

## BREEAM 2008

WHAT CREDITS CAN KINGSPAN TEK® BUILDING SYSTEM  
STRUCTURAL INSULATED PANELS ACHIEVE?



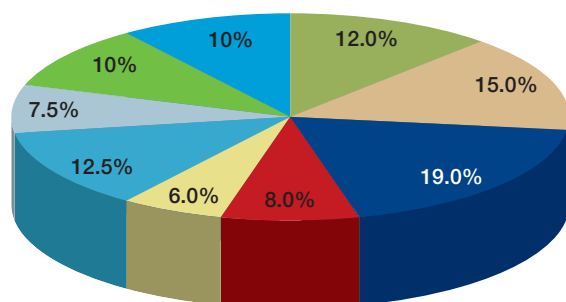
*Low Energy –  
Low Carbon Buildings*

## 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 nine 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 is BREEAM 2008.

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

- management (Man 1 – Man 8);
- health & wellbeing (Hea 1 – Hea 13);
- energy (Ene 1 – Ene 9);
- transport (Tra 1 – Tra 6);
- water (Wat 1 – Wat 4);
- materials (Mat 1 – Mat 7);
- waste (Wst 1 – Wst 6);
- land use & ecology (LE1 – LE6); and
- pollution (Pol 1 – Pol 8).

**Only two of these sections, energy and materials, offer credits related directly to structural insulated panels. The relevant subsections are Ene 1, Mat 1, Mat 5 and Mat 6.**

## Ene 1 - Reduction of CO<sub>2</sub> Emissions

Up to 15 credits are available for a building's operational CO<sub>2</sub> emissions. The number of credits achieved is determined by comparing the building's CO<sub>2</sub> index (EPC Rating), taken from the Energy Performance Certificate (EPC), with the table of benchmarks below:

BREEAM Credits	CO <sub>2</sub> Index (EPC Rating)	
	New Build	Refurbishment
1	63	100
2	53	87
3	47	74
4	45	61
5	43	50
6	40	47
7	37	44
8	31	41
9	28	36
10	25	31
11	23	28
12	20	25
13	18	22
14	10	18
15	0	15
Exemplar credit 1	<0	≤0
Exemplar credit 2	True zero carbon building	

**Clearly, thermal insulation and air-tightness are amongst the most effective ways to reduce a building's operational CO<sub>2</sub> emissions. Advanced thermal insulation and air-tightness are two of the main benefits of buildings constructed with structural insulated panels. These panels 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 - Materials

### Specification (Major Building Elements)

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. Each element is awarded points according to its 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
5	2
8	3
10	4
12	5
14	6

The Green Guide assesses the environmental impacts of building elements assuming they contain a "generic average" insulation material and the environmental impacts of the "specific" insulation material are dealt with under Mat 6.

**The exception to this rule is where the insulation provides a significant additional function or where the insulation is incorporated into the construction offsite e.g. in structural insulated panels. In this case a specific Green Guide rating is required for the building element of which the panels form the basis, with the environmental impacts of the "specific" insulation included in the assessment of the environmental impacts of the building element in question. The "specific" insulation is then assumed to have a Green Guide rating of A+ for the purposes of Mat 6.**

## Mat 5 - Responsible Sourcing of Materials

Up to 3 credits are available where evidence provided demonstrates that at least 80% by volume of the assessed materials in the following building elements are responsibly sourced:

- structural frame;
- ground & upper floors (including separating floors);
- roof;
- external & internal walls;
- foundation / substructure; and
- staircase.

Additionally 100% of any timber must be legally sourced.

The assessed materials are: bricks & clay tiles; resin-based composites & materials; concrete and cement based materials; glass; plastics and rubbers; metals; dressed or building stone & slate; 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	3	FSC, CSA, SFI with CoC, PEFC, Reused materials
2	2	There are currently no schemes allocated to this tier
3	1.5	Timber: MTCC, Verified, SGS, TFT Other materials: Certified EMS for the key Process and Supply Chain Recycled Materials with certified EMS for the Key Process
4	1	Certified EMS for key process stage

**For the type of structural insulated panels manufactured by Kingspan Insulation, only the OSB facing materials are assessed under this credit. The insulation core of the panels is dealt with under Mat 6. In the case of OSB, only the Tier level 1 and 3 timber certification routes allow credits. Hence the OSB must be certified by FSC, CSA, SFI with CoC, PEFC, MTCC, Verified, SGS or TFT.**

## Mat 6 - Insulation

Mat 6 affords two credits relevant to structural insulated panels: 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, floors and services.

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

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

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+.

**The insulation content of structural insulated panels is assumed to have a Green Guide rating of A+ for the purposes of Mat 6 as its environmental impacts are taken account of under Mat 1.**

### Second Credit – Responsible Sourcing

The second credit is available if the insulation products used in a building's roofs, external walls, 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, 2 or 3 described in the table shown under credit Mat 5.

The level that relates to thermal insulation materials is level 3. This requires that there is a certified environmental management system for their manufacturing processes and their supply chains.

**For the type of thermal insulation that comprises the core of the structural insulated panels manufactured by Kingspan Insulation, the part of the supply chain identified as requiring a certified environmental management system is the manufacturing process of its principle polymer component.**

# Kingspan TEK® Building System Panels



## Green Guide Ratings - Relevant to Mat 1 & 6

Ecoprofiles, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, have been created for building elements of which *Kingspan TEK® Building System* panels form the basis.

Details of all BRE Green Guide 2008 Summary Ratings are published in BRE's Green Book Live website. Go to [www.greenbooklive.com/search/search.jsp?partid=10000](http://www.greenbooklive.com/search/search.jsp?partid=10000) and search on the product "TEK". Click on the appropriate Appendix No. and a copy of the relevant certificate will be displayed.

The 2008 BRE Green Guide Summary Ratings for walls and roofs constructed using *Kingspan TEK® Building System* panels, as a result of the comparatively low environmental

impact of the panels, are heavily influenced by the external cladding specification. Wall and roof elements of which the panels form the basis, typically achieve A+ or A Summary Ratings as shown in the table below.

NB The environmental impact of the insulation core of *Kingspan TEK® Building System* panels is incorporated into the elemental Green Guide Summary Ratings of the roof and walls of which the panels form the basis, because it provides a significant structural function. Therefore, the Green Guide Summary Rating of the insulation core of *Kingspan TEK® Building System* panels can be taken as being A+ for the purposes of BREEAM section Mat 6.

### 2008 Green Guide Summary Ratings for Various Building Elements Based on *Kingspan TEK® Building System Panels*

External Wall Elements	Ecopoint Score	Element No.	Certificate Appendix No.	2008 Green Guide Summary Rating
Brickwork, cement mortar, breather membrane, <i>Kingspan TEK® Building System</i> panels, plasterboard on battens, paint	0.42	806190057	330a	A+
Pre-treated softwood weatherboarding on timber battens, breather membrane, <i>Kingspan TEK® Building System</i> panels, plasterboard on battens, paint	0.25	806210063	330b	A+
Canadian cedar cladding, breather membrane, <i>Kingspan TEK® Building System</i> panels, plasterboard on battens, paint	0.25	806210064	330c	A+
Clay tiles on timber battens, breather membrane, <i>Kingspan TEK® Building System</i> panels, plasterboard on battens, paint	0.54	806210065	330d	A
Concrete tiles on timber battens, breather membrane, <i>Kingspan TEK® Building System</i> panels, plasterboard on battens, paint	0.41	806210066	330e	A+
Polymeric render on cement bonded particle-board on timber battens, breather membrane, <i>Kingspan TEK® Building System</i> panels, plasterboard on battens, paint	0.41	806210062	330k	A+
Pitched Roof Elements				
<i>Kingspan TEK® Building System</i> panels, breather membrane, counterbattens, battens and concrete interlocking tiles	0.44	812411073	330f	A+
<i>Kingspan TEK® Building System</i> panels, breather membrane, counterbattens, battens and UK produced fibre cement slates	0.58	812411074	330g	A
<i>Kingspan TEK® Building System</i> panels, breather membrane, counterbattens, battens and resin bonded slates	0.76	812411075	330h	A
<i>Kingspan TEK® Building System</i> panels, breather membrane, counterbattens, battens and UK produced slates	0.67	812411076	330i	A
<i>Kingspan TEK® Building System</i> panels, breather membrane, counterbattens and UK produced clay plain tiles	0.58	812411077	330j	A



Environmental Profiles Scheme  
Certification Number ENP 330

## Responsible Sourcing - Relevant to Mat 5 & 6

It should be noted that Kingspan Insulation only manufactures and supplies **Kingspan TEK® Building System** panels and the information below only relates to the **Kingspan TEK® Building System** panels. The **Kingspan TEK® Building System** has **Kingspan TEK® Building System** panels at its core but it also uses a large number of other components e.g. timber, engineered timber beams and joists, joist hangers, fixings, sealants etc. These other components are sourced and provided by the **Kingspan TEK® Delivery Partner** or its contractor. Kingspan Insulation can not provide certification for these other components and this must be sought from the **Kingspan TEK® Delivery Partner** or its contractor.

**Kingspan TEK® Building System** panels carry PEFC Chain of Custody certification in accordance with TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits. This certification verifies that the timber content of the panels has chain of custody and is legally sourced. Thus the OSB content of the panels has the potential to achieve maximum credits for responsible sourcing under Mat 5. However, in order to realise this potential, your **Kingspan TEK® Delivery Partner** must also have Chain of Custody certification.



**Kingspan TEK® Building System** panels are not manufactured under a certified environmental management system. Thus the Mat 6 insulation responsible sourcing credit is not available for the insulation at the core of these panels.

*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's PEFC Chain of Custody certificate can be obtained along with confirmation of the Green Guide ratings of building elements comprising Kingspan TEK® Building System panels.*

# Contact Details

## Customer Service

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

UK – Tel: +44 (0) 1544 388 601  
– Fax: +44 (0) 1544 388 888  
– email: customerservice.uk@tek.kingspan.com

Ireland – Tel: +353 (0) 42 979 5000  
– Fax: +353 (0) 42 975 4299  
– email: info.ie@tek.kingspan.com

## Literature & Samples

Kingspan 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.

Kingspan **TEK**® technical literature is an essential specification tool. For copies please contact the Kingspan **TEK**® Marketing Department or visit the Kingspan **TEK**® website, using the details below:

UK – Tel: +44 (0) 1544 387 384  
– Fax: +44 (0) 1544 387 484  
– email: literature.uk@tek.kingspan.com  
– www.tek.kingspan.co.uk/literature

Ireland – Tel: +353 (0) 42 979 5000  
– Fax: +353 (0) 42 975 4299  
– email: info.ie@tek.kingspan.com  
– www.tek.kingspan.ie/literature

## Technical Advice

The Kingspan **TEK**® Technical Services Department offers free advice regarding the performance of the Kingspan **TEK**® Building System.

The services offered include: calculation of U-values\*; analysis of condensation risk\*\*; calculation of SAP Ratings / provision of Energy Performance Certificates (EPCs) in the UK; and calculation of DEAP Ratings / provision of Building Energy Rating (BER) Certificates in the Republic of Ireland.

The department can also offer advice on: design detailing; fixing; ventilation; heating systems; BREEAM ratings; and Code for Sustainable Homes ratings.

\* Calculations performed to BS / I.S. EN ISO 6946: 2007 (Building components and building elements. Thermal resistance and thermal transmittance. Calculation method) and using the conventions set out in BR443 (Conventions for U-value calculations).

\*\* Calculations performed to BS 5250: 2002 (Code of practice for control of condensation in buildings).

Please contact the Kingspan **TEK**® Technical Service Department on the numbers below:

UK – Tel: +44 (0) 1544 387 382  
– Fax: +44 (0) 1544 387 482  
– email: technical.uk@tek.kingspan.com

Ireland – Tel: +353 (0) 42 975 4297  
– Fax: +353 (0) 42 975 4296  
– email: technical.ie@tek.kingspan.com

## General Enquiries

For all other enquiries contact Kingspan on the numbers below:

UK – Tel: +44 (0) 1544 388 601  
– Fax: +44 (0) 1544 388 888  
– email: info.uk@tek.kingspan.com

Ireland – Tel: +353 (0) 42 979 5000  
– Fax: +353 (0) 42 975 4299  
– email: info.ie@tek.kingspan.com

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



**Kingspan Insulation Ltd**  
Pembroke, Leominster, Herefordshire HR6 9LA, UK  
Castleblayney, County Monaghan, Ireland

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