CI/Sfb (21.9) Rn7 M2
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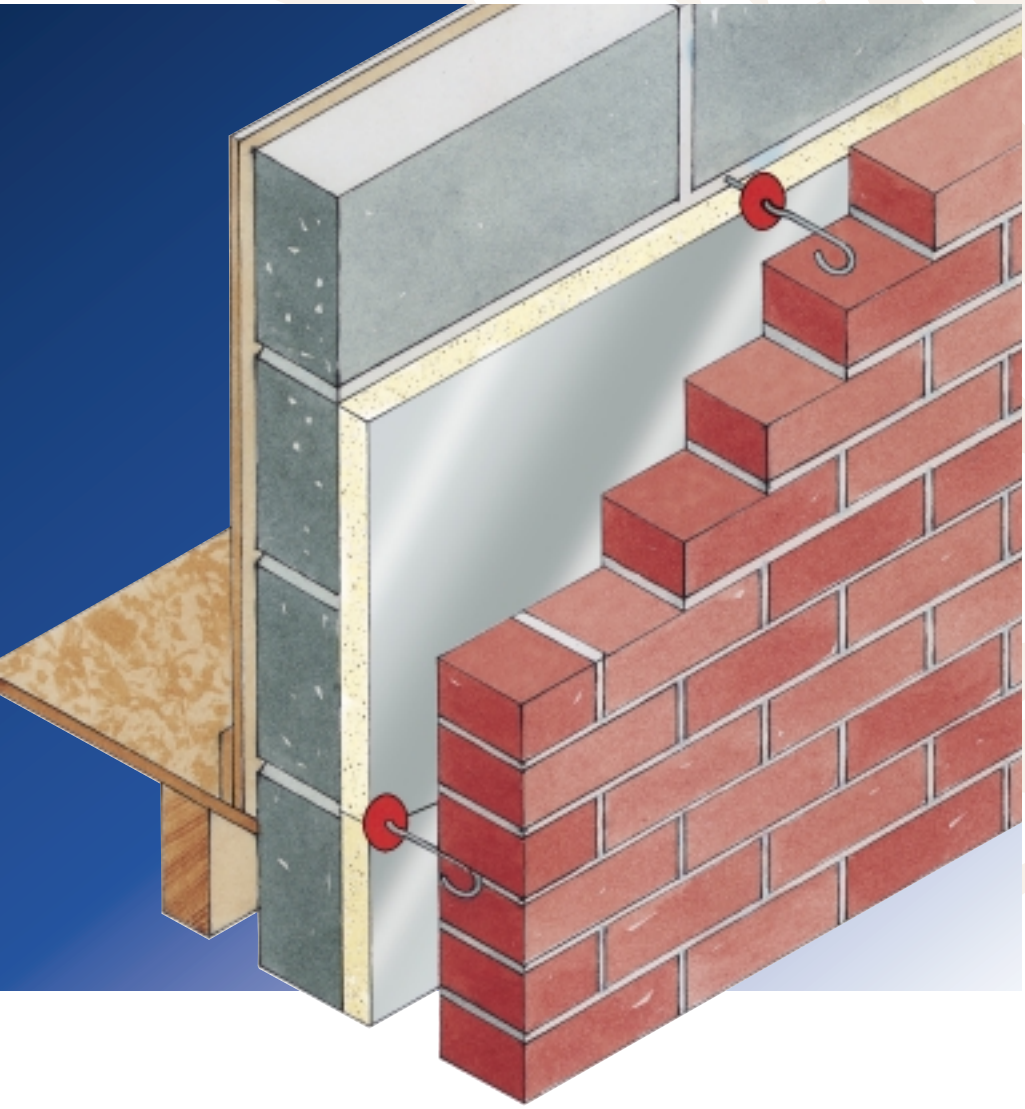
Thermawall TW50 zero ODP

PARTIAL FILL CAVITY WALL INSULATION



- High performance rigid urethane insulation – thermal conductivity 0.022 W/m.K
- Utilises traditional cavity wall construction methods
- Clear cavity is maintained – resists moisture penetration
- Low emissivity foil facings are resistant to the passage of water vapour and double the thermal resistance of the cavity
- Meets NHBC technical requirements when used with a 50mm residual cavity
- Unaffected by air movement
- Easy to handle and install
- CFC/HCFC-free with zero Ozone Depletion Potential (ODP)

zero O.D.P

BS EN ISO 9002 : 1994
Certificate No. FM 10697

BBA BRITISH BOARD OF AGREMENT CERTIFICATE 94/2992

Kingspan **Therma**wall TW50 zero ODP

TYPICAL DESIGN DETAIL

Figure 1

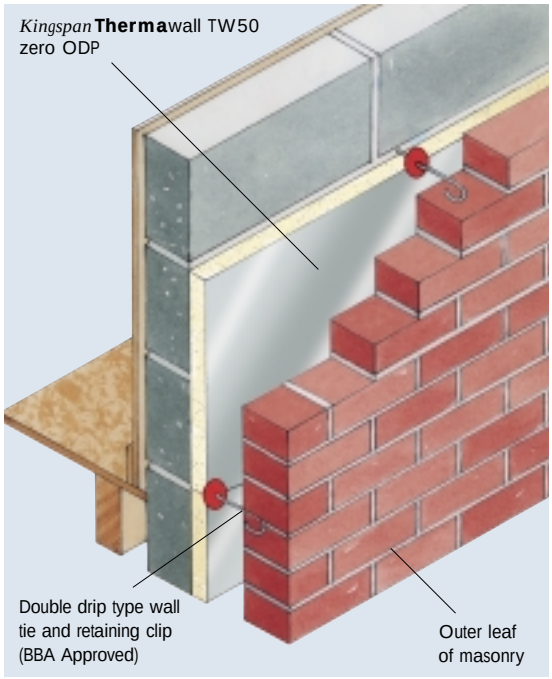
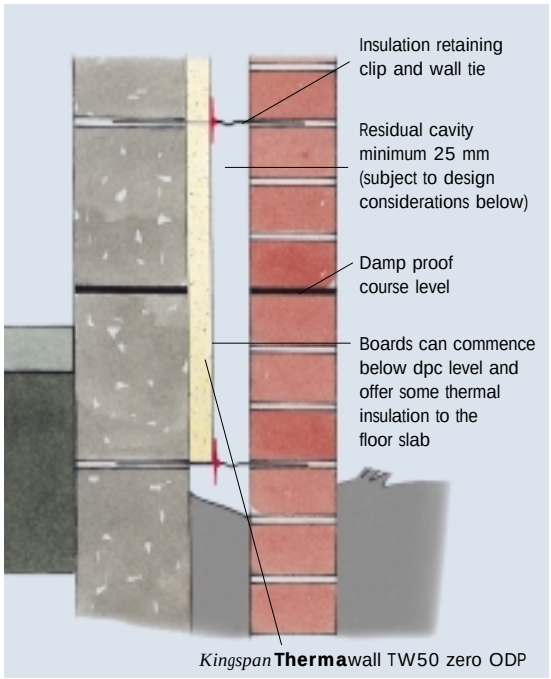


Figure 2



SPECIFICATION CLAUSE

Kingspan **Therma**wall TW50 zero ODP should be described in specifications as:-

The wall insulation shall be *Kingspan* **Therma**wall TW50 zero ODP ____mm thick comprising a CFC / HCFC-free rigid urethane insulation core with low emissivity composite foil facings on both sides manufactured to BS EN ISO 9002: 1994 by Kingspan Insulation Limited and shall be applied in accordance with the instructions issued by them.

Details also available in NBS PLUS.
NBS users should refer to clause(s):
F30 151 (Standard and Intermediate)
F30 12 (Minor Works)

DESIGN CONSIDERATIONS

RESIDUAL CAVITY WIDTH

For practical purposes it is recommended that a 25 mm cavity is always maintained up to a wall height of 12 m, and a minimum 50 mm cavity for wall height greater than 12 m*, after the installation of *Kingspan* **Therma**wall TW50 zero ODP irrespective of the thickness specified. By maintaining a clear cavity, problems associated with fully filled cavities can be avoided.

*A residual cavity width of 50 mm nominal will be required by the NHBC where nominal standards of tolerance and workmanship are accepted.

DESIGN STANDARDS

BS 5628: Part 1: 1992 (Code of practice for use of masonry. Structural use of unreinforced masonry) and Part 2: 2000 (Code of practice for use of masonry. Structural use of reinforced and prestressed masonry) should be consulted regarding the construction of insulated cavity walls.

WALL TIES

Wall ties should have a retaining clip for securing the insulant to the masonry plane and be of a double drip type. Ideally they should be BBA approved and conform to BS 1243: 1978 (Specification for metal ties for cavity wall construction).

SEVERE EXPOSURE ZONES

In severe exposure zones only stainless steel or copper alloy wall ties should be used. BS 5628: Part 3: 1985 (Code of practice for use of masonry. Materials and components, design and workmanship) refers to this.

THERMAL PROPERTIES

The R-values and λ-values quoted in this document for rigid urethane insulation are based on the procedures for the determination of the aged values of thermal resistance and thermal conductivity, laid down in the harmonised European standard BS EN 13165, using so called 90:90 principles. Comparison with alternative products may not be appropriate unless the same procedures have been followed.

THERMAL CONDUCTIVITY

The boards achieve a thermal conductivity (λ-value) of 0.022 W / m.K.

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.

Insulant Thickness (mm)	Thermal Resistance (m^2.K / W)
17	0.773
20	0.909
25	1.136
30	1.364
35	1.591
40	1.818
45	2.045
50	2.273
55	2.500
60	2.727
65	2.955

TYPICAL U-VALUES

The following examples have been calculated using both the combined method and the proportional area method. The combined method is required for compliance with Building Regulations / Standards revised after the year 2000. These examples are based on the use *Kingspan* **Therma**wall TW50 zero ODP fixed to the outer face of the inner leaf of a masonry cavity wall with a minimum 25 mm clear cavity between the face of the *Kingspan* **Therma**wall TW50 zero ODP and the outer leaf of brickwork. For reasons of comparison the internal wall finish is taken as 12.5 mm plasterboard on dabs. The U-values quoted take account of the low emissivity cavity created by the foil-faced insulation. If your construction is any different, please consult our Technical Services Department (see rear cover).

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 / IS 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 to BS / IS EN ISO 6946: 1997, the type of wall tie used may change the thickness of insulation required. These calculations assume a stainless steel double triangle tie 3.7 mm diameter giving a cross sectional area of 10.75 mm^2. 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 a condensation risk analysis should be completed for each individual project. Please call our Technical Services Department for assistance (see rear cover).

BRICK / DENSE CONCRETE BLOCK (λ-value 1.13 W / m.K)

Insulant Thickness (mm)	U-value (W / m^2.K)	
	Combined Method	*Proportional Area Method*
17	0.56	*0.59*
20	0.52	*0.55*
25	0.47	*0.49*
30	0.42	*0.44*
40	0.35	*0.37*
45	0.33	*0.34*
50	0.30	*0.31*
55	0.28	*0.29*
60	0.27	*0.27*
65	0.25	*0.26*

BRICK / MEDIUM DENSITY CONCRETE BLOCK (λ-value 0.51 W / m.K)

Insulant Thickness (mm)	U-value (W / m^2.K)	
	Combined Method	*Proportional Area Method*
17	0.53	*0.56*
20	0.49	*0.52*
25	0.44	*0.46*
30	0.40	*0.42*
35	0.37	*0.38*
40	0.34	*0.35*
50	0.30	*0.30*
60	0.26	*0.27*
65	0.25	*0.25*

BRICK / LIGHTWEIGHT CONCRETE BLOCK (λ-value 0.15 W / m.K) ACCOUNTING FOR MORTAR JOINTS

Insulant Thickness (mm)	U-value (W / m^2.K)	
	Combined Method	*Proportional Area Method*
17	0.44	*0.45*
20	0.42	*0.42*
25	0.38	*0.39*
30	0.35	*0.36*
40	0.30	*0.31*
50	0.27	*0.27*
55	0.25	*0.25*

BRICK / AERATED CONCRETE BLOCK (λ-value 0.11 W / m.K) ACCOUNTING FOR MORTAR JOINTS

Insulant Thickness (mm)	U-value (W / m^2.K)	
	Combined Method	*Proportional Area Method*
17	0.41	*0.41*
20	0.39	*0.39*
25	0.36	*0.36*
30	0.33	*0.33*
40	0.29	*0.29*
45	0.27	*0.27*
50	0.25	*0.25*

PREVENTION OF THERMAL BRIDGING

In an effort to prevent a cold bridge detail at window cill and jamb details the designer may wish to adopt the following details. The insulation is simply cut and returned to suit.

Figure 3 TYPICAL JAMB DETAIL

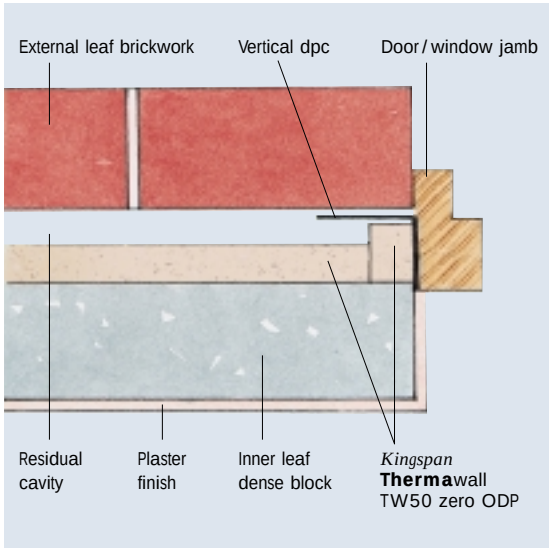
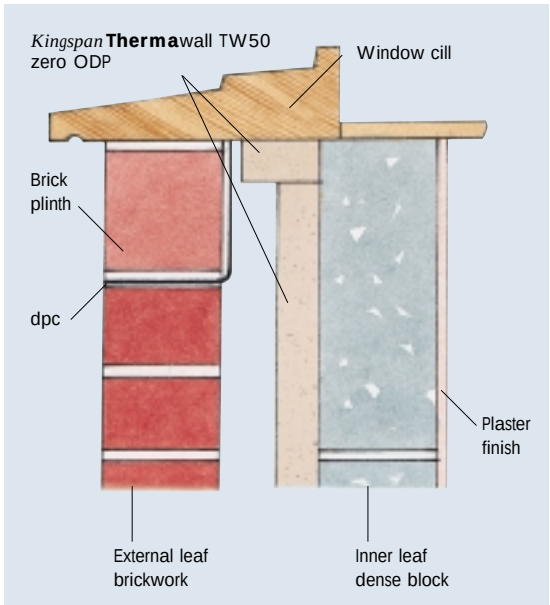


Figure 4 TYPICAL CILL DETAIL



SITEWORK

WALL TIES & RETAINING CLIPS

Kingspan **Therma**wall TW50 zero ODP is normally held in position by the wall ties used to tie the two skins of masonry together using retaining clips. Walls are constructed in the conventional manner but with the first run of wall ties at least one course below the damp-proof course and at approximately 600 mm horizontal centres. A section of the inner or outer leaf of the wall is built up to the course below the next run of the wall ties which are situated at a spacing of 450 mm vertically and 900 mm horizontally. The *Kingspan* **Therma**wall TW50 zero ODP boards are then placed in position behind the retaining clips on the wall ties, and additional wall ties and clips are used to retain the top of the board. Additional ties may also be required at corners, junctions and cut board ends. Each board should be secured by a minimum of three retaining clips. The boards should form a reasonable butt jointed row. The other leaf is then built up to the level of the top of the boards and construction proceeds.

The first row of boards commencing below damp-proof course level also provides some edge insulation to the floor slab (see figure 2). Successive sections of wall incorporating wall ties and clips are constructed and *Kingspan* **Therma**wall TW50 zero ODP boards installed as work proceeds up to the required height. After raising each section of inner leaf, before installation, excess mortar should be removed and mortar droppings cleaned from exposed edges of the installed slabs. Use of a cavity batten or cavity board, is recommended to protect board edges and maintain a clear cavity (see Figures 5 & 6 or refer to BBA Certificate 94 / 2992).

Figure 5 USE OF A CAVITY BATTEN TO PROTECT THE CAVITY

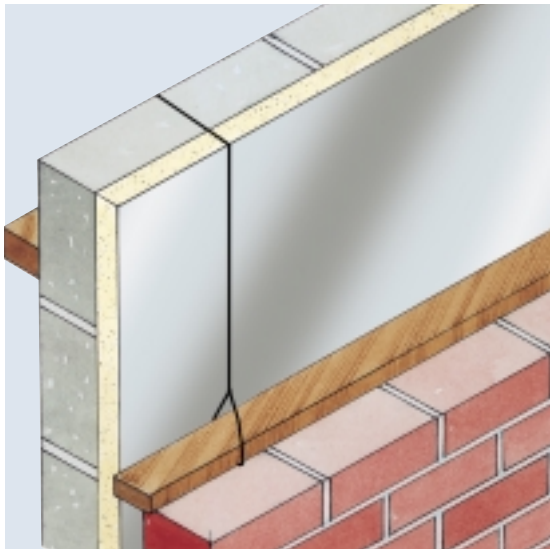


Figure 6 USE OF A CAVITY BOARD TO PROTECT THE CAVITY

DAILY WORKING PRACTICE

Installed *Kingspan* **Therma**wall TW50 zero ODP boards should be protected against inclement weather.

CUTTING

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

AVAILABILITY

Kingspan **Therma**wall TW50 zero ODP is available through specialist insulation distributors and selected builders merchants throughout the UK, Ireland and Europe.

PACKAGING

The boards are supplied in labelled packs shrinkwrapped in polythene.

STORAGE

The packaging of *Kingspan* **Therma**wall TW50 zero ODP should not be considered adequate for long term outside protection. Ideally, boards should be stored inside a building. However, if 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).

Please note that the reflective surface on this product is designed to enhance its thermal performance. As such, it will reflect light as well as heat, including ultraviolet light. Therefore, if this board is being installed during very bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream.

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

Kingspan **Therma**wall TW50 zero ODP

PRODUCT DESCRIPTION

THE FACINGS

Kingspan **Therma**wall TW50 zero ODP is faced on both sides with a low emissivity composite foil which is highly resistant to the transmission of water vapour. This reflective, low emissivity surface effectively doubles the thermal resistance of the cavity in which the board is placed.

THE CORE

The core of *Kingspan* **Therma**wall TW50 zero ODP is a high performance CFC / HCFC-free rigid urethane insulant of typical density 32 kg / m^3.

CFC / HCFC-FREE

Kingspan **Therma**wall TW50 zero ODP is manufactured without the use of CFCs / HCFCs and has zero Ozone Depletion Potential (ODP).

zero o.d.p

PRODUCT DATA

STANDARDS AND APPROVALS

Kingspan **Therma**wall TW50 zero ODP is manufactured to the highest standards under a quality control system approved to BS EN ISO 9002: 1994 (Quality systems. Model for quality assurance in production, installation and servicing). Its use is covered by BBA Certificate 94 / 2992.

BBA BRITISH BOARD OF AGREMENT CERTIFICATE 94/2992

BSI REGISTERED FIRM

BS EN ISO 9002 : 1994
Certificate No. FM 10697

STANDARD DIMENSIONS

Kingspan **Therma**wall TW50 zero ODP is available in the following standard sizes and thicknesses:

Nominal Dimension		Availability
Length	(m)	1.2
Width	(m)	0.45 (0.6)
Insulant Thickness*	(mm)	17, 20, 25, 30, 35, 40 45, 50, 55, 60, 65

* Other thicknesses are available subject to quantity.

INSULATION COMPRESSIVE STRENGTH

Typically exceeds 140 kPa at 10% compression when tested to British Standard 4370: Part 1: 1988 (1996) (Methods of test for rigid cellular materials).

WATER VAPOUR RESISTANCE

Modified to include board facings, the boards achieve a resistance far greater than 100 MN.s / g when tested in accordance with BS 4370: Part 2: 1993.

DURABILITY

If correctly applied, *Kingspan* **Therma**wall TW50 zero ODP has 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 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**wall TW50 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**wall TW50 zero ODP resist attack by mould and microbial growth and do not provide any food value to vermin.

FIRE PERFORMANCE

Kingspan **Therma**wall TW50 zero ODP, when subjected to British Standard fire tests, achieves the results given below. Further details on the fire performance of Kingspan Insulation products may be obtained from our Technical Services Department (see rear cover).

Test	Result
BS 476: Part 7: 1997 (Surface Spread of Flame Test)	Class 1 rating

The use of the product in the context of BBA Certificate 94 / 2992 does not prejudice the fire resistance properties of the wall. It is unlikely to become ignited within the cavity. If fire does penetrate into an unventilated cavity, the amount of air present will be insufficient to support combustion, and flame spread will be minimal.

Walls containing the product do not need cavity barriers in buildings of any purpose group provided they are constructed in accordance with the provisions of BBA Certificate 94 / 2922.

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 and IS 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

INSULATED DRY LINING

TAPERED ROOFING SYSTEMS

Kingspan **Kool**Duct® PRE-INSULATED DUCTING

Kingspan ***nilvent***™ BREATHABLE MEMBRANES

Kingspan **TEK** Haus™ BUILDING SYSTEM

THE KINGSPAN INSULATION PRODUCT RANGE

THE KINGSPAN KOOLTHERM® K-RANGE

- With a thermal conductivity of 0.018 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 0.022-0.026 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™ & 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 – masks are not required, as Kingspan Insulation products do not produce loose dust or irritable fibres.
- 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:

TECHLINE

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, on CD-ROM 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:

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

Kingspan Insulation reserve the right to amend product specifications without prior notice. 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

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