



## Between and Under Joist Applications

Flat Roof Insulation

**Celotex**  
Insulation Specialists

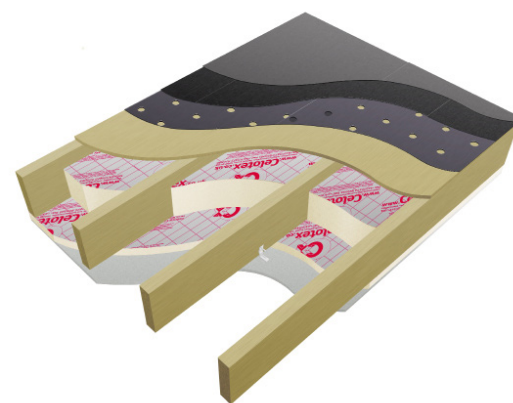
### Introduction

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 a combination of **Celotex GA4000** or **Celotex XR4000** with **Celotex PL4000** high performance plasterboard thermal laminate in flat roof between and under joist applications to minimise insulation thickness and give the following benefits:

- Celotex PL4000 provides both the below joist insulation and plasterboard in one product helping reduce installation time
- Celotex PL4000 offers the installer maximum flexibility and installation speed due to the tapered edge plasterboard
- A perfect solution to upgrade older buildings
- Provides reliable long term energy savings for buildings
- No need to remove existing weatherproofing covering
- Ventilated cold roof construction
- The ideal renovation/conversion solution
- Helps to minimise any loss of internal headroom



Celotex XR4000 & PL4000

### 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

### Celotex PL4000 Technical Data

Product Code	Thickness (mm)	R-value (m <sup>2</sup> K/W)	Weight (kg/m <sup>2</sup> )
PL4015	15 + 9.5	0.70	6.62
PL4025	25 + 12.5	1.20	9.06
PL4040	40 + 12.5	1.85	9.52
PL4045	45 + 12.5	2.10	9.67
PL4050	50 + 12.5	2.30	9.83
PL4055	55 + 12.5	2.55	10.01
PL4060	60 + 12.5	2.75	10.15
PL4065	65 + 12.5	3.00	10.30

12.5mm tapered edge plasterboard is laminated to the specified insulation thickness  
9.5mm tapered edge plasterboard is laminated to PL4015



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

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## Example U-value Calculation: Cold Flat Roof - Between and Under Joists

Construction	100 deep joists Thickness (mm)	125 deep joists Thickness (mm)	150 deep joists Thickness (mm)	175 deep joists Thickness (mm)
Outside surface resistance	-	-	-	-
Weather-proofing system	n/a	n/a	n/a	n/a
Plywood	19	19	19	19
Ventilated cavity	50	50	50	55
Celotex between joists @ 400 ctrs (11.7% brg)	GA4050	GA4075	GA4100	XR4120
<b>Variable layer</b> (for below joists)	See below	See below	See below	See below
Inside surface resistance	-	-	-	-
Celotex Product - Variable layer	Thickness (mm)	U-value (W/m <sup>2</sup> K)	U-value (W/m <sup>2</sup> K)	U-value (W/m <sup>2</sup> K)
Celotex PL4000	15 + 9.5	-	-	-
Celotex PL4000	25 + 12.5	-	-	0.19
Celotex PL4000	40 + 12.5	-	-	0.17
Celotex PL4000	45 + 12.5	-	-	0.16
Celotex PL4000	50 + 12.5	-	0.20	0.15
Celotex PL4000	55 + 12.5	-	0.19	0.15
Celotex PL4000	60 + 12.5	-	0.18	0.14
Celotex PL4000	65 + 12.5	0.20	0.17	0.14

## Installation Guidelines

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

- Make sure that there is enough joist depth to accommodate not only the thickness of the Celotex insulation, but also a 50mm ventilated airspace above the boards.
- Fix battens to the inside face of the joists so that the bottom of the batten is 50mm below the decking.
- Measure the space to be filled between the inside face of the joists prior to cutting the board.
- The Celotex Insulation Clip is designed to allow insulation boards to be installed between timber joists quickly and without nails or screws.
- Fit the clips at one metre maximum centres along the insulation.
- Push the boards into the void between the joists until they are tight up to the underside of stop battens, ensuring that the lateral joints are tightly butted.
- Secure Celotex PL4000 to the underside of the joists.
- Joints between the boards must be tightly butted, taped and jointed using appropriate tape and jointing material to create the vapour control layer.

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Composite systems can be used to combine Celotex insulation under joist lining with quilt type insulant between the joists which will provide acoustic, as well as thermal insulation. This option is particularly useful when upgrading to modern acoustic insulation standards.

When updating an existing ceiling, Celotex PL4000 can be fitted directly underneath the ceiling, providing there is no vapour check layer such as gloss paint or foil backed plasterboard. Always ensure that there is a 50mm minimum ventilation gap above any original insulation.

Ventilation must be provided above an insulated ceiling directly through the cold void. Failure to do so could result in serious condensation problems that may lead to decay and possible failure.

### 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.

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