickness of insulation, the heating and ventilation system being designed with condensation in mind, and subsequently the combination of heating and ventilation being used correctly.

Interstitial Condensation

The Kingspan Insulation Technical Services Department can provide a condensation risk analysis of your proposed design (see rear cover). Alternatively the designer can undertake an independent assessment by following the procedures set out in BS 5250: 2002 (Code of practice for the control of condensation in buildings).

The vapour resistance of the wall lining can be increased by the use of a vapour check plasterboard or by the application of two coats of Gyproc Drywall Sealer if required.

Fire Stops

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

Typical U-values

For typical U–values please contact the Kingspan Insulation Technical Services Department (see rear cover).

Sitework

Installation

Because rainscreen cladding systems are proprietary and utilise different mechanisms for attaching cladding panels to the wall structure, sitework guidance should be sought from system manufacturers.

However, in the absence of any other guidance *Kingspan* **Kool**therm® K15 Rainscreen Board can be fully restrained against the structural wall in a brick bond pattern with suitable insulation fasteners. A minimum number of nine fasteners should be placed within the individual board area and be sited > 50 mm but < 150 mm from the edges and corners of the board.

Timber Boarding Rainscreen

Where the intended external cladding is to be timber boarding, *Kingspan* **Kool**therm® K15 Rainscreen Board are temporarily pinned in place with all joints tightly butted. A breathable membrane eg. *Kingspan* **nilvent**® is applied over the insulation boards and temporarily stapled or pinned in place. Preservative treated softwood counter battens are fixed vertically to the wall structure at 600 mm centres. The timber boarding system is then fixed to the counter battens. Should the external wall be of a timber frame construction the counter battens should be fixed at centres to coincide with the timber wall studs. Application advice should be sought from the appropriate membrane manufacturer. Timber boarding should be secured in accordance with the boarding manufacturer's recommendations.

Tile Hanging Rainscreen

Where intended external cladding is to be wall tiling, *Kingspan* **Kool**therm® K15 Rainscreen Board are temporarily pinned in place with all joints tightly butted. A breathable membrane eg. *Kingspan* **nilvent**® is applied on the insulation boards and temporarily stapled or pinned in place. Preservative treated softwood counter battens are fixed vertically to the wall structure at 600 mm centres. Horizontal tile battens are then fixed to the counter battens to carry the tile hanging system. Should the external wall be of timber frame construction, the counter battens should be fixed at centres to coincide with the timber frame wall studs. Application advice should be sought from the appropriate membrane manufacturer. Tile hanging should be secured in accordance with the boarding manufacturer's recommendations.

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

Weatherproofing
Manufacturers approved rainscreen cladding tape can be applied to the external joints of insulation board to provide a weather–tight finish.

Refer to individual manufacturers fixing instructions:

Bostik–Findley	+44 (0)1785 272 727
Venture	+44 (0)1327 876 555
EJOT Ecofast Ltd	+44 (0)113 247 0880

Availability
Kingspan **Kool**therm® K15 Rainscreen Board is available through specialist insulation distributors and selected builders merchants throughout the UK, Ireland and Europe.

Packaging
The boards are supplied in labelled packs shrinkwrapped in polythene.

Storage
The packaging of *Kingspan* **Kool**therm® K15 Rainscreen Board should not be considered adequate for long term outside protection. Ideally boards should be stored inside a building. If however, outside storage cannot be avoided the boards should be stacked clear of the ground and covered with a 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 leaflet on this topic which satisfies the requirements set out in the Control of Substances Hazardous to Health Regulations 1988 (COSHH) is available from the Kingspan Insulation Marketing Department (see rear cover).

Please note that the reflective surface on this product is designed to enhance its thermal performance. As such, it will reflect light as well as heat, including ultraviolet light. Therefore, if this board 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 facing used on this product can be slippery underfoot when wet. Therefore, it is recommended that any excess material should be contained to avoid a slip hazard.

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

Product Description

The Facings
Kingspan **Kool**therm® K15 Rainscreen Board is faced on both sides with a low emissivity composite foil facing which is highly resistant to the transmission of water vapour. This reflective, low emissivity surface effectively doubles the thermal resistance of the cavity in which the board is placed.

The Core
The core of *Kingspan* **Kool**therm® K15 Rainscreen Board is a premium performance CFC/HCFC–free rigid phenolic insulant of typical density 40–42 kg/m^3.

CFC/HCFC–free
Kingspan **Kool**therm® K15 Rainscreen Board is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential (ODP).

zero O.D.P

Product Data

Standards and Approvals
Kingspan **Kool**therm® K15 Rainscreen Board is manufactured to the highest standards under a quality control system approved to BS EN ISO 9001: 2000 (Quality management systems. Requirements).

Manufactured to BS EN ISO 9001: 2000
Certificate No. 388

Standard Dimensions
Kingspan **Kool**therm® K15 Rainscreen Board is available in the following standard size and thicknesses:

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.

Insulation Compressive Strength
Typically exceeds 100 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

Kooltherm® K15 Rainscreen Board

Fire Performance

Kingspan **Kool**therm® K15 Rainscreen Board will achieve the results given below which enables it to be classified by the Building Regulations as being Class O and Low Risk by the Technical Standards in Scotland.

Kingspan **Kool**therm® K15 Rainscreen Board, when subjected to British Standard fire tests, achieves the following results.

Test	Result
BS 476-6:1989 (Fire tests on building materials and structures. Method of test for fire propagation for products)	Index of performance (1) not exceeding 12 and sub Index (i_1) not exceeding 6 (for rigid phenolic insulation core)
BS 476-7:1997 (Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products)	Class 1 rating
BS 5111-1:1974 (Smoke obscuration)	< 5%

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

Thermal Properties

The λ–values and R–values quoted are in accordance with the with the principles in the Harmonised European Standard BS EN 13166: 2001 (Thermal insulation products for buildings – Factory made products of phenolic foam (PF) – Specification) using so called 90/90 principles. Comparison with alternative products may not be appropriate unless the same procedures have been followed.

Thermal Conductivity

The boards achieve a thermal conductivity (λ–value) of 0.024 W/m·K (insulant thickness 15–24 mm), 0.023 W/m·K (insulant thickness 25–44 mm), 0.021 W/m·K (insulant thickness ≥ 45 mm).

Kingspan Insulation

Kingspan Insulation offers an extensive range of premium and high performance insulation products, breathable membranes and pre–fabricated/ pre–insulated systems for the construction industry. Following an extensive investment programme, Kingspan Insulation is continuing to lead the insulation industry by manufacturing its insulation products with zero Ozone Depletion Potential (ODP) and quoting thermal performance data in accordance with the new harmonised European Standards.

Kingspan Insulation Limited specialise in the solution of insulation problems. The Kingspan Insulation range of insulation products meet the exacting requirements of the construction industry are produced to the highest standards, including BS EN ISO 9001: 2000/I.S. EN ISO 9001: 2000. Each product has been designed to fulfil a specific need and has been manufactured to precise standards and tolerances.

Insulation for:

- Pitched Roofs
- Flat Roofs
- Cavity Walls
- Timber and Steel Framing
- Externally Insulated Cladding Systems
- Floors
- Soffits

Solutions:

- Insulated Dry Lining
- Tapered Roofing Systems
- *Kingspan* **Kool**Duct® Pre–Insulated Ducting
- *Kingspan* **nilvent**® Breathable Membranes

The Kingspan Insulation Product Range

The *Kingspan* Kooltherm® **K–range**

- With a thermal conductivity of 0.021–0.024 W/m·K CFC/HCFC–free rigid phenolic insulation is the most thermally efficient insulation product commonly available.
- Utilises the thinnest possible insulation board to achieve required U–values.
- Fire performance can be equivalent to mineral fibre.
- Achieves a Class O fire rating to the Building Regulations and Low Risk rating for the Technical Standards in Scotland.
- Achieves the best possible rating of < 5% smoke obscuration when tested to BS 5111: Part 1: 1974.
- CFC/HCFC–free with zero Ozone Depletion Potential (ODP).

The *Kingspan* **Therma Range**

- With a thermal conductivity of 0.022–0.028 W/m·K CFC/HCFC–free rigid urethane insulation is one of the most thermally efficient insulation products commonly available.
- Easily achieves required U–values with minimum board thickness.
- Achieves the required fire performance for the intended application.
- CFC/HCFC–free with zero Ozone Depletion Potential (ODP).

The *Kingspan* Styrozone® **& Purlcrete Ranges**

- Rigid extruded polystyrene insulation (XPS) has the highest compressive strength of any commonly available insulant.
- Ideal for specialist applications such as inverted roofing and heavy–duty flooring.
- Easily achieves required U–values with minimum board thickness.
- Achieves the required fire performance for the intended application.
- CFC/HCFC–free with zero Ozone Depletion Potential (ODP).

All Products

- Their closed cell structure resists both moisture and water vapour ingress – problems which can be associated with open cell materials such as mineral fibre and which can result in reduced thermal performance.
- Unaffected by air movement – problems that can be experienced with mineral fibre and which can reduce thermal performance.
- Safe and easy to install – non–fibrous
- Provide reliable long term thermal performance over the lifetime of the building.

Contact Details

Customer Service

For quotations, order placement and details of despatches please contact the Kingspan Insulation Customer Services Department on the numbers below:

UK – Telephone: +44 (0) 870 850 8555
– Fax: +44 (0) 870 850 8666
– email: commercial.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95000
– Fax: +353 (0) 42 97 46129
– email: commercial.ie@insulation.kingspan.com

Literature & Samples

Kingspan Insulation produce 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.

Available as a complete Design Manual or as individual product brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact the Kingspan Insulation Marketing Department on the numbers below:

UK – Telephone: +44 (0) 870 733 8333
– Fax: +44 (0) 1544 387 299
– email: literature.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95038
– Fax: +353 (0) 42 97 46129
– email: literature.ie@insulation.kingspan.com

Tapered Roofing

For technical guidance, quotations, order placement and details of despatches please contact the Kingspan Insulation Tapered Roofing Department on the numbers below:

UK – Telephone: +44 (0) 870 761 7770
– Fax: +44 (0) 1544 387 289
– email: tapered.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95032
– Fax: +353 (0) 42 97 95669
– email: tapered.ie@insulation.kingspan.com

Technical Advice/Design

Kingspan Insulation Ltd support all of their products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a computer–aided service designed to give fast, accurate technical advice. Simply phone the Kingspan Insulation *TECHLINE* with your project specification. Calculations can be carried out to provide U–values, condensation/dew point risk, required insulation thicknesses etc… Thereafter any number of permutations can be provided to help you achieve your desired targets.

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

Please contact the Kingspan Insulation Building Fabric Insulation Technical Services Department on the *TECHLINE* numbers below:

UK – Telephone: +44 (0) 870 850 8333
– Fax: +44 (0) 1544 387 278
– email: techline.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95032
– Fax: +353 (0) 42 97 95669
– email: techline.ie@insulation.kingspan.com

General Enquiries

For all other enquiries contact Kingspan Insulation on the numbers below:

UK – Telephone: +44 (0) 870 850 8555
– Fax: +44 (0) 870 850 8666
– email: info.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95000
– Fax: +353 (0) 42 97 46129
– email: info.ie@insulation.kingspan.com

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