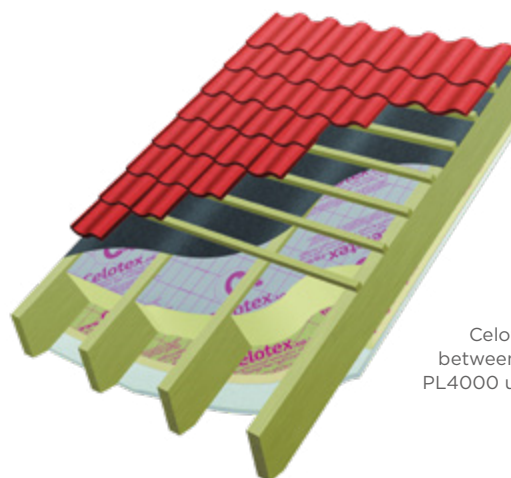


Insulation Between and Under Rafters - Pitched Roof

Use a combination of [Celotex GA4000](#) or [Celotex XR4000](#) with [Celotex PL4000](#) high performance plasterboard thermal laminate in pitched roof [between and under rafter applications](#) to minimise insulation thickness and give the following benefits:

- Provides both the below rafter insulation and plasterboard in one product helping reduce installation time
- Offers the installer maximum flexibility and installation speed due to the tapered edge plasterboard
- Ideal for use with shallow rafters
- Provides reliable long term energy savings for buildings
- Minimised additional loading to the structure
- Ideal for loft conversions / room in roof applications
- Upgrade existing ceilings to current standards



Celotex XR4000
between rafters and
PL4000 under rafters

Celotex GA4000 Technical Data

Thickness (mm)	R-value (m ² K/W)	Maximum Board Weight (kg/m ²)
GA4050	2.25	1.92
GA4060	2.70	2.26
GA4070	3.15	2.61
GA4075	3.40	2.78
GA4080	3.60	2.96
GA4090	4.05	3.31
GA4100	4.50	4.15

Celotex XR4000 Technical Data

Thickness (mm)	R-value (m ² K/W)	Maximum Board Weight (kg/m ²)
XR4110	5.00	4.54
XR4120	5.45	4.93
XR4130	5.90	5.32
XR4140	6.35	5.71
XR4150	6.80	6.10
XR4165	7.50	6.69
XR4200	9.05	8.06

Celotex PL4000 Technical Data

Thickness (mm)	R-value (m ² K/W)	Maximum Board Weight (kg/m ²)
PL4015 + 12.5 [†]	0.70 [‡]	9.69 [‡]
PL4025 + 12.5 [†]	1.20 [‡]	9.99 [‡]
PL4040 + 12.5 [†]	1.85 [‡]	10.46 [‡]
PL4050 + 12.5 [†]	2.30 [‡]	10.96 [‡]
PL4060 + 12.5 [†]	2.75 [‡]	11.31 [‡]
PL4065 + 12.5 [†]	3.00 [‡]	11.48 [‡]

For product information for your project, please contact either our [technical team](#) or our [specification team](#).

[†] 12.5mm tapered edge plasterboard is laminated to the insulation thickness
[‡] insulation component only



We have an experienced team of energy assessors who can carry out SAP calculations, water calculations, airtightness testing and much more. [Contact us](#).



Celotex presents a comprehensive range of thermal bridging models featuring our PIR insulation products. This tool helps you identify the build-up required to reduce heat loss through a typical junction of elements or at openings. [Sign up now](#).

Example U-value calculation: Un-ventilated Between and Under Rafters

Construction		100 deep rafters Thickness (mm)	125 deep rafters Thickness (mm)	150 deep rafters Thickness (mm)	175 deep rafters Thickness (mm)
Outside surface resistance		-	-	-	-
Tiling including batten space		-	-	-	-
Breather membrane		-	-	-	-
Low emissivity cavity, between rafters (11.7% brg)		20	25	30	25
Celotex between rafters @ 400 ctrs (11.7% brg)		GA4080	GA4100	XR4120	XR4150
Variable layer (for below rafters)		See below	See below	See below	See below
Board joints taped for VCL		-	-	-	-
Plaster skim		-	-	-	-
Inside surface resistance		-	-	-	-
Variable Layer	Thickness (mm)	U-value (W/m ² K)	U-value (W/m ² K)	U-value (W/m ² K)	U-value (W/m ² K)
Celotex PL4000	15 + 12.5 [†]	-	-	0.19	0.17
Celotex PL4000	25 + 12.5 [†]	-	0.20	0.17	0.15
Celotex PL4000	40 + 12.5 [†]	0.19	0.17	0.15	0.14
Celotex PL4000	50 + 12.5 [†]	0.18	0.16	0.14	0.13
Celotex PL4000	60 + 12.5 [†]	0.16	0.15	0.13	0.12
Celotex PL4000	65 + 12.5 [†]	0.16	0.14	0.13	0.12

U-value

[†] 12.5mm tapered edge plasterboard is laminated to the insulation thickness

For U-values see variable layer list, or for more options, refer to our online U-value calculator at celotex.co.uk

Installation Guidelines

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

- Install the breather membrane over the rafters. Fix battens to the side of the rafters to allow the membrane to sag between the rafters. Alternatively, fix counter battens over the membrane, leaving the entire rafter depth to be filled with insulation. All details are to be in accordance with the membrane manufacturer's recommendations
- Measure the space to be filled between the inside face of the rafter prior to cutting the board
- Use the Celotex Insulation Saw to cut the boards at a slight angle, making the board width slightly oversized on one surface to achieve a 'friction fit'
- Push the boards into the void between the rafters until they are tight up to the battens or the membrane, ensuring that lateral joints are closely butted. Secure Celotex PL4000 to the underside of the rafters with suitable mechanical fixings. Fixing details should be in accordance with the fixing manufacturer's instructions
- Joints between boards must be tightly butted, taped and jointed using appropriate tape and jointing material to create the vapour control layer.

Where building regulation approval is required, you should take advice from your local building control authority and the building designer.

Certifications and accreditations

Celotex products GA4000 and XR4000 are covered by BBA Agrément Certificate No [17/5405](#) and [17/5357](#). To download a copy of this certificate, visit the 'literature' pages on our website.

Further information

If you wish to contact Celotex, please do so through the '[contact us](#)' page on our website. For information regarding storage, installation and handling of Celotex products, or for health & safety information, please refer to our online 'literature' pages.

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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Example U-value calculation: Ventilated Between and Under Rafters

Construction		100 deep rafters Thickness (mm)	125 deep rafters Thickness (mm)	150 deep rafters Thickness (mm)	175 deep rafters Thickness (mm)
Outside surface resistance		-	-	-	-
Tiling including batten space		-	-	-	-
Sarking felt		-	-	-	-
Ventilated cavity		50	50	50	50
Celotex between rafters @ 400 ctrs (11.7% brg)		GA4050	GA4075	GA4100	XR4120
Variable layer (for below rafters)		See below	See below	See below	See below
Board joints taped for VCL		-	-	-	-
Plaster skim		-	-	-	-
Inside surface resistance		-	-	-	-
Variable Layer	Thickness (mm)	U-value (W/m ² K)	U-value (W/m ² K)	U-value (W/m ² K)	U-value (W/m ² K)
Celotex PL4000	25 + 12.5 [†]	-	-	-	0.19
Celotex PL4000	40 + 12.5 [†]	-	-	0.19	0.17
Celotex PL4000	50 + 12.5 [†]	-	0.20	0.17	0.15
Celotex PL4000	60 + 12.5 [†]	-	0.18	0.16	0.14
Celotex PL4000	65 + 12.5 [†]	0.20	0.17	0.15	0.14

U-value

[†] 12.5mm tapered edge plasterboard is laminated to the insulation thickness

For U-values see variable layer list, or for more options, refer to our online U-value calculator at celotex.co.uk

Installation Guidelines

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

- Make sure there is enough rafter 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 rafter so that the bottom of the batten is 50mm below the sarking felt.
- Measure the space to be filled between the inside face of the rafter prior to cutting the board
- Use the Celotex Insulation Saw to cut the boards at a slight angle, making the board width slightly oversized on one surface to achieve a 'friction fit'
- Push the boards into the void between the rafters until they are tight up to the battens or the membrane, ensuring that lateral joints are closely butted. Secure Celotex PL4000 to the underside of the rafters with suitable mechanical fixings. Fixing details should be in accordance with the fixing manufacturer's instructions
- Joints between boards must be tightly butted, taped and jointed using appropriate tape and jointing material to create the vapour control layer.

Where building regulation approval is required, you should take advice from your local building control authority and the building designer.

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