



BREEAM 2011

WHAT CREDITS CAN KINGSPAN KOOLTHERM[®],
KOOLDUCT[®] & THERMA[™] PRODUCTS ACHIEVE?



Low Energy –
Low Carbon Buildings

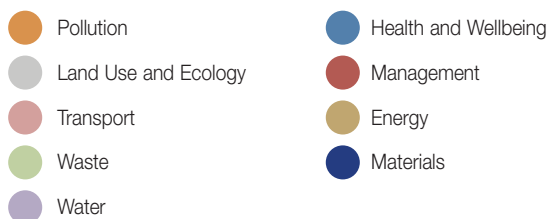
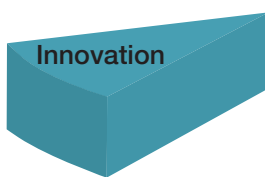
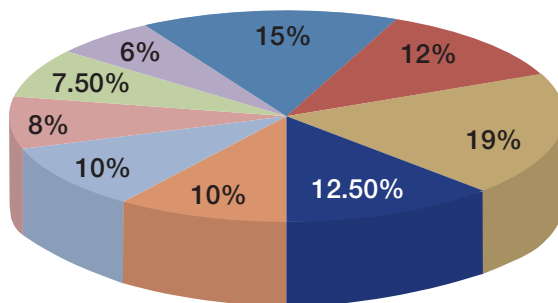
BREEAM 2011

Introduction

BREEAM (the Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for non-residential buildings. Credits are awarded in ten sections according to performance. These credits are then added together to produce a single overall score on a scale of Pass, Good, Very Good, Excellent or Outstanding. The current version of BREEAM for new construction works is BREEAM 2011 New Construction.

The process of determining a BREEAM rating is outlined below.

1. For each BREEAM section a number of credits are awarded.
2. The percentage of the total number of credits available in each BREEAM section that have been awarded is calculated.
3. The percentage of total credits awarded is then multiplied by the corresponding BREEAM section weighting to give a section score. The diagram below shows the section weightings for BREEAM. The percentages reflect the relative importance of the different sections.



4. The section scores are then added together to give the overall BREEAM score.
5. The relevant BREEAM rating (i.e. Pass, Good, Very Good, Excellent or Outstanding) is achieved based on the overall BREEAM score.

Each of the ten sections of which BREEAM comprises is broken up into subsections and these are shown below:

- management (Man 1 - Man 5);
- health & wellbeing (Hea 1 - Hea 6);
- energy (Ene 1 - Ene 9);
- transport (Tra 1 - Tra 5);
- water (Wat 1 - Wat 4);
- materials (Mat 1 - Mat 5);
- waste (Wst 1 - Wst 4);
- land use & ecology (LE 1 - LE 6); and
- pollution (Pol 1 - Pol 5).

Furthermore, ten additional credits are available for:

- Innovation (Inn 1).

Only two of these sections, energy and materials, offer credits related directly to thermal insulation products. The relevant subsections are Ene 1, Mat 1, Mat 3 and Mat 4.

Ene 1 - Reduction of CO₂ Emissions

Up to 15 credits are available for a building's operational energy demand, energy consumption and CO₂ emissions. The number of credits achieved is determined by comparing the building's Energy Performance Ratio for New Construction (EPRNC) with the table of benchmarks below:

BREEAM Credits	EPR _{NC}	Minimum Requirements
1	0.05	Requires a performance improvement
2	0.15	progressively better than the Target
3	0.25	Emission Rate (TER) required for Building
4	0.35	Regulations approval.
5	0.45	
6	0.55	BREEAM Excellent level (≥6 credits):
7	0.59	Requires a CO ₂ parameter for the EPRNC
8	0.63	calculation of 0.22. This is equivalent to a
9	0.67	25% improvement on the TER
10	0.72	BREEAM Outstanding level (≥10 credits):
11	0.75	Requires a CO ₂ parameter for the EPRNC
12	0.79	calculation of 0.30. This is equivalent to a
13	0.83	40% improvement on the TER
14	0.87	
15	0.90	Requires a CO ₂ parameter for the EPRNC
		calculation of 0.38. This is equivalent to a
		100% improvement on the TER i.e. zero net
		CO ₂ emissions.

Clearly, thermal insulation and ductwork air-tightness are two of the most effective ways to reduce a building's operational energy demand, energy consumption and CO₂ emissions. Insulation and air-tight ductwork do not achieve any specific credits under this BREEAM subsection, but their use can contribute enormously to the achievement of a large number of credits.

Mat 1 - Life Cycle Impacts

Up to six credits are available, based on the Green Guide ratings of a building's major elements i.e. external walls, windows, roof, upper floor slabs, internal walls, and floor finishes / coverings. Not all of these elements are assessed for all building types. The number of elements assessed differs by building type. One credit is available for each element assessed. The process for calculating the number of credits awarded can be summarised as follows. Each element is awarded points according to its area weighted Green Guide rating as shown in the table below.

Green Guide Rating	Points
A+	3
A	2
B	1
C	0.5
D	0.25
E	0

The total number of points for all elements is converted in to BREEAM credits as in the table below.

Total Points	Credits
2	1
4	1 (2 for industrial)
5	2
8	3
10	4
12	5
14	6

The number of elements assessed, for which points are available, and the maximum number of credits, differs by building type. So, for instance, in Healthcare buildings 6 elements are assessed, and so 18 points in total are available with a maximum of 6 credits. In Prisons 4 elements are assessed, and so 12 points in total are available with a maximum of 4 credits. Surplus credits can be converted into Innovation credits.

The Green Guide assesses the environmental impacts of building elements assuming they contain a "generic average" insulation material, except where the insulation provides a significant additional function or where the insulation is incorporated into the construction offsite e.g. in structural insulated panels.

Where the insulation does not provide a significant additional function or where the insulation is not incorporated into the construction offsite, the environmental impacts of the "specific" insulation materials used in a project are assessed in the BREEAM 2011 "Materials" section Mat 4.

Where the insulation provides a significant additional function or where the insulation is incorporated into the construction offsite, the "specific" insulation is listed in the building element description and its environmental impacts are included in the assessment of the environmental impacts of the building element in question. For the purposes of section Mat 4 the "specific" insulation is assumed to have a Green Guide rating of A+.

For thermal insulation, Mat 1 is therefore only relevant if the thermal insulation is incorporated into a system and in this case a specific Green Guide rating will be required for the building element of which that system forms the basis. Mat 1 does not cover HVAC ductwork.

BREEAM 2011

Mat 3 - Responsible Sourcing of Materials

Up to 3 credits are available where evidence provided demonstrates that materials in the following building elements are responsibly sourced:

- structural frame;
- ground & upper floors (including separating floors);
- roof;
- external & internal walls;
- foundation / substructure;
- staircase, windows, doors; and
- hard landscaping

Additionally 100% of any timber must be legally sourced.

The assessed materials are: bricks & clay tiles; pavers; resin-based composites & materials; concrete and cement based materials; glass; plastics and rubbers; metals; dressed or building stone & gravel; timber and wood panel products; plasterboard and plaster; bituminous materials; other mineral-based materials including fibre cement and calcium silicate; and products with recycled content.

Insulation materials, fixings, adhesives and additives are excluded from the assessment.

To be responsibly sourced these materials must be certified in accordance with the relevant tier level described in the table below:

Tier level	Points available per element	Examples of compliant certification schemes
1	4.0	There are currently no schemes allocated to this tier
2	3.5	BES 6001 - certified "excellent"
3	3.0	BES 6001 - certified "very good" Timber: CSA, FSC®, PEFC or SFI CoC certification Reused materials
4	2.5	BES 6001 - certified "good"
5	2.0	BES 6001 - certified "pass"
6	1.5	Recycled Materials with certified EMS for the Key Process Timber: MTCC CoC certification, SGS (TLTV) or Rainforest Alliance (VLO/VLC) Certified EMS for the Key Process and Supply Chain.
7	1.0	Certified EMS for the Key Process Green Dragon Environmental Standard - Level 4 or above

80% by volume of the materials that make up each element must be in Tiers 1-7. Of the materials that make up this 80%, the volume weighted average Tier level points score is calculated for each element. These are added up for all elements and the total point score is expressed as a % of the maximum available points (4 per element). Credits are awarded as shown in the table below.

Credits	% of available points
3	54%
2	36%
1	18%

The FSC® and PEFC certification schemes require that at least 70% of the certified product comprises FSC® or PEFC certified (respectively) or recycled timber. It is, however, possible to certify a product at a certified percentage of 70%, 100%, or anywhere between.

BRE has clarified that all products certified by FSC® and PEFC, regardless of %, are deemed by BREEAM as responsibly sourced at Tier level 3. Furthermore, BRE has clarified that 100% of the products is deemed responsibly sourced, regardless of the certified percentage.

BRE has further clarified that where timber or timber-based materials become a permanent part of a product, Chain of Custody is only required up to and including the manufacturing process during which they become permanently incorporated.

For the type of insulation products manufactured by Kingspan Insulation, only thick facing materials, e.g. plywood and plasterboard are assessed under this credit. The insulation core of the panels is dealt with under Mat 4. In the case of timber-based products, only the Tier level 3 and 6 timber certification routes allow credits. Hence they must be Chain of Custody (CoC) certified by FSC®, CSA, SFI, PEFC or MTCC, or comply with the requirements of SGS's TLTV or Rainforest Alliance's VLO/VLC schemes. In the case of plasterboard there are a number of alternative routes including BES 6001 certification.

Mat 4 - Insulation

Mat 4 affords two credits relevant to thermal insulation products: to recognise and encourage the use of thermal insulation which has a low embodied environmental impact relative to its thermal properties and has been responsibly sourced.

First Credit – Embodied Impact

One credit is available for the area and thermal resistance (R-value) weighted average of the Green Guide ratings of the insulation products used in a building's roofs, external walls, ground floors and services.

For each type of thermal insulation, an area and thermal resistance weighting is calculated by the formula:

$$\begin{aligned} \text{weighting} &= \text{area of insulation (m}^2\text{) x thermal} \\ &\quad \text{resistance (m}^2\cdot\text{K/W)} \\ &= \frac{\text{area of insulation (m}^2\text{) x thickness (m)}}{\text{thermal conductivity (W/m}\cdot\text{K)}} \end{aligned}$$

The weighting for each insulation material is then multiplied by the relevant point(s) from the following table:

Green Guide Rating	Points
A+	3
A	2
B	1
C	0.5
D	0.25
E	0

An Insulation Index is then calculated by dividing the sum of these values by the sum of the weightings. Where the Insulation Index for the building insulation is the same as or greater than 2, the credit is awarded. An Insulation Index of 2 or greater means that the weighted average Green Guide rating of the insulation is an A or A+.

For thermal insulation products, their BRE Green Guide Rating will determine whether or not Mat 4 credits are achieved.

Second Credit – Responsible Sourcing

The second credit is available if the insulation products used in a building's roofs, external walls, ground floors and services, are responsibly sourced.

At least 80% by volume of the thermal insulation used in these building elements must be certified in accordance with tier levels 1 to 6 described in the table shown under section Mat 3.

For the type of thermal insulation products manufactured by Kingspan Insulation, this requires that the products are certified to BES 6001, or that there is a certified environmental management system for their manufacturing processes and their supply chains. The part of the supply chain identified as requiring a certified environmental management system is the manufacturing process of their principle polymer components.

BREEAM 2011

Responsible Sourcing - Relevant to Mat 3 & 4

Kingspan Kooltherm[®] insulation products and *Kingspan KoolDuct*[®] Panels, produced at Kingspan Insulation's Pembridge manufacturing facility are certified to BES 6001 'Very Good'.

Kingspan Therma[™] insulation products, produced at Kingspan Insulation's Pembridge and Selby manufacturing facilities are certified to BES 6001 'Very Good'.

Kingspan Kooltherm[®] and *Kingspan Therma*[™] cavity closers, produced at Kingspan Insulation's Selby manufacturing facility are certified to BES 6001 'Very Good'.

Thus these products have the potential to achieve maximum credits for responsible sourcing under Mat 4.



Kingspan Insulation's British manufacturing facility, at which *Kingspan Thermawall*[®] TR31 is produced, carries FSC[®] and PEFC Chain of Custody certification. As standard, the plywood facing of *Kingspan Thermawall*[®] TR31 is FSC[®] certified at 70%. This certification verifies that, a minimum of 70% of the plywood facing of *Kingspan Thermawall*[®] TR31 has Chain of Custody and is legally sourced. Thus the plywood content of the product has the potential to achieve credits for responsible sourcing under Mat 3.



The plasterboard used at Kingspan Insulation's British manufacturing facility, at which *Kingspan Kooltherm*[®] K17 Insulated Plasterboard and *Kingspan Kooltherm*[®] K18 Insulated Plasterboard are produced, is certified to BES 6001 Very Good. Thus the plasterboard content of the products has the potential to achieve credits for responsible sourcing under Mat 3.

NB please confirm the above information at the point of need by contacting Kingspan Insulation's Technical Service Department (see rear cover), from which copies of Kingspan Insulation and its suppliers' BES 6001 and Kingspan Insulation's FSC[®] and PEFC Chain of Custody certificates can be obtained along with confirmation of Kingspan Insulation's products' Green Guide ratings.

Green Guide Ratings - Relevant to Mat 4

Ecoprofiles, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, have been created for *Kingspan Kooltherm*[®] Duct Insulation, *Kingspan KoolDuct*[®] Panels, the insulation strips used in *Kingspan Kooltherm*[®] Cavity Closer and all products in the *Kingspan Kooltherm*[®] K-range, produced at Kingspan Insulation's Pembridge manufacturing facility.

The BRE has assigned *Kingspan Kooltherm*[®] Duct Insulation and all products in the *Kingspan Kooltherm*[®] K-range a 2008 Green Guide Summary Rating of A+ as shown in the table on page 7. *Kingspan KoolDuct*[®] Panels and the insulation strips used in *Kingspan Kooltherm*[®] Cavity Closer have been assigned a 2008 Green Guide Summary Rating of A as shown in the table on page 7.

Ecoprofiles, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, have been created for most of the products in the *Kingspan Therma*[™] Range produced at Kingspan Insulation's Pembridge and Selby manufacturing facilities.

The BRE has assigned all foil faced *Kingspan Therma*[™] products a 2008 Green Guide Summary Rating of A+ and all certified *Kingspan Therma*[™] products with other facings have been assigned a 2008 Green Guide Summary Rating of A as shown in the table on page 7.

Details of all 2008 BRE Green Guide Summary Ratings are published in BRE's Green Book Live website. Go to www.greenbooklive.com and search on the company name "Kingspan Insulation". Click on the appropriate Appendix No. and a copy of the relevant certificate will be displayed.



Environmental Profiles Scheme
Certification Number ENP-500



RSPB Environment and Education Centre, Rainham Marshes

Designed to achieve BREEAM Excellent. This building was constructed with *Kingspan Therma*[™]roof[®] TR27 LPC/FM and *Kingspan Therma*[™]taper[®] TT47 LPC/FM on its roof.

2008 Green Guide Summary Ratings for Various Kingspan Insulation Products

Product	No Airspace		Airspace on One Side		2008 Green Guide Summary Rating
	Ecopoint Score	Element No.	Ecopoint Score	Element No.	
<i>Kingspan</i> Kooltherm ® K3 Floorboard	0.031/0.037	1415320100/101	–	–	A+
<i>Kingspan</i> Kooltherm ® K5 External Wall Board	0.031	1415320100	–	–	A+
<i>Kingspan</i> Kooltherm ® K7 Pitched Roof Board	0.030	1415320094	0.027 ¹	1415320095	A+
<i>Kingspan</i> Kooltherm ® K8 Cavity Board	0.030	1415320094	0.025 ²	1415320096	A+
<i>Kingspan</i> Kooltherm ® K10 Soffit Board	0.033	1415320102	–	–	A+
<i>Kingspan</i> Kooltherm ® K12 Framing Board	0.030	1415320094	0.025 ²	1415320096	A+
<i>Kingspan</i> Kooltherm ® K15 Rainscreen Board	–	–	0.034 ³ /0.035	1415320099/106	A+
<i>Kingspan</i> Kooltherm ® K17 Insulated Plasterboard	0.033	1415320102	–	–	A+
<i>Kingspan</i> Kooltherm ® K18 Insulated Plasterboard	0.033	1415320102	0.029 ²	1415320103	A+
<i>Kingspan</i> Kooltherm ® Cavity Closer Insulation Strips	0.056	1415320097	–	–	A
<i>Kingspan</i> Kooltherm ® Duct Insulation	0.033	1415320102	–	–	A+
<i>Kingspan</i> KoolDuct ® Panel	0.056	1415320098	–	–	A
<i>Kingspan</i> Thermapitch ® TP10	0.042	1415320108	0.038 ¹	1415320109	A+
<i>Kingspan</i> Thermaroof ® TR21	0.055	1415320110	–	–	A
<i>Kingspan</i> Thermaroof ® TR24	0.057	1415320111	–	–	A
<i>Kingspan</i> Thermaroof ® TR26 LPC/FM	0.045	1415320090	–	–	A+
<i>Kingspan</i> Thermaroof ® TR27 LPC/FM	0.058	1415320091	–	–	A
<i>Kingspan</i> Thermaroof ® TR31	0.042	1415320108	0.038 ¹	1415320109	A+
<i>Kingspan</i> Thermataper ® TT41	0.055	1415320110	–	–	A
<i>Kingspan</i> Thermataper ® TT44	0.057	1415320111	–	–	A
<i>Kingspan</i> Thermataper ® TT46 LPC/FM	0.045	1415320090	–	–	A+
<i>Kingspan</i> Thermataper ® TT47 LPC/FM	0.058	1415320091	–	–	A
<i>Kingspan</i> Thermawall ® TW50	–	–	0.036 ²	1415320115	A+
<i>Kingspan</i> Thermawall ® TW53	0.055	1415320107	–	–	A
<i>Kingspan</i> Thermawall ® TW55	0.042	1415320108	0.036 ²	1415320115	A+
<i>Kingspan</i> Thermafloor ® TF70	0.042	1415320108	–	–	A+
<i>Kingspan</i> Therma ® Duct Insulation	0.042	1415320108	–	–	A+

1 in a roof with a min. 13mm unventilated airspace one side
2 in a wall with a min. 20mm unventilated airspace one side
3 in a wall with a ventilated airspace to one side

Contact Details

Customer Service

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

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

Literature & Samples

Kingspan Insulation produces a comprehensive range of technical literature for specifiers, contractors, stockists and end users. The literature contains clear 'user friendly' advice on typical design; design considerations; thermal properties; sitework and product data.

Available as a complete Design Manual or as individual product brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact the Kingspan Insulation Marketing Department, or visit the Kingspan Insulation website, using the details below:

Tel: +44 (0) 1544 387 384
Fax: +44 (0) 1544 387 484
email: literature@kingspaninsulation.co.uk
www.kingspaninsulation.co.uk/literature

Tapered Roofing

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

Tel: +44 (0) 1544 387 383
Fax: +44 (0) 1544 387 483
email: tapered@kingspaninsulation.co.uk

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a computer-aided service designed to give fast, accurate technical advice. Simply phone the Kingspan Insulation Technical Service Department with your project specification. Calculations can be carried out to provide U-values, condensation / dew point risk, required insulation thicknesses etc... Thereafter any number of permutations can be provided to help you achieve your desired targets.

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

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

Tel: +44 (0) 1544 387 382
Fax: +44 (0) 1544 387 482
email: technical@kingspaninsulation.co.uk
email: hvac-technical@kingspaninsulation.co.uk

General Enquiries

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

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

Kingspan Insulation Ltd. reserves 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's Customer Service Department (see above left). 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 for suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a Technical Advisory Service (see above), the advice of which should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of this literature is current by contacting the Kingspan Insulation Marketing Department (see left).

Kingspan Insulation Ltd is a member of:
The National Insulation Association (NIA)



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