Insulation

TECHNICAL BULLETIN

Sixth Issue July 2016

BREEAM 2014 UK New Construction and UK Refurbishment and Fit-Out

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

Kingspan®

Low Energy –
Low Carbon Buildings

BREEAM 2014

TECHNICAL BULLETIN

Introduction

BREEAM (the Building Research Establishment's Environmental Assessment Method) is the world's leading environmental assessment method for buildings.

Schemes applicable to the UK include BREEAM UK New Construction and BREEAM UK Non Domestic Refurbishment and Fit Out.

The BREEAM UK New Construction 2014 assessment covers the majority of non-domestic new builds including both commercial and public (non-housing) projects and can be used for fully fitted, shell only or shell and core-only projects at the design and construction stages. Shell only or shell and core only projects can be 'topped up' by using the BREEAM 2014 UK Refurbishment and Fit-Out scheme.

The UK Non Domestic Refurbishment and Fit Out scheme is applicable to existing non-domestic buildings in the UK at the refurbishment and fit out stages. This scheme is split into four parts. The number of parts being assessed will be dependent on the scope of the project.

- Part One deals with the building fabric and structure (Shell)
- Part Two is concerned with core services (e.g. centralised M&E plant)
- Part Three deals with local services
- Part Four with interior design

Other BREEAM schemes are available for domestic and non UK buildings.

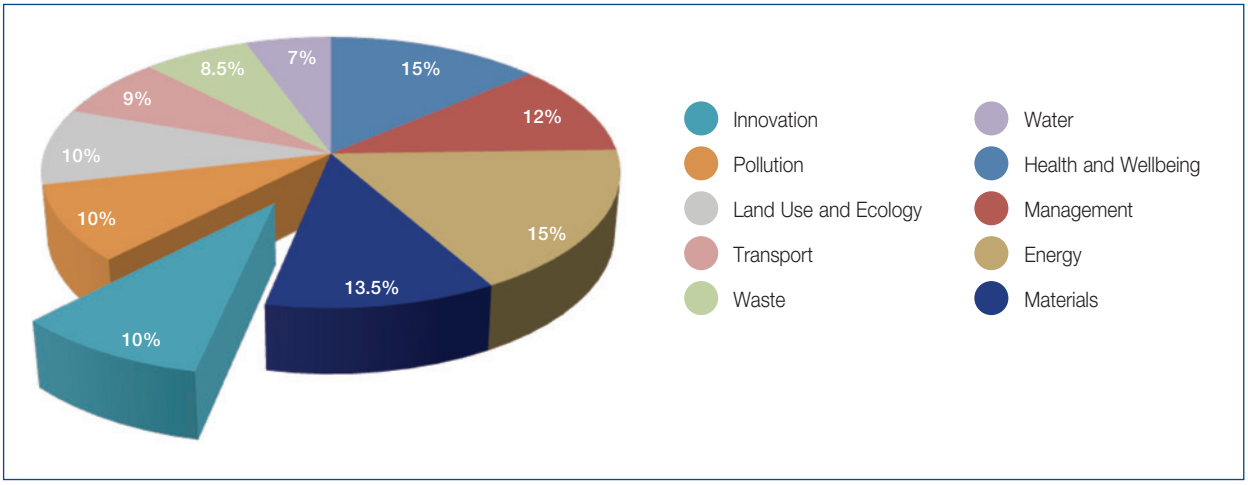
For the BREEAM UK New Construction Scheme, and UK Refurbishment and Fit-Out Schemes credits are awarded in ten sections according to performance.

Each of the ten sections comprising BREEAM is divided into subsections. Each are given different weightings depending on the scope. The sections are shown below.

The section scores are then added together to produce a single overall score on a scale of Pass, Good, Very Good, Excellent or Outstanding.

BREEAM Sections
Management (Man 1 – Man 5)
Health and Wellbeing (Hea 1 – Hea 6)
Energy (Ene 1 – Ene 9)
Transport (Tra 1 – Tra 5)
Water (Wat 1 – Wat 4)
Materials (Mat 1 – Mat 6)
Waste (Wst 1 – Wst 6)
Land Use and Ecology (LE 1 – LE 5)
Pollution (Pol 1 – Pol 5)
Innovation (Inn 1) (additional)

Example BREEAM Section weighting for a fully fitted out, new construction project



This diagram shows the weighting for a new construction fully fitted out project. The percentages reflect the relative importance of the different sections. The weightings vary according to the type and scope of project and the applicable BREEAM scheme.

Credits directly related to thermal insulation products

TECHNICAL BULLETIN

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.

Ene1 – Reduction of energy use and carbon emissions

The aim of this section is to recognise and encourage buildings which are designed or refurbished to minimise operational energy demand, primary energy consumption and CO_2 emissions.

The number of credits achieved is determined by comparing the building's Energy Performance Ratio for New Construction (EPR_{NC}) or Non Domestic Refurbishment (EPR_{NDR}) with a table of benchmarks and award the corresponding number of BREEAM credits.

When calculating the EPR_{NC} / EPR_{NDR} there are three metrics of modelled building performance which are considered. These are:

1. The building's heating and cooling energy demand;
2. The building's primary energy consumption;
3. The total resulting 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 CO_2 emissions. Insulation and air–tight ductwork do not directly achieve any specific credits under this BREEAM subsection, but their use can indirectly contribute enormously to the achievement of a large number of credits.

Mat 1 – Life Cycle Impacts

The aim of this section is to recognise and encourage the use of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building. The impact is assessed for the building's major elements, (i.e. external walls, roof etc.).

For new constructions the number of credits available is based on the Green Guide rating(s) achieved for the specifications that make-up the main building elements.

Each element is awarded points according to its area weighted Green Guide rating. Credits are awarded on the basis of the total number of points achieved.

Where the total points achieved exceeds the level required for maximum credits, the building may be eligible for an additional innovation credit.

For refurbishment projects this can be assessed on project life cycle assessment, or elemental assessment of environmental performance information.

The first method measures the life cycle environmental impact of the refurbishment or fit out works. Green Guide ratings can be used as a LCA tool to assess some elements. In the second method points are awarded for using products which have a third party certificated product declaration.

When a specific Environmental Product Declaration is available for a product which forms part of an element, this can potentially be used to uplift the element's BREEAM performance. This includes insulation used in wall, floor or roof elements.

The use of thermal insulation with a higher Green Guide rating or a specific EPD will contribute to achieving credits within this area. Kingspan Insulation's Kooltherm, Koolduct and Therma ranges hold A or A+ BRE Green Guide Ratings and further details can be found at the end of this document. This section does not apply to HVAC.

Credits directly related to thermal insulation products

TECHNICAL BULLETIN

Mat 3 – Responsible sourcing of materials

This aims to recognise the specification and procurement of responsibly sourced materials. Additionally, 100% of any timber must be legally sourced.

There are two different routes to demonstrating compliance for this section; either, or a combination of both, may be followed, depending on the amount of information available regarding quantities of materials used and their associated supply chains. The two routes follow similar methodologies but the second route allows for a more detailed calculation, usually resulting in a higher score.

Points are awarded for the use of materials, including insulation, which are covered by a Responsible Sourcing Certification Scheme certificate. This is converted into a percentage of maximum points available which is used to allocate the number of credits gained in this section.

For the type of thermal insulation products manufactured by Kingspan Insulation, this requires that there is a certified environmental management system for their manufacturing processes and their supply chains. All Kooltherm, KoolDuct and Therma insulation products and cavity closers manufactured at Kingspan Insulation's Pembridge and Selby manufacturing facilities are certified to BES 6001 'Excellent'.

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 and Castleblayney manufacturing facilities, are manufactured under a management system certified to ISO 14001: 2004. The principle polymer component of these products is also manufactured under a management system certified to ISO 14001: 2004.

Kingspan Therma products are produced at Kingspan Insulation's Pembridge, Selby and Castleblayney manufacturing facilities, under a management system certified to ISO 14001: 2004.

The principle polymer components of these products are also manufactured under a management system certified to ISO 14001: 2004.

Kingspan Insulation's manufacturing facility carries FSC® and PEFC Chain of Custody Certification for all timber.

NB Some Kingspan Insulation products combine insulation with thick facers comprising materials such as cork, plywood and plasterboard. The responsible sourcing of these thick facer materials is considered by BREEAM under section Mat 3, but is beyond the scope of this document. For further information, please refer to the Kingspan Insulation literature for the products in question.

Mat 4 – Insulation

The aim of this section is to recognise and encourage use of thermal insulation which has a low embodied environmental impact relative to its thermal properties. For each type of thermal insulation used in the relevant building elements, the volume weighted thermal resistance provided by each type of insulation is calculated by the formula:

weighting = area of insulation (m^2) x thickness (m) / thermal conductivity (W/m.K)

Or = Total volume of insulation used (m^3)/ thermal conductivity (W/m.K)

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

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 2.5, the credit is awarded.

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

For thermal insulation products, their BRE Green Guide Rating will determine whether or not the Mat 4 credit is achieved. Kingspan Insulation's Kooltherm, Koolduct and Therma ranges hold A or A+ BRE Green Guide Ratings and further details can be found at the end of this document.

Other Credits

There are a number of other credits available which the use of Kingspan Insulation products may contribute to, although these credits are not directly achievable from the use of Kingspan Insulation products. This may include (but not be limited to) the following:

Management 03
One credit in this section covers monitoring transport of construction materials from the factory gate to the construction site and waste from the site to disposal / recovery centre. Part of Kingspan's sustainability work includes increasing the fuel efficiency of the transport fleet and information can be provided on the transport of the insulation.

Energy 04
This section offers credits for low carbon design. Projects which use passive design measures can gain credits in this section and the analysis should include the building fabric and thermal mass of the building. Thermal insulation could be one such measure to reduce the heating load of the building and therefore reduce the energy consumption and assist in gaining credits in this section.

Material 06
One credit is available for recognising and encouraging measures which promote material efficiency. The aim of this credit is to encourage discussion with the supply chain, in order to ensure the best / most appropriate products are put forward, saving energy, waste etc. Kingspan Insulation's Technical Service Department (see rear cover) can provide advice regarding appropriate insulation products.

Waste 01
Credits are available for the proportion of construction waste which is diverted from landfill. Kingspan Insulation's waste take back scheme could contribute to this, as waste recovered on the scheme is sent as waste to energy or recycled.

Also in this section, credits are awarded for the use of a resource management plan, which promotes resource efficiency. Services provided by Kingspan Insulation for particular applications can help in reducing the amount of on-site waste; for example on tapered roofs, pre-mitred boards provided by Kingspan Insulation help reduce waste from the installation process. The use of BIM objects is also given as an example of a measure which can be taken to minimise waste. Kingspan's BIM objects are available through the website www.kingspaninsulation.co.uk.

Health and Wellbeing 04
Up to 3 credits are available for ensuring that appropriate thermal comfort levels are achieved through design. Although insulation and duct work are not specifically mentioned in this section, the use of these could contribute significantly to achieving appropriate thermal comfort levels and may help achieve passive solutions.

Kingspan Insulation Green Guide Ratings – Relevant to Mat 1 and 4
Ecoprofiles, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, have been created for *Kingspan* **Kool**therm® Duct Insulation, *Kingspan* **Kool**Duct® Panels, the insulation strips used in *Kingspan* **Kool**therm® Cavity Closer and all products in the *Kingspan* **Kool**therm® K–range, produced at Kingspan Insulation's Pembridge manufacturing facility.

The BRE has assigned *Kingspan* **Kool**therm® Duct Insulation, and all products in the *Kingspan* **Kool**therm® K–range a 2008 Green Guide rating of A+ as shown in the table on page 6. *Kingspan* **Kool**Duct® Panels and the insulation strips used in *Kingspan* **Kool**therm® Cavity Closer have been assigned a 2008 Green Guide rating of A as shown in the table on page 6.

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 rating of A+ and all certified Kingspan Therma™ products with other facings have been assigned a 2008 Green Guide rating of A as shown in the table on page 6.

Details of all BRE Green Guide 2008 Summary Ratings and all BRE BES 6001 certifications 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.

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' ISO 14001 certificates can be obtained along with confirmation of Kingspan Insulation's products' Green Guide ratings.

TECHNICAL BULLETIN

2008 Green Guide Summary Ratings for Various Kingspan Insulation Products

Products	No Airspace		Airspace on One Side		2008 Green Guide Summary Rating
	Ecopoint Score	Element No.	Ecopoint Score	Element No.	
Kingspan **Kool**therm® K3 Floorboard	0.031/0.037	1415320100/101	–	–	**A+**
Kingspan **Kool**therm® K5 External Wall Board	0.031	1415320100	–	–	**A+**
Kingspan **Kool**therm® K7 Pitched Roof Board	0.030	1415320094	0.027[1]	1415320095	**A+**
Kingspan **Kool**therm® K8 Cavity Board	0.030	1415320094	0.025[2]	1415320096	**A+**
Kingspan **Kool**therm® K10 Soffit Board	0.033	1415320102		–	**A+**
Kingspan **Kool**therm® K12 Framing Board	0.030	1415320094	0.025[2]	1415320096	**A+**
Kingspan **Kool**therm® K15 Rainscreen Board	–	–	0.034[3]/0.035	1415320099/106	**A+**
Kingspan **Kool**therm® K17 Insulated Plasterboard	0.033	1415320102	–	–	**A+**
Kingspan **Kool**therm® K18 Insulated Plasterboard	0.033	1415320102	0.029[1]	1415320103	**A+**
Kingspan **Kool**therm® Cavity Closer Insulation Strips	0.056	1415320097	–	–	A
Kingspan **Kool**therm® Duct Insulation	0.033	1415320102	–	–	**A+**
Kingspan **Kool**Duct® Panel	0.056	1415320098	–	–	A
Kingspan **Therma**pitch® TP10	0.042	1415320108	0.038[1]	1415320109	**A+**
Kingspan **Therma**roof® TR21	0.055	1415320110	–	–	A
Kingspan **Therma**roof® TR24	0.057	1415320111	–	–	A
Kingspan **Therma**roof® TR26 LPC/FM	0.045	1415320090	–	–	**A+**
Kingspan **Therma**roof® TR27 LPC/FM	0.058	1415320091	–	–	A
Kingspan **Therma**roof® TR31	0.042	1415320108	0.038[1]	1415320109	**A+**
Kingspan **Therma**taper® TT41	0.055	1415320110	–	–	A
Kingspan **Therma**taper® TT44	0.057	1415320111	–	–	A
Kingspan **Therma**taper® TT46 LPC/FM	0.045	1415320090	–	–	**A+**
Kingspan **Therma**taper® TT47 LPC/FM	0.058	1415320091	–	–	A
Kingspan **Therma**wall® TW50	–	–	0.036[2]	1415320115	**A+**
Kingspan **Therma**wall® TW53	0.055	1415320107	–	–	A
Kingspan **Therma**wall® TW55	0.042	1415320108	0.036[2]	1415320115	**A+**
Kingspan **Therma**floor® TF70	0.042	1415320108	–	–	**A+**
Kingspan **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 operates under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U–value and Condensation Risk Calculations.

BBA CERTIFICATE CS/1004-2 U Value Competency Scheme

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
Fax: +44 (0) 1544 388 888
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)

Kingspan®

Kingspan Insulation Ltd
Pembridge, Leominster, Herefordshire HR6 9LA, UK
www.kingspaninsulation.co.uk