



FOR SOFFITS



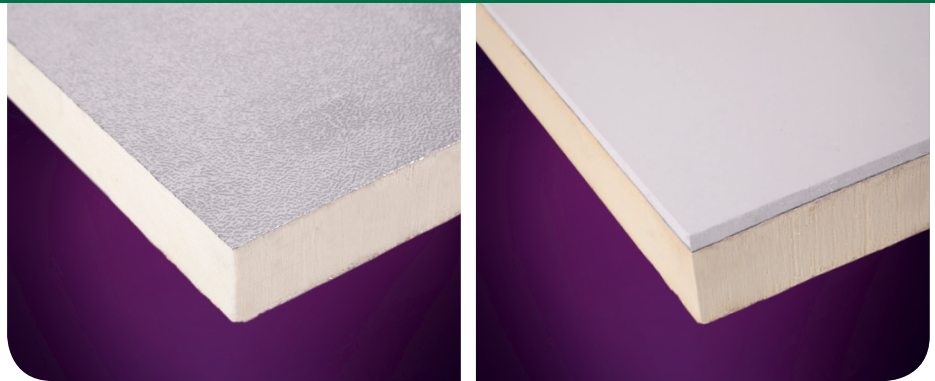
FOR WALLS



FOR PITCHED
ROOFS

Eco-Protect & Eco-Protect Plus

Class O fire performance insulation for use in semi-exposed soffits, framed walls, rainscreen and pitched roofs



Fibre free rigid polyisocyanurate (PIR) insulation core with pure aluminium foil facing to both sides and optional bonded building board for soffit applications



Eco-Protect & Eco-Protect Plus

Description

Eco-Protect comprises a fibre free rigid polyisocyanurate (PIR) insulation core with a pure aluminium foil facing on both sides, delivering Class O fire performance.

Eco-Protect Plus comprises an Eco-Protect insulation board (as described above) bonded to a non-combustible 8mm Calcium Silicate building board. Eco-Protect Plus provides Class O fire performance and a finished effect in soffit liner applications.

Applications

Eco-Protect is suitable for use in new build properties / buildings, and for upgrading the thermal performance of existing building elements. Eco-Protect is ideal for use in the following applications:

- Semi-exposed soffits
- Framed walls
- Pitched roofs
- Rainscreen cladding systems

Eco-Protect Plus is suitable for use within new-build and refurbishment of semi-exposed soffits (structural ceilings, for example car-parks, office/residential blocks and also unheated basements).



Product Properties

DIMENSIONS

Eco-Protect is available in the following standard sizes:

Width: 1200mm

Length: 2400mm

Thickness: 50mm - 120mm (requirements for larger thicknesses can be fulfilled with two layers of insulation boards)

Area: 2.88m²

Weight: As displayed in table 1

Eco-Protect Plus are available in the following standard sizes:

Width: 1200mm

Length: 2400mm

Area: 2.88m²

Thicknesses: 88mm - 128mm (including 8mm

Calcium Silicate building board)

Weight: As displayed in table 2

THERMAL PERFORMANCE

The thermal conductivity (λ -value) of Eco-Protect is 0.022W/mK, thermal resistances are shown in table 1.

The typical thermal conductivity (λ -value) of the calcium silicate building board featured in Eco-Protect Plus is 0.16 W/mK. Thermal Resistances of Eco-Protect Plus are shown in table 2. All Thermal Resistances are rounded down to the nearest 0.05 (m²K/W).

DURABILITY

When correctly installed, Eco-Protect has an indefinite life and its durability depends on the background/supporting structure and conditions of its use. It should not be used to isolate dampness nor be used in continuously damp/humid conditions. The fibre free insulation core of Eco-Protect and facings resists attack by mould and microbial growth and do not provide any food value to vermin.

COMPRESSIVE STRENGTH

The typical compressive strength of Eco-Protect is 140 kPa when tested at 10% compression to BS EN 826: 2013 Thermal Insulating Products for Building Applications – Determination of Compression Behaviour.

FIRE PERFORMANCE

Both Eco-Protect and Eco-Protect Plus offer Class O fire performance.

Having been tested, Eco-Protect achieves a BS476-7 Class 1 rating for surface spread of flame. This plus a BS 476-6 pass enables Eco-Protect to claim a Class O classification.

The specific fire resistance of the system will depend upon the conditions of use. For further information please contact EcoTherm Technical Services.

RESISTANCE TO SOLVENTS

The PIR insulation core of Eco-Protect resists attack from alkalis, dilute acids, mineral oil and petrol. The fibre free insulation core is not resistant to ketonic solvents.

ENVIRONMENTAL

All EcoTherm PIR insulation is manufactured with a blowing agent that is CFC/HCFC free and has zero Ozone Depletion Potential (ODP) with a low Global Warming Potential (GWP). Eco-Protect and Eco-Protect Plus are manufactured under an ISO 14001 Environmental Management System (LPCB certificate - 388 – 7EMS).

Eco-Protect corresponds to the BRE Global Green Guide generic specification which achieves a summary rating of A.

Eco-Protect is not classified as a dangerous substance, so no special provisions are required regarding carriage.

STANDARDS AND APPROVALS

Eco-Protect and Eco-Protect Plus are manufactured under an ISO 9001 Quality Management System (LPCB certificate 388 – 7QMS), an ISO 14001 Environmental Management System (LPCB certificate - 388 – 7EMS) and a BS OHSAS 18001 Occupational Health and Safety Management System (LPCB certificate 388 – 7HS). All certificates are available for download from www.ecotherm.co.uk

EcoTherm PIR insulation lambda and thermal resistance values stated in this datasheet are in accordance with BS EN 13165:2012+A2:2016 Thermal insulation products for buildings – Factory made rigid polyurethane foam products – Specification.

A CE Declaration of Performance for Eco-Protect is available to download from www.ecotherm.co.uk



Design Considerations

TYPICAL U-VALUES

Eco-Protect and Eco-Protect achieve typical U-values as shown in Tables 3, 4, 5 & 6.

WATER VAPOUR RESISTANCE

Eco-Protect has an integral Vapour Control Layer (VCL) to minimise the risk of interstitial condensation. Foil facings have a high water vapour resistance and will, therefore, provide a significant resistance to water vapour transmission.

WORK ON EXISTING STRUCTURES

When installing EcoTherm insulation boards onto an existing structure (refurbishment or upgrade), the condition of the existing structure should be assessed to ensure it is in good condition and water tight. EcoTherm insulation boards should not be used to hide or isolate damp. Where mechanically fixing EcoTherm insulation, use a detector to ensure no cables, pipes or wires are running within the area. Always check with EcoTherm Technical Services when upgrading existing insulation for guidance on potential condensation risk.

Table 1 Eco-Protect Typical Weights & Thermal Resistances

Thickness (mm)	Weight per board (kg)	Thermal Resistance / R-value (m ² K/W)
50	5.13	2.25
55	5.56	2.50
60	5.99	2.70
65	6.42	2.95
70	6.85	3.15
75	7.29	3.40
80	7.72	3.60
85	8.15	3.85
90	8.58	4.00
95	9.01	4.30
100	9.45	4.50
110	10.31	5.00
120	11.17	5.45

For walls

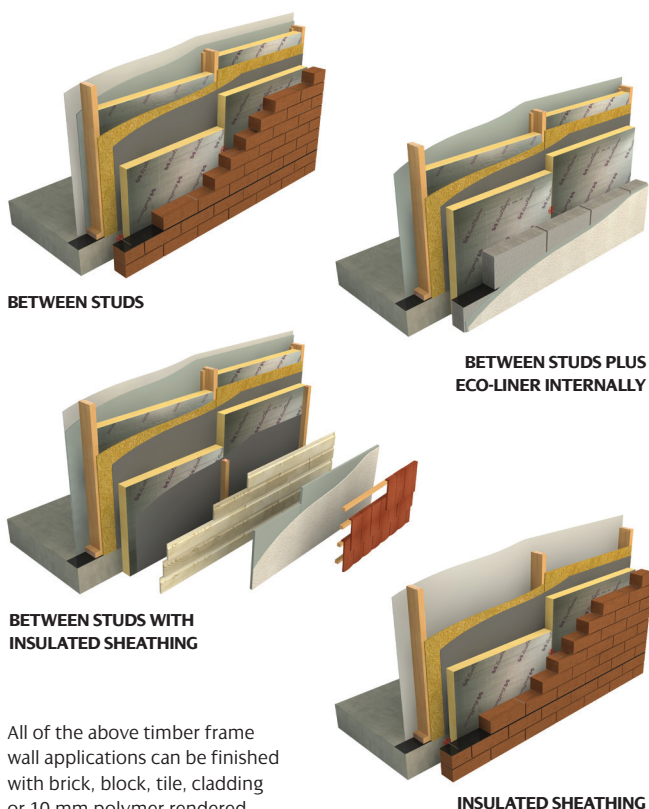
VAPOUR CONTROL

If Eco-Protect is to be installed between timber frame studs only, EcoTherm recommends the installation of a Vapour Control Layer (VCL) or vapour check plasterboard.

In order to control the risk of condensation, a VCL should be installed behind the plasterboard. A Condensation Risk Analysis should be carried out in accordance with BS5250:2011(Code of practice for the control of condensation in buildings). Please contact EcoTherm Technical Services for further assistance.

INSTALLATION

Eco-Protect is suitable for the following timber frame wall applications:



All of the above timber frame wall applications can be finished with brick, block, tile, cladding or 10 mm polymer rendered calcium silicate board outer.

Table 2 Eco-Protect Plus Typical Weights & Thermal Resistances

Thickness (mm)	Weight per board (kg)	Thermal Resistance / R-value (m ² K/W)
88	28.7	3.65
98	29.03	4.10
108	29.90	4.55
118	30.76	5.00
128	31.62	5.50

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Email: technical@ecotherm.co.uk

Table 3 Typical U-values for Timber Frame Walls using Eco-Protect

Thickness (mm)	Typical U-values (W/m ² K)			
	Between studs	Between studs & inside using 37.5mm Eco-Liner	Insulated sheathing	Insulation between studs and insulated sheathing*
50	0.37	0.26	0.23	0.16
60	0.33	0.24	0.21	0.14
65	0.32	0.23	0.20	0.14
70	0.31	0.22	0.19	0.13
75	0.29	0.22	0.18	0.12
80	0.28	0.21	0.18	0.12
90	0.26	0.20	0.16	0.11
100	0.25	0.19	0.15	0.10
120	0.23	0.17	0.13	0.09

*thickness shown is for two layers of Eco-Protect (i.e. 50mm between plus 50mm sheathing, 100mm between plus 100mm sheathing)

Between studs: Calculations are based on 3mm skim, 12.5mm plasterboard, Vapour Control Layer (VCL) 140mm timber studs, Eco-Protect, 9mm OSB, breathable membrane, 50mm cavity, and 102.5mm brick outer leaf.

Between studs & inside using 37.5mm Eco-Liner: Calculations are based on 3mm skim, 37.5mm Eco-Liner, 140mm timber studs, Eco-Protect, 9mm OSB, breathable membrane, 50mm cavity, and 102.5mm brick outer leaf.

Insulated sheathing: Calculations are based on 3mm skim, 12.5mm plasterboard, 140mm timber studs, Eco-Protect, 9mm OSB, breathable membrane, 50mm cavity, and 102.5mm brick outer leaf.

Insulation between timber frame studs and insulated sheathing: Calculations are based on 3mm skim, 12.5mm plasterboard, 140mm timber studs, Eco-Protect, 9mm OSB, Eco-Protect, breathable membrane, 50mm cavity, and 102.5mm brick outer leaf.

Adjustments for fixings to be included once fixing centres / type have been confirmed.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services.

TYPICAL FIXING INSTRUCTIONS

- Measure the distance between studs before cutting Eco-Protect boards to ensure a good fit.
- Eco-Protect boards should be fitted tightly between studs and adjoining timbers.
- Fill all gaps with PU expanding filler foam.
- The use of timber stop battens will prevent the boards from moving and provide specified air cavity if required. The cavity can also be used to as a service void (internal side only).
- Eco-Protect boards should be butted to maintain continuity of insulation.
- The outer leaf should be constructed in the conventional manner/in accordance to the manufacturer, using appropriate wall ties to hold the two wall leaves together.

Full, step-by-step installation details can be found in the EcoTherm Quick Guide.

Eco-Protect is also suitable for use on the outer of metal frame wall systems - in multi storey buildings up to 18 metres in height. Please speak to EcoTherm Technical Services for more details.

For roofs

BREATHABLE MEMBRANE

A breathable membrane should be fixed in accordance with the manufacturer's instructions. Generally for a pitched roof, the membrane should be laid over the rafters and be secured by the use of tile or slate laths.

VAPOUR CONTROL

When constructing a warm roof or installing Eco-Liner under rafters there is no need to use a Vapour Control Layer (VCL). Eco-Liner has an integral VCL.

VERTICAL BATTENS

In all over-rafter applications Eco-Protect boards should be fixed by the use of vertical counter battens. The counter battens allow slate and tile laths to be fixed in the traditional manner.

The breather membrane should be laid directly on to the Eco-Protect board before the counter battens are installed. Alternatively, the counter battens can be installed on top of the Eco-Protect board and the breather membrane installed after, draping over the battens.

UNVENTILATED AND VENTILATED CONSTRUCTIONS

Generally, there is a choice between unventilated and ventilated constructions – the exception is refurbishment / loft conversions on existing roofs.

Ventilated Roof (existing roofs) - Unless there is a breathable sarking membrane already in situ or the whole roof is to be stripped, it is impossible to use an unventilated roof, because a breathable sarking membrane cannot be installed. A 50mm ventilation air gap is required between the insulation and the sarking felt to avoid condensation.

Unventilated Roof (new build or new roofs) – An unventilated roof approach creates a warm roof space that does not require cross ventilation. It is preferable to seal all joints in the breathable sarking membrane, with a tape recommended by the membrane manufacturer.

TYPICAL FIXING INSTRUCTIONS

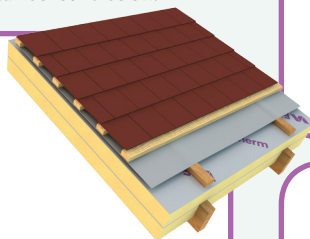
GENERAL

- Breather membranes should be installed in accordance with the manufacturer's instructions.
- Measure the exact distance between rafters before cutting Eco-Protect boards, to allow for variances and achieve tightly fitting boards.
- Fill any small gaps with expanding PU foam for improved thermal performance.

Dependent on the U-value required and the roof design, different approaches can be taken. Full, step-by-step installation details can be found in the EcoTherm Quick Guide. Summary details can be found below.

OVER RAFTERS

- Eco-Protect boards should be installed with lightly butted edges and joints break bonded.
- Long edges should run across the rafters with edges supported.
- Fix Eco-Protect by use of a treated counter batten (min. 38mm x 38mm) placed above the insulation down the line of each rafter.
- Install the breather membrane in accordance with manufacturer's instructions.
- Where very low U-values are required, it may be practical to add a layer of insulation boards between the rafters in addition to over.



OVER & BETWEEN RAFTERS

- If installing the between rafter insulation from the outside, install timber battens to position the insulation flush with top of the rafter.
- Fit Eco-Protect tightly between rafters.
- Install over rafter insulation as above.

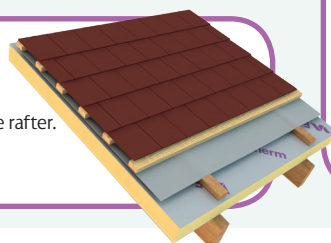


Table 4 Typical U-values for Pitched Roofs using Eco-Protect

Thickness (mm)	Typical U-values (W/m²K)**					
	Between & under rafters (ventilated) plus 72.5mm Eco- Liner under rafters		Between & under rafters (unventilated) plus 72.5mm Eco- Liner under rafters		Thickness (mm) between & over	Over & between rafters
60	125mm timber rafters	0.20	150mm timber rafters	0.18	40 + 40	0.26
70	150mm timber rafters	0.19		0.17	50 + 50	0.22
80		0.18		0.16	60 + 60	0.18
90		0.17		0.16	70 + 70	0.16
100		0.16		0.15	75 + 75	0.15
110	175mm timber rafters	0.15	175mm timber rafters	0.14	80 + 80	0.14
120		0.14		0.14	90 + 90	0.13
130***	200mm timber rafters	0.14	175mm timber rafters	0.13	100 + 100	0.12
140***		0.13		0.13	110 + 110	0.11
150***		0.13		0.12	120 + 120	0.10
160***	225mm timber rafters	0.12	200mm timber rafters	0.12	125 + 125	0.10
170***		0.12		0.11	130 + 130	0.09
180***	250mm timber rafters	0.11	225mm timber rafters	0.11	140 + 140	0.09
190***		0.11		0.11	150 + 150	0.08
200***		0.11		0.10	150 + 180	0.07

**Between & under rafters (ventilated): Calculations are based on tiles on battens, sarking felt, timber rafters at thickness stated above and 400mm centres, 50mm cavity, Eco-Protect between rafters, 72.5mm Eco-Liner (insulated plasterboard) below rafters.

Between & under rafters (unventilated): Calculations are based on tiles on battens, breathable membrane, timber rafters at thickness stated above and 400mm centres, Eco-Protect between rafters, 72.5mm Eco-Liner (insulated plasterboard) below rafters.

Over & between rafters: Calculations are based on, tiles on battens, timber counter battens, breathable membrane, Eco-Protect, 150mm timber rafters at 400mm centres, Eco-Protect between rafters, vapour control layer, plasterboard and skim.

Adjustments for fixings to be included once fixing centres / type have been confirmed.

*** requirements for larger thicknesses can be fulfilled with two layers of insulation boards.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services.

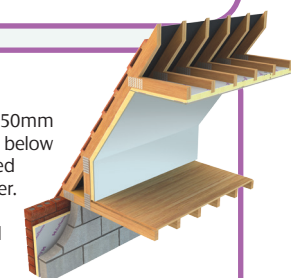
BETWEEN RAFTERS

- Push the cut Eco-Protect board up between the rafters to fit tightly, sitting flush with the bottom of the rafter.
- Unventilated roof: Ensure a minimum 25mm air gap is retained above the insulation board and below the breather membrane. This is easily achieved with a timber stop batten installed inside the rafter. Alternatively, rafters can be full filled with insulation if a counter batten is installed on top of the rafter, followed by the breather membrane.



BETWEEN & UNDER RAFTERS (USING ECO-LINER, INSULATED PLASTERBOARD)

- PARTIAL FILL: Ventilated roof: Ensure a minimum 50mm air gap is retained above the insulation board and below the membrane / sarking felt. This is easily achieved with a timber stop batten installed inside the rafter.
- FULL FILL: Unventilated roof: Install the insulation board to match the thickness of the rafter. Install counter battens, followed by the breather membrane to retain minimum 25mm air gap.
- Push the cut Eco-Protect board up between the rafters to fit tightly, sitting flush with the bottom of the rafter.
- Install Eco-Liner closely butted to insulate under the rafters and achieve a plasterboard finish in one application (VCL not required when using this method).



Images shown above are for example only. Numerous assembly options are available in a pitched roof construction.

For soffit liner

Both Eco-Protect and Eco-Protect Plus are suitable for use within new-build and refurbishment of semi-exposed soffits (structural ceilings, for example car-parks, office/residential blocks and also unheated basements).

Eco-Protect provides Class O fire performance insulation, the foil facings can be left as a finished layer, or Eco-Protect is able to receive a building board.

Eco-Protect Plus provides Class O fire performance insulation with a finished effect as a result of the product's laminated calcium silicate building board.

Table 5 Typical U-values for Semi-Exposed Concrete Soffits using Eco-Protect

Thickness (mm)****	Typical U-value (W/m ² K)
60	0.32
70	0.29
75	0.27
80	0.25
85	0.24
90	0.23
95	0.21
100	0.20
105	0.19
110	0.19
120	0.17

Table 6 Typical U-values for Semi-Exposed Concrete Soffit using Eco-Protect Plus

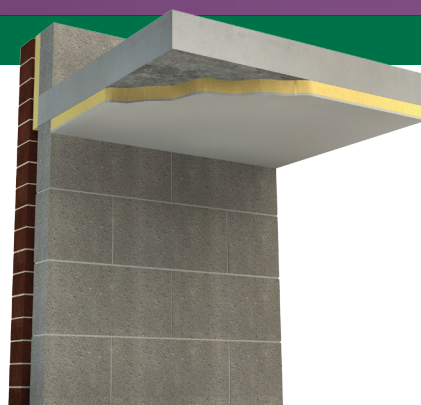
Thickness of insulation core + building board (mm) ****	Typical U-value (W/m ² K)
68	0.32
78	0.28
83	0.27
88	0.25
93	0.24
98	0.23
103	0.21
108	0.20
113	0.19
118	0.19
128	0.17
138*	0.15
148*	0.14

****requirements for larger thicknesses can be fulfilled with two layers of insulation boards.

Calculations are based on Eco-Protect Plus, 150mm concrete slab concrete soffit.

Adjustments for fixings to be included once fixing centres / type have been confirmed.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services. This is particularly relevant when using metal fixings.



Fixing Methods

DIRECT TO SOFFIT

Fix directly to soffit using proprietary non-combustible concrete fixings such as SPIT Isomet Insulation Anchors, Insofast Fixings or Ejot self-tapping concrete anchors at 400mm centres, strictly in accordance with manufacturer's instructions.

STEEL FRAME SYSTEM

Follow manufacturer guidelines when installing the steel frame system. Install insulation board at right angles to the framing using appropriate fixings at 600mm centres in the field of the board and at board ends ensuring a minimum 10mm penetration.

TIMBER FRAME SYSTEM

Mechanically fix to 75 x 50mm pre-treated timber framing at 600mm centres in the field of the board and at board ends. Install insulation board at right angles to the framing using appropriate fixings ensuring a minimum 25mm penetration.

Please contact EcoTherm Technical Services for further guidance on fixing advice.

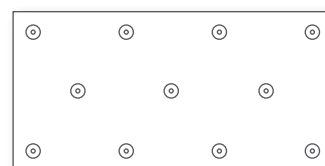
TYPICAL FIXING INSTRUCTIONS

- The concrete soffit should be checked prior to installation by a competent person to ensure that it is structurally sound.
- EcoTherm Insulation recommend a minimum mechanical fixings as shown to the right, however it is strongly recommended to seek project specific advice from a suitable fixing manufacturer.
- Insulation boards should be installed in a break bonded pattern (to the right) with tightly butted edges.
- Ensure the fixing device is long enough to give adequate penetration into either the framing or the concrete soffit. Fixings must be located 50-150mm from the edges and corners of the board and never overlap board joints. Consult fixing manufacturer for advice on appropriate fixing patterns.
- It is recommended that surface mounted services should be fixed back to the concrete soffit and not the surface building board.
- Where the board may be subjected to external wind pressure, the requirement for additional fasteners should be assessed in accordance with BS EN 1991-1-4:2005 (UK National Annex to Eurocode 1 Actions on structures, general actions, wind actions).

TYPICAL FIXING PATTERNS – DIRECT TO CONCRETE SOFFIT

ECO-PROTECT

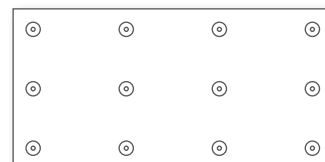
A minimum of 11 mechanical fixings, with a minimum head diameter of 35 mm, are required to secure the insulation board to the soffit. Fixings at board edges must be located > 50 mm and < 150 mm from edges and corners of the board and not overlap board joints.



11 No. per board
(2.4 x 1.2m board - 3.81 fixings / m²)

ECO-PROTECT PLUS

A minimum of 12 mechanical fixings, with a minimum head diameter of 25 mm, are required to secure the insulation board to the soffit. Fixings at board edges must be located >50 mm from edges and corners of the boards and not overlap board joints.



12 No. per board
(2.4 x 1.2m board - 4.16 fixings / m²)

FINISHING/DECORATION

The calcium silicate building boards used to face Eco-Protect Plus are of organic origin and as such, natural variances will occur between batches.

When installing Eco-Protect, apply proprietary 75mm wide self-adhesive foil tape at board joints and visually exposed board edges.

Eco-Protect & Eco-Protect Plus



FOR SOFFITS



FOR WALLS



FOR PITCHED
ROOFS

For rainscreen cladding systems

Eco-Protect is suitable for use in new build and upgrading the thermal performance of existing walls in rainscreen cladding applications of multi storey buildings up to 18 metres in height.

VAPOUR CONTROL / CONDENSATION

Consideration should be given to the risk of condensation when designing thermal elements. A Condensation Risk Analysis should be carried out in accordance with BS5250:2011 (Code of practice for the control of condensation in buildings). Please contact EcoTherm Technical Services for further assistance.

U-VALUES FOR RAINSCREEN CLADDING APPLICATION

Due to the numerous different fixing mechanisms and cladding systems involved in rainscreen applications, it is advised to contact EcoTherm Technical Services to complete a project specific U-value calculation.

TYPICAL FIXING INSTRUCTIONS

- Eco-Protect is suitable for use in rainscreen cladding systems in multi storey buildings up to and including 18 metres in height.
- Due to the variations in cladding systems, installation advice should be sought from the system (fixing and facade) manufacturers.

- Eco-Protect boards should be installed lightly butted and in a break bonded pattern, apply proprietary self adhesive rainscreen cladding aluminium foil tape at board joints and exposed board edges. EcoTherm recommend min 75mm wide tape for board joints, and min 50mm tape overlap for exposed board edges on to the board face.
- To avoid gaps, Eco-Protect boards should be cut neatly around fixings and brackets.
- A minimum of 9 fixings per 2.88m² board is recommended in the below fixing pattern, however, additional fixings may be required dependent on the geographical location of the building, the local topography, the height and width of the wall concerned, the wall structure, and the type of mechanism being used to attach the cladding system. To assess the requirement for additional fixings please refer to BS 6399-2: 1997 (Loadings for buildings. Code of practice for wind loads) or BS / I.S. EN 1991-1.4: 2005 (National Annex to Eurocode 1. Actions on structures, General Actions, Wind Actions).
- Fixings at board edges must be located > 50 mm and < 150 mm from edges and corners of the board and not overlap board joints.

TYPICAL FIXING PATTERN



9 No. per board
(2.4 x 1.2m board - 3.12 fixings / m²)

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Site work

HANDLING

- Do not drop boards.
- Wear appropriate hand and eye protection due to the sharp edges of the board. Cut level 5 class of gloves offer an improved cut resistance when compared to standard protective gloves.
- Damaged boards should not be used.
- To cut - use a sheet saw with hardened steel teeth.
- Do not breathe the dust, avoid contact with skin and eyes.
- Cutting with power tools generates non-hazardous dust, so should be kept to a minimum. Ideally all operations which produce dust should be carried out in well ventilated conditions; where possible a dust mask selected in accordance with BS EN 149 should be worn.

ECO-PROTECT PLUS SPECIFIC HANDLING

- Care should be taken when removing boards from pallets. Employ a two-man lift to ensure no marking.
- Boards should be lifted off the pallet, never dragged.
- Secondary trades must take care when installing services, pipes and cable trays etc. to reduce the risk of damaging boards in situ.
- Additional lifting equipment may be required and may need to be considered in the risk assessment.
- Any light scratches or scuffs on the Eco-Protect laminated building board can be treated by light sanding, then wiped with a damp cloth.
- Edge reveals being covered by building boards should be mechanically fixed.

HEALTH AND SAFETY

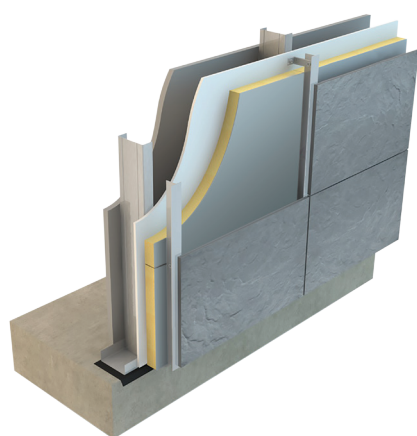
Eco-Protect and Eco-Protect Plus are chemically inert and safe to use, product safety information is available to download from www.ecotherm.co.uk

STORAGE

Store boards in a flat, dry area off the ground away from mechanical and water damage and sources of ignition.

The boards must be protected from prolonged exposure to sunlight and should be stored either under cover or covered with opaque polyethylene or tarpaulin.

Keep boards dry at all times.



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Please consult EcoTherm for details of BBA certificate numbers for specific products
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