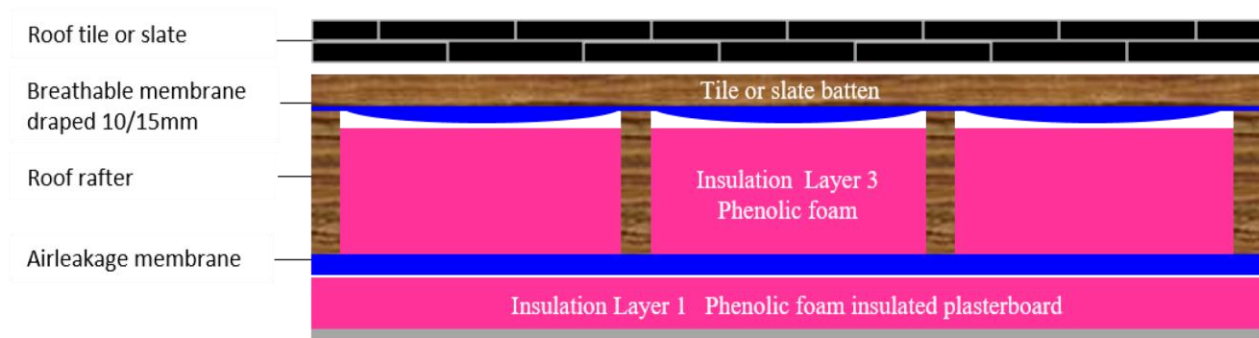


Your One Stop Shop Insulation Provider

Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters
- U Value Results **0.17, 0.16, 0.15, 0.14, 0.13, 12, 11 & 0.10 W/m²K**
- Calculation Reference: Rafter 125mm Kooltherm K7



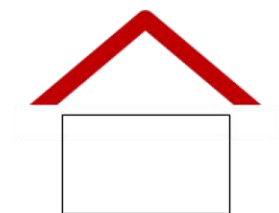
Building Regulations ROI

The current back stop U Value for the roof rafters is **0.16 W/m²K**

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

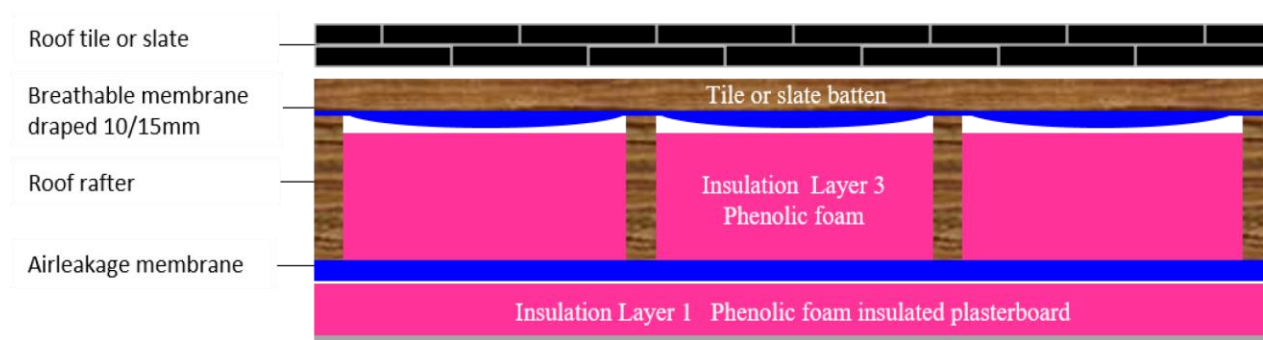
The insulation layer is simply the most important building material to consider when looking to achieve the best energy efficiency rating for your home. If the insulation layer is not fitted correctly it will fail. If the insulation fails, there will be no energy efficiency. The BER result does not take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



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **37.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.17 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	37.5	R-value			1.256		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15						Roof tile or slate
					0.100		Rse
<u>238 mm</u> (total roof thickness)					<u>7.706</u>		

Total resistance: Upper limit: 6.211 Lower limit: 5.350 Ratio: 1.161 Average: 5.781 m²K/W

U-value (uncorrected) 0.173

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.173

U-Value (rounded) 0.17 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,
Ballycoolin Dublin 15.

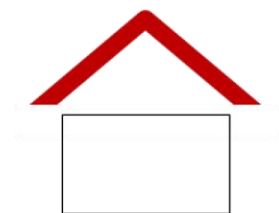
Phone (01) 861 2000

E Mail sales@uvalue.ie

<http://www.uvalue.ie>

Insulation Suggestions

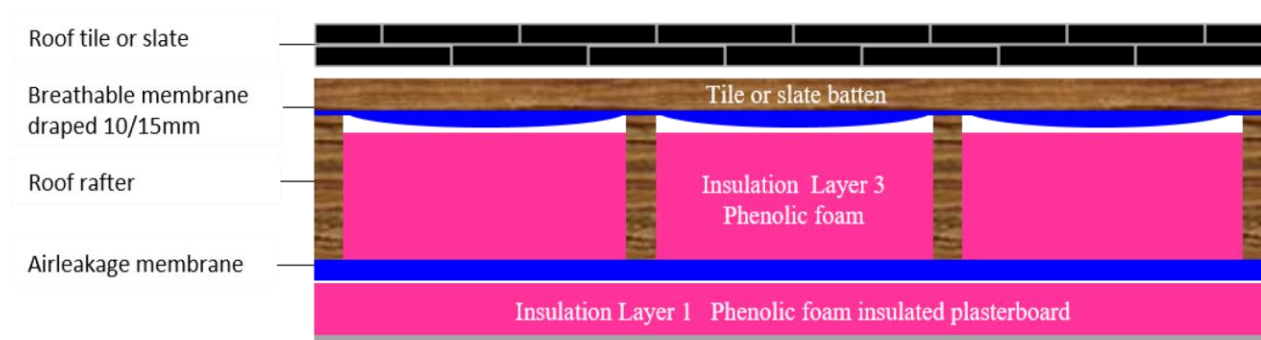
- **125mm** Kingspan K7 Pitch roof board
- **37.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **42.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.16 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	42.5	R-value			1.495		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15						Roof tile or slate
					0.100		Rse
	<u>243 mm</u> (total roof thickness)				7.945		

Total resistance: Upper limit: 6.518 Lower limit: 5.589 Ratio: 1.166 Average: 6.053 m²K/W

U-value (uncorrected) 0.165

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.165

U-Value (rounded) 0.16 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,

Ballycoolin Dublin 15.

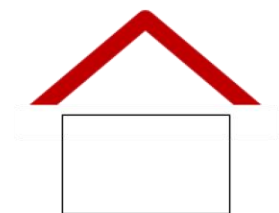
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Insulation Suggestions

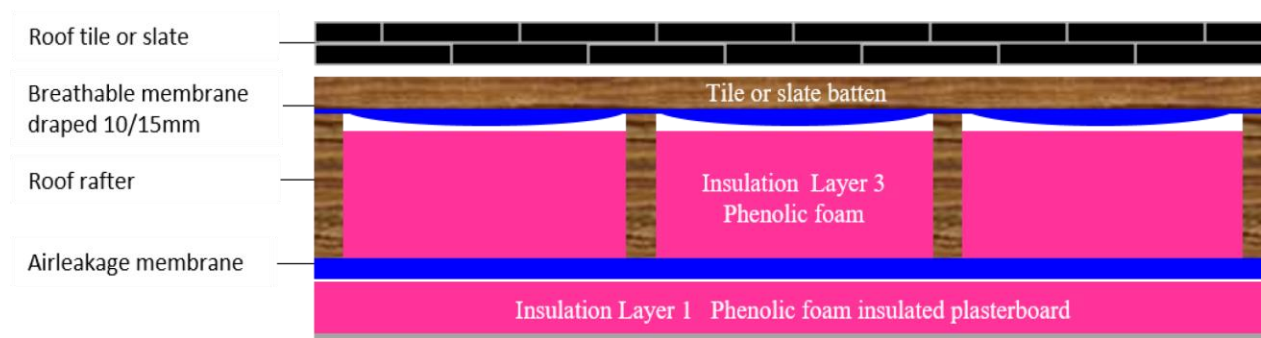
- **125mm** Kingspan K7 Pitch roof board
- **42.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **52.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.15 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	52.5	R-value			1.971		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15	1.000					Roof tile or slate
					0.100 #		Rse
	<u>253 mm</u> (total roof thickness)				8.421		

Total resistance: Upper limit: 7.102 Lower limit: 6.065 Ratio: 1.171 Average: 6.584 m²K/W

U-value (uncorrected) 0.152

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.152

U-Value (rounded) 0.15 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,
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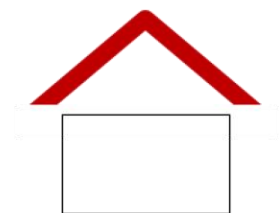
Phone (01) 861 2000

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<http://www.uvalue.ie>

Insulation Suggestions

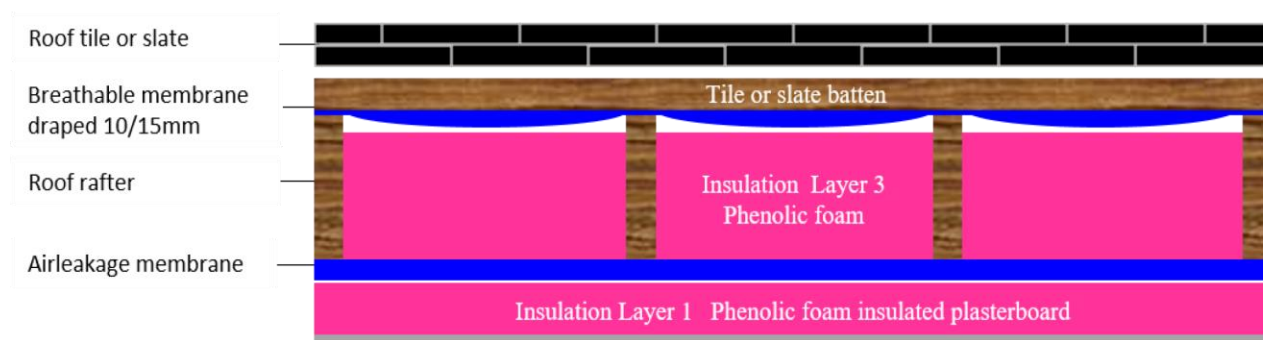
- **125mm** Kingspan K7 Pitch roof board
- **52.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **62.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.14 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	62.5	R-value			2.566		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15						Roof tile or slate
					0.100		Rse
<u>263 mm</u> (total roof thickness)					9.016		

Total resistance: Upper limit: 7.799 Lower limit: 6.660 Ratio: 1.171 Average: 7.229 m²K/W

U-value (uncorrected) 0.138

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.138

U-Value (rounded) 0.14 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,
Ballycoolin Dublin 15.

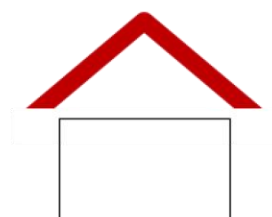
Phone (01) 861 2000

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Insulation Suggestions

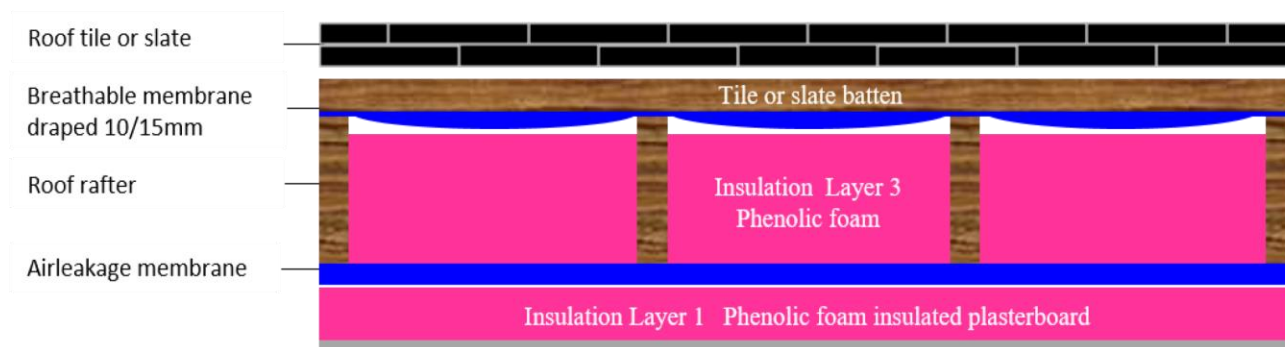
- **125mm** Kingspan K7 Pitch roof board
- **62.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **72.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.13 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
1	72.5	R-value			0.100		Rsi
2					3.066		Kooltherm K7 Ins-Plasterboard
3	125	0.020	0.130	0.110	6.250	0.962	Airtight membrane
4	25	R-value					Kooltherm K7 Pitch roof board
5							Air layer ventilated
6	35	R-value					Breathable roofing membrane
7	15						Air layer ventilated
							Roof tile or slate
					0.100		Rse
<u>273 mm</u> (total roof thickness)					9.516		

Total resistance: Upper limit: 8.365 Lower limit: 7.160 Ratio: 1.168 Average: 7.763 m²K/W

U-value (uncorrected) 0.129

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.129

U-Value (rounded) 0.13 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,

Ballycoolin Dublin 15.

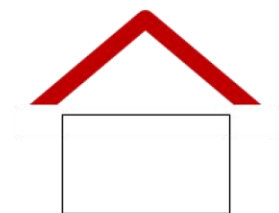
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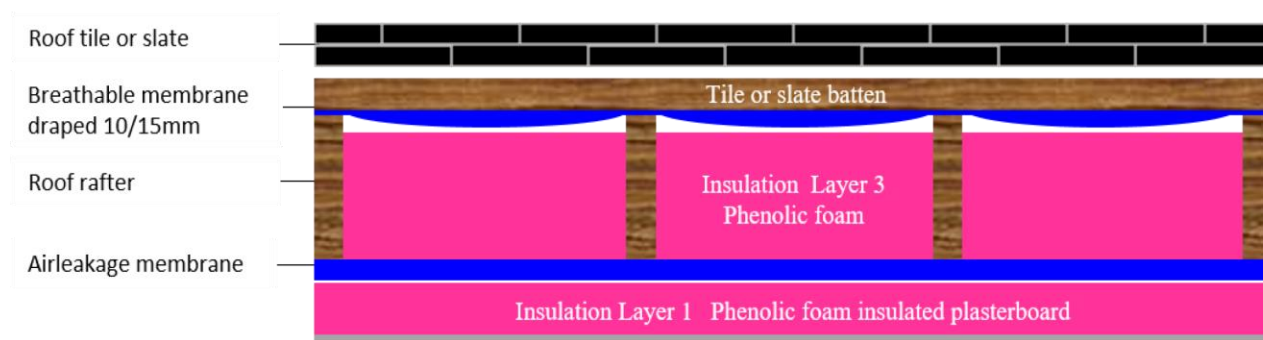
- **125mm** Kingspan K7 Pitch roof board
- **72.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **82.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.12 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	82.5	R-value			3.566		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15	1.000					Roof tile or slate
					<u>0.100 #</u>		Rse
	<u>283 mm</u> (total roof thickness)				10.016		

Total resistance: Upper limit: 8.919 Lower limit: 7.660 Ratio: 1.164 Average: 8.289 m²K/W

U-value (uncorrected) 0.121

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.121

U-Value (rounded) 0.12 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,
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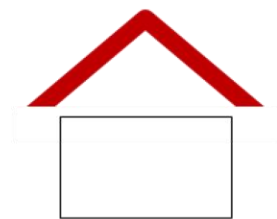
Phone (01) 861 2000

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Insulation Suggestions

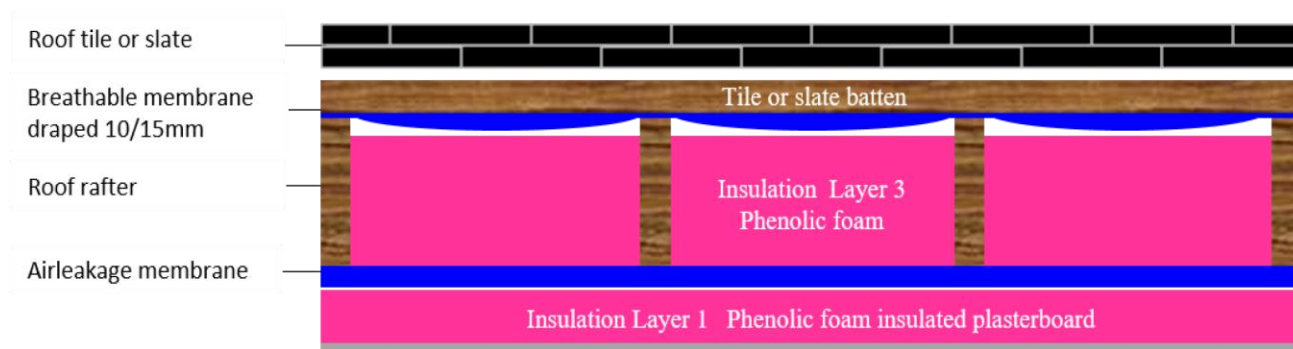
- **125mm** Kingspan K7 Pitch roof board
- **82.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **92.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.11 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	92.5	R-value			4.066		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15	1.000					Roof tile or slate
					<u>0.100 #</u>		Rse
	<u>293 mm</u> (total roof thickness)				10.516		

Total resistance: Upper limit: 9.463 Lower limit: 8.160 Ratio: 1.160 Average: 8.812 m²K/W

U-value (uncorrected) 0.113

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.113

U-Value (rounded) 0.11 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

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Ballycoolin Dublin 15.

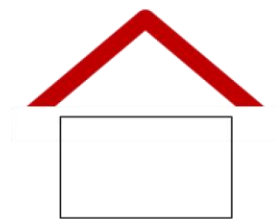
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<http://www.uvalue.ie>

Insulation Suggestions

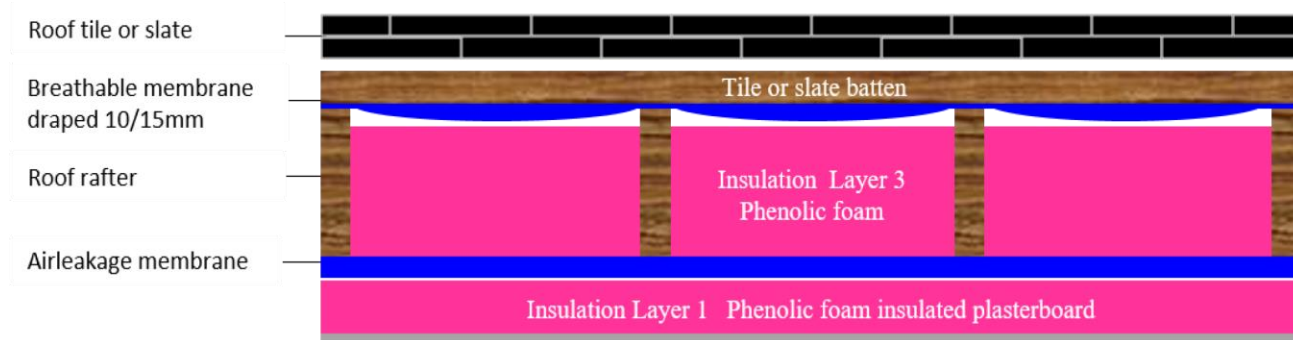
- **125.5mm** Kingspan K7 Pitch roof board
- **92.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **102.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.11 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	102.5	R-value			4.566		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15	1.000					Roof tile or slate
					0.100 #		Rse
<u>303 mm</u> (total roof thickness)					11.016		

Total resistance: Upper limit: 10.000 Lower limit: 8.660 Ratio: 1.155 Average: 9.330 m²K/W

U-value (uncorrected) 0.107

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.107

U-Value (rounded) 0.11 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

Unit 505B, Northwest Business Park,
Ballycoolin Dublin 15.

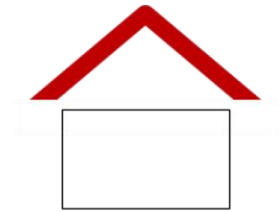
Phone (01) 861 2000

E Mail sales@uvalue.ie

<http://www.uvalue.ie>

Insulation Suggestions

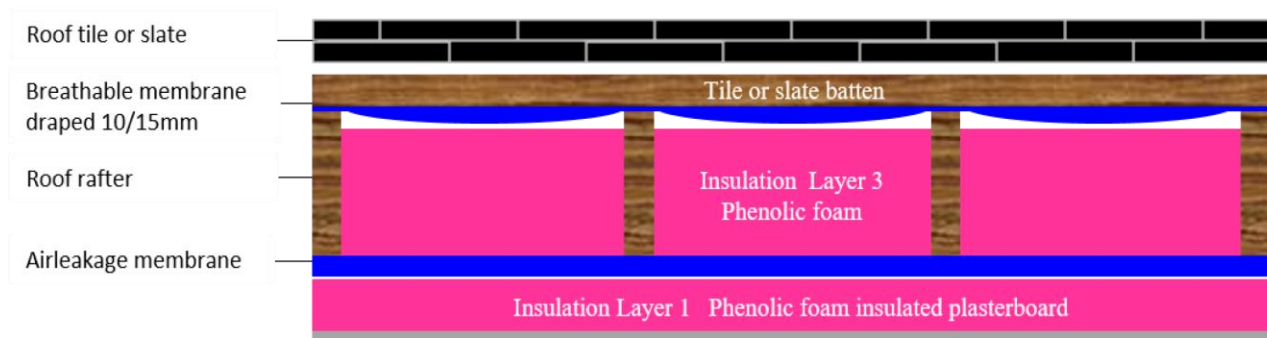
- **125mm** Kingspan K7 Pitch roof board
- **102.5mm** Kingspan K18 Insulated plasterboard



Application: Rafter Insulation

- **125mm Kooltherm K7 Pitch roof boards** applied **Between** the roof rafters
- **112.5mm Kooltherm K18 Insulated plasterboards** applied **Below** the roof rafters

U-Value Calculation Method: I.S. EN ISO 6946 **U-Value Result 0.10 W/m²K**



Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	112.5	R-value			5.066		Kooltherm K7 Ins-Plasterboard
2							Airtight membrane
3	125	0.020	0.130	0.110	6.250	0.962	Kooltherm K7 Pitch roof board
4	25	R-value					Air layer ventilated
5							Breathable roofing membrane
6	35	R-value					Air layer ventilated
7	15	1.000					Roof tile or slate
					<u>0.100 #</u>		Rse
	<u>313 mm</u> (total roof thickness)				11.516		

Total resistance: Upper limit: 10.532 Lower limit: 9.160 Ratio: 1.150 Average: 9.846 m²K/W

U-value (uncorrected) 0.102

U-value corrections

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

No fixings in layer 1

Total ΔU 0.000

U-value (corrected) 0.102

U-Value (rounded) 0.10 W/m²K

Contact Your Local Insulation Provider

U Value Insulation

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Insulation Suggestions

- **125mm** Kingspan K7 Pitch roof board
- **112.5mm** Kingspan K18 Insulated plasterboard

Simple Insulation Solutions - Rafter Insulation

- **125mm Kingspan K7 Pitch roof boards** applied **Between** the roof rafters
- **Kingspan K18 Insulated plasterboards** applied **Below** the roof Rafters

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

Note:

When applying foil faced rigid insulation boards a 25mm airspace space between the top side of the insulation layer and the breathable membrane is recommended by most manufacturers.

Question 1

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 2

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 3

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 4

Are you applying an airtight/vapour control membrane below the roof rafters? Yes, is the best option, airtightness reduces heat loss.

Question 5

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.

Insulation & Associated Building Materials Available from U Value Insulation

Phenolic Foam, foil faced rigid insulation boards

- 125mm Kingspan Kooltherm K7 Pitch roof boards

PIR Insulated plasterboards

- 37.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 42.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 52.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 62.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 72.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 82.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 92.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 102.5mm Kingspan Kooltherm K18 Insulated plasterboard
- 112.5mm Kingspan Kooltherm K18 Insulated plasterboard

- ✓ 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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