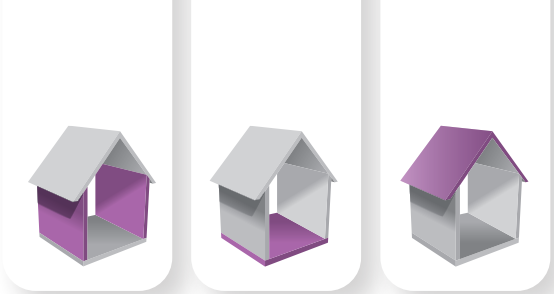


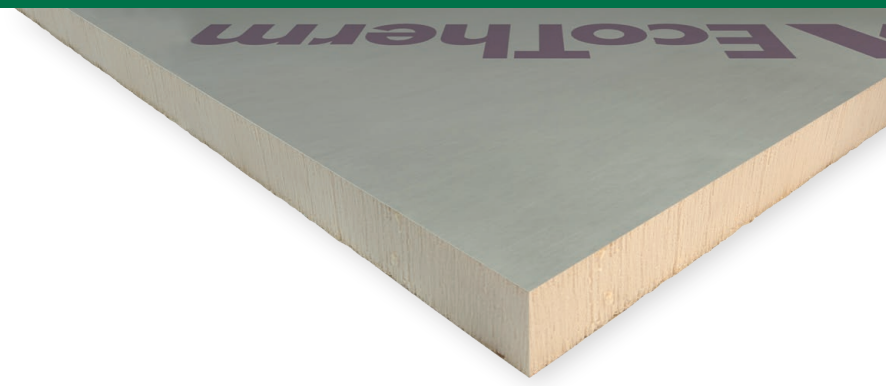
FOR WALLS FOR FLOORS FOR ROOFS

EcoTherm® Insulation

Eco-Versal

Eco-Versal • 5 in 1 Eco-Versal • 5 in 1

Insulation for pitched roofs, floors, walls, dormer cheeks & ceilings



Fibre free rigid polyisocyanurate (PIR) insulation core with aluminium foil composite facing to both sides

Fourth Issue October 2022

Eco-Versal

Description

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

Applications

Eco-Versal is suitable for use within new build and upgrading the thermal performance of existing building elements.

The board is suitable for use in:

- floors
- pitched roofs
- cold flat roofs
- timber frame walls
- solid walls
- dormer cheeks
- ceilings
- room-in-the-roof applications

Product properties

DIMENSIONS

Eco-Versal is available in the following standard sizes:

Width (mm): 1200
Length (mm): 2400
Thickness (mm): 25 - 150
Area: 2.88 m^2
Weight: See Table 1 for board weights

STANDARDS AND APPROVALS

Eco-Versal in thicknesses of (25 - 150 mm), produced at the Pembridge (Herefordshire) and Selby (North Yorkshire) manufacturing facilities, is covered by BBA Agrément Certificate No 14/5157.

EcoTherm PIR Insulation is manufactured under a management system certified to ISO 9001: 2015 (Quality Management Systems. Requirements), ISO 14001: 2015 (Environmental Management Systems. Requirements), ISO 45001: 2018 (Occupational Health and Safety Management Systems. Requirements with guidance for use) and ISO 50001: 2018 (Energy Management Systems. Requirements with guidance for use).

All certificates are available for download from **www.ecotherm.co.uk**.

THERMAL PERFORMANCE

Eco-Versal has a thermal conductivity (lambda/λ-value) of 0.022 W/mK. The thermal resistance (R-value) of Eco-Versal varies with thickness (see Table 1).

The low emissivity surface of the reflective foil can help improve U-values in certain constructions when reflecting into a cavity.

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

FIRE PERFORMANCE

There are potential restrictions placed upon this product which vary dependant on building type, height, construction and location in Great Britain. For guidance regarding the routes to compliance for meeting fire safety requirements please refer to the relevant Building Regulations/Standards for England, Wales and Scotland.

Under System 4 AVCP, Eco-Versal has a Euroclass rating of F.

Further details on the fire performance may be obtained from EcoTherm Technical Services (see rear cover for details).

COMPRESSIVE STRENGTH

The compressive strength of Eco-Versal typically exceeds 140 kPa when tested at 10% compression to BS EN 826: 2013 (Thermal insulating products for building applications. Determination of compressive behaviour).

DURABILITY

When correctly installed, Eco-Versal has an indefinite life. Its durability depends on the background/supporting structure and conditions of its use. It should not be used to isolate dampness or be used in continuously damp/humid conditions.

RESISTANCE TO SOLVENTS, FUNGI & RODENTS

Eco-Versal resists attack from dilute alkalis and acids, mineral oil and petrol, however it is not resistant to ketonic solvents. The insulation core of Eco-Versal and facings resists attack from mould and microbial growth and do not provide any food value to vermin. Damaged boards should not be used.

Design considerations

ENVIRONMENTAL
An Environmental Product Declaration (EPD), certified to BS EN 15804 + A1:2013 (Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products), has been created for Eco-Versal produced at the Pembridge (Herefordshire) and Selby (North Yorkshire) manufacturing facilities. Please visit the Eco-Versal web page at **www.ecotherm.co.uk** for more information.

The core of Eco-versal is manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

EcoTherm Insulation is manufactured under a management system certified to ISO 14001: 2015.

SPANNING
When fixed to timber framing, metal channels, rafters or battens, the maximum board span should be 600 mm.

TYPICAL U-VALUES

Please see the following pages for typical U-values for each application.

In a floor application the U-value will be dependant on the (P/A) ratio. Eco-Versal achieves typical U-values as shown in the exposed perimeter/area tables throughout this datasheet.

Project specific U-value and Condensation Risk Anaylysis (CRA) calculations are available from EcoTherm Technical Services on request (see rear cover for details).

The U-values quoted are for guidance only. Detailed U-value calculations should be completed for each project by EcoTherm Technical Services (see rear cover for details). For instant U-value calculations 24/7 visit EcoTherm's online U-value calculator at **www.ecotherm.co.uk**

Table 1 **Typical weights and thermal resistances**

Thickness (mm)	Weight per board (kg)	Thermal Resistance / R-value (m^2K/W)
25	3.38	1.136
30	3.83	1.364
35	4.28	1.591
40	4.72	1.818
45	5.17	2.045
50	5.62	2.273
55	6.06	2.500
60	6.51	2.727
65	6.96	2.955
70	7.40	3.182
75	7.85	3.409
80	8.29	3.636
90	9.19	4.091
100	10.08	4.545
110	10.97	5.000
120	11.87	5.455
130	12.76	5.909
140	13.65	6.364
150	14.54	6.818

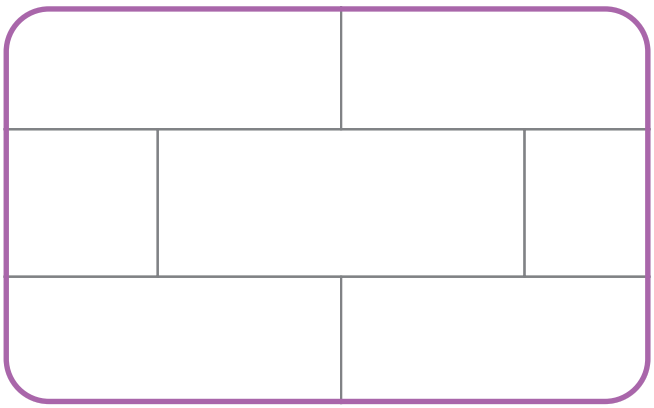
For floors

MOISTURE TOLERANCE
The product must be used above the Damp Proof Membrane (DPM) and must not be used where it may come into contact with moisture from the ground.

MEMBRANE
In applications where a concrete slab is specified or exists, Eco-Versal should be overlaid with protective membrane of minimum 500 gauge prior to application of the screed.

UFH SYSTEMS
Eco-Versal is suitable for use with most Underfloor Heating Systems (UFH). A minimum 500 gauge polythene sheet must be laid over the Eco-Versal boards before the UFH system is installed. Please refer to the UFH system manufacturer instructions when installing the UFH system.

LAYING PATTERN/FLOORS
On solid floors lay Eco-Versal closely butted with staggered joints.



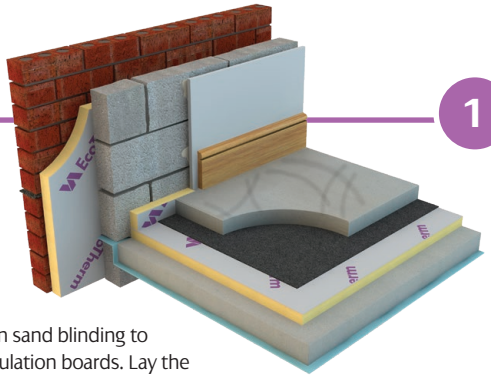
Fibre-free Core

5 fixing methods for floors

Table 2 Typical U-values for solid floor (above slab) using Eco-Versal

Thickness (mm)	Perimeter / Area (P/A)					
	0.2	0.3	0.4	0.5	0.6	0.7
40	0.20	0.24	-	-	-	-
50	0.18	0.21	0.23	0.25	-	-
60	0.17	0.19	0.21	0.22	0.23	0.24
70	0.15	0.18	0.19	0.20	0.21	0.22
75	0.15	0.17	0.18	0.19	0.20	0.21
80	0.14	0.16	0.18	0.19	0.19	0.20
90	0.13	0.15	0.16	0.17	0.18	0.18
100	0.13	0.14	0.15	0.16	0.16	0.17
110	0.12	0.13	0.14	0.15	0.15	0.16
120	0.11	0.12	0.13	0.14	0.14	0.15
130	0.11	0.12	0.13	0.13	0.13	0.14
140	0.10	0.11	0.12	0.12	0.13	0.13
150	0.10	0.11	0.11	0.12	0.12	0.12

75 mm screed, polythene sheet, Eco-Versal, DPM, 100 mm concrete



1

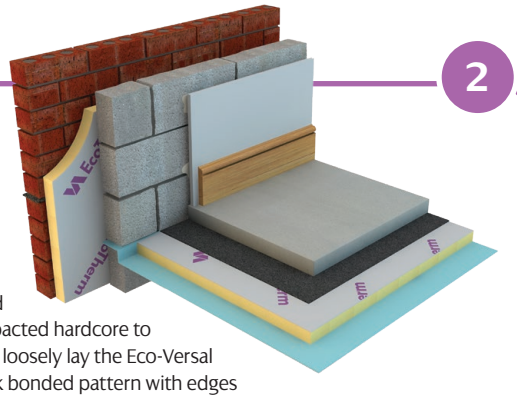
SOLID FLOOR (ABOVE SLAB)

Level the surface with a thin sand blinding to continually support the insulation boards. Lay the Eco-Versal insulation boards in a break bonded pattern with edges tightly butted. Install a 25 mm upstand of insulation on top of the loose laid boards up the wall. 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 150 mm overlaps and turned up at upstands. Lay concrete to finished floor level and allow to dry completely before installing floor finish.

Table 3 Typical U-values for solid floor (below slab) using Eco-Versal

Thickness (mm)	Perimeter / Area (P/A)					
	0.2	0.3	0.4	0.5	0.6	0.7
40	0.20	0.24	-	-	-	-
50	0.18	0.21	0.23	0.25	-	-
60	0.17	0.19	0.21	0.22	0.23	0.24
70	0.15	0.18	0.19	0.20	0.21	0.22
75	0.15	0.17	0.18	0.19	0.20	0.21
80	0.14	0.16	0.18	0.19	0.19	0.20
90	0.13	0.15	0.16	0.17	0.18	0.18
100	0.13	0.14	0.15	0.16	0.16	0.17
110	0.12	0.13	0.14	0.15	0.15	0.16
120	0.11	0.12	0.13	0.14	0.14	0.15
130	0.11	0.12	0.13	0.13	0.13	0.14
140	0.10	0.11	0.12	0.12	0.13	0.13
150	0.10	0.11	0.11	0.12	0.12	0.12

75 mm screed, 100 mm concrete, polythene sheet, Eco-Versal, DPM



2

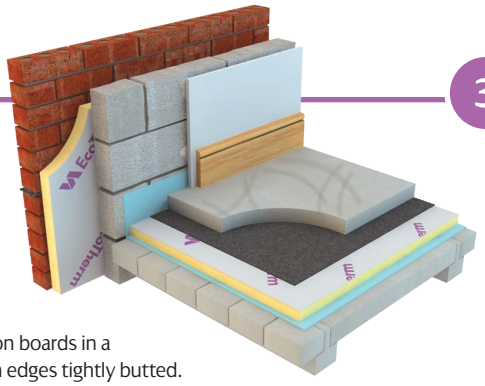
SOLID FLOOR (BELOW SLAB)

A thin sand blinding should be laid on top of well compacted hardcore to level site. Install a DPM and loosely lay the Eco-Versal insulation boards in a break bonded pattern with edges tightly butted. Install a 25 mm upstand of insulation on top of the loose laid boards up the wall. Overlay insulation boards with a minimum 500 gauge polythene sheet to act as a VCL and to prevent cement penetrating board joints. Ensure the sheet is taped at joints with 150 mm overlaps and turned up at upstands. Lay concrete to finished floor level and allow to dry completely before installing floor finish.

Table 4 Typical U-values for suspended block & beam floor using Eco-Versal

Thickness (mm)	Perimeter / Area (P/A)					
	0.2	0.3	0.4	0.5	0.6	0.7
40	0.23	-	-	-	-	-
50	0.21	0.24	0.25	-	-	-
60	0.19	0.21	0.23	0.24	0.25	0.25
70	0.18	0.19	0.21	0.21	0.22	0.23
75	0.17	0.19	0.20	0.20	0.21	0.21
80	0.16	0.18	0.19	0.20	0.20	0.20
90	0.15	0.17	0.17	0.18	0.18	0.19
100	0.14	0.15	0.16	0.17	0.17	0.17
110	0.13	0.14	0.15	0.15	0.16	0.16
120	0.13	0.14	0.14	0.14	0.15	0.15
130	0.11	0.13	0.13	0.14	0.14	0.14
140	0.11	0.12	0.12	0.13	0.13	0.13
150	0.11	0.11	0.12	0.12	0.12	0.12

75 mm screed, polythene sheet, Eco-Versal, DPM, 100 mm dense block & beam



3

SUSPENDED BLOCK & BEAM

Lay the Eco-Versal insulation boards in a break bonded pattern with edges tightly butted. Install a 25 mm upstand of insulation on top of the loose laid boards up the wall. Overlay insulation boards with a minimum 500 gauge polythene sheet to act as a VCL and to prevent cement penetrating board joints. Ensure the sheet is taped at joints with 150 mm overlaps and turned up at upstands. Lay concrete to finished floor level and allow to dry completely before installing floor finish.

Fibre-free Core

Table 5 Typical U-values for suspended timber floor using Eco-Versal

Thickness (mm)	Perimeter / Area (P/A)					
	0.2	0.3	0.4	0.5	0.6	0.7
40	0.24	-	-	-	-	-
50	0.22	0.25	0.25	-	-	-
60	0.21	0.23	0.23	0.24	-	-
70	0.20	0.22	0.23	0.24	0.25	-
75	0.19	0.21	0.22	0.23	0.24	0.25
80	0.19	0.21	0.21	0.21	0.24	0.24
90	0.18	0.19	0.19	0.20	0.22	0.22
100	0.17	0.18	0.19	0.19	0.21	0.21
110	0.16	0.17	0.18	0.18	0.20	0.20
120	0.15	0.17	0.18	0.18	0.18	0.19
130	0.15	0.16	0.17	0.17	0.18	0.18
140	0.14	0.15	0.16	0.16	0.17	0.17
150	0.14	0.15	0.15	0.16	0.16	0.16

18 mm chipboard, Eco-Versal between 200 mm timber joists at 400 mm centres

4

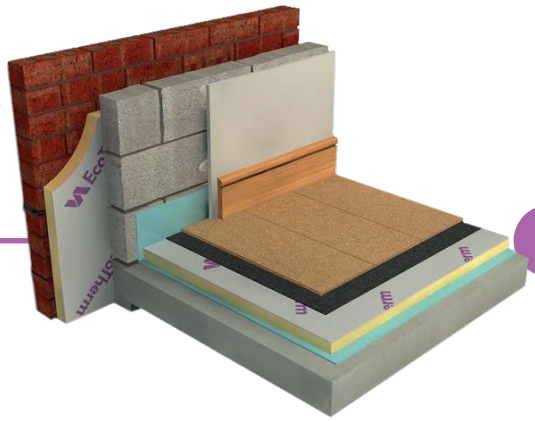
SUSPENDED TIMBER

Cut the Eco-Versal insulation boards to the required measurements for between joists, allowing for variances and achieving a tight fit. If installing from below (floor boards fixed over joists), push the insulation board up between the joists, ensuring a tight fit and the boards sit flush with the floor boards. Install 25 x 25 mm treated softwood timber battens or partially driven galvanised nails inside the joists, to support the insulation boards. If installing from above (prior to the installation of floor boarding), install 25 x 25 mm 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 and fill any gaps between joists and perimeter walls with either cut pieces of insulation board or expanding foam.

Table 6 Typical U-values for floating timber floor using Eco-Versal

Thickness (mm)	Perimeter / Area (P/A)					
	0.2	0.3	0.4	0.5	0.6	0.7
40	0.19	0.23	-	-	-	-
50	0.18	0.21	0.23	0.24	-	-
60	0.16	0.19	0.21	0.22	0.23	0.24
70	0.15	0.17	0.19	0.20	0.21	0.21
75	0.15	0.17	0.18	0.19	0.20	0.20
80	0.14	0.16	0.17	0.18	0.19	0.20
90	0.13	0.15	0.16	0.17	0.18	0.18
100	0.12	0.14	0.15	0.16	0.16	0.17
110	0.12	0.13	0.14	0.15	0.15	0.15
120	0.11	0.12	0.13	0.14	0.14	0.14
130	0.10	0.12	0.12	0.13	0.13	0.14
140	0.10	0.11	0.12	0.12	0.13	0.13
150	0.10	0.11	0.11	0.12	0.12	0.12

18 mm chipboard, vapour control layer, Eco-Versal, DPM, 100 mm concrete



5

FLOATING TIMBER FLOOR

Ensure all surfaces are flat, level, smooth and grouted where necessary. Ensure a DPM is installed either below or above the slab or block and beam lapping into the Damp Proof Course (DPC). Treated softwood timber battens should be positioned at doorways, access panels and to support partitions, ensuring the size of these is level with the top of the insulation. Lay the Eco-Versal insulation boards in a break bonded pattern with edges tightly butted. Overlay insulation boards with a minimum 1000 gauge polythene sheet to act as a slip layer and VCL. Timber floor boards should then be laid over the Eco-Versal with staggered cross–joints. An expansion gap of 2 mm per metre run of floor, or a minimum of 10 mm overall, should be provided between the floor boards and the perimeter walls. Expansion joints should be installed at 2 mm gaps per metre run where there are long (5 m+) 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 PU to help prevent cold bridging. Skirtings may then be fixed.

For walls

For further guidance on the fire safety requirements of timber frame applications, please refer to `Structural Timber Buildings Fire Safety in Use Guidance Volume 1 - Pattern Book Systems' and `Structural Timber Buildings Fire Safety in Use Guidance Volume 2 - Cavity Barriers and Fire Stopping' by the Structural Timber Association.

BREATHABLE MEMBRANE
A breathable membrane should be fixed in accordance with the manufacturer's instructions.

VAPOUR CONTROL
In order to control the risk of condensation, a VCL should be installed behind the plasterboard (please note this may not be necessary where the plasterboard is an insulated plasterboard).

Table 7 Typical U-values for timber frame walls using Eco-Versal

Thickness (mm)	Typical U-values (W/m^2K)			Thickness (mm)	Typical U-values (W/m^2K)
	Between Studs	Between & inside using 37.5 mm Eco-Liner	Insulated sheathing*		Insulated sheathing & between studs*
50	0.34	0.25	0.31	25 + 25	0.30
60	0.31	0.23	0.27	30 + 30	0.27
65	0.30	0.22	0.26	40 + 40	0.22
70	0.29	0.22	0.24	50 + 50	0.19
75	0.28	0.21	0.23	60 + 60	0.17
80	0.27	0.20	0.22	70 + 70	0.15
90	0.25	0.19	0.20	75 + 75	0.14
100	0.24	0.18	0.18	80 + 80	0.13
110	0.23	0.18	0.17	90 + 90	0.12
120	0.22	0.17	0.16	100 + 100	0.11

Calculations are based on brickwork, 50 mm cavity, breathable membrane, 9 mm OSB, 140 mm timber studs with Eco-Versal between, VCL + 15 mm plasterboard / 37.5 mm Eco-Liner, plaster skim.

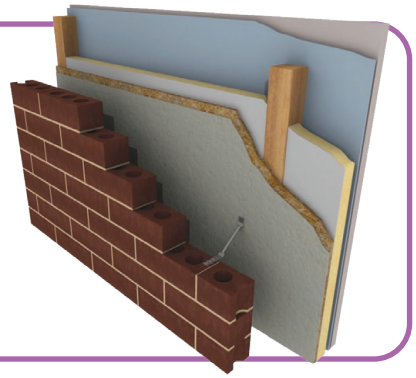
*Insulated sheathing: calculations are based on 102.5 mm brick outer leaf, 50 mm cavity, breathable membrane, Eco-Versal, 9mm OSB, 140 mm timber studs, 15 mm plasterboard, 3 mm skim.

For alternative wall constructions/applications please contact EcoTherm Technical Services to obtain a U-value calculation or head to www.ecotherm.co.uk to use EcoTherm's online U-value calculator.

3 fixing methods for timber frame

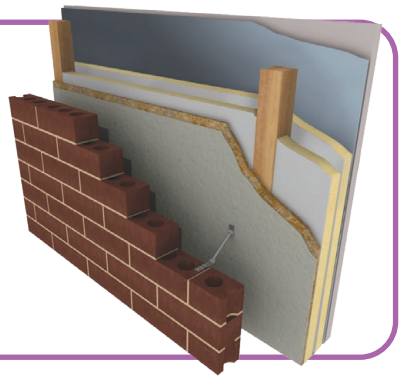
1

INSULATION BETWEEN TIMBER STUDS



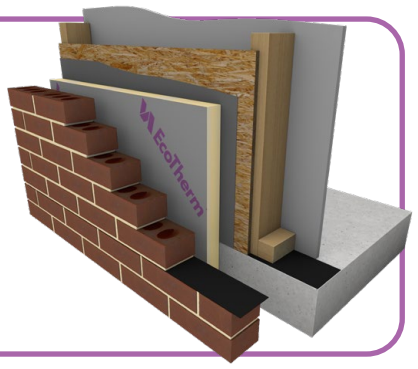
2

INSULATION BETWEEN AND INSIDE TIMBER STUDS



3

INSULATED SHEATHING



Eco-Versal can be installed on the inside surface of the timber studs in addition to between them to reduce the cold bridging effect and further improve the thermal performance of the wall. Insulated plasterboard such as Eco-Liner can be used as an alternative on the inside surface of the timber studs helping to reduce installation time. When fixed to timber framing, the maximum board span should be 600 mm. The insulation board must be installed flush with the stud and there should be no gap between insulation layers.

Install Eco-Versal tightly between the studs and flush against the OSB/ply sheathing. Use timber stop battens to prevent the insulation boards from moving and provide the specified air cavity within the frame if required. This cavity may be used as a service void.

When Eco-Versal is fitted in a continuous layer over the internal face of the timber studs, board joints should be butted to maintain continuity of insulation and joints taped using a 50 mm wide aluminium foil tape. Sealant can be used around all perimeter abutments to help further maintain the vapour seal.

For roofs

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

VAPOUR CONTROL
The requirement for a vapour control layer and/or undertile ventilation should be assessed to BS 5250: 2021 (Code of practice for control of condensation in buildings).

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

The breathable membrane should be laid directly on to the Eco-Versal board before the counter battens are installed.

Alternatively, the counter battens can be installed on top of the Eco-Versal board and the breathable membrane installed after, draping over the battens.

LAYERS
Where very low U-values are required, it may be more practical to install the insulation between the rafters and use an insulated plasterboard, such as Eco-Liner, to the underside of the rafters.

Table 8 **Typical U-values for pitched roofs using Eco-Versal**

Thickness (mm)	Typical U-values (W/m^2K)					Thickness (mm) between & over*	Typical U-values (W/m^2K)
	Between & 37.5 mm Eco-Liner under rafters (ventilated)		Between & 37.5 mm Eco-Liner under rafters (unventilated)		Single layer over rafters*		Between & over
70	150 mm timber rafters	0.27	150 mm timber rafters	0.24	0.26	40+40	0.25
75		0.26		0.23	0.25	50+50	0.21
80		0.25		0.22	0.23	60+60	0.18
90		0.23		0.21	0.21	70+70	0.16
100		0.22		0.20	0.19	75+75	0.15
110	175 mm timber rafters	0.20		0.19	0.18	80+80	0.14
120		0.19		0.18	0.17	90+90	0.13
125		0.19		0.18	0.16	100+100	0.12
130	200 mm timber rafters	0.18	175 mm timber rafters	0.17	0.16	110+110	0.11
140		0.17		0.16	0.15	120+120	0.10
150		0.16		0.16	0.14	125+125	0.10

When calculating U-values to BS / I.S. EN ISO 6946: 2017, the type of mechanical fixing used may change the thickness of insulation required. The U-value calculations for 'between & over' assume that over rafter layers of insulation are fixed using stainless steel fixings with a cross sectional area 7.9 mm^2, with 3.7 fasteners per m^2 (insulant thickness 0-40 mm), 6.2 per m^2 (insulant thickness 41-60 mm), 8.3 per m^2 (insulant thickness 61-80 mm) and 10.0 per m^2 (insulant thickness 81-100 mm).

For the purposes of these calculations the standard of workmanship has been assumed good, and therefore the correction factor for air gaps has been ignored.

The figures quoted are for guidance only. A detailed U-value calculation and a condensation risk analysis should be completed for each project.

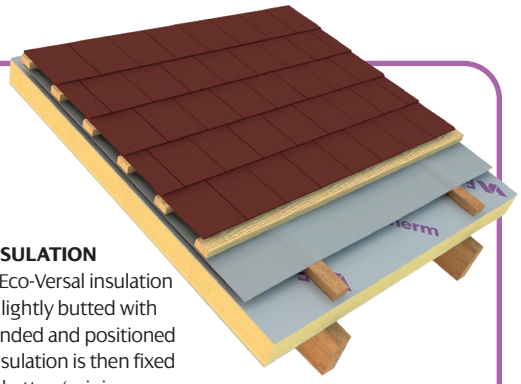
Calculations are based on tiles on battens, counter battens, breathable membrane, Eco-Versal, timber rafters at 400 mm centres (*150 mm unventilated), VCL + 12.5 mm plasterboard/37.5 mm Eco-Liner, plaster skim.

For alternative wall constructions/applications please contact EcoTherm Technical Services to obtain a U-value calculation or head to www.ecotherm.co.uk to use EcoTherm's online U-value calculator.

3 fixing methods for roofs

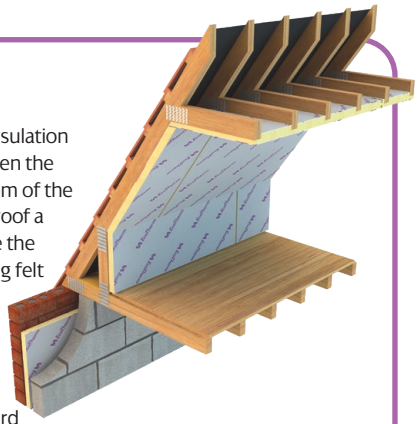
Dependent on the U-value required and the roof design, different approaches can be taken:

1



OVER RAFTER INSULATION
Cut and install the Eco-Versal insulation boards so they are lightly butted with the joints break bonded and positioned over rafters. The insulation is then fixed by use of a vertical batten (minimum size 50 mm x 25 mm) placed above the insulation down the line of each rafter.

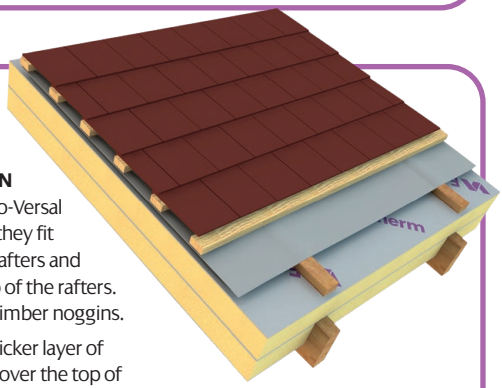
2



BETWEEN & UNDER RAFTER INSULATION
Cut and install the Eco-Versal insulation boards so they fit tightly between the rafters and flush with the bottom of the rafters. In a ventilated pitched roof a 50 mm cavity is required above the insulation and below the sarking felt to avoid condensation.

Fix a secondary thinner layer of Eco-Versal insulation to the underside of the rafter and cover with 12.5 mm plasterboard or use EcoTherm's insulated plasterboard, Eco-Liner.

3



BETWEEN & OVER RAFTER INSULATION
Cut and install the Eco-Versal insulation boards so they fit tightly between the rafters and are flush with the top of the rafters. Secure in place with timber noggins.

Install a secondary thicker layer of Eco-Versal insulation over the top of the rafters and secure with a vertical batten down the line of each rafter. Install the breathable membrane as per the manufacturer's instructions.

Eco-Versal

FOR ROOFS

Sitework

HANDLING

- Do not drop boards
- Wear appropriate hand and eye protection
- To cut use a fine toothed saw
- Damaged boards should not be used

Cutting with power tools generates dust so should be kept to a minimum. Ideally all operations which produce dust should be carried out in well ventilated conditions; where possible a dust mask selected in accordance with BS EN 149: 2001 + A1: 2009 (Respiratory protective devices. Filtering half masks to protect against particles. Requirements, testing, marking) should be worn.

Ensure accurate trimming to achieve close butt joints and continuity of insulation.

HEALTH AND SAFETY

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

STORAGE

Store boards in a flat, dry area off the ground away from mechanical and water damage. If temporary outdoor storage cannot be avoided then the boards must be stacked clear of the ground and completely protected by use of an opaque polythene sheet or weatherproof tarpaulin. Boards that have been allowed to get wet should not be used.

Consider Eco-Liner in combination with Eco-Versal to achieve a lower U-value and insulate & dry line in one application. Further details are available from EcoTherm Technical services or at www.ecotherm.co.uk

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To access pre-existing product information or information relating to previously sold/discontinued products please email **marketing@ecotherm.co.uk**.

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