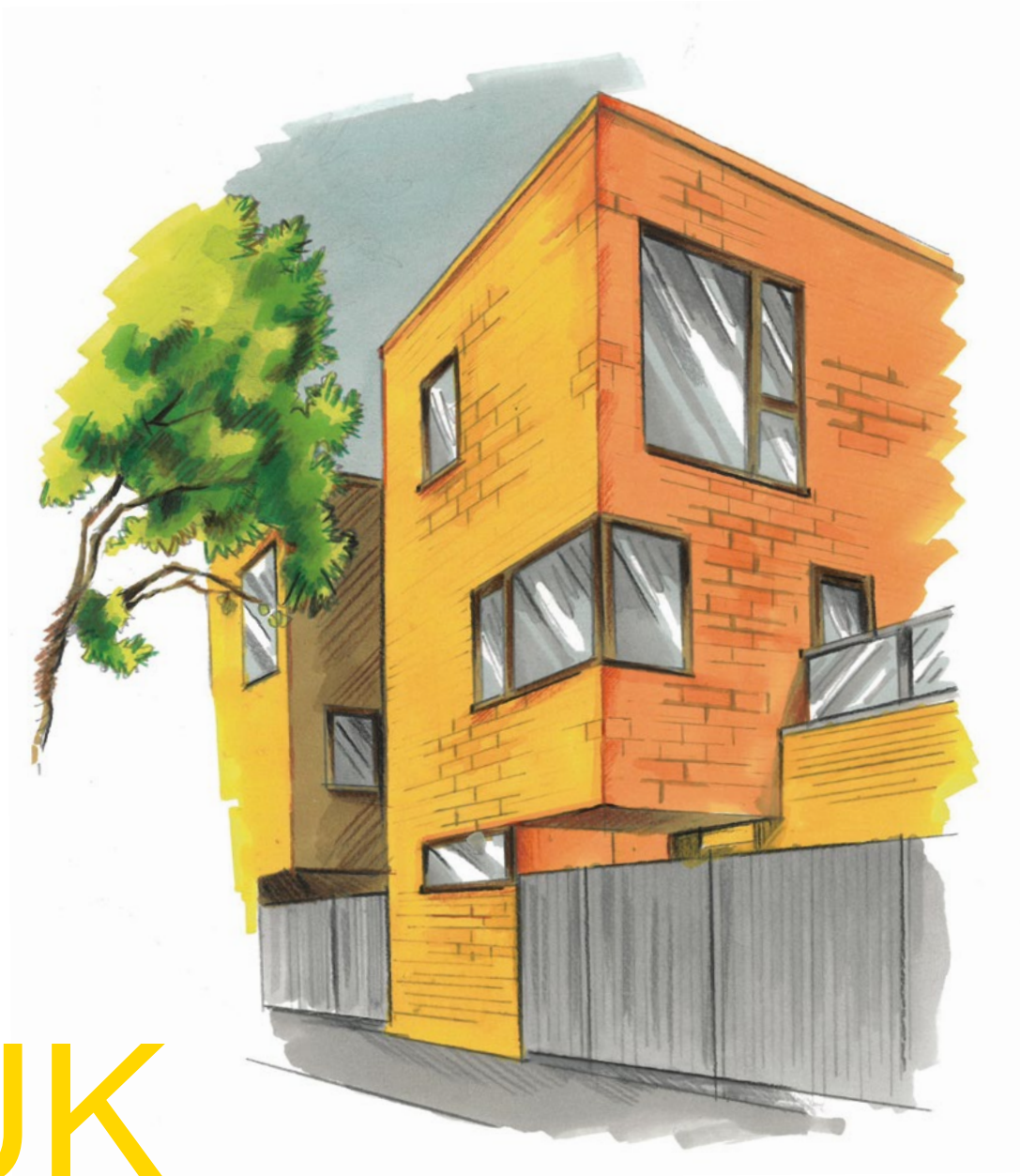


FEEL  
GOOD  
INSIDE



UK

# Cavity Walls

Specification Guide

V2

FEEL  
GOOD  
INSIDE

**RECTICEL**  
insulation

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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 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,

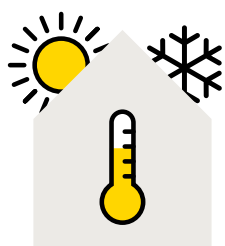
and its Stoke-on-Trent site has attained ISO 14001 certification for its environmental management system.

In order to maintain its reputation as instigators par-excellence in the field of insulation advancement, Recticel's search for new 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 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://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.



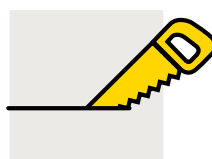
## Quick installation

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 cavity walls

Cavity wall is the UK's most common construction method, typically having a masonry inner and outer skin separated by a wall cavity either fully or partially filled with insulation. For architects and specifiers, the main challenge nowadays is how to retain cavities while complying with increasingly-stringent thermal regulations. So it's vital to specify the right cavity wall insulation at the design stage.

### Recticel Products for Cavity Wall Applications

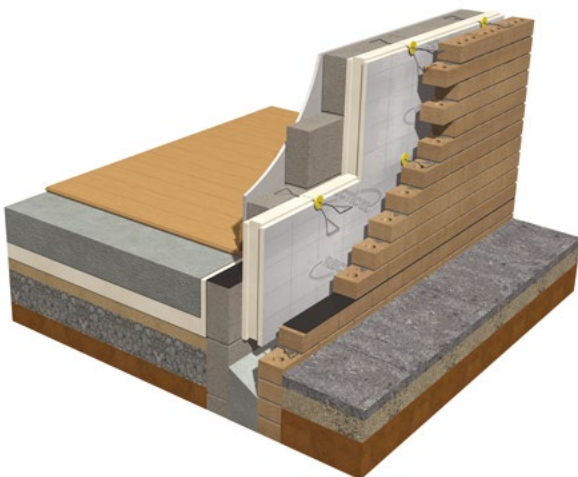
Recticel Insulation's range of **Eurowall® +** and **Eurowall® Cavity** products are suitable for masonry cavity wall constructions throughout the UK. Polyisocyanurate (PIR) insulation is among the most thermally efficient insulation types available, making it the best choice for achieving maximum thermal performance from minimum thicknesses and helping to meet the requirements of energy performance-focused building regulations.

**Eurowall® +** and **Eurowall® Cavity** are certified by BBA, both covered by certificate number 02/3908.

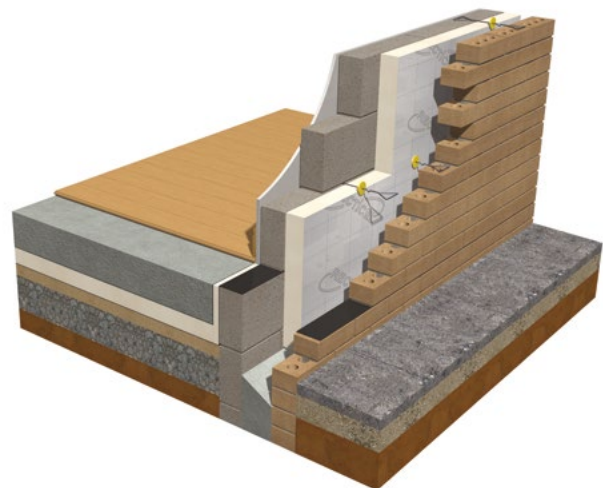
**Eurowall® +** is an innovative full fill cavity wall solution that changes the way your wall works, without changing the way you work. By extracting more performance from the cavity without slowing on-site trades, buildings can achieve lower U-values without widening the footprint of the external wall, or incurring the additional design and material costs associated with larger cavities.

**Eurowall® Cavity** continues to offer a partial fill, rigid insulation solution for use in new buildings and extensions to existing buildings.

### **Eurowall® +**



### **Eurowall® Cavity**



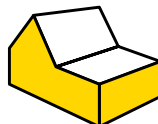


A high performance thermal insulation board for full fill masonry cavity wall applications.

### Product Benefits

- Good thermal performance:  $\lambda = 0.022 \text{ W/mK}$
- Easy and fast installation
- Can help to achieve 0.18 U-value in 100mm cavities
- Tongue and groove rebate minimises thermal bridging

### Applications: Cavity Walls



## Product Overview

**Eurowall® +** is a premium, high performance PIR insulation board that can help to achieve a 0.18W/m<sup>2</sup>K U-value in 100mm masonry cavity walls, meeting the requirements of Part L1A England 2013 and Part L1A Wales 2014. This means existing designs can be maintained, avoiding increased building footprints or reduced room sizes.

Manufactured at 75mm to work within an 85mm cavity, 90mm for a 100mm cavity, 115mm for 125mm cavities and 140mm for 150mm cavities, the compact design of **Eurowall® +** leaves space for bricklayers to use conventional installation techniques. With enough room to 'roll' the outer leaf bricks into place, bricklayers' work takes the same time to complete.

Precision cut tongue and groove joints on all 4 sides ensure that boards lock tightly together, minimising heat loss through thermal bridging. This unique joint also offers increased protection against wind driven rain, as well as air tightness.

**Eurowall® +** has a grey alkali resistant facing against the inner leaf and a low emissivity multilayer aluminium facing on the front face that delivers thermal resistance within the cavity airspace.

### Specification Clause

The insulation shall be Recticel **Eurowall® +** \_\_\_\_mm\* thick for use in full fill masonry cavity wall 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. **Eurowall® +** should be installed in accordance with Recticel's recommendations.

### Eurowall® + Thermal Resistances

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)
64698/008	75	3.40
64698/002	90	4.05
64698/004	115	5.20
64698/006	140	6.35

### Key Specifications

Thermal Conductivity Lambda ( $\lambda$ )	0.022 W/mK
Water vapour diffusion coefficient (foam)	Tabulated value EN ISO 10456 $\mu$ 50-100
Fire Performance	Euroclass F, EN 13501-1
Emissivity**	$\epsilon = 0.05$
Dimensions	1190mm (l) x 450mm (w) (1200mm (l) x 460mm (w) including the tongue and groove)
Facing	Gas diffusion tight multilayer foil of which one side is reflective with grid pattern and the other side alkali resistant (mat grey).
Certification	BBA 02/3908 LABC EWW620

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

\*\* Emissivity can only be taken into account in the thermal calculation of a wall when the insulation is installed in a non-ventilated cavity.

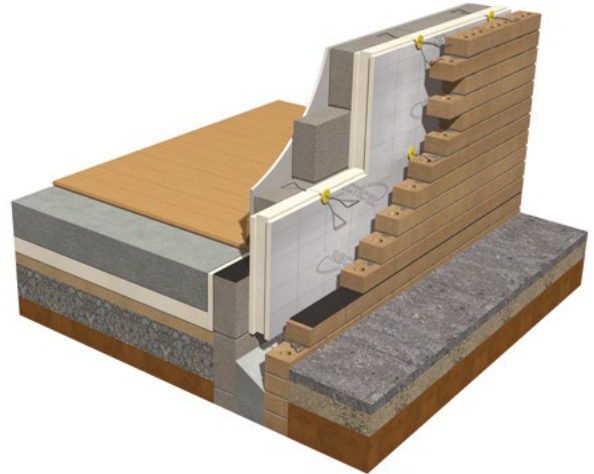


## Thermal Performance

Typical U-values ( $W/m^2K$ ) achieved in common wall constructions

### Brick And Block Cavity Wall

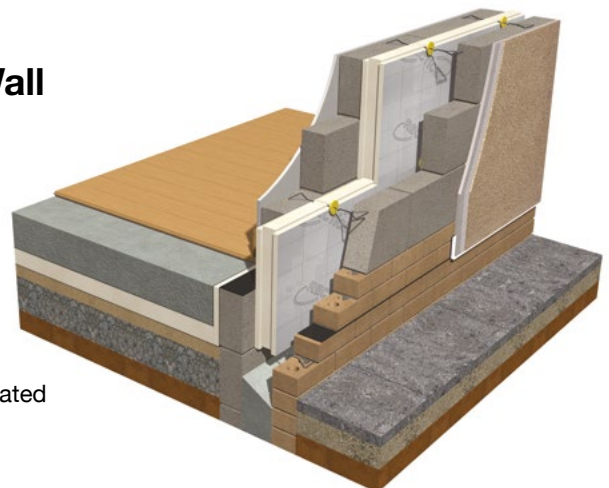
- ▶ 102.5mm outer leaf brickwork
- ▶ Low emissivity unvented cavity, 10mm
- ▶ Recticel **Eurowall**® +, thickness as indicated
- ▶ 100mm inner leaf concrete blockwork, thermal conductivity as indicated
- ▶ Plasterboard on dabs



Insulation thickness (mm)	Inner leaf block thermal conductivity ( $W/mK$ )					
	0.11	0.15	0.22	0.47	0.59	1.13
75	0.20	0.21	0.21	0.22	0.23	0.23
90	0.18	0.18	0.19	0.19	0.20	0.20
115	0.15	0.15	0.15	0.16	0.16	0.16
140	0.13	0.13	0.13	0.13	0.14	0.14

### Rendered Dense Block And Block Cavity Wall

- ▶ 19mm render
- ▶ 100mm outer leaf blockwork, dense (1.13  $W/mK$  thermal conductivity)
- ▶ Low emissivity unvented cavity, 10mm
- ▶ Recticel **Eurowall**® +, thickness as indicated
- ▶ 100mm inner leaf concrete blockwork, thermal conductivity as indicated
- ▶ Plasterboard on dabs



Insulation thickness (mm)	Inner leaf block thermal conductivity ( $W/mK$ )					
	0.11	0.15	0.22	0.47	0.59	1.13
75	0.20	0.21	0.21	0.23	0.23	0.23
90	0.18	0.18	0.19	0.20	0.20	0.20
115	0.15	0.15	0.15	0.16	0.16	0.16
140	0.13	0.13	0.13	0.14	0.14	0.14



# Typical installation

## Product Characteristics

**Eurowall® +** is designed for full fill cavity wall constructions with a nominal cavity of 10mm, which should be maintained throughout the construction.

The main purpose of the cavity is to leave space for the bricklayer to position the outer leaf brick or block, which can otherwise be difficult and time consuming with a full fill rigid insulation board. At the same time, the low emissivity aluminium facing offers enhanced thermal resistance from the cavity. Insulation retaining discs act as a spacer and effectively maintain the cavity of 10mm between the insulation facing and external leaf.

Two distinct facers – one a grey alkali-resistant coating placed against the inner leaf, the other a low emissivity multi-layer aluminium facing the cavity airspace – help the installer to fit the boards the right way up with the horizontal tongue joint facing upwards.

The product is designed to be installed by a competent general builder experienced with this type of product.

## Exposure Zones

The BBA certificate for **Eurowall® +** covers the use of the product in any exposure zone, but does not preclude the need to apply an external render coat (or other suitable finish) to the external masonry in severe exposure zones where such application would be normal practice.

NHBC accepts the use of **Eurowall® +**, other than in very severe exposure locations with fair-faced masonry, provided it is installed, used and maintained in accordance with the BBA certificate, in relation to NHBC Standards, Chapter 6.1, External masonry walls.

## Use of Eurowall® + in Scotland

Section 3 of the Scottish Technical Handbooks deals with Environment, including 'Precipitation'. Figure 3.14 ('Wall type B') illustrates a wall with cavity fill insulation and no residual cavity, which is "only recommended for sheltered conditions".

Therefore, before specifying **Eurowall® +** on projects in Scotland, Recticel Insulation recommends consulting the relevant Local Authority Building Standards department to confirm the acceptability of a full fill insulation product.

## 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 the wall insulation should continue 250mm above the internal ceiling insulation and the cavity tray installed 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. To support the use of **Eurowall® +**, Recticel Insulation has a range of thermal bridging details calculated to offer psi values for use in SAP calculations. Please email [technicalservices@recticel.com](mailto:technicalservices@recticel.com) for further details.

## Cavity Barriers

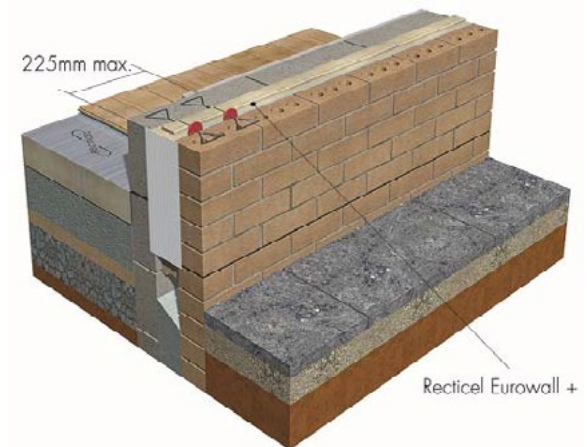
The building designer and building control officer should be consulted regarding the inclusion and installation of cavity fire barriers to ensure compliance with the relevant provisions of the Building Regulations. Additional advice can also be sought from the cavity barrier manufacturer.



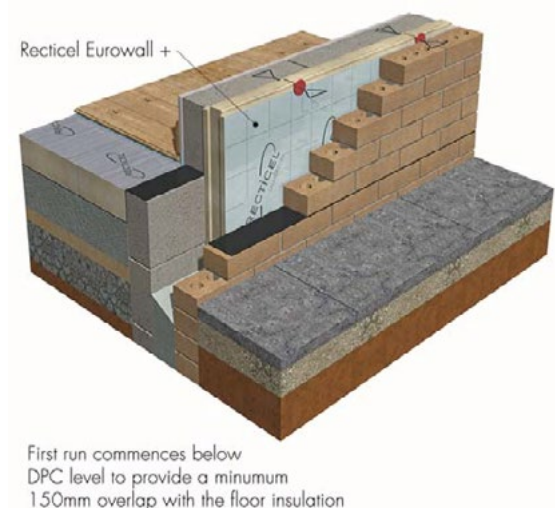
### Installing Eurowall® +

1. The correct wall tie type should be selected for the type of building under construction. Wall tie manufacturers should be consulted for further advice regarding suitability.
2. The internal leaf is constructed ahead of the external leaf. Any mortar protruding into the cavity airspace from the back of the internal leaf should be cleaned off before installing the product.
3. **Eurowall® +** insulation boards should be installed against the inner leaf, secured with universal retaining clips.
4. It is recommended that an additional wall tie is included within 225mm of openings on each board course level to satisfy the structural requirements of the wall.  
**See Fig. 1.**
5. Walls are constructed with the first row of wall ties where the insulation is to begin, but not directly on the DPC, and at approximately 600mm horizontal centres. The first row of boards can start below the DPC to allow at least a 150mm overlap with the floor insulation.  
**See Fig. 2.**
6. A section of the wall leaf is built up to a course above the next row of wall ties, which are placed at 450mm vertically and 900mm horizontally. Insulation boards are placed between two rows of wall ties with the tongue and groove joints tightly interlocked and vertical joints staggered. Slots should be cut with a sharp knife or fine toothed saw into the insulation boards to allow wall ties to fit snugly between board joints, sloping down to the outer leaf.
7. Upon completion of each section, excess mortar should be removed and mortar droppings cleaned from exposed board edges before installation of the next section. Use of a cavity board is recommended to make cleaning easier.  
**See Fig. 3.**

**Fig. 1. Reveal detail with double ties**



**Fig. 2. Building in the first row of boards**

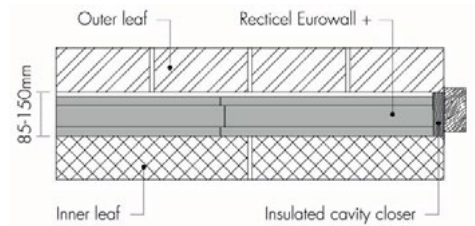


**Fig. 3. Use of a cavity board when cleaning off excess mortar**

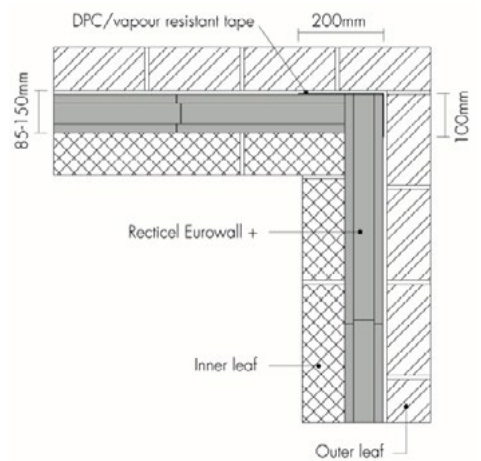


8. To fit around any opening, doors or windows, boards should be cut carefully and accurately to completely fill the spaces for which they are intended, ensuring continuous insulation throughout the wall.
9. Where multiple openings are in close proximity, it is recommended that a continuous lintel or cavity tray is used. Proofing at lintel level must be provided with stop ends and weepholes.
10. Where required, door and window reveals must incorporate cavity closure depending on the set-back of the frame. See Fig. 4.
11. Corner details are formed by cutting the boards squarely and closely butt-jointing, or by cutting board ends at a 45° angle to create a mitred joint, so that all board interfaces are uninterrupted. All corner details incorporate a vertical 300mm wide DPC or a proprietary tape, e.g. Recticel Rectitape. See Figs. 5, 6 & 7.
12. At the end of each day's work, or during any interruption in construction, the exposed unfinished cavity should be covered to protect it from poor weather.

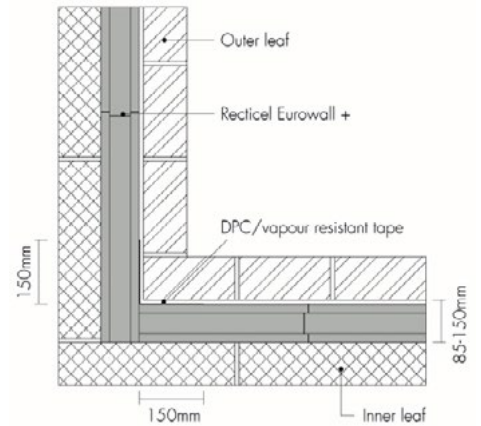
**Fig. 4. Reveal detail with cavity closure**



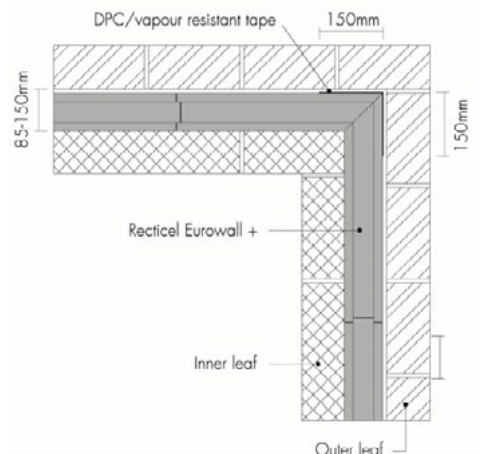
**Fig. 5. External corner**



**Fig. 6. Internal corner**



**Fig. 7. External corner (note: internal corner as per fig.6 but with mitred insulation joint)**



# Eurowall® Cavity

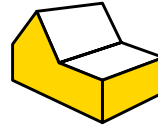
A high performance thermal insulation board for partial fill masonry cavity wall applications.



## Product Benefits

- Good thermal performance:  $\lambda = 0.022 \text{ W/mK}$
- Limited moisture absorption

## Applications: Cavity Walls



## Product Overview

**Eurowall® Cavity** is a specialist high performance product for cavity walls, with precision-cut straight edges to ensure gaps between boards are kept to a minimum. It has a low emissivity facing which delivers thermal resistance within the clear cavity.

**Eurowall® Cavity** offers:

- A low thermal conductivity value (0.022 W/mK) providing an excellent thermal performance
- A range of thicknesses from 30mm to 100mm and in a board size of 1200mm x 450mm
- No degradation or deterioration if exposed to moisture, maintaining its thermal performance

## Specification Clause

The insulation shall be Recticel **Eurowall® Cavity** \_\_\_\_mm\* thick for use in partial fill masonry cavity wall 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. **Eurowall® Cavity** should be installed in accordance with Recticel's recommendations.

## Eurowall® Cavity Thermal Resistances

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)
64678/814	30*	1.35
64678/053	40*	1.80
64678/058	50	2.25
64678/152	60	2.70
64678/336	70	3.15
64678/345	75	3.40
64678/377	80	3.60
64678/398	90	4.05
64678/347	100	4.50

\*Made to order thickness dependant on minimum order quantity

## Key Specifications

Thermal Conductivity Lambda ( $\lambda$ )	0.022 W/mK
Water Vapour Diffusion Coefficient (foam)	Tabulated value EN ISO 10456 $\mu$ 50-100
Fire Performance	Euroclass F, EN 13501 -1
Dimensions	1200mm (l) x 450mm (w)
Facing	Gas-diffusion tight and multi-layered complex of kraft and metal foil
Certification	BBA 02/3908

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

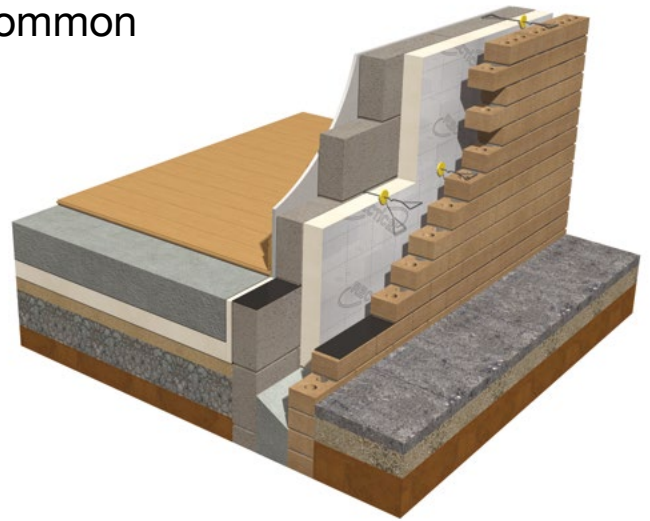
\*\* Emissivity can only be taken into account in the thermal calculation of a wall when the insulation is installed in a non-ventilated cavity.

## Thermal Performance

Typical U-values ( $W/m^2K$ ) achieved in common wall constructions

### Brick And Block Cavity Wall

- ▶ 102.5mm outer leaf brickwork
- ▶ Low emissivity unvented cavity
- ▶ Recticel **Eurowall® Cavity**, thickness as indicated
- ▶ 100mm inner leaf concrete blockwork, thermal conductivity as indicated
- ▶ Plasterboard on dabs



Insulation thickness (mm)	Inner leaf block thermal conductivity (W/mK)					
	0.11	0.15	0.22	0.47	0.59	1.13
50	0.24	0.25	0.26	0.28	0.28	0.29
60	0.22	0.23	0.24	0.25	0.25	0.25
70	0.20	0.21	0.21	0.22	0.22	0.23
75	0.19	0.20	0.20	0.21	0.21	0.22
80	0.18	0.19	0.19	0.20	0.20	0.21
90	0.17	0.17	0.18	0.19	0.19	0.19
100	0.16	0.16	0.17	0.17	0.17	0.17

### Rendered Dense Block And Block Cavity Wall

- ▶ 19mm render
- ▶ 100mm outer leaf blockwork, dense (1.13 W/mK thermal conductivity)
- ▶ Low emissivity unvented cavity
- ▶ Recticel **Eurowall® Cavity**, thickness as indicated
- ▶ 100mm inner leaf concrete blockwork, thermal conductivity as indicated
- ▶ Plasterboard on dabs



Insulation thickness (mm)	Inner leaf block thermal conductivity (W/mK)					
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60	0.22	0.23	0.24	0.25	0.25	0.25
70	0.20	0.21	0.21	0.22	0.22	0.23
75	0.19	0.20	0.20	0.21	0.21	0.22
80	0.18	0.19	0.19	0.20	0.20	0.21
90	0.17	0.17	0.18	0.19	0.19	0.19
100	0.16	0.16	0.17	0.17	0.17	0.17

# Typical installation

## Residual Cavity Width

Eurowall Cavity is only suitable for partial fill cavity wall constructions, with the clear cavity preventing moisture ingress to the inner leaf – the insulation boards should only be fixed to the inner leaf for the wall to perform correctly.

Subject to a site's location and exposure rating, buildings up to 12m high need to have a residual cavity of at least 25mm. However, it is recommended to design a 50mm wide cavity to allow for inaccuracies in the building process. As local factors such as site topography can also change exposure zone ratings, consultation with Local Authority Building Control/ Standards is recommended to confirm acceptable clear cavity widths and project-specific requirements.

To meet NHBC and Zurich Building Guarantees: where facing masonry has tooled flush joints, a residual cavity width of 50mm is required in areas of sheltered to severe exposure (exposure zones 1-3) and 75mm in areas of very severe exposure (zone 4). If an external rendered finish is to be applied, a 50mm residual cavity is sufficient in any exposure zone.

It's important to keep the residual cavity clean and free of mortar snots and debris that can help moisture cross the cavity. Above doors, windows and other openings protect the lintel using a cavity tray with appropriate stop-ends and weepholes. Cavity trays may also be needed for projections and discontinuities within the cavity such as ring beams.

## Thermal Bridging

Heat loss at junctions is referred to as linear thermal bridging, and can be reduced by ensuring continuity of the insulation layer with adjacent building elements through careful detailing to minimise the effects.

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

Accredited Construction Details (ACDs) and Enhanced Construction Details (ECDs) have been developed to assist the construction industry achieving the performance to comply with UK Building Regulations.

## Wall Ties & Positioning

1. Fixing manufacturers can advise on the correct wall tie for the building, but the basic types are:
  - 1.1. Type 1: heavy duty rigid ties suitable for most masonry cavity walls anywhere in the UK
  - 1.2. Type 2: general purpose flexible ties suitable for domestic and light commercial applications
  - 1.3. Type 3: light duty ties suitable for housing where inner and outer leaf are similar thickness
2. For positioning, use the following guidelines:
  - 2.1. Construct the inner leaf first, with the Eurowall Cavity insulation boards held in position against it by double drip wall ties with a retaining disc
  - 2.2. Build the outer leaf to the level of the boards and repeat the process
  - 2.3. Install wall ties with the drip of the tie downward, approximately half way across the residual cavity and slightly sloping down from inner to outer leaf
  - 2.4. For solid concrete floors: install the first row of wall ties in the inner leaf at 600mm horizontal centres and a minimum of one course of blocks below the course (DPC) or 150mm below the top of the ground floor edge insulation
  - 2.5. For suspended timber floors: install the first row of wall ties in the inner leaf at 600mm horizontal centres and 200mm below the top surface of the ground floor edge insulation
  - 2.6. Raise the leading leaf two courses of blocks to the level of the next row of wall ties, normally at 450mm vertical centres. Clean any excess mortar from the inner leaf before installing the boards
  - 2.7. Fit the next and subsequent rows of wall ties at maximum 900mm horizontal centres to retain the tops of the boards
  - 2.8. Additional ties may be required for structural stability and to make sure the boards are retained against the inner leaf

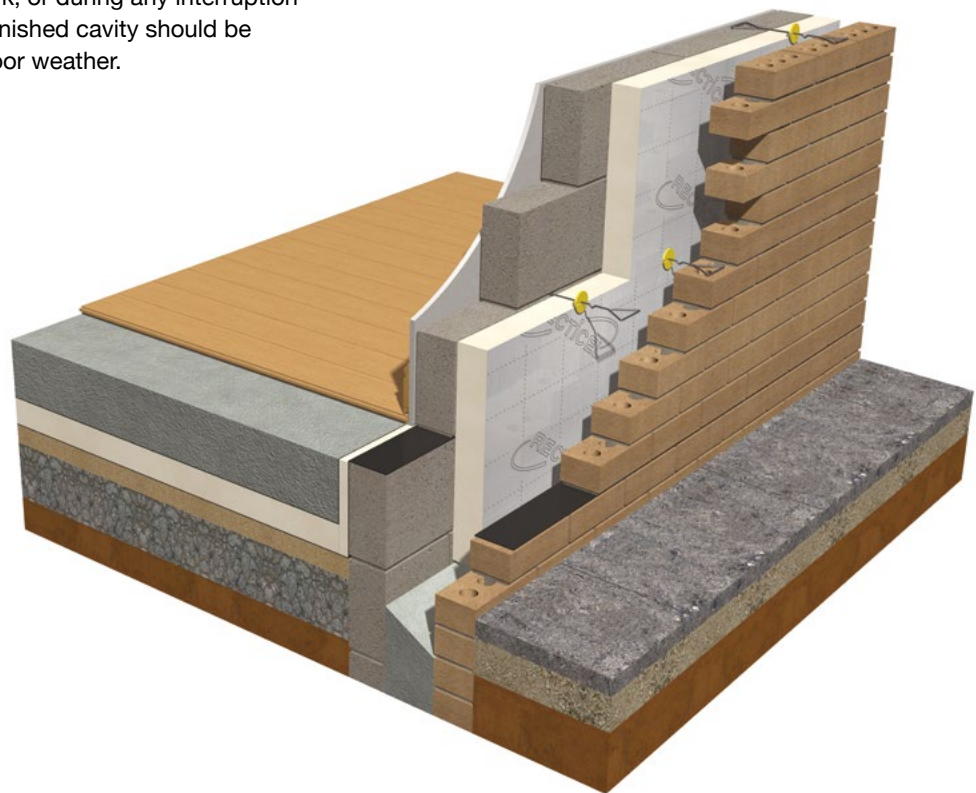
## Cavity Barriers

The building designer and building control officer should be consulted regarding the inclusion and installation of cavity fire barriers to ensure compliance with the relevant provisions of the Building Regulations.

Additional advice can also be sought from the cavity barrier manufacturer.

### Installing Eurowall Cavity

1. Fit insulation boards between the two rows of wall ties, tightly butted and secured by the retaining discs at a minimum of three points.
2. Install subsequent rows of boards with all joints tightly butted and vertical joints staggered in a brick-bond pattern. Boards with damaged edges or corners should not be used.
3. A double layer of insulation boards may be used as long as vertical joints do not coincide and the thickest layer is positioned outermost.
4. At gable ends, continue the wall insulation 250mm above the height of the internal ceiling insulation and install a cavity tray over.
5. At all stages of the work, ensure the residual cavity is kept clean and free from mortar droppings or other debris. Use of a cavity board is recommended in order to protect board edges and maintain a clear cavity.
6. Ensure all joints are accurately cut in order to maintain the continuity of the insulation layer.
7. At the end of each day's work, or during any interruption in building, the exposed unfinished cavity should be covered to protect it from poor weather.



# 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 of 0.70 and the roof 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 effective 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.

Polyurethane insulation's performance remains consistent throughout the lifetime of the product, making them a very effective solution. In addition, our manufacturing facility operates to an ISO 14001 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 in 2019, the CO<sub>2</sub> emissions prevented by our insulation solutions offset over 40 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 Guide to Specification produced by the BRE gives Recticel Insulation products manufactured in the UK a summary rating of A.

The 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 guided under BS EN ISO 14001, and our raw materials come from companies with EMS where possible (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 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

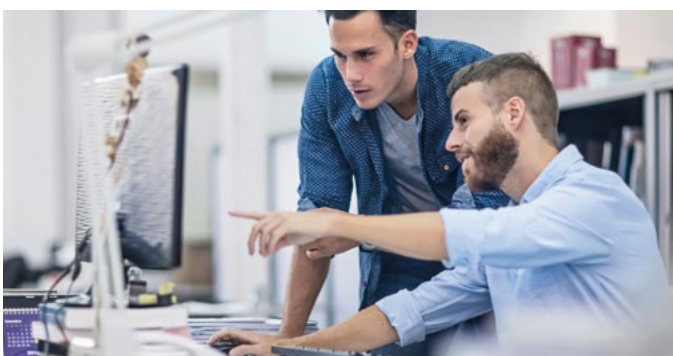
Linear thermal transmittance (or psi value) is a measure of heat loss at junctions. In order to minimise this, it is necessary to ensure continuity of the insulation layer across adjacent building elements. This means careful detailing of junctions between elements and openings to reduce thermal bridging. 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 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 and performance that are unmatched in the industry. Benefits we pass on to you in the form of performance, value and a 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 fall under 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

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.



# Notes






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