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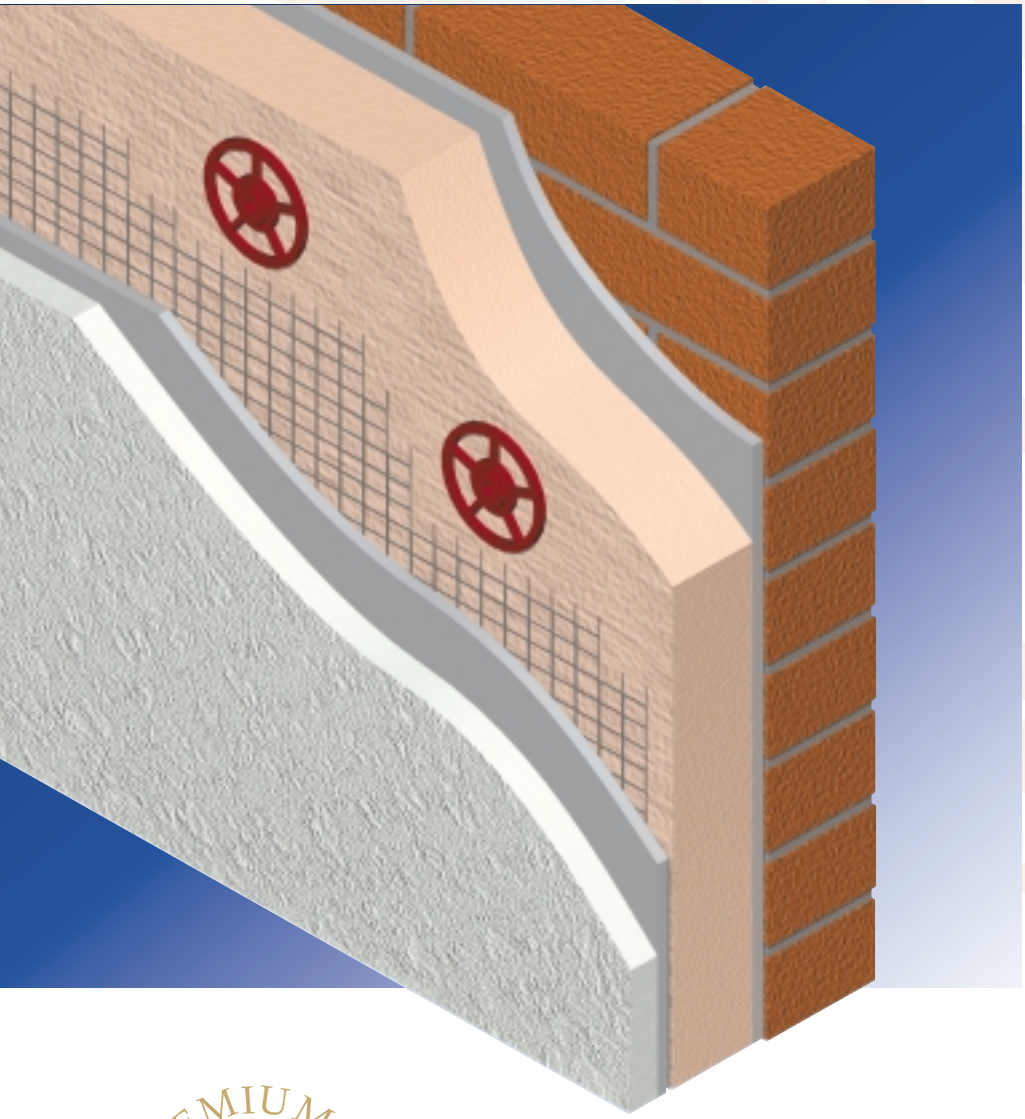
Kingspan® Insulation Solutions

Kooltherm® K5 EWB

INSULATION FOR USE BEHIND TRADITIONAL AND LIGHTWEIGHT POLYMER MODIFIED RENDERS AND TIMBER OR TILE RAINSCREENS



- Premium performance rigid phenolic insulation – thermal conductivity 0.022–0.024 W/m.K
- Class O fire rating/low risk
- Negligible smoke emission
- Suitable for use behind traditional and lightweight polymer modified renders
- Suitable for use behind timber or tile rainscreens
- Transforms and upgrades the appearance of existing buildings
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for newbuild and refurbishment
- CFC–free

PREMIUM PERFORMANCE

LPCB LOSS PREVENTION CERTIFICATION BOARD
UKAS QUALITY MANAGEMENT 007

Manufactured to BS EN ISO 9002: 1994
Certificate No. 388/2

Kingspan **Kool**therm® K5 EWB

TYPICAL DESIGN DETAILS

Figure 1 INSULATED RENDER SYSTEM ON MASONRY

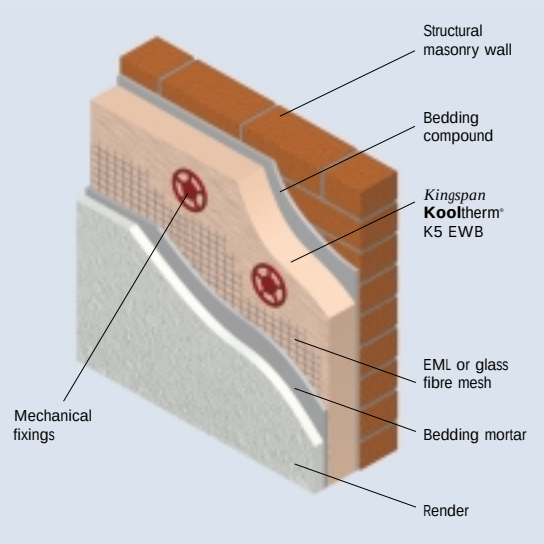


Figure 2 INSULATED RENDER SYSTEM ON TIMBER FRAME / STRUCTURAL INSULATED PANELS

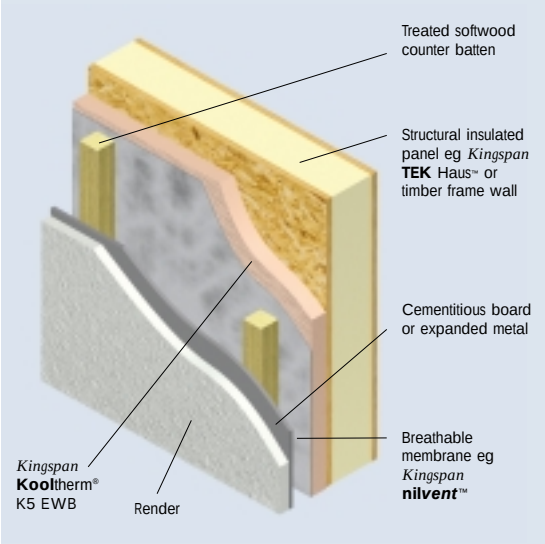


Figure 3 TIMBER BOARDING RAINSCREEN

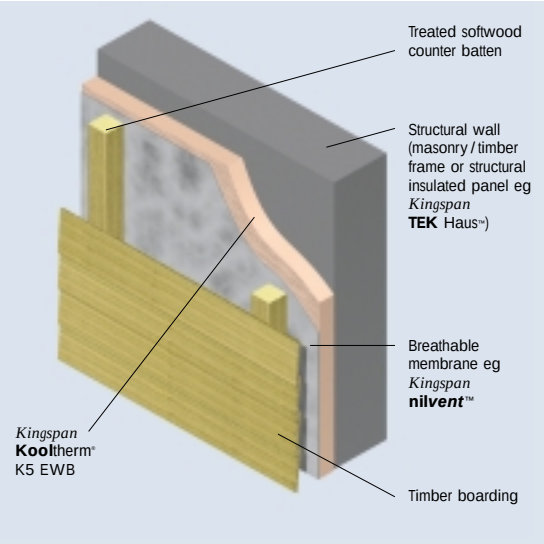
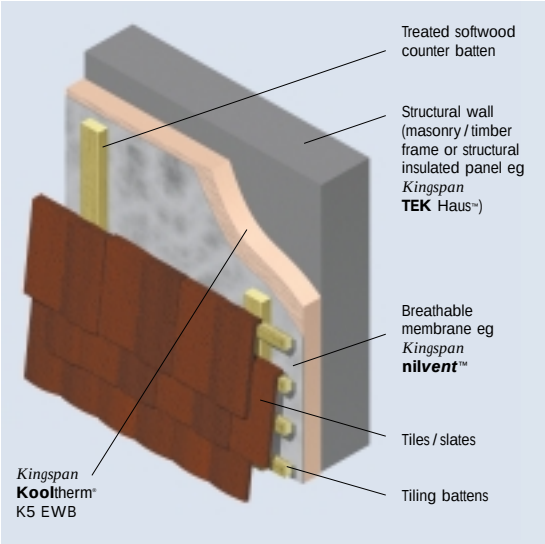


Figure 4 TILE HANGING RAINSCREEN



SPECIFICATION CLAUSE

Kingspan **Kool**therm® K5 EWB should be described in specifications as:–

The wall insulation shall be *Kingspan* **Kool**therm® K5 EWB ____mm thick comprising a CFC–free rigid phenolic insulation core with plain glass tissue facings on both sides manufactured in accordance with the requirements of 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):
H20 150, H20 155, H92 776, M21 210, M21 220 and P10 217 (Standard and Intermediate)

DESIGN CONSIDERATIONS

TYPICAL APPLICATIONS

Kingspan **Kool**therm® K5 EWB may be installed either mechanically fixed to an existing masonry wall behind a traditional or lightweight polymer modified render system or fixed behind timber counter battens behind rendered expanded metal / cementitious board, or a timber boarding or tile hanging rainscreen. Once installed, *Kingspan* **Kool**therm® K5 EWB can exceed Building Regulations / Standards requirements for these applications.

WATER VAPOUR CONTROL

Surface Condensation

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

Interstitial Condensation

The Kingspan Insulation Technical Services Department can provide a condensation risk analysis of your proposed design (see rear cover). Alternatively the designer can undertake an independent assessment by following the procedures set out in BS 5250: 1989 (1995) (Code of practice for the control of condensation in buildings).

FIRE STOPS

Current Building Regulations / Standards should be considered with regard to the requirements for and / or provision of fire stops in the case of installation behind a timber boarding or tile hanging rainscreen.

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. For reasons of comparison the internal wall finish in these examples is taken as 13 mm dense plaster unless stated otherwise. 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 / 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 a condensation risk analysis should be completed for each individual project. Please call our Technical Services Department for assistance (see rear cover).

INSULATED RENDER SYSTEM ON:

Kingspan **TEK** Haus™ LINED WITH 12.5 mm PLASTERBOARD ON MIN 10 mm BATTENS

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.18	*0.18*
25	0.17	*0.17*
30	0.17	*0.16*
40	0.16	*0.15*
50	0.14	*0.14*
60	0.14	*0.13*
70	0.13	*0.12*

215 mm SOLID AERATED CONCRETE BLOCK (λ–VALUE 0.11 W / m.K) ACCOUNTING FOR MORTAR JOINTS WITH 12.5 mm PLASTERBOARD ON DABS

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.36	*0.34*
25	0.33	*0.31*
30	0.31	*0.29*
35	0.29	*0.27*
40	0.27	*0.26*
45	0.25	*0.24*

BRICK / CAVITY / MEDIUM DENSITY CONCRETE BLOCK (λ–VALUE 0.51 W / m.K)

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.63	*0.63*
25	0.55	*0.54*
30	0.49	*0.49*
40	0.40	*0.40*
50	0.33	*0.33*
55	0.31	*0.31*
60	0.29	*0.29*
70	0.25	*0.25*

BRICK / CAVITY / BRICK

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.64	*0.64*
25	0.55	*0.55*
30	0.49	*0.49*
40	0.41	*0.41*
50	0.33	*0.33*
55	0.31	*0.31*
60	0.29	*0.29*
70	0.26	*0.26*
75	0.24	*0.24*

215 mm SOLID BRICKWORK

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.74	*0.74*
25	0.62	*0.62*
30	0.55	*0.55*
40	0.44	*0.44*
45	0.39	*0.39*
50	0.36	*0.36*
55	0.33	*0.33*
60	0.31	*0.31*
70	0.27	*0.27*
75	0.25	*0.25*

103 mm SOLID BRICKWORK UNLINED

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.85	*0.85*
25	0.70	*0.70*
30	0.61	*0.61*
40	0.48	*0.48*
45	0.42	*0.42*
50	0.38	*0.38*
55	0.35	*0.35*
60	0.33	*0.33*
70	0.28	*0.28*
75	0.27	*0.27*
80	0.25	*0.25*

TIMBER BOARDING OR TILE HANGING RAINSCREEN ON:

Kingspan **TEK** Haus™ LINED WITH 12.5 mm PLASTERBOARD ON MIN 10 mm BATTENS

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.18	*0.18*
25	0.17	*0.17*
30	0.17	*0.16*
40	0.16	*0.15*
50	0.14	*0.14*
60	0.14	*0.13*
70	0.13	*0.12*
80	0.12	*0.12*

215 mm SOLID AERATED CONCRETE BLOCK (λ–VALUE 0.11 W / m.K) ACCOUNTING FOR MORTAR JOINTS WITH 12.5 mm PLASTERBOARD ON DABS

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.35	*0.33*
25	0.32	*0.30*
30	0.30	*0.28*
35	0.28	*0.27*
40	0.27	*0.25*
45	0.25	*0.23*

BRICK / CAVITY / MEDIUM DENSITY CONCRETE BLOCK (λ–VALUE 0.51 W / m.K)

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.61	*0.60*
25	0.53	*0.52*
30	0.47	*0.47*
40	0.39	*0.39*
50	0.33	*0.32*
55	0.30	*0.30*
60	0.28	*0.28*
70	0.25	*0.25*

BRICK / CAVITY / BRICK

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.62	*0.60*
25	0.53	*0.52*
30	0.48	*0.47*
40	0.40	*0.39*
50	0.33	*0.32*
55	0.30	*0.30*
60	0.28	*0.28*
70	0.25	*0.25*

215 mm SOLID BRICKWORK

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.71	*0.69*
25	0.60	*0.59*
30	0.53	*0.52*
35	0.48	*0.47*
40	0.43	*0.43*
45	0.38	*0.39*
50	0.35	*0.35*
55	0.33	*0.32*
60	0.30	*0.30*
70	0.27	*0.26*
75	0.25	*0.25*

103 mm SOLID BRICKWORK UNLINED

Insulant Thickness (mm)	U–value (W / m².K)	
	Combined Method	*Proportional Area Method*
20	0.81	*0.79*
25	0.67	*0.66*
30	0.59	*0.57*
35	0.52	*0.51*
40	0.47	*0.46*
45	0.41	*0.40*
50	0.37	*0.37*
55	0.34	*0.34*
60	0.32	*0.32*
65	0.30	*0.30*
70	0.28	*0.28*
75	0.26	*0.26*
80	0.25	*0.25*

SITEWORK

INSULATED RENDER SYSTEMS
Because insulated render systems are proprietary and utilise different mechanisms for attaching insulation to the wall structure, sitework guidance should be sought from the system manufacturers.

However, in the absence of any other guidance *Kingspan* **Kool**therm® K5 EWB insulation boards are mechanically fixed to the exterior of masonry external walls using anchor bolts, expansion fixings, proprietary fixings or bedded in render. In the case of timber frame walls or the *Kingspan* **TEK** Haus™ Building System, the insulation is attached in the same manner as for timber boarding rainscreens. However, an expanded metal sheet or cementitious board replaces the timber boarding and it is this that carries the render. Sill extenders and flashings are used around openings, although the use of rigid phenolic insulation minimises the overall thickness of the external render system.

TIMBER BOARDING RAINSCREEN
Where the intended external cladding is to be timber boarding, *Kingspan* **Kool**therm® K5 EWB boards are temporarily pinned in place with all joints tightly butted. A breathable membrane eg. *Kingspan* **nil*vent***™ is applied over the insulation boards and temporarily stapled or pinned in place. Preservative treated softwood counter battens are fixed vertically to the wall structure at 600 mm centres. The timber boarding system is then fixed to the counter battens. Should the external wall be of timber frame construction the counter battens should be fixed at centres to coincide with the timber frame wall studs. Application advice should be sought from the appropriate membrane manufacturer. Timber boarding should be secured in accordance with the boarding manufacturer's recommendations.

TILE HANGING RAINSCREEN
Where the intended external cladding is to be wall tiling, *Kingspan* **Kool**therm® K5 EWB boards are temporarily pinned in place with all joints tightly butted. A breathable membrane eg *Kingspan* **nil*vent***™ is applied on the insulation boards and temporarily stapled or pinned in place. Preservative treated softwood counter battens are fixed vertically to the wall structure at 600 mm centres. Horizontal tile battens are then fixed to the counter battens to carry the tile hanging system. Should the external wall be of timber frame construction, the counter battens should be fixed at centres to coincide with the timber frame wall studs. Application advice should be sought from the appropriate membrane manufacturer. Tile hanging should be secured in accordance with the tile manufacturer's recommendations.

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

FIXINGS FOR ATTACHMENT OF VERTICAL COUNTER BATTENS
Target TurboFlex or similar approved fixings should be applied at centres appropriate to the design of the wall and location of the building, in order to fix vertical battens through to the underlying masonry wall.

Helifix In–Skew, Target Skewfast, Wallfast Timfix or similar approved fixings should be applied at centres appropriate to the design of the wall and location of the building in order to fix vertical battens through to the wall studs of a timber frame wall.

Refer to:

Helifix Limited	+44 (0)20 8735 5222;
Target Fixings Limited	+44 (0)1344 777 189; or
Wallfast Limited	+44 (0)23 9265 3330.

AVAILABILITY
Kingspan **Kool**therm® K5 EWB is available through specialist insulation distributors and selected Builders Merchants throughout the UK, Ireland and Europe.

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

STORAGE
The packaging of *Kingspan* **Kool**therm® K5 EWB 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.

PRODUCT DESCRIPTION

THE FACINGS
Kingspan **Kool**therm® K5 EWB is faced on both sides with plain glass tissue autohesively bonded to the insulation core during manufacture.

THE CORE
The core of *Kingspan* **Kool**therm® K5 EWB is a CFC–free rigid phenolic insulant of typical density 50 kg / m^3.

CFC–FREE*
Kingspan **Kool**therm® K5 EWB is produced using alternative blowing agents in compliance with the Montreal Protocol.

* *Kingspan* **Kool**therm® K5 EWB is also available CFC / HCFC–free subject to enquiry.

PRODUCT DATA

STANDARDS AND APPROVALS

Kingspan **Kool**therm® K5 EWB 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).

STANDARD DIMENSIONS

Kingspan **Kool**therm® K5 EWB is available in the following standard size and thicknesses:

Nominal Dimension		Availability
Length	(m)	1.2
Width	(m)	0.6
Insulant Thickness*	(mm)	20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80

* 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).

WATER VAPOUR RESISTANCE

Modified to include board facings, the boards achieve a resistance far greater than 15 MN.s/g, when tested in accordance with BS 4370: Part 2: 1993.

DURABILITY

If correctly applied, *Kingspan* **Kool**therm® K5 EWB has an indefinite life. It's durability depends on the supporting structure and the conditions of it's 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* **Kool**therm® K5 EWB. Boards which have been in contact with harsh solvents, petrol, mineral oil or acids, or boards that have been damaged in any way should not be used.

The insulation core and facings used in the manufacture of *Kingspan* **Kool**therm® K5 EWB resist attack by mould and microbial growth and do not provide any food value to vermin.

FIRE PERFORMANCE

The rigid phenolic insulation core of *Kingspan* **Kool**therm® K5 EWB will achieve the results given below which enables it to be classified by the Building Regulations as being Class O and low risk by the Technical Standards in Scotland.

Kingspan **Kool**therm® K5 EWB, when subjected to British Standard fire tests, achieves the results stated in the table below. Further details of the fire performance of Kingspan Insulation products may be obtained from our Technical Services (see rear cover).

Test	Result
BS 476: Part 6: 1989 (Fire Propagation Test)	Index of performance (I) (Fire not exceeding 12 and sub–index (i1) not exceeding 6 (for rigid phenolic insulation core)
BS 476: Part 7: 1997 (Surface Spread of Flame Test)	Class 1 rating for rigid phenolic insulation core
BS 5111: Part 1: 1974 (Smoke Obscuration)	< 5%

THERMAL PROPERTIES

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

THERMAL CONDUCTIVITY

The thermal conductivity (λ–value) of the insulation core of *Kingspan* **Kool**therm® K5 EWB is 0.024 W/m.K (insulant thickness 15–24 mm), 0.023 W/m.K (insulant thickness 25–44 mm), 0.022 W/m.K (insulant thickness ≥45 mm).

THERMAL RESISTANCES

Thermal resistance (R–value) varies with the 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)
20	0.80
25	1.05
30	1.30
35	1.50
40	1.70
45	2.00
50	2.25
55	2.50
60	2.70
65	2.95
70	3.15
75	3.40
80	3.60

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 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

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

www.insulation.kingspan.com

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