



## Kingspan TEK® Building System

### AN INTRODUCTION



- Can achieve whole wall and roof U-values of 0.21 - 0.10 W/m<sup>2</sup>·K or better
- Can achieve air leakage levels as good as approximately 1 m<sup>3</sup>/hour /m<sup>2</sup> at 50 Pa
- Recognised by the major building warranty providers such as: Building Life Plans and NHBC
- BBA, and NSAI Agreement certified
- Insulation core manufactured with a blowing agent that has zero ODP and low GWP
- 2008 BRE Green Guide A+ Summary Rated elements available
- Quick and safe to build
- Can provide up to 10% additional floor space
- Can create warm homes with very low fuel bills
- Internal works can start earlier
- Minimal on-site waste



CERTIFICATE No. 02/0158



*Low Energy –  
Low Carbon Buildings*

## The Kingspan TEK® Building System

The Kingspan TEK® Building System comprises 142 mm thick structural insulated panels (SIPs) connected with a unique jointing system for walls and roofs, and intermediate floors using I-beams or open web joists.

Kingspan TEK® Building System panels consist of a high performance rigid urethane insulation core, manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP), sandwiched between two layers of Oriented Strand Board type 3 (OSB/3). During manufacture, the insulation core of Kingspan TEK® Building System panels is autohesively bonded to the OSB/3 facings. This process provides more reliable and superior adhesion than the secondary bonding process used in the manufacture of most other SIPs.



Kingspan TEK® Building System panels are a structural composite. This composite assembly provides stiffness, strength and predictable responses to applied loads.

The Kingspan TEK® Building System is recognised by the major building warranty providers such as NHBC, Building Life Plans, Premier, Build Zone Homebond and HAPM.

The Kingspan TEK® Building System also holds BBA and NSAI Agreement certification.



CERTIFICATE No. 02/0158

Buildings constructed with the Kingspan TEK® Building System can have extremely low levels of energy use. As a result, the Kingspan TEK® Building System can be the perfect high performance building fabric solution for Passivhaus design, and has been an integral component of delivering several Code for Sustainable Homes Level 5 and Level 6 developments.



## Design Flexibility

The Kingspan TEK® Building System leaves ample scope for individual design. The panels are pre-cut to match a project's engineering and design specifications, and a complete kit is delivered to site ready for erection.

The Kingspan TEK® Building System can be used to create the walls (loadbearing and non-loadbearing), roofs and intermediate floors of a complete building.

The Kingspan TEK® Building System can be erected on any ground floor construction, however the foundations must have specific tolerances as per guidance available from the Kingspan TEK® Technical Services Department (see rear cover).

The Kingspan TEK® Building System can be used to create buildings up to 4 storeys. The panels are lightweight compared with brick and block, at a maximum of 25 kg/m<sup>2</sup>, therefore they are ideal for use where heavy constructions are not possible.

As with all construction methods, including traditional masonry, a long lasting external weather proofing is also a necessary part of walls and roofs constructed using the Kingspan TEK® Building System.

The performance characteristics of buildings constructed from the Kingspan TEK® Building System quoted in this document are predicated on its use as a full System i.e. incorporating walls and roof built with Kingspan TEK® Building System panels. Kingspan TEK® Building System roof and wall elements can be used individually with other non-Kingspan TEK® Building System components. For example Kingspan TEK® Building System panels can be used as a wall system in conjunction with a timber rafter roof. For further guidance on the performance characteristics of Kingspan TEK® Building System panels used in conjunction with other construction components please contact the Kingspan TEK® Technical Services Department (see rear cover).

NB The System is not recommended for cellars or basement constructions or for use in high humidity environments.



## CO<sub>2</sub> Emissions

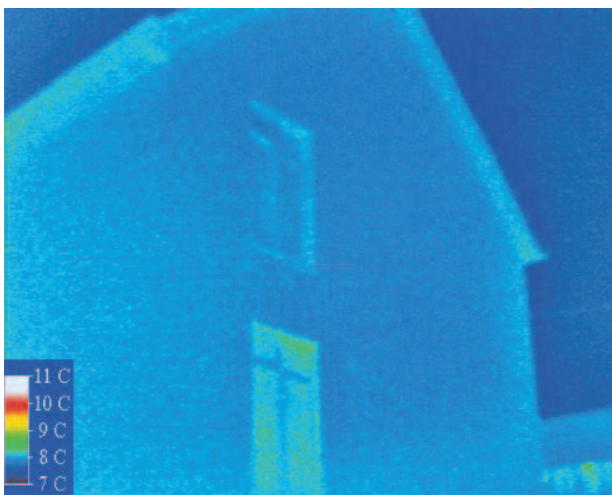
The first step in minimising the CO<sub>2</sub> emissions of a building is to reduce its space heating demand. The most effective way to reduce the space heating demand of a building is to improve the performance of its envelope by specifying low U-values, low air permeability and by avoiding significant thermal bridging wherever possible.

The *Kingspan TEK*<sup>®</sup> Building System yields worst case whole wall and roof U-values of 0.21 W/m<sup>2</sup>·K with no additional insulation. Extremely low U-values, e.g. 0.10 W/m<sup>2</sup>·K, can easily be achieved with the addition of an insulated lining, e.g. *Kingspan Kooltherm*<sup>®</sup> K12 Framing Board, on the inside of the *Kingspan TEK*<sup>®</sup> Building System panels.

In addition to the excellent U-values that can be achieved by walls and roofs constructed using the *Kingspan TEK*<sup>®</sup> Building System, the closed cell structure of the rigid urethane insulation core of *Kingspan TEK*<sup>®</sup> Building System panels does not allow movement of air within the panels. The insulation will not sag or physically deteriorate over time, as may be the case with other insulating materials.

The *Kingspan TEK*<sup>®</sup> Building System's proprietary jointing system can create a very air-tight structure. Air leakage levels can be as good as 0.91 air changes per hour at 50 Pa (approximately 1 m<sup>3</sup>/hour/m<sup>2</sup> at 50 Pa).

Repeating thermal bridges occur where a material with a significantly worse thermal conductivity interrupts the insulation layer in a construction. U-value calculations for conventional timber frame systems take into account the effects of repeating thermal bridges, i.e. timber studs etc. The insulation layer in the *Kingspan TEK*<sup>®</sup> Building System is not interrupted by repeating studwork. Therefore, there is less repeating thermal bridging, which results in a better thermal performance. There are, however, some thermal bridges, e.g. where timbers are used to support point loads etc.



Linear thermal bridges occur at junctions, e.g. wall to floor interface, and openings, e.g. windows, in the building fabric, and are expressed as psi ( $\psi$ ) values.  $\psi$ -values are an important factor in the calculation methodologies used to assess the operational CO<sub>2</sub> emissions of buildings. The *Kingspan TEK*<sup>®</sup> Building System achieves very good  $\psi$ -values, due to the continuity of insulation at junctions and openings inherent in the System's design.

The above features mean that *Kingspan TEK*<sup>®</sup> Building System can help achieve the requirements of the Building Regulations / Standards, and credits in the Code for Sustainable Homes section Ene 1 and BREEAM section Ene 1.

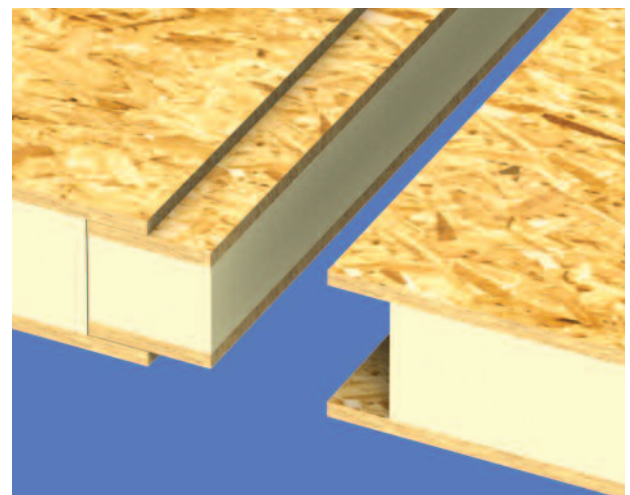
## Zero ODP and Low GWP

The insulation core of *Kingspan TEK*<sup>®</sup> Building System panels is manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

This can help achieve credits in the Code for Sustainable Homes section Pol 1.

## Chain of Custody

*Kingspan TEK*<sup>®</sup> Building System panels are manufactured from the routine thinnings of managed plantations and carry PEFC Chain of Custody certification in accordance with TUV NORD CERT auditing and certification procedures. This can help achieve credits in the Code for Sustainable Homes section Mat 2 and BREEAM section Mat 5.



## Green Guide Ratings

The 2008 BRE Green Guide Summary Ratings for walls and roofs constructed using the **Kingspan TEK® Building System**, as a result of its comparatively low environmental impact, are heavily influenced by the external cladding specification. Wall and roof elements constructed using the system typically achieve A+ or A Summary Ratings. [This can help achieve credits in the Code for Sustainable Homes section Mat 1 and BREEAM section Mat 1.](#)

The environmental impact of the insulation core of **Kingspan TEK® Building System** panels is incorporated into its elemental Green Guide Summary Ratings 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+. [This can help achieve credits in BREEAM section Mat 6.](#)

## Delivery Partners

The **Kingspan TEK® Building System** is available via a network of Delivery Partners, that are responsible for the design, production and erection of **Kingspan TEK® Building System** kits. **Kingspan TEK® Delivery Partners** are located across Europe and are able to deliver buildings of any scale in virtually any location. A full list of UK, Irish and international Delivery Partners is available from the **Kingspan TEK® Building System** website (see rear cover).

Enquiries should be directed to a **Kingspan TEK® Delivery Partner** for:

- project specific structural engineering and design advice;
- conversion of plans into a **Kingspan TEK® Building System** scheme; and
- quotations and lead times.



## Floor Space

When building a wall to achieve a U-value of 0.20 W/m<sup>2</sup>-K using the **Kingspan TEK® Building System**, the structure can be just 223 mm thick. In comparison, a timber frame wall to achieve the same U-value may have to be 385.5 mm thick, (100 mm brick 50 mm cavity, 12 mm OSB, 210 mm glass fibre quilt between 210 mm studs, 12.5 mm vapour check plasterboard). A full fill masonry cavity wall to achieve the same U-value may have to have a wall 395 mm thick (100 mm brick, 170 mm glass fibre quilt full fill, 100 mm dense block, 12.5 mm plasterboard on dabs).

This means that the **Kingspan TEK® Building System** can provide more floor space for the same external dimensions. Ideal when considering compliance with the housing densities demanded by guidelines such as PPS3 in England and Section 5 of Planning and Development Act in the Republic of Ireland.

Figure 1: Brick slips on render on Kingspan TEK  
**223 mm**

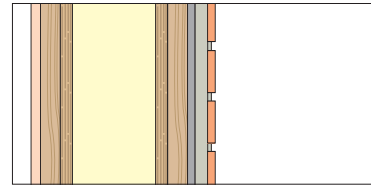


Figure 2: Standard 140 mm wide timber frame, brick clad  
**385.5 mm**

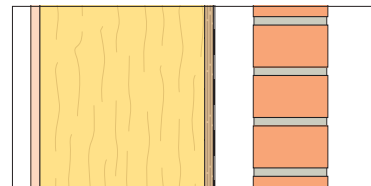
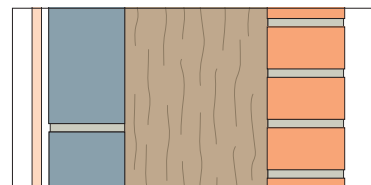


Figure 3: Full fill masonry cavity wall  
**395 mm**



## Advantages of the *Kingspan TEK*<sup>®</sup> Building System

### Environmental Sustainability at its Core

- Can be used to create highly energy efficient buildings.
- Can achieve whole wall and roof U-values of 0.21 - 0.10 W/m<sup>2</sup>·K or better.
- Can achieve air leakage rates as good as 0.91 air changes per hour at 50 Pa (approximately 1 m<sup>3</sup>/hour/m<sup>2</sup> at 50 Pa).
- Creates minimal site waste, as kits are designed, cut and palletised in a quality controlled, factory environment.
- All the components for a typical *Kingspan TEK*<sup>®</sup> Building System kit, e.g. panels and ancillaries, come from one source, therefore there are fewer deliveries compared with more traditional construction methods, where components can often be sourced from, and delivered by, a number of different distributors or manufacturers. The overall result is less transport, congestion, noise and traffic pollution, which reduces a project's impact on the environment.
- The panels are PEFC Chain of Custody certified.
- 2008 BRE Green Guide A+ or A Summary Rated roof and wall elements available.
- Manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



### Fast, Cost Effective & Predictable

- The panelised nature of the System can enable a fast track building process, which can help to reduce construction time.
- Follow on trades can start work sooner, as an erected *Kingspan TEK*<sup>®</sup> Building System kit, when wrapped with a breathable membrane (e.g. *Kingspan nilvent*<sup>®</sup>), can provide a weather-tight shell, helping the contractor complete the project faster.
- Much easier to predict project completion times, as the System is relatively simple to erect and requires no wet trades or brick layers.
- Defects are vastly reduced due to factory controlled manufacturing, precise engineering and the design of the System.

### Innovative

- Can provide a more controllable indoor environment than traditional construction methods, such as masonry, due to the System's potential for superior air-tightness.
- First SIP building system in the UK and Ireland to receive BBA and NSAI Agreement certification.
- Used on the UK's first house to achieve Code for Sustainable Homes – Level 6 (BRE Innovation Centre 2007).
- Has since been used on several multiple dwelling projects that have achieved Code for Sustainable Homes Level 5 and Level 6.



# Contact Details

## Customer Service

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

UK – Tel: +44 (0) 1544 388 601  
– Fax: +44 (0) 1544 388 888  
– email: [customerservice@kingspantek.co.uk](mailto:customerservice@kingspantek.co.uk)

Ireland – Tel: +353 (0) 42 979 5000  
– Fax: +353 (0) 42 975 4299  
– email: [info@kingspantek.ie](mailto:info@kingspantek.ie)

## Technical Advice

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 TEK**® 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 TEK**® Technical Service Department can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

The **Kingspan TEK**® British 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.



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@kingspantek.co.uk](mailto:technical@kingspantek.co.uk)

Ireland – Tel: +353 (0) 42 975 4297  
– Fax: +353 (0) 42 975 4296  
– email: [technical@kingspantek.ie](mailto:technical@kingspantek.ie)

## 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.

**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@kingspantek.co.uk](mailto:literature@kingspantek.co.uk)  
– [www.kingspantek.co.uk/literature](http://www.kingspantek.co.uk/literature)

Ireland – Tel: +353 (0) 42 979 5000  
– Fax: +353 (0) 42 975 4299  
– email: [info@kingspantek.ie](mailto:info@kingspantek.ie)  
– [www.kingspantek.ie/literature](http://www.kingspantek.ie/literature)

## General Enquiries

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

UK – Tel: +44 (0) 1544 388 601  
– Fax: +44 (0) 1544 388 888  
– email: [info@kingspantek.co.uk](mailto:info@kingspantek.co.uk)

Ireland – Tel: +353 (0) 42 979 5000  
– Fax: +353 (0) 42 975 4299  
– email: [info@kingspantek.ie](mailto:info@kingspantek.ie)

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**  
Pembridge, Leominster, Herefordshire HR6 9LA, UK  
Castleblayney, County Monaghan, Ireland  
[www.kingspantek.co.uk](http://www.kingspantek.co.uk) [www.kingspantek.ie](http://www.kingspantek.ie)