

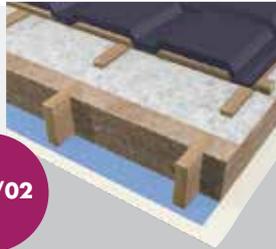
Section 2.2

Pitched Roofs Rafter Level

Between rafters only

Product: Earthwool Rafter Roll or Earthwool Flexible Slab

Pr01/02



Between and below rafter

Product: Earthwool Rafter Roll and Knauf PIR Laminate

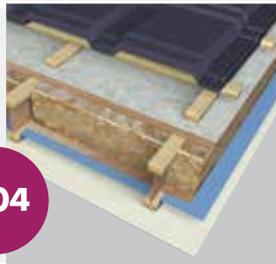
Pr03



Between engineered timber rafters

Product: Earthwool Rafter Roll

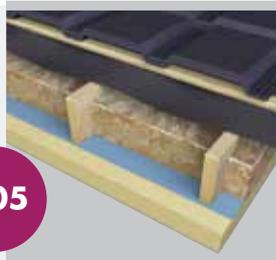
Pr04



Between and below rafters – existing roof

Product: Earthwool Rafter Roll and Knauf PIR Laminate

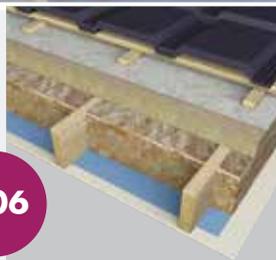
Pr05



Between and above rafters

Products: Rocksilks Pitched Roof Slab and Earthwool Rafter Roll

Pr06



Between and in front of timber studs

Products: Earthwool Rafter Roll and Knauf PIR Laminate

Pr07/08



Pitched roofs – rafter level

Insulation at rafter level design

Rafter level insulation

Insulation between the rafters can be designed in two ways:

- 'Breathing' roof with Low Resistance (LR) underlay
- Ventilated design with High Resistance (HR) underlay

Rafter level insulation with LR underlay

With this option, insulation fully fills the rafter space without an airspace between the insulation and type LR underlay. Counterbattens are needed to ensure wind driven rain drains freely to the gutter.

The space created by the counterbattens allows the dispersion of any water vapour that passes through the LR underlay. Where the roof covering is very tight fitting, eaves ventilation above the underlay is recommended.

A combined air barrier/vapour control layer should be placed on the warm side of the insulation. This not only makes the ceiling convection tight, but also restricts the amount of water vapour passing through the ceiling.

Where cables and piped services are to be installed, the plasterboard lining may be battened out to provide a services duct. The services should be routed on the warm side of the vapour control layer to avoid it being punctured.

Over rafter insulation with LR underlay

Insulation over the rafters provides a completely insulated external envelope to the roof construction, and allows the maximum usable space within the roof enclosure.

The insulation boards are laid across the rafters. It is important that there should be no gaps in the insulation layer and no ventilation between the outside and the attic space. A LR underlay must be provided to allow water vapour to diffuse through the entire roof construction.

Counterbattens are fixed through the insulation boards and LR underlay into the rafters. Where the over rafter insulation is over 50mm thick, consideration should be given to the fixing of the counterbattens.

Further insulation is placed between the rafters to achieve the desired thermal performance. If the insulation board over the rafters has a high vapour resistance, the use of mineral wool between the rafters is not recommended unless the designer is confident that an effective vapour control layer can be provided to the underside of the rafters.

The rafters should be faced with 12.5mm plasterboard, or similar, to provide fire protection.

Rafter level insulation with HR underlay

With this design, a 50mm ventilated airspace is required between the top of the insulation and the tiling underlay. Should the rafter depth be insufficient to accommodate both the required thickness of insulation and the 50mm ventilated airspace, a Knauf PIR Laminate board can be used to underline the rafters and provide additional thermal resistance. This has the added benefit of minimising thermal bridging through the rafters.

Ventilation openings should be provided at each and every roof void at both low and high level. At the eaves, ventilation openings should be equivalent to a 25mm continuous gap. At the ridge the ventilation opening should be the equivalent of a 5mm continuous gap each side of the ridge.

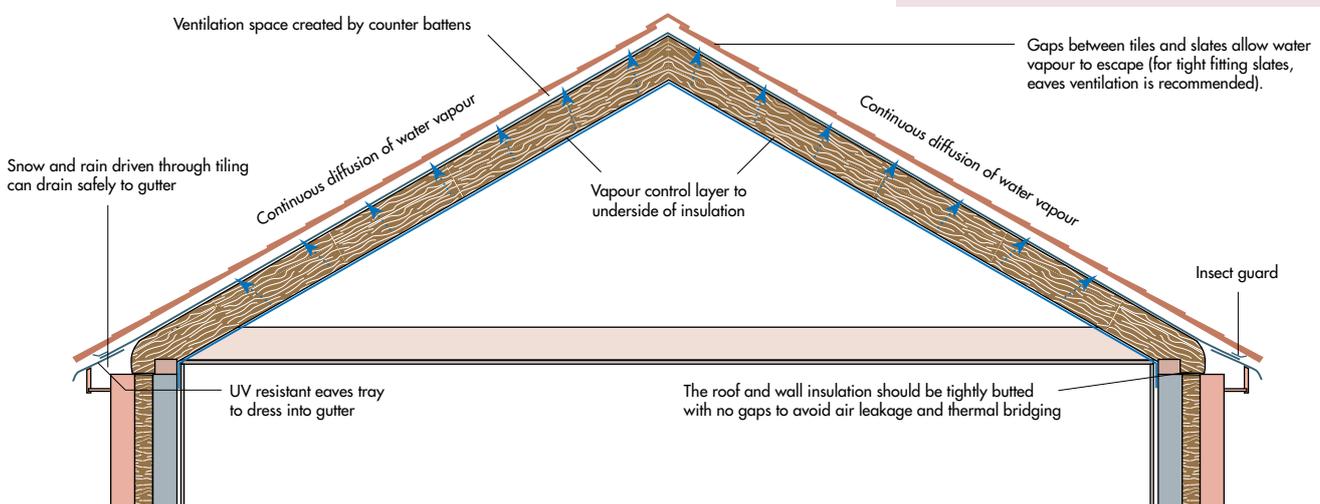
Care is needed where rooflights and dormer windows interrupt the ventilation path. Ventilation to the outside must be provided at the top and bottom of each space between the rafters.

The HR underlay usually drapes by at least 10mm between the rafters. A vapour control layer must be installed to the warm side of the insulation.

BS 5250 provides guidance for pitched roofs with two types of tiling underlay:

- Type HR (high water vapour resistance), such as traditional sarking felt
- Type LR (low water vapour resistance) – less than 0.25 MN s/g)

Rafter level insulation with LR underlay

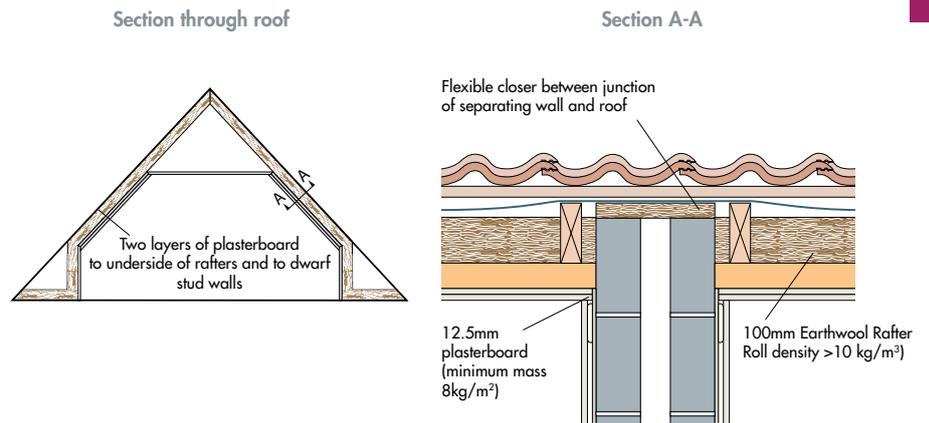


Flanking sound

Roofs insulated at rafter level that adjoin masonry separating walls between 'rooms for residential purposes' can act as a flanking path for sound transmission between the rooms. Installing glass or rock mineral wool between the rafters will restrict the passage of sound from the roof space into the rooms below, reducing the effect of flanking sound transmission. The excellent acoustic properties of glass and rock mineral wool are also beneficial in reducing the noise from road traffic and airplanes as well as rainfall drumming on the roof.

The ceiling and dwarf walls should be lined with two layers of plasterboard with a combined minimum mass of 16 kg/m². Normally this would be achieved using two layers of 12.5mm plasterboard, but could also be achieved using a combined layer of 9.5mm and 15mm plasterboards.

Warm roof construction details to restrict flanking transmission sound and external noise ingress



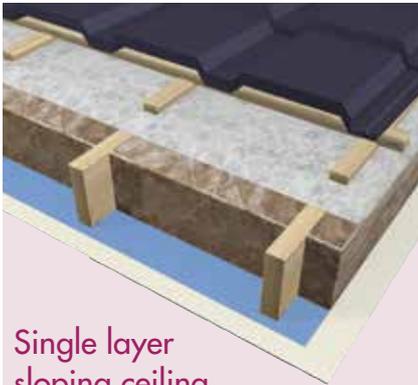
Pitched roofs – rafter level

Insulation at rafter level design

This option allows the designer to omit a flat ceiling and use the space within the roof volume as a functioning area of the property without significantly altering the building envelope. Where cables and piped services are to be installed within the heated envelope, the plasterboard lining may be battened out to provide a service void.

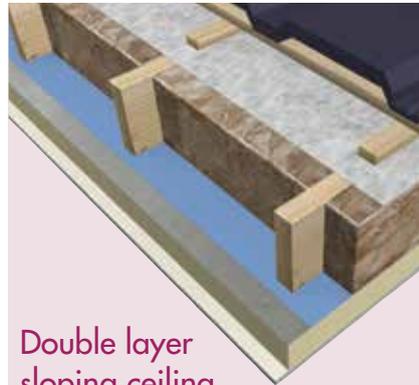
These types of construction require the installation of insulation at rafter level, following the pitch of the roof. Knauf Insulation products provide a number of insulation options for this type of construction, maximising both space and thermal efficiency.

Many designers of commercial and public buildings (especially offices and schools) use the height offered in the pitch of the roof to create light, attractive interiors with high level sloping ceilings which include light wells and roof windows.



Single layer sloping ceiling

- Uses void in structure as insulation zone
- Semi rigid mineral wool products can be friction fitted with no special fixings, speeding up the installation process
- Simple installation from within sealed roof
- Utilises Euroclass A1 insulation throughout
- Using mineral wool insulation will significantly improve the acoustic performance of the roof



Double layer sloping ceiling

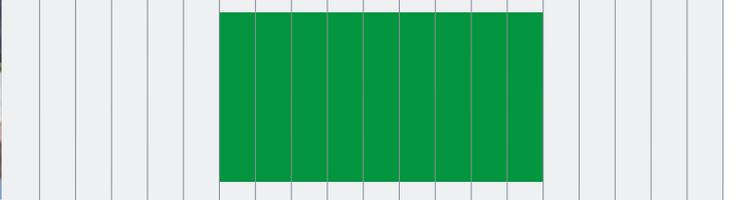
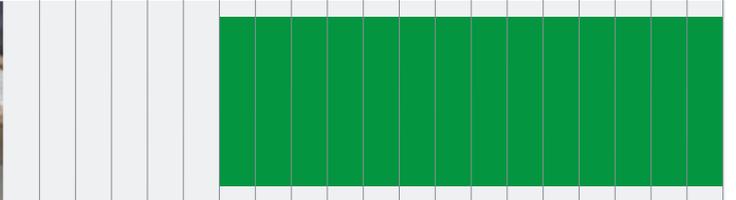
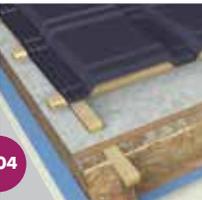
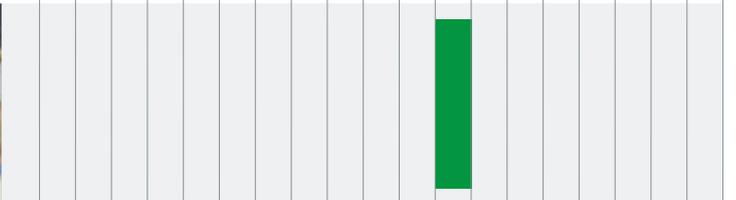
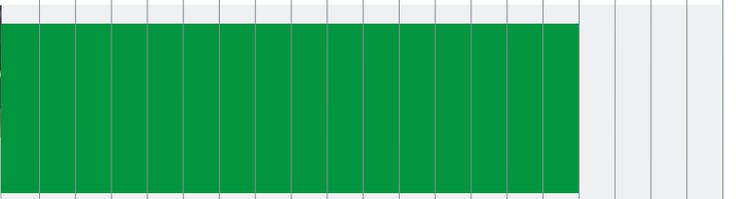
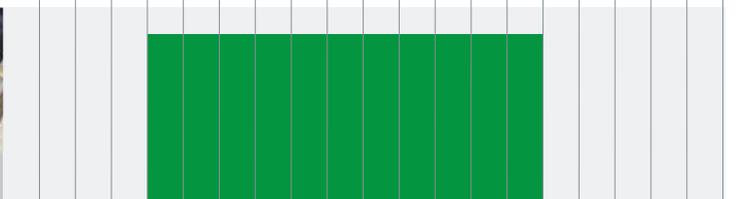
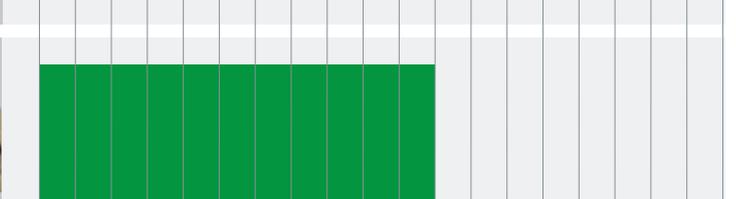
- Systems can achieve low U-values even with shallow rafters
- Minimises thermal bridging through timber rafters
- Solutions with low emissivity air layers provide service void
- Using mineral wool will significantly improve the acoustic performance of the roof



Rafter level sloping ceiling

- Use when low U-values are required and internal lining would restrict head room in the room in roof
- Rafters are within the insulated envelope and kept warm, removing the risk of condensation forming on them
- Using mineral wool will significantly improve the acoustic performance of the roof

Solution optimiser and pathfinder

Knauf Insulation solution	U-values	0.30 0.29 0.28 0.27 0.26 0.25 0.24 0.23 0.22 0.21 0.20 0.19 0.18 0.17 0.16 0.15 0.14 0.13 0.12 0.11 0.10
<p>Between rafters only Product: Earthwool Rafter Roll or Earthwool Flexible Slab See page: 80</p>	 <p>Pr01/02</p>	
<p>Between and below rafter Product: Earthwool Rafter Roll and Knauf PIR Laminate See page: 82</p>	 <p>Pr03</p>	
<p>Between engineered timber rafters Product: Earthwool Rafter Roll See page: 84</p>	 <p>Pr04</p>	
<p>Between and below rafters – existing roof Products: Earthwool Rafter Roll and Knauf PIR Laminate See page: 86</p>	 <p>Pr05</p>	
<p>Between and above rafters Products: RocksilK Pitched Roof Slab and Earthwool Rafter Roll See page: 88</p>	 <p>Pr06</p>	
<p>Between and in front of timber studs Products: Earthwool Rafter Roll and Knauf PIR Laminate See page: 90</p>	 <p>Pr07/08</p>	

Key

-  Thermal insulation achievable by constructions within this document.
-  Pb01 Find online. Visit knaufinsulation.co.uk and key in construction code to find the most up to date information on your chosen solution.

Pitched roofs – rafter level

Between rafters only

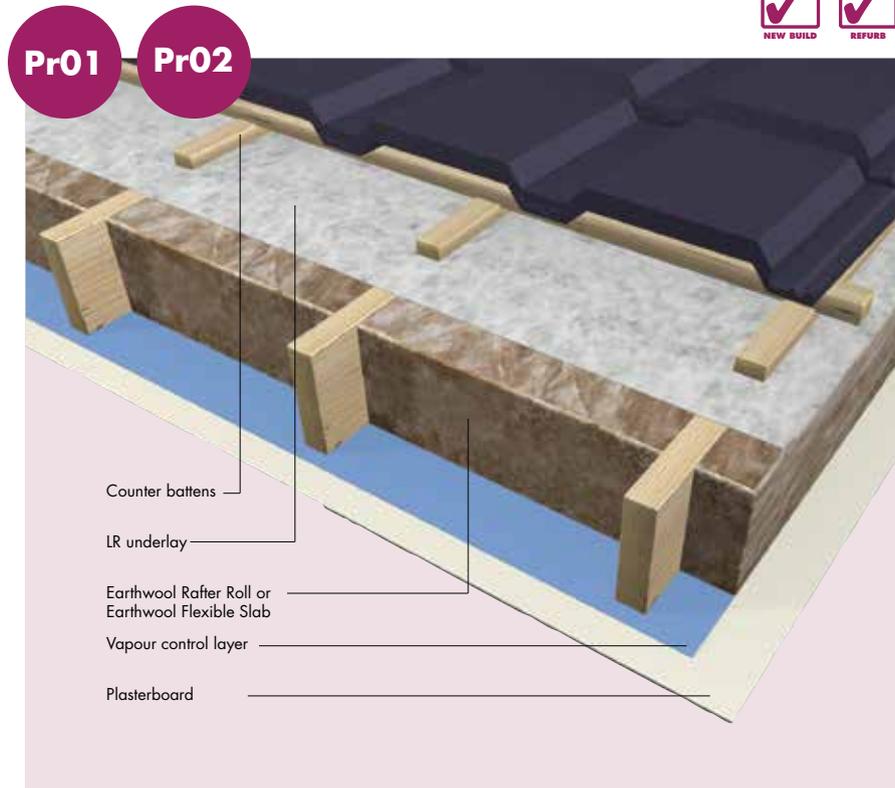
Earthwool Rafter Roll



- Friction fitting between rafters ensures rafter space is fully filled thereby preventing air infiltration
- Can be used to satisfy the requirements of Robust Details, restricting flanking sound around separating walls
- Product is compression packed to reduce transport related CO₂ emissions

Earthwool Rafter Roll and Earthwool Flexible Slab

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide Rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool Rafter Roll is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible, its manufacture has a very low impact on the environment.

Earthwool Flexible Slab is a semi-rigid rock mineral wool slab. In this construction Earthwool Flexible Slab can be used as an alternative to Earthwool Rafter Roll.

Robust Details

In order to comply with the Robust Details requirements for masonry separating walls and roof junctions, the complete ceiling area should contain at least 100mm of mineral wool (10 kg/m³ min) between the rafters and installed so that it is flush with the soffit of the rafters. Any dwarf walls which are adjacent to the separating wall where there are rooms in the roof should also contain at least 100mm of mineral wool (10 kg/m³ min).

Introduction

The most satisfactory method of insulating at rafter level in a roof is when the required thermal performance can be achieved within the depth of the rafters. This is because it does not increase the depth of the roof build up, special fixings are not required and all insulation work can be carried out from within the sealed roof space.

Typical construction

A pitched roof of timber rafters with tiles or slates on battens and counter battens on a LR underlay. The space between the rafters is fully filled with Earthwool Rafter Roll or Earthwool Flexible Slab.

Installation

A LR underlay is pulled taut and laid directly over the rafters. 50x32mm counter battens are nailed into the rafters with minimum penetration of 38mm into the rafter. Alternatively, helical fixings can be used with a minimum penetration of 35mm into the rafter. Tiling battens are nailed to the counter battens. Finally, the roofing tiles or slates are fixed to the manufacturer's recommendations.

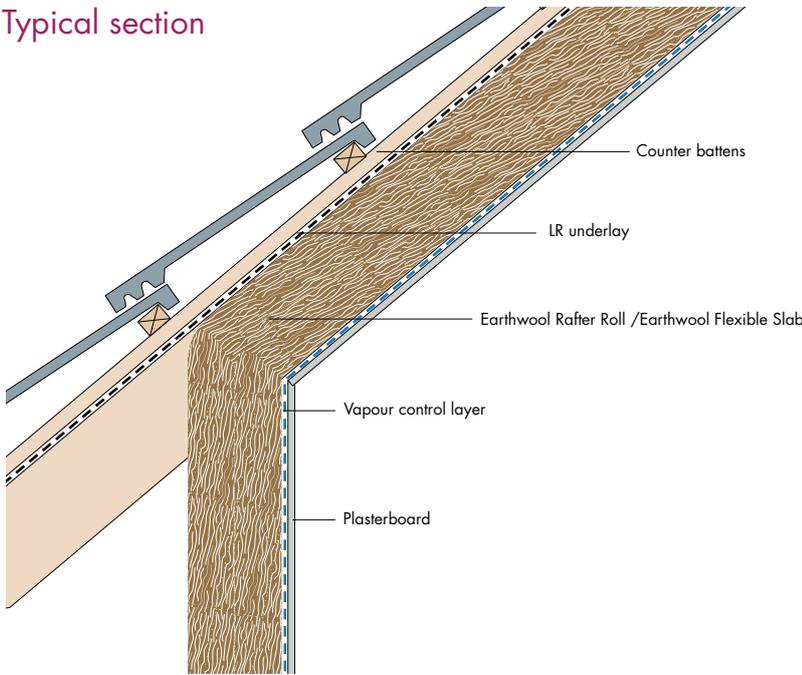
Earthwool Rafter Roll or Earthwool Flexible Slab is simply friction fitted (in layers if necessary) to fully fill the space between the rafters. All layers should be closely butt jointed, and are usually installed from below once the roof is weathertight.

If installed in layers, ensure joints are staggered.

The roof insulation should be cut to shape to link with the wall insulation to avoid a thermal bridge at the eaves.

A continuous vapour control layer should be fixed to the underside of the rafters with all joints, tears and perforations sealed.

Typical section



Typical specification

The whole area of the pitched roof to be insulated with Earthwool Rafter Roll/ Earthwool Flexible Slab* ...mm thick, friction fitted between the rafters. The insulation to be pushed over the wall plate at the eaves to link up with the wall insulation.

(*Delete as appropriate)

nbsPlus Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/140 and 310.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Performance

Thermal performance

Earthwool Rafter Roll has a thermal conductivity of 0.032 or 0.036 W/mK.

Earthwool Flexible Slab has a thermal conductivity of 0.035 or 0.037 W/mK.

Fire performance

Earthwool Rafter Roll and Earthwool Flexible Slab are classified as Euroclass A1 to BS EN 13501-1.

Refurbishment of existing roofs

This is a valid solution for the refurbishment of an existing roof where the roof tiles and roof tile underlay are not being removed. In these circumstances a continuous 50mm ventilated airspace must be maintained between the insulation and the roof tile underlay.

Table 7 - Typical U-values of roofs with insulation between rafters

Pr01	Product	Thickness	U-values
		(mm)	(W/m ² K)
	Earthwool Rafter Roll	250 (2 x 125)	0.15
		225 (100 + 125)	0.16
		200 (2 x 100)	0.18
		175	0.22
		150 (2 x 75)	0.24

BBA Note: Rafter sizes assumed to be 38mm wide at 600mm centres (6.3% bridging) and the same depth as the insulation.

Table 8 - Typical U-values of roofs with insulation between rafters

Pr02	Product	Thickness	U-values
		(mm)	(W/m ² K)
	Earthwool Flexible Slab	250 (2 x 100 + 50)	0.16
		230 (140 + 90)	0.17
		200 (2 x 100)	0.20
		180 (2 x 90)	0.22
		170 (100 + 70)	0.23

BBA Notes: Rafter sizes assumed to be 38mm wide at 600mm centres (6.3% bridging) and the same depth as the insulation.

Pitched roofs – rafter level

Between and below rafters

Earthwool Rafter Roll

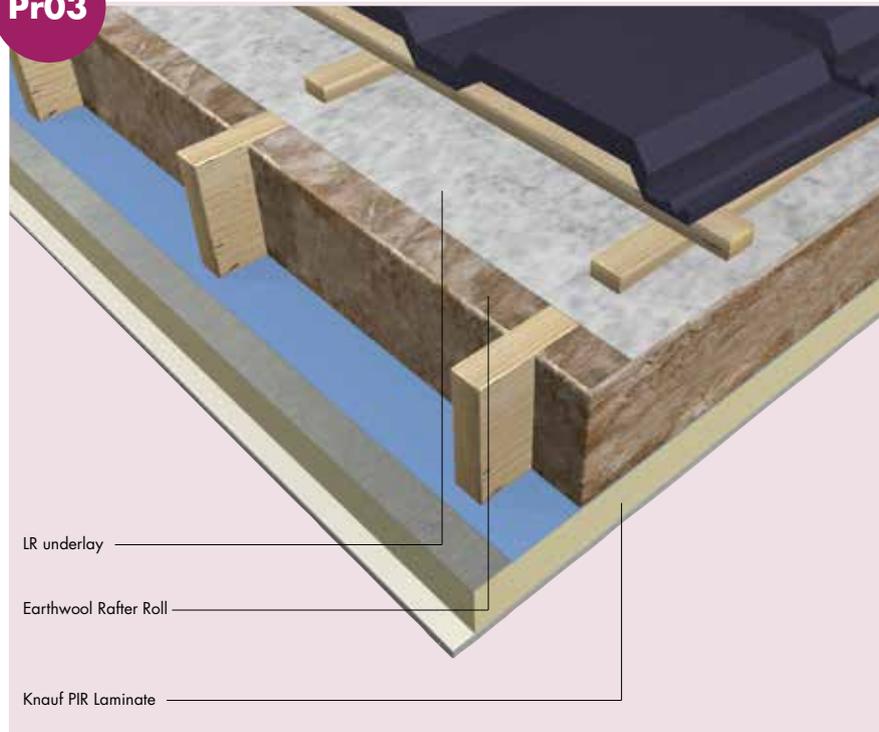


Pr03

- Friction fitting between rafters ensures rafter space is fully filled thereby preventing air infiltration
- Low U-values can be achieved, even with shallow rafters
- Product is compression packed to reduce transport related CO₂ emissions

Earthwool Rafter Roll

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide Rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool Rafter Roll is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible, its manufacture has a very low impact on the environment.

Knauf PIR Laminate is comprised of 9.5mm taper edged plasterboard bonded to a polyisocyanurate (PIR) board*.

*Knauf PIR Laminate is available from Knauf Drywall.

Typical construction

A pitched roof of timber rafters with tiles or slates on battens. Either with counter battens if a LR underlay is pulled taut and insulation is to the full depth of the rafters, or alternatively without counter battens if it is draped and the insulation stops at least 10mm below the top of the rafters. Insulated with Earthwool Rafter Roll between the rafters and lined internally with Knauf PIR Laminate.

Installation

A LR underlay is pulled taut and laid directly over the rafters. 50x32mm counter battens are nailed into the rafters with minimum penetration of 38mm into the rafter, alternatively, helical fixings can be used with a minimum penetration of 35mm into the rafter.

Tiling battens are nailed into the counter battens. Finally, the roofing tiles or slates are fixed, to the manufacturer's recommendations.

Friction fit Earthwool Rafter Roll between the rafters. The insulation should be butt jointed and continuous with the wall insulation to avoid thermal bridging.

Finally, Knauf PIR Laminate is nailed or screwed to the underside of the rafters at maximum 300mm centres at least 12mm in from the board edge.

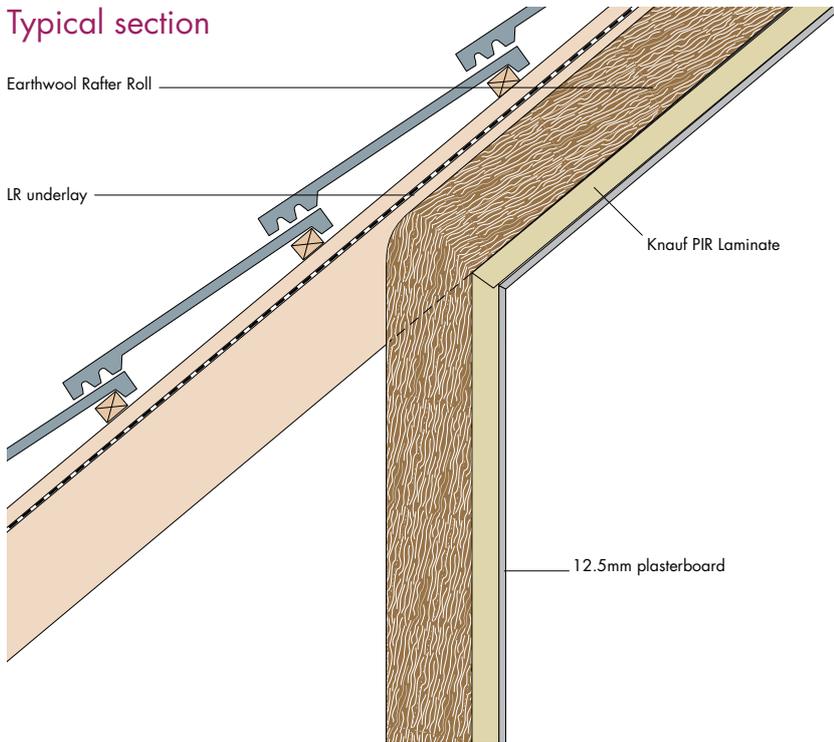
The fixings should be long enough to penetrate at least 25mm into the rafters. The boards are finished using standard drylining techniques.

With service void

Where a service void is provided, nail a foil faced PIR/PUR board to the rafters and tape all the board joints and joints where the board abuts walls, roof windows and other intrusions with self adhesive aluminised tape to complete the vapour control layer. The vapour control layer formed by the PIR/PUR insulation board and the tape should form a complete, unbroken, barrier to the warm side of the insulation. The vapour control layer should be linked to the air barrier in the external walls.

Nail 50mm wide timber battens through the PIR/PUR board into the rafters. The battens to be a minimum of 25mm deep but to suit the required depth of the service void. After installing first fix services, nail plasterboard to the timber battens. The boards are finished using standard drylining techniques.

Typical section



Typical specification

The whole area of the pitched roof to be insulated withmm of Earthwool Rafter Roll, friction fitted between the rafters. The width of the insulation should be appropriate to the spacing of the rafters.

(*Delete as appropriate)

Knauf PIR Laminate thicknessmm nailed or screwed to the rafters at maximum 300mm centres and finished using standard drylining techniques.



Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/140 and 310.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Performance

Thermal performance

Earthwool Rafter Roll has a thermal conductivity of 0.032 or 0.036 W/mK.

The PIR content of Knauf PIR Laminate has a thermal conductivity of 0.022 W/mK, the plasterboard facing has a thermal conductivity of 0.210 W/mK.

Acoustic performance

Earthwool Rafter Roll meets the specification for a mineral wool insulation required for the control of flanking sound as described in Appendix A of Robust Details.

Fire performance

Earthwool Rafter Roll is classified as Euroclass A1 to BS EN 13501-1.

Refurbishment of existing roofs

This is a valid solution for the refurbishment of an existing roof where the roof tiles and roof tile underlay are not being removed. In these circumstances a continuous 50mm gap must be maintained between the insulation and the roof tile underlay which is vented at the eaves and ridge.

Table 9 - Typical U-values with insulation between and below rafters

Product	Thickness (mm)	U-values (W/m ² K)			
		Knauf PIR Laminate (mm)			
		35	50	65	75
Earthwool Rafter Roll					
	250 (2 x 125)	0.12	0.11	0.10	0.10
	225 (100 + 125)	0.13	0.12	0.11	0.11
	200	0.16	0.14	0.13	0.12
	175	0.18	0.16	0.14	0.13
	150 (2 x 75)	0.18	0.16	0.15	0.14
	125	0.21	0.18	0.16	0.15
	100	0.24	0.21	0.18	0.17



Note: Rafter sizes assumed to be 38mm wide at 600mm centres (6.3% bridging) and the same depth as the insulation.

Pitched roofs – rafter level

Between engineered timber rafters

Earthwool Rafter Roll

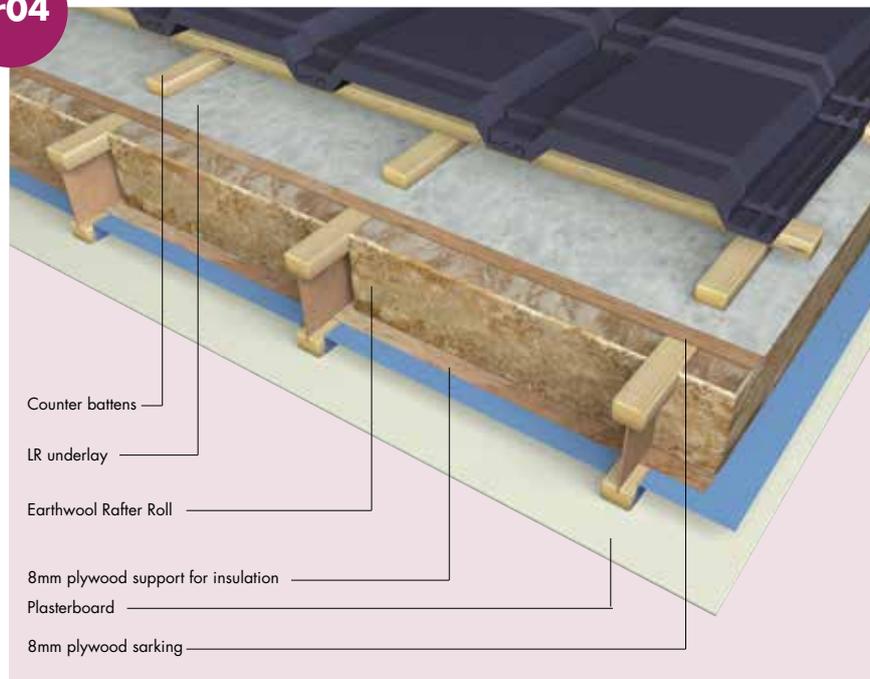


Pr04

- Friction fitting between rafters ensures rafter space is fully filled thereby preventing air infiltration
- No special fixings are required allowing fast installation
- Product is compression packed to reduce transport related CO₂ emissions

Earthwool Rafter Roll

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide Rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool Rafter Roll is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible, its manufacture has a very low impact on the environment.

Typical construction

A pitched roof of engineered timber rafters with tiles or slates on battens. 8mm plywood sarking fixed to the top of the rafters with a LR underlay laid across the plywood. Insulated with Earthwool Rafter Roll between the rafters supported by plywood fixed to the upper edge of the lower flange of the engineered timber rafter and lined internally with a vapour control layer and plasterboard.

Installation

The insulation is fitted from above or below once the roof is watertight.

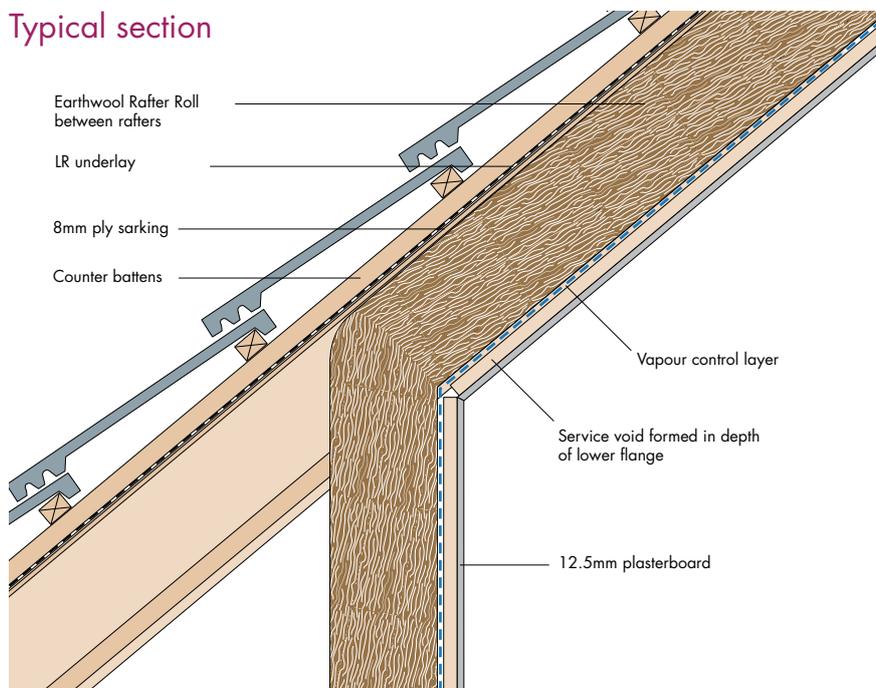
If fitting from above fix the plywood support pieces to the upper edge of the lower flange of the engineered timber rafter making sure the timber fits tightly to the sides of the web of the rafters. Friction fit Earthwool Rafter Roll between the web and upper flange of the engineered timber rafter to the full depth, in layers if necessary. The insulation should be butt jointed and continuous with the wall insulation to avoid thermal bridging.

Fix the 8mm plywood sarking board to the top of the rafters. A LR underlay is laid directly over the plywood sarking board and 50x32mm counter battens placed on top of a LR underlay directly above the rafters and nailed into the rafters with minimum penetration of 38mm into the rafter – alternatively, helical fixings can be used with a minimum penetration of 35mm into the rafter. Tiling battens are nailed into the counter battens and the roofing tiles or slates are fixed to the manufacturer's recommendations.

Install the vapour control layer to the lower face of the plywood support pieces and across the lower edge of each engineered timber flange taping all joints to ensure its integrity is maintained. After first fix services have been installed finish using standard drylining techniques.

If the insulation is fitted from below then the plywood sarking board, a LR underlay, counter battens, tiling battens and slates or tiles are fixed as above. Friction fit Earthwool Rafter Roll (in layers if necessary) between the rafters. The insulation should be butt jointed and continuous with the wall insulation to avoid thermal bridging. Install the insulation support pieces and fix the vapour control layer to the lower face of the plywood support pieces and across the lower edge of each engineered timber flange taping all joints to ensure its integrity is maintained. After first fix services have been installed finish using standard drylining techniques.

Typical section



Typical specification

The whole area of the pitched roof to be insulated with Earthwool Rafter Roll, of thickness mm friction fitted between the engineered rafters. The width of the insulation should be appropriate to the spacing of the rafters.

Staple a vapour control layer to the underside of the rafters and seal all joints.

Nail 50x25mm timber battens to the rafters to form a service void. Nail foil backed plasterboard to the timber battens.



Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/140 and 310.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Performance

Thermal performance

Earthwool Rafter Roll has a thermal conductivity of 0.032 or 0.036 W/mK.

Acoustic performance

Earthwool Rafter Roll meets the specification for a mineral wool insulation required for the control of flanking sound as described in Appendix A of Robust Details.

Fire performance

Earthwool Rafter Roll is classified as Euroclass A1 to BS EN 13501-1.

Table 10 - Typical U-values for roofs with Earthwool Rafter Roll between engineered rafters

Product	Thickness (mm)	U-values (W/m ² K)	
		Service void	Low E service void
Earthwool Rafter Roll	200 (2x100mm)	0.18	0.17



Note: Rafters assumed to be 58mm wide, 241mm deep with 9.5mm web, spaced at 600 centres, with no bracing between the rafters.

Pitched roofs – rafter level

Between and below rafters – existing roof

Earthwool Rafter Roll

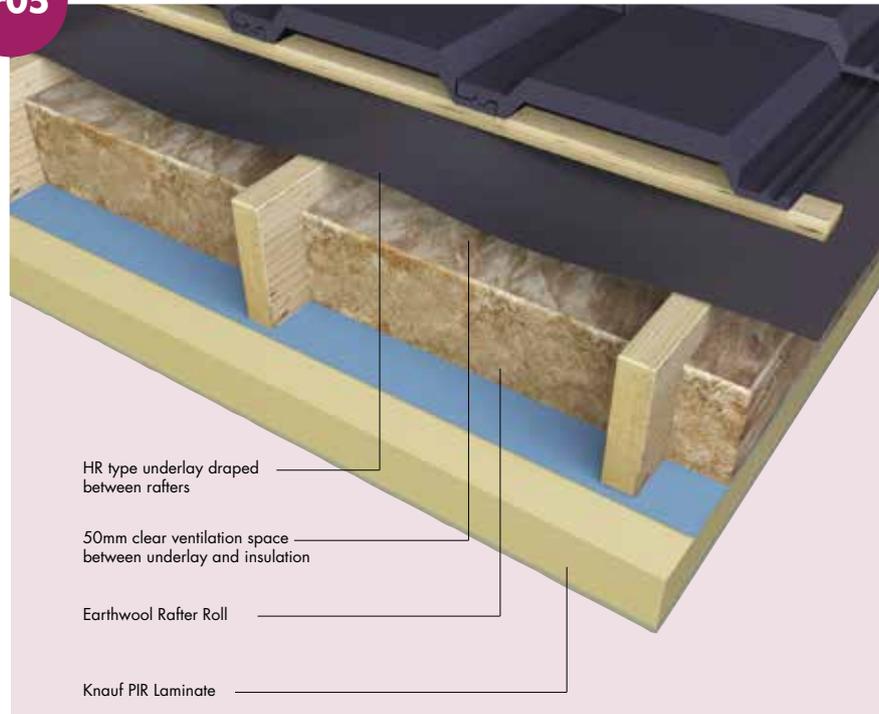


Pr05

- Friction fitting between rafters ensures rafter space is fully filled thereby preventing air infiltration
- Low U-values can be achieved, even if the existing roof has shallow rafters
- Product is compression packed to reduce transport related CO₂ emissions

Earthwool Rafter Roll

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide Rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool Rafter Roll is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible. Its manufacture has a very low impact on the environment.

Knauf PIR Laminate is comprised of 9.5mm taper edged plasterboard bonded to a polyisocyanurate (PIR) board*.

*Knauf PIR Laminate is available from Knauf Drywall.

Typical construction

A pitched roof of timber rafters with tiles or slates on battens on an HR type underlay. Insulated with Earthwool Rafter Roll between the rafters and lined internally with Knauf PIR Laminate.

There must be a continuous 50mm gap above the insulation (installed between the rafters) which is vented at the eaves and ridge. This is the most popular method for insulating an existing roof when a loft is converted to habitable accommodation.

Installation

Earthwool Rafter Roll is friction fitted (in layers if necessary) between the rafters, taking care to leave a 50mm ventilated gap above the insulation.

The rolls should be butt jointed and continuous with the wall insulation to avoid thermal bridging.

Finally, Knauf PIR Laminate is nailed or screwed to the underside of the rafters at maximum 300mm centres at least 12mm in from the board edge. The fixings should be long enough to penetrate at least 25mm into the rafters. The boards are finished using standard drylining techniques.

Performance

Thermal performance

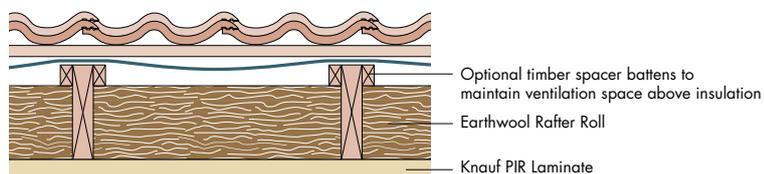
Earthwool Rafter Roll has a thermal conductivity of 0.032 or 0.036 W/mK.

The PIR content of Knauf PIR Laminate has a thermal conductivity of 0.022 W/mK, the plasterboard facing has a thermal conductivity of 0.210 W/mK.

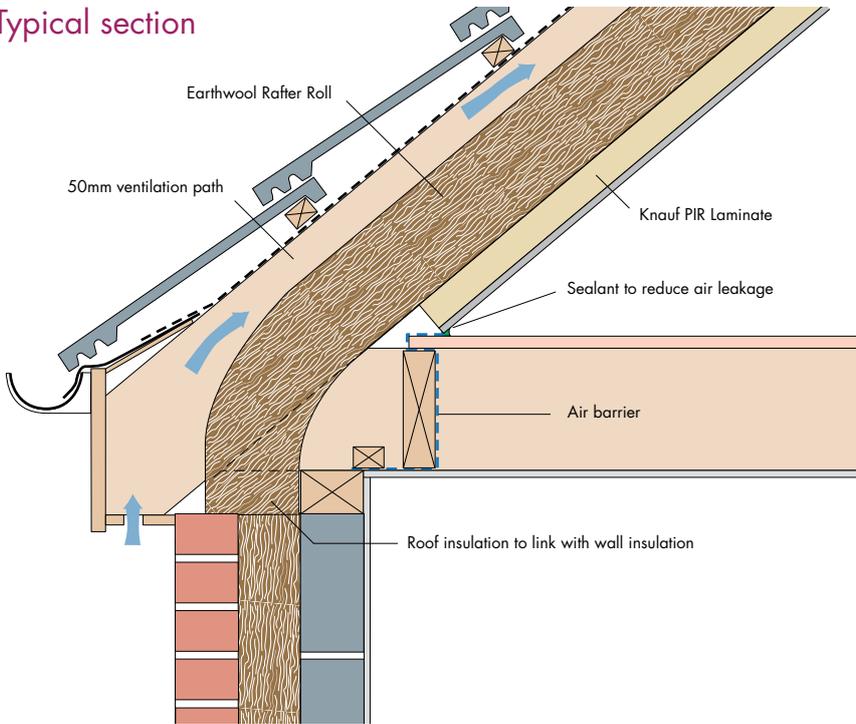
Fire performance

Earthwool Rafter Roll is classified as Euroclass A1 to BS EN 13501-1.

Knauf PIR Laminate is faced with 9.5mm plasterboard which is non-combustible.



Typical section



Typical specification

The whole area of the pitched roof to be insulated with Earthwool Rafter Rollmm thick, friction fitted between the rafters, with a continuous 50mm ventilation space above the insulation. The width of the insulation should be appropriate to the spacing of the rafters.

Knauf PIR Laminate of thicknessmm with integral 9.5mm plasterboard nailed or screwed to the rafters at maximum 300mm centres and finished using standard drylining techniques.

(*Delete as appropriate)



Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/140 and 310 and K10/245.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Table 11 - Typical U-values of pitched roofs with insulation between and below rafters

Product	Thickness (mm)	U-values (W/m ² K) Knauf PIR Laminate (mm)			
		35	50	65	75
Earthwool Rafter Roll	150 (2 x 75)	0.19	0.17	0.15	0.14
	125	0.21	0.19	0.16	0.15
	100	0.25	0.21	0.18	0.17
	85	0.27	0.23	0.20	0.18
	75	0.30	0.25	0.21	0.19



Notes: Existing rafters assumed to be 50mm wide at 600mm centres (8.3% bridging) and the same depth as the insulation plus the airspace. A 50mm ventilated airspace is required between Earthwool Rafter Roll and the existing HR roof tile underlay.

Pitched roofs – rafter level

Between and above rafters

Earthwool Rafter Roll and Rocksilk Pitched Roof Slab

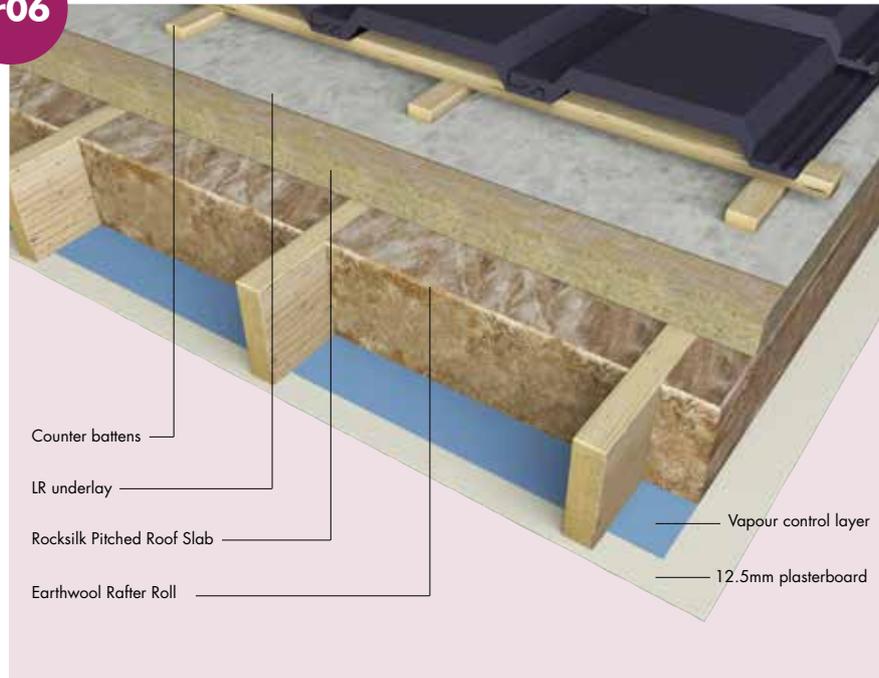


Pr06

- Friction fitting between rafters ensures rafter space is fully filled thereby preventing air infiltration
- Rock mineral wool layer above rafters provides support to the roof structure and reduces impact of thermal bridging
- Earthwool Rafter Roll is compression packed to reduce transport related CO₂ emissions

Earthwool Rafter Roll and Rocksilk Pitched Roof Slab

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide Rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool Rafter Roll is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible, its manufacture has a very low impact on the environment.

Rocksilk Pitched Roof Slab is a compression resistant, water repellent, rock mineral wool slab specifically developed for over rafter (sarking) insulation, its manufacture has a very low impact on the environment.

Typical construction

A pitched roof of timber rafters with tiles or slates on battens and counter battens and a LR underlay. Insulated with Rocksilk Pitched Roof Slab laid over the rafters and Earthwool Rafter Roll, friction fitted between the rafters.

Installation

A timber stop rail is fixed to the ends of the rafters. Rocksilk Pitched Roof Slab is fitted starting from the timber stop rail, with all slabs tightly butted together.

Rocksilk Pitched Roof Slab should be laid across the rafters with staggered joints. The slabs should be cut to length to match the centres of the rafters.

A LR underlay can be installed either below the counter battens (as shown above), or above the counter battens. When installed above the counter battens the LR underlay should be draped by no less than 10mm.

Counter battens should be fixed through the Rocksilk Pitched Roof Slab boards using spiral fixings such as Helifix Inskew 600 or Buildex RG, with a minimum penetration into the rafter of 35mm.

The fixings are to be installed at no greater than 400mm centres along the battens.

From below, Earthwool Rafter Roll is simply friction fitted between the rafters so that it is in direct contact with the Rocksilk Pitched Roof Slab, with no air gaps between the two layers of insulation.

To avoid a thermal bridge at the eaves, Rocksilk Pitched Roof slabs should be cut to shape to link the roof and wall insulation.

A continuous vapour control layer should be fixed to the underside of the rafters.

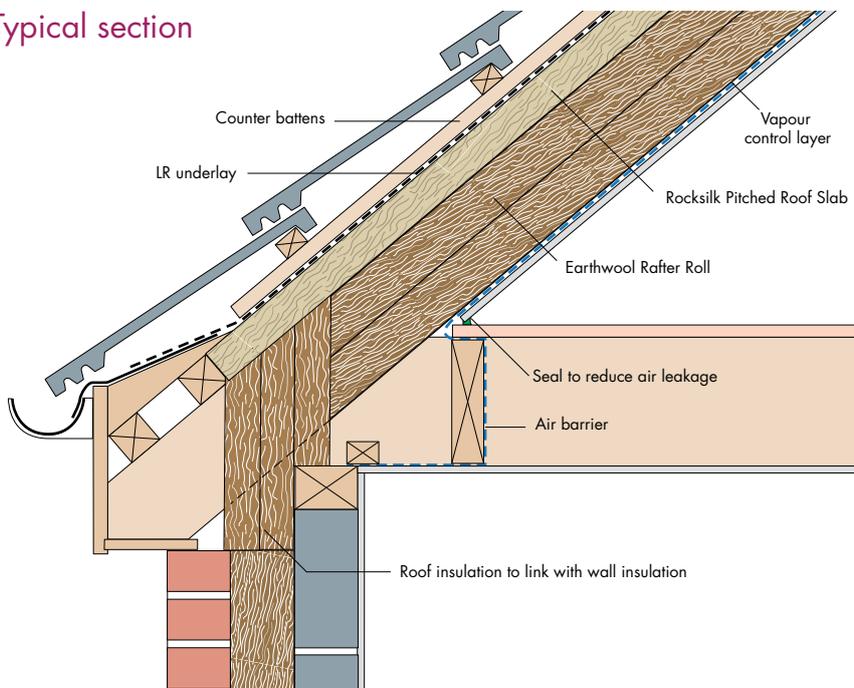
Performance

Thermal performance

Rocksilk Pitched Roof Slab has a thermal conductivity of 0.038 W/mK.

Earthwool Rafter Roll has a thermal conductivity of 0.032 or 0.036 W/mK.

Typical section



Typical specification

Insulation laid over rafters to be Rocksilk Pitched Roof Slab,mm thick. All slabs tightly butted together and with staggered joints. A LR underlay should then be laid over the insulation with the edges lapped.

The insulation and underlay to be held in place by 50 x 32mm counter battens fixed through the slabs, into the rafters. Tiling battens to be nailed into the counter battens.

Earthwool Rafter Roll.....mm thick, to be friction fitted between the rafters. The width of the insulation should be appropriate to the spacing of the rafters.

nbsPlus Alternatively, consult the National Building Specifications, Standard version clause/clauses... K11/695 and P10/140 and 310.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Acoustic performance

Earthwool Rafter Roll meets the specification for mineral wool insulation required for the control of flanking sound as described in Appendix A of Robust Details.

Fire performance

Earthwool Rafter Roll and Rocksilk Pitched Roof Slab are classified as Euroclass A1 to BS EN 13501-1.

Table 12 - Typical U-values of pitched roofs with insulation between and over rafters

Product	Thickness (mm)	U-values (W/m ² K) Rocksilk Pitched Roof Slab (mm)	
		50	70
Earthwool Rafter Roll	200	0.16	0.15
	175	0.17	0.16
	150 (2 x 75)	0.18	0.17
	125	0.21	0.18
	100	0.24	0.21
	85	0.26	0.23

BBA Notes: Rafter sizes assumed to be 38mm wide at 600mm centres (6.3% bridging) and the same depth as the insulation.
CERTIFICATE CS1001-2
U Value Competency Scheme

Pitched roofs - rafter level

Dwarf attic walls

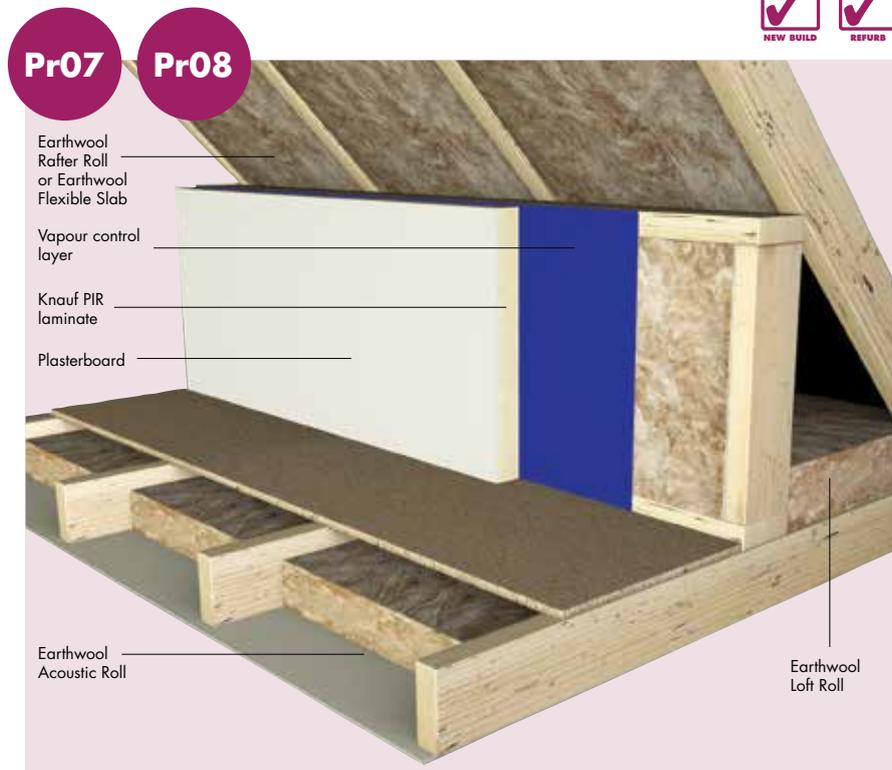
Earthwool Rafter Roll and Earthwool Flexible Slab



- Friction fitting between studs ensures stud space is fully filled thereby preventing air infiltration
- Low U-values can be achieved with shallow studs
- Earthwool Rafter Roll is compression packed to reduce transport related CO₂ emissions

Earthwool Rafter Roll and Earthwool Flexible Slab

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide Rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool Rafter Roll is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible, its manufacture has a very low impact on the environment.

Earthwool Flexible Slab is a multi-purpose, flexible, rock mineral wool slab designed to be friction-fitted between timber studs, its manufacture has a very low impact on the environment.

Knauf PIR Laminate is comprised of 9.5mm taper edged plasterboard bonded to a polyisocyanurate (PIR) board*.

*Knauf PIR Laminate is available from Knauf Drywall.

Typical construction

A timber stud dwarf attic wall insulated with Earthwool Rafter Roll or Earthwool Flexible Slab between the studs and lined internally with Knauf PIR Laminate.

When an existing pitched roof (with an HR underlay) is being converted into habitable accommodation with insulation at rafter level a 50mm ventilated rafter airspace must be maintained between the insulation and the HR underlay. The 50mm ventilated airspace must not be compromised by the installation of the dwarf attic wall.

Installation

Earthwool Rafter Roll or Earthwool Flexible Slab (the same depth as the studs) is friction fitted between the timber studs. The insulation should be butt jointed and in contact with the sole, head plate and timber studs forming the dwarf attic wall. Timber battens (25mm x 38mm) should be fixed on the cold side of the attic wall studs as a secondary measure to maintain the position of the insulation between the studs, alternatively staple mesh to the back of the timber studs, access permitting.

A vapour control layer is then installed to the face of the studs which in turn is overlaid with Knauf PIR Laminate which is secured with either nails or screws to the studs at maximum 300mm centres and at least 12mm in from the board edge. The fixings should be long enough to penetrate as least 25mm into the timber studs. The boards are finished using standard drylining techniques.

Performance

Thermal

Earthwool Rafter Roll has a thermal conductivity of 0.032 or 0.036 W/mK.

Earthwool Flexible Slab has a thermal conductivity of 0.035 or 0.037 W/mK.

The PIR content of Knauf PIR Laminate has a thermal conductivity of 0.022 W/mK and the plasterboard has a thermal conductivity of 0.210 W/mK.

Acoustic

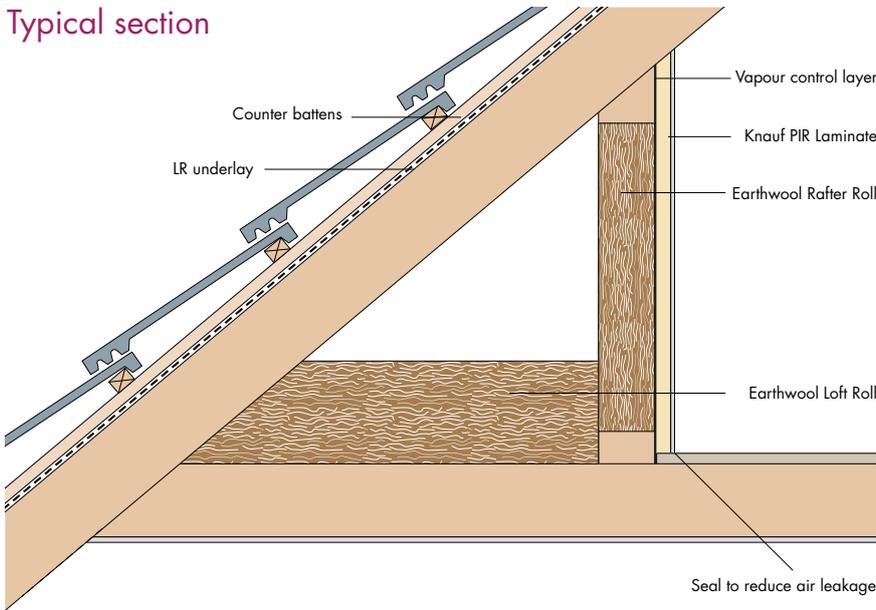
Earthwool Rafter Roll and Earthwool Flexible Slab provide a high level of sound absorption and can significantly improve the acoustic performance of dwarf attic walls.

Fire

Earthwool Rafter Roll and Earthwool Flexible Slab are classified as Euroclass A1 to BS EN 13501-1.

Knauf PIR Laminate is faced with 9.5mm plasterboard which is non-combustible.

Typical section



Typical specification

Earthwool Rafter Roll*/Earthwool Flexible Slab*mm thick to be friction fitted between the timber studs. The whole area of the wall to be overlaid with a vapour control layer which is stapled to the timber studs.

Knauf PIR Laminate of thicknessmm with integral 9.5mm plasterboard nailed or screwed to the timber studs at maximum 300mm centres and finished using standard drylining techniques.

(*Delete as appropriate)



Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/210 and 310 and K10/205.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Table 13 - Typical U-values of dwarf attic walls insulation between and over studs

Product	Thickness (mm)	Knauf PIR Laminate Thickness (mm)	U-values (W/m ² K)
Earthwool Rafter Roll	100	65	0.18
	100	50	0.20
	100	35	0.23
	75	65	0.20
	75	50	0.23
	75	35	0.27
Earthwool Flexible Slab	100	65	0.18
	100	50	0.21
	100	35	0.25
	70	65	0.21
	70	50	0.24
	70	35	0.29

Pr07

Pr08



Notes: Studs assumed to be 38mm wide at 600mm centres with 0.13% bridging. Thermal conductivity of timber studs is 0.13W/mK. An additional R-value of 0.50 m²K/W has been included to account for the pitched roof airspace behind the dwarf attic wall as defined and detailed in BR 443.

Knauf Insulation Ltd
PO Box 10
Stafford Road
St Helens
Merseyside
WA10 3NS

Customer Service (Sales)
Tel: 0844 800 0135
Fax: 01744 612007
Email: sales.uk@knaufinsulation.com
www.knaufinsulation.co.uk

Technical Advice and Support Centre
Tel: 01744 766 666
Fax: 01744 766 667
Email: technical.uk@knaufinsulation.com

Literature
Tel: 08700 668 660
Fax: 0870 400 5797
Email: info.uk@knaufinsulation.com

KNAUFINSULATION
it's time to save energy