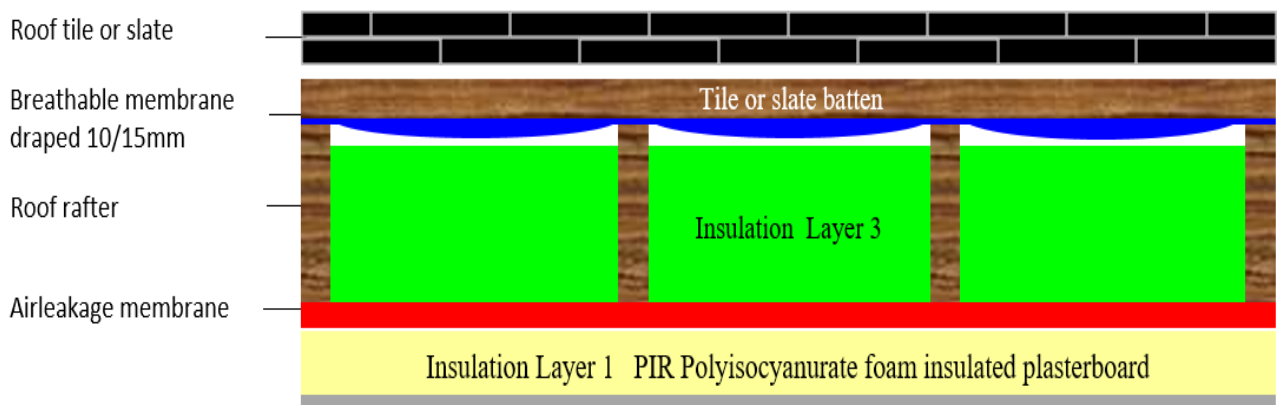


## Application: Rafter Insulation

- **High performance glasswool roll 34** applied **Between** the roof rafters.
- **Warmline PIR Insulated plasterboards** applied **Below** the roof rafters
- U Value Results **0.16, 0.15, 0.14, 13 & 0.12 W/m<sup>2</sup>K**
- Calculation Reference: Rafter 1, 2, 3, 4, 5 & 6



## Building Regulations ROI

The current back stop U Value for the roof rafters is **0.16 W/m<sup>2</sup>K**

The preliminary building energy rating BER certificate will determine the U Value required for all new homes and extensive renovations. In most cases the U Values required are typically lower than the backstops.

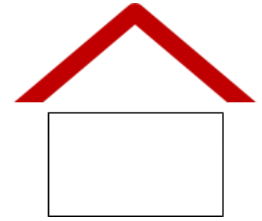
- The lower the U Value the slower the heat loss
- The slower the heat loss the greater the savings

The insulation layer is simply the most important building material to consider when looking to achieve the best energy efficiency rating for your home. If the insulation layer is not fitted correctly it will fail. If the insulation fails, there will be no energy efficiency. The BER result does not take into account badly fitted insulation materials.

U Value Insulation  
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Phone (01) 861 2000  
E Mail [sales@uvalue.ie](mailto:sales@uvalue.ie)  
<http://www.uvalue.ie>

### Insulation Suggestions

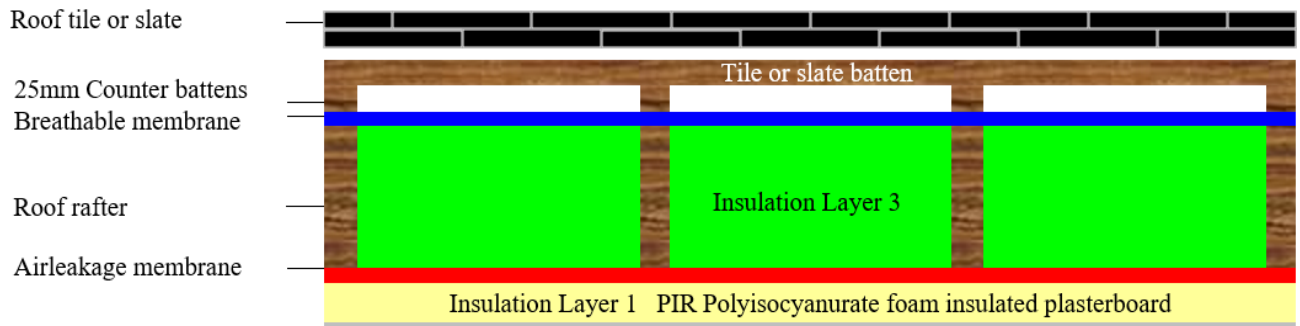
- **150mm** Knauf Earthwool OmniFit Roll **34**
- **150mm** Isover Metac Roll **34**
- **150mm** Superglass Timber and Rafter Roll **34**
- **62.5mm** PIR Warmline Insulated plasterboard



## Application: Rafter Insulation

- **150mm High performance glasswool insulation** applied **Between** the roof rafters
- **62.5mm Warmline PIR Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.16 W/m<sup>2</sup>K**



Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
<b>1</b>	<b>62.5</b>	<b>R-value</b>			<b>2.339</b>		<b>Warmline PIR Ins-Plasterboard</b>
2							Airtight membrane
<b>3</b>	<b>150</b>	<b>0.034</b>	<b>0.130</b>	<b>0.110</b>	<b>4.412</b>	<b>1.154</b>	<b>High performance glasswool roll</b>
4							Breathable roofing membrane
5							25mm Counter battens
6	35	R-value					Air-layer ventilated - Tile battens
7	10	1.000					Roof tile or slate
					<u>0.100</u>		Rse
	<u>258 mm</u> (total roof thickness)				<u>6.951</u>		

Total resistance: Upper limit: 6.336 Lower limit: 5.905 Ratio: 1.073 Average: 6.121 m<sup>2</sup>K/W

U-value (uncorrected) 0.163

### U-value corrections

Air gaps in layer 1  $\Delta U = 0.000$  (Level 0)

Fixings in layer 1  $\Delta U = 0.001$  (4.00 per m<sup>2</sup>, 7.5 mm<sup>2</sup> cross-section,  $\lambda = 17.0$ )

Total  $\Delta U$  0.001

U-value (corrected) 0.164

## U-Value (rounded) 0.16 W/m<sup>2</sup>K

### Contact Your Local Insulation Provider

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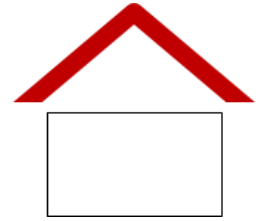
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<http://www.uvalue.ie>

### Insulation Suggestions

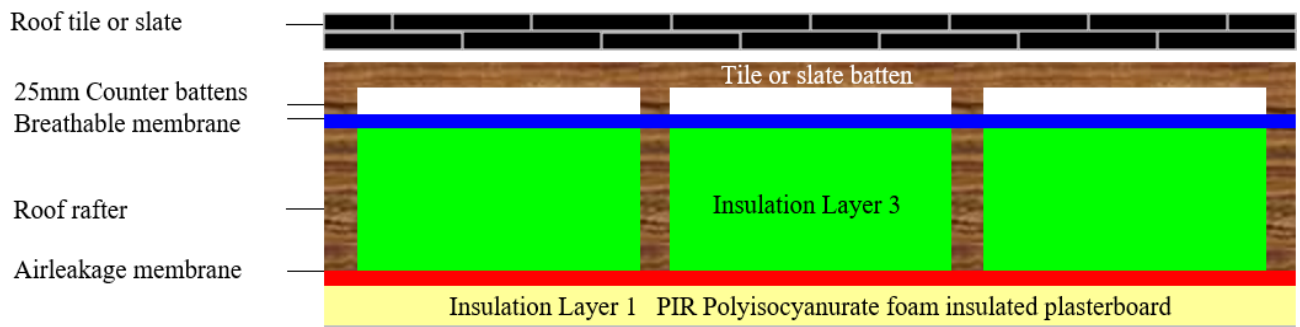
- **150mm** Knauf Earthwool OmniFit Roll **34**
- **150mm** Isover Metac Roll **34**
- **150mm** Superglass Timber and Rafter Roll **34**
- **62.5mm** PIR Warmline Insulated plasterboard



## Application: Rafter Insulation

- **180mm High performance glasswool insulation** applied **Between** the roof rafters
- **62.5mm Warmline PIR Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.15 W/m<sup>2</sup>K**



Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
1	62.5	R-value			2.339		Warmline PIR Ins-Plasterboard
2							Airtight membrane
3	180	0.034	0.130	0.110	5.294	1.385	High performance glasswool roll
4							Breathable roofing membrane
5							25mm Counter battens
6	35	R-value					Air layer ventilated
7	10	1.000					Roof tile or slate
					<u>0.100 #</u>		Rse
<u>288 mm</u> (total roof thickness)					<u>7.833</u>		

Total resistance: Upper limit: 7.059 Lower limit: 6.578 Ratio: 1.073 Average: 6.819 m<sup>2</sup>K/W

U-value (uncorrected) 0.1467

### U-value corrections

Air gaps in layer 1  $\Delta U = 0.0000$  (Level 0)

Fixings in layer 1  $\Delta U = 0.0006$  (4.00 per m<sup>2</sup>, 7.5 mm<sup>2</sup> cross-section,  $\lambda = 17.0$ )

Total  $\Delta U$  0.0006

U-value (corrected) 0.147

## U-Value (rounded) 0.15 W/m<sup>2</sup>K

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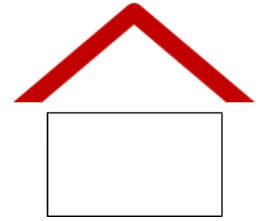
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### Insulation Suggestions

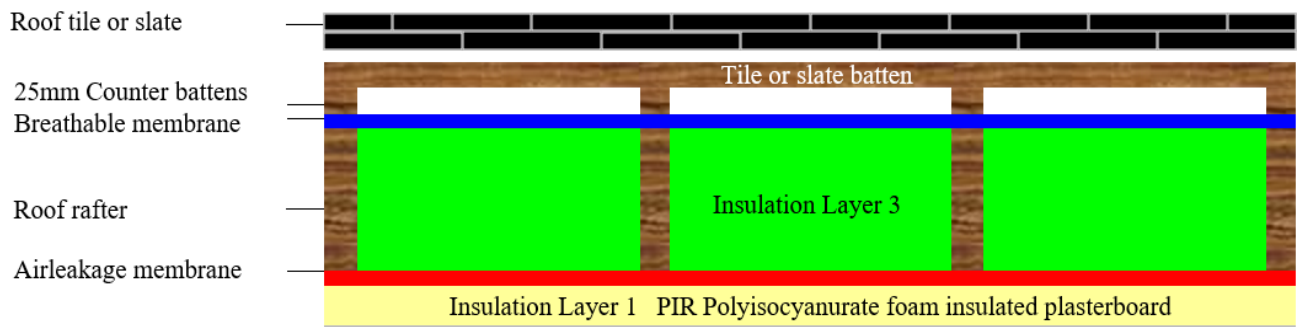
- **180mm** Knauf Earthwool OmniFit Roll **34**
- **180mm** Isover Metac Roll **34**
- **180mm** Superglass Timber and Rafter Roll **34**
- **62.5mm** Warmline PIR Insulated plasterboard



## Application: Rafter Insulation

- **150mm High performance glasswool insulation** applied **Between** the roof rafters
- **72.5mm Warmline PIR Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.15 W/m<sup>2</sup>K**



Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
1	72.5	R-value			0.100		Rsi
2					2.791		Warmline PIR Ins-Plasterboard
3	150	0.034	0.130	0.110	4.412	1.154	Airtight membrane
4							High performance glasswool roll
5							Breathable roofing membrane
6	35	R-value					25mm Counter battens
7	10	1.000					Air layer ventilated
							Roof tile or slate
					0.100 #		Rse
	<u>268 mm</u> (total roof thickness)				7.403		

Total resistance: Upper limit: 6.814 Lower limit: 6.357 Ratio: 1.072 Average: 6.585 m<sup>2</sup>K/W

U-value (uncorrected) 0.152

### U-value corrections

Air gaps in layer 1  $\Delta U = 0.000$  (Level 0)

Fixings in layer 1  $\Delta U = 0.001$  (4.00 per m<sup>2</sup>, 7.5 mm<sup>2</sup> cross-section,  $\lambda = 17.0$ )

Total  $\Delta U$  0.001

U-value (corrected) 0.153

## U-Value (rounded) 0.15 W/m<sup>2</sup>K

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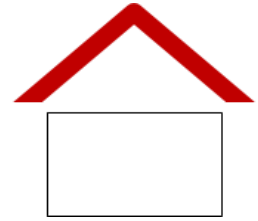
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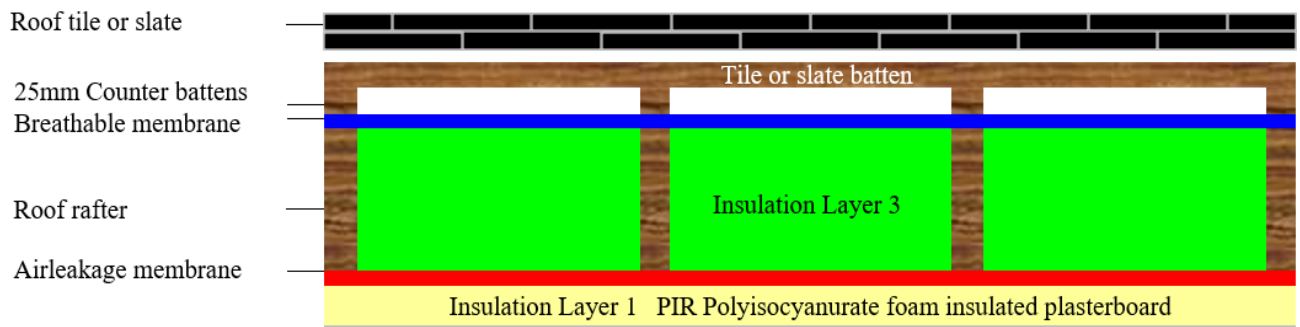
- **150mm** Knauf Earthwool OmniFit Roll **34**
- **150mm** Isover Metac Roll **34**
- **150mm** Superglass Timber and Rafter Roll **34**
- **72.5mm** Insulated plasterboard



## Application: Rafter Insulation

- **180mm** High performance glasswool insulation applied **Between** the roof rafters
- **72.5mm** Warmline PIR Insulated plasterboards applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.14 W/m<sup>2</sup>K**



Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
1	72.5	R-value			0.100		Rsi
2					2.791		Warmline PIR Ins-plasterboard
3	180	0.034	0.130	0.110	5.294	1.385	Airtight membrane
4							High performance glasswool roll
5							Breathable roofing membrane
6	35	R-value					25mm Counter battens
7	10	1.000					Air layer ventilated
							Roof tile or slate
					0.100 #		Rse
	<u>298 mm</u> (total roof thickness)				8.285		

Total resistance: Upper limit: 7.544 Lower limit: 7.030 Ratio: 1.073 Average: 7.287 m<sup>2</sup>K/W

U-value (uncorrected) 0.137

### U-value corrections

Air gaps in layer 1  $\Delta U = 0.000$  (Level 0)

Fixings in layer 1  $\Delta U = 0.001$  (4.00 per m<sup>2</sup>, 7.5 mm<sup>2</sup> cross-section,  $\lambda = 17.0$ )

Total  $\Delta U$  0.001

U-value (corrected) 0.138

## U-Value (rounded) 0.14 W/m<sup>2</sup>K

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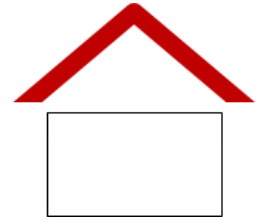
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### Insulation Suggestions

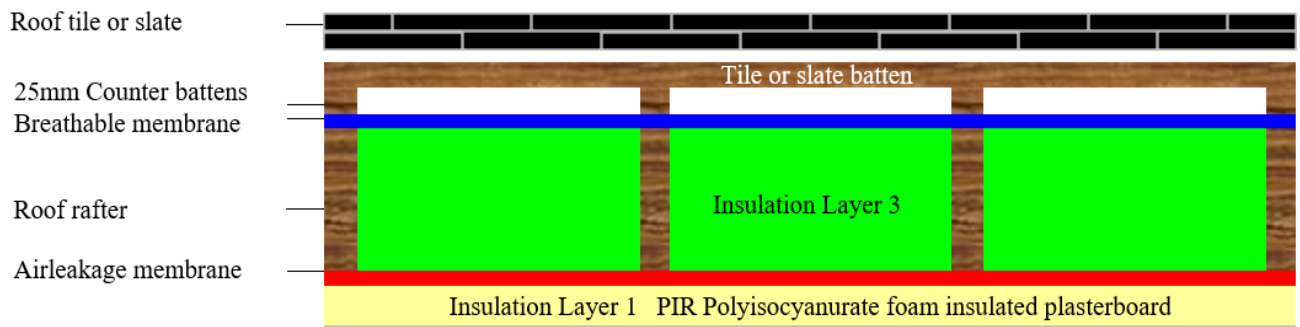
- **180mm** Knauf Earthwool OmniFit Roll **34**
- **180mm** Isover Metac Roll **34**
- **180mm** Superglass Timber and Rafter Roll **34**
- **72.5mm** Warmline PIR Insulated plasterboard



## Application: Rafter Insulation

- **220mm High performance glasswool insulation** applied **Between** the roof rafters
- **62.5mm Warmline PIR Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.13 W/m<sup>2</sup>K**



Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
1	62.5	R-value			0.100		Rsi
2					2.339		<b>Warmline PIR Ins-plasterboard</b>
3	220	0.034	0.130	0.110	6.471	1.692	Airtight membrane <b>High performance glasswool roll</b>
4							Breathable roofing membrane
5							25mm Counter battens
6	35	R-value					Air layer ventilated
7	10	1.000					Roof tile or slate
					<u>0.100 #</u>		Rse
<u>328 mm</u> (total roof thickness)					9.010		

Total resistance: Upper limit: 8.014 Lower limit: 7.476 Ratio: 1.072 Average: 7.745 m<sup>2</sup>K/W

U-value (uncorrected) 0.1291

### U-value corrections

Air gaps in layer 1  $\Delta U = 0.0000$  (Level 0)

Fixings in layer 1  $\Delta U = 0.0004$  (4.00 per m<sup>2</sup>, 7.5 mm<sup>2</sup> cross-section,  $\lambda = 17.0$ )

Total  $\Delta U$  0.0004

U-value (corrected) 0.130

## U-Value (rounded) 0.13 W/m<sup>2</sup>K

### Contact Your Local Insulation Provider

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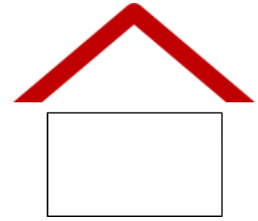
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### Insulation Suggestions

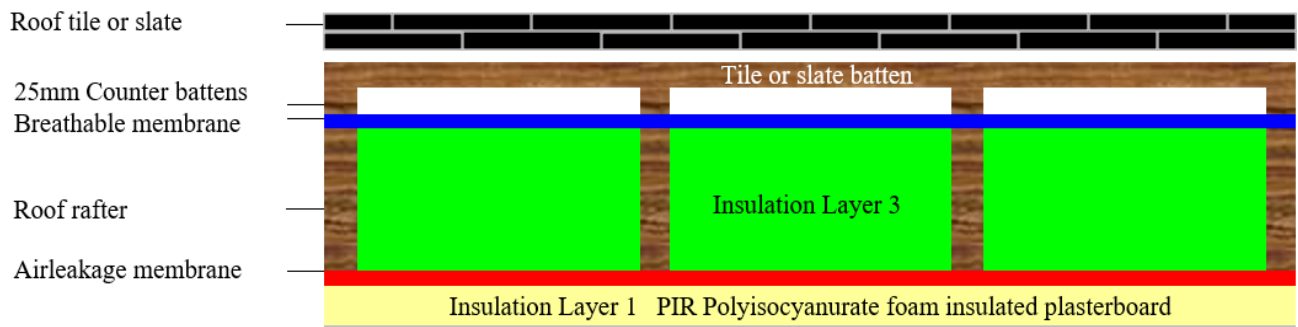
- **220mm** Knauf Earthwool OmniFit Roll **34**
- **220mm** Isover Metac Roll **34**
- **62.5mm** Warmline PIR Insulated plasterboard



## Application: Rafter Insulation

- **220mm High performance glasswool insulation** applied **Between** the roof rafters
- **72.5mm Warmline PIR Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.12 W/m<sup>2</sup>K**



Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
1	72.5	R-value			0.100		Rsi
2					2.791		<b>Warmline PIR Ins-plasterboard</b>
3	220	0.034	0.130	0.110	6.471	1.692	Airtight membrane
4							<b>High performance glasswool roll</b>
5							Breathable roofing membrane
6	35	R-value					25mm Counter battens
7	10	1.000					Air layer ventilated
							Roof tile or slate
					<u>0.100 #</u>		Rse
	<u>338 mm</u> (total roof thickness)				9.462		

Total resistance: Upper limit: 8.507 Lower limit: 7.928 Ratio: 1.073 Average: 8.218 m<sup>2</sup>K/W

U-value (uncorrected) 0.122

### U-value corrections

Air gaps in layer 1  $\Delta U = 0.000$  (Level 0)

Fixings in layer 1  $\Delta U = 0.000$  (4.00 per m<sup>2</sup>, 7.5 mm<sup>2</sup> cross-section,  $\lambda = 17.0$ )

Total  $\Delta U$  0.000

U-value (corrected) 0.122

## U-Value (rounded) 0.12 W/m<sup>2</sup>K

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### Insulation Suggestions

- **220mm** Knauf Earthwool OmniFit Roll **34**
- **220mm** Isover Metac Roll **34**
- **72.5mm** Warmline PIR Insulated plasterboard

# Simple Insulation Solutions - Rafter Insulation

Insulation applied **Between** and **Below** the roof rafters

## Before we can provide a solution we need to know the following

### Question 1

**Applying high performance Glasswool or Rockwool insulation materials between the roof rafters.**

Are you applying timber counter battens above the breathable roofing membrane? Yes, is the best option.

If the answer is **NO**, there will be less insulation space available.

### Question 2

Are you applying a breathable or non-breathable roofing membrane? Breathable is the best option.

If the answer is non-breathable there will be less insulation space available.

### Question 3

What is the depth of the roof rafters? Are they 125mm, 150mm, 180mm or 225mm?

The answer to this question will determine the insulation space available.

### Question 4

What is the spacing/centers between the roof rafters? Are they 300mm, 400mm or 600mm centres?

The answer to this question will determine the bridging factor.

### Question 5

Are you applying an airtight/vapour control membrane below the roof rafters?

Yes, is the best option, airtightness reduces heat loss.

### Question 6

What U value would you like to achieve? Example: 0.16 Good 0.14 Better 0.12 Best

**Note:** For the purpose of the U Value calculations the air layer (air space) between the breathable roofing membrane and the insulation layer is calculated as a ventilated space. The airspace can only be described as an unventilated air layer where the breathable roofing membrane is fully taped and sealed (**not common practice**).

Where a non-breathable (slaters felt) is applied above the roof rafters you must maintain a minimum **50mm fully ventilated airspace (cross flow)** between the slaters felt and the top side of the insulation layer. The purpose of the ventilated airspace is to reduce the risk of condensation and damage to the roof rafters. A 50mm still airspace is not sufficient.

### Best Practice:

Applying additional insulation directly below the roof rafters will reduce the risk of thermal bridging.

### Note:

- The slate or roof tile will not affect the U value result.
- The roof tile battens will not affect the U value result.

Timber roof rafters are natural building materials and will continue to expand and contract over the entire lifetime of the building. Small gaps between the insulation layers and the sides of the roof rafters can considerably reduce the overall thermal performance of the roof. Cold air must not be permitted to circulate on the warm side (inside) of the insulation materials applied between the roof rafters. High performance Glasswool insulation materials are flexible and easy to apply making it easier to achieve a snug fit between the construction layers. Glasswool insulation materials are non-combustible with an A1 Fire rating, Glasswool insulation materials are vapour open allowing the structure to breathe freely through the construction layers. Glasswool will also provide a level of acoustic sound reduction from external conditions such as traffic and rain noise. Glasswool insulation materials provide Thermal, Acoustic, Breathable and Fire Safe solutions.



## Insulation and Associated Building Materials

- 150mm, 180mm, 220mm Knauf Earthwool OmniFit Roll 34
  - 150mm, 180mm, 220mm Isover Metac Roll 34
  - 150mm, 180mm Superglass Timber and Rafter Roll 34
  - 62.5mm PIR Insulated plasterboards.
  - 72.5mm PIR Insulated plasterboards.
- 
- ✓ High performance breathable roof membrane
  - ✓ Eaves carrier
  - ✓ Roof vents
- 
- ✓ Airtight membrane
  - ✓ Airtight tapes
  - ✓ Airtight sealant
- 
- ✓ Roof tiles
  - ✓ Roof slates
  - ✓ Counter battens
  - ✓ Roof tile battens
- 
- ✓ Fire stopping insulation for party walls
- 
- ✓ Loft Walk boards
  - ✓ Pipe lagging
  - ✓ Cold water tank jackets
- 
- ✓ Loft ladders
  - ✓ Downlight covers
- 
- ✓ Plasterboards
  - ✓ Timber drywall screws
  - ✓ Joint filler
  - ✓ Paper joint tape
  - ✓ Scrim tape
  - ✓ Plaster skim coat

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For more information and pricing please call 01-8612000

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