

Single-ply membrane flat roofing applications using Celotex TA3000

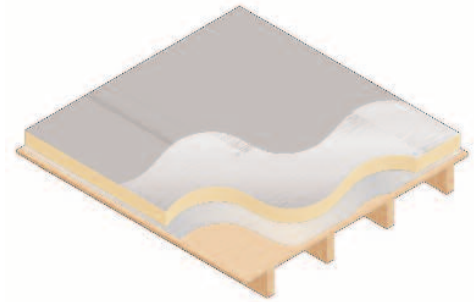
Introduction

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 TA3000** high performance insulation in mechanically fixed, single-ply flat roofing systems where the higher compressive strength of the board gives improved resistance to site traffic during installation.

When designing a flat roof using Celotex TA3000 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 TA3000 over timber deck

Celotex TA3000 Technical Data

Product Code	Thickness (mm)	R-value (m ² K/W)	Weight (kg/m ²)
TA3050	50	2.15	1.82
TA3070	70	3.00	2.45
TA3075	75	3.25	2.61
TA3085	85	3.65	2.93
TA3090	90	3.90	3.09
TA3100	100	4.30	3.43
TA3110	110	4.75	3.75
TA3125	125	5.40	4.23
TA3150	150	6.50	5.03
TA3165	165	7.15	5.51
TA3200	200	8.65	6.63

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: TA3000 - single-ply membrane

Construction	Concrete Deck		Steel Deck		Timber Deck	
	MF	TB	MF	TB	MF	TB
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 TA3000	50	0.43	0.40	0.46	0.43	0.39
Celotex TA3000	70	0.32	0.30	0.34	0.31	0.30
Celotex TA3000	75	0.31	0.28	0.32	0.29	0.29
Celotex TA3000	85	0.28	0.25	0.29	0.26	0.26
Celotex TA3000	90	0.26	0.24	0.27	0.25	0.25
Celotex TA3000	100	0.24	0.22	0.25	0.22	0.23
Celotex TA3000	110	0.22	0.20	0.23	0.20	0.21
Celotex TA3000	125	0.20	0.17	0.20	0.18	0.19
Celotex TA3000	150	0.17	0.15	0.17	0.15	0.17
Celotex TA3000	165	0.16	0.13	0.16	0.14	0.15
Celotex TA3000	200	0.14	0.11	0.14	0.11	0.13

MF = Mechanically fixed
TB = Thermally broken

Installation Guidelines

Laying pattern

It is recommended that Celotex TA3000 boards are laid with joints break-bonded. When used on metal decks, the Celotex TA3000 boards should be laid with the long sides at right angles to the corrugations.

Single-ply 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.

Mechanical fastening

Except where the roof system is to be retained by ballast, the insulation must be mechanically fixed to the deck. The Celotex TA3000 board should be laid with all joints tightly butted together, over the vapour control layer (VCL) and then mechanically secured through to the deck.

The standard board size of 2400mm x 1200mm is the optimum size suitable for the mechanical attachment. When used on metal decks, joints parallel to the deck corrugations should be positioned over the crown of the profile – not over the trough. To satisfy this requirement, non-standard board lengths are available to special order.

It is important that the securing of the Celotex TA3000 insulation be considered independently of the waterproofing system and only where positioning of membrane fasteners coincides with the insulation fasteners can the latter be omitted. Celotex recommends the use of BS 6399:2 Code of Practice for Wind Loads when determining the number of fixings required for insulation boards in flat roof applications.

Installation Guidelines (cont)

Mechanical fastening (cont)

Fasteners should be installed between 50-150mm from the edges and corners of the board. Suitable fasteners should comprise a screw type suitable for the deck into which it is to be driven, combined with a circular or rectangular plate washer having a surface area of not less than 45cm².

Trafficking

Celotex TA3000 boards are capable of withstanding the trafficking associated with normal roof laying work. However, flat roofs are generally only designed for occasional lightweight foot traffic for 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.

Vapour control layer (VCL)

The VCL should be minimum 1000 gauge polythene or reinforced aluminium foil. This should be fully sealed at all laps, prior to applying the insulation, using self-adhesive tape appropriate to the type of VCL used.

At perimeters and abutments the VCL should be turned up around the insulation board edges and a flap of approximately 300mm should be sealed and taped to the top face of the board. The VCL should be loose laid immediately prior to the installation of the roof insulation board.

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. The deck must be structurally sound, dry, clean and where necessary, primed before application of the weathering and insulating system.

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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