FEEL
GOOD
INSIDE

RECTICEL insulation

UK
Floors

Specification Guide

V1.5

FEEL GOOD INSIDE

RECTICEL insulation

Contents

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 upmost 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.

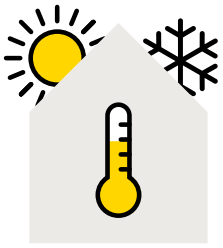
Insulating a building is a once-in-a-lifetime investment, hence the need to select PIR products of proven quality to help reduce long-term energy consumption - a major contributor to lowering carbon emissions and meeting the challenge of global warming. Renowned as a leading technical innovator within 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** 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

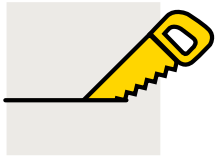
Recticel Insulation guarantees maximum comfort by creating a living or working environment with a healthy and stable inside climate.

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

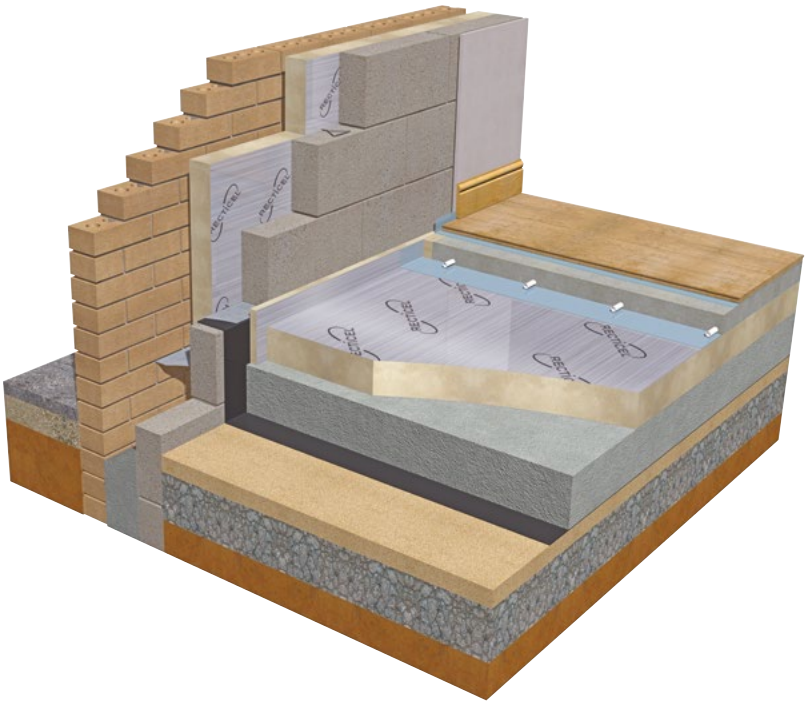
With their high insulation values, the insulation boards give you the opportunity to install thinner layers of insulation and create extra living space.

Recticel

High performance in floors

When it comes to specifying ground floor insulation, it is important to select a product that not only offers the correct thermal properties, but also suitable mechanical properties. Whether it's for use in domestic or commercial buildings, **Eurothane® GP** offers the low thermal conductivity and high compressive strength required for a range of floor constructions. And as underfloor heating remains a popular feature of modern flooring, with its excellent pipe clip retention, **Eurothane® GP** is the ideal choice.

Eurothane® GP



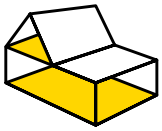
Eurothane® GP

A high performance PIR insulation board suitable for common ground floor constructions.

Product Benefits

- Good thermal performance: λD = 0.022 W/mK
- Quick, easy installation
- Easy to cut and install
- High compressive strength

Applications: Floors



Product Overview

Eurothane® GP is a high performance PIR insulation suitable for ground floor 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 flooring 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.

*In floor applications: 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.

If the insulation boards are left exposed in cool temperatures without being fixed in place, there is the potential for them to warp due to the temperature differential between the floor and the air. Although this is rare and can happen when the temperature is around or below 5 degrees it only happens when the boards are loose laid on the floor.

Ensure all boards are laid as close as possible to the screed/slab installation.

For further information see section 12.10 of the BBA certificate.

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

Eurothane® GP Thermal Resistances

Product Code	Thickness (mm)	R-value (m²K/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 (λ)	0.022 W/mK
Compressive Strength	Minimum compressive strength at 10% compression (kPa) 140.
Water vapour diffusion coefficient (foam)	Tabulated value EN ISO 10456 μ 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

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 02/3905

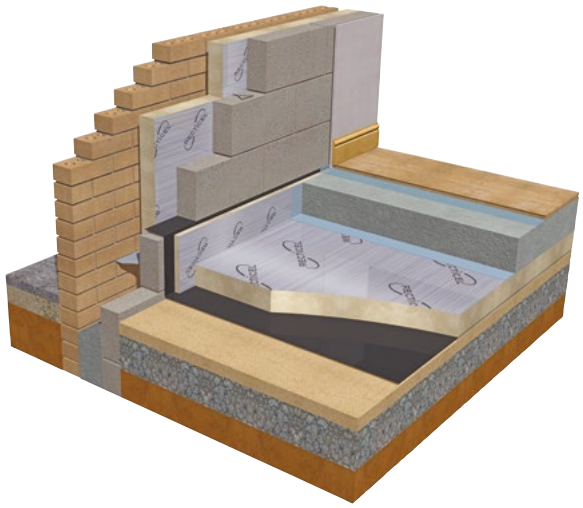
Eurothane® GP

Thermal Performance

Typical U-values (W/m²K) achieved in common floor constructions

Insulation Below Concrete Slab

- Concrete slab (with 25mm insulated upstand to reduce thermal bridging)
- 500-gauge polythene VCL
- Recticel Eurothane® GP, thickness as indicated
- 1200-gauge polythene DPM
- Sub-floor make up



P/A*	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
25 (mm)	0.19	0.29	0.35	0.40	0.43	0.45	0.47	0.48	0.50	0.52
30 (mm)	0.18	0.27	0.32	0.36	0.39	0.40	0.42	0.44	0.45	0.46
40 (mm)	0.16	0.24	0.28	0.31	0.33	0.34	0.35	0.36	0.37	0.38
50 (mm)	0.15	0.21	0.25	0.27	0.28	0.29	0.30	0.31	0.32	0.33
60 (mm)	0.14	0.19	0.22	0.24	0.25	0.26	0.27	0.27	0.28	0.28
70 (mm)	0.13	0.18	0.20	0.21	0.23	0.23	0.24	0.24	0.25	0.25
75 (mm)	0.13	0.17	0.19	0.20	0.21	0.22	0.23	0.23	0.23	0.24
80 (mm)	0.12	0.16	0.18	0.20	0.21	0.21	0.22	0.22	0.22	0.23
90 (mm)	0.12	0.15	0.17	0.18	0.19	0.19	0.20	0.20	0.20	0.21
100 (mm)	0.11	0.14	0.16	0.17	0.17	0.18	0.18	0.18	0.18	0.19
110 (mm)	0.10	0.13	0.15	0.15	0.16	0.16	0.17	0.17	0.17	0.17
120 (mm)	0.10	0.12	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.16
130 (mm)	0.10	0.12	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15
140 (mm)	0.09	0.11	0.12	0.13	0.13	0.13	0.14	0.14	0.14	0.14
150 (mm)	0.09	0.11	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13
80+80 (mm)	0.08	0.10	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
75+100 (mm)	0.08	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11
90+100 (mm)	0.07	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.11
100+100 (mm)	0.07	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10

*For further details on the P/A ratio and how this is calculated please see page 12

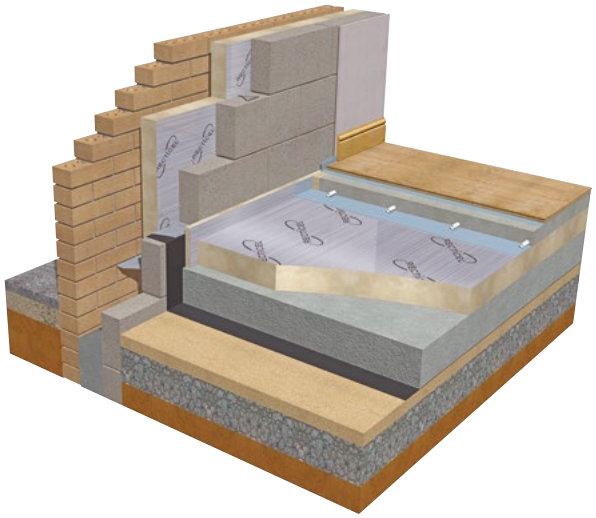
Eurothane® GP

Thermal Performance

Typical U-values (W/m²K) achieved in common floor constructions

Insulation Over Slab, Below Screed

- 75mm screed (with 25mm insulated upstand to reduce thermal bridging)
- 500-gauge polythene VCL
- Recticel Eurothane® GP, thickness as indicated
- Concrete slab
- 1200-gauge polythene DPM
- Sub-floor make up



P/A*	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
25 (mm)	0.19	0.28	0.34	0.39	0.42	0.44	0.46	0.48	0.49	0.50
30 (mm)	0.18	0.26	0.32	0.35	0.38	0.39	0.41	0.43	0.44	0.45
40 (mm)	0.16	0.23	0.27	0.30	0.32	0.33	0.35	0.36	0.37	0.37
50 (mm)	0.15	0.21	0.24	0.26	0.28	0.29	0.30	0.31	0.31	0.32
60 (mm)	0.14	0.19	0.22	0.23	0.25	0.26	0.26	0.27	0.28	0.28
70 (mm)	0.13	0.17	0.20	0.21	0.22	0.23	0.24	0.24	0.24	0.25
75 (mm)	0.13	0.17	0.19	0.20	0.21	0.22	0.22	0.23	0.23	0.23
80 (mm)	0.12	0.16	0.18	0.19	0.20	0.21	0.21	0.22	0.22	0.22
90 (mm)	0.12	0.15	0.17	0.18	0.19	0.19	0.20	0.20	0.20	0.20
100 (mm)	0.11	0.14	0.16	0.16	0.17	0.18	0.18	0.18	0.18	0.19
110 (mm)	0.10	0.13	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.17
120 (mm)	0.10	0.12	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.16
130 (mm)	0.09	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.15
140 (mm)	0.09	0.11	0.12	0.13	0.13	0.13	0.13	0.14	0.14	0.14
150 (mm)	0.09	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.13	0.13
80+80 (mm)	0.08	0.10	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
75+100 (mm)	0.08	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11
90+100 (mm)	0.07	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.11
100+100 (mm)	0.07	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10

*For further details on the P/A ratio and how this is calculated please see page 12

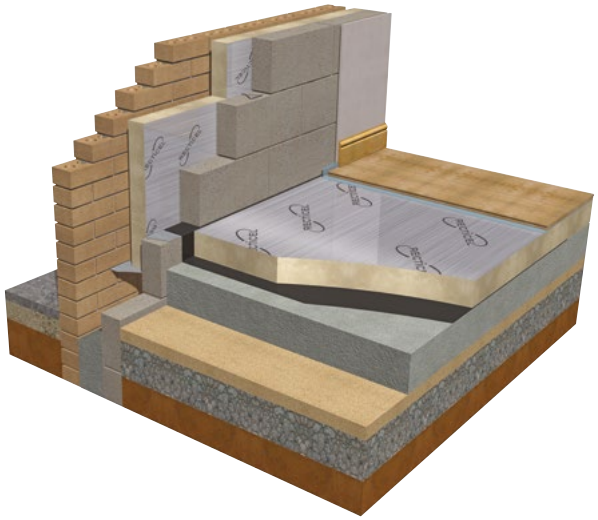
Eurothane® GP

Thermal Performance

Typical U-values (W/m²K) achieved in common floor constructions

Insulation Over Slab, Below Floating Timber Floor

- 18mm chipboard
- 500-gauge polythene VCL
- Recticel Eurothane® GP, thickness as indicated
- 1200-gauge polythene DPM
- Concrete slab (with 25mm insulated upstand to reduce thermal bridging)
- Sub-floor make up



P/A*	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
25 (mm)	0.18	0.28	0.34	0.38	0.41	0.43	0.45	0.46	0.48	0.49
30 (mm)	0.17	0.26	0.31	0.34	0.37	0.38	0.40	0.42	0.43	0.44
40 (mm)	0.16	0.23	0.27	0.29	0.31	0.33	0.34	0.35	0.36	0.36
50 (mm)	0.15	0.21	0.24	0.26	0.27	0.29	0.30	0.30	0.31	0.31
60 (mm)	0.14	0.19	0.21	0.23	0.24	0.25	0.26	0.27	0.27	0.27
70 (mm)	0.13	0.17	0.19	0.21	0.22	0.23	0.23	0.24	0.24	0.24
75 (mm)	0.13	0.17	0.18	0.20	0.21	0.22	0.22	0.22	0.23	0.23
80 (mm)	0.12	0.16	0.18	0.19	0.20	0.21	0.21	0.21	0.22	0.22
90 (mm)	0.12	0.15	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.20
100 (mm)	0.11	0.14	0.15	0.16	0.17	0.17	0.18	0.18	0.18	0.18
110 (mm)	0.10	0.13	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.17
120 (mm)	0.10	0.12	0.13	0.14	0.15	0.15	0.15	0.15	0.16	0.16
130 (mm)	0.09	0.12	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15
140 (mm)	0.09	0.11	0.12	0.13	0.13	0.13	0.13	0.14	0.14	0.14
150 (mm)	0.09	0.10	0.11	0.12	0.12	0.12	0.13	0.13	0.13	0.13

*For further details on the P/A ratio and how this is calculated please see page 12

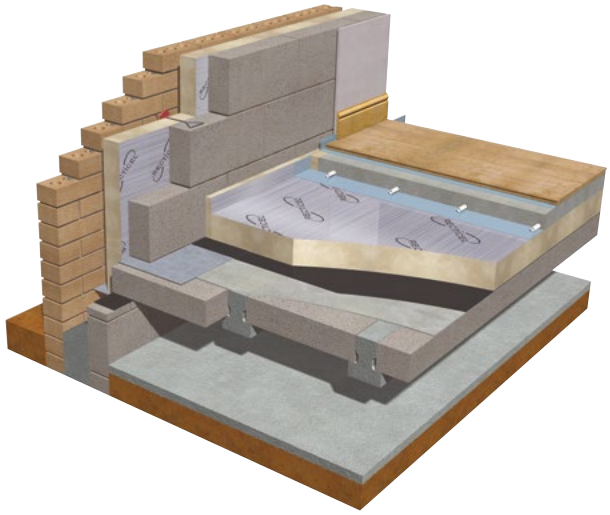
Eurothane® GP

Thermal Performance

Typical U-values (W/m²K) achieved in common floor constructions

Suspended Block And Beam, Insulation Below Screed

- 75mm screed (with 25mm insulated upstand to reduce thermal bridging)
- 500-gauge polythene VCL
- Recticel Eurothane® GP, thickness as indicated
- 1200-gauge polythene DPM
- Concrete block and beam floor deck
- Ventilated void and sub-floor make up



P/A*	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
25 (mm)	0.23	0.31	0.35	0.39	0.41	0.42	0.44	0.45	0.46	0.46
30 (mm)	0.21	0.29	0.33	0.35	0.37	0.38	0.39	0.40	0.41	0.42
40 (mm)	0.20	0.25	0.28	0.30	0.32	0.33	0.33	0.34	0.35	0.35
50 (mm)	0.18	0.23	0.25	0.27	0.28	0.28	0.29	0.30	0.30	0.30
60 (mm)	0.17	0.21	0.23	0.24	0.25	0.25	0.26	0.26	0.26	0.27
70 (mm)	0.15	0.19	0.21	0.22	0.22	0.23	0.23	0.23	0.24	0.24
75 (mm)	0.15	0.18	0.20	0.20	0.21	0.21	0.22	0.22	0.22	0.22
80 (mm)	0.14	0.17	0.19	0.20	0.20	0.21	0.21	0.21	0.21	0.21
90 (mm)	0.14	0.16	0.17	0.18	0.18	0.19	0.19	0.19	0.19	0.20
100 (mm)	0.13	0.15	0.16	0.17	0.17	0.17	0.18	0.18	0.18	0.18
110 (mm)	0.12	0.14	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.17
120 (mm)	0.11	0.13	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15
130 (mm)	0.11	0.12	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14
140 (mm)	0.10	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.14
150 (mm)	0.10	0.11	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13
80+80 (mm)	0.09	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
75+100 (mm)	0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11
90+100 (mm)	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
100+100 (mm)	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10

*For further details on the P/A ratio and how this is calculated please see page 12

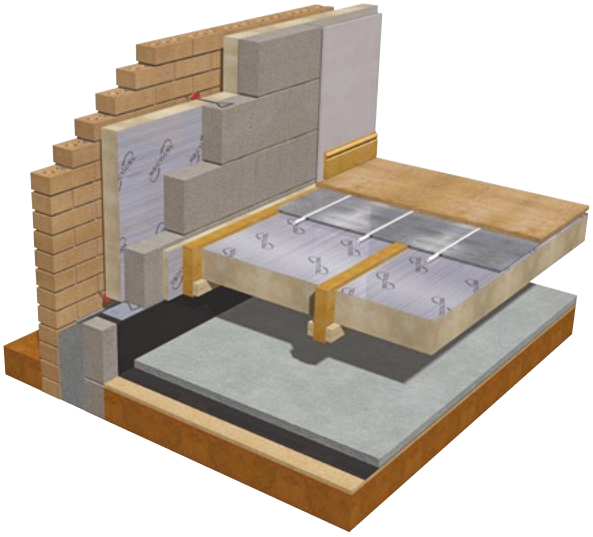
Eurothane® GP

Thermal Performance

Typical U-values (W/m²K) achieved in common floor constructions

Suspended Timber Floor, Insulation Between Joists

- 18mm chipboard
- Reticel Eurothane® GP, thickness as indicated, between joists (13.316% bridging, based on 47mm joists at 400mm centres plus an addition for cross pieces)
- Ventilated void and sub-floor make up



P/A*	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
25 (mm)	0.24	0.34	0.41	0.45	0.48	0.51	0.53	0.54	0.56	0.57
30 (mm)	0.23	0.33	0.38	0.42	0.45	0.47	0.49	0.50	0.51	0.52
40 (mm)	0.22	0.30	0.34	0.38	0.40	0.41	0.43	0.44	0.45	0.45
50 (mm)	0.21	0.28	0.31	0.34	0.36	0.37	0.38	0.39	0.40	0.40
60 (mm)	0.20	0.26	0.29	0.31	0.32	0.33	0.34	0.35	0.36	0.36
70 (mm)	0.18	0.24	0.27	0.28	0.30	0.31	0.31	0.32	0.32	0.33
75 (mm)	0.18	0.23	0.26	0.27	0.28	0.29	0.30	0.31	0.31	0.31
80 (mm)	0.18	0.22	0.25	0.26	0.27	0.28	0.29	0.29	0.30	0.30
90 (mm)	0.17	0.21	0.23	0.25	0.25	0.26	0.27	0.27	0.27	0.28
100 (mm)	0.16	0.20	0.22	0.23	0.24	0.24	0.25	0.25	0.25	0.26
110 (mm)	0.15	0.19	0.21	0.22	0.22	0.23	0.23	0.24	0.24	0.24
120 (mm)	0.15	0.18	0.19	0.20	0.21	0.21	0.22	0.22	0.22	0.22
130 (mm)	0.15	0.18	0.19	0.20	0.21	0.21	0.21	0.22	0.22	0.22
140 (mm)	0.14	0.17	0.18	0.19	0.20	0.20	0.20	0.20	0.21	0.21
150 (mm)	0.14	0.16	0.17	0.18	0.19	0.19	0.19	0.19	0.20	0.20
80+80 (mm)	0.13	0.16	0.17	0.17	0.18	0.18	0.18	0.18	0.19	0.19
75+100 (mm)	0.13	0.15	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.18
90+100 (mm)	0.12	0.14	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16
100+100 (mm)	0.12	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.16	0.16

*For further details on the P/A ratio and how this is calculated please see page 12

Eurothane® GP

Typical installation

General

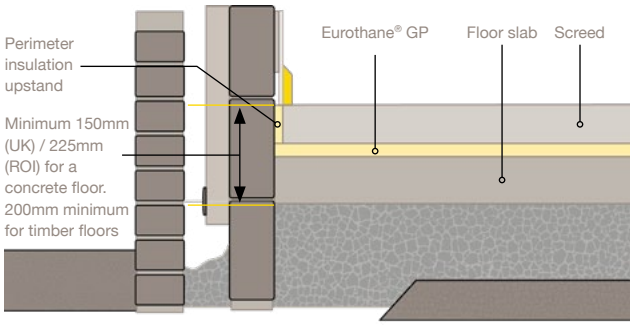
Calculating P/A ratios for U-value calculations

Because of the uneven heat loss patterns in floors, the usual calculation method for U-values has to be adapted. As floors get larger their overall heat transmittance reduces, so to take this into account a P/A ratio is required.

'P' is a measurement of the length of the exposed perimeter (i.e. not including any length of floor adjacent to heated spaces). 'A' is a measurement of the total floor area being insulated, then P is divided by A to give the ratio. Where guideline U-value tables are consulted, the calculated ratio should be rounded up – i.e. for a ratio of 0.32, refer to the column for 0.4.

Perimeter upstand insulation

Heat loss through a ground floor depends on the size and shape of a building and the type of soil on which it is constructed. Although calculations average it over the whole floor area, the greatest heat loss is around the perimeter. For any floor, where the screed or slab abuts external walls or unheated spaces, a perimeter upstand of at least 25mm **Eurothane® GP** insulation will minimise thermal bridging at the floor/wall junction. Similarly, care should be taken to ensure that cavity wall insulation continues beyond the top of the floor insulation by 150mm.



Underfloor heating

Eurothane® GP is suitable for use with underfloor heating systems, which should be installed in accordance with the manufacturer's instructions.

Heating regime

In a solid floor construction it is helpful to position the insulation based on the anticipated heating regime of the building, particularly where underfloor heating is incorporated.

For continuous heating, placing the insulation below the slab increases the thermal mass of the building. The concrete slab takes time to warm up, but then acts as a heat store for when the heating is switched to a lower setting or off.

Conversely, where the heating is used intermittently, the insulation is placed above the concrete slab and below the screed or chipboard covering for a faster thermal response.

Underfloor heating pipes can also be incorporated in a suspended timber floor with either a proprietary carrier system or with a dry sand/cement fill between the chipboard and insulation (please note a suitable membrane must be used over the insulation and joists before applying the sand / cement infill). These additional arrangements also suit intermittent heating.

Compressive strength

Eurothane® GP is perfectly suited to bearing typical domestic and light commercial loads in any of the constructions detailed. During installation, use scaffolding planks (or similar) in heavily trafficked areas to avoid damaging boards. If higher loadings are anticipated, a structural engineer should be consulted. Mesh reinforcement or an increased slab or screed thickness may be required.

Fire Performance

Used within a ground floor construction, and installed in accordance with this installation guide and good practice guidance, **Eurothane® GP** will not prejudice the fire resistance of the floor and adds no significant fire load to the building. The product has a Class 1 fire rating, tested to BS 476-7: 1997, Euroclass F, EN 13501-1.

Eurothane® GP

Insulation Below Concrete Slab

- Site preparation should be complete, with foundations in position and load-bearing walls built to damp proof course (DPC) level.
- Lay, level and compact the hardcore before applying sand blinding. This base should be level to within 5mm along any 3m straight edge.
- The damp proof membrane (DPM), minimum 1200 gauge / 300 micron polythene sheet or a radon barrier (where required), is laid over the blinding with suitably lapped and sealed joints. Extend the DPM to connect with or form the damp proof course (DPC).
- Install the **Eurothane® GP** boards, laid in a tightly butted brick bond pattern.
- If the desired insulation thickness requires two layers, board joints should be offset, ensuring that joints between insulation layers do not coincide and the thickest layer should be positioned outermost.
- Cut strips of 25mm **Eurothane® GP** to be fitted vertically around the perimeter to prevent cold bridging. The top of the cut insulation perimeter strip should be level with the top of the floor slab and the bottom level with that of the horizontal floor insulation.
- Overlay the **Eurothane® GP** with a minimum 500 gauge / 125 micron polythene sheet to act as a vapour control layer (VCL) and a separating layer to prevent the wet concrete from seeping between board joints, additionally it also protects the insulation boards from the concrete. Laps should be 150mm minimum with taped joints.
- For underfloor heating: lay the pipes and clip to the **Eurothane® GP** through the VCL, in accordance with the heating system design and supplier's instructions.
- Pour and compact the concrete slab in the normal manner. The concrete slab should be allowed to dry fully before the installation of any flooring finishes.

During construction, 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. The product must also be protected from water spillage, plaster droppings and traffic.

Insulation Below Screed

- Lay, level and compact the hardcore before applying sand blinding. This base should be level to within 5mm along any 3m straight edge.
- Pour and compact the concrete slab in the normal manner. Sand blinding may be required to ensure the base is level.
- Allow the slab to dry fully prior to continuing – the normal rate is one day for every millimetre of floor slab.
- Pre-cast systems or block & beam floors should be installed in accordance with manufacturer's instructions. A thin levelling screed or grout may be required to ensure the base is level.
- Lay the damp proof membrane (DPM), minimum 1200 gauge / 300 micron polythene sheet polythene sheet or a radon barrier (where required), on the concrete with suitably lapped and taped joints. Extend the DPM to connect with or form the damp proof course (DPC).
- Install the **Eurothane® GP** boards, laid in a tightly butted brick bond pattern.
- If the desired insulation thickness requires two layers, board joints should be offset, ensuring that joints between insulation layers do not coincide and the thickest layer should be positioned outermost.
- Cut strips of 25mm **Eurothane® GP** to be fitted vertically around the perimeter to prevent cold bridging. The top of the cut insulation perimeter strip should be level with the top of the floor slab and the bottom level with that of the horizontal floor insulation.
- Overlay the **Eurothane® GP** with a minimum 500 gauge / 125 micron polythene sheet to act as a vapour control layer (VCL) and a separating layer to prevent the wet concrete from seeping between board joints, additionally it also protects the insulation boards from the concrete. Laps should be 150mm minimum with taped joints.
- For underfloor heating: lay the pipes and clip to the **Eurothane® GP** through the VCL, in accordance with the heating system design and supplier's instructions.
- Lay and thoroughly compact the sand/cement screed. The minimum thickness to prevent cracking is 65mm for domestic applications and 75mm for others.
- Thinner liquid screeds are also available, but guidance and confirmation on suitability must be sought from the screed manufacturer.

Eurothane® GP

Insulation Below Floating Chipboard Floor

- Lay, level and compact the hardcore before applying sand blinding. This base should be level to within 5mm along any 3m straight edge.
- Pour and compact the concrete slab in the normal manner. Sand blinding may be required to ensure the base is level.
- Allow the slab to dry fully prior to continuing – the normal rate is one day for every millimetre of floor slab.
- Pre-cast systems or block & beam floors should be installed in accordance with manufacturer's instructions. A thin levelling screed or grout may be required to ensure the base is level.
- Lay the damp proof membrane (DPM), minimum 1200 gauge / 300 micron polythene sheet polythene sheet or a radon barrier (where required), on the concrete with suitably lapped and sealed joints. Extend the DPM to connect with or form the damp proof course (DPC).
- Install the **Eurothane® GP** boards, laid in a tightly butted brick bond pattern. In this form of construction, a single layer of insulation only is recommended.
- Overlay the **Eurothane® GP** with a minimum 500 gauge / 125 micron polythene sheet to act as a vapour control layer (VCL) and a separating layer to prevent the wet concrete from seeping between board joints, additionally it also protects the insulation boards from the concrete. Laps should be 150mm minimum with taped joints.
- For underfloor heating: mechanically fix timber battens to the concrete slab which have been suitably oversized to accommodate both the insulation and heating pipes. Install the **Eurothane® GP** between the battens ensuring a tight fit and fill any gaps using expanding foam. Lay the pipes and clip to the **Eurothane® GP** through the VCL, in accordance with the heating system design and supplier's instructions.
- Use pre-treated timber battens at doorways and to support stud partitions or access panels. Battens should be appropriately sized for them to sit flush with the top of the insulation.
- Lay flooring grade tongue and groove chipboard or OSB, minimum 18mm thick, with all edges glued, leaving an expansion gap of 2mm per metre run or a minimum of 10mm, which ever is greater, around the floor perimeter.
- Once the overlay board is laid, temporary wedges should be inserted to maintain tight joints until the glue has set.
- When set, the wedges are removed and the gap filled with a suitable compressible filler before skirting boards are fixed.

Insulation Between Suspended Timber Joists

- **Eurothane® GP** should not be fixed directly over joists, only between.
- Install floor joists over the ventilated sub-floor void in the normal manner, including any bracing.
- Fix timber support battens to the sides of the joists, leaving sufficient depth for the insulation and any additional airspace (if required for underfloor heating pipes). Alternatively use galvanised nails, driven into the sides of the joists and left 40mm proud.
- Cut **Eurothane® GP** boards to size and slot between the joists, ensuring a tight fit. Take into account variations in joist spacing where necessary, ensuring the boards are supported by the battens or nails.
- Gaps between the joists and any perimeter walls should be insulated using insulation boards specifically cut to size and supported by blocks or battens nailed under the joists.
- For smaller gaps (less than 25mm) expanding foam should be used.
- If the desired insulation thickness comprises two layers, board joints should be staggered and the thicker layer positioned outermost.
- Use expanding foam to seal any remaining gaps (less than 25mm).
- Lay the chipboard covering and fix directly to the joists in the normal manner.
- A vapour control layer (VCL) is not required in this form of construction. However, a polythene layer may still be installed to help improve the airtightness of the construction.
- Limit air infiltration around the perimeter of the floor by using expanding foam or mastic-type sealants under the skirting board to seal the floor edge.
- If installing the insulation from below, ensure the floor boards are already in position. Friction fit the insulation, pushing it up to the underside of the boards, then fix the chosen means of support.

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/m²K).

		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/m²K).

		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/m²K).

		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/m²K).

		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/m²K).

	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/m²K).

		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_2 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 certified Environmental Management System.

The Recticel Group's sustainability strategy was developed to respond to key challenges such as energy conservation, CO_2 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_2 footprint

We make constant efforts to minimise our CO_2 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_2 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_2 footprint.

NHIC NATIONAL HOME IMPROVEMENT COUNCIL MEMBER

SUSTAINABLE ENERGY ASSOCIATION

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**

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**.

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**

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 a better conceived, better performing, better value flat roof that complies with all the relevant legislative standards

For more information visit: **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 facilty 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.

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RECTICEL insulation

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