

Building a **Zero** Energy Future...



...with Tomorrow's **Solutions** Today

What is nZEB?

nZEB - “Nearly Zero Energy Buildings” which means buildings that have a very high energy performance in which the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

Zero

What does this mean?

Maximise the performance of the building fabric to significantly reduce energy demand, then use the most efficient method (using renewable energy) for heating, hot water and electrical requirements. A high performance building fabric is easy to achieve, a once off investment requiring no maintenance or replacement and will ensure the efficiency and longevity of the heating system and plant.

Why nZEB?

nZEB represents a great challenge for the construction industry but also a huge opportunity to make a positive change in the way we construct our buildings and mitigate against the adverse effects of Climate Change. We cannot continue to waste energy and damage our environment for future generations - Kingspan is committed to providing solutions to protect that future and is committed to a net Zero Energy future.

When?

The nZEB standard applies to all buildings occupied after 31st December 2020 - **the time for action is now!**

How?

It's as easy as

A B C ...

Achieve High Performance Building Fabric

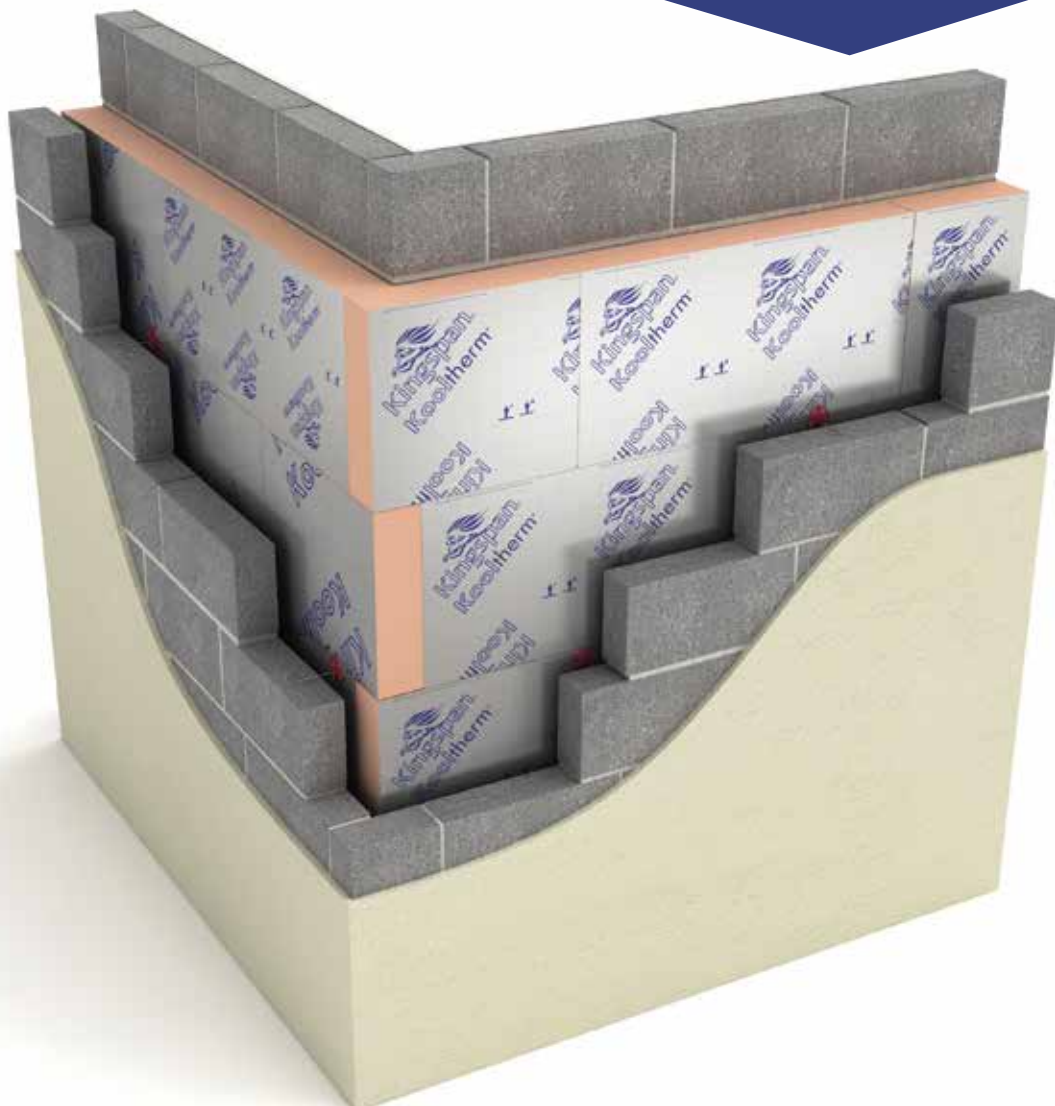
The starting point for nZEB compliance is to maximise the performance of the building fabric elements which includes floors, walls, roof and windows. A key decision is the construction methodology which typically starts with the walls - Kingspan have all the options covered however our Kooltherm® Cavity Wall insulation solutions tick all the boxes in terms of superior thermal performance, buildability and affordability achieving U-values as low as 0.13 W/m²K.

Then choose the preferred floor, roof and wall Constructions to complete the high performance building envelope.

U-values as low as
0.13 W/m²K

Key Benefits:

- Traditional Construction Methodology
- Easy to cut and work around awkward details
- No requirement for ancillary items such as corner DPCs or taping where boards are cut
- Superior Performance in standard 150mm partial fill construction
- Retains cavity to eliminate risk of water ingress



Achieve High Performance Building Fabric

Kooltherm® K8 and K108 Wall Insulation

Kooltherm® K8 and K108 are superior performance cavity wall insulation solutions to maximise performance in any given cavity.

| Product | Blockwork | Thickness (mm) | U-value (W/m²K) |
|-----------------|-------------|----------------|-----------------|
| Kooltherm® K108 | Standard | 90 | 0.16 |
| Kooltherm® K8 | Standard | 110 | 0.15 |
| Kooltherm® K108 | Standard | 110 | 0.14 |
| Kooltherm® K108 | Lightweight | 110 | 0.13 |

* U-values are indicative only, please contact Kingspan Technical services on +353 (0) 42 975 4297 or technical@kingspaninsulation.ie for project specific calculations.

Kooltherm® K8 and K108



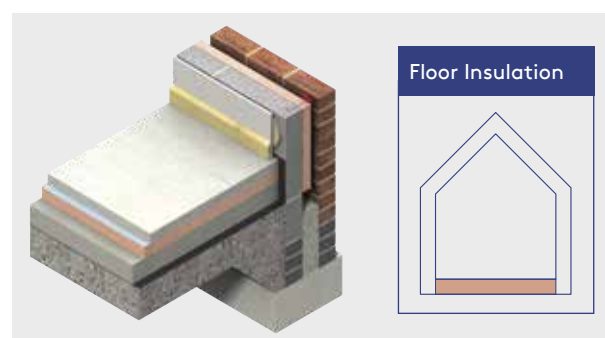
Kooltherm® K3 Floor Insulation

Kooltherm® K3 is a superior performance floor insulation to maximise thermal resistance within a given thickness. With Kooltherm® technology U-values of 0.10 W/m²K and lower are easily achievable.

| Product | Thickness (mm) | U-value (W/m²K) |
|---------------|----------------|-----------------|
| Kooltherm® K3 | 90 | 0.15 |
| Kooltherm® K3 | 110 | 0.13 |
| Kooltherm® K3 | 135 | 0.11 |
| Kooltherm® K3 | 150 | 0.10 |

* U-value will depend on floor area and length of exposed perimeter.

Kooltherm® K3



Kooltherm® K7 and K18 Roof Insulation

Combining Kooltherm® K7 and K18 in a pitched roof application provides superior U-values while eliminating repeating thermal bridging of rafters.

| Product | Thickness (mm) | U-value (W/m²K) |
|---------------------|----------------|-----------------|
| Kooltherm® K7 / K18 | 90 / 62.5 | 0.15 |
| Kooltherm® K7 / K18 | 120 / 62.5 | 0.13 |
| Kooltherm® K7 / K18 | 120 / 82.5 | 0.11 |

* U-value based on 47 mm rafters at 600 mm centres.

Kooltherm® K7 and K18



Better

Detailing at Element Junctions

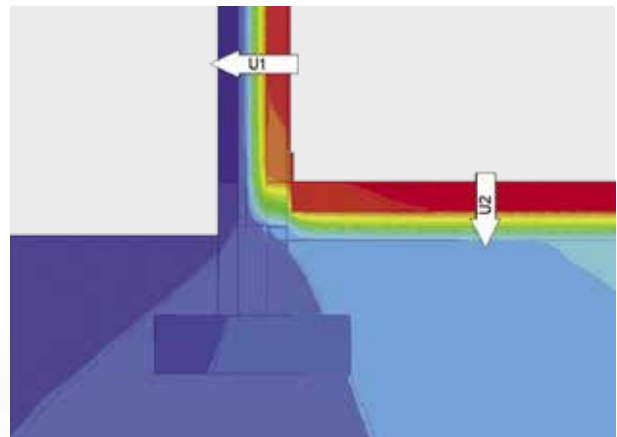
Key to nZEB is to minimise the energy demand from the outset. By using premium thermally efficient products, good detailing and attention to detail on site compliance can be achieved without excessive reliance on 'bolt on' mechanical and renewable technologies. Investing in the building fabric is a long term, low cost strategy requiring no maintenance or replacement for the functional life of the building, while guaranteeing complete thermal comfort.

Psi-value

This is the additional heat loss per linear metre at building element junctions and is calculated by numerical modelling of the respective junctions.

Y-value

A penalty added to the total element heat loss and is calculated by dividing the sum of all the thermal bridges by the total exposed surface area.

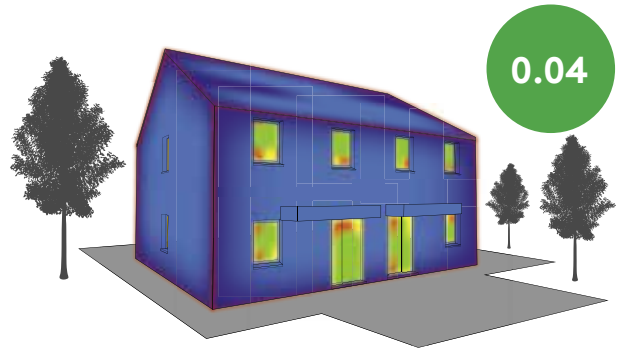


Better

Detailing at Element Junctions

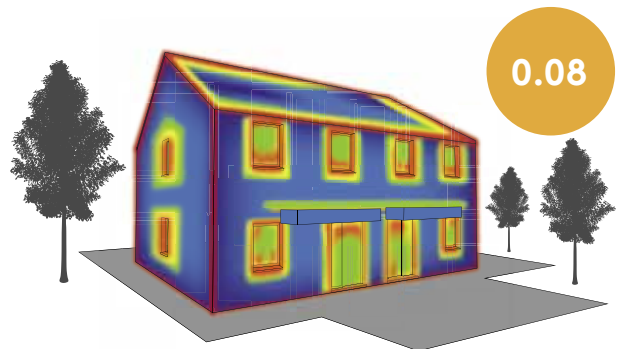
Kingspan Performance Junctions

- Y-value = 0.04 or lower.
- 73% reduction in design junction heat loss.
- Accurate performance and design efficiency.
- Less reliance on renewable technology and mechanical services.



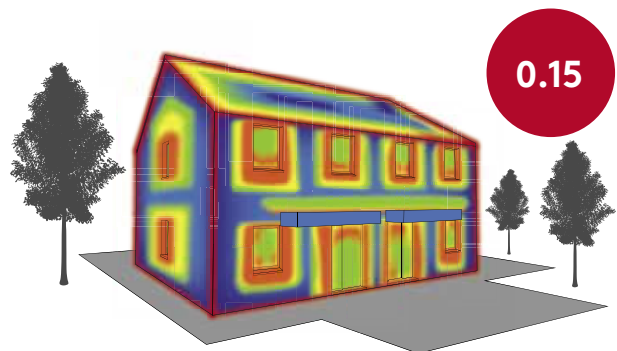
Standard Acceptable Construction Details

- Default Y-value = 0.08.
- 47% reduction in design junction heat loss.
- Restrictive details.



Default Y-value

- Default Y-value = 0.15.
- May require compensatory measures to achieve compliance.
- Limited focus on key junctions.
- Risk of complacency during construction.
- May still require modelling of some complex junctions to ensure there is no risk of condensation.



Once individual building fabric elements are finalised it is imperative to consider how these elements come together. With high performance building fabric the impact of these junctions becomes increasingly important. There are four options here:

1. Use NSAI Approved Thermal modelled details such as **Kingspan Performance Junctions** to achieve a Y-value as low as 0.04 or lower.
2. Use the standard Acceptable Construction Details and use the default Y-value of 0.08.
3. Use a combination of the modelled details and the standard ACDs to derive a project specific Y-value.
4. Accept the default 0.15 Y-value.

Better

Detailing at Element Junctions



■ Total Floor Area = 110.55 sqm ■ Total Envelope Area = 222 sqm

Better

Detailing at Element Junctions

Thermal Bridge table using Kingspan Performance Junctions

| Semi-Detached House | | | | | |
|-----------------------|---------------------------------------|------------|--|-------------|-------|
| Total Envelope Area = | | 222 | sqm | | |
| Total Floor Area = | | 110.55 | sqm | | |
| ACD Reference | Junction Description | Length (m) | Kingspan Performance Psi-values (W/mK) | Total (W/K) | |
| 1.02b | Ground Floor - External Wall Junction | 15 | 0.10 | 1.500 | |
| 1.06.1 | Solid Masonry Separating Wall | 10.6 | 0.019 | 0.196 | |
| 1.10 | Eaves - Ventilated Attic | 11 | 0.048 | 0.528 | |
| 1.15 | Ceiling - Gable Junction | 10.05 | 0.097 | 0.975 | |
| 1.23.2 | Heads | 20.25 | -0.002 | -0.041 | |
| 1.25 | Jambs | 29.85 | -0.002 | -0.060 | |
| 1.26 | Sills | 20.25 | 0.020 | 0.405 | |
| 1.27.1 | Walls - External Corner | 10.6 | 0.044 | 0.466 | |
| G01.2 | Ceiling - Party Wall Junction | 10.05 | 0.129 | 1.291 | |
| G05.1 | Ground Floor - Party Wall Junction | 10.05 | 0.062 | 0.623 | |
| | | | Total L x Psi-value | 5.885 | W/K |
| | | | Y-value | 0.03 | W/m²K |

0.03

Y-value achieved
using Kingspan
Performance
Junctions

Choose Kingspan

Premium Product, Premium Service

Kingspan's Kooltherm® Range is produced in our Award Winning World Class Manufacturing Facility in Castleblayney, Co. Monaghan. Our products are manufactured to the highest possible quality standards - ISO 14001- 2015 (Environmental Management Systems), ISO 9001-2015 (Quality Management Systems) and OHSAS 18001: 2007 (Occupational Health & Safety Management Systems).

Kooltherm® is one of the most advanced rigid foam technologies on the market providing unrivalled thermal performance, dimensional stability and fire performance. Choosing Kooltherm® guarantees premium performance and thinnest construction methodologies.



Kingspan is renowned for our customer service and providing unrivalled dedicated support to our customer base. We pioneered and developed our Premium Service to take that a step further offering bespoke technical support for all projects where our Premium Performance Kooltherm insulation has been specified in at least two building elements.



Kingspan Premium

Benefits

1. Free Consultation Service
2. Pre-Tender Specification Review
3. Project Specific Performance Specifications
4. U-value Calculations & Condensation

Risk Analysis

5. Support on Psi-values and Y-values
6. Priority Response within 24 hrs
7. BER/SAP Calculation Advice
8. 3 No. Site Inspection Visits
9. Site Visit by Kingspan Technical

Representative

10. Toolbox Talks on Product installation
11. Product Specific Warranty
12. Kingspan Certificate on Completion

"We know that the built environment has an important part to play in combatting climate change, and we pledge to take the lead. Our commitment to sustainability is instilled at every level of the company and at every step in the manufacturing process.

Together we have the opportunity to make our built environment more energy-efficient, attractive, adaptable, environmentally responsible and productive. The way we build can be more effective and reach higher standards than ever before. We can make our buildings really work for us; consuming and generating energy smartly to become real investments in our future."

Gene M. Murtagh
Chief Executive Officer
Kingspan Group PLC

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