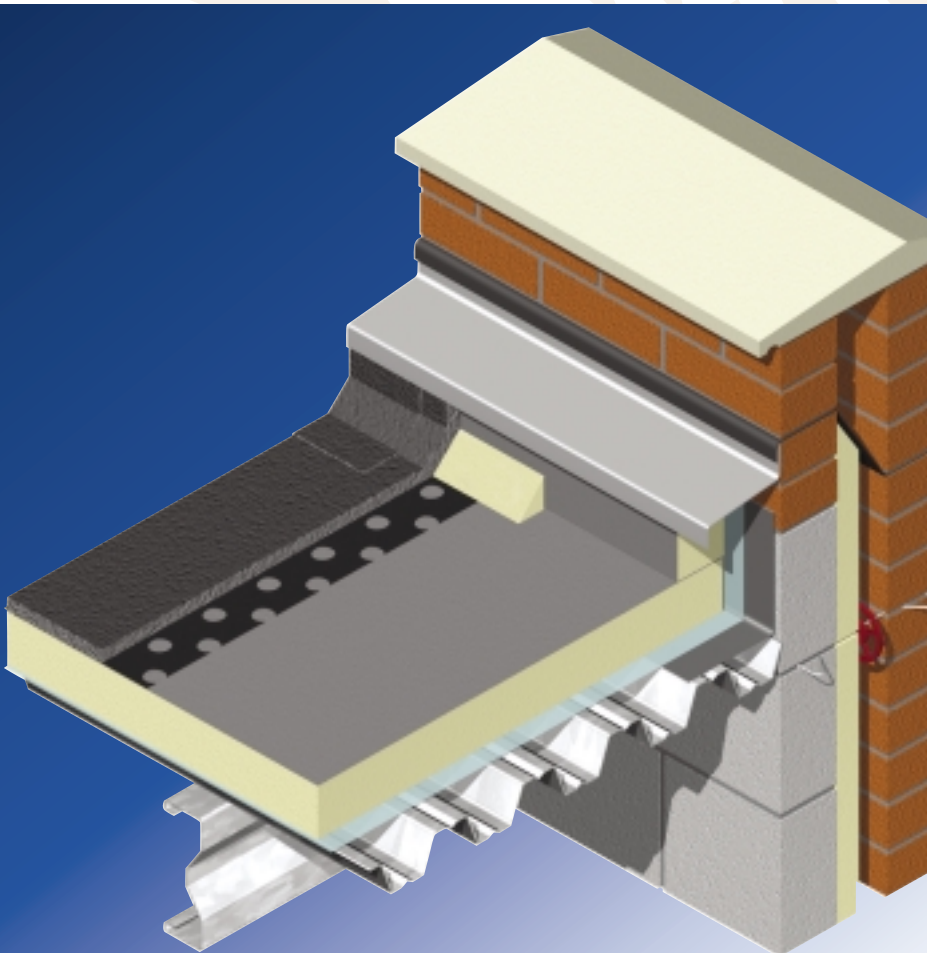


# Therma<sup>®</sup>roof TR21 zero ODP

INSULATION BENEATH PARTIALLY BONDED  
BUILT-UP FELT AND MASTIC ASPHALT

*OTHER THAN INSULATED BALCONIES WATERPROOFED WITH MASTIC ASPHALT WITH A POROUS PROMENADE TILE OVERLAY*



- ▼ High performance rigid urethane insulation – thermal conductivity 0.025–0.027 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)
- ▼ No need for a fibreboard overlay – 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 newbuild and refurbishment
- ▼ CFC/HCFC-free with zero Ozone Depletion Potential (ODP)



BS EN ISO 9002 : 1994  
Certificate No. FM 10697



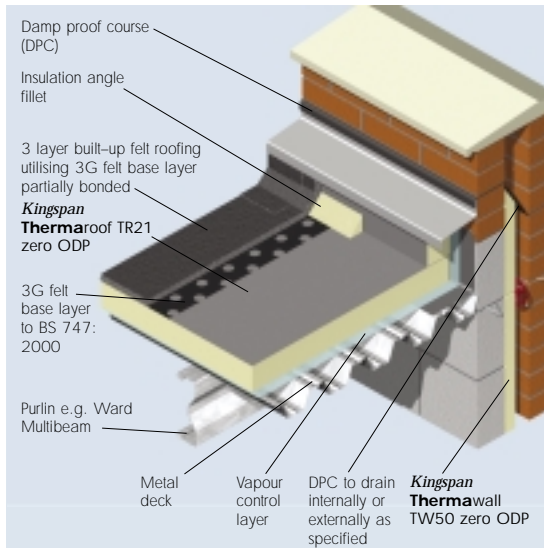
I.S. EN ISO 9001: 2000  
Registration No. 19.0633



zero o.d.p.

# Kingspan Therma<sup>roof</sup> TR21 zero ODP

## TYPICAL DESIGN DETAIL



## SPECIFICATION CLAUSE

**Kingspan Therma<sup>roof</sup> TR21 zero ODP** should be described in specifications as:

The roof insulation shall be **Kingspan Therma<sup>roof</sup> TR21 zero ODP** \_\_\_\_\_mm thick comprising a CFC/HCFC-free rigid urethane insulation core with glass reinforced perforated cellulose facings on both sides manufactured to BS EN ISO 9002: 1994/I.S. EN ISO 9001: 2000 by Kingspan Insulation Limited and shall be applied in accordance with the instructions issued by them.

## DESIGN CONSIDERATIONS

### SUSTAINABILITY

It is widely recognised that there are four main global environmental sustainability issues: global warming, non-renewable resource depletion, toxic pollution and ozone depletion, and that these global issues far outweigh any local sustainability issues in their need for immediate attention and potential impact from inaction.

Recent studies have shown that the first three issues are essentially one. The extraction and consumption (burning) of fossil fuels is by far the most significant contributor to global warming, non-renewable resource depletion and toxic pollution.

Therefore, saving energy by specifying the lowest U-value possible and using zero ODP insulation materials are the best actions to take when considering sustainability for the insulation requirements of a building.

**Kingspan Therma<sup>roof</sup> TR21 zero ODP** is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential (ODP).



In the past, erroneously, the relative sustainability of insulation materials has been compared on the basis of embodied energy. It is now known that the embodied energy of insulation materials is insignificant compared with the energy saved by insulation over the lifetime of a building in which it is used and so is of limited importance. However, it is a matter of social responsibility to state the environmental impact in the manufacture of a product, and a full Life Cycle Analysis (LCA) rather than embodied energy is recognised as the preferred tool to achieve this.

An LCA, independently certified by the BRE, has been carried out for UK produced **Kingspan Therma<sup>roof</sup> TR21 zero ODP** and a copy is available from Kingspan Insulation, see rear cover.

Kingspan Insulation Limited is the first insulation manufacturer to publish openly such information.



### WIND LOADING

Wind loadings should be assessed in accordance with BS 6399: Part 2: 1997 (Code of practice for wind loads).

### ROOF WATERPROOFING

**Kingspan Therma<sup>roof</sup> TR21 zero ODP** is designed for use with most bitumen based waterproofing systems, including high performance types which incorporate and are compatible with a Type 3G perforated base layer to BS 747: 2000 (Specification for Roofing Felt). The 3G felt layer is laid dry and loose, mineral face down. The roof waterproofing should be applied as soon as possible after the laying of the boards. The built-up roof specification should be laid where applicable in accordance with BS 8217: 1994 (Code of practice for built-up felt roofing). It is also suited to mastic asphalt waterproofing systems. The roof waterproofing should be applied as soon as possible after the laying of the boards. The built-up roof specification should be laid where applicable in accordance with BS 8217: 1994 (Code of practice for built-up felt roofing) and BS 8218: 1998 (Code of practice for mastic asphalt roofing). Mastic asphalt should always be laid over an isolating layer of Type 4A sheathing felt to BS 747: 2000 (Specification for Roofing Felt).

Certain approved single ply membranes are also compatible.

### FALLS

The fall on a flat roof should be smooth and steep enough to prevent the formation of rainwater pools. To ensure adequate drainage, BS 6229: 1982, recommends uniform gradients of not less than 1 in 80. However, because of building settlement, it can be advisable to 'design in' even greater falls.

### WATER VAPOUR CONTROL

The need for a separate vapour control layer with **Kingspan Therma<sup>roof</sup> TR21 zero ODP** in a warm roof construction should be assessed in accordance with BS 5250: 1989 (1995) and as defined in BS 6299: 1982. A minimum vapour control layer should consist of a coated roofing felt complying with BS 747: 2000 Type 3B, or any appropriate metal-cored vapour control layer.

Allowance should be made for the adequate bonding of the vapour control layer to the deck so as to provide a suitable surface for **Kingspan Thermaroof TR21 zero ODP** to be laid upon and sufficient resistance to wind up-lift (see 'Wind Loading').

Metal decks and concrete decks should be primed prior to the application of the hot bitumen used to bond the vapour control layer to the deck.

#### ROOF LOADING

Depending on the chosen waterproofing system, **Kingspan Thermaroof TR21 zero ODP** is suitable for use on access roof decks subject to limited foot traffic. Where continuous or excessive loadings are liable to occur it is recommended that the roof surface is protected by promenade tiles. The roof should 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 the storage of heavy building components such as bricks or air condition equipment.

#### SPANNING ON METAL DECKS

The designer's attention is drawn to the requirement that insulation boards comply with the minimum thicknesses shown in the table below, when used over metal decks with trough openings as shown.

Trough Opening (mm)	Minimum Insulant Thickness (mm)
≤75	25
76-100	30
101-125	35
126-150	40
151-175	45
176-200	50

#### TYPICAL U-VALUES

These examples shown are based on the use of **Kingspan Thermaroof TR21 zero ODP** waterproofed either using 3 layers of built-up felt or 2 layers of mastic asphalt, with the surface covered with mineral chippings. The board is laid over a bitumen based vapour control layer, which is fully bonded, to the type of deck stated for each application. The suspended ceiling, where shown, is taken to be 12.5 mm plasterboard with a cavity between it and the underside of the deck. If your construction is any different, please consult our Technical Services Department.

Combined Method – U-values were calculated using the method which has been adopted to bring National standards in line with the European Standard calculation method, BS/I.S. EN ISO 6946: 1997 (Building components and building elements. Thermal resistance and thermal transmittance. Calculation method).

Proportional Area Method – the U-values shown below were calculated using the proportional area method as detailed in The Chartered Institute of Building Services Engineers (CIBSE) Guide A3 (Thermal Properties of Building Structures).

NB when calculating U-values using the combined method as detailed in BS/I.S. EN ISO 6946: 1997, the type of mechanical fixing used may change the thickness of insulation required. The effect of fixings has been ignored for the purposes of these calculations. Please contact the Kingspan Insulation Technical Services Department (see rear cover) for project calculations.

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.

The figures below are for guidance only. A detailed U-value calculation together with condensation risk analysis should be completed for each individual project. Please call our Technical Services Department for assistance (see rear cover).

#### METAL DECK WITH NO CEILING

Insulant Thickness (mm)	U-value (W/m <sup>2</sup> .K)	
	Combined Method	Proportional Area Method
55	0.43	0.43
60	0.39	0.39
70	0.34	0.34
75	0.32	0.32
80	0.31	0.31
90	0.27	0.27
95	0.25	0.25
100	0.24	0.24
105	0.23	0.23
110	0.22	0.22
120	0.20	0.20
125	0.19	0.19
130	0.18	0.18
140	0.17	0.17
145	0.16	0.16

#### DENSE CONCRETE DECK WITH SUSPENDED CEILING

Insulant Thickness (mm)	U-value (W/m <sup>2</sup> .K)	
	Combined Method	Proportional Area Method
45	0.45	0.45
50	0.42	0.41
60	0.36	0.36
65	0.34	0.34
70	0.32	0.32
75	0.30	0.30
80	0.28	0.28
85	0.26	0.26
90	0.25	0.25
100	0.23	0.23
105	0.22	0.22
110	0.21	0.21
120	0.19	0.19
125	0.18	0.18
130	0.17	0.17
135	0.17	0.17
140	0.16	0.16

#### TIMBER DECK WITH PLASTERBOARD CEILING

Insulant Thickness (mm)	U-value (W/m <sup>2</sup> .K)	
	Combined Method	Proportional Area Method
45	0.45	0.44
50	0.41	0.41
60	0.36	0.35
65	0.34	0.34
70	0.32	0.31
75	0.30	0.30
80	0.27	0.27
85	0.26	0.26
90	0.25	0.25
100	0.23	0.23
105	0.22	0.22
110	0.21	0.21
120	0.19	0.19
125	0.18	0.18
130	0.17	0.17
135	0.17	0.17
140	0.16	0.16

# Kingspan **Therma**roof TR21 zero ODP

## SITWORK

### VAPOUR CONTROL LAYER

Metal decks and concrete decks should be primed prior to the application of the hot bitumen used to bond the vapour control layer to the deck.

To provide an effective vapour control layer, the roofing felt should be bonded in hot bitumen to the supporting substrate with all joints lapped at least 50 mm and bonded. At all edges, abutments and penetrations the felt should be either turned back at least 150 mm onto the insulation and sealed down or turned up and sealed with the roof covering to form an envelope. This will be dependant upon whether built-up felt or mastic asphalt is specified. Reference should be made to BS 8217: 1994 (Code of practice for built-up roofing) and/or the Mastic Asphalt Council Roofing Handbook. Where verge/eaves details exist, the vapour control layer should be dressed accordingly to a minimum of 150 mm.

### FIXING OVER METAL DECKS

On metal decks, **Kingspan Therma**roof TR21 zero ODP should be laid into hot bitumen (max. temperature 240°C) mopped or poured over the vapour control layer. Alternatively the boards can be secured using mechanical fixing systems (see Figure 1). **Kingspan Therma**roof TR21 zero ODP should be laid break-bonded with its long edges at right angles to the trough openings, or alternatively, diagonally across the corrugation line. Whichever system is chosen, care must be taken to ensure that all joints are supported by the deck. The joints should be lightly butted. Taping of the joints is not required.

### FIXING 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. 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 specified manufacturer's instructions. The vapour control layer should be fully bonded to the deck and similarly the **Kingspan Therma**roof TR21 zero ODP to the vapour control layer by laying into hot bitumen mopped or poured over the vapour control layer. Alternatively the boards can be secured using mechanical fixing systems (see Figure 1). The boards should be laid break-bonded with all joints lightly butted.

### FIXING OVER PLYWOOD DECKS

**Kingspan Therma**roof TR21 zero ODP should be fully bedded in hot bitumen over a continuous vapour control layer which has been nailed or bonded to the deck with laps at the side and end sealed with hot bitumen. Alternatively the boards can be secured using mechanical fixing systems (see Figure 1). The joints should be break-bonded and the boards laid at right angles to the edge of the roof or diagonally across the roof. All joints should be lightly butted.

### FIXING OVER TONGUE & GROOVE DECKS

On timber tongue and groove decks, the vapour control layer should be nailed. During the laying of **Kingspan Therma**roof TR21 zero ODP the nail heads will become sealed in hot bitumen to the vapour control layer by the subsequent bonding of the roofboard. The **Kingspan Therma**roof TR21 zero ODP is then applied as described under plywood decks.

### FIXING OVER WOODWOOL DECKS

On woodwool slab decks, **Kingspan Therma**roof TR21 zero ODP should be fully bedded in hot bitumen over a continuous vapour control layer. Boards should be laid with their long edges at right angles to the slabs, or preferably diagonally across the roof. Alternatively boards can be secured using specialist mechanical fixing systems (see Figure 1). Board joints should not coincide with those of the slabs. The roof boards should be laid break-bonded, with all joints lightly butted.

### PITCHED OR SLOPING ROOFS

Any provision for mechanical fixing of the waterproofing layer or layers, to prevent slippage of the cap sheet, should be made prior to the application of **Kingspan Therma**roof TR21 zero ODP.

### MECHANICAL FIXINGS

The number of mechanical fixings required to fix **Kingspan Therma**roof TR21 zero ODP will vary with the geographical location of the building, the topographical data, and the height and width of the roof concerned.

Each fixing should incorporate a square or circular plate washer (70 mm x 70 mm or 75 mm diameter).

A minimum 4 No. fixings should be placed within the individual board area and be sited >50 mm and <150 mm from the edges and corners of the board giving a minimum fixing rate of 5.55 fixings per square metre: (1.2 x 0.6 m boards).

The requirement for additional fixings should be assessed in accordance with BS 6399: Part 2: 1997 (Code of practice for wind loads). (see Figure 1).

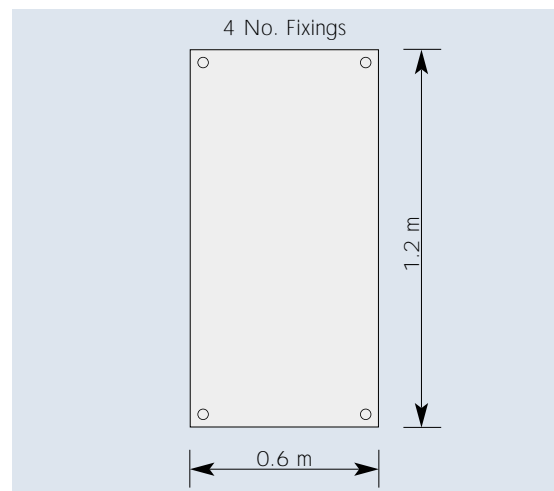


Figure 1 TYPICAL MECHANICAL FIXING PATTERN

## PRODUCT DESCRIPTION

### PERIMETER MECHANICAL FIXINGS

Where perimeter mechanical fixings are specified, the minimum number and distribution should be as stated for full mechanical fixing. The extent of the perimeter mechanical fixing will depend on the design and location of the roof concerned. The fixings should cover a distance of not less than two metres from the edge of the roof. The area to be mechanically fixed should extend around the complete perimeter of the roof.

### REFLECTIVE COATINGS

Bitumen based and mastic asphalt built up waterproofing systems laid over **Kingspan Thermarroof TR21 zero ODP** should always incorporate a solar reflective layer such as chippings or specialist coatings.

### DAILY WORKING PRACTICE

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

### CUTTING

**Kingspan Thermarroof TR21 zero ODP** can be cut easily and cleanly using a fine toothed saw or a sharp knife, to fit roof openings and fixtures. Do not attempt to snap the board. Ensure accurate trimming to achieve close butting joints and continuity of insulation.

### AVAILABILITY

**Kingspan Thermarroof TR21 zero ODP** is available through specialist insulation distributors and selected roofing merchants throughout the UK, Ireland and Europe.

### PACKAGING

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

### STORAGE

The packaging of **Kingspan Thermarroof TR21 zero ODP** should not be considered adequate for long term outside protection. Ideally, boards should be stored inside a building. If, however, outside storage cannot be avoided, the boards should be stacked clear of the ground, and covered with a polythene sheet or weatherproof tarpaulin. Boards that have been allowed to get wet should not be used.

### HEALTH AND SAFETY

Kingspan Insulation products are chemically inert and safe to use. A leaflet on this topic which satisfies the requirements set out in the Control of Substances Hazardous to Health Regulations 1988 (COSHH) is available from our Technical Services Department (see rear cover).

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

### THE FACINGS

**Kingspan Thermarroof TR21 zero ODP** is faced on both sides with glass reinforced perforated cellulose autohesively bonded to the insulation core during manufacture.

### THE CORE

The core of **Kingspan Thermarroof TR21 zero ODP** is a high performance CFC/HCFC-free rigid urethane insulant of typical density 32 kg/m<sup>3</sup>.

### CFC/HCFC-FREE

**Kingspan Thermarroof TR21 zero ODP** is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential (ODP).



## PRODUCT DATA

### STANDARDS AND APPROVALS

**Kingspan Thermarroof TR21 zero ODP** is manufactured to the highest standards under quality control systems approved to BS EN ISO 9002: 1994 (Quality systems. Model for quality assurance in production, installation and servicing)/I.S. EN ISO 9001: 2000 (Quality management systems – Requirements).



BS EN ISO 9002 : 1994  
Certificate No. FM 10697



I.S. EN ISO 9001: 2000  
Registration No. 19.0633

### STANDARD DIMENSIONS

**Kingspan Thermarroof TR21 zero ODP** is available in the following standard sizes and thicknesses.

Nominal Dimension	Availability
Length (m)	1.2
Width (m)	0.6
Insulant Thickness* (mm)	45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 120, 125, 130, 135, 140, 145

\* Other thicknesses are available subject to quantity.

### INSULATION COMPRESSIVE STRENGTH

Typically exceeds 150 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

# Kingspan **Therma**roof TR21 zero ODP

## WATER VAPOUR RESISTANCE

The boards achieve a resistance greater than 15 MN.s/g, when tested in accordance with BS 4370: Part 2: 1993. **Kingspan Therma**roof TR21 zero ODP should always be installed over a separate felt vapour control layer as detailed in 'Water Vapour Control' page 3.

## DURABILITY

If correctly applied, **Kingspan Therma**roof TR21 zero ODP has an indefinite life. Its durability depends on the supporting structure, waterproofing and the conditions of its use.

## RESISTANCE TO SOLVENTS, FUNGI & RODENTS

The insulation core is resistant to dilute acids, alkalis, mineral oil and petrol. It 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 **Kingspan Therma**roof TR21 zero ODP. Boards which have been in contact with harsh solvents, petrol, mineral oil or acids, or boards that have been damaged in any other way should not be used.

The insulation core and facings used in the manufacture of **Kingspan Therma**roof TR21 zero ODP resist attack by mould and microbial growth and do not provide any food value to vermin.

## FIRE PERFORMANCE

Flat roofs insulated with **Kingspan Therma**roof TR21 zero ODP, waterproofed with built-up felt roofing and finished with a loading coat of 10 mm chippings achieve external FAA rating when tested to BS 476: Part 3: 1975 (External fire exposure roof test). For specifications without the chippings please consult the manufacturer of the mineral surfaced cap sheet.

## THERMAL PROPERTIES

The  $\lambda$ -values and R-values quoted are in accordance with the Harmonised European Standard BS EN 13165: 2001 (Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products – Specification) using so called 90/90 principles. Comparison with alternative products may not be appropriate unless the same procedures have been followed.

## THERMAL CONDUCTIVITY

The boards achieve a thermal conductivity ( $\lambda$ -value) of 0.027 W/m.K for thicknesses < 80 mm, 0.026 W/m.K for thicknesses from 80 mm to < 120 mm, and 0.025 W/m.K for thicknesses  $\geq$  120 mm.

## THERMAL RESISTANCES

Thermal resistance (R-value) varies with thickness and is calculated by dividing the thickness of the board (expressed in metres) by its thermal conductivity.

Product Thickness (mm)	Thermal Resistance (m <sup>2</sup> .K/W)
45	1.65
50	1.85
55	2.00
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	4.20
110	4.20
120	4.80
125	5.00
130	5.20
135	5.40
140	5.60
145	5.80
150	6.00

## KINGSPAN INSULATION

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

Kingspan Insulation Limited specialise in the solution of insulation problems. Our range of insulation products which meet the exacting requirements of the construction industry are produced to the highest standards, including BS EN ISO 9002: 1994/ I.S. EN ISO 9002: 1994. Each product has been designed to fulfil a specific need and has been manufactured to precise standards and tolerances.

### INSULATION FOR:

- PITCHED ROOFS
- FLAT ROOFS
- CAVITY WALLS
- TIMBER AND STEEL FRAMING
- EXTERNALLY INSULATED CLADDING SYSTEMS
- FLOORS
- SOFFITS

### SOLUTIONS:

- INSULATED DRY LINING
- TAPERED ROOFING SYSTEMS
- *Kingspan KoolDuct*<sup>®</sup> PRE-INSULATED DUCTING
- *Kingspan nilvent*<sup>™</sup> BREATHABLE MEMBRANES
- *Kingspan TEK* Haus<sup>™</sup> BUILDING SYSTEM

## THE KINGSPAN INSULATION PRODUCT RANGE

### THE KINGSPAN KOOLTHERM<sup>®</sup> K-RANGE

- With a thermal conductivity of 0.022–0.024 W/m.K rigid phenolic insulation is the most thermally efficient insulation product commonly available.
- Utilises the thinnest possible insulation board to achieve required U-values.
- Fire performance can be equivalent to mineral fibre.
- Achieves a Class O fire rating to the Building Regulations.
- Achieves the best possible rating of <5% smoke emission when tested to BS 5111: Part 1: 1974.
- CFC-free/available CFC/HCFC-free with zero Ozone Depletion Potential subject to enquiry.

### THE KINGSPAN THERMA ZERO ODP RANGE

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

### THE KINGSPAN STYROZONE<sup>™</sup> & PURLCRETE ZERO ODP RANGES

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

### ALL PRODUCTS

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

## CUSTOMER SERVICE

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

UK – Telephone: +44 (0) 870 850 8555  
– Fax: +44 (0) 870 850 8666  
– email: commercial.uk@insulation.kingspan.com  
Ireland – Telephone: +353 (0) 42 97 95000  
– Fax: +353 (0) 42 97 46129  
– email: commercial.ie@insulation.kingspan.com

## TECHNICAL ADVICE

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

This includes a free computer-aided service designed to give fast, accurate technical advice. Simply phone our **TECHLINE** with your project specification and we can run calculations to provide U-values, condensation/dew point risk, required insulation thicknesses etc... Thereafter we can run any number of permutations to help you achieve your desired targets.

We can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

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



UK: – Telephone: +44 (0) 870 850 8555  
– Fax: +44 (0) 1544 387 278  
– email: techline.uk@insulation.kingspan.com  
Ireland: – Telephone: +353 (0) 42 97 95032  
– Fax: +353 (0) 42 97 46129  
– email: techline.ie@insulation.kingspan.com

## LITERATURE AND 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 our Marketing Department on the numbers below:

UK – Telephone: +44 (0) 1544 387 210  
– Fax: +44 (0) 1544 387 299  
– email: literature.uk@insulation.kingspan.com  
Ireland – Telephone: +353 (0) 42 97 95038  
– Fax: +353 (0) 42 97 46129  
– email: literature.ie@insulation.kingspan.com

## GENERAL ENQUIRIES

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

UK – Telephone: +44 (0) 870 850 8555  
– Fax: +44 (0) 870 850 8666  
– email: info.uk@insulation.kingspan.com  
Ireland – Telephone: +353 (0) 42 97 95000  
– Fax: +353 (0) 42 97 46129  
– email: info.ie@insulation.kingspan.com

*Kingspan Insulation reserve the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and reference should be made to the current Kingspan Insulation price-list or advice sought from Kingspan Insulation Sales department. The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described. Recommendations for use should be verified as to the suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a free Technical Advisory Service (see left) whose advice should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of the literature is current by contacting our Marketing Department (see above).*



### Kingspan Insulation

Pembridge, Leominster, Herefordshire HR6 9LA, UK  
Castleblayney, County Monaghan, Ireland

[www.insulation.kingspan.com](http://www.insulation.kingspan.com)