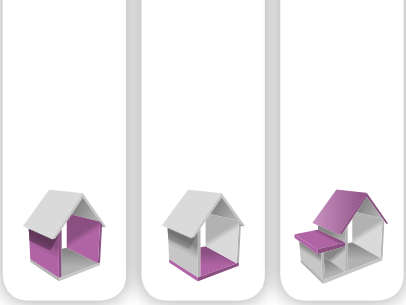
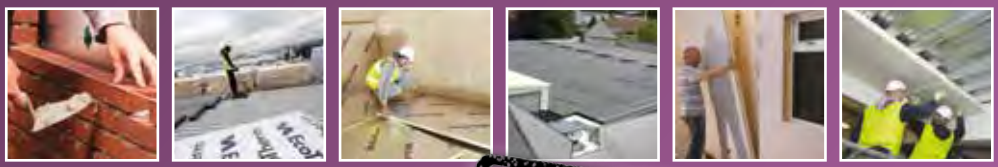


EcoTherm®
Insulation

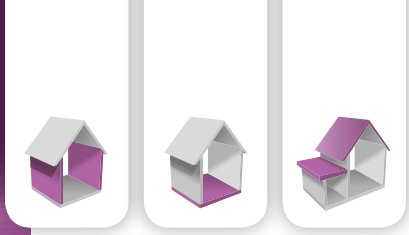
ALL IN ONE INSULATION

Quick Guide



EASY TO SELECT
EASY TO INSTALL
EASY WITH ECOTHERM

- ☑ BUILDING REGULATIONS
- ☑ PRODUCT SELECTION
- ☑ INSTALLATION ESSENTIALS
- ☑ STRUCTURAL APPLICATIONS
- ☑ FLAT ROOFING APPLICATIONS
- ☑ PRODUCT INFORMATION



Simple Insulation Solutions

EcoTherm Insulation...

...comprises fibre free rigid polyisocyanurate (PIR) insulation sandwiched between two high performance facings to create a tough, durable, light weight insulation board that performs whilst reducing the overall cost to build.

EcoTherm Insulation (UK) Ltd is one of the UK's largest PIR thermal insulation suppliers. In addition to a standard range of insulation boards EcoTherm produces speciality products that offer Class O fire performance or time saving multi-application benefits. EcoTherm's product range is suitable for use within flat and pitched roofs, walls, floors and ceilings in new and existing buildings.

Manufactured under management systems certified to ISO 9001: 2008, ISO 14001: 2004, ISO 50001: 2001 and BS OHSAS 18001: 2007, EcoTherm's boards are recognised for their compressive strength, low weight, ease of installation and excellent thermal performance. They are also manufactured at facilities carrying FSC® certification.

EcoTherm's Technical Services team provides a comprehensive service, assisting with product queries, U-value calculations, Condensation Risk Analysis and general specification and application advice. EcoTherm is proud to offer these services, along with first class customer service and marketing support.

What thickness of insulation do I need?

EcoTherm's online **U-value Calculator** gives you instant answers and provides the **most suitable product for your application.**

Simple step by step tool that guides you to the ideal insulation solution. **Available 24/7**

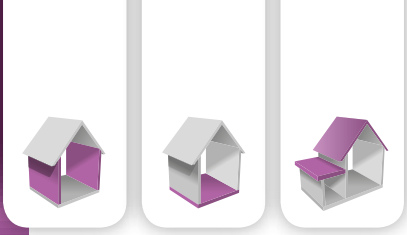
Follow us to view our latest news:

YouTube **EcoTherm Insulation**

@EcoThermUK

EcoTherm-Insulation-UK-Ltd

Contents



About PIR

Fibre-free Core

Polyisocyanurate (PIR), the core of EcoTherm's rigid insulation boards, has evolved from polyurethane (PUR). Polyurethane is a material that has been used as an insulation material since the 1930s and you will find it in many every day products, such as car interiors, refrigerators, shoes and spandex. PIR insulation boards offer many advantages when compared with other traditional insulation materials, and over their useful life will save 80 times more energy than was used to make them.

EcoTherm PIR features & benefits

Excellent thermal performance
EcoTherm's PIR insulation boards achieve low lambda values, as low as just 0.022W/mK. PIR users require approximately half the thickness of traditional forms of insulation to meet the same level of thermal performance - don't adjust your standard construction design, optimise the space you save.

Achieve current and future UK Building Regulations / Standards
Due to their excellent thermal performance, EcoTherm Insulation products can accommodate thinner constructions. This provides more space for the homeowner or building occupants. Being conscious of the thermal performance of your chosen insulation material will massively affect the building's thermal efficiency and return on investment.

Lightweight
PIR boards are easy to handle and transport making installation much easier and quicker than traditional insulants. Their low weight also lends themselves to modern methods of construction and lighter, supporting structures.

Durable
Lifelong thermal insulation - the need to replace PIR insulation is highly unlikely due to its rigidity, durability and excellent compressive strength. When installed correctly, the boards will not rot, sag or decay and will therefore continue to deliver designed insulation values throughout the lifetime of the building.

Resilient
The insulation core and facings resist attack by mould and microbial growth. Therefore there is not a need to replace decaying insulation.

Non-irritant
EcoTherm Insulation boards are non-irritant due to their fibre free core. Handling them will not cause skin irritation.

Easy to cut
Due to its rigidity and lightweight core, EcoTherm Insulation is simple to cut using a fine tooth saw.

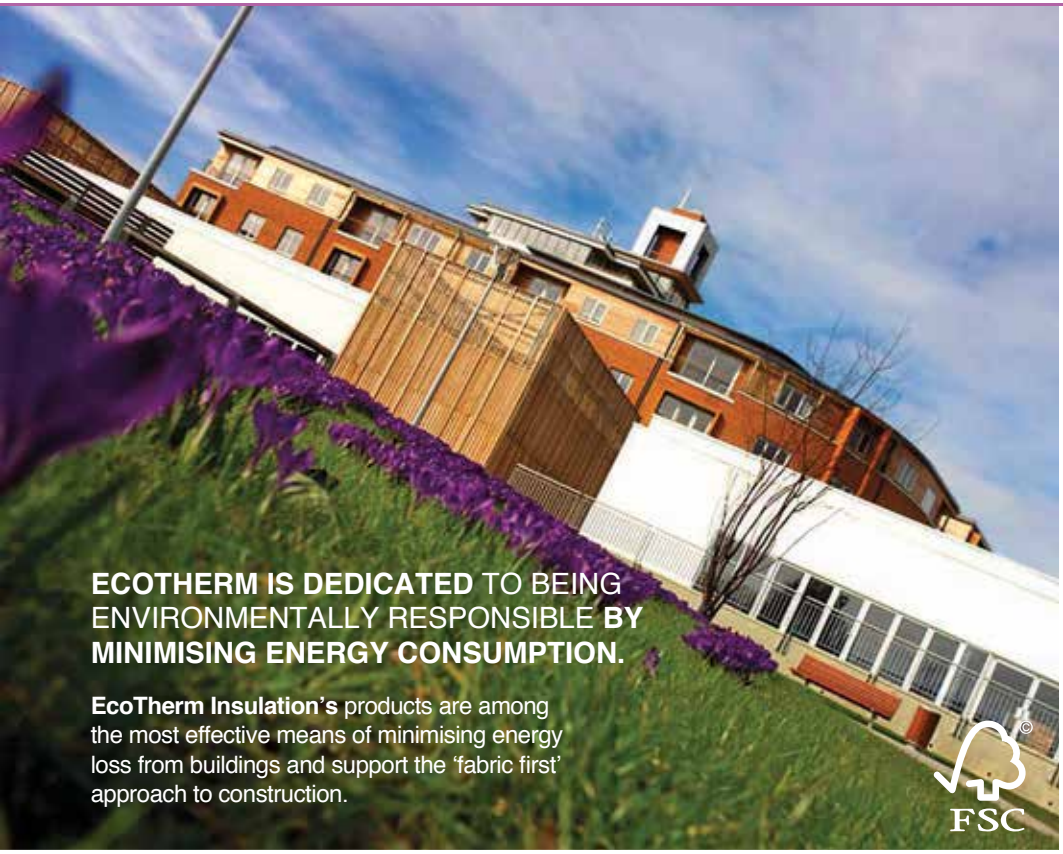
Availability
EcoTherm has the majority of its product range in stockists around the UK. Therefore most of EcoTherm's products can be purchased or delivered quickly to meet your demanding schedule.

Time & money saving
EcoTherm produces speciality products, designed to cut costs and time from projects. For example, EcoTherm Eco-Liner is a 2in1 application board that insulates and dry lines walls at the same time, meaning only one board to cut, carry and fix.

Certified
EcoTherm's products are backed with third party certifications* such as BBA Approvals, Energy Saving Trust Recommendation and management systems certified to ISO 9001:2008, ISO 14001: 2004, ISO 50001:2001 and BS OHSAS 18001: 2007. EcoTherm's customers can be assured to receive high quality, sustainable products and services.

* please see product pages for details on product specific certifications

EcoTherm and the Environment



EcoTherm Insulation products are manufactured with a CFC and HCFC-free blowing agent, that has zero Ozone Depletion Potential (ODP) and a low Global Warming Potential (GWP). Achieving ISO 14001: 2004 accreditation reflects EcoTherm's commitment to environmental sustainability. EcoTherm Insulation products with a certified BRE Global Green Guide rating of A+ are available subject to enquiry.

EcoTherm are conscious of which timber products we source and where from. The manufacturing facilities, at which EcoTherm boards are produced, carries FSC® certification.

UK Building Regulations & Standards

Building Regulations and Standards apply statutory requirements on building work in the UK for new and existing buildings. Not only do they provide building standards with regards to design, quality, sustainability, and health and safety, but they keep the UK on track with its climate change commitments (targeting an 80% reduction in carbon emissions by 2050). Insulation plays a key part in meeting these requirements and it is important they are adhered to.

Did you know?

The fine for contravening Building Regulations/ Standards can be up to £5000 and an additional £50 per day until the work is rectified to the correct standard. These fines usually apply to the builder or contractor, however, action can also be taken against the home or building owner who will be required to alter or remove the work. For work that does not meet Building Regulations or has not been rectified, local authorities can withhold completion certificates and the sub-standard work will appear on land search enquiries, affecting the sale of the property.

Supporting documents are available from the Government (Part L* and Technical Handbook Section 6 Energy) that provide detailed information on each section of the Building Regulations and Standards.** EcoTherm has compiled a summary of the insulation related elements of these documents and provided U-values that will help achieve compliance.

*England & Wales regulations **Scotland standards

What is a U-value?

A U-value is the measure of heat loss through a building element (walls, floors or roofs). U-value calculations take into consideration all components of a building element (i.e. U-value calculations for cavity walls typically take the following into consideration; outer & inner surface resistance, outer brick/blockwork, cavity, insulation, inner blockwork, plaster dabs, plasterboard and plaster skim).

U-value calculations are available free of charge from EcoTherm's Technical Services or 24/7 with the online U-value calculator at www.u-value-calculator.co.uk.

The figures and information quoted are for guidance only. Insulation thicknesses quoted are dependent on the construction build up. Official Building Regulation / Standard documentation should always be consulted. Contact EcoTherm Technical Services for detailed U-value calculations and condensation risk analysis which should be completed for each project.

England (from April 2014)

New Dwellings (Domestic Buildings) - Approved Document L1A/ADL1A

Approved Document L1A looks at the entire building's performance and CO_2 emissions, rather than isolating one particular element. All dwellings (domestic buildings) must be designed and built so the individual Dwelling CO_2 Emissions Rate (DER) is no worse than the Target CO_2 Emissions Rate (TER). The TER is based upon the performance of a defined Notional Dwelling.

A new requirement to also reach a Target Fabric Energy Efficiency (TFEE) brings the need to specify improved insulation standards and a focus on thermal bridging and air tightness, again based on a Notional Dwelling. Introducing a target for the Dwelling Fabric Energy Efficiency (DFEE) ensures that a 'fabric first' approach is taken throughout the building, which ultimately makes it easier to reach the TER.

Both the Dwelling Emission Rate (DER) and Dwelling Fabric Energy Efficiency (DFEE) are calculated using a calculation methodology called Standard Assessment Procedure (SAP) 2012. If the dwelling is built precisely to match the Notional Dwelling criteria, it should meet the Target Emission Rate (TER) and Target Fabric Energy Efficiency (TFEE). Note that other factors need to be taken into consideration including continuous building fabric insulation, air permeability, thermal bridging, information submission (design and build values) and limiting the effects of heat gains in summer.

The area-weighted average U-values, taken from the Notional Dwelling specification (used to set the TER and TFEE targets), are shown in table 1 below.

The actual specification required for a compliant building and necessary building fabric U-value targets may vary depending on the actual overall proposed specification and the outcome of the energy assessment.

	ROOFS	WALLS	FLOORS
Notional Dwelling area weighted average U-value	0.13	0.18	0.13

Table 1

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Existing Dwellings (Domestic Buildings) - Approved Document L1B/ADL1B

Existing dwellings differ from new dwellings, in that they do not have to achieve a whole building Target CO_2 Emissions Rate (TER, see New Dwellings). However, existing dwellings do have to meet certain target U-values for building elements (walls, floors and roofs).

The target U-values for existing dwellings or new elements within them are shown in table 2 below.

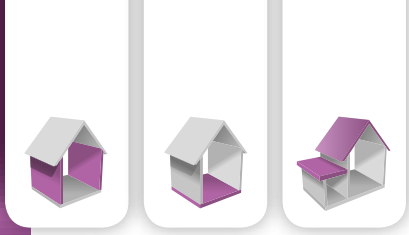
Table 2

	ROOFS				WALLS		FLOORS	
	FOR REPLACED OR REFURBISHED ROOFS		NEW ELEMENTS (EXTENSION/ CONVERSION)		EXISTING WALLS (REFURB)	NEW WALLS (EXT)	EXISTING FLOORS (REFURB)	NEW FLOORS (EXT)
	Ceiling level	Flat & pitched roof level	Ceiling level	Flat & pitched roof level				
Required area weighted average U-value	0.16	0.18	0.16	0.18	0.30	0.28	0.25	0.22

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

New Buildings other than Dwellings - Approved Document L2A/ADL2A

Approved Document L2A adopts the same approach to Approved Document L1A, taking the entire building's performance and CO_2 emissions into consideration. All new buildings other than dwellings must be designed and built with their Building CO_2 Emissions Rate (BER) being no worse than the Target CO_2 Emissions Rate (TER). The TER is set from a Notional Building of same size and shape to the actual building. There are three defined Notional Buildings; heated and cooled buildings (that are side lit or unlit), and toplit buildings. The specification for each building type is summarised in Section 5 of ADL2A. CO_2 Emissions Rates for buildings other than dwellings are calculated using the Simplified Building Energy Model (SBEM).



Scotland

(from October 2015)

Special considerations are made for low energy demand buildings, modular/portable buildings, temporary buildings, industrial sites, workshops, and non-residential agricultural buildings. ADL2A should be consulted for further details. If the building is built to match the Notional Building specification, its BER should meet the TER. Note that other factors need to be taken into consideration including continuous building fabric insulation, air permeability, thermal bridging, performance testing and limiting the effects of heat gains in summer.

The area weighted average U-values, used in the Notional Building specifications for setting the TER, are shown in table 3 below. The actual specification required for a compliant building and necessary building fabric U-value targets may vary depending on the actual overall proposed specification and the outcome of the energy assessment.

Although ADL2A is for new buildings other than dwellings, there are some exceptions if a dwelling is featured within the new building. For more details on these exceptions ADL2A should be referred to.

Table 3

	ROOFS	WALLS	FLOORS
Notional Building area weighted average U-value	0.18	0.26	0.22

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Existing Buildings other than Dwellings - Approved Document L2B/ADL2B

Existing buildings do not require a Target CO_2 Emissions Rate, however they do require a target U-value to be met for building elements (walls, floors and roofs).

The target U-values for existing buildings other than dwellings are shown in table 4 below.

Table 4

	ROOFS				WALLS		FLOORS	
	FOR REPLACED OR RENOVATED ROOFS		NEW ELEMENTS (EXTENSION/ CONVERSION)		EXISTING WALLS (REFURB)	NEW WALLS (EXT)	EXISTING FLOORS (REFURB)	NEW FLOORS (EXT)
	Ceiling level	Flat & pitched roof level	Ceiling level	Flat & pitched roof level				
Required U-value	0.16	0.18	0.16	0.18	0.30	0.28	0.25	0.22

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Domestic Buildings (Dwellings) Technical Handbook: Section 6 Energy

New Dwellings

The Scottish Technical Handbook for Domestic Buildings looks at the entire building's performance and CO_2 emissions, rather than isolating one particular element. All domestic buildings must be designed and built so their individual Dwelling CO_2 Emissions Rate (DER) is no worse than the Target CO_2 Emissions Rate (TER).

The TER is generated from a package of measures set for each main heating fuel type; if buildings are constructed following the full package, then it is likely that the DER will meet the TER. As a simplified approach, the dwelling can be considered to reduce CO_2 emissions to the same level. CO_2 Emission Rates are calculated using a calculation methodology called Standard Assessment Procedure (SAP) 2012.

The typical Notional Dwelling U-values and targets for building elements are shown in table 5 below.

Table 5

	ROOFS	WALLS	FLOORS
Notional Dwelling area weighted average U-value	0.11	0.17	0.15

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Existing Dwellings

For existing domestic buildings, the Scottish Technical Handbook provides specific U-values based upon the particular element (walls, floors and roofs) that is being replaced or renovated. There are different requirements for new elements (extensions or conversions) and the Technical Handbook should be referred to for details on these.

U-values shown in table 6 are the requirements for existing buildings.

Table 6

		FOR EXTENSIONS OR REFURBISHMENTS			
		ROOFS		WALLS	FLOORS
		Ceiling level	Flat & pitched roof level		
Required area weighted average U-value	Where U-values for wall and roof of the existing dwelling are poorer than 0.7 and 0.25 respectively	0.11	0.13	0.17	0.15
	Where the above wall and roof U-values do not apply	0.15	0.18	0.22	0.18

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Non-Domestic Buildings Technical Handbook: Section 6 Energy

New Buildings

Matching the requirements for new domestic buildings, the Scottish Technical Handbook sets a Target CO_2 Emissions Rate (TER) for non-domestic buildings based on Notional Buildings that the individual Buildings CO_2 Emissions Rate (BER) must meet. The TER is generated from a set of Notional Buildings; if buildings are constructed within these parameter values their BER should meet the TER. CO_2 Emissions Rates are calculated using the Simplified Building Energy Model (SBEM).

The actual specification required for a compliant building and necessary building fabric U-value targets may vary depending on the actual overall proposed specification and the outcome of the energy assessment.

The typical Notional Building U-values and targets for building elements are shown in table 7.

Table 7

		ROOFS	WALLS	FLOORS
Notional Building area weighted average U-value	Heated + Natural ventilation	0.18	0.23	0.22
	Mech. Ventilated / Cooled	0.16	0.20	0.20

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Existing Buildings

The Scottish Technical Handbook sets specific U-values based upon the particular building element (wall, floor or roof).

For existing non-domestic buildings the U-values in table 8 below show the requirements for building elements.

Table 8

	ROOFS		WALLS		FLOORS	
	FOR REPLACED OR RENOVATED ROOFS	NEW ELEMENTS (EXTENSION)	EXISTING WALLS (REFURB)	NEW WALLS (EXTENSIONS)	EXISTING FLOORS (REFURB)	NEW FLOORS (EXTENSIONS)
Required area weighted average U-value	0.25	0.15	0.30	0.25	0.25	0.20

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.



Wales (from July 2014)

New Dwellings (Domestic Buildings) - Approved Document L1A/ADL1A

Approved Document L1A looks at the entire building's performance and CO_2 emissions, rather than isolating one particular element. All dwellings (domestic buildings) must be designed and built so their individual Dwelling CO_2 Emissions Rate (DER) is no worse than the Target CO_2 Emissions Rate (TER). The TER is based upon the performance of a defined Notional Dwelling. The Dwelling Emission Rate (DER) is calculated using a calculation methodology called Standard Assessment Procedure (SAP) 2012.

In addition to meeting the TER, there are also mandatory minimum energy efficiency standards (U-values) for the building elements (walls, floors and roofs) to achieve.

If the dwelling is built to match the Notional Dwelling criteria and better the limiting fabric U-values, it should meet the Target Emission Rate (TER). Note that other factors need to be taken into consideration including thermal bridging, ventilation, information submission (design and build values) and limiting the effects of heat gains in summer.

The typical Notional Dwelling U-values and target for building elements are shown in table 9 below.

Table 9

	ROOFS	WALLS	FLOORS
Notional Dwelling area weighted average U-value	0.13	0.18	0.13

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Existing Dwellings (Domestic Buildings) - Approved Document L1B/ADL1B

Existing dwellings differ from new dwellings, in that they do not have to achieve a whole building Target CO_2 Emissions Rate (TER, see New Dwellings). However, existing dwellings do have to meet certain target U-values for building elements (walls, floors and roofs). The target U-values for building elements within existing dwellings or new elements are shown in table 10 below.

Table 10

	ROOFS			WALLS		FLOORS	
	FOR REPLACED OR RENOVATED ROOFS		NEW ELEMENTS (EXT)	EXISTING WALLS (REFURB)	NEW WALLS (EXT)	EXISTING FLOORS (REFURB)	NEW FLOORS (EXT)
	Ceiling level	Flat & pitched roof level					
Required area weighted average U-value	0.16	0.18	0.15	0.30	0.21	0.25	0.18

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

New Buildings other than Dwellings - Approved Document L2A/ADL2A

Approved Document L2A adopts a similar approach to Approved Document L1A, taking the entire building's performance and CO_2 emissions into consideration. All new buildings other than dwellings must be designed and built with their Building CO_2 Emissions Rate (BER) being no worse than the Target CO_2 Emissions Rate (TER).

The TER is set from a Notional Building of the same size and shape to the actual building. There are three defined Notional Buildings; heated and cooled buildings (that are side lit or unlit), and toplit buildings. The specification for each building type is summarised in ADL2A. CO_2 Emissions Rates for buildings other than dwellings are calculated using the Simplified Building Energy Model (SBEM) or other approved software.

In addition to meeting the TER, a new Target Primary Energy Consumption (TPEC) rate has been introduced for new buildings other than dwellings. Put simply, this new target is aimed at two factors - energy efficiency of the fabric and its building services.

The TPEC ensures these two factors are carefully considered and prevents renewable technologies being highly specified to counteract a lower performing fabric or services standards.

If the building is built to match the Notional Building specification, its BER should meet the TER. Note that other factors need to be taken into consideration including continuous building fabric insulation, air permeability, thermal bridging, performance testing and limiting the effects of heat gains in summer.

The required U-value for building elements, as per the Notional Building specifications, are shown in table 11 below.

Table 11

	ROOFS	WALLS	FLOORS
Notional Building area weighted average U-value	0.18	0.26	0.22

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

Although ADL2A is for new buildings other than dwellings, there are some exceptions if a dwelling is featured within the new building. For more details on these exceptions ADL2A should be referred to.

Special considerations are made for low energy demand buildings, modular/portable buildings, temporary buildings, industrial sites, workshops, and non-residential agricultural buildings. ADL2A should be consulted for further details.

Existing Buildings other than Dwellings - Approved Document L2B/ADL2B

Existing buildings do not require a Target CO_2 Emissions Rate, however they do require a target U-value to meet for building elements (walls, floors and roofs). There is a new consideration for the character of the building, with buildings that are essentially domestic in character having more stringent targets to meet for extensions.

The target U-values for building elements within existing buildings other than dwellings are shown below in table 12.

Table 12

	ROOFS				WALLS		FLOORS	
	FOR REPLACED OR RENOVATED ROOFS		NEW ELEMENTS (EXTENSION)		EXISTING WALLS (REFURB)	NEW WALLS (EXT)	EXISTING FLOORS (REFURB)	NEW FLOORS (EXT)
	Ceiling level	Flat & pitched roof level	Ceiling level	Flat & pitched roof level				
Required area weighted average U-value	0.16	0.18	0.15	0.15 *** / 0.18	0.30	0.21 *** / 0.26	0.25	0.18 *** / 0.22

Typical PIR insulation thicknesses to meet these U-values are available on the application pages within this guide.

**** Rooms for residential purposes (for example in nursing homes, student accommodation, etc.) are not dwellings, and so ADL2B will apply, however they are essentially domestic in character.*



Product Selector

	Application	Most suitable product(s)
 For Pitched Roofs	Between rafters **pg17**	Eco-Versal **pg48**
	Between & under rafters - ventilated **pg18**	Eco-Versal **pg48** Eco-Liner **pg49**
	Between & under rafters - unventilated **pg19**	
	Over rafters **pg20**	Eco-Versal **pg48**
	Between & over rafters **pg21**	
	Loft floors **pg22**	
 For Flat Roofs	Torch on felt **pg25**	Eco-Torch **pg54**
	3 layer pour & roll felt **pg26**	
	Single ply fully adhered **pg27**	
	Mastic asphalt **pg28**	
	Directly over timber joists **pg29**	Eco-Deck **pg55**
	Tapered insulation roof schemes **pg30**	
 For Walls	Partial fill cavity wall **pg32**	Eco-Cavity **pg50**
	Full fill cavity wall **pg33**	Eco-Cavity Full Fill **pg51**
	Internal wall (dry lining) - dot & dab **pg34**	Eco-Liner **pg49**
	Internal wall (dry lining) - mechanically fixed to timber battens **pg35**	
	Timber frame wall - between & inside studs **pg36**	Eco-Versal **pg48** | Eco-Liner **pg49**
	Timber frame wall - insulated sheathing **pg37**	Eco-Versal **pg48**
	Rainscreen **pg38**	Eco-Protect **pg52**
 For Floors	Solid floor below slab **pg40**	Eco-Versal **pg48** Eco-UFH
	Solid floor above slab **pg41**	
	Suspended block & beam **pg42**	
	Suspended timber floor **pg43**	
	Floating timber floor **pg44**	
	Underfloor heating (UFH) **pg45**	
	Semi-exposed soffit - structural ceiling **pg46**	Eco-Protect **pg52** Eco-Protect Plus **pg53**

Installation Essentials

Before installing EcoTherm Insulation, please read through the below Installation Essentials to ensure that required protection and methods of installation are observed.

Handling and Cutting

- Do not drop boards.
- Damaged boards should not be used.
- Wear appropriate hand and eye protection.
- To cut, use a sharp knife or fine tooth saw.
- Ensure accurate trimming to ensure continuity of insulation and to achieve closely butted edges where appropriate.
- Cutting with power tools generates non-hazardous dust, so should be kept to a minimum.
- Do not breathe in dust, avoid contact with skin and eyes.
- 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.

Health and Safety

EcoTherm Insulation products are chemically inert and safe to use. Product Safety Datasheets are available 24/7 on the EcoTherm website, or on request via EcoTherm Technical Services.

Storage

At no time should the insulation boards be left exposed to rain. Whenever work is interrupted, a night joint must be made to prevent water penetration. Packs are stretch wrapped in recyclable polythene. Store boards in a flat, dry area off the ground away from mechanical damage and sources of ignition. Boards should be completely covered with weatherproof sheeting. Boards must be kept dry at all times and must be protected from prolonged exposure to sunlight. Boards should be stored either under cover or covered with opaque polyethylene sheets.

Spanning

When fixing EcoTherm Insulation boards to timber framing, metal channels, rafters or battens, the maximum board span should be 600mm.

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.

Applications & Installation Guidelines

PITCHED ROOFS

FLAT ROOFS

WALLS

FLOORS

PITCHED ROOFS

Pitched Roof Applications

EcoTherm's rigid PIR insulation boards

are the ideal solution for pitched roofs including dormer cheeks and loft floors. Their excellent thermal performance means U-values are met with minimal thicknesses, maximising space between rafters and not impacting on head space. The lightweight boards are easily cut and fit snuggly between rafters or ceiling joists, saving time on installation. Their durable and rigid qualities means they will not rot, decay or sag – therefore there is no need to replace or upgrade your pitched roof insulation.

Pitched roofs insulated at rafter level create warm roofs, negating the need for pipe or tank lagging. Warm roofs also provide usable living space, making the boards ideal for loft conversions.

Condensation
The risk of condensation should be carefully considered, particularly when insulating an existing pitched roof. Warm, moist air, particularly from bathrooms or kitchens, can have a detrimental effect on the roof structure should it not be ventilated properly. EcoTherm Insulation Technical Services can provide advice on condensation and a Condensation Risk Analysis (CRA).

Unventilated and Ventilated Constructions
Generally, there is a choice between unventilated and ventilated constructions – the exception is refurbishment of existing roofs and loft conversions.

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 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 of the breathable membrane, with a tape recommended by the membrane manufacturer.

Over-Rafter Constructions
In all over-rafter applications EcoTherm Insulation boards should be fixed by the use of vertical counter battens. Horizontal counter battens allow slate and tile laths to be fixed in the traditional manner. The breather membrane should be laid directly onto the EcoTherm Insulation boards before the counter battens are installed. Alternatively, the vertical counter battens can be installed on top of the EcoTherm Insulation board and the breather membrane installed after, draping over the vertical battens.

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

Between Rafters | Unventilated

INSTALLATION DETAILS

- If installing the insulation from the outside, use timber stop battens to place the insulation correctly.
- Measure the exact distance between rafters to allow for variances and achieve tightly fitted boards.
- Cut the insulation boards to the required measurements (see Installation Essentials on page 13 for guidance on cutting).
- If installing the insulation from the inside, push the cut insulation up between the rafters to fit tightly, sitting flush with the bottom of the rafter.
- Ensure a minimum 25mm air gap is retained above the insulation board and below the breathable membrane. This is easily achieved with a timber stop batten installed inside the rafter.
- Fill any small gaps with PU foam for improved thermal performance.
- A Vapour Control Layer (VCL) should be installed under the rafters (a polythene sheet is recommended under the insulation in areas of potential high humidity i.e. bathrooms or kitchens).
- For internal finishing, install plasterboard over t he VCL using drywall screws penetrating 25mm into the timber.
- Where very low U-values are required, it may be practical to add a second layer of insulation board or Eco-Liner (insulated plasterboard) under the rafters in addition to between (see page 18).

SAVE TIME

Use insulated plasterboard, **Eco-Liner**, under rafters to achieve better U-values and dry line in one application

Typical U-values using Eco-Versal

THICKNESS (MM)		TYPICAL U-VALUES (W/M^{2}K)	
		BETWEEN 400MM CENTRES	BETWEEN 600MM CENTRES
90	150mm timber rafters	0.29	0.26
100		0.27	0.25
110		0.26	0.24
120		0.25	0.22
125		0.24	0.22
130	175mm timber rafters	0.23	0.21
140		0.22	0.20
150		0.21	0.19
160*	200mm timber rafters	0.19	0.18
170*		0.19	0.17

Calculations are based on outside surface resistance, tiles on battens, breathable membrane, timber rafters at thickness and centres stated above, Eco-Versal, vapour control layer, 12.5mm plasterboard, inside surface resistance.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

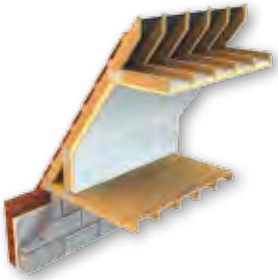
OTHER ECOTHERM PRODUCTS SUITABLE FOR **BETWEEN RAFTER APPLICATION**

Eco-Protect

see page **52** for more details

IDEAL FOR LOFT CONVERSIONS

Between & Under Rafters | Ventilated



INSTALLATION DETAILS

- 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.
- Measure the exact distance between rafters to allow for variances and achieve tightly fitted boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Push the cut insulation up between the rafters to fit tightly, sitting flush with the bottom of the rafter.
- Fill any small gaps with PU foam for improved thermal performance.
- Install Eco-Liner (insulated plasterboard) closely butted to insulate under the rafters and achieve a plasterboard finish in one application (VCL not required when using this method).
- Alternatively, a secondary thinner layer of lightly butted insulation can be installed to the underside of the rafters. Ensure insulation boards are supported by fixings to the underside of the rafters, with long board edges running across the rafters. Apply foil tape at board joints to create a Vapour Control Layer (VCL) and finish with 12.5mm plasterboard using drywall screws at 200mm centres.

SAVE TIME

Use insulated plasterboard, **Eco-Liner**, under rafters to achieve better U-values and dry line in one application

Typical U-values using Eco-Versal

THICKNESS (MM)		TYPICAL U-VALUES (W/M^{2}K)	
		BETWEEN 400MM CENTRES	BETWEEN 600MM CENTRES
		plus 72.5mm Eco-Liner under rafters	
70	150mm timber rafters	0.19	0.18
80		0.18	0.17
90		0.17	0.16
100		0.16	0.15
110	175mm timber rafters	0.15	0.14
120		0.14	0.14
125		0.14	0.13
130	200mm timber rafters	0.14	0.13
140		0.13	0.13
150		0.13	0.12

Calculations are based on outside surface resistance, tiles on battens, breathable membrane, timber rafters at thickness and centres stated above, 50mm cavity, Eco-Versal between rafters, 72.5mm Eco-Liner (insulated plasterboard) below rafters, inside surface resistance.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

BEST PRODUCT CHOICE

see page 49 Eco-Liner

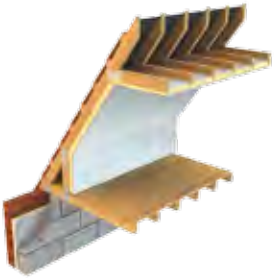
see page 48 Eco-Versal

OTHER ECOTHERM PRODUCTS SUITABLE FOR **BETWEEN & UNDER RAFTER APPLICATION**

Eco-Protect see page **52** for more details

IDEAL FOR NEW BUILD OR NEW ROOFS

Between & Under Rafters | Unventilated



INSTALLATION DETAILS

PARTIAL FILL: Install a timber batten inside the rafter to provide a stop for the insulation.

FULL FILL: Install the insulation board to match the thickness of the rafter.

- Measure the exact distance between rafters to allow for variances and achieve tightly fitted boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Push the cut insulation up between the rafters to fit tightly, sitting flush with the bottom of the rafter.
- If installing the insulation from the outside, use timber stop battens to place the insulation correctly, flush with underside of the rafter.
- Fill any small gaps with PU foam for improved thermal performance.
- Install Eco-Liner (insulated plasterboard) closely butted to insulate under the rafters and achieve a plasterboard finish in one application (Vapour Control Layer (VCL) not required when using this method).
- Alternatively, a secondary thinner layer of lightly butted insulation can be installed to the underside of the rafters. Ensure insulation boards are supported by fixings to the underside of the rafters, with long board edges running across the rafters. Apply foil tape at board joints to create a VCL and finish with 12.5mm plasterboard using drywall screws at 200mm centres.
- Install the breather membrane above the rafters in accordance with manufacturers instructions. For partial fill between rafters, fix timber battens to rafters and allow the membrane to sag. For full fill between, fix counter battens over the membrane.

Typical U-values using Eco-Versal

THICKNESS (MM)		TYPICAL U-VALUES (W/M²K)	
		BETWEEN 400MM CENTRES	BETWEEN 600MM CENTRES
		plus 72.5mm Eco-Liner under rafters	
60	150mm timber rafters	0.18	0.18
70		0.17	0.17
80		0.16	0.16
90		0.16	0.15
100		0.15	0.14
110		0.14	0.14
120		0.14	0.13
125	175mm timber rafters	0.13	0.13
130		0.13	0.12
140		0.13	0.12
150		0.12	0.12
160*	200mm timber rafters	0.12	0.11
170*		0.11	0.11

Calculations are based on outside surface resistance, tiles on battens, breathable membrane, timber rafters at thickness and centres stated above, Eco-Versal between rafters, 72.5mm Eco-Liner (insulated plasterboard) below rafters, inside surface resistance.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

BEST PRODUCT CHOICE

see page 49 Eco-Liner

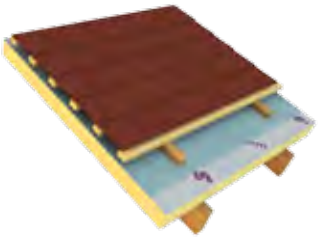
see page 48 Eco-Versal

OTHER ECOTHERM PRODUCTS SUITABLE FOR **BETWEEN & UNDER RAFTER APPLICATION**

Eco-Protect see page **52** for more details

IDEAL FOR NEW BUILD OR NEW ROOFS

Over Rafters



INSTALLATION DETAILS

- Install a treated timber batten (stop rail) of equal thickness to the insulation at the eaves on top of the rafters.
- Place insulation boards over rafters and butted to the stop rail. Long board edges should run across the rafters.
- Ensure insulation boards are staggered with lightly butted edges that are supported by rafters.
- If required, cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Fix the insulation boards by use of a counter batten (minimum 38 x 38mm) placed above the insulation down the line of each rafter.
- Use headed helical nails to fix through the vertical batten and insulation into the rafter below.
- Install the breather membrane in accordance with the manufacturer's instructions.
- Fix tile battens over the counter battens at appropriate spacing to suit tile or slate lath fixings.
- A Vapour Control Layer (VCL) or plasterboard should be installed to the underside of the rafters.
- 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.

Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K)
	OVER RAFTERS
70	0.25
80	0.23
90	0.21
100	0.19
110	0.17
120	0.16
130	0.15
140	0.14
150	0.13
160*	0.12
170*	0.12
180*	0.11
190*	0.11
200*	0.10

Calculations are based on outside surface resistance, tiles on battens, counter battens, breathable membrane, Eco-Versal, 150mm timber rafters, vapour control layer, plasterboard and skim, inside surface resistance.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

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

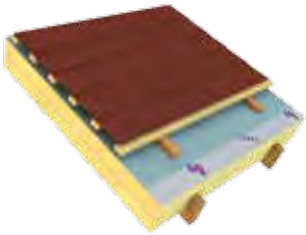
The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR **OVER RAFTER APPLICATION**

Eco-Protect see page **52** for more details

IDEAL FOR NEW BUILD OR NEW ROOFS

Between & Over Rafters



INSTALLATION DETAILS

- Measure the exact distance between rafters to allow for variances and achieve tightly fitted boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- If installing the between rafter insulation from the outside, use timber battens to position the insulation flush with top of the rafter.
- If installing the between rafter insulation from the inside, install the over layer of insulation first (following the below instructions) and push the insulation board up between the rafters to fit tightly and flush with the top of the rafter to meet the over insulation layer.
- Install timber battens to the inside of the rafter to hold the between rafter insulation in place.
- To install the over rafter insulation layer, install a treated timber batten (stop rail) of equal thickness to the insulation at the eaves on top of the rafters.
- Place insulation boards over rafters and butted to the stop rail. Long board edges should run across the rafters.
- Ensure insulation boards are staggered with lightly butted edges that are supported by rafters.
- Fix the insulation boards by use of a counter batten (minimum 38 x 38mm) placed above the insulation down the line of each rafter.
- Use headed helical nails through the vertical batten and insulation into the rafter below.
- Install the breather membrane in accordance with the manufacturer's instructions.
- Fix tile battens over the counter battens at appropriate spacing to suit tile or slate lath fixings.
- A Vapour Control Layer (VCL) or plasterboard should be installed to the underside of the rafters.

Typical U-values using Eco-Versal

THICKNESS (MM) BETWEEN & OVER	TYPICAL U-VALUES (W/M^2K)	
	BETWEEN 400MM CENTRES	BETWEEN 600MM CENTRES
40 + 40	0.25	0.25
50 + 50	0.21	0.21
60 + 60	0.18	0.18
70 + 70	0.16	0.15
75 + 75	0.15	0.14
80 + 80	0.14	0.14
90 + 90	0.13	0.12
100 + 100	0.12	0.11
110 + 110	0.11	0.10
120 + 120	0.10	0.09

Calculations are based on outside surface resistance, tiles on battens, counter battens, breathable membrane, Eco-Versal over rafters, 150mm timber rafters at centres stated above, Eco-Versal between rafters, vapour control layer, plasterboard and skim, inside surface resistance.

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 or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR
BETWEEN & OVER RAFTER APPLICATION

Eco-Protect see page **52** for more details

IDEAL FOR UPGRADING EXISTING LOFT FLOORS

Loft Floors

INSTALLATION DETAILS

Over loft floor joists

- Place a layer of insulation boards over loft floor joists. Ensure boards are laid at right angles to the joists.
- Insulation boards should be laid in a staggered pattern with board edges supported by the joists. Fix insulation boards using wood screws, through the insulation, penetrating the joists at least 30mm.
- To utilise the loft floor as a storage space, minimum 9mm plywood, chipboard or OSB should be mechanically fixed over the joists. Where pedestrian access is required, a further layer of 18mm plywood, chipboard or OSB is recommended over the insulation.
- When fixing screws, ensure any pipes, cables or wires are not penetrated. Care should be taken that no electrical cables are trapped between the insulation board and the joists. It is recommended to permanently mark on top of the board the location of any electrical cables / pipes etc that are covered.

Between loft floor joists

- Measure the exact distance between joists to allow for variances and achieve tightly fitted insulation boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Install 25 x 25mm treated softwood timber battens or galvanised steel saddle clips inside the joists, at the correct height to support the insulation boards and ensure the boards sit flush with the top of the joists.
- Push the insulation board tightly into the joists.
- Fill any gaps between joists and perimeter walls with either cut pieces of insulation board or PU foam.

Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K) OVER LOFT FLOOR JOISTS
70	0.25
75	0.24
80	0.22
90	0.20
100	0.19
110	0.17
115	0.17
120	0.16
125	0.15
130	0.15
140	0.14
150	0.13
160*	0.12

Calculations are based on outside surface resistance, tiles on battens, breathable membrane, 18mm chipboard, Eco-Versal over timber joists, 9mm plywood, 150mm timber joists at 600 centres, vapour control layer, 12.5mm plasterboard and skim, inside surface resistance.

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K) BETWEEN & OVER JOISTS
35mm + 35mm	0.25
40mm + 40mm	0.23
45mm + 45mm	0.21
50mm + 50mm	0.19
60mm + 60mm	0.17
65mm + 65mm	0.16
70mm + 70mm	0.15
80mm + 80mm	0.13

Calculations are based on outside surface resistance, tiles on battens, breathable membrane, 18mm chipboard, Eco-Versal over and between timber joists, 9mm plywood, 150mm timber joists at 600 centres, vapour control layer, 12.5mm plasterboard and skim, inside surface resistance.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

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

OTHER ECOTHERM PRODUCTS SUITABLE FOR
LOFT FLOOR APPLICATION

Eco-Protect see page **52** for more details

FLAT ROOFS

Up to 25% of a building's heat loss is through the roof.

By installing insulation with excellent thermal performance this will greatly improve the energy efficiency of the roof, the building, and in turn make meeting Building Regulations/ Standards easy.

EcoTherm's PIR flat roof insulation boards are ideal for both new build and existing roofs (replacing or refurb). Our boards are compatible with the majority of waterproofing systems – both traditional methods and newer technologies. Their light weight and rigid properties mean they are easy and quick to install and will not weigh the structure down. They are also simple to cut to fit around roof lights, ventilation and roof edges.

With excellent thermal performance, less thickness is required to meet U-values when compared to traditional mineral fibre insulation materials. Therefore factors such as building height or construction depth are not impacted.

Flat Roof Applications

Types of Flat Roof

There are a few different methods of insulating a flat roof:

Warm Flat Roof - Insulation installed above the flat roof joists/deck and below the waterproofing system.

Cold Flat Roof - Insulation installed below flat roof deck (between or between and below the joists of the roof). Advice should be sought on ventilation with this application.

Hybrid Flat Roof - Hybrid systems can be adopted to keep the roof height down. We would advise contacting EcoTherm Technical Services to discuss this option further on a project-by -project basis.

Inverted Roof - Insulation installed above the flat roof deck and above the waterproofing system. EcoTherm Insulation is not recommended for use in inverted roofs.

Green Roofs

EcoTherm Insulation is suitable for use in green roofs (a roof covered with plants or grass, all planted over the waterproofing layer of the roof). We recommend seeking advice from EcoTherm Technical Services on a project-by-project basis.

Roof Loading

Depending on the chosen waterproofing system, EcoTherm Insulation products are suitable for use on roof decks that are subject to limited maintenance foot traffic. Walkways should be provided on roofs requiring regular pedestrian access. If site work is to take place after the roof board has been laid and the roof made watertight, the roof should be boarded out with protective boarding.

Wind Loading

Wind loadings should be assessed in accordance to BS EN 1991-1- 4:2005 + A1:2010 (Eurocode 1. Actions on structures. General Actions. Wind Actions and the UK National Annex). EcoTherm recommend contacting the waterproofing manufacturer for a project specific wind uplift calculation.

Vapour Control

EcoTherm Insulation recommends a Condensation Risk Assessment (CRA) be completed for each project. On new build roofs, the insulation boards should be installed over a Vapour Control Layer (VCL) or sealed metal deck. Insulation boards should only be installed on a clean, dry existing roof or new deck.

When installing EcoTherm Insulation boards over an existing roof, the condition of the existing waterproofing system must be assessed to ensure it is in good condition and water tight. If the waterproofing system is deemed not water tight, a VCL should be installed before laying the insulation boards, please seek advice from EcoTherm Technical Services.

Spanning Metal Decks

On metal decks, the long edges of the insulation boards should be at right angles to the corrugations. All board joints should be fully supported by the deck.

TROUGH OPENING (MM)	MINIMUM ROOF BOARD THICKNESS (MM)
< 75	25
≤75 and ≤100	30
>100 and ≤125	35
>125 and ≤150	40
>150 and ≤175	45
>175 and ≤200	50
>200 and ≤225	55
>225 and ≤250	60

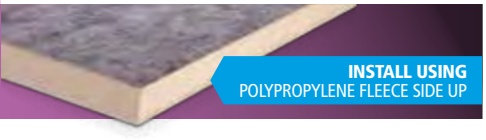
Installation

- Check with the membrane manufacturer for compatibility of the EcoTherm Insulation board with your waterproofing system.
- When mechanically fixing, fixings should not be installed within 50mm of the board edge and a minimum 50mm countersunk washer should be used.
- All flat roofs necessitate the use of a vapour control layer.
- Boards should be laid with ends butted and in a break bonded, staggered pattern laid at right angles to the edges of the roof or diagonally across the roof.
- Always install approved angle fillets at all upstands or kerbs.
- Whenever work is interrupted, a night joint must be made to prevent water penetration.

Torch On Felt

INSTALLATION DETAILS

- Roof deck should be clean and dry and constructed laid to fall to all rainwater outlets (alternatively use a tapered insulation scheme, see page 30).
- If the insulation boards are to be bonded down to a concrete deck, to ensure an adequate bond between the vapour control layer (VCL) and deck, the surface should be suitably primed, in accordance with the primer manufacturer's instructions.
- Install VCL to deck, ensuring a minimum 150mm overlap occurs at VCL edges, and that the VCL is turned up at the edge of the roof to the height specified by the membrane manufacturer.
- Fully bond insulation boards, fleece side up, to the VCL, with hot bitumen (max 230°C) or with PU adhesive.
- Alternatively, the boards can be mechanically fixed to the deck (the VCL underneath should be loose laid on the deck if using this method and fixings must incorporate a square/circular 50mm thermally broken washer).
- Always ensure that boards are laid break bonded.
- A minimum 25mm upstand of the insulation board should be installed around the roof perimeter and approved angle fillets should be used at upstands or kerbs.
- Follow manufacturer's guidelines for the application of the felt waterproofing.
- Apply torch with minimum heat.
- Continue the felt waterproofing vertically at upstands, to a minimum of 150mm above the top of the horizontally laid insulation or 300mm above the deck.



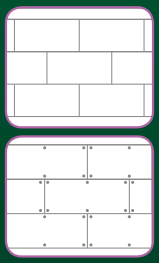
Typical U-values using Eco-Torch

THICKNESS (MM)	TYPICAL U-VALUES (W/M²K) **		
	METAL DECK	CONCRETE DECK	TIMBER DECK
70	0.35	0.31	0.31
80	0.30	0.27	0.26
90	0.27	0.24	0.24
100	0.24	0.22	0.22
110	0.22	0.20	0.20
120	0.19	0.18	0.18
130	0.18	0.17	0.17
140	0.17	0.16	0.16
150	0.16	0.15	0.15
80+80*	0.15	0.14	0.14
80+90*	0.14	0.14	0.14
80+100*	0.14	0.13	0.13
90+100*	0.13	0.12	0.12
100+100*	0.12	0.12	0.12

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

** Typical U-values are based on: **Metal deck:** profiled metal deck, vapour control layer, Eco-Torch, waterproofing system. **Concrete deck:** 3mm skim coated 12.5mm plasterboard fixed to timber battens at 600mm centres, 150mm concrete deck, 50mm screed laid to falls, vapour control layer, Eco-Torch, waterproofing system. **Timber deck:** 3mm skim coated 12.5mm plasterboard, 50 x 150mm timber joists at 600mm centres, 18mm plywood deck, vapour control layer, Eco-Torch, waterproofing system.

LAYING PATTERN



3 Layer Pour & Roll Felt

INSTALLATION DETAILS

- Roof deck should be clean and dry and constructed laid to fall to all rainwater outlets (alternatively use a tapered insulation scheme, see page 30).
- If the insulation boards are to be bonded down to a concrete deck, to ensure an adequate bond between the vapour control layer (VCL) and deck, the surface should be suitably primed, in accordance with the primer manufacturer's instructions.
- Install VCL to deck, ensuring a minimum 150mm overlap occurs at VCL edges, and that the VCL is turned up at the edge of the roof to the height specified by the membrane manufacturer.
- Fully bond insulation boards, coated glass tissue side up, to the VCL, with hot bitumen (max 230°C) or with PU adhesive.
- Alternatively, the boards can be mechanically fixed to the deck (the VCL should be loose laid if using this method and fixings must incorporate a square/circular 50mm thermally broken washer).
- Always ensure that boards are laid break bonded.
- A minimum 25mm upstand of the insulation board should be installed around the roof perimeter and approved angle fillets should be used at upstands or kerbs.
- Follow manufacturer's guidelines for the application of the felt waterproofing.
- Continue the felt waterproofing vertically at upstands, to a minimum of 150mm above the top of the horizontally laid insulation or 300mm above the deck.

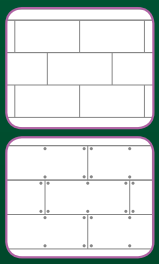
Typical U-values using Eco-Torch

THICKNESS (MM)	TYPICAL U-VALUES (W/M²K) **		
	METAL DECK	CONCRETE DECK	TIMBER DECK
70	0.35	0.31	0.30
80	0.29	0.26	0.26
90	0.26	0.24	0.24
100	0.24	0.22	0.22
110	0.22	0.20	0.20
120	0.19	0.18	0.18
130	0.18	0.17	0.17
140	0.17	0.16	0.15
150	0.16	0.15	0.15
80+80*	0.15	0.14	0.14
80+90*	0.14	0.14	0.13
80+100*	0.14	0.13	0.13
90+100*	0.13	0.12	0.12
100+100*	0.12	0.12	0.12

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

** Typical U-values are based on: **Metal deck:** profiled metal deck, vapour control layer, Eco-Torch, waterproofing system. **Concrete deck:** 3mm skim coated 12.5mm plasterboard fixed to timber battens at 600mm centres, 150mm concrete deck, 50mm screed laid to falls, vapour control layer, Eco-Torch, waterproofing system. **Timber deck:** 3mm skim coated 12.5mm plasterboard, 50 x 150mm timber joists at 600mm centres, 18mm plywood deck, vapour control layer, Eco-Torch, waterproofing system.

LAYING PATTERN



OTHER ECOTHERM PRODUCTS SUITABLE FOR ECO-DECK SEE PAGE 55

Single Ply Fully Adhered

INSTALLATION DETAILS

- Roof deck should be clean and dry and constructed laid to fall to all rainwater outlets (alternatively use a tapered insulation scheme, see page 30).
- Install vapour control layer (VCL) to deck, ensuring a minimum 150mm overlap occurs at VCL edges, and that the VCL is turned up at the edge of the roof to the height specified by the membrane manufacturer.
- If fixing to a sealed metal deck, there is no need for a VCL. If it is not sealed, loose lay the VCL.
- Lay boards break bonded, ensuring all joints are supported by deck crowns or metal profiles.
- Fix the insulation boards to the deck with the appropriate number of fixings (a minimum of 6 per board) – this should be assessed in accordance to BS EN 1991-1-4:2005 + A1:2010 (Eurocode 1. Actions on structures. General Actions. Wind Actions and the UK National Annex) as this will depend on building height and location. Fixings must incorporate a square/circular 50mm thermally broken washer and must be more than 50mm but less than 150mm away from the edge or corner of the board.
- Alternatively, the insulation boards can be bonded to the deck by laying in mopped hot bitumen, or with PU adhesive over a bituminous VCL or sealed metal deck. Follow manufacturer's instructions, pay particular attention to coating weights.
- Follow manufacturer's installation guidelines of the adhesive and waterproofing membrane.
- If required, a minimum 25mm upstand of the insulation board should be installed around the roof perimeter and approved angle fillets should be used at upstands or kerbs.
- Continue the membrane vertically on the upstand to a minimum of 150mm above the top of the horizontally laid insulation or 300mm above the deck.

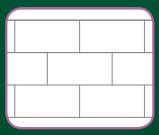
Typical U-values using Eco-Torch

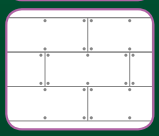
THICKNESS (MM)	TYPICAL U-VALUES (W/M²K) **		
	METAL DECK	CONCRETE DECK	TIMBER DECK
70	0.35	0.31	0.30
80	0.30	0.27	0.26
90	0.27	0.24	0.24
100	0.24	0.22	0.22
110	0.22	0.20	0.20
120	0.19	0.18	0.18
130	0.18	0.17	0.17
140	0.17	0.16	0.16
150	0.16	0.15	0.15
80+80*	0.15	0.14	0.14
80+90*	0.14	0.14	0.14
80+100*	0.14	0.13	0.13
90+100*	0.13	0.12	0.12
100+100*	0.12	0.12	0.12

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

** Typical U-values are based on: **Metal deck:** profiled metal deck, vapour control layer, Eco-Torch, waterproofing system. **Concrete deck:** 3mm skim coated 12.5mm plasterboard fixed to timber battens at 600mm centres, 150mm concrete deck, 50mm screed laid to falls, vapour control layer, Eco-Torch, waterproofing system. **Timber deck:** 3mm skim coated 12.5mm plasterboard, 50 x 150mm timber joists at 600mm centres, 18mm plywood deck, vapour control layer, Eco-Torch, waterproofing system.

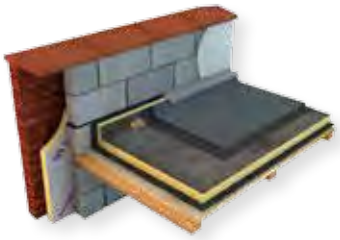
LAYING PATTERN





OTHER ECOTHERM PRODUCTS SUITABLE FOR ECO-DECK SEE PAGE 55

Mastic Asphalt



INSTALLATION DETAILS

- Roof deck should be clean and dry and constructed laid to fall to all rainwater outlets (alternatively use a tapered insulation scheme, see page 30).
- If the insulation boards are to be bonded down to a concrete deck, to ensure an adequate bond between the vapour control layer (VCL) and deck, the surface should be suitably primed, in accordance with the primer manufacturer's instructions.
- Install VCL to deck, ensuring a minimum 150mm overlap occurs at VCL edges, and that the VCL is turned up at the edge of the roof to the height specified by the membrane manufacturer.
- Fully bond insulation boards, fleece side up, to the bituminous VCL, with hot bitumen (max 230°C) or with PU adhesive.
- Alternatively, the boards can be mechanically fixed to the deck (the VCL should be loose laid if using this method and fixings must incorporate a square/circular 50mm thermally broken washer)
- Always ensure that boards are laid break bonded.
- Loose lay a black sheathing felt (or equivalent) over the insulation boards.
- Spread 20mm of asphalt and float to a smooth finish, or install according to the manufacturer's installation guidelines of the specific asphalt waterproofing system.
- A minimum 25mm upstand of the insulation board should be installed around the roof perimeter and approved angle fillets should be used at upstands or kerbs. The exposed face of insulation upstands, at parapets and abutments, must be lined with 18mm exterior grade plywood, prior to the mastic asphalt waterproofing being laid. The plywood is used as an anchor point for the expanded metal substrate onto which the vertical mastic asphalt is laid.
- Continue the waterproofing vertically at upstands, to a minimum of 150mm above the top of the horizontally laid insulation or 300mm above the deck.

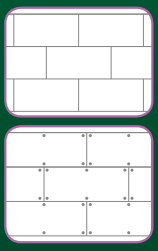
Typical U-values using Eco-Torch

THICKNESS (MM)	TYPICAL U-VALUES (W/M²K) **		
	METAL DECK	CONCRETE DECK	TIMBER DECK
70	0.35	0.31	0.30
80	0.30	0.26	0.26
90	0.26	0.24	0.24
100	0.24	0.22	0.22
110	0.22	0.20	0.20
120	0.19	0.18	0.18
130	0.18	0.17	0.17
140	0.17	0.16	0.16
150	0.16	0.15	0.15
80+80*	0.15	0.14	0.14
80+90*	0.14	0.14	0.13
80+100*	0.14	0.13	0.13
90+100*	0.13	0.12	0.12
100+100*	0.12	0.12	0.12

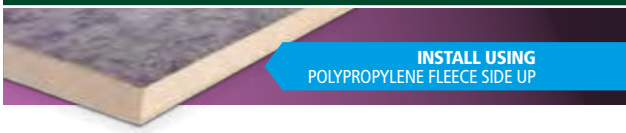
*Thicknesses greater than 150mm can be achieved using two layers of insulation.

** Typical U-values are based on: **Metal deck:** profiled metal deck, vapour control layer, Eco-Torch, waterproofing system. **Concrete deck:** 3mm skim coated 12.5mm plasterboard fixed to timber battens at 600mm centres, 150mm concrete deck, 50mm screed laid to falls, vapour control layer, Eco-Torch, waterproofing system. **Timber deck:** 3mm skim coated 12.5mm plasterboard, 50 x 150mm timber joists at 600mm centres, 18mm plywood deck, vapour control layer, Eco-Torch, waterproofing system.

LAYING PATTERN



OTHER ECOTHERM PRODUCTS SUITABLE FOR ECO-DECK SEE PAGE 55



Directly Over Timber Joists

INSTALLATION DETAILS

- Boards should be fixed to joists set at a maximum of 600mm centres.
- 50 x 50mm minimum timber noggins should be used to support all edges of boards which are not fully supported by a joist, or where they have been cut to fit openings etc.
- A vapour control layer can be achieved by applying a continuous bead of mastic (i.e. neutral curing silicone sealant) to the upper surface of all supporting timber (joists and noggins).
- Lay the boards plywood side up, lightly butted with all board edges supported by a minimum of 20mm bearing onto the face of the supporting timber.
- Long edges of the board should run over the centre of the joist.
- Boards should be laid onto the mastic, and fixed with screws at 300mm centres down the line of each joist and / or noggin.
- The screws should be long enough to allow a minimum 35mm penetration of the supporting timber, and be positioned not less than 10mm from the edge of the board, or 50mm from the corner. Screw heads should finish flush with the plywood surface.
- Headed helical nails can also be used, follow manufacturer's installation guidelines.
- Where two boards are fixed to the same joist or noggin, the fixing centres should be staggered.
- Follow manufacturer's installation guidelines of the waterproofing membrane.
- A minimum 25mm upstand of insulation board (compatible with waterproofing membrane) should be installed around the roof perimeter.

Typical U-values using Eco-Deck

THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K) **
96*	0.20
106*	0.19
116*	0.17
126*	0.16
136*	0.15
146*	0.14
156*	0.13

*Thickness includes 6mm plywood facing

**Typical U-value calculations are based on outside surface resistance, built up 3 layer bitumen waterproofing system, Eco-Deck, timber joists at 400mm centres, plasterboard ceiling and plaster skim, inside surface resistance. Adjustments for fixings to be included once fixing centres / type have been confirmed.

building innovation
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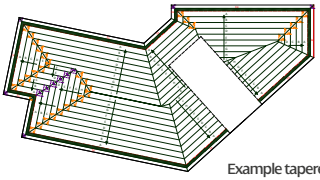

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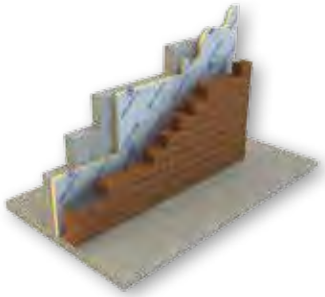
WALLS



Partial Fill Cavity Wall

INSTALLATION DETAILS

- A minimum 25mm clear cavity should always be maintained between the Eco-Cavity insulation board and outer wall leaf. The National House Building Council (NHBC) require a 50mm clear cavity.
- Seek advice from wall tie manufacturer for the most suitable tie for the construction.
- Wall ties should include a retaining clip / disc to ensure insulation boards are held in place.
- Install the first row of wall ties at 600mm horizontal centres (2 per board) at a minimum of one course of blockwork below the Damp Proof Course (DPC).
- Construct the inner wall leaf up to 450mm (2 block courses) and install wall ties at 900mm horizontal centres.
- Install the first row of Eco-Cavity boards between the 2 rows of wall ties, tightly to the inner wall leaf and secure in place with a retaining clip / disc on each tie.
- Ensure each Eco-Cavity board is secured with a minimum of 3 wall ties. Additional ties may be required to meet BS EN 845-1:2013 + A1:2016, BS EN 1996-1-1:2005 + A1:2012, BS EN 1996-2:2006, BS EN 1996-3:2006 and/ or PD 6697:2010.
- Construct the outer wall leaf to meet the top of the Eco-Cavity boards and repeat the process (wall ties spaced at 450mm vertical centres and 900mm horizontal centres).
- Use insulated cavity closers at the top of the cavity, and at all door and window openings.
- At gable walls Eco-Cavity should be continued 250mm beyond the top storey ceiling and a cavity tray installed to protect the top of the Eco-Cavity boards.

Typical U-values using Eco-Cavity

THICKNESS (MM)	TYPICAL U-VALUES (W/M²K)			
	BRICK & DENSE BLOCK	BRICK & MEDIUM BLOCK	BRICK & LIGHT BLOCK	LIGHT BLOCK & DENSE BLOCK
40	0.32	0.31	0.29	0.27
50	0.28	0.27	0.25	0.24
60	0.25	0.24	0.23	0.21
65	0.24	0.23	0.22	0.20
70	0.22	0.22	0.21	0.19
75	0.21	0.21	0.20	0.19
80	0.20	0.20	0.19	0.18
90	0.19	0.18	0.17	0.17
100	0.17	0.17	0.16	0.15
110	0.16	0.16	0.15	0.14
120	0.15	0.15	0.14	0.13

Calculations are based on outside surface resistance, external finish as above, 50mm cavity, Eco-Cavity, block as above, 12.5mm plasterboard and skim, inside surface resistance.

Lambda value of brick and block work above as follows: Brick 0.77 W/mK, dense block 1.13 W/mK, medium block 0.51 W/mK, light block 0.11 W/mK. Adjustments for fixings to be included once fixing centres / type have been confirmed.

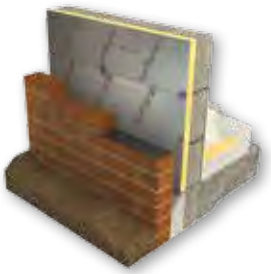
The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

USE INSULATED PLASTERBOARD, ECO-LINER, ON THE INTERNAL WALL TO ACHIEVE EVEN LOWER U-VALUES AND DRY LINE IN ONE APPLICATION

see page 50

BEST PRODUCT CHOICE

Eco-Cavity



Full Fill Cavity Wall

INSTALLATION DETAILS

- A 10mm residual cavity should always be maintained between Eco-Cavity Full Fill insulation board and external wall leaf.
- Seek advice from wall tie manufacturer for the most suitable tie for the construction. Wall ties should include a retaining clip or disc no greater than 10mm in thickness to ensure insulation boards are held in place against the internal wall leaf.
- Install the first row of wall ties at 600mm horizontal centres (2 per board) at a minimum of one course of blockwork below the Damp Proof Course (DPC). A small incision in the Eco-Cavity Full Fill boards tongue and grooved edge should be made to allow insertion of wall ties. It is essential that all wall ties slope downwards towards the external wall leaf.
- Wall ties should not be placed directly on the DPC. The insulation boards should commence at least 150mm below the DPC to provide edge insulation for the floor, but not be in contact with the ground.
- Construct the internal wall leaf up to 450mm (2 block courses) and install wall ties at 900mm horizontal centres.
- Install the first row of Eco-Cavity Full Fill boards between the 2 rows of wall ties, tightly to the internal wall leaf, with the tongue and grooved edges tightly interlocked to form a closely jointed run, and secure in place with a retaining clip / disc on each tie.
- Construct the external wall leaf to meet the top of the Eco-Cavity Full Fill boards and repeat the process up to the required height (wall ties spaced at 450mm vertical centres and 900mm horizontal centres).
- All boards should be fitted or butted together with vertical joints staggered.
- Excess mortar should be cleaned from the cavity face of the internal wall leaf before the installation of the each run of Eco-Cavity Full Fill boards.

Typical U-values using Eco-Cavity Full Fill

THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K)				
	BRICK & LIGHT BLOCK	BRICK & MEDIUM BLOCK	BRICK & DENSE BLOCK	LIGHT BLOCK & DENSE BLOCK	MEDIUM BLOCK & DENSE BLOCK
90	0.18	0.19	0.20	0.18	0.20
115	0.15	0.16	0.16	0.15	0.16
140	0.13	0.13	0.14	0.13	0.14

Calculations are based on outside surface resistance, external finish as above, 10mm cavity, Eco-Cavity Full Fill, block as above, 12.5mm plasterboard and skim, inside surface resistance.

Lambda value of brick and block work above as follows: Brick 0.77 W/mK, dense block 1.13 W/mK, medium block 0.51 W/mK, light block 0.11 W/mK.

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

USE INSULATED PLASTERBOARD, ECO-LINER, ON THE INTERNAL WALL TO ACHIEVE EVEN LOWER U-VALUES AND DRY LINE IN ONE APPLICATION

see page 51

- Use insulated cavity closers at the top of the cavity, and at all door and window openings.
- Corner details are formed by cutting the boards squarely and closely butting the two Eco-Cavity Full Fill boards. Alternatively, board ends can be cut at a 45° angle to create a mitred joint. All corner details, internal and external are to incorporate a vertical DPC or self-adhesive vertical DPC overlapping beyond the board ends (at all courses).
- At gable walls Eco-Cavity Full Fill should be continued no less than 200mm beyond the top storey ceiling and a cavity tray installed to protect the top of the Eco-Cavity Full Fill boards.

Internal Wall (Dry Lining)
Dot & Dab

INSTALLATION DETAILS

- Do not use Eco-Liner to hide or isolate damp or wet walls.
- Remove all fittings (skirting boards, rails, coving, radiators, socket facings etc) and ensure walls are clean, dry and free from protrusions. Strip gloss paint or vinyl wallpaper.
- Set out the positioning of Eco-Liner and cut boards to size if required, to fit floor to ceiling of the room. Allow 15mm off the floor to ceiling height. Consideration should be given to windows, sockets, doors, phone cables etc.
- Eco-Liner boards should be tightly butted and joints taped.
- Gaps between the board and floor can be filled with PU foam or flexible acrylic sealant.
- For window reveals use a thin Eco-Liner board and apply drywall adhesive to the back of the board or wall to secure in place.

Dot & dab

- When installing onto existing plastered walls, a bonding agent must be applied and allowed to fully dry prior to Eco-Liner installation.
- Prepare drywall adhesive to manufacturer's instructions. Advice should be sought from the adhesive manufacturer to confirm suitability onto intended masonry substrate.
- Trowel a continuous band of adhesive around all wall edges and openings to provide a fire stop.
- Apply dabs of adhesive to the wall approximately 50-60mm wide x 250mm long, with at least 18 dabs per board (approx. 600mm centres vertically).
- Install Eco-Liner board onto the wall and adhesive dabs, tap the board with a straight edge ensuring the board is in the correct position.
- Come round the internal wall a minimum of 400mm.
- Once the adhesive has dried (approx. 24 hours), fix nailable plugs (a minimum of 2 per board to the tapered edge, ensuring 25mm penetration to wall).

Typical U-values using Eco-Liner

THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K)	
	RENDERED SOLID BLOCKWORK	BRICK & BLOCK CAVITY WALL
52.5*	0.40	0.38
62.5*	0.34	0.33
72.5*	0.30	0.28
82.5*	0.26	0.25
92.5*	0.23	0.23

* Thickness includes 12.5mm plasterboard

Calculations are based on outside surface resistance, rendered solid blockwork or brick & block cavity wall, adhesive dabs, Eco-Liner, plaster skim, inside surface resistance.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

Internal Wall (Dry Lining)
Mechanically Fixed to Timber Battens

INSTALLATION DETAILS

Mechanically fixed to timber battens

- Treated 25 x 50mm soft timber battens should be used to install the Eco-Liner boards.
- Fix DPC strips to the back of the timbers with staples prior to installation.
- Install timber battens to wall at a maximum of 600mm centres. Secure timbers in place using wood screws and wall plugs or nailable plugs.
- Fixings should penetrate a minimum of 45mm into the wall.
- Fix battens around all wall edges, openings and services.
- Timbers can be packed out to ensure a level surface.
- Come round the internal wall a minimum of 400mm.
- Place Eco-Liner board in position. The board must meet the centre lines of the timber battens.
- Secure Eco-Liner to the timber battens using drywall screws at 300mm centres and 200mm centres, around openings / external corners. The fixing should penetrate as least 25mm into the timber.

Typical U-values using Eco-Liner

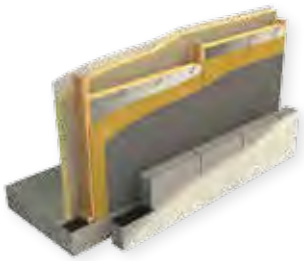
THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K)	
	RENDERED SOLID BLOCKWORK	BRICK & BLOCK CAVITY WALL
62.5*	0.35	0.32
72.5*	0.30	0.28
82.5*	0.26	0.25
92.5*	0.24	0.22

*Thickness includes 12.5mm plasterboard

Calculations are based on outside surface resistance, rendered solid blockwork or brick & block cavity wall, timber battens, Eco-Liner, plaster skim, inside surface resistance. 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 or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

Timber Frame Wall
Between & Inside Studs



INSTALLATION DETAILS

Between timber studs – use Eco-Versal

- Measure the exact distance between studs to allow for variances and achieve tightly fitted insulation boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Install insulation board tightly between the studs, pushing the board back to the OSB/ plywood sheathing.
- Fix treated soft timber stop battens inside the studs to prevent the boards moving within the cavity.
- Ensure boards edges are tightly butted and fill gaps with PU foam.
- Services can be installed in the cavity if required.
- If only installing insulation between studs a Vapour Control Layer (VCL) should be installed over the timber frame (warm side) and finished with plasterboard.

Between & inside timber frame – use Eco-Versal & Eco-Liner (insulated plasterboard)

- Follow installation instructions above for insulation between studs.
- Install timber noggins where joints between Eco-Liner boards are unsupported.
- Fix Eco-Liner boards to the studs / noggins using drywall screws at 300mm centres, penetrating 25mm into the timber.
- Tape joints and use sealant around all perimeter abutments to maintain the VCL.

Typical U-values using Eco-Versal

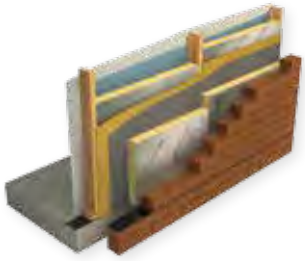
THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K)	
	BETWEEN STUDS	BETWEEN & INSIDE USING 37.5MM ECO-LINER
50*	0.36	0.25
60*	0.33	0.23
65*	0.32	0.23
70*	0.31	0.22
75*	0.30	0.21
80**	0.27	0.20
90**	0.25	0.19
100**	0.24	0.18
120**	0.22	0.17
125**	0.22	0.16

Calculations are based on outside surface resistance, rendered dense blockwork, 50mm cavity, breathable membrane, 9mm OSB, 100mm*/150**mm timber studs with Eco-Versal between, plasterboard / Eco-Liner, plaster skim, inside surface resistance.

The figures quoted above are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR TIMBER FRAME WALL APPLICATION

Eco-Protect see page **52** for more details



Timber Frame Wall
Insulated Sheathing

INSTALLATION DETAILS

Between timber studs (if required)

- Install insulation between studs as described on page 36.

Insulated Sheathing (outside timber frame)

- Fix Eco-Versal to the external surface of the timber frame construction. This must also be on the outside of any breathable membrane, OSB or plywood sheeting.
- Fix in accordance with the frame manufacturers recommendations. However, in the absence of any other guidance please note the following.
- Boards should be lightly butted.
- Use large headed galvanised clout nails to temporarily fix insulation boards prior to the boards being tied into the masonry leaf with an appropriate timber frame wall tie.
- Ensure that fixings synchronise with timber studs, head rails and sole plates.
- A breathable membrane should be fitted over the insulation for ventilated cladding systems. The membrane should be temporarily stapled or pinned in place.
- Fix treated softwood battens vertically to the wall structure, through the insulation sheathing, and breathable membrane. Again, ensure that fixings synchronise with timber studs, head rails and sole plates.
- Seek advice from the cladding system manufacturer on appropriate fixings for the weight of the system.
- Install the breathable membrane and ventilated cladding system as per the manufacturer's recommendations.
- Install the outer leaf of masonry cladding in the conventional manner, using appropriate wall ties to hold the two wall leaves together.

Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K) INSULATED SHEATHING	THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K) INSULATED SHEATHING & BETWEEN STUDS
50	0.31	25 + 25*	0.30
60	0.27	30 + 30*	0.27
70	0.24	40 + 40*	0.22
75	0.23	50 + 50*	0.19
80	0.22	60 + 60*	0.17
90	0.20	70 + 70*	0.15
100	0.18	75 + 75*	0.14
110	0.17	80 + 80*	0.13
120	0.16	90 + 90*	0.12
125	0.15	100 + 100*	0.11
130	0.15	110 + 110*	0.10
140	0.14		
150	0.13		

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

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

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

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

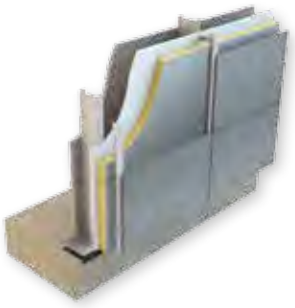
The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services s or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR
TIMBER FRAME WALL APPLICATION

Eco-Protect

see page **52** for more details

Rainscreen



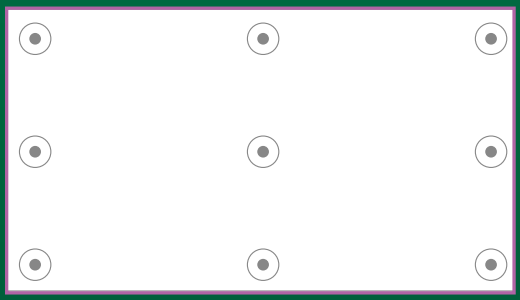
TYPICAL FIXING INSTRUCTIONS

Due to the variations in cladding systems, installation advice should be sought from the system (fixing and façade) manufacturers.

Typical Fixing Instructions

- EcoTherm Insulation boards are suitable for use in rainscreen cladding systems in multi storey buildings up to and including 18 metres in height.
- 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 a minimum 75mm wide tape for board joints, and a minimum 50mm tape overlap for exposed board edges on to the board face.
- To avoid gaps, boards should be cut neatly around fixings and brackets.
- A minimum of 9 fixings per 2.88m^2 board is recommended. However, additional fixings may be required depending 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 EN 1991-1- 4:2005 + A1:2010 (Eurocode 1. Actions on structures. General Actions. Wind Actions and the UK National Annex).
- 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 / m^2)

Typical U-values

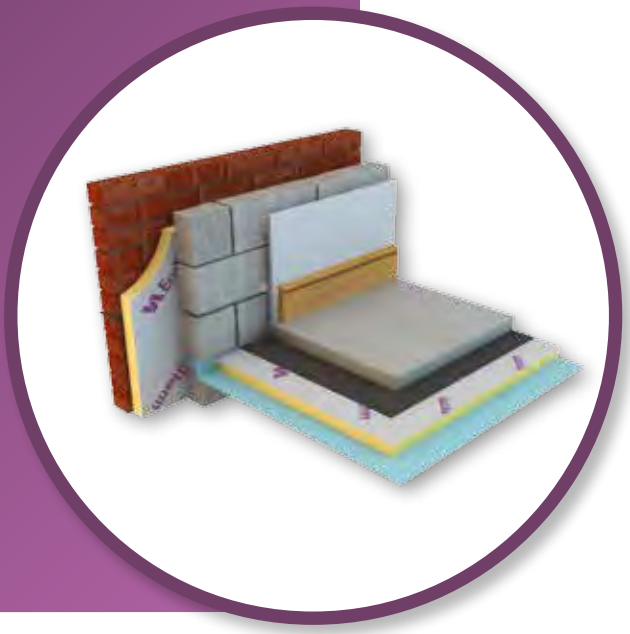
Due to the numerous different fixing mechanisms and cladding systems involved in rainscreen applications, it is advised to contact EcoTherm Technical Services to complete a project specific U-value calculation.

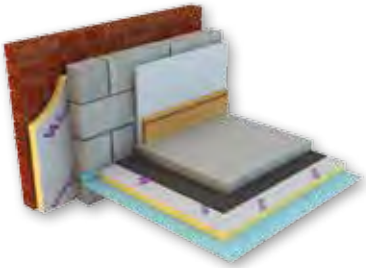
OTHER ECOTHERM PRODUCTS SUITABLE FOR **RAINSCREEN APPLICATION**

Eco-Versal

see page **48** for more details

FLOORS



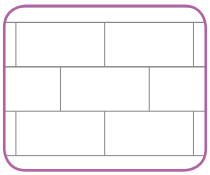


Solid Floor Below Slab

INSTALLATION DETAILS

- A thin sand blinding should be laid on top of well compacted hardcore to level site.
- Install a Damp Proof Membrane (DPM - min 300 micron / 1200 gauge polythene) lapping up the wall into the Damp Proof Course (DPC).
- Loose lay the insulation boards in a break bonded pattern (see below) with edges tightly butted.
- Where two layers of insulation are being installed ensure they are laid break bonded.
- Install a 25mm upstand of insulation on top of the loose laid boards up the wall. The upstand should follow around the perimeter of the floor to a height intended floor level.
- Overlay insulation boards with a minimum 500 gauge polythene sheet to act as a Vapour Control Layer (VCL) and to prevent cement penetrating board joints. Ensure the sheet is taped at joints with 150mm overlaps and turned up at upstands.
- Lay concrete to finished floor level and allow to dry completely before installing floor finish (approx. 1 day per mm of slab thickness).

LAYING PATTERN



Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K)
	SOLID FLOOR BELOW SLAB
50	0.25
60	0.22
65	0.21
70	0.20
75	0.19
80	0.18
90	0.17
100	0.16
110	0.15
115	0.14
120	0.14
125	0.13
130	0.13
140	0.12
150	0.12
160*	0.11
170*	0.11
180*	0.10
190*	0.10
200*	0.09

Calculations are based on outside surface resistance, damp proof membrane, Eco-Versal, polythene sheet, 100mm concrete, 75mm screed, inside surface resistance.

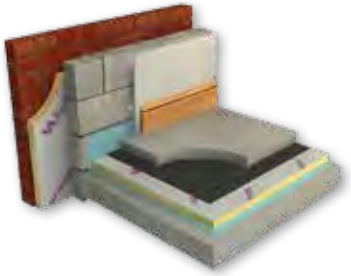
Based on a P/A ratio of 0.5.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR
SOLID FLOOR BELOW SLAB APPLICATION

Eco-UFH

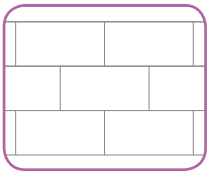


Solid Floor Above Slab

INSTALLATION DETAILS

- Ensure concrete slab is completely dry (approx. 1 day per mm of slab thickness).
- If a Damp Proof Membrane (DPM) has not been installed below the slab, install DPM above the slab (min 300 micron / 1200 gauge polythene) lapping into the Damp Proof Course (DPC).
- Level the surface with a thin sand blinding to continually support the insulation boards.
- Lay the insulation boards in a break bonded pattern (see below) with edges tightly butted.
- Where two layers of insulation are being installed ensure they are laid break bonded.
- Install a 25mm upstand of insulation on top of the loose laid boards up the wall. The upstand should follow around the perimeter of the floor to a height intended floor level.
- Overlay insulation boards with a minimum 500 gauge polythene sheet to act as a Vapour Control Layer (VCL) and to prevent wet screed penetrating board joints. Ensure the sheet is taped at joints with 150mm overlaps and turned up at upstands.
- Lay sand and cement screed on top of the VCL to a minimum thickness of 65mm for domestic applications (larger thicknesses may be required for higher floor loadings or non-domestic applications).
- Allow screed to dry completely before installing floor finish.

LAYING PATTERN



Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K)
	SOLID FLOOR ABOVE SLAB
50	0.25
60	0.22
65	0.21
70	0.20
75	0.19
80	0.18
90	0.17
100	0.16
110	0.15
115	0.14
120	0.14
125	0.13
130	0.13
140	0.12
150	0.12
160*	0.11
170*	0.11
180*	0.10
190*	0.10
200*	0.09

Calculations are based on outside surface resistance, 100mm concrete, damp proof membrane, Eco-Versal, polythene sheet, 75mm screed, inside surface resistance.

Based on a P/A ratio of 0.5.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

see page 48

BEST PRODUCT CHOICE

Eco-Versal

OTHER ECOTHERM PRODUCTS SUITABLE FOR
SOLID FLOOR ABOVE SLAB APPLICATION

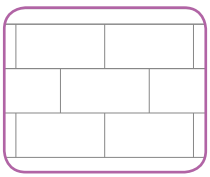
Eco-UFH

Suspended Block & Beam

INSTALLATION DETAILS

- Install a Damp Proof Membrane (DPM - min 300 micron / 1200 gauge polythene) lapping up the wall into the Damp Proof Course (DPC).
- The surface can be levelled using a thin sand blinding if required.
- Lay the insulation boards in a break bonded pattern (see below) with edges tightly butted.
- Where two layers of insulation are being installed ensure they are laid break bonded.
- Install a 25mm upstand of insulation on top of the loose laid boards up the wall. The upstand should follow around the perimeter of the floor to a height intended floor level.
- Overlay insulation boards with a minimum 500 gauge polythene sheet to act as a Vapour Control Layer (VCL) and to prevent wet screed penetrating board joints. Ensure the sheet is taped at joints with 150mm overlaps and turned up at upstands.
- Lay sand and cement screed on top of the VCL to a minimum thickness of 65mm for domestic applications (larger thicknesses may be required for higher floor loadings or non-domestic applications).
- Allow screed to dry completely before installing floor finish.

LAYING PATTERN



Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K)
	SUSPENDED BEAM & BLOCK FLOOR
50	0.27
60	0.24
65	0.23
70	0.21
75	0.20
80	0.20
90	0.18
100	0.17
110	0.15
115	0.15
120	0.14
125	0.14
130	0.14
140	0.13
150	0.12
160*	0.11
170*	0.11
180*	0.10
190*	0.10
200*	0.09

Calculations are based on outside surface resistance, 100mm dense block & beam, damp proof membrane, Eco-Versal, polythene sheet, 75mm screed, inside surface resistance.

Based on a P/A ratio of 0.5.

*Thicknesses greater than 150mm can be achieved using two layers of insulation.

The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

see page 48

BEST PRODUCT CHOICE

Eco-Versal

OTHER ECOTHERM PRODUCTS SUITABLE FOR
SUSPENDED BLOCK & BEAM APPLICATION

Eco-UFH

Suspended Timber Floor

INSTALLATION DETAILS

From above - prior to the installation of floor boarding

- Measure the exact distance between joists to allow for variances and achieve tightly fitted insulation boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Install 25 x 25mm treated softwood timber battens or galvanised steel saddle clips inside the joists, at the correct height to support the insulation boards and ensure the boards sit flush with the top of the joists.
- Fit the insulation board tightly into the joists.
- Fill any gaps between joists and perimeter walls with either cut pieces of insulation board or PU foam.

From below - floor boards fixed over joists

- Measure the exact distance between joists to allow for variances and achieve tightly fitted insulation boards.
- Cut the insulation boards to required measurements (see Installation Essentials on page 13 for guidance on cutting).
- Push the insulation board up between the joists, ensuring a tight fit and the boards sit flush with the floor boards.
- Install 25 x 25mm treated softwood timber battens or partially driven galvanised nails inside the joists, to support the insulation boards.
- Fill any gaps between joists and perimeter walls with either cut pieces of insulation board or PU foam.

Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K)
	SUSPENDED TIMBER FLOOR
50*	0.25
60*	0.23
65*	0.22
70*	0.21
75*	0.20
80*	0.20
90*	0.19
100*	0.17
110*	0.17
115*	0.16
120*	0.16
125*	0.15
130*	0.15
140*	0.14
150*	0.14
160**	0.13
170**	0.13

Calculations are based on outside surface resistance, suspended void, *150mm/**200mm timber joists at 400mm centres, Eco-Versal, 18mm chipboard, inside surface resistance.

Based on a P/A ratio of 0.5.

Thicknesses greater than 150mm can be achieved using two layers of insulation.

The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

see page 48

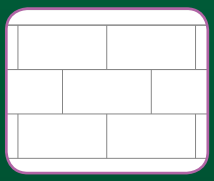
Floating Timber Floor

INSTALLATION DETAILS

- Ensure concrete slab is completely dry (approx. 1 day per mm of slab thickness).
- The surface of the concrete slab should be flat and smooth. Block and beam floors should be level and grouted. Levelling screed or a thin layer of cement can provide a level surface. This should be completely dry before proceeding (approx. 1 day per mm).
- If a Damp Proof Membrane (DPM) has not been installed, install DPM above the slab or block and beam (min 300 micron / 1200 gauge polythene) lapping into the Damp Proof Course (DPC).
- Treated softwood timber battens should be positioned at doorways, access panels and to support partitions. The size of the battens should ensure the top of the insulation is level with the top of the battens.
- Lay the insulation boards in a break bonded pattern (see below) with edges tightly butted.
- Overlay insulation boards with a minimum 1000 gauge polythene sheet to act as a slip layer and Vapour Control Layer (VCL).
- Timber floor boards e.g. tongue–and–groove 18 mm thick plywood, should then be laid over the insulation with staggered cross–joints.
- An expansion gap of 2mm per metre run of floor, or a minimum of 10mm overall, should be provided between the floor boards and the perimeter walls.
- Expansion joints should be installed at 2mm gaps per metre run where there are long (5m+) uninterrupted lengths of timber floor boards.
- Before the timber floor boards are interlocked, apply a continuous bead of waterproof wood grade PVA adhesive to the top and bottom of the tongue and groove joints.
- Temporary wedges should be inserted between the walls and floor, to maintain tight joints, until the adhesive has set.
- Replace wedges with strips of cork or polyethylene foam to help prevent cold bridging. Skirtings may then be fixed.

Typical U-values using Eco-Versal

THICKNESS (MM)	TYPICAL U-VALUES (W/M^{2}K)
	FLOATING TIMBER FLOOR
50	0.24
60	0.22
65	0.21
70	0.20
75	0.19
80	0.18
90	0.17
100	0.16
110	0.15
115	0.14
120	0.14
125	0.13
130	0.13
140	0.12
150	0.12



Calculations are based on outside surface resistance, 150mm concrete slab, damp proof membrane, Eco-Versal, polythene sheet, 18mm chipboard, inside surface resistance.

Based on a P/A ratio of 0.5.

The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR
FLOATING TIMBER FLOOR APPLICATION

Eco-UFH

Underfloor Heating (UFH)

INSTALLATION DETAILS

Concrete slab

- Ensure concrete slab is completely dry (drying time approx. 1 day per mm of slab thickness).
- If a Damp Proof Membrane (DPM) has not been installed below the slab, install DPM above the slab (min 300 micron / 1200 gauge polythene) lapping into the Damp Proof Course (DPC).
- Level the surface with a thin sand blinding to continually support the insulation boards.

Suspended block & beam

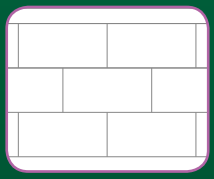
- Install a Damp Proof Membrane (DPM - min 300 micron / 1200 gauge polythene) lapping up the wall into the Damp Proof Course (DPC).
- The surface can be levelled using a thin sand blinding if required.

Installing Eco-UFH

- Lay Eco-UFH boards in a break bonded pattern (see right) with edges tightly butted.
- Where two layers of insulation are being installed, ensure they are laid break bonded.
- Install a 25mm upstand of insulation on top of the loose laid boards up the wall. The upstand should follow around the perimeter of the floor to a height intended floor level.
- A polythene sheet overlay is not required when using Eco-UFH, however EcoTherm do recommend taping board joints when using a liquid screed.
- Install the underfloor heating system in accordance with the manufacturers guidelines.
- Use the printed grid as a guideline for laying pipes.
- Pipe retaining clips can be inserted directly through the woven foil facing into the insulation core.
- Lay sand and cement screed on top of the boards and underfloor heating system to a minimum thickness of 65mm for domestic applications (larger thicknesses may be required for higher floor loadings or non-domestic applications).
- Allow screed to dry completely before installing floor finish.

Typical U-values using Eco-UFH

THICKNESS (MM)	TYPICAL U-VALUES (W/M²K)	
	SOLID ABOVE CONCRETE SLAB*	SUSPENDED BLOCK & BEAM**
50	0.25	0.27
75	0.19	0.20
85	0.18	0.19
90	0.17	0.18
100	0.16	0.17
105	0.15	0.16
120	0.14	0.14



Calculations are based on * outside surface resistance, 100mm concrete, damp proof membrane, Eco-UFH, 75mm screed, inside surface resistance.

**outside surface resistance, 100mm dense block & beam, damp proof membrane, Eco-UFH, polythene sheet, 75mm screed, inside surface resistance.

Based on a P/A ratio of 0.5.

The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services s or using EcoTherm's online U-value calculator at www.u-value-calculator.co.uk

OTHER ECOTHERM PRODUCTS SUITABLE FOR **UNDERFLOOR HEATING APPLICATION**

Eco-Versal
(with use of a minimum 500 gauge separating layer)

see page **48** for more details

Semi-Exposed Soffit
Structural Ceiling

A semi-exposed soffit is a floor that has a heated space above and unheated space below.

INSTALLATION DETAILS

- EcoTherm Insulation recommend a minimum of 11 mechanical fixings per EcoProtect board and a minimum of 12 per EcoProtect Plus board. 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 with joints foil-taped.
- 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.

Direct to concrete 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.

ECO-PROTECT PLUS INSULATES & PROVIDES A FINISH IN ONE BOARD

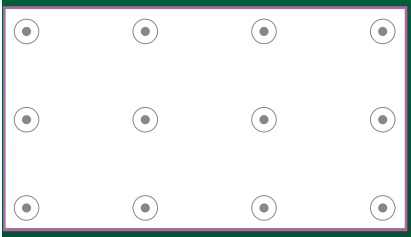
Typical U-values using Eco-Protect Plus

THICKNESS (MM)	TYPICAL U-VALUES (W/M^2K)
78*	0.28
88*	0.25
93*	0.24
98*	0.22
103*	0.21
108*	0.20
118*	0.19
128*	0.17
138*	0.16
148*	0.15

* insulation core + 8mm calcium silicate

Calculations are based on outside surface resistance, Eco-Protect Plus, 150mm concrete slab, inside surface resistance. Adjustments for fixings to be included once fixing centres / type have been confirmed.

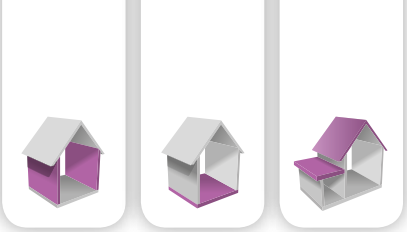
The figures quoted above are for guidance only. Detailed U–value calculations should be completed for each project by EcoTherm Technical Services. This is particularly relevant when using metal fixings.



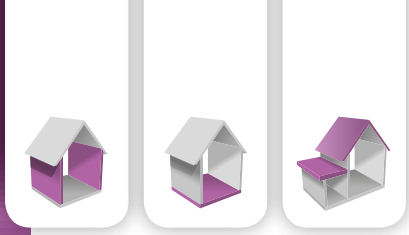
12 No. per board (2.4 x 1.2m board - 4.16 fixings / m^2)

OTHER ECOTHERM PRODUCTS SUITABLE FOR
SEMI EXPOSED SOFFIT APPLICATION

Eco-Protect see page **52** for more details



PRODUCTS



Eco-Versal

BBA

EcoTherm Eco-Versal • Multi application board •

Description
EcoTherm Eco-Versal comprises a fibre free rigid polyisocyanurate (PIR) insulation core faced with an aluminium foil composite on both sides.

Application
Eco-Versal is a universal insulation board suitable for use in:

PITCHED ROOFS
- Over rafters
- Over and between rafters
- Between rafters only
- Between and under rafters
- To create a room in the roof
- Loft floors
- Ceilings and dormer cheeks

WALLS
- Internal walls
- Timber frame walls
- Upgrading cavity walls internally

FLOORS
- Solid concrete floors (above and below slab)
- Block and beam floors
- Suspended timber floors
- Floating timber floors
- Underfloor heating systems

Benefits
- BBA certified
- Non irritant, rigid boards are easy to cut and fit between rafters / studs
- Will not rot, sag or decay – no need to replace
- Lightweight boards will not weigh structure down
- Out performs traditional insulants by 50% - you need approximately half the thickness
- Universal board can be used in a number of applications – reduced waste

Board size:
2400 x 1200mm (2.88m^2)

Thicknesses available:
25 – 150mm

Thermal conductivity (lambda value):
0.022W/mK

Compressive strength:
Typically exceeds 140 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

Fire performance:
Eco-Versal achieves BS 476-7: 1997 Class 1 rating for surface spread of flame. Further details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board (kg)
25	3.4
30	3.8
40	4.7
50	5.6
60	6.5
70	7.4
80	8.3
90	9.2
100	10.1
110	11
120	11.9
130	12.8
140	13.7
150	14.5

energy saving trust listed

Fibre-free Core

VISIT WWW.ECOTHERM.CO.UK

to download the Eco-Versal technical datasheet, product safety information or order a sample

Eco-Liner

Description
EcoTherm Eco-Liner comprises a fibre free rigid polyisocyanurate (PIR) insulation core bonded to 12.5mm tapered edge gypsum plasterboard using proprietary gypsum adhesive.

Application
Eco-Liner is suitable for insulating and dry lining:

- Internal walls
- Pitched roofs below rafters
- Cold flat roofs
- Room in the roof applications

Eco-Liner is suitable for both adhesive dot and dab application or mechanically fixed systems and is ideal for refurbishing existing walls to a higher thermal performance.

Benefits
- BBA certified
- Dry line and insulates in one application
- 1 board, 2 different application methods available
- Offers excellent thermal resistance in practical thicknesses - saving space internally
- Will not rot, sag or decay.

Board size:
2400 x 1200mm (2.88m^2)

Thicknesses available:
37.5 - 82.5mm (insulation + plasterboard)

Thermal conductivity (lambda value):
Insulation core: 0.022W/mK
Plasterboard: 0.19W/mK

Fire performance:
The plasterboard component is Class 0 or 'low risk' in accordance with BS 476-6: 1989 and BS 476-7: 1997. Further details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:*

Thickness (mm)	Weight per board (kg)
37.5	27
42.5	27.4
52.5	28.3
62.5	29.2
72.5	30.1
82.5	31

* including 12.5mm plasterboard

energy saving trust listed

Fibre-free Core

VISIT WWW.ECOTHERM.CO.UK

to download the Eco-Liner technical datasheet, product safety information or order a sample

Eco-Cavity

EcoTherm Eco-Cavity • Sized for bricks & blocks •

Description
EcoTherm Eco-Cavity comprises a fibre free rigid polyisocyanurate (PIR) insulation core faced with an aluminium foil composite on both sides.

Application
Eco-Cavity is suitable for use within partial fill cavity walls. Eco-Cavity achieves high levels of thermal performance for thinner constructions whilst maintaining a clear residual air gap; effective protection against driving rain, particularly in coastal and exposed locations.

Benefits
- BBA certified
- Boards are specifically designed to combine accurately with standard sized bricks/blocks
- Enables easy installation of wall ties
- Will not rot, sag or decay within the cavity wall
- Out performs traditional insulants by 50% - you need approximately half the thickness

Board size:
1200 x 450mm (0.54m^2)

Thicknesses available:
25 – 100mm

Thermal conductivity (lambda value):
0.022W/mK

Fire performance:
Eco-Cavity achieves BS 476-7: 1997 Class 1 rating for surface spread of flame. Further details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board (kg)
25	0.6
30	0.7
40	0.9
50	1.1
60	1.2
70	1.4
80	1.6
90	1.7
100	1.9

TONGUE & GROOVED ECO-CAVITY AVAILABLE, CONTACT ECOTHERM TECHNICAL SERVICES TO FIND OUT MORE

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Fibre-free Core

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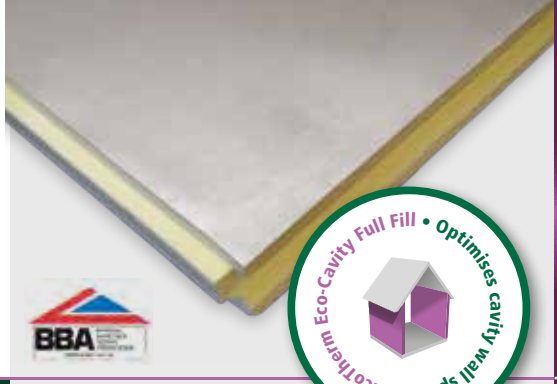
to download the Eco-Cavity technical datasheet, product safety information or order a sample



Eco-Cavity Full Fill

Description
EcoTherm Eco-Cavity Full Fill comprises a fibre free rigid polyisocyanurate (PIR) insulation core with tongue and groove edges, faced with aluminium foil composite on both sides.

Application
Eco-Cavity Full Fill insulation boards are suitable for full filling cavity walls with PIR insulation. The boards allow users to optimise the full cavity with high performing thermal insulation, meaning U-values and Building Regulations can be met without altering standard construction designs. Eco-Cavity Full Fill prevents the need to increase cavity space and overall wall width to accommodate larger thicknesses of traditional insulation materials.

The board's tongue and groove edges ensure a continuous layer of insulation, increases protection from wind driven rain and also aids installation. Maintaining a residual 10mm cavity helps resist moisture transfer, aids installation and accommodates mortar squeeze.

Benefits
- BBA certified
- 0.18 W/m2K U-value easily achieved in a 100mm cavity wall without altering standard construction design
- Easy and quick installation with specific boards sized to combine accurately with standard sized bricks/blocks and tongue and grooved edges
- Will not rot, sag or decay within the cavity wall
- Offers excellent thermal resistance in practical thicknesses
- Tough, light and easily fitted using standard wall ties or simple clipping methods

Board size:
1200 x 450mm (0.54mm^2)

Thicknesses available:
90, 115 & 140mm

Thermal conductivity (lambda value):
0.022W/mK

Fire performance:
Eco-Cavity Full Fill achieves BS 476-7: 1997 Class 1 rating for surface spread of flame. Further details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board (kg)
90	1.72
115	2.14
140	2.56

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to download the Eco-Cavity Full Fill technical datasheet, product safety information or order a sample

Eco-Protect

Description
EcoTherm 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.

Application
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

Benefits
- Class O fire performance
- Universal board can be used in a number of applications – reduced waste
- Rigid, lightweight boards are easy to cut, transport and install

Board size:
2400 x 1200mm (2.88m^2)

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

Thermal conductivity (lambda value):
0.022W/mK

Fire performance:
EcoTherm Eco-Protect is classified as a Class O fire performance product in accordance with UK Building Regulations. Further details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board (kg)
50	5.1
60	6
70	6.9
75	7.3
80	7.7
90	8.6
95	9
100	9.4
110	10.3
120	11.2

Fibre-free Core

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to download the Eco-Protect technical datasheet, product safety information or order a sample

Eco-Protect Plus

Description
Ecotherm Eco-Protect Plus comprises an Eco-Protect insulation board (as described on page 52) 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.

Application
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). Eco-Protect Plus can be installed:

- Direct to concrete soffits
- Onto timber frame systems
- Onto steel frame systems

Benefits
- Class O fire performance
- Non-combustible building board to finish structural ceilings
- Insulate and finish in one application
- Thermal PIR insulation achieves Building Regulations with minimum thickness
- Rigid boards are easy to cut, transport and install

Board size:
2400 x 1200mm (2.88m^2)

Thicknesses available:
88mm - 128mm (including 8mm calcium silicate building board)

Thermal conductivity (lambda value):
0.022W/mK

Fire performance:
EcoTherm Eco-Protect Plus is classified as a Class O fire performance product in accordance with UK Building Regulations. Further details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board (kg)
88	27.3
98	28.8
108	29.9
118	30.1
128	31.6

Fibre-free Core

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to download the Eco-Protect Plus technical datasheet, product safety information or order a sample

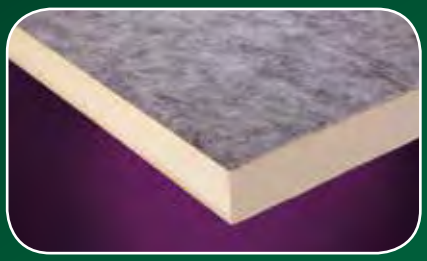
Eco-Torch

Description

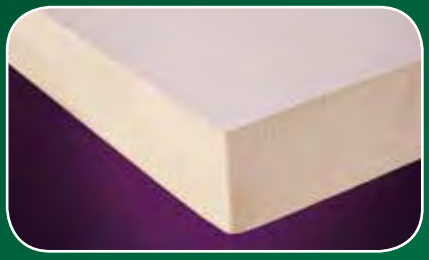
EcoTherm Eco-Torch comprises a fibre free rigid polyisocyanurate (PIR) insulation core, faced with a coated glass tissue on one side and a bitumenised glass fibre tissue with polypropylene fleece on the other. The PIR insulation core is temperature tolerant and withstands the application of hot bitumen and asphalt to the surface at up to 230°C.

Applications

For use with torch on, pour & roll felt systems, mastic asphalt and fully adhered single ply systems. Used for metal, timber or concrete decks, on new build or existing roofs.



Lay with polypropylene fleece side up for torch-on and mastic asphalt systems



Lay with coated glass tissue side up for single ply adhered and pour and roll felt systems

Board size:

1200mm x 600mm (0.72m^2)

Thicknesses available:

30 – 150* mm

Thermal conductivity (lambda value):

0.026W/mK <80mm thickness
0.025W/mK 80 - 119mm thickness
0.024W/mK ≥ 120mm

Compressive strength:

Typically exceeds 150 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

Fire performance:

Details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board (kg)
30	1
40	1.2
50	1.4
60	1.7
70	1.9
80	2.1
90	2.3
100	2.6
110	2.8
120	3
130	3.2
140	3.4
150	3.6

* Requirements for thicknesses over 150mm can be fulfilled with two layers of insulation boards.

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Fibre-free Core

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to download the Eco-Torch technical datasheet, product safety information or order a sample

Eco-Deck

Description

EcoTherm Eco-Deck comprises a fibre free rigid polyisocyanurate (PIR) insulation core, faced with an aluminium foil composite facing on one side and 6mm plywood on the other to create pre-insulated roof decking.

Applications

For use with mechanically fixed single-ply waterproofing membranes, mastic asphalt, pour & roll felt and adhered systems. Used for metal, timber or concrete decks, on new build or existing roofs.

Board size:

2400mm x 1200mm (2.88m^2)

Thicknesses available:

Insulation core: 90 - 150mm

Plywood timber board: 6mm

Thermal conductivity (lambda value):

Insulation core: 0.022W/mK

Plywood timber board: 0.14W/mK

Compressive strength:

Typically exceeds 150 kPa at 10% compression when tested to BS EN 826: 1996 (Thermal insulating products for building applications. Determination of compression behaviour).

Fire performance:

Details on the fire performance may be obtained from EcoTherm Technical Services.

Typical weight:

Thickness (mm)	Weight per board with 6mm plywood(kg)
96	20.2
106	21.1
116	22
126	22.9
136	23.8
146	24.7
156	25.5

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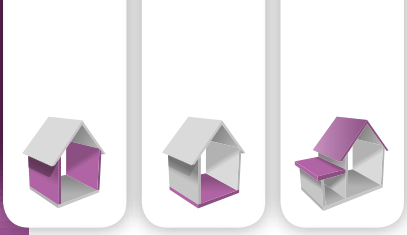


Technical Services

WHATEVER YOUR REQUIREMENT, **WE HAVE IT COVERED...**

EcoTherm Insulation prides itself on providing fuss free technical advice. EcoTherm Technical Services are a friendly team that provide a prompt, unrivalled, free of charge service answering the most basic questions to complicated in-depth queries. It is EcoTherm's aim to provide simple to understand advice on anything from specification to installation including:

- U-value calculations to show compliance with current Building Regulations in floors, walls and roofs (both flat and pitched);
- Condensation Risk Analysis;
- advice on product selection and technical data for all EcoTherm Insulation products;
- general application, installation and fixing methods on all applications;
- specification advice;
- impartial product advice on associated products and proposed system elements;
- full site surveys can be completed for tapered roof projects with EcoTherm's partner Building Innovation; and
- technical samples for compatibility testing.

EcoTherm's Technical Services department is open
Monday - Friday 8.30am - 5.00pm

Tel: +44 (0)1268 597 212 / 213
Email: technical@ecotherm.co.uk

ECOTHERM'S **ONLINE U-VALUE CALCULATOR**

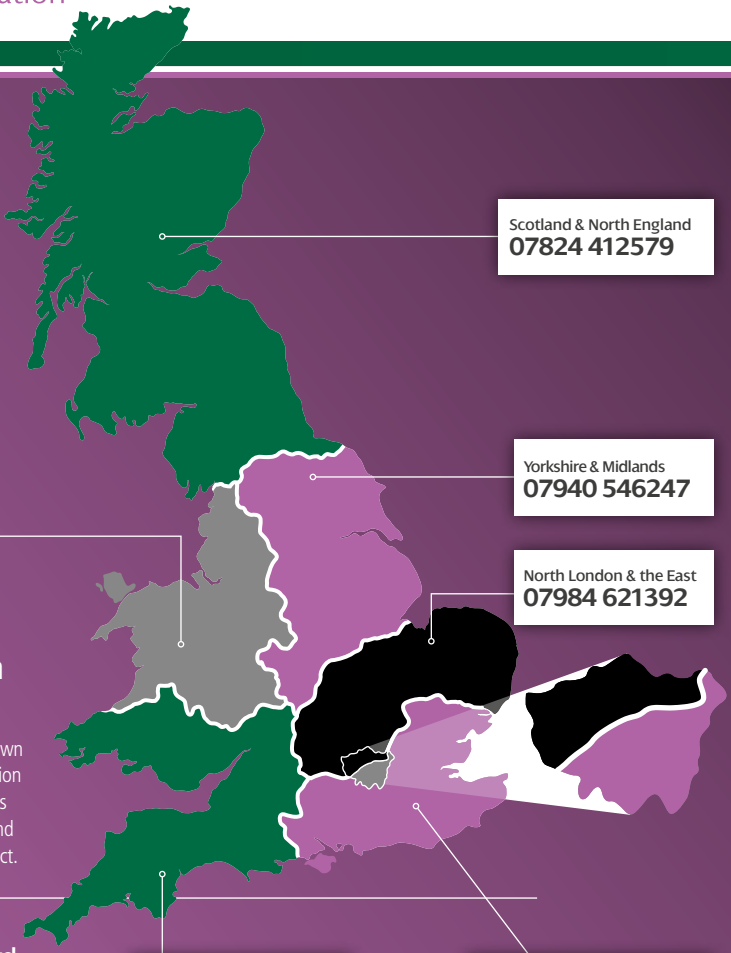
Find out instantly what insulation thickness you require to meet your project's U-value using our online U-value calculator available 24/7 at
www.u-value-calculator.co.uk

NEED **TECHNICAL INFORMATION** FAST OR OUT OF HOURS?

The EcoTherm Insulation website holds a wealth of product and technical information, including documents such as BBA certificates, CE Declaration of Performance (DoP's) and product safety datasheets. You will also find useful information on UK Building Regulations, U-values and the features and benefits of PIR Insulation. Simply **visit www.ecotherm.co.uk**



EcoTherm®
Insulation



Scotland & North England
07824 412579

Yorkshire & Midlands
07940 546247

North Wales & North West
07825 570100

North London & the East
07984 621392

EcoTherm Insulation UK Sales Team

EcoTherm's National Sales Team are known for their superb construction and insulation industry knowledge. Give your Area Sales Manager a call and they will help you find the best stockist and price for your project.

South Wales & South West
07879 495283

South London & the South East
07939 535286

EcoTherm Insulation (UK) Ltd
Harvey Road, Burnt Mills Ind. Est.
Basildon Essex SS13 1QJ
tel: +44 (0) 1268 591155
fax: +44 (0) 1268 591852

www.ecotherm.co.uk
email: info@ecotherm.co.uk