

Single-ply membrane flat roofing applications using Celotex EL3000

Introduction

Celotex is the brand leading manufacturer of PIR insulation boards, with its range encompassing the thinnest and thickest boards available to the construction industry today. All of the Company's products are manufactured at its plant in Suffolk, from where the dedicated Celotex Technical Centre offers advice and calculations for compliance with current regulations and legislation. Celotex: We know insulation inside and out.

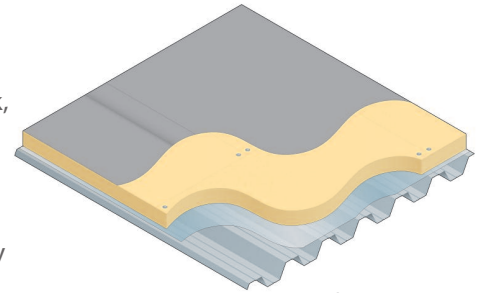
Use **Celotex EL3000** high performance insulation in either mechanically fixed or fully adhered single-ply flat roofing applications. The unperforated facer is suitable for single-ply fully adhered roof systems, self adhesive membranes and liquid-applied membranes.

When designing a flat roof using Celotex EL3000 boards, three basic principles apply:

1. Design to a fall of 1:80, 1:60 or 1:40 as appropriate to the weathering system, type of deck and construction tolerances.
2. Have due regard for the use and design of the building and the need to ensure that the design will not allow a build up of moisture below the waterproofing membrane.
3. Provide adequate protection for both insulation and waterproofing if significant foot traffic is expected either during or after the completion of the roof.

Celotex EL3000 Technical Data

Product Code	Thickness (mm)	R-value (m ² K/W)	Weight (kg/m ²)
EL3050	50	1.85	2.04
EL3080	80	3.05	3.00
EL3090	90	3.45	3.32
EL3100	100	3.80	3.64
EL3110	110	4.20	3.96
EL3120	120	4.80	4.28
EL3140	140	5.60	4.92
EL3150	150	6.00	5.24
EL3165	165	6.60	5.72
EL3200	200	8.00	6.84



Celotex EL3000 with single-ply membrane over metal deck

Sustainable Insulation

Celotex PIR insulation has been independently assessed by BRE Global and has been accredited with an A+ rating in the 2008 Green Guide.

The results also show that Celotex offers a lower environmental impact than other typical PIR manufacturers.

For further information about Celotex' sustainable insulation solutions, visit the sustainability pages of the website at celotex.co.uk



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Example U-value Calculation: EL3000 - single-ply membrane

Construction	Concrete Deck		Steel Deck		Timber Deck		
	FB	MF	FB	MF	FB	MF	
Outside surface resistance	-	-	-	-	-	-	
Single-ply membrane	1.5	1.5	1.5	1.5	1.5	1.5	
Variable layer	See below	See below	See below	See below	See below	See below	
Polythene 1000 gauge, VCL	-	-	-	-	-	-	
Concrete deck	250	250	n/a	n/a	n/a	n/a	
Steel deck	n/a	n/a	1.5	1.5	n/a	n/a	
Timber deck plywood	n/a	n/a	n/a	n/a	19	19	
Cavity between joist @ 11.7% bridging	n/a	n/a	n/a	n/a	150	150	
Plasterboard	n/a	n/a	n/a	n/a	12.5	12.5	
Inside surface resistance	-	-	-	-	-	-	
Variable layer	U-value	U-value	U-value	U-value	U-value	U-value	
Celotex Product	Thickness (mm)	(W/m²K)	(W/m²K)	(W/m²K)	(W/m²K)	(W/m²K)	
Celotex EL3000	50	0.47	0.49	0.50	0.52	0.42	0.45
Celotex EL3000	80	0.30	0.32	0.31	0.34	0.28	0.30
Celotex EL3000	90	0.27	0.29	0.28	0.30	0.25	0.28
Celotex EL3000	100	0.24	0.27	0.25	0.28	0.23	0.25
Celotex EL3000	110	0.22	0.25	0.23	0.25	0.21	0.24
Celotex EL3000	120	0.20	0.22	0.20	0.23	0.19	0.21
Celotex EL3000	140	0.17	0.19	0.17	0.20	0.16	0.19
Celotex EL3000	150	0.16	0.18	0.16	0.19	0.15	0.18
Celotex EL3000	165	0.14	0.17	0.15	0.17	0.14	0.17
Celotex EL3000	200	0.12	0.15	0.12	0.15	0.12	0.14

FB = Fully bonded
MF = Mechanically fixed

Installation Guidelines

Cold applied systems

For single-ply membranes, the vapour control layer (VCL) should be either polythene or reinforced aluminium foil. The VCL should be loose-laid immediately prior to installation of the roof board and detailed at edges and abutments. The VCL should be sealed and taped to the top surface of the board.

Mechanical fastening

The boards should be laid, with all joints tightly butted together, over the VCL and then mechanically secured through to the deck. Celotex recommends the use of BS 6399:Part 2 when determining the number of fixings required to secure the insulation boards to the deck. When used on metal decks, these roof boards should be laid with the long sides at right angles to corrugations. When mechanical fasteners are utilised to secure the single ply membrane, they should be selected to the suit the type of deck used. A plate washer with a surface area of not less than 45cm² must be used with each fastener, with no less than four fasteners used per board. Fasteners should be installed between 50mm-150mm from the edges and corners of the board.

Installation of weathering systems

Different types of weathering systems require different installation instructions and guidelines. Advice on the installation of these weathering systems should be sought from the manufacturer or provider of the weathering system type.

Laying pattern

It is recommended that boards are laid with joints break-bonded.

Installation Guidelines (cont)

Supporting deck

The supporting deck must provide adequate support for the VCL and insulation board with joints being supported by the ridges of the deck. It must be capable of supporting the static and dynamic design loads and the loads associated with the construction activity without deflection in excess of the limits defined in BS 6399:Part1. The deck must be structurally sound, dry, clean and, where necessary, primed before application of the weathering and insulating system.

Trafficking

Boards are capable of withstanding the trafficking associated with normal roof laying work. However, roofs are generally designed for only occasional lightweight foot traffic or maintenance access. Where more frequent or heavier access is required, protected walkways should be provided. Under no circumstances should the roof be used as a working platform, either during or after the construction programme. Extra care should be taken to protect the insulation and weathering when ballasting.

Use of adhesives

When using adhesives, the installer should take care not to use products that contain chemicals likely to attack the insulating foam such as ketonic solvents. Celotex EL3000 contains no chemicals or solvents likely to damage the PVC membrane. When using adhesives, the installer should check the compatibility of the adhesive with the adhesive manufacturer.

Further Information

If you wish to contact Celotex, please visit celotex.co.uk and click on the 'contact us' page.

For information regarding storage and handling of Celotex products, or for Health and Safety advice, please refer to the 'literature' pages of the website at celotex.co.uk

Celotex has a policy of continuous product development and reserves the right to alter product designs or specifications without prior notice.

*Calls to the Celotex Technical Centre are charged at 30p per minute from a BT landline and lines are open Monday - Friday from 8.00am - 5.15pm. Details and pricing are correct at date of publication - January 2009.

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