

FEEL  
GOOD  
INSIDE



UK

# Pitched Roofs

Specification Guide



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# Recticel Insulation

## – your partner in comfort

As well as producing PIR products of unparalleled quality, Recticel Insulation is a company of thought leaders and creators, driven by a desire to develop insulation which establishes unprecedented levels of thermal performance and usability. Based at its state-of-the-art facility in Stoke-on-Trent, Recticel Insulation – which is part of the Recticel Group, one of the world's largest producers of polyurethane products – is a committed solution-provider: an industry pioneer in the quest for future generations to be able to enjoy a sustainable environment, without compromising on comfort.



Much of our lifetime will be spent at home and in the workplace. Therefore, ensuring both areas are well-insulated is of the utmost importance. By creating a healthy interior climate, we enhance the well-being of those within. Customer comfort lies at the heart of Recticel Insulation's success – and there can be no greater achievement than its facilitation of safe, secure and sustainable living space.

Insulating a building is a once-in-a-lifetime investment, hence the need to select PIR products of proven quality to help reduce long-term energy consumption - a major contributor to lowering carbon emissions and meeting the challenge of global warming. Renowned as a leading technical innovator within the insulation industry, Recticel is focused on the future needs of our children and guiding them towards a comfortable and worry-free future. Its worldview displays similar compassion. Recticel's products are designed and

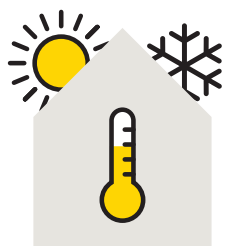
manufactured to result in the lowest environmental impact, and its Stoke-on-Trent site has attained ISO 14001 certification for its environmental management system.

In order to maintain its reputation as instigators par-excellence in the field of insulation advancement, Recticel's search for new and improved product solutions continues daily at its Belgium-based Sustainable Innovation Department. From its high-specification European facility, a dedicated research and development team works tirelessly to discover formulas which will lead to the manufacture of materials comprising even greater thermal efficiency and workability. Quality product producers, unbeatable service providers, environmental engagers, future solution suppliers... Recticel Insulation has more than earned its position as one of the world's leading PIR manufacturers – but its journey has only just begun.

Visit [recticelinsulation.co.uk](https://www.recticelinsulation.co.uk) to view detailed product guides, including U-value calculations, or contact **Recticel Technical Services Department** on **0800 0854079** or our **Sales Department** on **01782 590480** to discuss your requirements.

# Feel good inside

As your insulation partner, we work together to create a feel good inside climate by providing a range of intelligent insulation solutions. By constantly innovating and improving our products we want to increase comfort for you and your customers. Discover the many ways you benefit from insulating with Recticel Insulation:



## Stable inside temperature

Recticel Insulation guarantees maximum comfort by creating a living or working environment with a healthy and stable inside climate.



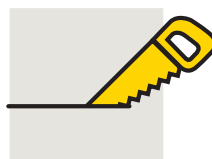
## Quick installation

The boards are user friendly and comfortable to install. They reduce the installation time on site.



## Lightweight

The insulation boards are light and easy to handle.



## Easy to cut

Our boards are easy to cut on site in different dimensions. This gives you the ability to customise sizes to fit every project.



## More living space

With their high insulation values, the insulation boards give you the opportunity to install thinner layers of insulation and create extra living space.

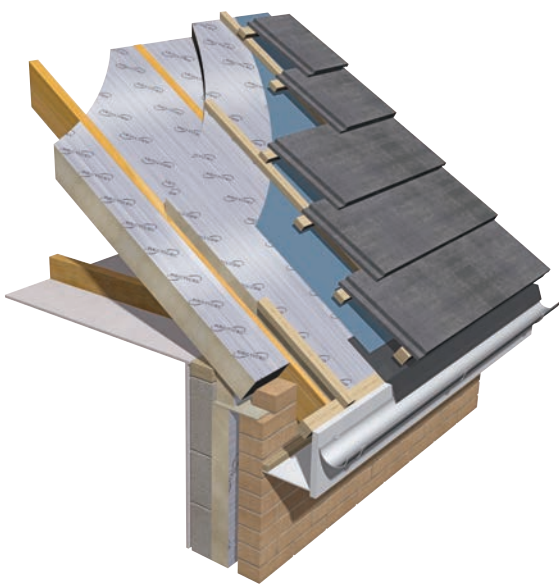


# Recticel

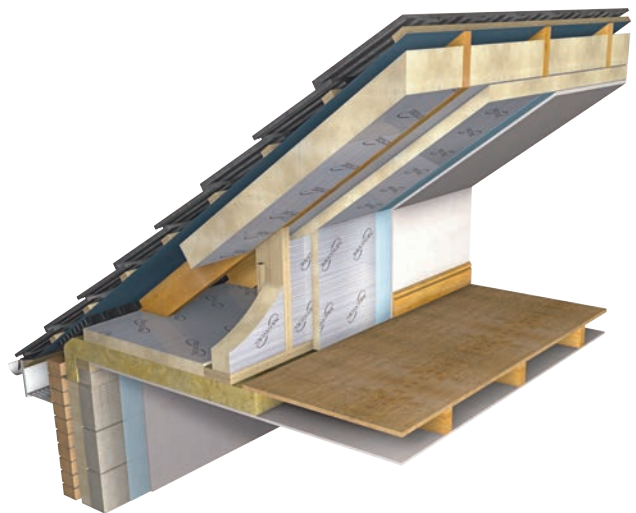
## High performance in pitched roofs

Ensuring that a pitched roof offers the necessary weather protection and thermal performance is a vital part of any building project. It could be a new-build roof or the conversion of an existing structure to provide additional living accommodation – **Eurothane® GP**, used in conjunction with our **Eurothane® PL** plasterboard laminate, offers the versatility and performance to meet almost any solution. And because PIR is one of the thinnest insulation types on the market, our two products maximise the available space as part of the solution that's right for you.

### Eurothane® GP



### Eurothane® PL



# Eurothane® GP

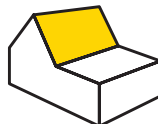
A high performance PIR insulation board, perfectly suited for pitched roof applications.



## Product Benefits

- Good thermal performance:  $\lambda D = 0.022 \text{ W/mK}$
- Quick, easy installation
- Easy to cut and install
- High compressive strength

## Applications: Pitched Roofs



## Product Overview

**Eurothane® GP** is a high performance PIR insulation suitable for pitched roof applications. Lightweight and easy to cut, handle and install, the board is available in a variety of thicknesses to suit precise specifications and to ensure that thermal regulations are met or even exceeded.

### With Eurothane® GP, you are specifying a board that:

- Has a low thermal conductivity (0.022 W/mK) providing an excellent thermal performance
- Is available in a range of thicknesses from 25mm – 160mm and in a board size of 2400mm x 1200mm
- Will not degrade or deteriorate if exposed to moisture, therefore maintaining its thermal performance.

## Specification Clause

The insulation shall be Recticel **Eurothane® GP** \_\_\_mm\* thick for use in pitched roof applications, manufactured in accordance with an ISO 9001 quality management system and an ISO 14001 environmental management system. It should comprise a rigid polyisocyanurate (PIR) core faced on both sides with a gas tight multilayer composite aluminium foil facing. The product should be manufactured using a blowing agent with zero ODP and low GWP, and be CE marked in accordance with BS EN 13165. **Eurothane® GP** should be installed in accordance with Recticel's recommendations.

## Eurothane® GP Thermal Resistances

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)
64681/001	25	1.10
64681/002	30	1.35
64681/004	40	1.80
64681/005	50	2.25
64681/006	60	2.70
64681/008	70	3.15
64681/058	75	3.40
64681/009	80	3.60
64681/010	90	4.05
64681/011	100	4.50
64681/089	110	5.00
64681/068	120	5.45
64681/086	130	5.90
64681/080	140	6.35
64681/091	150	6.80
64681/104	160	7.25

## Key Specifications

Thermal Conductivity Lambda ( $\lambda$ )	0.022 W/mK
Compressive Strength	Thickness: 50-160mm $\geq 140\text{kPa}$ at yield Thickness: <50mm $\geq 120$ at yield
Water vapour diffusion coefficient (foam)	Tabulated value EN ISO 10456 $\mu$ 50-100
Specific Heat Capacity	1.4kJ/kgK
Fire Performance	Euroclass F, EN 13501-1 Class 1, BS 476 (part 7)
Dimensions	2400mm (l) x 1200mm (w)
Facing	Gas diffusion tight multilayer foil on both sides and grid on both sides
Certification	BBA 02/3905

\*Thickness as per the Thermal Resistances table on the right



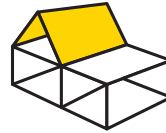


Eurothane® PL is a durable PIR insulated plasterboard for pitched roof applications.

### Product Benefits

- Good thermal performance:  $\lambda = 0.022 \text{ W/mK}$
- 3-in-1 solution: insulation board, vapour control layer and plasterboard
- Multiple fixing methods can be applied

### Internal Applications: Pitched Roofs



## Product Overview

**Eurothane® PL** is a durable PIR-insulated plasterboard suitable for mechanical fixing to the inside of pitched roof constructions. It is easy to cut, handle and install and, as a factory-bonded solution, provides optimum adhesion between plasterboard and insulation.

#### With Eurothane® PL, you are specifying a board that:

- Has a low thermal conductivity (0.022 W/mK) providing an excellent thermal performance. The plasterboard offers a thermal conductivity of 0.21 W/mK
- Has a reaction to fire classification Euroclass B-s1, d0
- Is available in a range of thicknesses from 37.5mm to 77.5mm, and in a board size of 2400 x 1200mm

### Specification Clause

The insulation shall be Recticel **Eurothane® PL** \_\_\_mm\* thick for use as an insulated dry-lining product, manufactured in accordance with an ISO 9001 quality management system and an ISO 14001 environmental management system. It should comprise a rigid polyisocyanurate (PIR) core faced on both sides with a gas tight kraft and aluminium multilayer facing, together with a factory bonded 12.5mm tapered edge plasterboard on the upper face. The product should be manufactured using a blowing agent with zero ODP and low GWP. **Eurothane® PL** should be installed in accordance with Recticel's recommendations.

### Eurothane® PL Thermal Resistances

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)
64238/001	37.5	1.15
64238/002	52.5	1.85
64238/004	62.5	2.30
64238/006	77.5	3.00

### Key Specifications

Thermal Conductivity Lambda ( $\lambda$ )	0.022 W/mK
Water Vapour diffusion coefficient (foam)	Resistance Factor (Tabulated value) EN ISO 10456 $\mu$ 50-100
Fire Performance	Euroclass B-s1, d0 (end use), EN 13501-1
Dimensions	2400mm (l) x 1200mm (w)
Facing	Multilayer kraft and aluminium foil with 12.5 tapered edge plasterboard bonded to one side
Certification	BBA 14/5136

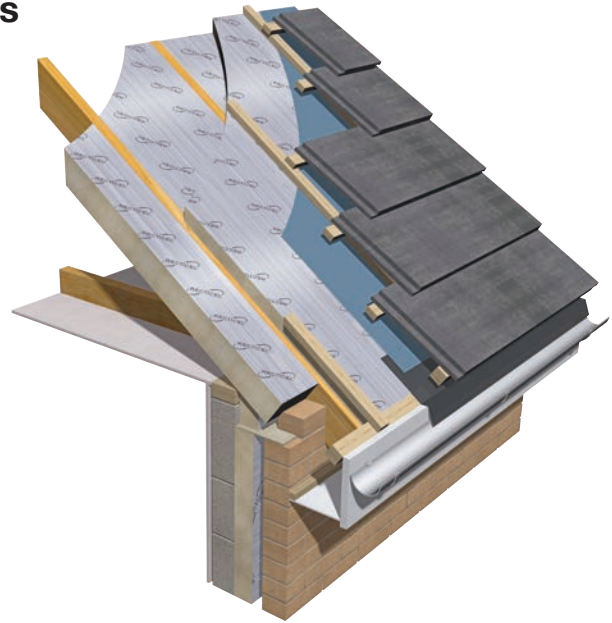
\*Thickness as per the Thermal Resistances table on the right

## Thermal Performance

Typical U-values (W/m<sup>2</sup>K) achieved in common pitched roof constructions

### Insulation Over/Over And Between Rafters

- ▶ Tiles, battens, and ventilated counterbatten void
- ▶ Breather membrane
- ▶ Recticel Eurothane GP over rafters, stainless steel fixings, 6.7 per m<sup>2</sup>
- ▶ 50mm wide timber rafters, depth and centres as indicated
- ▶ Recticel Eurothane GP between rafters, as indicated
- ▶ Low-emissivity clear cavity, unvented
- ▶ Plasterboard finish



Insulation over rafters (mm)	Insulation between rafters (mm)	Rafter Centres		
		400mm	600mm	
<b>Insulation over rafters</b>				
50	n/a	0.33	0.34	min. 100mm deep rafters
75	n/a	0.24	0.24	
90	n/a	0.21	0.21	
100	n/a	0.19	0.19	
110	n/a	0.17	0.17	
120	n/a	0.16	0.16	
140	n/a	0.14	0.14	
150	n/a	0.13	0.13	
<b>Insulation over and between rafters</b>				
40	40	0.26	0.25	min. 100mm deep rafters
50	50	0.22	0.21	
60	60	0.19	0.18	
70	70	0.16	0.16	
75	75	0.15	0.15	
80	80	0.14	0.14	min. 150mm deep rafters
90	90	0.13	0.12	
100	100	0.12	0.11	
110	110	0.11	0.10	
120	120	0.10	0.10	

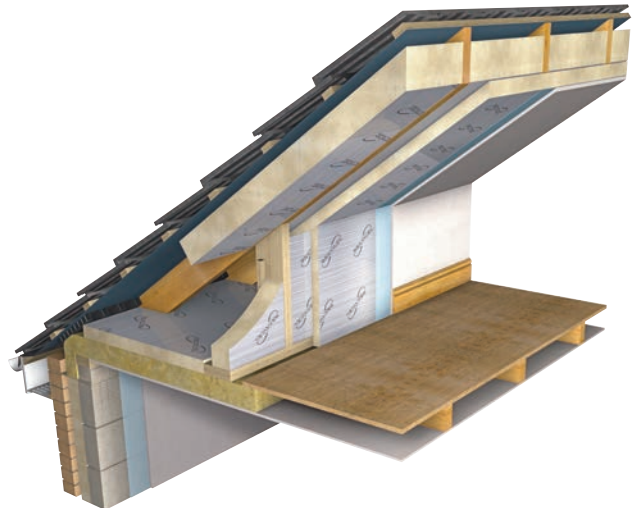


## Thermal Performance

Typical U-values (W/m<sup>2</sup>K) achieved in common pitched roof constructions

### Insulation Between And Under Rafters

- ▶ Unventilated roof construction
- ▶ Tiles and battens
- ▶ Breather membrane
- ▶ Low-emissivity rafter cavity, unvented
- ▶ Recticel Eurothane GP, thickness indicated in first column, between rafters (spacing as indicated)
- ▶ Recticel Eurothane GP or Eurothane PL fixed below rafters
- ▶ VCL (incorporated within product if using Eurothane PL)
- ▶ Plasterboard finish (incorporated within product if using Eurothane PL)



	Insulation thickness under rafters									
	25mm		40mm		50mm		60mm		75mm	
	400 cts	600 cts	400 cts	600 cts	400 cts	600 cts	400 cts	600 cts	400 cts	400 cts
75mm	0.24	0.23	0.20	0.19	0.19	0.18	0.17	0.16	0.15	0.15
80mm	0.23	0.22	0.20	0.19	0.18	0.17	0.17	0.16	0.15	0.14
90mm	0.22	0.20	0.19	0.18	0.17	0.16	0.16	0.15	0.14	0.14
100mm	0.20	0.19	0.18	0.17	0.16	0.15	0.15	0.14	0.14	0.13
110mm	0.19	0.18	0.17	0.16	0.16	0.15	0.14	0.14	0.13	0.12
120mm	0.18	0.17	0.16	0.15	0.15	0.14	0.14	0.13	0.13	0.12
130mm	0.17	0.16	0.15	0.14	0.14	0.13	0.13	0.12	0.12	0.11
140mm	0.16	0.15	0.15	0.14	0.14	0.13	0.13	0.12	0.12	0.11
150mm	0.16	0.14	0.14	0.13	0.13	0.12	0.12	0.12	0.11	0.11

# Typical installation

## General

### Thermal Bridging

Linear thermal bridging is concerned with heat loss at junctions. To reduce heat loss it is necessary to ensure continuity of the insulation layer with adjacent building elements. This means careful detailing at junctions between elements to minimise the effects of thermal bridging.

For example, at gable ends continue the wall insulation 250mm above the height of the internal ceiling insulation and install a cavity tray over.

For further guidance on reducing thermal bridging, Accredited Construction Details (ACDs) and Enhanced Construction Details (ECDs) have been developed to assist the construction industry achieve the performance standards required to demonstrate compliance with the energy efficiency requirements of the building regulations.

It is recommended that any detailing and jointing of the boards achieves a draught free airtight envelope. Form tight joint details between boards at rafters and at ridges, valleys and hips.

### Condensation Control

The specification of a vapour control layer (VCL) will vary depending on building use and the humidity of the internal environment. For all roof constructions it is recommended that a condensation risk analysis be performed in accordance with BS 5250 (Code of practice for control of condensation in buildings) in order to determine the requirement for a VCL.

A VCL typically acts as an airtightness membrane also, depending on the specific project requirements.

### Breather membranes

Should be installed in accordance with the specific manufacturer's instructions and BBA certificate. Air gaps between insulation and membrane should be 25mm to 50mm generally. Some membranes can be laid directly on the insulation (i.e. insulation can fully fill the rafters), but require a counterbatten layer above the membrane to provide an air gap.

### Fire Performance

Installed in accordance with this installation guide and good practice guidance, Eurothane GP will not prejudice the fire resistance of the roof and adds no significant fire load to the building. The product has a Class 1 fire rating, tested to Euroclass F, EN 13501-1.

# Installation over rafters

## Warm Roof

This is a true warm roof construction that does not require ventilation, and maintains the roof structure at (or close to) the internal temperature. A breathable sarking membrane is installed over the insulation, allowing condensate to diffuse outwards and preventing moisture ingress.

As well as insulating above the rafters, insulation can be added between to avoid an excessively deep roof construction. The insulation layer over the rafters should be at least as thick as the layer between to avoid possible condensation issues.

## Instructions

- ▶ A treated timber stop rail is secured at the base of the rafters at the eaves to provide a secure anchor for the counter battens.
- ▶ Eurothane GP boards are laid with the long edges parallel to the rafters, tightly butted in a brick-bond pattern.
- ▶ All board joints running eaves to ridge should be supported by rafters. Boards can be temporarily fixed with nails prior to counter battening.
- ▶ Counter battens fixed over the insulation layer need to be appropriately sized to accept the helical nails being driven through to the rafters underneath. Secure the insulation boards using 38mm x 50mm counter battens down the line of each rafter. The lower end of the counter batten is nailed directly into the stop rail.
- ▶ Nail the counter batten through the Eurothane GP boards into the rafter. Helical fixings are generally advisable to ensure resistance to wind loads. Fixing manufacturers provide calculations to work out the size and number of fixings required, and aid compliance with British Standards and Euro-codes.
- ▶ Lay the breathable sarking membrane over the counter battens. The membrane should extend over the fascia to ensure drainage of water into the gutter, a continuous timber fillet should be used to support the edge of the membrane.
- ▶ Secure the tiling battens, normally 50mm x 25mm, to the rafters by fixing through the insulation and the counter battens.
- ▶ Tiles are fixed in accordance with manufacturers recommendations.
- ▶ Where required, install the between rafter layer of Eurothane GP so that the boards are flush with the top of the rafters, with no air gap between the over rafter layer of insulation.
- ▶ Where insulation is installed over and between rafters, ensure that the layer of Eurothane GP over rafter is equal to or thicker than the Eurothane GP between rafter.
- ▶ Secure timber battens to the lower edge of the rafters to support the Eurothane GP boards.
- ▶ Finish the ceiling internally with a vapour control layer and plasterboard as required.

# Installation between and under rafters

## Unventilated Roof

This is a modern roof construction that potentially allows the full depth of the rafter to be used, depending on the requirements of the breathable sarking membrane manufacturer. Further insulation can be added under the rafters, head room permitting, which minimises the thermal bridge effect of the timber.

## Ventilated Roof

Most common in roof refurbishment, this is a traditional cold roof construction, normally featuring Type 1F vapour resistant sarking felt, with ridge to eaves ventilation and minimum 50mm airspace between the sarking felt and insulation. Again, further insulation can be added under the rafters.

## Instructions

- ▶ For unventilated roof construction, secure minimum 25mm x 25mm battens flush with the top edge of the rafters to provide a stop, and to ensure the required space above the insulation for the drape of the breather membrane.
- ▶ With ventilated roof construction, secure minimum 50mm x 25mm battens flush with the top edge of the rafters to provide a stop, and to ensure the required 50mm minimum ventilated airspace is maintained.
- ▶ When constructing a new roof or a complete roof refurbishment, complete the tiling, battening and felting in the normal manner using a BBA approved breathable sarking membrane.
- ▶ Accurately cut the Eurothane GP boards to fit between the rafter timbers and position against the stop battens.
- ▶ The stop battens should be positioned such that the bottom face of the Eurothane GP board is flush with the bottom of the rafters.
- ▶ If required, an additional layer of Eurothane GP or Eurothane PL boards can be fixed below the rafters by means of plasterboard timber screws. Timber screws reduce the risk of nail popping, allow for the boards to be tightly fixed against the structure and reduce the ability of boards to flex.
- ▶ Under rafter insulation boards should be lightly butted together and not forced into position.
- ▶ Consideration should be given to the method of vapour control, this will vary based on the proposed construction. It could be in the form of a separate polythene vapour control layer (VCL), foil backed plasterboard or by the taping of the board joints with an acrylic adhesive foil tape if Eurothane GP is used below rafters. Eurothane PL has an integral VCL, so installed below rafter with the correct detailing at board joints, junctions and penetrations, is also an accepted form of vapour control.
- ▶ The minimum distance from the screw to the edge of the board is 10mm. For horizontal or hand sawn edges a minimum distance of 15mm should be kept. The maximum distance between screws is 250mm.
- ▶ Screw length should be calculated based on a minimum penetration of 25mm into the timber structure.
- ▶ Screws should be tightened until the countersunk head is driven in just below the surface of the plasterboard. This allows a skimming over of the screw head.

# Building regulations

## England

### PART L 2013

U-values are part of wider assessment criteria to meet the requirements of Part L as a whole. Other factors taken into account include: airtightness, door and window U-values, the heating system, and thermal bridging.

'Limiting U-values' are the worst acceptable level of performance, but designing to these values is unlikely to result in compliance. The 'notional building specification' is a recipe approach that will ensure compliance if all standards are met. Regulatory compliance should be assessed through the appropriate Standard Assessment Procedure (SAP) – for domestic or Simplified Building Energy Model (SBEM) – for non domestic, calculation software.

### NEW BUILD: L1A – new dwellings; L2A – new buildings other than dwellings

(the values are presented in W/m<sup>2</sup>K).

		Floor	External Wall	Flat Roof	Pitched Roof	
					Sloped Ceiling	Flat Ceiling
L1A	Notional dwelling	0.13	0.18	0.13	0.13	0.13
	Limiting Values	0.25	0.30	0.20	0.20	0.20
L2A	Notional building	0.22	0.26	0.18	0.18	0.18
	Limiting Values	0.25	0.35	0.25	0.25	0.25

### EXISTING PROPERTIES: L1B – existing dwellings; L2B – existing buildings other than dwellings

U-value requirements for existing buildings are unchanged from Part L 2010.

(The values are presented in W/m<sup>2</sup>K).

		Floor	External Wall	Flat Roof	Pitched Roof	
					Sloped Ceiling	Flat Ceiling
L1B & L2B	New element	0.22	0.28	0.18	0.18	0.16
	Retained element	0.25	0.30*	0.18	0.18	0.16

\*where insulation is installed internally or externally

## Wales

### PART L 2014

U-values are part of wider assessment criteria to meet the requirements of Part L as a whole. Other factors taken into account include: airtightness, door and window U-values, the heating system, and thermal bridging.

'Limiting U-values' are the worst acceptable level of performance, but designing to these values is unlikely to result in compliance. The 'notional building specification' is a recipe approach that will ensure compliance if all standards are met. Regulatory compliance should be assessed through the appropriate SAP (for domestic) or SBEM (for non-domestic) calculation software.

### NEW BUILD: L1A – new dwellings; L2A – new buildings other than dwellings

(the values are presented in W/m<sup>2</sup>K).

		Floor	External Wall	Flat Roof	Pitched Roof	
					Sloped Ceiling	Flat Ceiling
L1A	Notional dwelling	0.15	0.18	0.11	0.11	0.11
	Limiting Values	0.18	0.21	0.15	0.15	0.15
L2A	Notional building	0.22	0.26	0.18	0.18	0.18

### EXISTING PROPERTIES: L1B – existing dwellings; L2B – existing buildings other than dwellings

(The values are presented in W/m<sup>2</sup>K).

		Floor	External Wall	Flat Roof	Pitched Roof	
					Sloped Ceiling	Flat Ceiling
L1B	New element	0.18	0.21	0.15	0.15	0.15
	Retained element	0.25	0.30	0.18	0.18	0.16
L2B - all elements	Domestic*	0.18	0.21	0.15	0.15	0.15
	Limiting Values	0.22	0.26	0.18	0.18	0.15

\*refers to buildings other than dwellings that are 'domestic' in character



## Scotland

### SECTION 6 2015

U-values are part of wider assessment criteria to meet the requirements of Section 6 as a whole. The ‘notional building specification’ is a recipe approach that will ensure compliance if all standards are met. Regulatory compliance should be assessed through the appropriate SAP (for domestic) or SBEM (for non-domestic) calculation software.

#### DOMESTIC NEW BUILD

As well as U-values, the notional dwelling specifications for gas, LPG and oil fuel packages take into account: airtightness, door and window U-values, the heating system, and thermal bridging. They also include photovoltaics and waste water heat recovery. Specifying U-values therefore needs to be done in careful consideration with the entire dwelling package.

(The values are presented in W/m<sup>2</sup>K).

	Floor	External Wall	Flat Roof	Pitched Roof	
				Sloped Ceiling	Flat Ceiling
New domestic (notional dwelling)	0.15	0.17	0.11	0.11	0.11

#### Existing Domestic Properties

For extensions to existing dwellings, the required U-values for the new elements depend on the performance of the existing building:

- ▶ The higher standards in ‘A’ apply where the walls of the existing building have a U-value poorer than 0.70 and the roof is poorer than 0.25.
- ▶ ‘B’ applies where the walls of the existing building have a U-value better than 0.70 and the roof better than 0.25, or will be upgraded to those levels as part of the works.

Where existing domestic elements are to be altered or refurbished, the standards in ‘B’ apply.

(The values are presented in W/m<sup>2</sup>K).

		Floor	External Wall	Flat Roof	Pitched Roof	
					Sloped Ceiling	Flat Ceiling
Existing domestic	A	0.15	0.17	0.13	0.13	0.11
	B	0.18	0.22	0.18	0.18	0.15

#### NON-DOMESTIC BUILDINGS – NEW AND EXISTING

For all building types, early consultation with Local Authority Building Standards is advised.

Non-domestic new build standards are based on heating/ventilation specification (natural or mechanical) and have different limiting values depending on type of building (e.g. shell construction where future occupancy/use is uncertain).

For existing buildings, a degree of flexibility is available depending on the feasibility of achieving U-value targets (e.g. in listed buildings). Again, early discussion Local Authority Building Standards is recommended.

# The sustainable solution

Recticel Insulation products offer significant environmental benefits. Efficient insulation means that less energy is needed for heating and cooling. As a result, CO<sub>2</sub> emissions are reduced, which means that our insulation products contribute significantly to the fight against global warming.

The durability of our products is another important environmental advantage. Polyurethane insulation's performance remains consistent throughout the lifetime of the product, making them a very sustainable solution. In addition, our manufacturing facility operates to an ISO 14001 certified Environmental Management System.

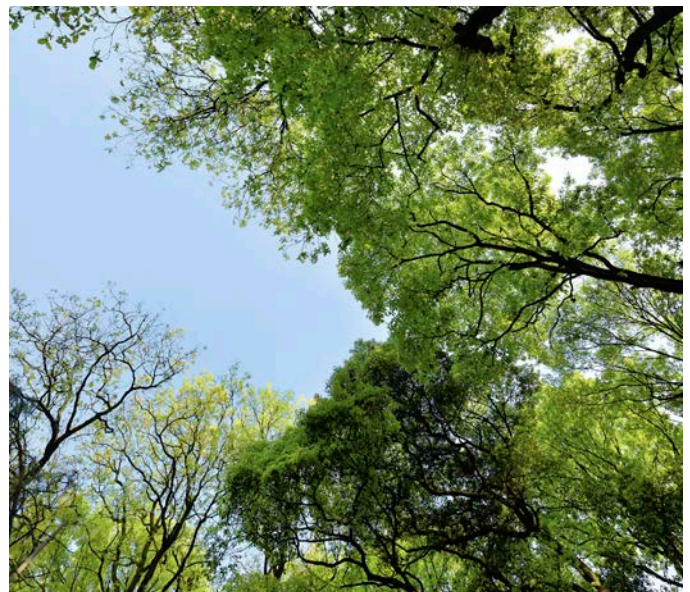
The Recticel Group's sustainability strategy was developed to respond to key challenges such as energy conservation, CO<sub>2</sub> reduction, and an aging and increasing population. Sustainability is also deeply embedded in the Group's DNA. This is evident in the company's core values, one of which is "We act with respect and integrity". Recticel Insulation adheres to this value by showing respect for all of society, particularly our employees, partners, the planet and legislation. We expect our core values to be applied not just by our colleagues, but also by our partners.

## Minimising our CO<sub>2</sub> footprint

We make constant efforts to minimise our CO<sub>2</sub> footprint by reducing the negative impact of our operations while significantly increasing the positive impact of our products. We estimate that the CO<sub>2</sub> emissions prevented by our insulation solutions in 2017 totalled over 30 times our carbon impact throughout the value chain.

We also try to reduce energy use in our factories. Most of our production plants are certified to ISO 14001 standards of environmental care.

When developing or launching new production plants, we choose green energy sources where possible in order to reduce our CO<sub>2</sub> footprint.



### Waste management and recycling

We seek out new ways to avoid waste during the production process, as well as possibilities to reuse or recycle production waste and products that have reached the End-Of-Life (EOL) phase. We also try to minimise the use of finite natural resources.

### The BRE Green Guide

The 2008 Green Guide to Specification produced by the BRE gives Recticel Insulation products manufactured in the UK a summary rating of A.

Green Guide ratings are used to gain credits in BREEAM (BRE Environmental Assessment Method) for non-residential buildings, and under 'Mat 4 – Insulation' the first credit requires the building to have an Insulation Index of 2 or greater – only achievable if the weighted average rating of the insulation is A or A+.

### Responsible Sourcing

The second BREEAM credit under that category is based on responsibly-sourced materials – at least 80% of the total insulation used in roofs, walls, ground floors and services must meet any of tier levels 1 to 6 in the BREEAM table of certification schemes.

Our Environmental Management System is certified under BS EN ISO 14001, and our raw materials come from companies with similarly-certified EMS (copies of these certificates are available for BREEAM assessments). This level of responsible sourcing meets tier level 6 in the BREEAM table.

### Global Warming and Ozone Depletion

All Recticel Insulation products use CFC- and HCFC-free materials, and are manufactured using a blowing agent with a low GWP and zero ODP.

### BREEAM

The Building Research Establishment's Environmental Assessment Method is an internationally-recognised process for assessing any type of building, of any age, anywhere in the world against established environmental and sustainability benchmarks. Although heat loss and energy use have a significant influence on the calculation method, environmental performance is measured by awarding credits in a number of categories, each of which is given a different weighting.





# Technical support

To help you find the best insulation products for your project – and comply with building regulations – our dedicated technical team can provide you with U-value calculations, condensation risk analysis and advice on installation.

Our team is focused on helping specifiers in particular specialist areas, details of which can be found at [recticelinsulation.co.uk](https://recticelinsulation.co.uk)

## Fabric First

Concentrate on getting a building's fabric right and each element - whether a floor, wall or roof - will be well-built, thermally efficient and airtight, achieving the designed level of performance for the life of the building. At Recticel, we advocate 'fabric first' as the best way to reduce energy consumption.

Sharing aspects of the Passivhaus comfort standard, a fabric first approach concentrates on high levels of thermal performance and airtightness (including from doors and windows), and reduced thermal bridging. Air quality is also a vital part of the building specification to ensure occupant comfort and health, so the correct ventilation strategy needs to be considered - possibly requiring mechanical ventilation with heat recovery (MVHR). When it comes to the insulation specification, we'll recommend the right thickness of PIR to meet your requirements in the most efficient manner possible.

## The Performance Gap

While new buildings might meet thermal regulations on paper, the actual performance level once occupied can be well below expectations. Although we can advise on the theoretical performance of our products in particular building elements, we still rely on contractors and site supervisors to make sure they perform as intended – so we're committed to providing more information and improving knowledge about the installation of our products.

## Thermal Bridging Models

Linear thermal transmittance (or psi value) is a measure of heat loss at junctions. In order to minimise this, it is necessary to ensure continuity of the insulation layer across adjacent building elements. This means careful detailing of junctions between elements and openings to reduce thermal bridging. For example; between wall and roof, wall and floor, lintel and wall.

## Why is it important to consider thermal bridging details?

Recent changes to building regulations have resulted in lower U-value requirements for the main construction elements. As thermal transmittance through these elements reduces, heat energy seeks to escape by the path of least resistance, normally through inadequately insulated junctions. Heat loss at junctions can account for up to 15% of a building's total heat loss.

Accredited and Enhanced Construction Details (ACDs & ECDs) are one way of limiting heat loss through thermal bridging at junctions, reducing psi values and improving the overall fabric energy efficiency of the building. An additional benefit of minimising thermal bridging is reducing the risk of surface condensation and associated mildew at otherwise cold spots, and thereby improving occupant health.

Recticel Insulation's range of thermal bridging details can assist designers with improved psi values for use in SAP calculations to ensure that carbon emissions and fabric energy efficiency targets of the latest building regulations are achieved, or even exceeded.





### U-values

Recticel Insulation supports the accurate calculation of U-values for the construction industry. Calculations are issued under the Competent Person scheme administered by the BBA (British Board of Agrément). All U-values are calculated by the Combined Method, in accordance with the conventions detailed in BS EN ISO 6946, BR 443, and other standards laid out by the BBA in their scheme guidance.

Calculations are provided free of charge to demonstrate the performance of Recticel products and compliance with building regulations. Calculation requests can be emailed to [technicalservices@recticel.com](mailto:technicalservices@recticel.com).

Recticel U-value calculations can be supplied with a Condensation Risk Analysis where appropriate, and additional guidance is offered when required. Advice on condensation risk is given in accordance with BS EN ISO 13788 and BS 5250.

### BIM (Building Information Modelling)

BIM not only helps with building simulation and architectural data, but also with structural engineering, sustainability and even project and cost management. To support architects and specifiers who use the BIM framework, we've utilised our relationship with RIBA through the NBS Product Selector and made our products available as 'BIM Objects' held within the NBS National BIM Library.

For instant access to Recticel's BIM library visit: [www.bimstore.co/manufacturers/recticel-insulation-products](http://www.bimstore.co/manufacturers/recticel-insulation-products)

### Single Layer Tapered Roofing Systems

Gradient work closely with customers and specifiers to design, manufacture and advise on the installation of bespoke, single-layer tapered roofing solutions.

It's a turnkey service that provides everything from initial consultation and design to after sales support. By controlling the whole process from start to finish, we are able to exercise control standards for design, manufacture, performance and sustainability that are unmatched in the industry. Benefits we pass on to you in the form of a better conceived, better performing, better value flat roof that complies with all the relevant legislative standards

For more information visit: [www.gradientuk.com](http://www.gradientuk.com) or call one of our technical support specialists on **01543 678777**.

### NBS Plus

RIBA NBS Plus gives architects access to a library of product information that can be consulted or copied directly into building specifications, supported by the RIBA Product Selector building product directory, both of which are widely used by industry professionals. Recticel products are listed within the RIBA product selector, making them accessible to all specifiers instantly.

### Certification

All our products are manufactured to the harmonised European standard EN 13165, and are CE marked accordingly. Where stated, products have been certified by the British Board of Agrément (BBA). Our manufacturing facility operates to an ISO 9001 Quality System and ISO 14001 Environmental Management System. Declarations of Performance are available as required by the Construction Product Regulations.



### CPD Presentations

Recticel Insulation is a member of the RIBA CPD Providers Network, which features manufacturers and suppliers who provide RIBA Continuing Professional Development to architects and specifiers.

We offer a range of RIBA CPD Assessed Material (some of which is part of the RIBA CPD Core Curriculum), including seminars (typically 45 minutes in duration, with 15 minutes available for questions and answers after) and CPD Articles that can be accessed directly on the RIBA CPD website.

Seminar bookings are available across the UK and can be requested online, via either the Recticel Insulation or RIBA CPD websites.



# Product characteristics

## Using Recticel PIR Insulation

### Durability

Treated with appropriate care and installed correctly, Recticel Insulation products should not require maintenance. They are resistant to mould growth and will not rot.

PIR foam is not resistant to solvent-based products and should not be used in conjunction with them. Any boards that have come into contact with solvents or acids, or been damaged by such products, should be discarded.

PIR foam is a closed cell material, meaning water absorption is minimal. However, they should always be protected from the elements and never installed in exposed situations such as inverted flat roofs or in direct contact with the ground. Boards should be kept dry during installation and covered at the end of each day's work on site. Boards that have been allowed to get wet should not be used.

### Handling, Cutting and Storage

Recticel Insulation's PIR boards are lightweight and inherently safe to handle. They should be treated with respect and maintained in the best possible condition during installation to ensure they perform as expected over the life of the building. They can be cut with a sharp knife or fine toothed saw.

Boards are supplied in polythene shrink wrap which is designed for short-term protection only. It is accepted that storing boards indoors is not always possible – when outdoor storage is necessary, boards should be stored clear of the ground, on a level surface, and under cover to protect them from prolonged exposure to moisture, UV light or mechanical damage.

Recticel Insulation products should not be installed when the temperature is at or below 5°C and falling.

To limit the risk of damage from condensation and other sources of dampness, the product and overlays should only be laid after the construction is made substantially weathertight, e.g. after glazing. During construction, the product must also be protected from water spillage, plaster droppings and traffic.

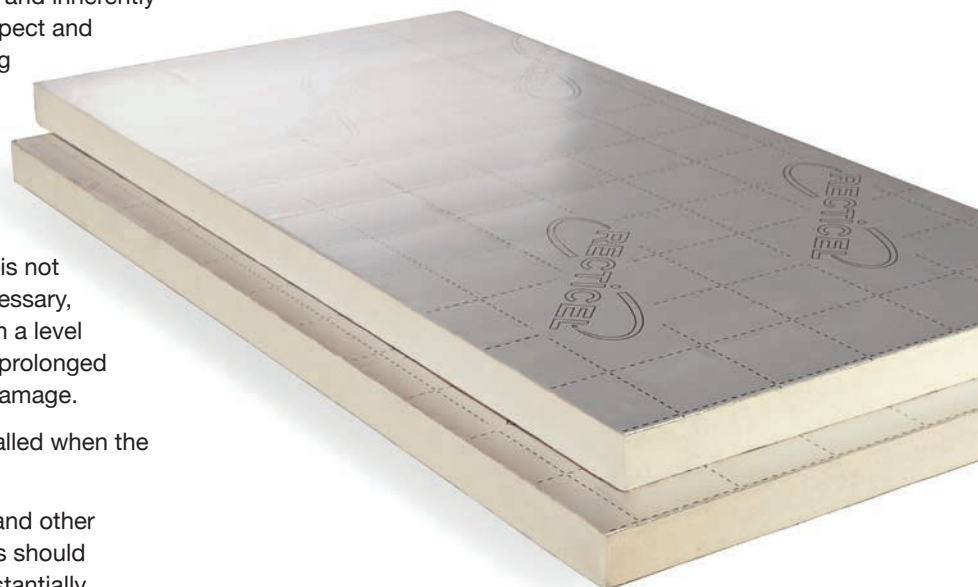
### Health and Safety

A comprehensive Product Information Data Sheet (PIDS) is available on request.

During cutting or machining, any dust is of nuisance value only. Large scale machining should be connected to a dust extraction system.

Foil-faced boards reflect light as well as heat, including ultraviolet light. Installation during bright weather may require UV eye protection, and a high SPF sun cream for bare skin. Foil facings can also become slippery when wet.

Avoid skin and eye contact with any sharp edges. Do not stand on or otherwise support your weight on boards unless the product is fully supported by a load-bearing surface.





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