

# PIR INSULATION PRODUCT GUIDE





# CONTENTS

<b>04</b>	<b>Preventing heat loss and reducing energy consumption</b>
<b>06</b>	<b>Why choose IKO enertherm?</b>
<b>09</b>	<b>Introducing - micro cell technology</b>
<b>10</b>	<b>IKO enerthem insulation board range</b>
<b>13</b>	<b>IKO enertherm - see the difference for yourself</b>
<b>14</b>	<b>Internal walls</b>
<b>16</b>	<b>External walls</b>
<b>18</b>	<b>Flooring (including loft flooring)</b>
<b>20</b>	<b>Pitched roofs</b>
<b>22</b>	<b>Flat roofs</b>
<b>24</b>	<b>Recommended U-values</b>
<b>26</b>	<b>IKO in action case study</b>
<b>29</b>	<b>We are IKO</b>





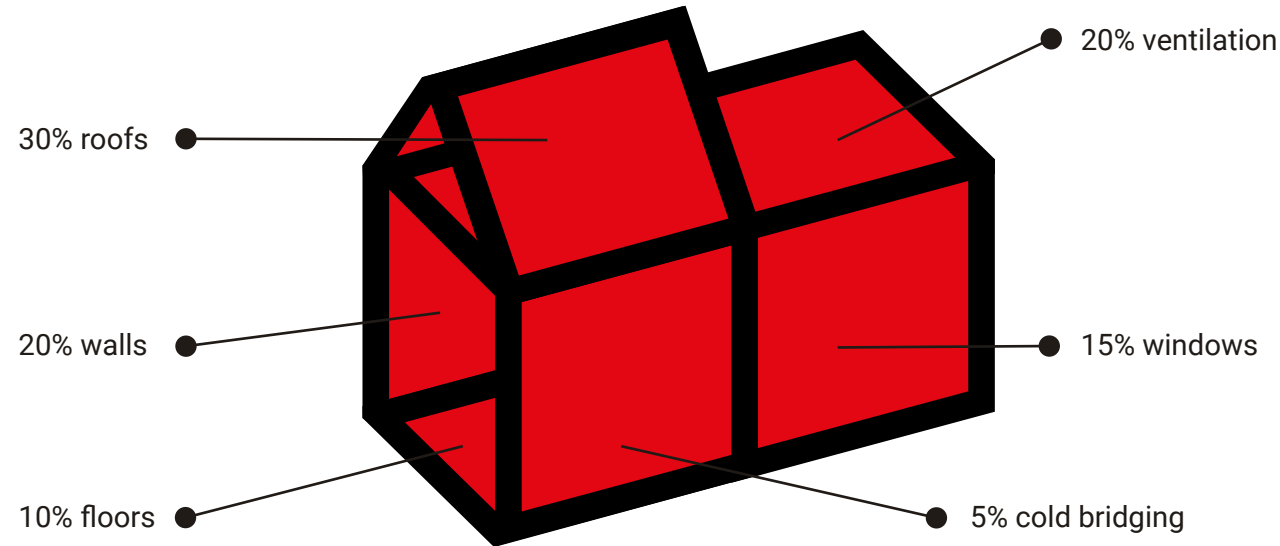
# PREVENTING HEAT LOSS AND REDUCING ENERGY CONSUMPTION, EVERY TIME

IKO enertherm high-performance insulation solutions, ranging from walls and floors to flat roofs and pitched roofs, can help lower heating and cooling costs. As a result, they can significantly reduce the energy consumption of the building thus lowering CO<sub>2</sub> emissions.

With its combination of moisture and mould-resistant properties and dimensional stability, IKO enertherm lasts for the lifetime of the building.

## IKO enertherm helps prevent energy loss through multiple areas of the building envelope.

Here's how much energy is lost from certain areas of a house construction:



This can be combatted with IKO enertherm insulation systems, including:

- External and internal wall insulation.
- Insulated plasterboard.
- Floor insulation.
- Loft insulation.
- Pitched roof insulation.
- Flat roof insulation.



# WHY CHOOSE IKO ENERTHERM?

IKO enertherm is a 100% CFC, HCFC or HFC-free insulation board with a rigid polyisocyanurate foam core. It is clad on both sides with various facings, depending on the required application and waterproof finishing.



## Top quality, multi-layer facing

IKO enertherm ALU Insulation boards are finished on both sides with a seven-layer facing that is laminated in a single complex.

The lamination is tested under the most extreme conditions. This involves putting it to the test in relation to water absorption, mechanical properties and emissivity.

**The high quality, multi-layer facing acts as a barrier against air that penetrates the insulation board and disrupts the U-value and overall performance.**



## Thermal performance

IKO enertherm PIR has a thermal conductivity (Lambda/ $\lambda$ -value) of 0.022 W/mK. The low emissivity surface of the reflective foil can help improve U-values in certain constructions when reflecting into a cavity.

IKO enertherm PIR insulation Lambda and thermal resistance are in accordance with BS EN 13165: 2012 + A2: 2016 (thermal insulation products for buildings).



## Fire performance

IKO enertherm ALU has a reaction to Fire Class NPD & F (in accordance with EN 13501-1) and UK Class 1 (in accordance with BS 476 - p7). It also has a low to zero smoke emission rate and does not melt or drip. This fire performance is an inherent part of the foam cell structure.

There are potential restrictions placed upon this product which vary dependant on building type, height, construction, and location within the UK. For guidance regarding the routes to compliance for meeting fire safety requirements, please refer to the relevant Building Regulations/Standards for England, Scotland and Wales.

Further details can be obtained from IKO enertherm Technical Services.



## Compressive strength

The compressive strength of IKO enertherm typically exceeds 175 kPa when tested at 10% compression to BS EN 826: 2013 (thermal insulating products for building applications - determination of compression behaviour).



## Durability

When correctly installed, IKO enertherm has an indefinite life. Its durability depends on the background/supporting structure and conditions of its use. It should not be used to isolate dampness or in continuously damp/humid conditions.



## Recycled content

PET bottles are recycled and used throughout the entire IKO enertherm insulation production process.

“

*Building a house which achieved new building regulation thermal performance was the key objective. To achieve this, a fabric-first approach was agreed to ensure the property's walls, floors and roof were fitted with suitably specified high-performance PIR insulation, hence we engaged with IKO.”*

**Architect, Elaine Kennedy**

To read the full case study, turn to page 26.

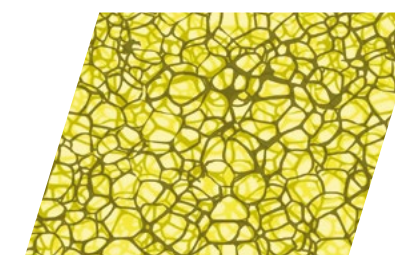




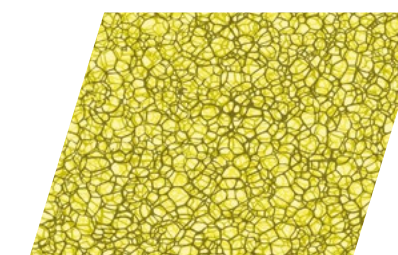
# INTRODUCING – MICRO CELL TECHNOLOGY

With its optimum raw material formulation and industry-leading production parameters, IKO enertherm features an exceptionally fine cell structure that is created using Micro Cell Technology (MCT).

## Standard PUR/PIR board cell structure vs IKO enertherm cell structure



Standard PUR/PIR Board Cell Structure  
(microscopic view)



IKO enertherm Cell Structure  
(microscopic view)

## IKO enertherm MCT unique characteristics – at a glance

### 1. Shape retention

IKO enertherm insulation boards retain their shape and dimensional stability.

**The end result:** No shrinking or cold bridging and a longer service life without any loss of insulating properties.

### 2. Moisture and mould resistance

Due to their unique MCT composition, IKO enertherm insulation boards have an extremely low, long-term water absorption rate (< 0.6%) compared to other insulation materials.

**The end result:** Increased weight (through water absorption) is eliminated, rot and mould prevention, and enhanced insulation value.

### 3. Exceptional flexibility

IKO enertherm insulation boards have a high level of elasticity, with MCT delivering exceptional pressure resistance.

**The end result:** Flexibility and no rupturing.



# IKO ENERTHERM INSULATION BOARD RANGE

RANGE		USAGE
ALU	A versatile, multi-application thermal insulation board. Suitable for walls, floors, pitched roofs and flat roofs.	
MG	Clad on both sides with a perforated glass membrane. Designed for flame-free flat roofing systems.	
BM	Clad on one side with polypropylene-coated bituminous sand and talc-free glass fabric. Designed for partially bonded bituminous flat roofing systems.  The other side is covered with a perforated glass membrane facing (MG) for added versatility.	
PB	Removes the hassle of installing insulation and plasterboard separately by combining both materials. A built-in damp screen and a straight edge creates a smooth finish, saving valuable time and space.	

## Key

- Flooring (including loft floor and underfloor heating)
- Internal walls (timber and steel frame and insulated plasterboard)
- External walls (partial and full filled cavity and external wall cladding)
- Pitched roofing
- Flat roofing







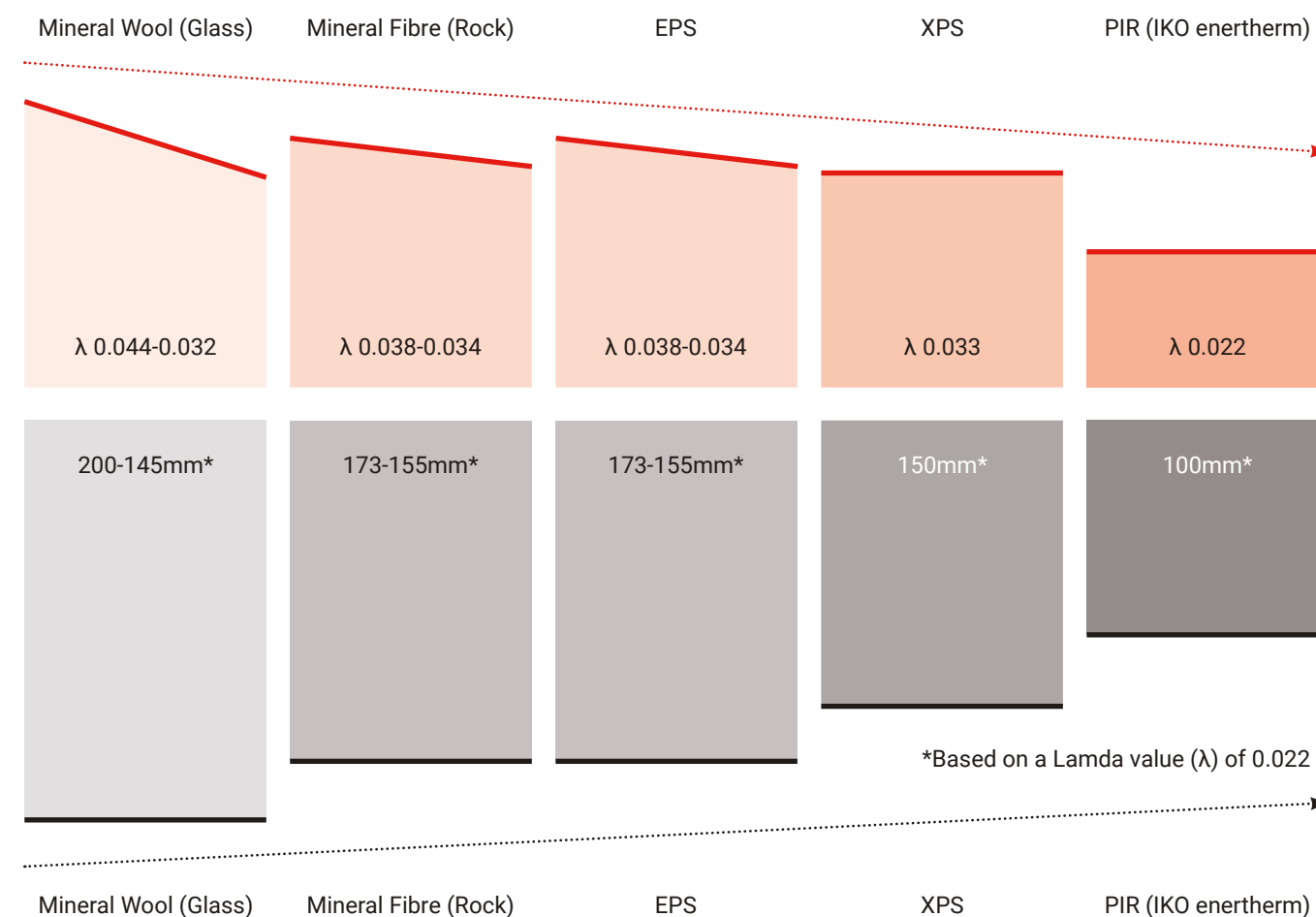
# IKO ENERTHERM – SEE THE DIFFERENCE FOR YOURSELF

Certain insulation products are suitable for certain applications. The lower the Lambda value ( $\lambda$ ), the better the product's overall thermal efficiency.

Application aside, thickness also plays a key role in specifying the correct insulation for the project at hand.

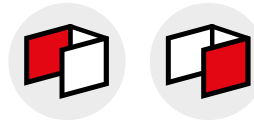
In comparison to other insulation boards (e.g. mineral wool, fibre, EPS and XPS), IKO enertherm may be dramatically thinner, but it is still capable of achieving a lower Lambda value.

Using a thinner insulation board doesn't compromise the dimensional structure of buildings in the same way other insulation materials do.





# INTERNAL WALLS



IKO enertherm ALU and PB are both widely used to insulate internal walls.

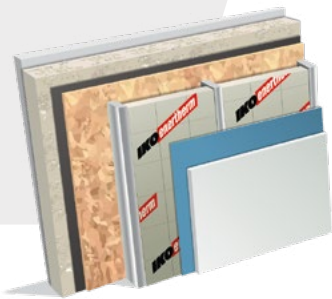
## IKO enertherm ALU

### Key benefits and features:

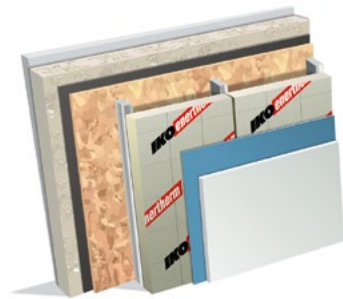
- ✓ The dimensional stability provides a guaranteed unbroken insulation shield.
- ✓ The outstanding thermal performance means just one thin layer may be enough, depending on the building construction.
- ✓ Quick and easy to cut and install.
- ✓ Lightweight and easy to transport.
- ✓ Fibre-free, zero irritation installation.



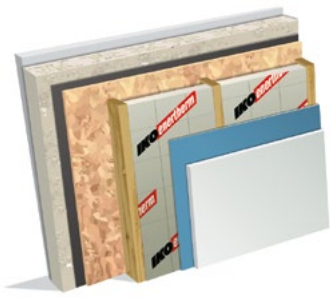
Dwarf wall



Steel friction fit



Steel mechanical fix



Timber friction fit



Timber wall mechanical fix

## IKO enertherm PB

Has been specifically created to insulate internal walls, as well as providing a ready-made plasterboard finish with various fixing options, such as dot and dab, below truss, over timber frame or stud and steel frame.

### Insulated plasterboard:

- ✓ Space-saving solution for renovations.
- ✓ Built-in damp screen.
- ✓ Larger-sized boards for quick and easy installation.
- ✓ Bevelled edges for a smoother, highly professional finish.
- ✓ Various fixing options available.

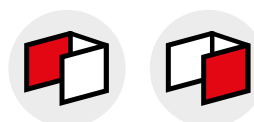


Insulated plasterboard

Contact our Technical Services Team:  
01257 256888



# EXTERNAL WALLS



**IKO enertherm ALU is widely used to insulate cavity walls and external walls.**

## IKO enertherm ALU

IKO enertherm ALU is a 100% CFC, HCFC or HFC-free insulation board with a rigid polyisocyanurate foam core, clad on both sides with a multi-layer gastight aluminium complex.

This high-quality reflecting aluminium cladding consists of no fewer than seven layers, combined into a single complex. It is tested under extreme conditions in respect of water absorption, mechanical properties, corrosion resistance and emissivity.

### IKO enertherm ALU key benefits and features:

- ✓ The dimensional stability of the boards guarantees one unbroken insulation shield.
- ✓ The outstanding thermal performance of IKO enertherm means that one thin layer of insulation board in the cavity may be enough (depending on the building construction).
- ✓ Quick and easy to cut and install.
- ✓ The lightweight board facilitates easy transportation.
- ✓ Fibre-free board, so no irritation during installation.
- ✓ The tongue and groove connection avoids thermal bridging and water ingress.
- ✓ Compatible with IKO Rubershield Breather Membranes as a house wrap, reducing condensation and protecting internal walls from moisture.

**Contact our Technical Services Team:  
01257 256888**

### IKO enertherm ALU CW & FF key benefits and features:

- ✓ Rigid PIR partial and full fill masonry cavity wall solution with great thermal performance – a Lambda of 0.022 W/mK.
- ✓ Engineered straight and T&G board edges maximise thermal performance and resist water penetration.
- ✓ Low emissivity foil facing 0.05 improves thermal performance in sealed cavity air spaces and U-values.
- ✓ The low thermal conductivity can maximise usable internal floor space.
- ✓ Available as 1200mm x 450mm rigid boards in a wide range of thicknesses for common cavity widths.
- ✓ Lightweight and rigid design for easy handling, transportation, and fitting.
- ✓ BBA-certified.
- ✓ Manufactured using a blowing agent that is CFC/HCFC-free and has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).
- ✓ Produced in accordance with an ISO 14001:2015-accredited Environmental Management System.



Partial fill only



Partial fill with insulated plasterboard



Full fill only



Full fill with insulated plasterboard



# FLOORING (INCLUDING LOFT FLOORING)

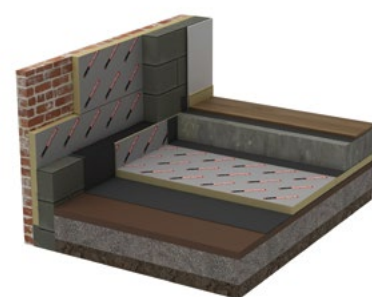


## IKO enertherm ALU

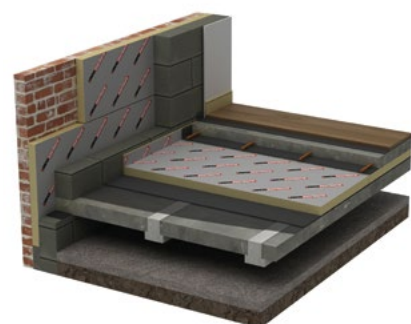
This insulation is frequently used to thermally insulate floors, including loft floors. It is widely recognised as being a convenient, highly effective solution for insulating new and refurbished properties at ground or loft level.

When used in lofts, or any ceiling that is above a cold space such as a garage, IKO enertherm ALU can reduce heat loss within the rest of the building by up to 10%; especially when the roofing structure does not provide any further insulation (i.e. between the rafters).

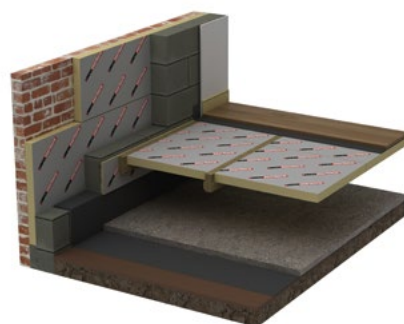
The overall building design will determine the insulation type. Regardless of whether the insulation is required above or below ground, IKO enertherm ALU is quick and easy to install.



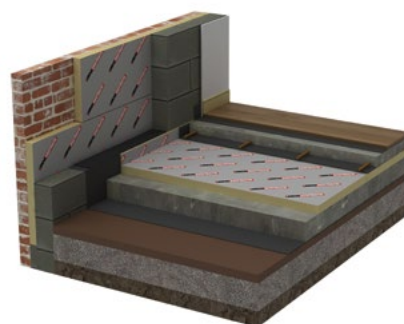
Below slab



Beam & block detail



Suspended timber floor



Above ground bearing slabs

### Key benefits and features:

- ✓ Exceptional dimensional and compressive stability. The compressive strength of IKO enertherm typically exceeds 175 kPa when tested at 10% compression to BS EN 826:2013 (thermal insulating products for building applications -determination of compression behaviour).
- ✓ Moisture and rot-proof.
- ✓ Can be installed quickly and easily due to lightweight properties and convenient sizes.
- ✓ Loose installation in combination with OSB boards.
- ✓ Can be used alongside IKO Hyload Structural Waterproofing products when insulating ground floors.

### Common applications:

- ✓ Below and above concrete floor slabs.
- ✓ Below cement-based screed on concrete slabs with a hard-core base.
- ✓ Below suitable OSB plywood or shipboard coverings on solid floors.
- ✓ Above suspended concrete floors (e.g. beam and block) with a cement-based screed.
- ✓ Between the joists of suspended timber ground floors.

**Contact our Technical Services Team:  
01257 256888**



# PITCHED ROOFS



## IKO enertherm ALU is the perfect pitched roofing insulation solution.

Using the correct type of insulation with a suitable breathable membrane can reduce the risk of condensation forming within pitched roof structures, which can lead to mould and can cause wider damage to the overall building over time.

IKO enertherm ALU insulation boards are available in a wide range of thicknesses.

For quick and easy installation, even if small adjustments are required for a tight fit. The boards also maintain their shape, eliminating the risk of thermal bridging.

**IKO enertherm ALU insulation boards feature a moisture-resistant cell structure in addition to IKO's Rubershield Breather Membrane, combatting condensation and reducing thermal bridging in the process.**



### Key benefits and features:

- ✓ Can be installed quickly and easily due to lightweight properties and convenient sizes.
- ✓ Moisture-proof and non-deformable.
- ✓ Thinner alternative to traditional loft insulation materials.
- ✓ Compatible with the IKO Rubershield Breather Membrane range.



Between and under rafters unventilated



Between and under rafters ventilated



Over and between rafters



Over rafters only



Under rafters only unventilated



Under rafters ventilated

**Contact our Technical Services Team:  
01257 256888**



# FLAT ROOFS



**IKO enertherm is used to insulate flat roofs within new and refurbishment projects on concrete, steel deck and timber substrates.**

In addition, the closed cell structure offers further protection against water ingress that can potentially compromise the insulation value. At the same time, the thinner dimension boards are capable of meeting the insulation requirements.

**This is extremely useful when overlaying roofs with abutments, cills, roof lights and doorways, as the need to remove or raise these features, in order to conform with Building Regulations, could be alleviated.**

## Wide range of facings

An extensive range of facings are available within the IKO enertherm range, which means there is an insulation board to suit most roofing requirements.

All of the facings incorporate the wealth of benefits offered by the ALU facing board, which include its compressive strength created by its unique closed core cell structure.

## Key benefits and features:

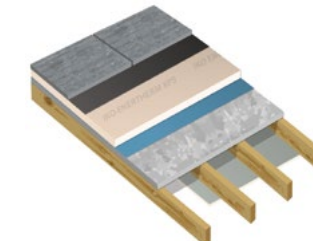
- ✓ Highly versatile – can be used within torch-on, pour and roll, self-adhesive, liquid, mastic asphalt, single ply, and PU adhesive installations.
- ✓ High dimensional stability and compressive strength provides added protection.
- ✓ Wide selection of board widths to suit most installations.
- ✓ Lightweight boards for easy transportation and handling.
- ✓ Can be installed quickly and easily.



Cold roof IKO build-up



Cold roof typical build-up



Inverted roof



Warm roof

**IKO enertherm ALU, MG and BM are used to insulate flat roofs.**

## IKO enertherm ALU

Due to its high compressive strength, IKO enertherm ALU offers additional protection during installation for a more efficient end result.

## IKO enertherm MG

IKO enertherm MG is clad on both sides with a perforated glass membrane. The MG board has been designed to be incorporated within flame-free applications, including self-adhesive membranes, single ply, mastic asphalt and liquid waterproofing.

## IKO enertherm BM

IKO enertherm BM is clad on one side with polypropylene-coated bituminous sand and talc-free glass fabric.

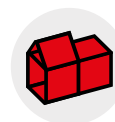
The other side is covered with a perforated glass membrane facing (MG) for providing added versatility for the stockist and roofing contractor.

This insulation board is designed for partially bonded bituminous torch-on flat roofing systems.

**Contact our Technical Services Team:  
01257 256888**



# RECOMMENDED U-VALUES



IKO's Technical Services team is on hand to provide a complete U-value analysis for every element of your project to make sure it complies with Building Regulations.

Current regulations stipulate that the U-value calculation must be used to assess thermal insulation in accordance with the England & Wales and Section 6 (Scotland) Building Regulations for new build and refurbishment projects.

### The value depends on a number of factors including:

- **Project location** – different regulations exist for England, Wales, and Scotland.
- **Building type** – domestic or commercial.
- **Insulation application** – roof, wall, or floor.
- **Positioning** – internal or external.

Producing a calculation that complies with the Building Regulations for each region can be complex. The factors listed above must be taken into consideration, as well as the:

- Build-up the insulation is part of.
- Cavity requirements.
- Slope and incline of the roof.
- P/A (perimeter area) ratio.

**These tables highlight the required target U-values, depending on the application and geographical location:**

**Contact our Technical Services Team:  
01257 256888**

England June 2023	Domestic New Build			Non-Domestic New Build		
	Target U Value W/m2K	Extension	Refurbish	Target U Value W/m2K	Extension	Refurbish
Wall	0.18	0.18	0.3	0.18	0.3	0.3
Floor	0.13	0.18	0.25	0.15	0.25	0.25
Pitch Roof - Ceiling level	0.11	0.15	0.16	0.15	0.16	0.16
Pitch Roof-Rafter Level	0.11	0.15	0.16	0.15	0.18	0.18
Flat Roof	0.11	0.15	0.16	0.15	0.18	0.18

Scotland February 2023	Domestic New Build			Non-Domestic New Build		
	Target U Value W/m2K	Extension	Refurbish	Target U Value W/m2K	Extension	Refurbish
Wall	0.15	0.17	0.17	0.15	0.21	0.21
Floor	0.12	0.15	0.15	0.13	0.18	0.18
Pitch Roof - Ceiling level	0.09	0.12	0.12	0.11	0.16	0.16
Pitch Roof-Rafter Level	0.09	0.12	0.12	0.11	0.16	0.16
Flat Roof	0.09	0.12	0.12	0.11	0.16	0.16

Wales November 2022	Domestic New Build			Non-Domestic New Build		
	Target U Value W/m2K	Extension	Refurbish	Target U Value W/m2K	Extension	Refurbish
Wall	0.13	0.18	0.3	0.22	0.26	0.3
Floor	0.11	0.15	0.25	0.22	0.22	0.25
Pitch Roof - Ceiling level	0.11	0.13	0.16	0.18	0.15	0.16
Pitch Roof-Rafter Level	0.11	0.13	0.16	0.18	0.18	0.18
Flat Roof	0.11	0.13	0.16	0.18	0.18	0.18

\* Column A for extensions where existing dwellings wall and roof U-values are worse than 0.70 W/mK in the walls and worse than 0.25 W/mK in the ceiling.

Column B applies to other extensions, upgraded existing thermal elements, non-exempt conservatories and conversion of unheated buildings.

\*\* 0.20 only applies when integral insulation is used.



# IKO IN ACTION

## CASE STUDY

### Residential house build

Project: Highwood House, Scotland

Product: 950m<sup>2</sup> of enertherm ALU insulation

Highwood House is a brand new, four bedroom, detached property in south west Scotland, which was constructed under the supervision of Elaine Kennedy Architects.

Designed with sustainability in mind, the house needed to be thermally-proofed and meet current Building Regulation thermal performance requirements. As a result, a fabric-first approach was implemented, which prioritised the property's energy efficiency credentials from the outset.

As part of this vision, specifying a high quality, high performance insulation system for the entire building was fundamental in maximising thermal efficiency and future-proofing the property.

More specifically, due to the fact Highwood House is located in open countryside, it is at the mercy of the elements, particularly wind-driven rain. This meant that the insulation solution had to be watertight and airtight, as well as delivering the required U-values.

IKO enertherm ALU was specified as the main insulation system throughout, providing a thermal capability of 0.022W/m<sup>2</sup>K and fitting easily between the timber studs, roof rafters and flooring. This enabled different air tightness levels and ventilation strategies to be incorporated, as well as various heating and hot water solutions.

Installing IKO enertherm ALU also resulted in the following U-values being achieved:

- ✓ **Ground floor** - 150mm IKO enertherm ALU = 0.11W/m<sup>2</sup>K
- ✓ **Walls** - full-fill IKO enertherm ALU = 0.12W/m<sup>2</sup>K
- ✓ **Pitched roof** - 140mm IKO enertherm ALU (between the rafters and 90mm below) = 0.10W/m<sup>2</sup>K







## WE ARE IKO

### We are recognised as being an industry institution in the UK.

With more than 140 years' manufacturing experience, IKO is firmly established as the UK's market leader in the design, manufacture and installation of roofing, waterproofing and insulation solutions, along with our fast-growing highways maintenance range.

This hard-earned reputation has been built on a foundation of high-quality products, exemplary customer service and an unwavering commitment to driving positive change and protecting what matters to our people and the planet.

With this comes a responsibility to continue investing in our product solutions, our manufacturing facilities and our extensive team of experts to deliver excellence at every level.

### Manufactured in the UK. Made for the future.

Our strategically-located manufacturing plants around the country, supported by our nationwide network of building contractors and distributors, make IKO best placed to provide our UK-wide customers with a reliable, responsible and responsive service.





**IKO Insulation**  
Alconbury Weald  
Huntingdon  
Cambridgeshire  
PE28 4YA

t: 01257 255771  
e: [getintouch.uk@iko.com](mailto:getintouch.uk@iko.com)  
**Member of the IKO Group**

**Sales Support**  
t: 01257 256751  
[iko.enertherm.uk@iko.com](mailto:iko.enertherm.uk@iko.com)

**Technical Services**  
t: 01257 256888  
[technical.uk@iko.com](mailto:technical.uk@iko.com)



**IKOGROUP.CO.UK**

Whilst every care is taken to see that the information given in this literature is correct and up to date it is not intended to form part of any contract or give rise to any collateral liability, which is hereby specifically excluded. Intending purchasers of our materials should therefore verify with the company whether any changes in our specification or application details or otherwise have taken place since this literature was issued.