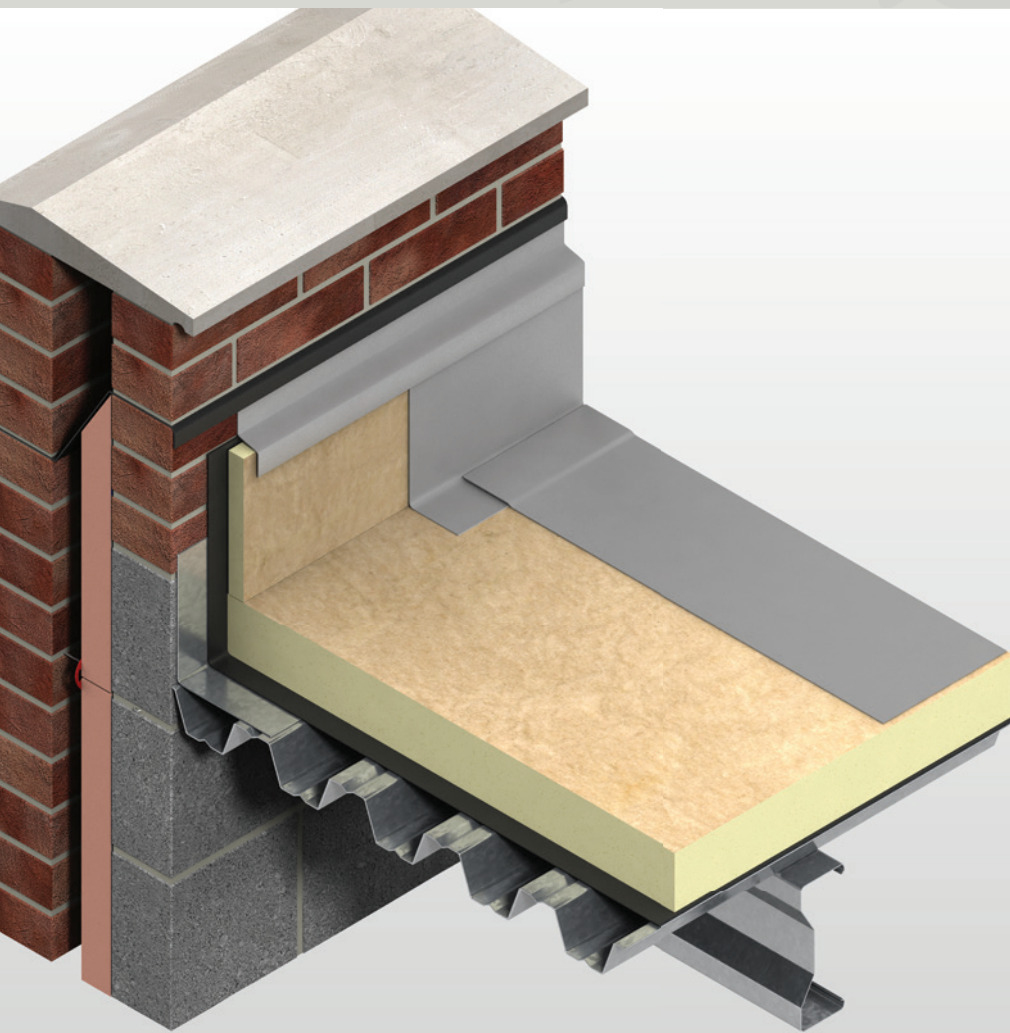


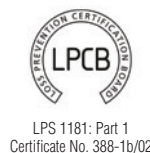


Thermaroom® TR27 LPC/FM

INSULATION FOR FLAT ROOFS WATERPROOFED WITH FULLY ADHERED SINGLE-PLY, PARTIALLY BONDED BUILT-UP FELT, MASTIC ASPHALT AND COLD LIQUID APPLIED WATERPROOFING



- High performance rigid thermoset insulation – thermal conductivities as low as 0.024 W/m-K
- LPCB approved to LPS 1181: Part 1
- FM approved for Class 1 steel deck roof assemblies
- Fully compatible with single-ply non-bituminous membranes that are fully bonded with solvent based adhesive systems
- Fully compatible with most bitumen based and mastic asphalt waterproofing systems
- Compatible with most green roof systems
- 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



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: 2017 / I.S. EN ISO 6946: 2007 (Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods), and using the conventions set out in BR 443 (Conventions for U-value calculations). They are valid for the constructions shown in the details immediately above each table.



These examples are based on **Kingspan Thermaroof® TR27 LPC/FM** waterproofed using either a fully adhered single-ply membrane, mastic asphalt, partially bonded built-up felt, or under a cold liquid applied waterproofing system. 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; or mechanically fixed through a sealed metal deck, or a vapour control layer, which has itself been loose-laid directly over 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 When calculating U-values BS EN ISO 6946: 2017 / I.S. EN ISO 6946: 2007, the type of mechanical fixing used may change the thickness of insulation required. These calculations assume telescopic tube fasteners with a thermal conductivity of 1.00 W/m K or less, the effect of which is insignificant.

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

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

NB If your construction is different from those specified, and / or to gain a comprehensive U-value calculation along with a condensation risk analysis 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:

- 2013 editions of Approved Documents L to the Building Regulations for England;
- 2014 editions of Approved Documents L to the Building Regulations for Wales;
- 2015 editions of Technical Handbooks Section 6 to the Building Standards for Scotland;
- 2012 editions of Technical Booklets F1 & F2 to the Building Regulations for Northern Ireland; and
- 2011 edition of Technical Guidance Document L (Dwellings) and 2008 edition of Technical Guidance Document L (Buildings other than Dwellings) to the Building Regulations for the Republic of Ireland.

Concrete Deck

Dense Concrete Deck with Suspended Ceiling

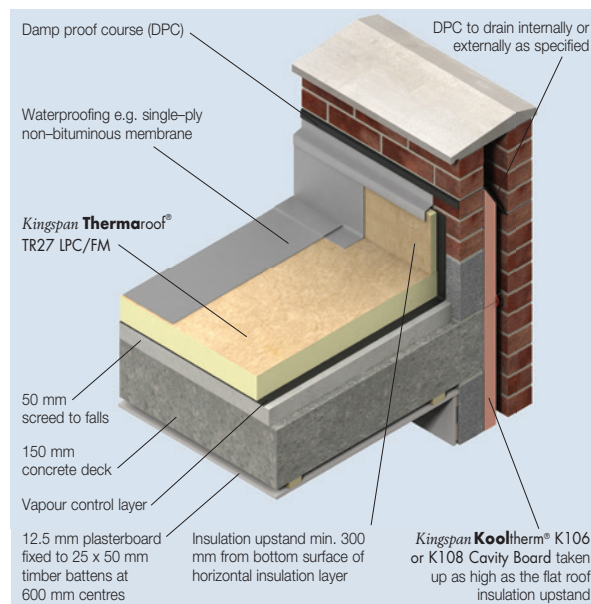


Figure 1

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	Fully Adhered Single-Ply / Cold Liquid Applied
80	X	X	X
85	0.25	0.25	0.25
90	0.24	0.24	0.24
100	0.22	0.22	0.22
110	0.20	0.20	0.20
115	0.19	0.19	0.19
120	0.18	0.18	0.18
125	0.17	0.17	0.17
130	0.17	0.17	0.17
135	0.16	0.16	0.16
140	0.16	0.16	0.16
145	0.15	0.15	0.15
150	0.15	0.15	0.15
160	0.14	0.14	0.14
85 + 90*	0.13	0.13	0.13
90 + 100*	0.12	0.12	0.12
100 + 110*	0.11	0.11	0.11
100 + 120*	0.10	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.

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

Timber Deck

Timber Deck with Plasterboard Ceiling

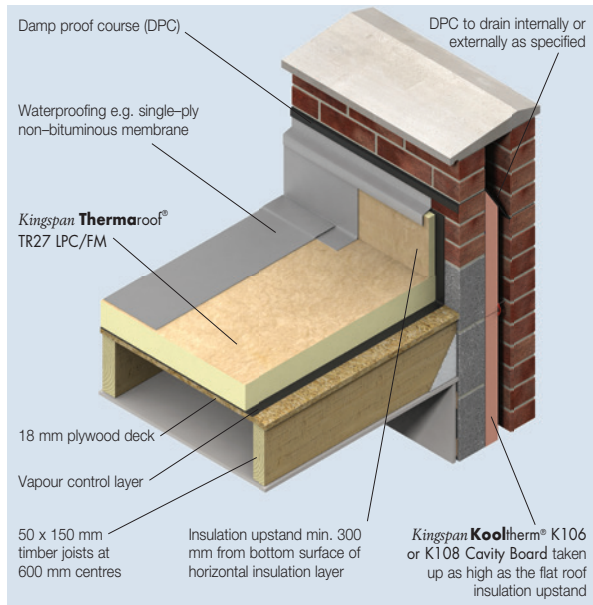


Figure 2

Metal Deck

Metal Deck with No Ceiling

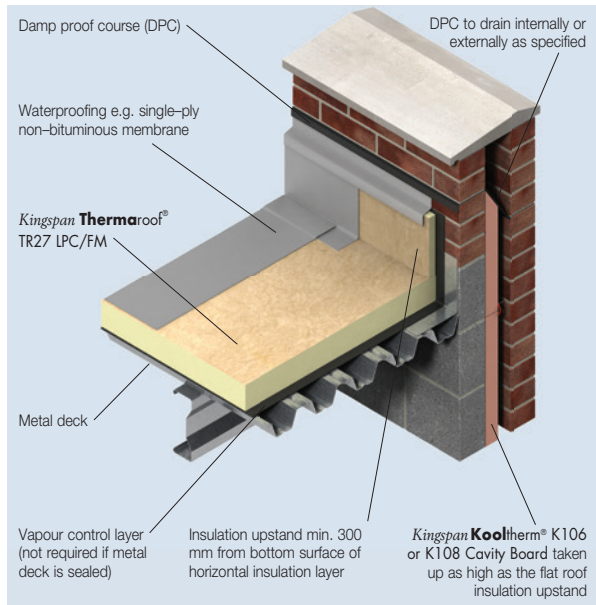


Figure 3

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	Fully Adhered Single-Ply / Cold Liquid Applied
80	X	X	X
85	0.25	0.25	0.25
90	0.24	0.24	0.24
100	0.22	0.22	0.22
110	0.20	0.20	0.20
115	0.19	0.19	0.19
120	0.18	0.18	0.18
125	0.17	0.17	0.17
130	0.17	0.17	0.17
135	0.16	0.16	0.16
140	0.16	0.16	0.16
145	0.15	0.15	0.15
150	0.15	0.15	0.15
160	0.14	0.14	0.14
80 + 90*	0.13	0.13	0.14
85 + 90*	0.13	0.13	0.13
90 + 100*	0.12	0.12	0.12
100 + 110*	0.11	0.11	0.11
100 + 120*	0.10	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.

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

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	Fully Adhered Single-Ply / Cold Liquid Applied
90	X	X	X
95	0.25	0.25	0.25
100	0.24	0.24	0.24
110	0.22	0.22	0.22
120	0.19	0.19	0.19
125	0.19	0.19	0.19
130	0.18	0.18	0.18
135	0.17	0.17	0.17
140	0.17	0.17	0.17
145	0.16	0.16	0.16
150	0.16	0.16	0.16
160	0.15	0.15	0.15
80 + 90*	0.14	0.14	0.14
90 + 95*	0.13	0.13	0.13
100 + 100	0.12	0.12	0.12
100 + 110*	0.11	0.11	0.11
110 + 120*	0.10	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.

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

Typical Constructions and U-values

Green Roof Systems

Extensive Green Roof Covering – Metal Deck with No Ceiling

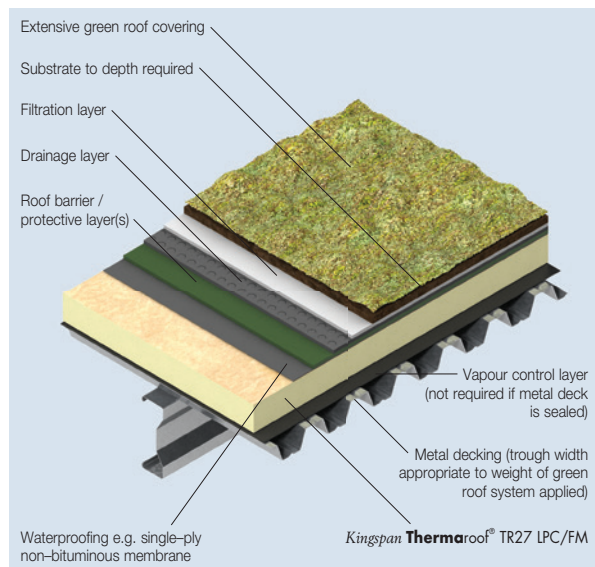


Figure 4

Semi-intensive Green Roof Covering – Dense Concrete Deck with Suspended Ceiling

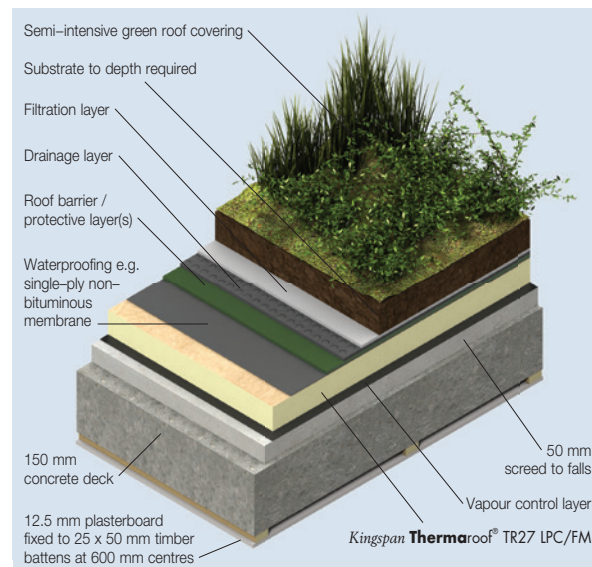


Figure 5

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	Fully Adhered Single-Ply / Cold Liquid Applied
90	X	X	X
95	0.25	0.25	0.25
100	0.24	0.24	0.24
110	0.22	0.22	0.22
120	0.19	0.19	0.19
125	0.19	0.19	0.19
130	0.18	0.18	0.18
135	0.17	0.17	0.17
140	0.17	0.17	0.17
145	0.16	0.16	0.16
150	0.16	0.16	0.16
160	0.15	0.15	0.15
80 + 90*	0.14	0.14	0.14
90 + 95*	0.13	0.13	0.13
100 + 100	0.12	0.12	0.12
100 + 110*	0.11	0.11	0.11
110 + 120*	0.10	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.
NB Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

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	Fully Adhered Single-Ply / Cold Liquid Applied
80	X	X	X
85	0.25	0.25	0.25
90	0.24	0.24	0.24
100	0.22	0.22	0.22
110	0.20	0.20	0.20
115	0.19	0.19	0.19
120	0.18	0.18	0.18
125	0.17	0.17	0.17
130	0.17	0.17	0.17
135	0.16	0.16	0.16
140	0.16	0.16	0.16
145	0.15	0.15	0.15
150	0.15	0.15	0.15
160	0.14	0.14	0.14
85 + 90*	0.13	0.13	0.13
90 + 100*	0.12	0.12	0.12
100 + 110*	0.11	0.11	0.11
100 + 120*	0.10	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.
NB Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

Design Considerations

Linear 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 buildings.

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

Reducing Linear Thermal Bridging

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

- Care is required to ensure continuation of insulation wherever possible between the wall and roof for best thermal performance. Where this is not possible, the roof and wall insulation should be overlapped and ideally, insulation material introduced between.
- Parapet detailing can represent a good, low heat loss approach, with insulation continuity maintained using an insulated upstand to reduce cold bridging. A minimum 25 mm thick *Kingspan ThermoRoof*® TR27 LPC/FM 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. Wall insulation should be carried up into parapets at least as high as the flat roof insulation upstand.
- Lightweight aggregate blockwork to the inner leaf of wall constructions can help to improve thermal performance at junctions generally and where used for the inner leaf of parapet walls it can help to reduce losses.
- Where a parapet construction is not used, to achieve best performance, the roof insulation should be carried over the wall plate to meet and extend past the wall insulation layer. For a timber warm roof construction, the first joist zone above the wall plate can be filled with insulation for best performance and to maintain thermal continuity.
- For best thermal performance, roof-lights and ventilator kerbs should be insulated with the same thickness of *Kingspan ThermoRoof*® TR27 LPC/FM as the general roof area.
- Where guttering is incorporated within a flat roof construction, this should be accounted for within the overall thermal design of the roof via an area-weighted calculation for the whole roof; the risk of localised interstitial condensation from reduced insulation provision at the gutter should be considered.

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 Thermaroof® TR27 LPC/FM** produced at Kingspan Insulation's British and Irish 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 Thermaroof® TR27 LPC/FM produced at Kingspan Insulation's Pembridge, Herefordshire and Selby, North Yorkshire manufacturing facilities is certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Excellent'.



Kingspan Thermaroof® TR27 LPC/FM 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 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 operations at its Pembridge, Herefordshire and Selby, North Yorkshire manufacturing facilities is available at www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Specification Clause

Kingspan Thermaroof® TR27 LPC/FM should be described in specifications as:-

The roof insulation shall be **Kingspan Thermaroof® TR27 LPC/FM** ____mm thick: comprising a high performance rigid thermoset insulation core faced on both sides with a coated glass tissue 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 and BS 4841-4; 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):
J21 420, J21 430, J31 335
(Standard and Intermediate)
J21 10 (Minor Works)



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.

Kingspan Thermaroof® TR27 LPC/FM is also available as part of various system families for typical construction build-ups, to be used within a Building Information Model. To download the objects, please visit www.uvalue-calculator.co.uk.

Wind Loading

Wind loadings should be assessed in accordance with BS / I.S. EN 1991-1-4: 2005 + A1: 2010 (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*[®] TR27 LPC/FM, 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 ponds. In order to ensure adequate drainage, BS 6229: 2018 (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 Therma taper*[®] LPC/FM tapered roofing system (see below).

Tapered Roofing

Kingspan Thermaroof[®] TR27 LPC/FM is also available in a tapered version, *Kingspan Therma taper*[®] TT47 LPC/FM, comprising a high performance rigid thermoset insulation core, manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP), faced on both sides with a coated glass tissue facing. *Kingspan Therma taper*[®] TT47 LPC/FM comes with a supporting design service. This ensures that the most cost-effective solution for a roof is identified and that the end result is a tapered system design which meets a roof's rainwater run-off and insulation requirements. Further details of *Kingspan Therma taper*[®] TT47 LPC/FM are available from the Kingspan Insulation Tapered Roofing Department (see rear cover), which should be consulted as early as possible in the process of designing a roof.

Roof Waterproofing

Kingspan Thermaroof[®] TR27 LPC/FM is suitable for use with most fully adhered single-ply waterproofing membranes. When using *Kingspan Thermaroof*[®] TR27 LPC/FM with fully adhered single-ply waterproofing membranes, the joints between boards and cut edges, immediately below the waterproofing membrane, must be taped with a min. 50 mm wide foil tape. Please contact the Kingspan Insulation Technical Service Department (see rear cover) to check waterproofing membrane and proprietary adhesive system compatibility. Advice should be sought, from the appropriate waterproofing membrane manufacturer, in relation to the requirement for the use of a fleece backed membrane with the waterproofing membrane in question.

Kingspan Thermaroof[®] TR27 LPC/FM is also suitable for use with most bitumen based waterproofing systems including high performance types which incorporate a Type 3G perforated base layer to BS EN 13707: 2013 (Flexible sheets for waterproofing. Reinforced bitumen sheets for roof waterproofing. Definitions and characteristics). 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[®] TR27 LPC/FM is also suitable for use with 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 EN 13707: 2013 (Flexible sheets for waterproofing. Reinforced bitumen sheets for roof waterproofing. Definitions and characteristics). 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*[®] TR27 LPC/FM 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*[®] TR27 LPC/FM prior to laying the Type 4A sheathing felt and mastic asphalt.

Kingspan Thermaroof[®] TR27 LPC/FM is also suitable for use with some cold liquid applied waterproofing systems. When using *Kingspan Thermaroof*[®] TR27 LPC/FM with cold liquid applied waterproofing systems, a carrier membrane for the waterproofing must be installed over the insulation boards. Advice should be sought, from the waterproofing system manufacturer, about the specification of the carrier membrane and the compatibility of the waterproofing system with *Kingspan Thermaroof*[®] TR27 LPC/FM. For further advice please contact the Kingspan Insulation Technical Service Department (see rear cover).

NB *Kingspan Thermaroof*[®] TR27 LPC/FM is also suitable for use with mechanically fixed single-ply waterproofing membranes.

Design Considerations

Water Vapour Control

Kingspan Thermaroof[®] TR27 LPC/FM 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.

For refurbishment projects, involving the addition of insulation to existing insulated flat roofs, or roofs constructed of insulated steel faced composite panels, it is imperative that a U-value calculation and condensation risk analysis is carried out for every project, in order to ensure that the correct thickness of insulation is installed to achieve the required thermal performance, whilst avoiding interstitial condensation.

In refurbishment projects, where *Kingspan Thermaroof*[®] TR27 LPC/FM is to be installed over an existing bituminous waterproofing membrane, the membrane can be used as a vapour control layer, as long as it is in a good water tight condition. Where this is not the case, a separate vapour control layer should be installed.

The type of separate vapour control layer required will be dependent upon the chosen method of fixing the insulation boards.

For mechanically fixed applications, a minimum vapour control layer should consist of a 1000 gauge (250 micron) polythene sheet, with all joints lapped and then sealed with double sided self adhesive tape.

For applications where the insulation boards are to be bonded to the vapour control layer, a minimum vapour control layer should consist of a coated roofing felt complying with Type 3B to BS EN 13707: 2013 (Flexible sheets for waterproofing. Reinforced bitumen sheets for roof waterproofing. Definitions and characteristics), 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.

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

Roof Loading / Traffic

Kingspan Thermaroof[®] TR27 LPC/FM 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*[®] TR27 LPC/FM 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.

Where inappropriate foot traffic is liable to occur, it is recommended that, for roofs waterproofed with fully adhered single-ply or cold liquid applied waterproofing systems, the roof surface is protected by specially constructed walk-ways.

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

Spanning on Metal Decks

Insulation boards should comply with the minimum thicknesses shown in the table below, when used over metal decks with trough openings.

Trough Opening (mm)	Minimum Insulant Thickness (mm)
≤ 75	25
76–100	30
101–125	35
126–150	40
151–175	45
176–200	50
201–225	55
226–250	60

Sitework

Green Roofs

Kingspan Thermaroof[®] TR27 LPC/FM is suitable for use under most green roof systems.

Green roof systems are a specialist design area. When designing a loose-laid insulated green roof assembly consideration needs to be given to the following.

Green roof systems are required to have a minimum dry weight of 80 kg/m² to ballast the insulation boards beneath them. However, the total required dry weight will depend upon wind uplift, which in turn will vary with the geographical location of the building, local topography, and the height and width of the roof concerned. The necessity for any additional dry weight should be assessed in accordance with BS / I.S. EN 1991-1-4: 2005 + A1: 2010 (National Annex to Eurocode 1 Actions on structures. General Actions. Wind Actions).

When installing a loose-laid insulated green roof assembly, any insulation must be immediately over-laid with the green roof system, which must meet all of the requirements outlined above.

Where these requirements cannot be ensured, the insulation must be mechanically fixed (see Sitework). For further information please contact the Kingspan Insulation Technical Service Department (see rear cover).

Board Size Selection

- If consideration is being given to bonding *Kingspan Thermaroof*[®] TR27 LPC/FM, either in hot bitumen or with the use of a suitable alternative proprietary adhesive system, it is recommended that 1.2 x 0.6 m boards (in Britain) or 1.2 x 1.2 m boards (in Ireland) are used.
- All sizes of board are suitable for mechanical fixing.

Installing over Metal Decks

- Where an FM or LPCB approved construction is required, please refer to 'LPCB & FM Certification' on page 16.
- 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, and the insulation boards are to be bonded down, in order to ensure an adequate bond between the metal deck 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.
- If the metal deck is not sealed, and the insulation boards are to be mechanically fixed, the vapour control layer should be loose-laid.
- 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*[®] TR27 LPC/FM should be secured to the deck using mechanical fixings e.g. telescopic tube fasteners (see 'Mechanical Fixings').
- Alternatively, the insulation boards should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer / sealed metal deck, or with the use of a suitable alternative proprietary adhesive system.

Sitework

- 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 be insulated with the same thickness of *Kingspan Thermaroof*[®] TR27 LPC/FM 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.
- For roofs without parapets, a timber edging batten of the same height of the insulation is to be used to fix the fascia board to the gutter system. Please contact the membrane manufacturer for more details.
- 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.
- 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*[®] TR27 LPC/FM should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer, or with the use of a suitable alternative proprietary adhesive system.
- Alternatively, the insulation boards should be secured to the deck using mechanical fixings e.g. telescopic tube fasteners (see 'Mechanical Fixings').
- 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 be insulated with the same thickness of *Kingspan Thermaroof*[®] TR27 LPC/FM 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.

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.
- If the insulation boards are to be bonded down, 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.
- If the insulation boards are to be mechanically fixed, the vapour control layer should be loose-laid.
- 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.
- For roofs without parapets, a timber edging batten of the same height of the insulation is to be used to fix the fascia board to the gutter system. Please contact the membrane manufacturer for more details.
- 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.

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 insulation boards are to be bonded down, in order to ensure an adequate bond between the plywood deck and the vapour control layer, 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.
- Alternatively, the vapour control layer can be nailed to the deck, in which case the nail heads will become sealed with the subsequent bonding of the insulation boards to the vapour control layer.
- If the insulation boards are to be mechanically fixed, the vapour control layer should be loose-laid.
- 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*[®] TR27 LPC/FM should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer, or with the use of a suitable alternative proprietary adhesive system.
- Alternatively, the insulation boards should be secured to the deck using mechanical fixings e.g. telescopic tube fasteners (see 'Mechanical Fixings').
- 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 be insulated with the same thickness of *Kingspan Thermaroof*[®] TR27 LPC/FM 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.
- For roofs without parapets, a timber edging batten of the same height of the insulation is to be used to fix the fascia board to the gutter system. Please contact the membrane manufacturer for more details.
- 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.

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, and the new insulation boards are to be bonded down, a separate vapour control layer should be bonded to it with hot bitumen, or suitable alternative proprietary adhesive system. If the insulation boards are to be mechanically fixed, the vapour control layer should be loose-laid.
- 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*[®] TR27 LPC/FM should be bonded down by laying into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer, or with the use of a suitable alternative proprietary adhesive system.
- Alternatively, the insulation boards should be secured to the deck using mechanical fixings e.g. telescopic tube fasteners (see 'Mechanical Fixings').
- 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.

Sitework

- Roof-light or ventilator kerbs etc. should always be insulated with the same thickness of *Kingspan Thermaroof*® TR27 LPC/FM 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.
- For roofs without parapets, a timber edging batten of the same height of the insulation is to be used to fix the fascia board to the gutter system. Please contact the membrane manufacturer for more details.
- 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.

Installing over Existing Composite Panel Roofs

- If the existing profile provides inadequate support for the insulation boards, the existing roof should be over-boarded, e.g. with plywood, prior to their installation.
- Boards of *Kingspan Thermaroof*® TR27 LPC/FM should be secured to the deck using mechanical fixings. Please refer to the Kingspan Insulation Technical Advice Service (see rear cover) for advice on fixing specification.
- Insulation boards should always be laid break-bonded and with joints lightly butted. There should be no gaps at abutments. If the existing roof has been over-boarded, then insulation boards should be laid with their long edges at right angles to the edge of, or diagonally across the roof. If not, they should be laid either with their long edges at right angles to the trough openings, or diagonally across the corrugation line.
- Roof-light or ventilator kerbs etc. should always be insulated with the same thickness of *Kingspan Thermaroof*® TR27 LPC/FM as the general roof area.
- 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.

Mechanical Fixings

- The number of mechanical fixings required to fix *Kingspan Thermaroof*® TR27 LPC/FM will vary with the geographical location of the building, the local topography, and the height and width of the roof concerned along with the deck type.
- A minimum of 4 fixings are required to secure 1.2 x 0.6 m boards of *Kingspan Thermaroof*® TR27 LPC/FM to the deck.
- A minimum of 5 fixings are required to secure 1.2 x 1.2 m boards of *Kingspan Thermaroof*® TR27 LPC/FM to the deck.
- A minimum of 6 fixings are required to secure 2.4 x 1.2 m boards of *Kingspan Thermaroof*® TR27 LPC/FM to the deck.
- The requirement for additional fixings should be assessed in accordance with BS 6399-2: 1997 (Loadings for buildings. Code of practice for wind loads) or BS / I.S. EN 1991-1.4: 2005 + A1: 2010 (National Annex to Eurocode 1. Actions on structures. General Actions. Wind Actions).
- Mechanical fixings must be arranged in an even pattern.
- Fasteners at insulation board edges must be located > 50 and < 150 mm from edges and corners of the board and not overlap board joints.
- Please refer to page 14 for recommended fixing patterns.
- Each fixing should incorporate a square or circular plate washer (min. 50 x 50 mm or 50 mm diameter).
- If two layers of insulation are to be installed, the base layer should be mechanically fixed with minimum 1 No. fixing in the centre of the insulation board before fixing the top layer as described above.
- Where alternative mechanical fixing systems are specified, such as bar fixing systems, the specified system must give similar restraint to the insulation board as would be attained by the use of conventional telescopic tube fasteners.
- For details on fixings 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 9004
www.makfasteners.com
 - SFS Intec +44 (0) 113 2 085 500
www.sfsintec.biz/uk

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. However, if mechanical fixing methods are to be employed, refer to 'Mechanical Fixings' for guidance on the number of fixings to be used in each layer.
- 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 6).

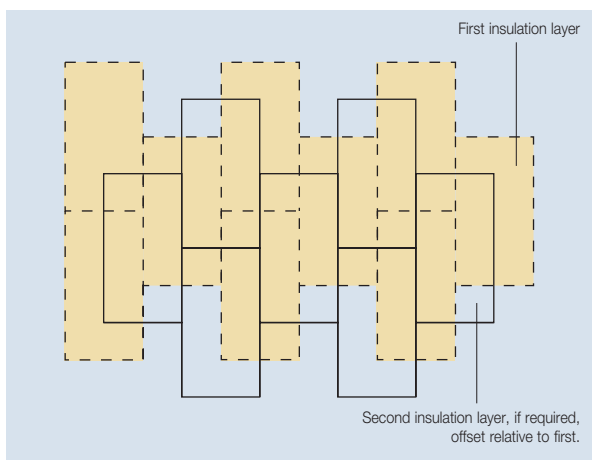


Figure 6 Offsetting of Multiple Insulation Layers

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 Thermo*roof® TR27 LPC/FM 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 Thermo*roof® TR27 LPC/FM is available through specialist insulation distributors and selected roofing merchants throughout the UK and Ireland.

Packaging and Storage

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

Health and Safety

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

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

Mechanical Fixing Patterns

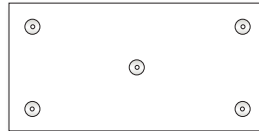
Recommended Fixing Patterns

The recommended fixing patterns for *Kingspan Thermaroof*[®] TR27 LPC/FM are shown below. The number of fixings necessary should be assessed in accordance with BS / I.S. EN 1991-1-4: 2005 + A1: 2010 (National Annex to Eurocode 1. Actions on structures. General Actions. Wind Actions).

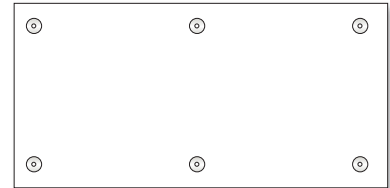
The images below show recommended fixing patterns, the number of fixings used and the resulting fixing density (number of fixings per m²).



4 No. per board
(1.2 x 0.6 m board – 5.55 fixings / m²)

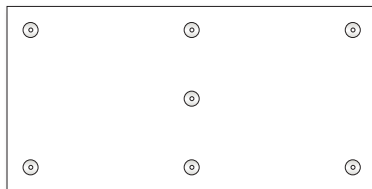


5 No. per board
(1.2 x 0.6 m board – 6.94 fixings / m²)
(1.2 x 1.2 m board – 3.47 fixings / m²)

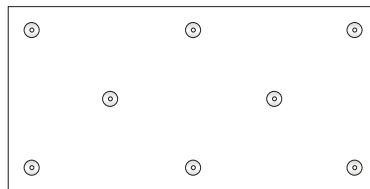


6 No. per board
(1.2 x 0.6 m board – 8.33 fixings / m²)
(1.2 x 1.2 m board – 4.16 fixings / m²)
(2.4 x 1.2 m board – 2.08 fixings / m²)

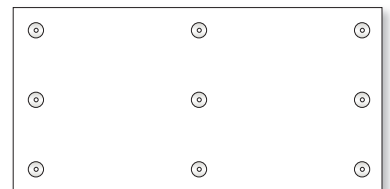
A minimum of 4 fixings are required to secure a 1.2 m x 0.6 m insulation board to the deck, a minimum of 5 fixings are required to secure a 1.2 x 1.2 m insulation board to the deck and a minimum of 6 fixings are required to secure a 2.4 x 1.2 m insulation board to the deck. Therefore, of the two fixing patterns above, that on the left can only be applied for a 1.2 x 0.6 m insulation board and that on the right for a 1.2 x 0.6 m insulation board or a 1.2 x 1.2 m insulation board.



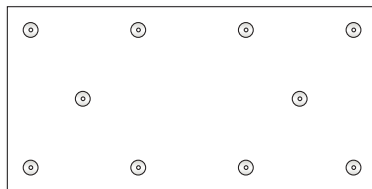
7 No. per board
(1.2 x 0.6 m board – 9.72 fixings / m²)
(1.2 x 1.2 m board – 4.86 fixings / m²)
(2.4 x 1.2 m board – 2.43 fixings / m²)



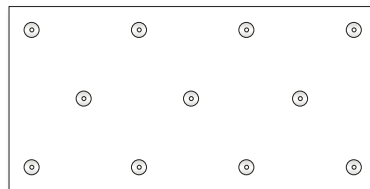
8 No. per board
(1.2 x 0.6 m board – 11.11 fixings / m²)
(1.2 x 1.2 m board – 5.55 fixings / m²)
(2.4 x 1.2 m board – 2.77 fixings / m²)



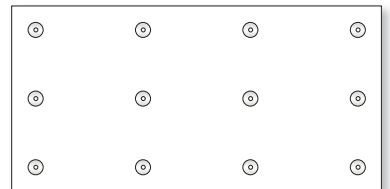
9 No. per board
(1.2 x 0.6 m board – 12.50 fixings / m²)
(1.2 x 1.2 m board – 6.25 fixings / m²)
(2.4 x 1.2 m board – 3.12 fixings / m²)



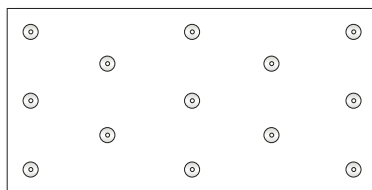
10 No. per board
(1.2 x 0.6 m board – 13.88 fixings / m²)
(1.2 x 1.2 m board – 6.94 fixings / m²)
(2.4 x 1.2 m board – 3.47 fixings / m²)



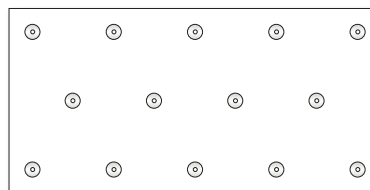
11 No. per board
(1.2 x 0.6 m board – 15.27 fixings / m²)
(1.2 x 1.2 m board – 7.63 fixings / m²)
(2.4 x 1.2 m board – 3.81 fixings / m²)



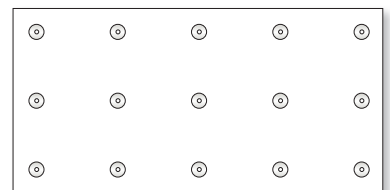
12 No. per board
(1.2 x 0.6 m board – 16.66 fixings / m²)
(1.2 x 1.2 m board – 8.33 fixings / m²)
(2.4 x 1.2 m board – 4.16 fixings / m²)



13 No. per board
(1.2 x 0.6 m board – 18.05 fixings / m²)
(1.2 x 1.2 m board – 9.02 fixings / m²)
(2.4 x 1.2 m board – 4.51 fixings / m²)



14 No. per board
(1.2 x 0.6 m board – 19.44 fixings / m²)
(1.2 x 1.2 m board – 9.72 fixings / m²)
(2.4 x 1.2 m board – 4.86 fixings / m²)



15 No. per board
(1.2 x 0.6 m board – 20.83 fixings / m²)
(1.2 x 1.2 m board – 10.41 fixings / m²)
(2.4 x 1.2 m board – 5.20 fixings / m²)

NB Mechanical fixings e.g. telescopic tube fasteners, must be arranged in an even pattern. Fasteners at board edges must be located > 50 mm and < 150 mm from edges and corners of the board and not overlap board joints.

Product Details

The Facings

Kingspan Thermaroof[®] TR27 LPC/FM is faced on both sides with a coated glass tissue, autohesively bonded to the insulation core during manufacture.

The Core

The core of *Kingspan Thermaroof*[®] TR27 LPC/FM is manufactured with **Nilflam**[®] **Fibre-free Core** technology, a high performance fibre-free 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[®] TR27 LPC/FM is manufactured to the highest standards in accordance with the requirements of both 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) and BS 4841-4 (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 single-ply roofing membranes).

Kingspan Thermaroof[®] TR27 LPC/FM is also 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 / I.S OHSAS 18001: 2007 (Occupational Health and Safety Management Systems. Requirements) and ISO 50001: 2011 (Energy Management Systems. Requirements with Guidance for Use).

Kingspan Thermaroof[®] TR27 LPC/FM, produced at Kingspan Insulation's Pembridge and Selby manufacturing facilities, is covered by BBA Certificate 16/5332.



Standard Dimensions

Kingspan Thermaroof[®] TR27 LPC/FM is available in the following standard size(s):

Nominal Dimension	Availability
Length (m)	1.2* 1.2** 2.4
Width (m)	0.6* 1.2** 1.2
Insulant Thickness (mm)	Refer to local distributor or Kingspan Insulation price list for current stock and non-stock sizes.

* for product produced at Kingspan Insulation's British manufacturing facilities only.

** for product produced at Kingspan Insulation's Irish manufacturing facility only.

Compressive Strength

The compressive strength of *Kingspan Thermaroof*[®] TR27 LPC/FM typically exceeds 150 kPa at 10% compression, when tested to BS / I.S. EN 826: 2013 (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 / I.S. EN 12086: 2013 (Thermal insulating products for building applications. Determination of water vapour transmission properties). *Kingspan Thermaroof*[®] TR27 LPC/FM should always be installed over a vapour control layer or sealed metal deck (see 'Water Vapour Control' on page 8).

Durability

If correctly installed, *Kingspan Thermaroof*[®] TR27 LPC/FM 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*[®] TR27 LPC/FM resist attack by mould and microbial growth, and do not provide any food value to vermin.

Acoustics

For details of the acoustic properties of *Kingspan Thermaroof*[®] TR27 LPC/FM, please visit www.kingspaninsulation.co.uk/acoustics.

Product Details

Fire Performance

Kingspan Therma® TR27, when incorporated in a roofing system, subjected to the external roof exposure testing, specified in the table below, can achieve the results shown. However performance is reliant on the roof covering, therefore for further details please contact your roofing system supplier or waterproof membrane manufacturer.

Test	Classification
BS 476-3: 2004	AA
DD CEN/TS 1187:2012	B _{ROOF(t4)}

Alternatively, roofs intended to be fully covered by inorganic materials, listed as per Commission Decision 2000/553/EC of 6th of September 2000, implementing Council Directive 89/106/ECC can be considered to fulfil the external fire performance requirements without the need for testing. These are:

- Loose laid gravel – ≥ 50 mm or ≥ 80 kg/m² (size 4-32 mm)
- sand/cement screed – ≥ 30 mm
- cast stone/mineral slabs – ≥ 40 mm.

LPCB & FM Certification

FM Certification

Kingspan Therma® TR27 LPC/FM is certified as achieving Class 1 Insulated Steel Deck Pass to Factory Mutual Research Standard 4470: 2016 (Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Non-combustible Roof Deck Construction), subject to the conditions of approval as a roof insulation product for use in Class 1 roof constructions as described in the current edition of the Factory Mutual Research Approval Guide.

For further details please contact the Kingspan Insulation Technical Service Department (see rear cover) or alternatively search for '*Kingspan Therma*™' on www.fmapprovals.com/roofnav.



LPCB Certification

Metal deck roofing constructions incorporating *Kingspan Therma*® TR27 LPC/FM, produced at Kingspan Insulation's Pembridge and Castleblayney manufacturing facilities, have been successfully tested to LPS 1181: Part 1 in combination with LPCB approved PIR core wall panels (Requirements and Tests for Built-up Cladding and Sandwich Panel Systems for use as the External Envelope of Buildings). The table below indicates the LPCB listed approvals for *Kingspan Therma*® TR27 LPC/FM.

For further details please contact the Kingspan Insulation Technical Service Department (see rear cover) or alternatively search for "*Therma*® TR27 LPC/FM" or approval reference number 388-1b/02 on www.redbooklive.com.

Product	Thickness (mm)	Vapour Control	Grade	LPCB Ref No.
<i>Kingspan Therma</i> ® TR27 LPC/FM	65 – 155 in a single layer	Sealed metal deck or separate vapour control layer	EXT – B	388-1b/02



LPS 1181: Part 1
Certificate No. 388-1b/02

Thermal Properties

The λ-values and R-values detailed below are quoted in accordance with BS / I.S. EN 13165: 2012 + A1: 2015 (Thermal insulation products for buildings – Factory made rigid polyurethane foam (PU) products – Specification).

Thermal Conductivity

The boards achieve a thermal conductivity (λ-value) of: 0.026 W/m·K (insulant thickness < 80 mm); 0.025 W/m·K (insulant thickness 80 – 119 mm); and 0.024 W/m·K (insulant thickness ≥ 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).

Insulant Thickness (mm)	Thermal Resistance (m ² ·K/W)
80	3.20
85	3.40
90	3.60
95	3.80
100	4.00
110	4.40
120	5.00
125	5.20
130	5.40
135	5.60
140	5.80
145	6.00
150	6.25
160	7.25

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
- The *Kingspan KoolDuct*® Pre-Insulated Ducting
- *Kingspan nilvent*® Breathable Membranes
- *Kingspan TEK*® Building System

Insulation Product Benefits

Kingspan OPTIM-R® Vacuum Insulation Panel (VIP)

Products

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

Kingspan Kooltherm® Range Products

- With a thermal conductivity of 0.018–0.023 W/m·K these are the most thermally efficient insulation products commonly used.
- The thinnest commonly used insulation products for any specific U-value.
- 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 0.022–0.028 W/m·K these are amongst the more thermally efficient insulation products commonly used.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

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

All Products

- Unaffected by air infiltration – a problem that can be experienced with mineral fibre and which can reduce thermal performance.
- Safe and easy to install.
- If installed correctly, can provide reliable long term thermal performance over the lifetime of the building.
- Each product achieves the required fire performance for its intended application.

Contact Details

Customer Service

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

- UK – Tel: +44 (0) 1544 388 601
– email: customerservice@kingspaninsulation.co.uk
- Ireland – Tel: +353 (0) 42 979 5000
– email: info@kingspaninsulation.ie

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.

For copies please contact the Kingspan Insulation Marketing Department, or visit the Kingspan Insulation website, using the details below:

- UK – Tel: +44 (0) 1544 387 384
– email: literature@kingspaninsulation.co.uk
– www.kingspaninsulation.co.uk/literature
- Ireland – Tel: +353 (0) 42 979 5000
– email: info@kingspaninsulation.ie
– www.kingspaninsulation.ie/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:

- UK – Tel: +44 (0) 1544 387 383
– email: tapered@kingspaninsulation.co.uk
- Ireland – Tel: +353 (0) 42 975 4297
– email: tapered@kingspaninsulation.ie

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service. Calculations can be carried out to provide U-values, condensation / dew point risk, required insulation thicknesses etc...

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.

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:

- UK – Tel: +44 (0) 1544 387 382
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General Enquiries

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

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– email: info@kingspaninsulation.co.uk
- Ireland – Tel: +353 (0) 42 979 5000
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