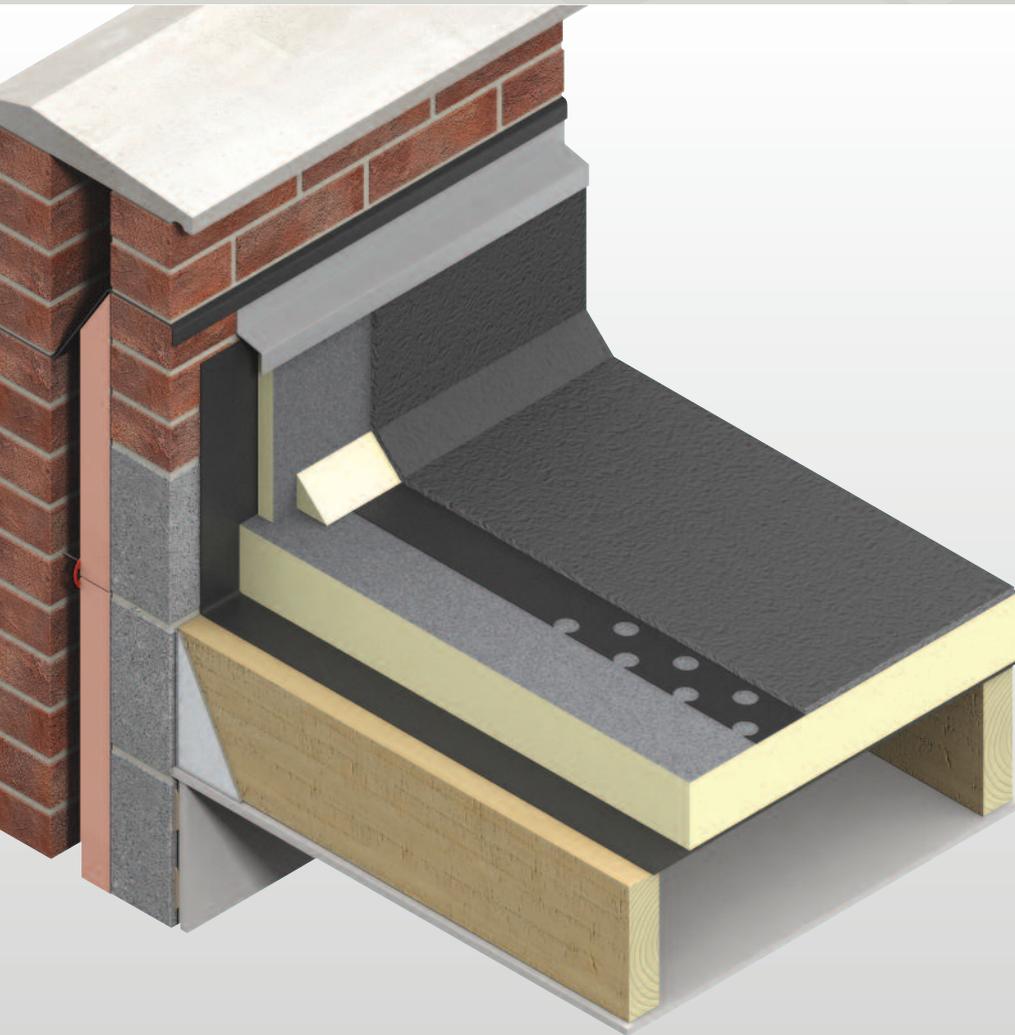




Thermarroof® TR21

INSULATION FOR FLAT ROOFS WATERPROOFED WITH PARTIALLY BONDED BUILT-UP FELT AND MASTIC ASPHALT



- High performance rigid thermoset insulation – thermal conductivities as low as 0.025 W/m·K
- Fully compatible with most bitumen based and mastic asphalt waterproofing systems
- Can accommodate partially bonded roofs up to a 10° pitch
- Unaffected by temperatures associated with mastic asphalt (up to 240°C)
- Asphalt with sheathing felt can be laid directly on top of the insulation
- 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



Kingspan®

*Low Energy –
Low Carbon Buildings*

Typical Constructions and U-values

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: 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). They are valid for the constructions shown in the details immediately above each table.



These examples are based on **Kingspan Thermaroof® TR21**, waterproofed using either partially bonded built-up felt, with the surface covered with mineral chippings, or mastic asphalt. The insulation board is fully bonded to a sealed metal deck, or a vapour control layer, which has itself been fully bonded to the type of deck stated for each application. The ceiling, where applicable, is taken to be a 3 mm skim coated 12.5 mm plasterboard with a cavity between it and the underside of the deck.

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 together with condensation risk analysis should be completed for each individual 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 for your project please consult the Kingspan Insulation Technical Service Department for assistance (see rear cover).

U-value Table Key

Where an **x** is shown, the U-value is higher than the worst of the maximum new build area weighted average U-values allowed by the 2010 Editions of Approved Documents L to the Building Regulations (England & Wales) and the 2010 Editions of Technical Handbooks Section 6 (Scotland).

Concrete Deck

Dense Concrete Deck with Suspended Ceiling

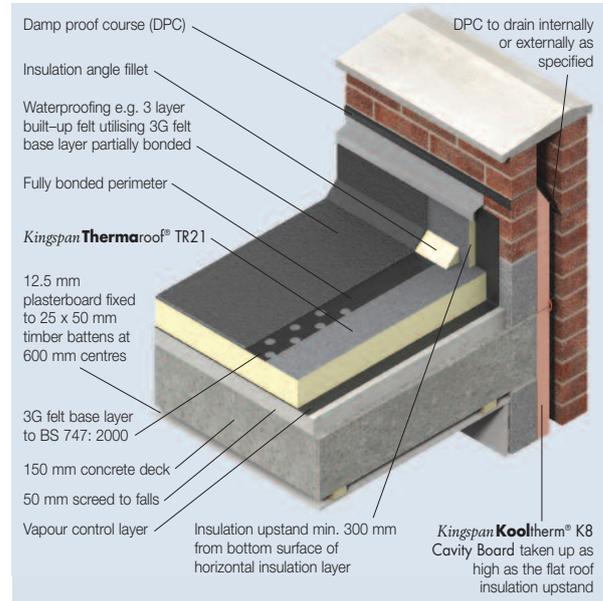


Figure 1

U-values (W/m²·K) for Various Thicknesses of Insulation and Waterproofing Systems

Insulant Thickness (mm)	Waterproofing System	
	Partially Bonded Built-Up Felt	Mastic Asphalt
85	x	x
90	0.25	0.25
100	0.23	0.23
105	0.22	0.22
110	0.21	0.21
115	0.20	0.20
120	0.19	0.19
65 + 70*	0.18	0.18
70 + 70	0.17	0.17
70 + 80*	0.16	0.16
80 + 80	0.15	0.15
80 + 90*	0.14	0.14
90 + 90	0.13	0.13
100 + 100	0.12	0.12
110 + 110	0.11	0.11
110 + 120*	0.10	0.10

* Where multiple layers of insulation of different thicknesses are used, the thickest layer should be installed as the outermost layer in the construction.

Timber Deck

Timber Deck with Plasterboard Ceiling

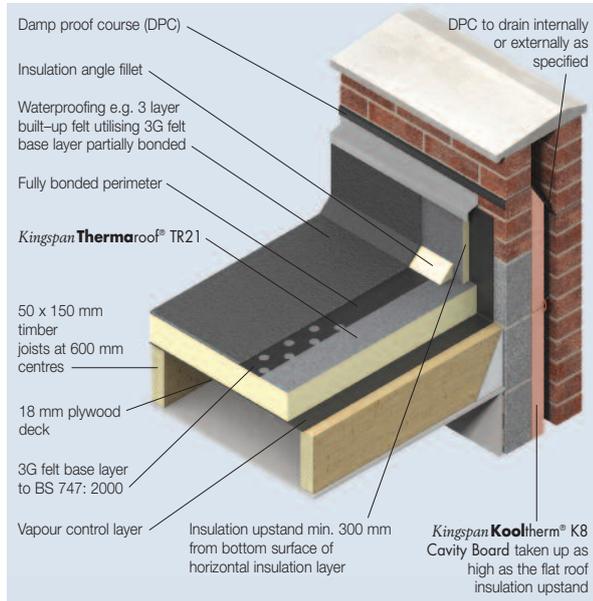


Figure 2

Metal Deck

Metal Deck with No Ceiling

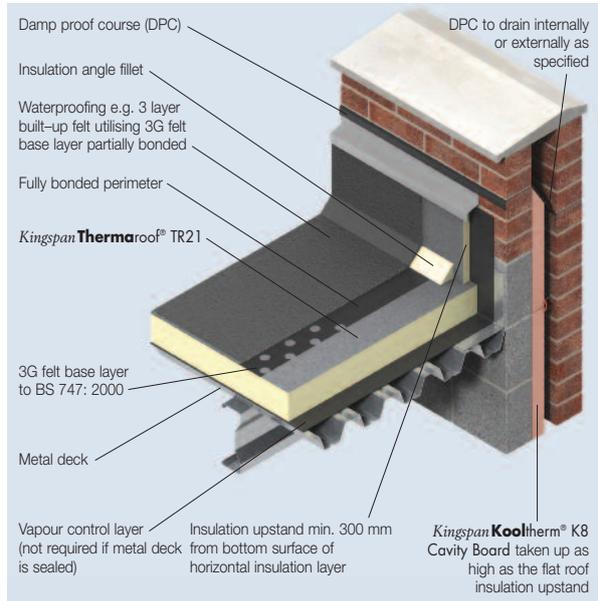


Figure 3

U-values (W/m ² ·K) for Various Thicknesses of Insulation and Waterproofing Systems		
Insulant Thickness (mm)	Waterproofing System	
	Partially Bonded Built-Up Felt	Mastic Asphalt
85	X	X
90	0.24	0.25
100	0.22	0.22
105	0.21	0.22
110	0.21	0.21
115	0.20	0.20
120	0.18	0.18
70 + 70	0.17	0.17
70 + 80*	0.16	0.16
75 + 80*	0.15	0.15
80 + 90*	0.14	0.14
90 + 90	0.13	0.13
100 + 100	0.12	0.12
100 + 110*	0.11	0.12
110 + 110	0.11	0.11
110 + 120*	0.10	0.10

* Where multiple layers of insulation of different thicknesses are used, the thickest layer should be installed as the outermost layer in the construction.

U-values (W/m ² ·K) for Various Thicknesses of Insulation and Waterproofing Systems		
Insulant Thickness (mm)	Waterproofing System	
	Partially Bonded Built-Up Felt	Mastic Asphalt
95	X	X
100	0.25	0.25
110	0.23	0.23
115	0.22	0.22
120	0.20	0.20
70 + 70	0.19	0.19
70 + 75*	0.18	0.18
70 + 80*	0.17	0.17
80 + 80	0.16	0.16
80 + 85*	0.15	0.15
90 + 90	0.14	0.14
95 + 95	0.13	0.13
100 + 110*	0.12	0.12
110 + 120*	0.11	0.11
120 + 120	0.10	0.10

* Where multiple layers of insulation of different thicknesses are used, the thickest layer should be installed as the outermost layer in the construction.

Design Considerations

Linear Thermal Bridging

Reasonable provision must be made to limit the effects of cold bridging. The design should ensure that roof-light or ventilator kerbs etc. are always insulated with the same thickness of *Kingspan Thermaroof*® TR21 as the general roof area. A 25 mm thick *Kingspan Thermaroof*® TR27 LPC/FM upstand should be used around the perimeter of the roof on the internal façade of parapets. A minimum distance of 300 mm should be maintained between the top of the insulation upstand and the bottom of the horizontal roof insulation. Wall insulation should also be carried up into parapets as high as the flat roof insulation upstand. Please contact the Kingspan Insulation Technical Service Department (see rear cover) for further advice.

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 Thermaroof*® TR21 produced at Kingspan Insulation's British manufacturing facilities. The BRE has assigned the product a 2008 Green Guide Summary Rating of A.



Environmental Profiles Scheme
Certificate Number ENP 409

Responsible Sourcing

Kingspan Thermaroof® TR21 is manufactured under a management system certified to BS EN ISO 14001: 2004. The principle polymer components of the product are also manufactured under management systems certified to EN ISO 14001: 2004.

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 and its suppliers' ISO 14001 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; 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 is available at www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Specification Clause

Kingspan Thermaroof® TR21 should be described in specifications as:-

The roof insulation shall be *Kingspan Thermaroof*® TR21 ____mm thick: comprising a high performance rigid thermoset insulation core faced on both sides with a glass reinforced perforated cellulose facing. The product shall be manufactured: with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP); in accordance with the requirements of BS 4841-3; under a management system certified to BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001: 2007; by Kingspan Insulation Limited; and installed in accordance with the instructions issued by them.

NBS Specification

Details also available in NBS Plus.
NBS users should refer to clause(s):
J21 420, J21 430, J41 420, J41 430
(Standard and Intermediate)
J21 10, J41 10 (Minor Works)



Wind Loading

Wind loadings should be assessed in accordance with BS 6399-2: 1997 (Loading for Buildings. Code of practice for wind loads) or BS EN 1991-1-4: 2005 (National Annex to Eurocode 1 Actions on Structures. General Actions. Wind Actions) taking into account:

- length / width / height of the building;
- orientation of the building;
- wind speed;
- aspect (e.g. on a hill side); and
- topographical value of the surrounding area.

Falls

The fall on a flat roof, constructed using *Kingspan Thermaroof*[®] TR21, is normally provided by the supporting structure being directed towards the rainwater outlets. The fall should be smooth and steep enough to prevent the formation of rainwater pools. In order to ensure adequate drainage, BS 6229: 2003 (Flat roofs with continuously supported coverings. Code of practice) recommends uniform gradients of not less than 1 in 80. However, because of building settlement, it is advisable to design in even greater falls. These can be provided by a *Kingspan Thermataper*[®] LPC/FM tapered roofing system. Further details of the *Kingspan Thermataper*[®] LPC/FM range and its supporting design service are available from the Kingspan Insulation Tapered Roofing Department (see rear cover).

Roof Waterproofing

Kingspan Thermaroof[®] TR21 is suitable for use with most bitumen based waterproofing systems including high performance types which incorporate a Type 3G perforated base layer to BS 747: 2000 (Reinforced bitumen sheets for roofing. Specification). The 3G felt layer should be laid dry and loose, mineral face down with a fully bonded perimeter zone. Partially bonded built-up felt waterproofing should be laid, where applicable, in accordance with BS 8217: 2005 (Reinforced bitumen membranes for roofing. Code of practice).

Kingspan Thermaroof[®] TR21 is also suited to mastic asphalt waterproofing systems. Mastic asphalt waterproofing should be laid, where applicable, in accordance with BS 8218: 1998 (Code of practice for mastic asphalt roofing). Mastic asphalt should always be laid over an isolating layer of loose-laid Type 4A sheathing felt to BS 747: 2000 (Reinforced bitumen sheets for roofing. Specification).

The exposed face of insulation upstands, at parapets and abutments, must be lined with 18 mm exterior grade plywood, prior to the mastic asphalt waterproofing being laid. The plywood is used as an anchor point for the expanded metal substrate onto which the vertical mastic asphalt is laid.

When *Kingspan Thermaroof*[®] TR21 is to be used to insulate balconies, waterproofed with mastic asphalt with a porous promenade tile overlay, a 20 mm cork roofboard should be bitumen bonded to the *Kingspan Thermaroof*[®] TR21 prior to laying the Type 4A sheathing felt and mastic asphalt.

Water Vapour Control

Kingspan Thermaroof[®] TR21 should be installed over a separate vapour control layer, in new build roofs, unless it is being used in conjunction with a sealed metal deck. Regardless of the deck type it is recommended that a condensation risk analysis is carried out for every project.

A minimum separate vapour control layer should consist of a coated roofing felt complying with Type 3B to BS 747: 2000 (Reinforced bitumen sheets for Roofing. Specification), or S1P1 to BS 8747: 2007 (Reinforced bitumen membranes (RBMs) for roofing. Guide to selection and specification), or any appropriate metal-cored vapour control layer.

Allowance should be made for adequate bonding of the vapour control layer to the substrate, so as to provide a suitable surface for upon which to lay the insulation boards and sufficient resistance to wind up-lift (see 'Wind Loading').

Roof Loading / Traffic

Kingspan Thermaroof[®] TR21 is suitable for use on access roof decks subject to limited foot traffic.

Where inappropriate foot traffic is liable to occur, it is recommended that, for roofs waterproofed with mastic asphalt, a 20 mm cork roofboard is bitumen bonded to the *Kingspan Thermaroof*[®] TR21 prior to waterproofing, and the roof surface is protected by promenade tiles.

Where inappropriate foot traffic is liable to occur, it is recommended that, for roofs waterproofed with partially bonded built-up felt, the roof surface is protected by promenade tiles.

For further advice on the acceptability of specific foot traffic regimes, please contact the Kingspan Insulation Technical Service Department (see rear cover).

Sitework

Installing over Metal Decks

- Metal decks should be clean, dry, without large projections, steps or gaps, and should be graded to allow correct falls to all rainwater outlets.
- If using a sealed metal deck there is no requirement for a separate vapour control layer.
- If the metal deck is not sealed, in order to ensure an adequate bond between it and the vapour control layer, the metal deck should be suitably primed, in accordance with the primer manufacturer's instructions, prior to the application of the hot bitumen, or suitable alternative proprietary adhesive system, used to bond the vapour control layer to the deck.
- Where one run of the specified vapour control layer laps another, there should be minimum 150 mm side and end overlaps, which should be adequately sealed.
- Turn up the vapour control layer at the edge of the roof to a height appropriate to the specified waterproofing membrane.
- Boards of **Kingspan Thermaroof® TR21** should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer / sealed metal deck.
- Insulation boards should always be laid break-bonded, either with their long edges at right angles to the trough openings, or diagonally across the corrugation line, and with joints lightly butted. There should be no gaps at abutments.
- Roof-light or ventilator kerbs etc. should always insulated with the same thickness of **Kingspan Thermaroof® TR21** as the general roof area.
- A 25 mm thick **Kingspan Thermaroof® TR27 LPC/FM** upstand should be used around the perimeter of the roof on the internal façade of parapets.
- A minimum distance of 300 mm should be maintained between the top of the insulation upstand and the bottom of the horizontal roof insulation.
- The waterproofing membrane is installed in accordance with the membrane manufacturer's instructions, over the whole insulated area including any insulation upstands, as soon as possible after laying the insulation boards.

*NB PU adhesive must not be used to either secure boards of **Kingspan Thermaroof® TR21** to the deck, or to secure the waterproofing membrane to boards of **Kingspan Thermaroof® TR21**.*

Installing over Concrete Decks

- Concrete decks should be clean, dry, without large projections, steps or gaps, and should be graded to allow correct falls to all rainwater outlets.
- In order to ensure an adequate bond between the vapour control layer and the concrete deck, the concrete or screeded surface should be suitably primed, in accordance with the primer manufacturer's instructions, prior to the application of the hot bitumen, or suitable alternative proprietary adhesive system, used to bond the vapour control layer to the deck.
- Where one run of the specified vapour control layer laps another, there should be minimum 150 mm side and end overlaps, which should be adequately sealed.
- Turn up the vapour control layer at the edge of the roof to a height appropriate to the specified waterproofing membrane.
- Boards of **Kingspan Thermaroof® TR21** should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer.
- Insulation boards should always be laid break-bonded, either with their long edges at right angles to the edge of, or diagonally across the roof, and with joints lightly butted. There should be no gaps at abutments.
- Roof-light or ventilator kerbs etc. should always insulated with the same thickness of **Kingspan Thermaroof® TR21** as the general roof area.
- A 25 mm thick **Kingspan Thermaroof® TR27 LPC/FM** upstand should be used around the perimeter of the roof on the internal façade of parapets.
- A minimum distance of 300 mm should be maintained between the top of the insulation upstand and the bottom of the horizontal roof insulation.
- The waterproofing membrane is installed in accordance with the membrane manufacturer's instructions, over the whole insulated area including any insulation upstands, as soon as possible after laying the insulation boards.

*NB PU adhesive must not be used to either secure boards of **Kingspan Thermaroof® TR21** to the deck, or to secure the waterproofing membrane to boards of **Kingspan Thermaroof® TR21**.*

Installing over Plywood Decks

- Plywood decks should be clean, dry, without large projections, steps or gaps, and should be graded to allow correct falls to all rainwater outlets.
- If the vapour control layer is to be bonded, in order to ensure an adequate bond between it and the plywood deck, the plywood surface should be suitably primed, in accordance with the primer manufacturer's instructions, prior to the application of the hot bitumen, or suitable alternative proprietary adhesive system, used to bond the vapour control layer to the deck.
- If the vapour control layer is to be nailed to the deck the nail heads will become sealed with the subsequent bonding of the insulation boards to the vapour control layer.
- Where one run of the specified vapour control layer laps another, there should be minimum 150 mm side and end overlaps, which should be adequately sealed.
- Turn up the vapour control layer at the edge of the roof to a height appropriate to the specified waterproofing membrane.
- Boards of **Kingspan Thermaroof® TR21** should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer.
- Insulation boards should always be laid break-bonded, either with their long edges at right angles to the edge of, or diagonally across the roof, and with joints lightly butted. There should be no gaps at abutments.
- Joints between insulation boards should not coincide with those between the plywood sheets.
- Roof-light or ventilator kerbs etc. should always insulated with the same thickness of **Kingspan Thermaroof® TR21** as the general roof area.
- A 25 mm thick **Kingspan Thermaroof® TR27 LPC/FM** upstand should be used around the perimeter of the roof on the internal façade of parapets.
- A minimum distance of 300 mm should be maintained between the top of the insulation upstand and the bottom of the horizontal roof insulation.
- The waterproofing membrane is installed in accordance with the membrane manufacturer's instructions, over the whole insulated area including any insulation upstands, as soon as possible after laying the insulation boards.

*NB PU adhesive must not be used to either secure boards of Kingspan **Thermaroof®** TR21 to the deck, or to secure the waterproofing membrane to boards of Kingspan **Thermaroof®** TR21.*

Installing over Existing Flat Roofs

- The existing waterproofing membrane surface should be clean, dry, without large projections, steps or gaps, and should be graded to allow correct falls to all rainwater outlets.
- Where the existing waterproofing membrane is not fit for purpose as a vapour control layer, a separate vapour control layer should be bonded to it with hot bitumen, or suitable alternative proprietary adhesive system.
- Where one run of the specified vapour control layer laps another, there should be minimum 150 mm side and end overlaps, which should be adequately sealed.
- Turn up the vapour control layer at the edge of the roof to a height appropriate to the specified new waterproofing membrane.
- Boards of **Kingspan Thermaroof® TR21** should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer.
- Insulation boards should always be laid break-bonded, either with their long edges at right angles to the edge of, or diagonally across the roof, and with joints lightly butted. There should be no gaps at abutments.
- Roof-light or ventilator kerbs etc. should always insulated with the same thickness of **Kingspan Thermaroof® TR21** as the general roof area.
- A 25 mm thick **Kingspan Thermaroof® TR27 LPC/FM** upstand should be used around the perimeter of the roof on the internal façade of parapets.
- A minimum distance of 300 mm should be maintained between the top of the insulation upstand and the bottom of the horizontal roof insulation.
- The waterproofing membrane is installed in accordance with the membrane manufacturer's instructions, over the whole insulated area including any insulation upstands, as soon as possible after laying the insulation boards.

*NB PU adhesive must not be used to either secure boards of Kingspan **Thermaroof®** TR21 to the deck, or to secure the waterproofing membrane to boards of Kingspan **Thermaroof®** TR21.*

Installing in Two Layers

- In situations where two layers of insulation are required, both layers should be installed in the same manner, as detailed in the preceding sections.
- In all cases, the layers should be horizontally offset relative to each other so that, as far as possible, the board joints in the two adjacent layers do not coincide with each other (see Figure 4).

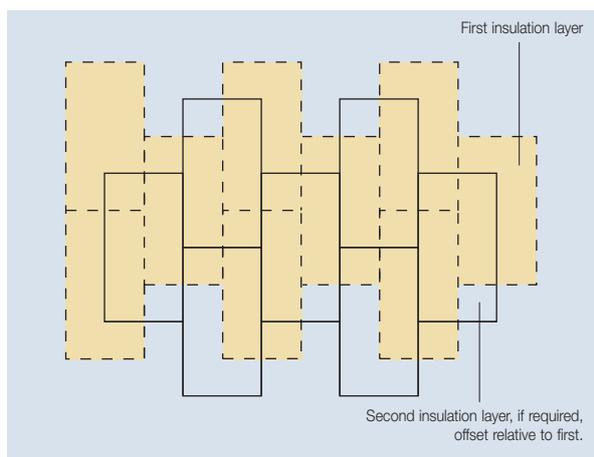


Figure 4 Offsetting of Multiple Insulation Layers

General

Following Trades

- The roof must be adequately protected when building works are being carried out on or over the roof surface. This is best achieved by close boarding. The completed roof must not be used for storage of heavy building components such as bricks or air conditioning equipment.

Reflective Coatings

- Bitumen based built-up waterproofing systems laid over **Kingspan Thermoroof[®] TR21** should always incorporate a solar reflective layer such as chippings or a specialist coating.

Daily Working Practice

- At the completion of each day's work, or whenever work is interrupted for extended periods of time, a night joint must be made in order to prevent water penetration into the roof construction.

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.

Availability

- **Kingspan Thermoroof[®] TR21** is available through specialist insulation distributors and selected roofing merchants throughout the UK.

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.

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 Thermaroof[®] TR21 is faced on both sides with glass reinforced perforated cellulose, autohesively bonded to the insulation core during manufacture.

The Core

The core of *Kingspan Thermaroof*[®] TR21 is manufactured with **Nilflam**[®] technology, a high performance rigid thermoset polyisocyanurate (PIR) insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



Standards and Approvals

Kingspan Thermaroof[®] TR21 is manufactured to the highest standards in accordance with requirements of BS 4841-3 (Rigid polyisocyanurate (PIR) and polyurethane (PUR) products for building end-use applications. Specification for laminated boards (roofboards) with auto-adhesively or separately bonded facings for use as roofboard thermal insulation under built-up bituminous roofing membranes).

Kingspan Thermaroof[®] TR21 is also manufactured to the highest standards under a management system certified to BS EN ISO 9001: 2008 (Quality management systems. Requirements), BS EN ISO 14001: 2004 (Environmental Management Systems. Requirements) and BS OHSAS 18001: 2007 (Health and Safety Management Systems. Requirements).

Kingspan Thermaroof[®] TR21, produced at Kingspan Insulation's Pembridge manufacturing facility, is covered by BBA Certificate 06/4384.



Standard Dimensions

Kingspan Thermaroof[®] TR21 is available in the following standard size:

Nominal Dimension	Availability
Length (m)	1.2
Width (m)	0.6
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 Thermaroof*[®] TR21 typically exceeds 150 kPa at 10% compression, when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

Water Vapour Resistivity

The product typically achieves a resistivity greater than 300 MN·s/g·m, when tested in accordance with BS EN 12086: 1997 (Thermal insulating products for building applications. Determination of water vapour transmission properties). *Kingspan Thermaroof*[®] TR21 should always be installed over a vapour control layer or sealed metal deck (see 'Water Vapour Control' on page 5).

Durability

If correctly installed, *Kingspan Thermaroof*[®] TR21 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 Thermaroof*[®] TR21 resist attack by mould and microbial growth, and do not provide any food value to vermin.

Fire Performance

*Kingspan Therma*roof® TR21, when subjected to the British Standard fire test specified in the table below, will achieve the result shown, when waterproofed with 3 layer built-up felt and a loading coat of 10 mm chippings. For specifications without the chippings please consult the manufacturer of the mineral surfaced cap sheet for their fire classification details.

Test	Result
BS 476-3: 2004 (External fire exposure roof test)	FAA rating

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

Thermal Properties

The λ -values and R-values detailed below are quoted in accordance with BS EN 13165: 2008 (Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products – Specification).

Thermal Conductivity

The boards achieve a thermal conductivity (λ -value) of:
 0.027 W/m·K (insulant thickness < 80 mm);
 0.026 W/m·K (insulant thickness 80 – 119 mm); and
 0.025 W/m·K (insulant thickness \geq 120 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 (m²·K/W).

Product Thickness (mm)	Thermal Resistance (m ² ·K/W)
60	2.20
65	2.40
70	2.55
75	2.75
80	3.05
85	3.25
90	3.45
95	3.65
100	3.80
105	4.00
110	4.20
115	4.40
120	4.80

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

Kingspan Insulation

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.

Products & Applications

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

Insulation for:

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

Further Solutions:

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

Insulation Product Benefits

Kingspan Kooltherm[®] K-range Products

- With a thermal conductivity of 0.020–0.023 W/m·K these are the most thermally efficient insulation products commonly used.
- The thinnest commonly used insulation products for any specific U-value.
- Rigid thermoset insulation core is Class 0, as defined by the Building Regulations in England, Wales & Ireland, and Low Risk, as defined by the Building Standards in Scotland.
- Rigid thermoset insulation core achieves the best possible rating of < 5% smoke obscuration when tested to BS 5111: Part 1: 1974.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

Kingspan Therma[™] Range Products

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

Kingspan Styrozone[®] Range 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.
- Each product achieves the required fire performance for its intended application.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP).

All Products

- Their closed cell structure resists both moisture and water vapour ingress – a problem which can be associated with open cell materials such as mineral fibre and which can result in reduced thermal performance.
- Unaffected by air infiltration – a problem that can be experienced with mineral fibre and which can reduce thermal performance.
- Safe and easy to install – non-fibrous.
- If installed correctly, can 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 Service Department on the numbers below:

Tel: +44 (0) 1544 388 601
Fax: +44 (0) 1544 388 888
email: customerservice@kingspaninsulation.co.uk

Literature & Samples

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.

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, or visit the Kingspan Insulation website, using the details below:

Tel: +44 (0) 1544 387 384
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email: literature@kingspaninsulation.co.uk
www.kingspaninsulation.co.uk/literature

Tapered Roofing

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

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Technical Advice / Design

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

The Kingspan Insulation British Technical Service Department operates under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U-value and Condensation Risk Calculations.



Please contact the Kingspan Insulation Technical Service Department on the numbers below:

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General Enquiries

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