



## Balcony and Terrace Applications

Flat Roof Insulation

**Celotex**  
 Insulation Specialists

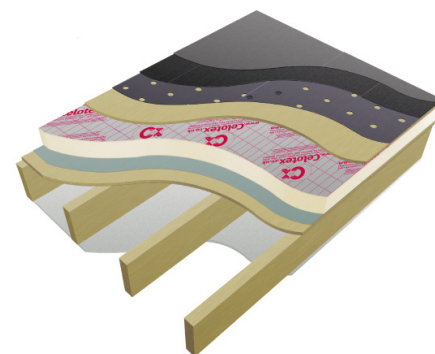
### Introduction

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 GA4000** or **Celotex XR4000** high performance thermal insulation between 19mm plywood sheeting for use in warm flat roof deck balcony applications to minimise insulation thickness and give the following benefits:

- Warm roof construction due to over joist insulation
- Provides reliable long term energy savings for buildings
- Eliminates the need to insulate between joists
- Ventilation not required through roof void
- Robust deck structure copes with regular foot traffic
- Rapidly installed and weatherproofed



Celotex XR4000

### Celotex GA4000 Technical Data

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)	Weight (kg/m <sup>2</sup> )
GA4050	50	2.25	1.55
GA4055	55	2.50	1.74
GA4060	60	2.70	1.90
GA4065	65	2.95	2.05
GA4070	70	3.15	2.19
GA4075	75	3.40	2.34
GA4080	80	3.60	2.48
GA4085	85	3.85	2.62
GA4090	90	4.05	2.76
GA4100	100	4.50	3.27

### Sustainable Insulation

Celotex PIR insulation has been independently assessed by BRE Global and has been accredited with an A+ rating when compared to the BRE 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](http://celotex.co.uk)



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### Celotex XR4000 Technical Data

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)	Weight (kg/m <sup>2</sup> )
XR4110	110	5.00	3.58
XR4120	120	5.45	3.88
XR4130	130	5.90	4.19
XR4140	140	6.35	4.49
XR4150	150	6.80	4.79
XR4165	165	7.50	5.43
XR4200	200	9.05	6.53



For premium performance including Class O fire performance Celotex FR5000 is suitable for this application.

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### Example U-value Calculation: Flat Roof Insulating Deck - Balcony

Construction	Terrace BUR Thickness (mm)	Terrace SPM Thickness (mm)	Terrace BUR EX-J Thickness (mm)
Outside surface resistance	-	-	-
Built-up roofing or single-ply membrane	12	1.5	12
Plywood	19	19	19
Variable layer	See below	See below	See below
Polythene 1000 gauge, VCL	-	-	-
Plywood	19	19	19
Cavity between joist @ 400 ctrs - 11.7% bridging	150	150	n/a
Plasterboard	12.5	12.5	12.5
Plasterboard between joist - 11.7%	n/a	n/a	12.5
Inside surface resistance	-	-	-
Variable layer		U-value (W/m <sup>2</sup> K)	U-value (W/m <sup>2</sup> K)
Celotex Product	Thickness (mm)		U-value (W/m <sup>2</sup> K)
Celotex GA4000	85	0.24	0.25
Celotex GA4000	90	0.23	0.24
Celotex GA4000	100	0.21	0.22
Celotex XR4000	110	0.19	0.20
Celotex XR4000	120	0.18	0.19
Celotex XR4000	130	0.17	0.18
Celotex XR4000	140	0.16	0.17
Celotex XR4000	150	0.15	0.16
Celotex XR4000	165	0.14	0.15
Celotex XR4000	200	0.12	0.12

Terrace BUR = Built-up roofing

Terrace SPM = Single-ply membrane

Terrace BUR EX-J = Built-up roofing, exposed joist

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### Installation Guidelines

Celotex insulation boards should not be installed when the temperature is at or below 4°C and falling.

- Ensure the joist spacing is at no more than 600mm centres and that the dimension of the joist is sufficient to span and accept additional loads. If asphalt weathering is to be used, joists should be at no more than 400mm centres. Install firrings to give a fall of 1:80, or as appropriate to type of construction tolerance.
- Install 19mm plywood to top of joists/firrings and fit 1000g polythene vapour control layer (VCL).
- Install Celotex insulation to the required thickness and install secondary layer of 19mm plywood.
- Fix with corrosion-proof wood screws at a frequency to suit the design wind load. Refer to BS6399-2 Code of Practice for Wind Loads. As a guide, 16 fasteners per board will resist a wind load of 2.22 KN/m<sup>2</sup> based on a design load of 0.4KN per fastener.
- Ensure that fixings are no less than 10mm in from the board edge or 50mm from each corner. They should be equally spaced along the supporting joists. Fixings should be long enough to penetrate at least 38mm into the supporting timber.
- Stagger opposing fixings where two board edges share the same joist.
- Provide a complete insulation envelope by extending the wall insulation board up to the underside of the roof deck.
- Ensure that the plywood is completely dry before any weathering system is applied.
- Built-up roofing (BUR). Always use a Type 3G felt to BS 747 as a vapour diffusion first layer when using BUR weathering systems.
- Single-ply membrane (SPM). Please consult the manufacturer or supplier or relevant trade association for installation guidelines on all SPM weathering systems.
- Temporary protection must be provided for both the insulation and the waterproofing, if significant foot traffic is anticipated either during or after installation.

### Additional Installation Guidelines for Balconies

- Before commencement of works, consult with a structural engineer to ensure that the whole structure is adequate to take the additional loads of a balcony.
- The chosen weather proofing system should then be applied directly to the surface of the plywood and protected from foot traffic with promenade tiles, decking or a similar finish.

### Further Information

If you wish to contact Celotex, please visit [celotex.co.uk](http://celotex.co.uk) and click on the 'contact us' page.

For information regarding [storage, installation and handling](#) of Celotex products, or for [Health and Safety](#) advice, please refer to the 'literature' pages of the website at [celotex.co.uk](http://celotex.co.uk)

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