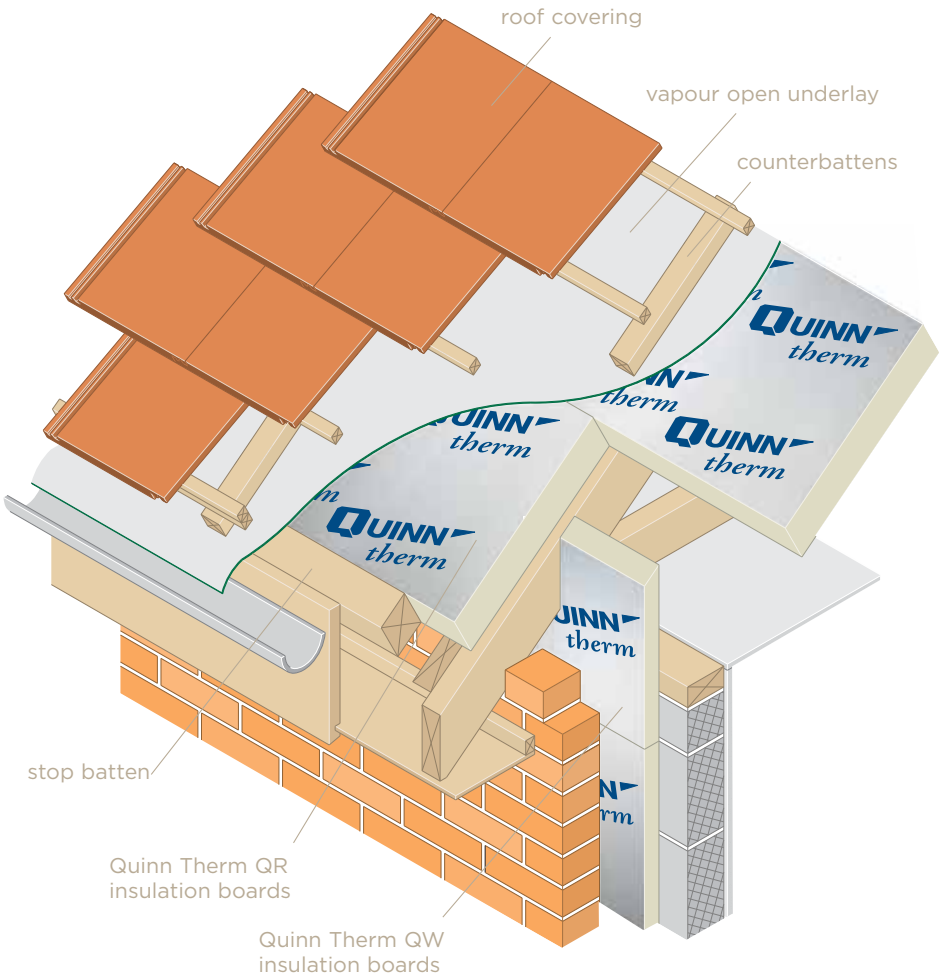
Quinn Therm

Insulating pitched roofs above the rafters



KEY PROPERTIES

Quinn Therm:

- does not readily absorb water, making it suitable for use in damp environments;
- is light, robust and easy to handle; it may be worked using a saw or sharp knife;
- is durable and will perform for the service life of the building.

MEETING REGULATIONS

Required thicknesses of Quinn Therm QR (mm)

Required U-value (W/m²K)	0.25	0.20	0.18	0.16
Thickness of Quinn Therm (mm)	75	100	115	130

Results based upon roof construction of: 12.5mm plasterboard, polyethylene VCL, 150mm deep rafters at 600mm centres, Quinn Therm QR insulation (thickness as shown), vapour open underlay, 50mm cavity formed by counterbattens and battens, large format concrete tiles.

Calculations performed to BS EN ISO 6946:1997, taking account of repeating thermal bridges.

* Overall heat loss method.

For U-value calculations for other roof constructions contact Quinn Technical Services.

DESIGN NOTES

- a vapour control layer is required behind the surface finish to prevent condensation forming within the structure. Contact Quinn Technical Services for advice on condensation control.
- a vapour open underlay (vapour resistance < 0.25MNs/g) should be installed as a secondary protection against wind-driven rain and snow.
- counterbattens allow rain and snow to drain from the underlay to the gutter and form a vented airspace to minimise condensation risk.

INTRODUCTION

Quinn Therm QR (Quinn Roof) is a PIR (polyisocyanurate) insulation for creating warm pitched roofs by insulating above the rafter.

Insulating a pitched roof at rafter line - to create what is usually known as a warm roof - makes full use of the building volume by making the roof space available for occupation. Having the insulation at rafter line can also reduce stress on the structure and, even if the loft space is not utilised, there is still the benefit in having water tanks and other services within the insulated area.

Forming a warm roof by laying in a continuous layer above the rafters avoids thermal bridging, and so minimises the depth of insulation required to meet building regulations. This form of construction is suitable for new build, as well as projects where the roof will be stripped and re-covered.

Quinn Therm QR rigid insulation is well suited to use in warm roof constructions: it is robust enough to span the rafters and withstand transferred loads from the roof covering and will resist moisture. Also, its high thermal resistance enables the required U-value to be achieved with a minimum thickness of insulation, which reduces the loads applied to fixings.

DESIGN

Thermal bridging

To limit heat loss and prevent problems such as condensation, mould growth and staining occurring at cold spots in the construction, it is desirable to design junctions between elements so as to maintain continuity of insulation. For roofs the key junctions are those at eaves and gable, where wall insulation should be continuous with roof insulation.

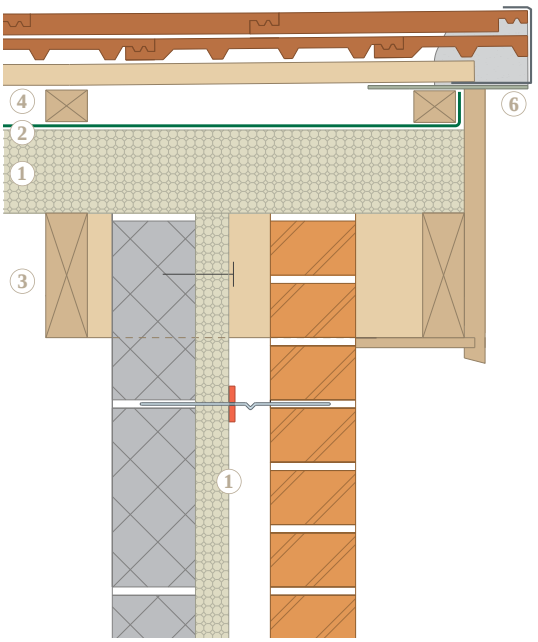
At eaves, wall insulation should be continued between the rafters until it butts the underside of the Quinn Therm QR boards. Where there is a cavity closer at the wall head the additional wall insulation may be fixed to the wall plate. Gable walls should be insulated for their full height and the insulation extended to meet the underside of the Quinn Therm QR boards.

The details shown here are designed to minimise thermal bridging and air leakage.

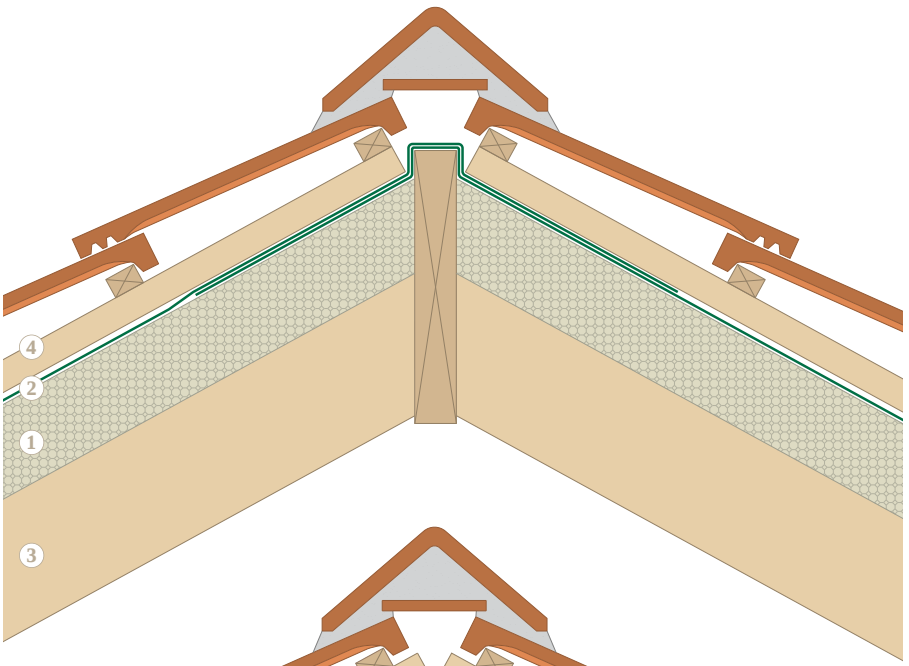
CONDENSATION CONTROL

To minimise the risk of interstitial condensation the roof structure should be progressively more vapour open from inside to outside; that may be achieved by using a high resistance insulation such as Quinn Therm QR and a vapour open underlay beneath the roof covering. The use of a vapour control layer between the insulation and the internal finish is recommended.

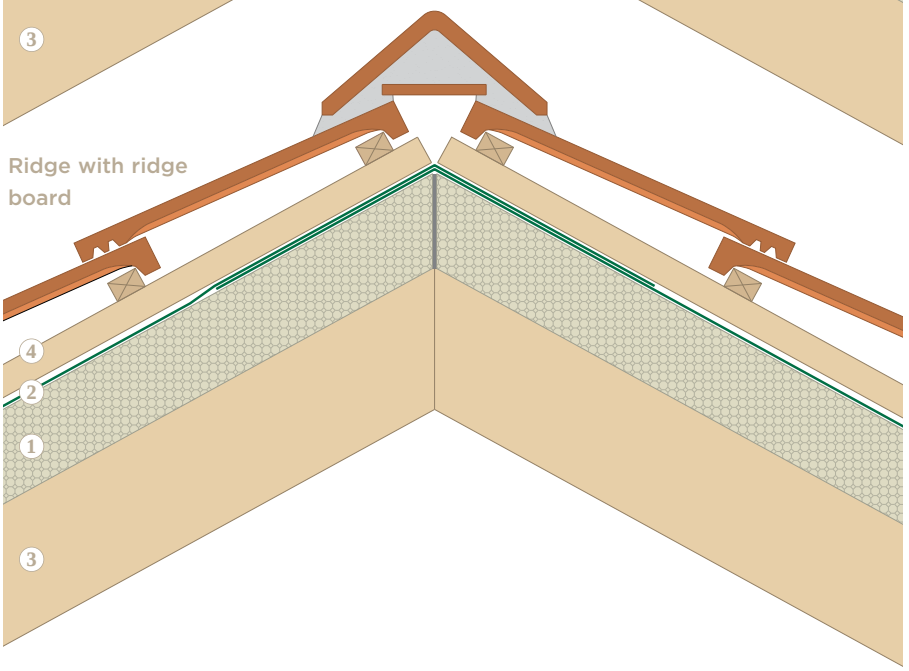
1. Quinn Therm insulation boards
2. Vapour open membrane
3. Rafters
4. Counterbattens
5. Lead lining on section of vapour open underlay or building paper
6. Undercloak
7. Valley boards set into ends of counterbattens and supported on a batten
8. Battens fixed to valley rafter to support insulation
9. Valley tile on counterbattens



Verge



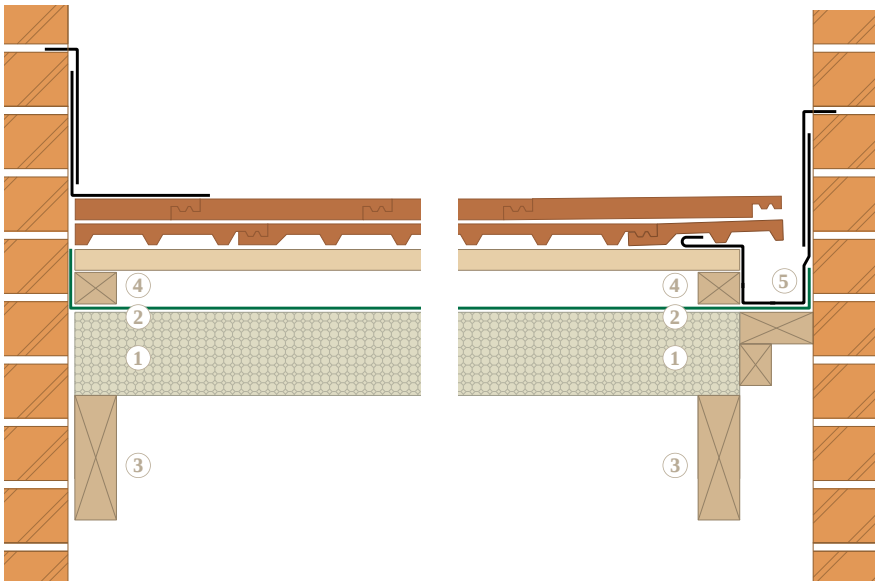
Ridge with ridge board



Ridge with trussed rafter

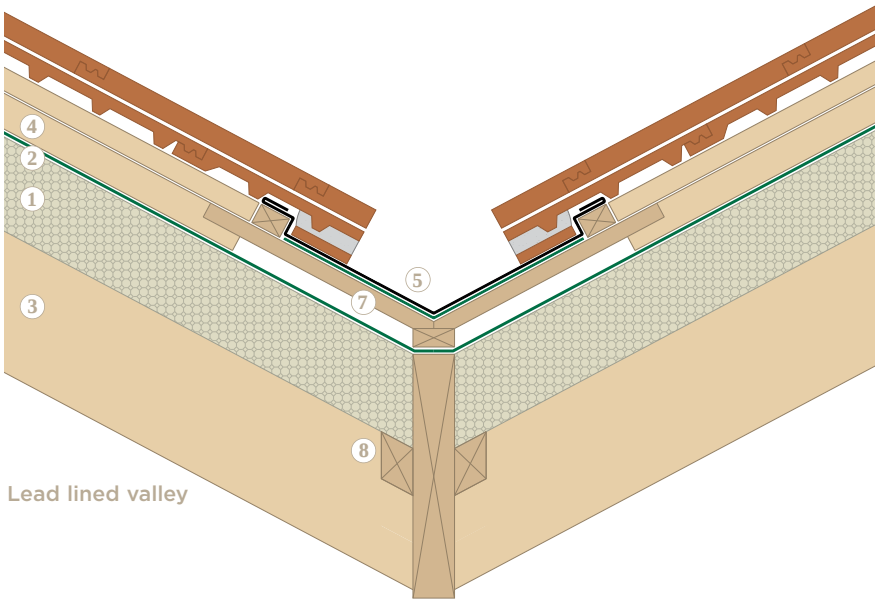
Quinn Therm

Insulating pitched roofs above the rafters

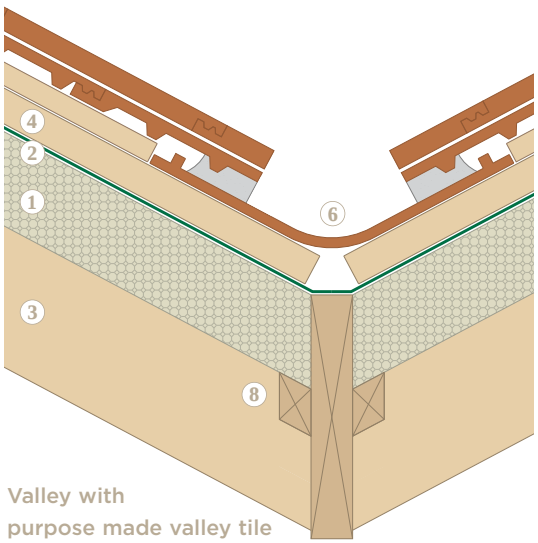


Abutment

Abutment with secret gutter



Lead lined valley



Valley with purpose made valley tile

1. Quinn Therm insulation boards
2. Vapour open membrane
3. Rafters
4. Counterbattens
5. Lead lining on section of vapour open underlay or building paper
6. Valley tile on counterbattens
7. Valley boards set into ends of counterbattens and supported on a batten
8. Battens fixed to valley rafter to support insulation

To prevent the build up of high moisture levels within the batten space - with the risk of condensation - the space must be adequately vented.

Coverings of tile or natural slate will usually allow enough air movement between the batten space and atmosphere, for other coverings specific provision for ventilation may be required (see BS 5250:2002 for details).

Condensation risk analysis should be conducted on all roofs using the method in ISO 13788:2001: consult Quinn Technical Services for assistance.

FIXINGS

Quinn Therm QR boards are held in place by the counterbattens which are fixed through to the rafters. The fixings for the counter battens must be strong enough to transfer dead and applied loads from the roof covering to the rafters without significant deflection.

A calculation method to determine the bending stress is given in BS 5534:2003 Annex B. A list of manufacturers of suitable fixings is available from Quinn Technical Services. Depending upon their dimensions and spacing, the fixings may affect the thermal performance of the roof.

A stop batten should be installed across the end of the rafters to prevent boards slipping down the roof. The boards should be nailed to the rafters during the installation process to give a temporary fixing until the counter battens are installed.

INSTALLATION GUIDANCE

1. Fix a stop batten across the rafters at the line where the insulation will stop.
2. Lay the first row of Quinn Therm QR boards across the rafters tight against the stop batten, with long sides running parallel to the eaves. Ensure board ends are supported on rafters.
3. Provide a temporary fix by nailing to the rafters.
4. Lay and fix subsequent rows of Quinn Therm QR boards.
   Stagger end joints from row to row.
5. Lay the underlay, following manufacturers instructions.
6. Fix counterbattens through to the rafters.
7. Fix the roof covering.

* for projects where the underlay is draped over the counterbattens reverse the order of items 5 and 6.

NOTES

- Butt boards tightly together to form a continuous layer of insulation.
- Cut boards neatly around penetrations. Seal gaps with expanding foam.
- At wall/roof junctions fit boards tight to the wall and seal any gaps with expanding foam.
- At junctions between roof planes cut boards to fit tightly together and seal with expanding foam.

Quinn Therm
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Website: www.quinn-group.com

PRODUCT DATA

Properties	Value	Quinn Therm QR
Board width x length	mm	2400 x 1200**
Board thickness	mm	60 - 200
Board density	kg/m^3	26 - 32
Area per board	m^2	2.88
Edge profiles available		Butt edged

PERFORMANCE DATA

Properties	Value	QuinnTherm QR
Thermal conductivity*	W/mK	0.022 - 0.023
Water vapour resistivity	MNs/gm	~ 400
Compressive strength	kPa	> 120

* quoted in accordance with BS EN 13165:2001 ¥Thermal insulation for Buildings - factory made polyurethane foam products¥.

** other sizes may be available upon request.

KEY PROPERTIES

Quinn Therm QR consists of a core of PIR foam bonded on both faces to composite aluminium facings; the gas filled cells give Quinn Therm its high thermal performance and strength.

When Quinn Therm QR is installed next to an airspace of at least 25mm deep the low emissivity surface of the insulation contributes to the thermal performance of the roof by reducing radiation heat loss across the cavity.

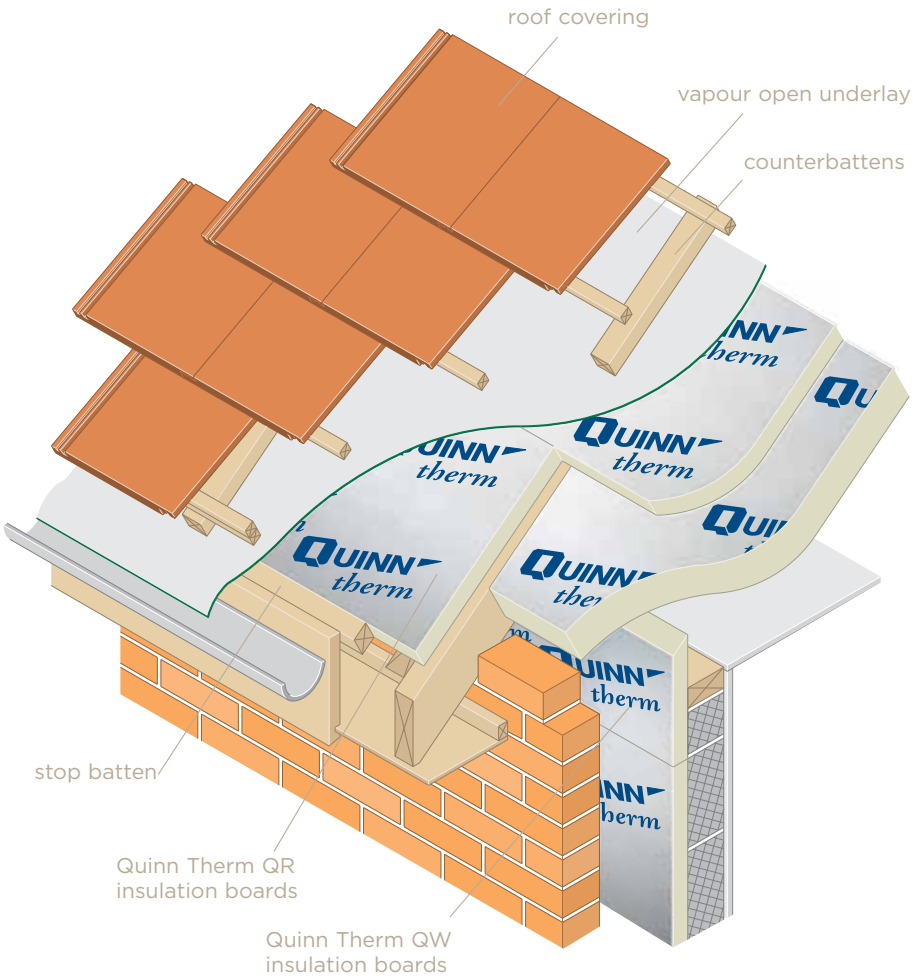
HANDLING AND STORAGE

Quinn Therm QR boards are supplied in shrink-wrapped packs. Store boards under cover and out of direct sunlight, keeping boards flat. When handling Quinn Therm QR do not knock corners and edges.

Whilst Quinn Therm boards are robust, they are not designed to support people: do not stand on the boards nor use them as a working platform.

Quinn Therm

Insulating pitched roofs above and between the rafters



KEY PROPERTIES

Quinn Therm:

- does not readily absorb water, making it suitable for use in damp environments;
- is light, robust and easy to handle; it may be worked using a saw or sharp knife;
- is durable and will perform for the service life of the building.

MEETING REGULATIONS

Required thicknesses of Quinn Therm QR (mm)

Required U-value (W/m²K)	0.25	0.20	0.18	0.16	0.14
Above Rafters	50	50	50	50	50
Between Rafters	35	65	80	105	130

Results based upon roof construction of: 12.5mm plasterboard, polyethylene VCL, 150mm deep rafters at 600mm centres, Quinn Therm QR insulation between rafters, 50mm Quinn Therm QR insulation above rafters, vapour open underlay, 50mm cavity formed by counterbattens and battens, large format concrete tiles.

Calculations performed to BS EN ISO 6946:1997, taking account of repeating thermal bridges.

* Overall heat loss method

For U-value calculations for other roof constructions contact Quinn Technical Services.

DESIGN NOTES

- a vapour control layer is required behind the surface finish to prevent condensation forming within the structure. Contract Quinn Technical Services for advice on condensation control.
- a vapour open underlay (vapour resistance < 0.25MNs/g) should be installed as a secondary protection against wind-driven rain and snow.
- counterbattens allow rain and snow to drain from the underlay to the gutter and form a vented airspace to minimise condensation risk.

INTRODUCTION

Quinn Therm QR (Quinn Roof) is a PIR (polyisocyanurate) insulation for creating warm pitched roofs by insulating above and between the rafters.

Insulating a pitched roof at rafter line - to create what is usually known as a warm roof - makes full use of the building volume by making the roof space available for occupation. Having the insulation at rafter line can also reduce stress on the structure and, even if the loft space is not utilised, there is still the benefit in having water tanks and other services within the insulated area.

A warm roof may be formed by laying insulation across the rafters and fitting additional insulation between the rafters. Using the space between the rafters reduces the depth of insulation required above the rafters which limits the loads on the fixings and makes installation easier. This form of construction is suitable for new build, as well as projects where the roof will be stripped and re-covered.

Quinn Therm QR rigid insulation is well suited to use in warm roof constructions: it is robust enough to span the rafters and withstand transferred loads from the roof covering and will resist moisture. Also, its high thermal resistance enables the required U-value to be achieved with a minimum thickness of insulation, which reduces the loads applied to fixings.

DESIGN

Thermal bridging

To limit heat loss and prevent problems such as condensation, mould growth and staining occurring at cold spots in the construction, junctions between elements should be designed to maintain continuity of insulation. For roofs the key junctions are those at eaves and gable, where wall insulation should meet roof insulation.

At eaves, wall insulation should be continued between the rafters until it butts the underside of the Quinn Therm QR boards. Where there is a cavity closer at the wall head the additional wall insulation may be fixed to the wall plate. Gable walls should be insulated for their full height and the insulation extended to meet the underside of the Quinn Therm QR boards.

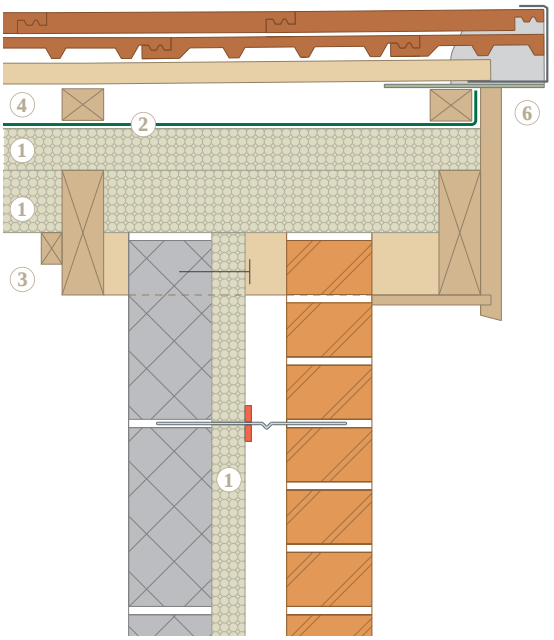
The details shown here are designed to minimise thermal bridging and air leakage.

CONDENSATION CONTROL

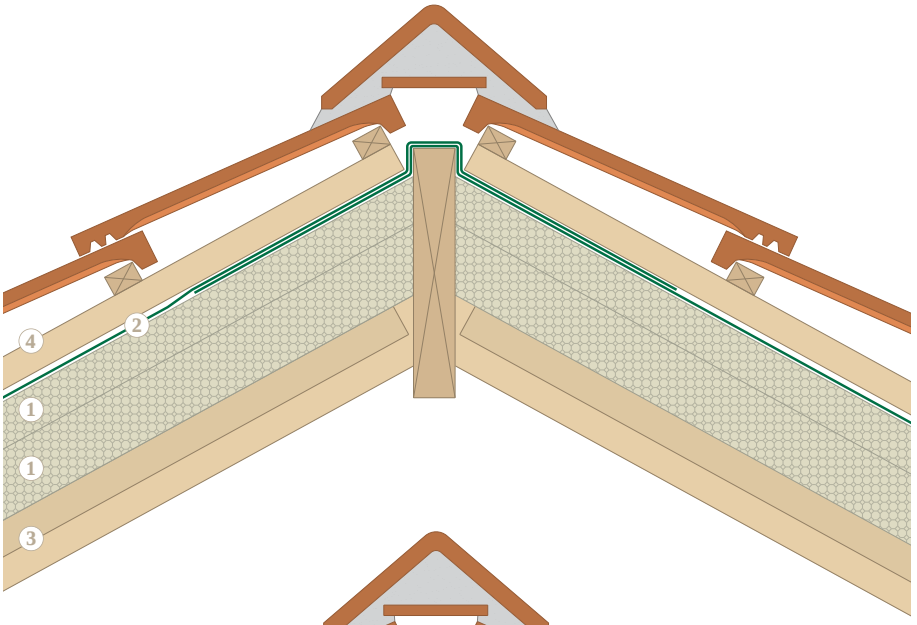
To minimise the risk of interstitial condensation the roof structure should be progressively more vapour open from inside to outside; that may be achieved by using a high resistance insulation such as Quinn Therm QR and a vapour open underlay beneath the roof covering. The use of a vapour control layer between the insulation and the internal finish is recommended.

To prevent the build up of high moisture levels within the batten space - with the risk of condensation - the space must be adequately vented.

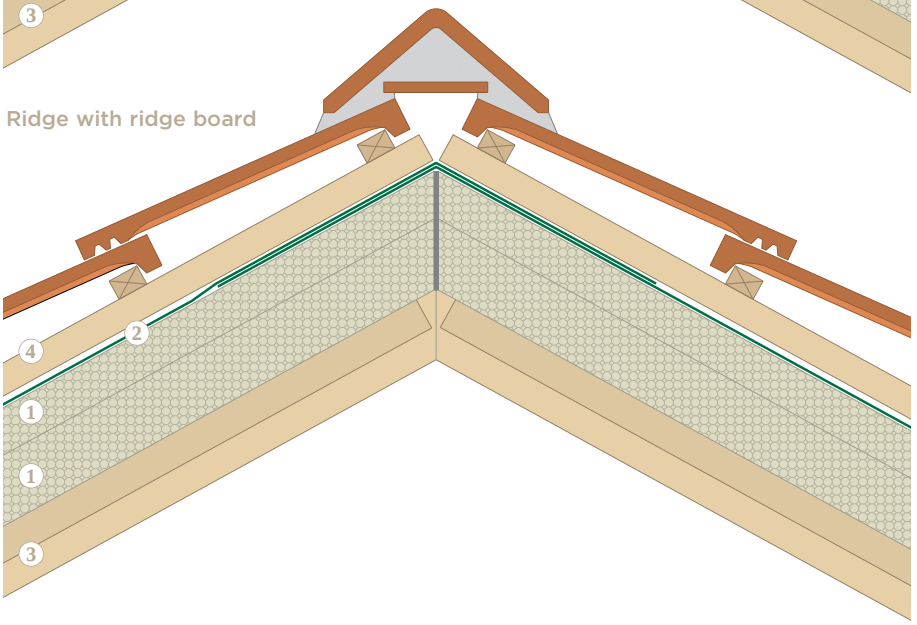
1. Quinn Therm insulation boards
2. Vapour open membrane
3. Support batten fixed to rafters
4. Counterbattens
5. Lead lining on section of vapour open underlay or building paper
6. Undercloak
7. Valley boards set into ends of counterbattens and supported on a batten
8. Battens fixed to valley rafter to support insulation
9. Valley tile on counterbattens



Verge



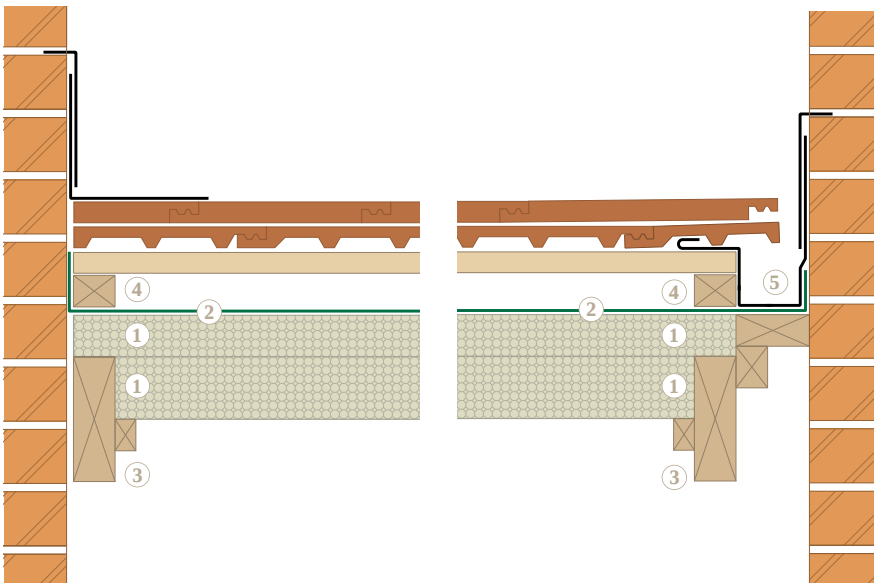
Ridge with ridge board



Ridge with trussed rafter

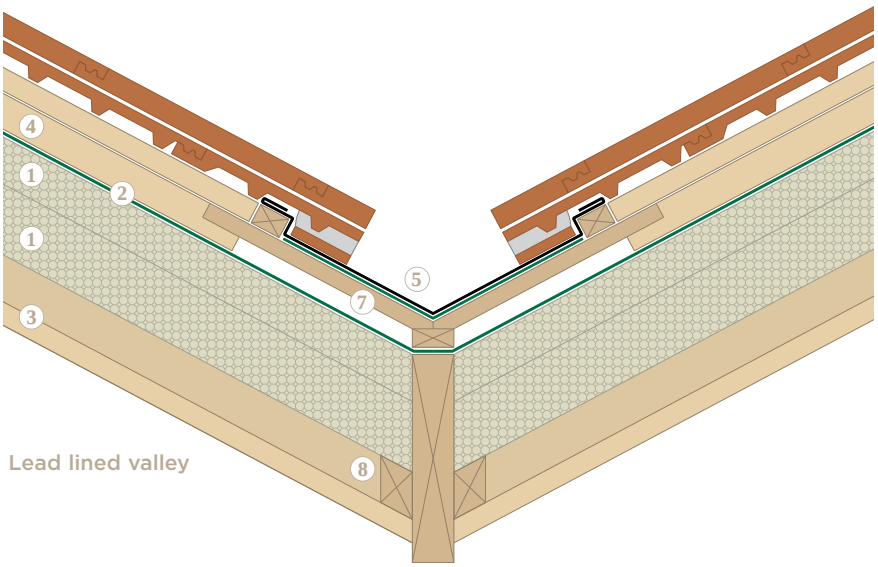
Quinn Therm

Insulating pitched roofs above and between the rafters

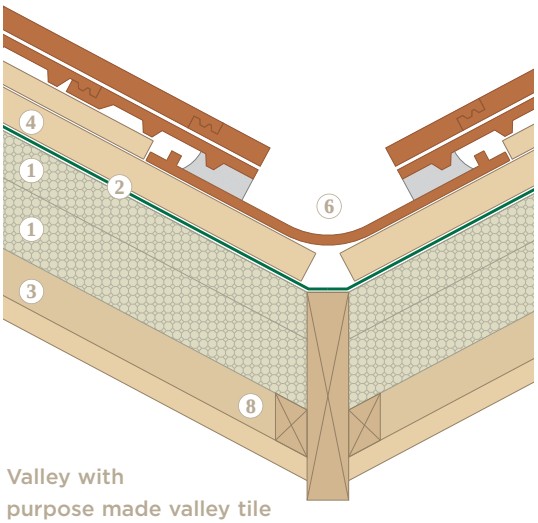


Abutment

Abutment with secret gutter



Lead lined valley



Valley with purpose made valley tile

1. Quinn Therm insulation boards
2. Vapour open membrane
3. Support batten fixed to rafters
4. Counterbattens
5. Lead lining on section of vapour open underlay or building paper
6. Valley tile on counterbattens
7. Valley boards set into ends of counterbattens and supported on a batten
8. Battens fixed to valley rafter to support insulation

Coverings of tile or natural slate will usually allow enough air movement between the batten space and atmosphere, for other coverings specific provision for ventilation may be required (see BS 5250:2002 for details).

Condensation risk analysis should be conducted on all roofs using the method in ISO 13788:2001: consult Quinn Technical Services for assistance.

FIXINGS

Quinn Therm QR boards laid across the rafters are held in place by the counterbattens which are fixed through to the rafters. The fixings for the counter battens must be strong enough to transfer dead and applied loads from the roof covering to the rafters without significant deflection.

A calculation method to determine the bending stress is given in BS 5534:2003 Annex B. A list of manufacturers of suitable fixings is available from Quinn Technical Services. Depending upon their dimensions and spacing, the fixings may affect the thermal performance of the roof.

A stop batten should be installed across the end of the rafters to prevent boards slipping down the roof. The boards should be nailed to the rafters during the installation process to give a temporary fixing until the counter battens are installed.

The Quinn Therm QR boards fitted between the rafters should be supported by battens nailed to the sides of the rafters.

INSTALLATION GUIDANCE

Quinn Therm QR boards over the rafters

1. Fix a stop batten across the rafters at the line where the insulation will stop.
2. Lay the first row of Quinn Therm QR boards across the rafters tight against the stop batten, with long sides running parallel to the eaves. Ensure board ends are supported on rafters.
3. Provide a temporary fix by nailing to the rafters.
4. Lay and fix subsequent rows of Quinn Therm QR boards. Stagger end joints from row to row.
5. Lay the underlay, following manufacturer's guidance.
6. Fix counterbattens through to the rafters. Fix the roof covering.

* for projects where the underlay is draped over the counterbattens reverse the order of items 5 and 6.

Quinn Therm QR boards between the rafters

1. Cut boards to fit snugly between the rafters.
2. Insert boards between the rafters. Push boards against the underside of the Quinn Therm QR board running over the rafters.
3. Nail timber battens to the rafters immediately beneath the boards.
4. Install the VCL and any internal finish. Seal gaps with expanding foam.

Quinn Therm
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Website: www.quinn-group.com

PRODUCT DATA	Properties	Value	Quinn Therm QR
	Board width x length	mm	2400 x 1200**
	Board thickness	mm	60 - 200
	Board density	kg/m^3	26 - 32
	Area per board	m^2	2.88
	Edge profiles available		Butt edged

PERFORMANCE DATA	Properties	Value	QuinnTherm QR
	Thermal conductivity*	W/mK	0.022 - 0.023
	Water vapour resistivity	MNs/gm	≃ 400
	Compressive strength	kPa	> 120

* quoted in accordance with BS EN 13165:2001 'Thermal insulation for Buildings - factory made polyurethane foam products'.

** other sizes may be available upon request.

KEY PROPERTIES

Quinn Therm QR consists of a core of PIR foam bonded on both faces to composite aluminium facings; the gas filled cells give Quinn Therm its high thermal performance and strength.

When Quinn Therm QR is installed next to an airspace of at least 25mm deep the low emissivity surface of the insulation contributes to the thermal performance of the roof by reducing radiation heat loss across the cavity.

NOTES

- Butt boards tightly together to form a continuous layer of insulation.
- Cut boards neatly around penetrations. Seal gaps with expanding foam.
- At wall/roof junctions fit boards tight to the wall and seal any gaps with expanding foam.
- At junctions between roof planes cut boards to fit tightly together and seal with expanding foam.

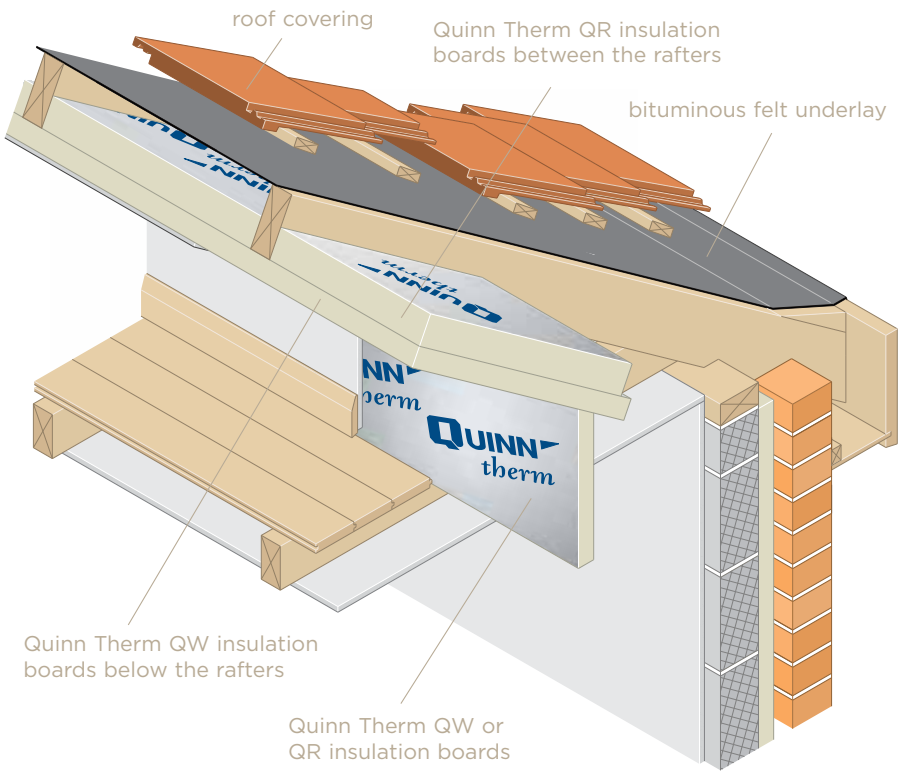
HANDLING AND STORAGE

Quinn Therm QR boards are supplied in shrink-wrapped packs. Store boards under cover and out of direct sunlight, keeping boards flat. When handling Quinn Therm QR do not knock corners and edges.

Whilst Quinn Therm boards are robust, they are not designed to support people: do not stand on the boards nor use them as a working platform.

Quinn Therm

Insulating pitched roofs between and below the rafters



KEY PROPERTIES

Quinn Therm:

- does not readily absorb water, making it suitable for use in damp environments;
- is light, robust and easy to handle; it may be worked using a saw or sharp knife;
- is durable and will perform for the service life of the building.

MEETING REGULATIONS

Required thicknesses of Quinn Therm QR (mm)

Required U-value (W/m²K)	0.25	0.20	0.18	0.16	0.14
Between Rafters	65	100	100	100	100
Below Rafters	25	25	40	55	75

Results based upon roof construction of:
12.5mm plasterboard, polyethylene VCL, 25mm Quinn Therm QR insulation across the underside of the rafters, 150mm deep rafters at 600mm centres, Quinn Therm QR insulation between rafters (thickness as shown), 50mm vented cavity, bituminous felt underlay, large format concrete tiles on battens.

Calculations performed to BS EN ISO 6946:1997, taking account of repeating thermal bridges.

* Overall heat loss method.

For U-value calculations for other roof constructions contact Quinn Technical Services.

DESIGN NOTES

- depending on the depth of the rafters and the required U-value, it may be necessary to install Quinn Therm QR between the rafters and below the rafters.
- a vapour control layer is required behind the surface finish to prevent condensation forming within the structure: that may be formed by taping the joints between the metallic surface of the boards with metalised tape. Contact Quinn Technical Services for further advice on condensation control.
- a vented cavity at least 50mm deep should be maintained between the underside of the underlay and the top of the insulation to prevent condensation.

INTRODUCTION

Quinn Therm QR (Quinn Roof) is a PIR (polyisocyanurate) insulation for creating warm pitched roofs by insulating between and below the rafters.

Insulating an existing pitched roof at rafter line - to create what is usually known as a warm roof - is an ideal way of increasing the usable space within the building without having to extend the structure. In projects where the loft space is being upgraded without removing the roof covering the insulation should be installed either in one layer between the rafters or in two layers, one between the rafters and the other fixed to the underside of the rafters (installing the insulation wholly between the rafters will in most cases result in insufficient headroom).

Quinn Therm QR rigid insulation is well suited to use in warm roof constructions: it is robust enough to span the rafters and will resist moisture. Also, its high thermal resistance enables the required U-value to be achieved with a minimum thickness of insulation, which minimises the loss of headroom within the loft space.

DESIGN

Thermal bridging

To limit heat loss and prevent problems such as condensation, mould growth and staining occurring at cold spots in the construction, junctions between elements should be designed to maintain continuity of insulation. For roofs the key junctions are those at eaves and gable, where wall insulation should meet roof insulation.

The thermal performance of existing gable walls should be upgraded with an insulated dry-lining system, such as Quinn Therm QL plasterboard laminate, or Quinn Therm QW wall insulation installed with plasterboard. Junctions with the roof slope should be designed to give continuity of insulation and sealed to prevent air leakage.

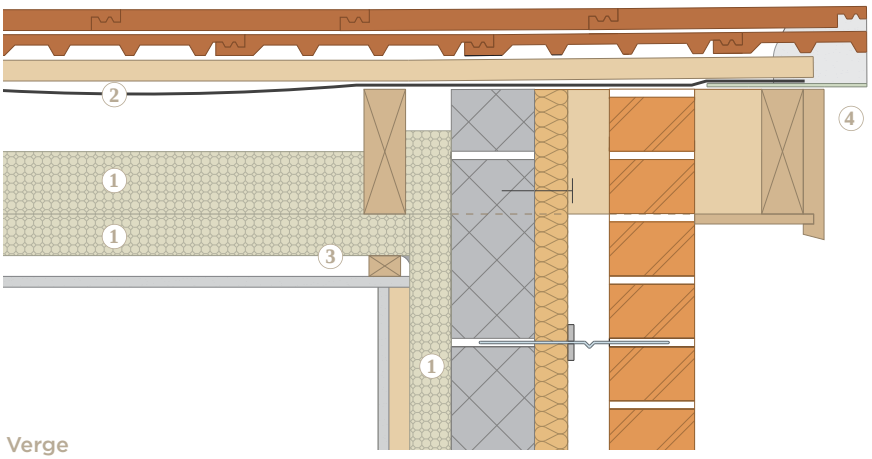
Given space constraints within existing roofs, it is usual to insulate the stud walls rather than attempt to extend insulation between the rafters as far as the eaves. The junctions between the stud walls and the roof insulation should be sealed. The roof between the stud walls and the eaves should be insulated between the joists, taking care to maintain any ventilation paths at eaves and ensuring continuity of insulation with the stud walls.

The details shown here are designed to minimise thermal bridging and air leakage.

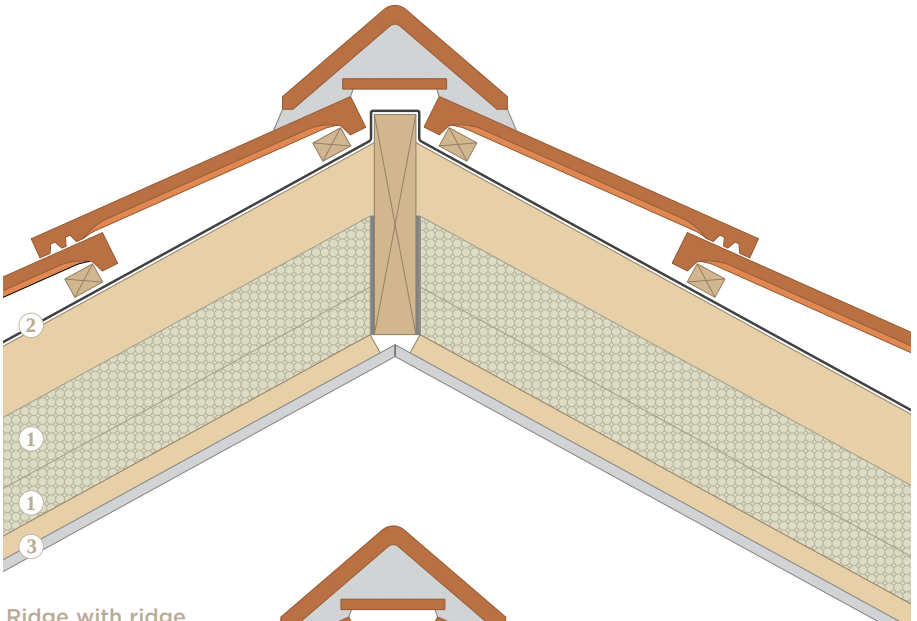
CONDENSATION CONTROL

In refurbishment and loft conversion projects the underlay is likely to be of bituminous felt, which has a very high vapour resistance. To prevent moisture from the occupied space condensing on the underside of the underlay and damaging the roof structure ventilated cavities at least 50mm deep must be maintained between underlay and the upper surface of the Quinn Therm QR boards (see BS 5250:2002 for details).

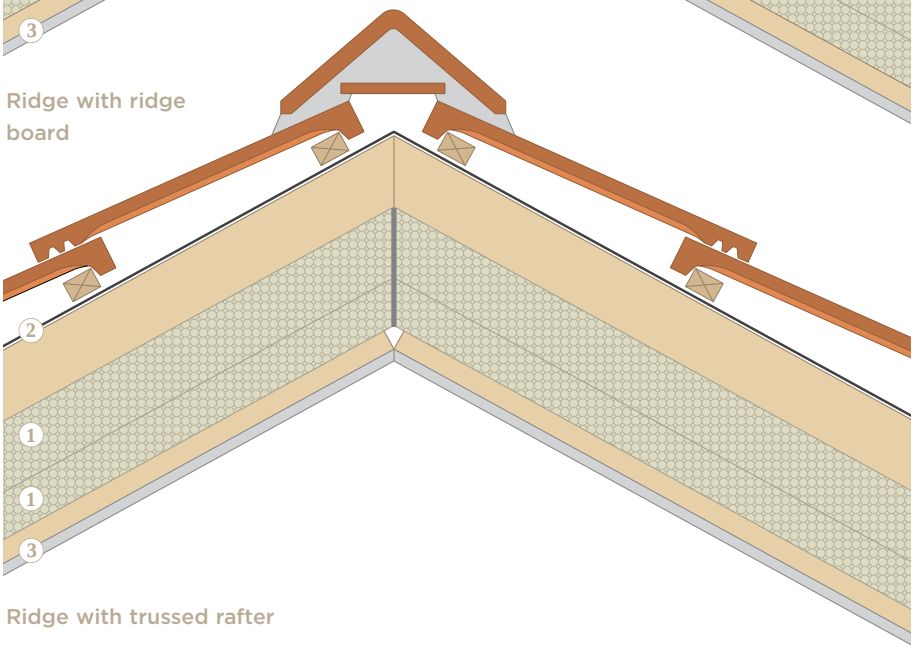
1. Quinn Therm insulation boards
2. Existing membrane
3. Battens fixed to rafters through insulation boards: plasterboard fixed to battens
4. Undercloak
5. Lead lining on section of vapour open underlay or building paper
6. Timber stud
7. Battens to secure vertical insulation boards



Verge



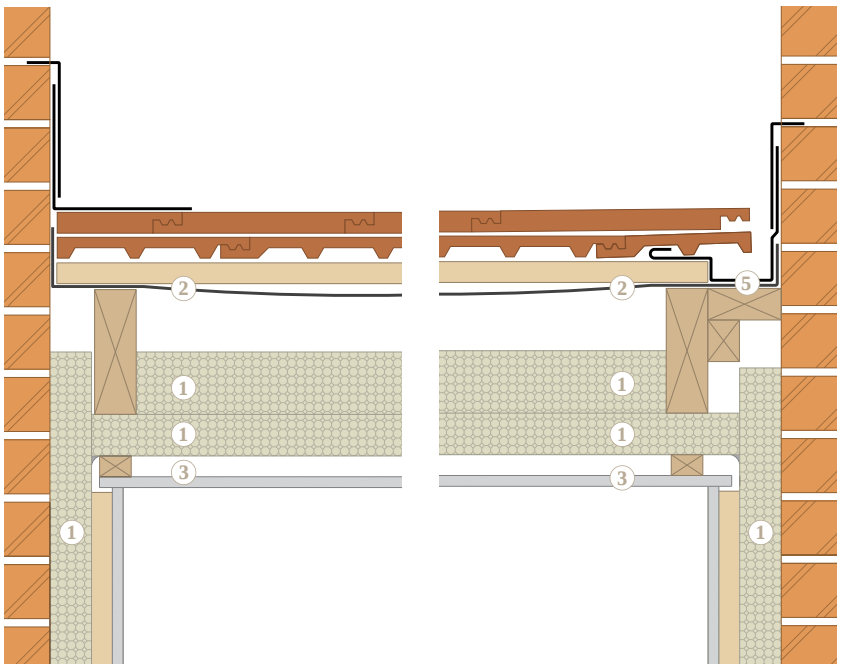
Ridge with ridge board



Ridge with trussed rafter

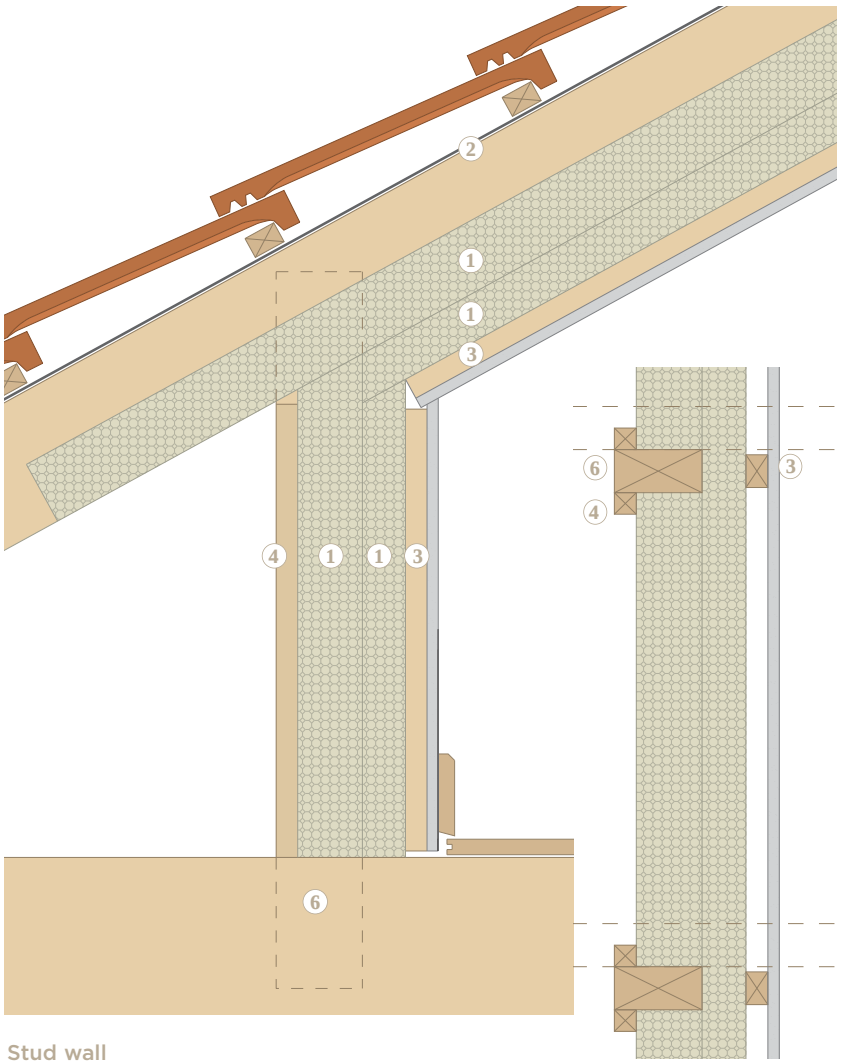
Quinn Therm

Insulating pitched roofs between and below the rafters



Abutment

Abutment with secret gutter



Stud wall

In some projects the rafters may not be deep enough to accommodate the insulation and the necessary cavity. The problem may be resolved either by increasing the depth of the rafter space by fixing 50mm x 50mm battens to the underside of the rafters or by installing some insulation between the rafters and the rest on the underside of the rafters.

To reduce vapour transfer through the roof structure there should be a vapour control layer behind the internal finish: that may be formed from the foil facing of the Quinn Therm QR boards by taping the joints with metalised tape.

Condensation risk analysis should be conducted on all roofs using the method in ISO 13788:2001: consult Quinn Technical Services for assistance.

FIXINGS

Quinn Therm QR boards fitted to the underside of the rafter should be fixed in place with 25mm deep timber battens nailed through to the rafters. The timber battens form a series of voids between the insulation and the surface finish which may be used for running services without disturbing the insulation. The voids, in combination with the low emissivity foil face of the boards will also improve the thermal performance of the roof by reducing radiation heat losses.

In stud walls the Quinn Therm QR boards should be cut to fit between the studs and fitted against timber battens nailed to the inside of the studs to prevent the insulation shifting out of place.

1. Quinn Therm insulation boards
2. Existing membrane
3. Battens fixed to rafters through insulation boards: plasterboard fixed to battens
4. Battens to secure vertical insulation boards
5. Lead lining on section of vapour open underlay or building paper
6. Timber stud

INSTALLATION GUIDANCE

Quinn Therm QR boards between the rafters

1. If necessary nail 50mm x 50mm battens to the undersides of the rafters to increase the available depth.
2. Cut boards to fit snugly between the rafters.
3. Insert boards between the rafters, ensuring there is a minimum 50mm gap between the underside of the underlay and the upper face of the boards.
4. Install the VCL and internal finish.

* see guidance on condensation risk

Quinn Therm QR boards between and below the rafters

1. Cut boards to fit snugly between the rafters.
2. Insert boards between the rafters, ensuring there is a minimum 50mm gap between the underside of the underlay and the upper face of the boards.
3. Fix the second layer of boards across the underside of the rafters using 25mm deep battens.
4. Tape the board joints with metalised tape to form a VCL.
5. Fix internal finish to battens.

Quinn Therm QR boards in stud walls

1. Follow the sequences for fitting boards between or between and below the rafters, but nail timber battens to the studs behind the boards to keep them in place.

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PRODUCT DATA

Properties	Value	Quinn Therm QR
Board width x length	mm	2400 x 1200**
Board thickness	mm	60 - 200
Board density	kg/m^3	26 - 32
Area per board	m^2	2.88
Edge profiles available		Butt edged

PERFORMANCE DATA

Properties	Value	QuinnTherm QR
Thermal conductivity*	W/mK	0.022 - 0.023
Water vapour resistivity	MNs/gm	~ 400
Compressive strength	kPa	> 120

* quoted in accordance with BS EN 13165:2001 'Thermal insulation for Buildings - factory made polyurethane foam products'.

** other sizes may be available upon request.

KEY PROPERTIES

Quinn Therm QR consists of a core of PIR foam bonded on both faces to composite aluminium facings; the gas filled cells give Quinn Therm its high thermal performance and strength.

When Quinn Therm QR is installed next to an airspace of at least 25mm deep the low emissivity surface of the insulation contributes to the thermal performance of the roof by reducing radiation heat loss across the cavity.

NOTES

- Butt boards tightly together to form a continuous layer of insulation.
- Cut boards neatly around penetrations. Seal gaps with expanding foam.
- At wall/roof junctions fit boards tight to the wall and seal any gaps with expanding foam.
- At junctions between roof planes and stud walls cut boards to fit tightly together and tape joints with metalised tape.

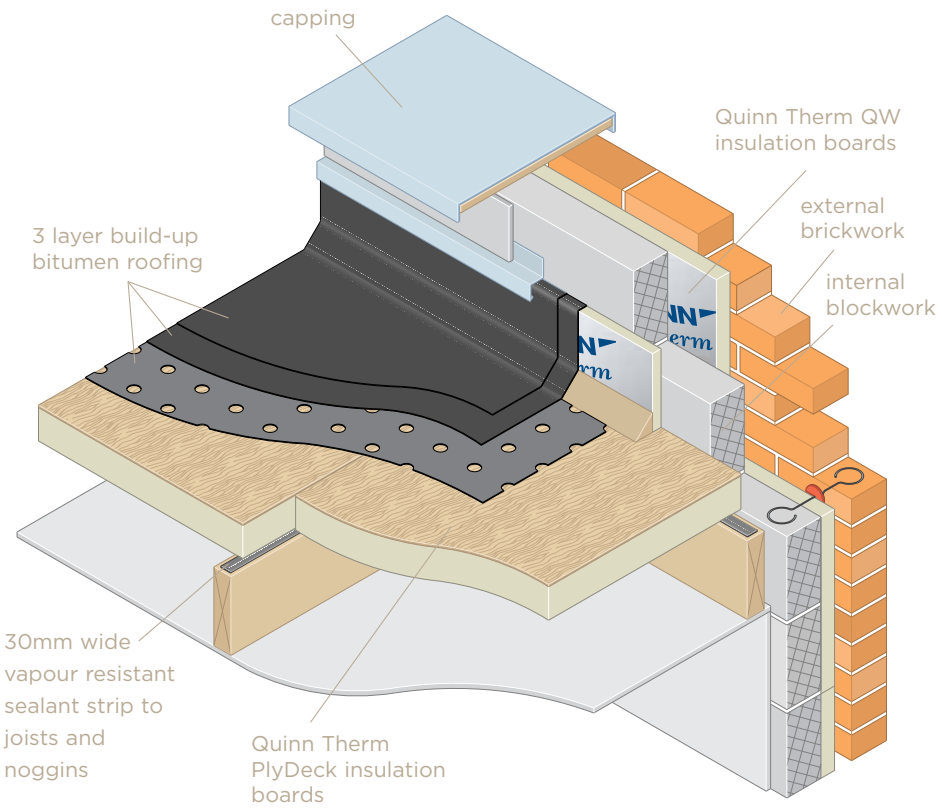
HANDLING AND STORAGE

Quinn Therm QR boards are supplied in shrink-wrapped packs. Store boards under cover and out of direct sunlight, keeping boards flat. When handling Quinn Therm QR do not knock corners and edges.

Whilst Quinn Therm boards are robust, they are not designed to support people: do not stand on the boards nor use them as a working platform.

Quinn Therm

Insulating warm flat roofs with PIR-plywood laminate



KEY PROPERTIES

Quinn Therm:

- does not readily absorb water, making it suitable for use in damp environments;
- is light, robust and easy to handle; it may be worked using a saw or sharp knife;
- is durable and will perform for the service life of the building.

MEETING REGULATIONS

Required thicknesses of Quinn Therm QPD PlyDeck for different U-values

U-value (W/m2K)	Quinn therm Plydeck thickness* (mm)	
	Joists @ 400mm centres	Joists @ 600mm centres
0.25	70* + 6**	70* + 6**
0.22	90* + 6**	90* + 6**
0.20	110* + 6**	110* + 6**
0.18	110* + 6**	110* + 6**
0.16	125* + 6**	125* + 6**

* thickness of PIR board

** 6mm WPB plywood

Results based on roof construction of: 3 layer built-up felt roofing, Quinn Therm PlyDeck board, unvented low emissivity cavity, 12.5mm plasterboard. Calculations performed to EN ISO 6946:1997, taking account of repeating thermal bridges.

DESIGN NOTES

- Stagger fixings for adjacent boards to the same joist or noggin.
- Ensure screw heads finish flush with the surface of the plywood.
- Minimise the period between installation of Quinn Therm PlyDeck and of the waterproofing system. In poor weather use polyethylene sheeting as temporary protection of Quinn Therm PlyDeck.

INTRODUCTION

Quinn Therm PlyDeck is a composite insulation board intended for forming warm flat roof decks which will be finished with partially bonded built-up felt waterproofing systems.

Quinn Therm consists of a core of PIR foam auto adhered to two composite aluminium facings. A layer of 6mm WPB plywood is bonded to the insulation to give additional strength and rigidity, and to provide a suitable substrate for partially bonded built-up waterproofing systems.

The low thermal conductivity of the insulation minimises the board thickness, while the composite board offers rapid coverage and straightforward installation. Quinn Therm PlyDeck is suitable for new build and refurbishment projects.

Warm roof construction reduces the risk of condensation within the roof structure and eliminates the need for ventilation beneath the deck: it also protects the structure from extremes of temperature.

INSTALLATION GUIDANCE

Quinn Therm PlyDeck can be installed on 50mm wide joists at 600mm max. centres on roofs intended for occasional maintenance traffic, or 400mm max. centres where more frequent traffic is expected.

Quinn Therm PlyDeck boards must be supported at all edges, including cut edges at penetrations: 50mm x 50mm cross noggins should be fitted between the joists. The boards must bear at least 20mm on all supporting timbers.

Quinn Therm PlyDeck should be fixed with low profile headed screws, long enough to give minimum 35mm embedment into the timbers. Fixings should be at 200mm centres around the board edges (300mm centres on any intermediate timbers) and set at least 10mm from board edges and 50mm from corners.

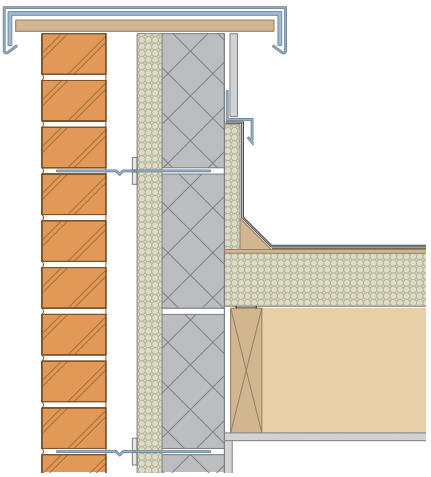
As 96mm is the maximum board thickness which is practicable to install over joists, U-values of 0.18 W/m²K and lower should be achieved by fitting additional Quinn Therm QR insulation between the joists.

Thermal bridging at roof-wall junctions must be avoided: at eaves and verges the joist space should be packed with insulation; at parapets vertical edge insulation should be applied to the inner face and the wall insulation carried at least 150mm above the surface of the Quinn Therm PlyDeck.

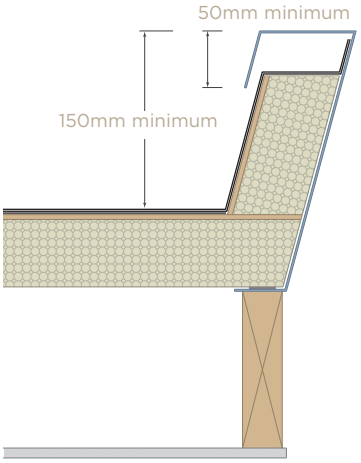
The foil facing on the underside of Quinn Therm PlyDeck has a very high vapour resistance and can be formed into a VCL by sealing the joints between boards, by setting the boards onto a wide (30mm) bead of vapour resistant sealant applied to the upper surface of all the joists and cross noggins.

INSTALLATION SEQUENCE

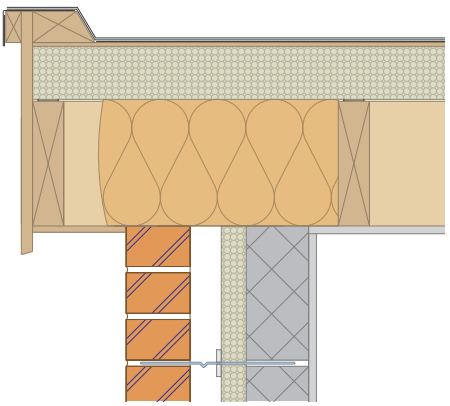
1. Plan the layout of Quinn Therm PlyDeck boards. Cut and fit cross noggins.
2. Apply vapour resistant sealant in a 30mm wide strip to the upper surface of the joists and cross noggins.
3. Lay Quinn Therm PlyDeck boards with long edges following joists and board edges in broken bond.
4. Fix with screws at 200mm centres around board edges: 300mm at any other cross timbers.
5. Lay the waterproofing system.



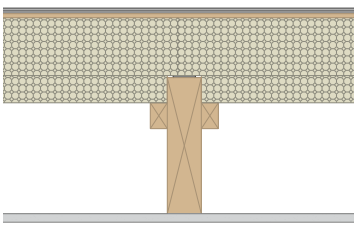
Parapet



Rooflight penetration



Verge



Insulation between joists

PRODUCT DATA	Properties	Value	Quinn Therm Plydeck
	Board width x length	mm	2400 x 1200*
	Board thickness	mm	56, 76, 96, 116, 131**
	PIR core density	kg/m³	32 - 34
	Area per board	m²	2.88
	Edge profiles available		Butt edged

* includes 6mm plywood facing ** other thicknesses available on request

PERFORMANCE DATA	Properties	Value	QuinnTherm Plydeck
	Thermal conductivity†	W/mK	0.022 - 0.023
	Water vapour resistivity	MNs/gm	≥ 400
	Compressive strength at 10% deformation	kPa	> 150
	Surface spread of flame, foil facing only††		Class 1

† measured to EN 12667 and EN 12939 and declared as a 90/90 value to EN 13165. The value does not include the thermal conductivity of the plywood facing, which may be taken as 0.14W/mK.

†† Measured to BS 476: Part 7: 1997. The fire rating of the roof will depend upon the performance of the waterproofing system and the internal lining.

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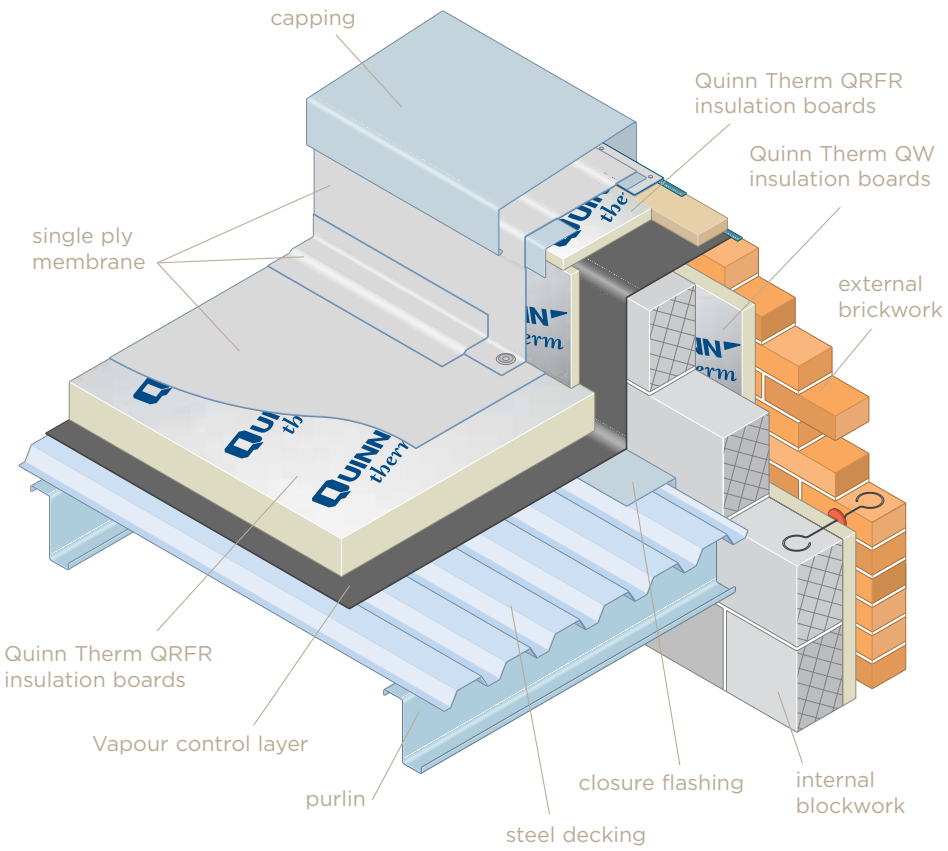
Quinn Therm
Insulating metal deck roofs



KEY PROPERTIES

Quinn Therm:

- does not readily absorb water, making it suitable for use in damp environments;
- is light, robust and easy to handle; it may be worked using a saw or sharp knife;
- is durable and will perform for the service life of the building.

MEETING REGULATIONS

Thickness of Quinn Therm QRFR to meet required U-value (W/m²K)

Required U-value (W/m²K)	0.25	0.22	0.20	0.18	0.16
Thickness of Quinn Therm (mm)	90	100	110	125	140

Results based on roof construction of:
Lightweight metal deck, Quinn Therm QRFR, waterproofing membrane. 5 fixings/m².
Calculations performed to BS EN ISO 9646:1997, taking account of repeating thermal bridges.

DESIGN NOTES

- Detail perimeters to minimise thermal bridging and air infiltration at wall/roof junctions.
- The fixing pattern should be determined from the predicted uplift forces, and the type of fixing selected. Consult Quinn Technical Services for advice.
- Whilst Quinn Therm QRFR boards are compatible with a wide range of membranes the membrane manufacturer should always be consulted to confirm compatibility.

INTRODUCTION

Quinn Therm QRFR (Quinn Flat Roof) is a PIR (polyisocyanurate) insulation board intended for use in lightweight metal roof decks covered with single ply roofing membranes. Quinn Therm consists of a core of PIR foam bonded on both faces to composite aluminium facings; the gas filled cells give Quinn Therm its high thermal performance and strength.

Lightweight metal deck construction enables rapid weatherproofing of large roof spans. In a typical system the metal deck is covered with a VCL then rigid insulation boards are mechanically fixed to the deck.

The waterproofing layer - usually a single-ply polymeric membrane is then laid and fixed through to the deck. Quinn Therm QRFR is an ideal solution for such roofs: its low thermal conductivity minimises the insulation thickness, while the boards provide a stable substrate for installing the waterproofing.

INSTALLATION GUIDANCE

1. Lay the vapour control layer over the metal deck with laps sealed and edges bonded to the roof perimeter.
2. Lay Quinn Therm boards in brick bond, with long edges at right angles to the troughs of the deck. Ensure board ends are supported on the crowns of the deck.
3. Fix Quinn Therm boards to the deck with mechanical fixings, which should be at least 50 mm from board edges.
4. Lay and fix the waterproofing membrane.

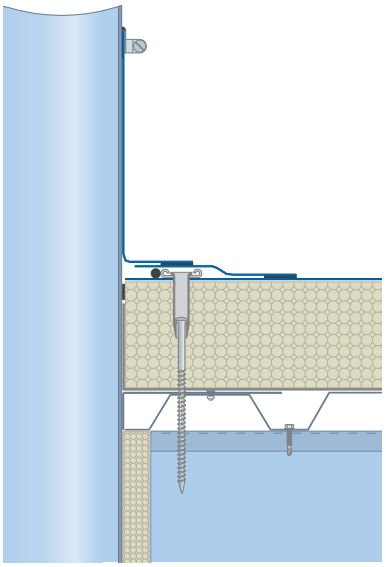
NOTES

- Butt boards tightly together to form a continuous layer of insulation.
- Cut boards neatly at penetrations. Seal gaps with expanding foam.
- Avoid high point loads on boards during installation.

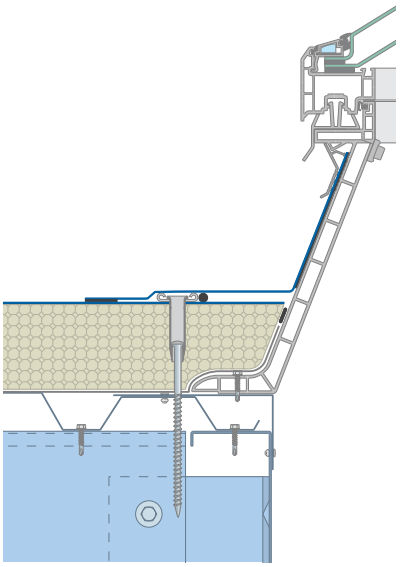
HANDLING AND STORAGE

Quinn Therm QRFR boards are supplied in shrink-wrapped packs. Store boards under cover and out of direct sunlight, keeping boards flat.

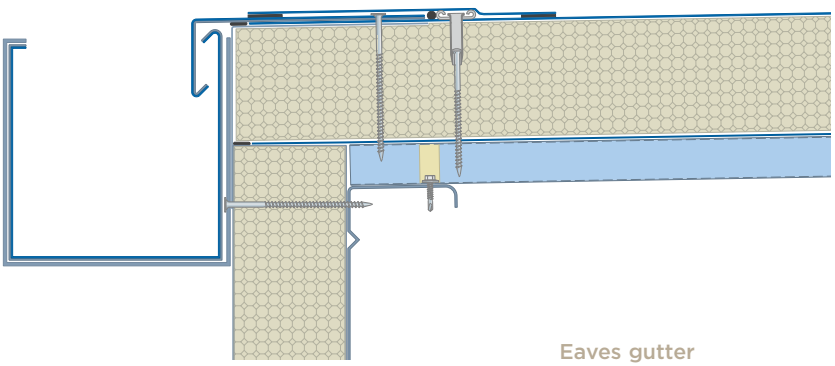
When handling Quinn Therm QRFR do not knock corners and edges. Cut Quinn Therm QRFR with a fine tooth saw or trimming knife.



Pipe penetration



Rooflight penetration



Eaves gutter

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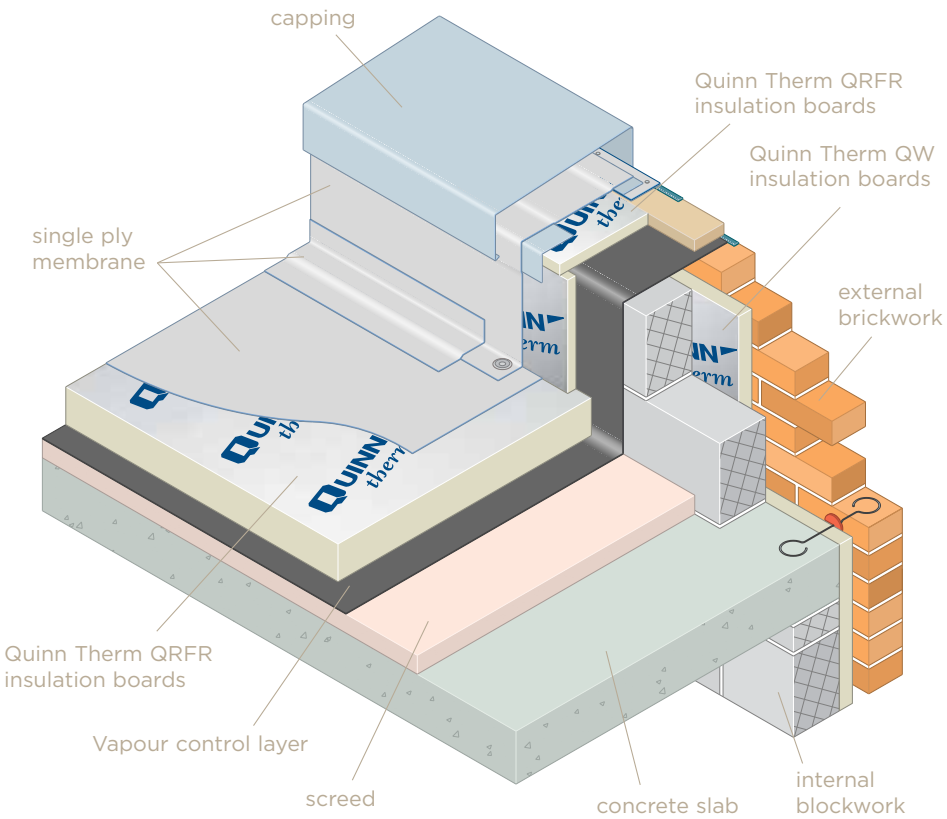
PRODUCT DATA	Properties	Value	Quinn Therm QRFR
	Board width x length	mm	2400 x 1200**
	Board thickness	mm	60 - 200
	Board density	kg/m³	30 - 34
	Area per board	m²	2.88
	Edge profiles available		Butt edged

PERFORMANCE DATA	Properties	Value	QuinnTherm QRFR
	Thermal conductivity*	W/mK	0.022 - 0.023
	Water vapour resistivity	MNs/gm	~ 400
	Compressive strength	kPa	> 150

* quoted in accordance with BS EN 13165:2001 'Thermal insulation for Buildings - factory made polyurethane foam products'.

** other sizes may be available upon request.

Quinn Therm
Insulating concrete deck roofs



DESIGN NOTES

- Detail perimeters to minimise thermal bridging and air infiltration at wall/roof junctions.
- Fixing requirements should be determined from the predicted uplift forces, and the selected fixing method. Consult Quinn Technical Services for advice.
- Whilst Quinn Therm QRFR boards are compatible with a wide range of membranes the membrane manufacturer should always be consulted to confirm compatibility.

INTRODUCTION

Quinn Therm QRFR (Quinn Flat Roof) is a PIR (polyisocyanurate) insulation board intended for use in concrete deck flat roofs. Quinn Therm consists of a core of PIR foam bonded on both faces to composite aluminium facings; the gas filled cells give Quinn Therm its high thermal performance and strength.

In a warm roof construction the insulation maintains the structure of the roof at a temperature close to that of the building interior, protecting it from extremes of temperature and minimising the risk of condensation. Quinn Therm is an ideal solution for forming warm concrete roof decks, in combination with mechanically fixed single ply membranes: the low thermal conductivity of Quinn Therm minimises the insulation thickness required, while the rigid boards provide a stable substrate for installing the waterproofing.

KEY PROPERTIES

Quinn Therm:

- does not readily absorb water, making it suitable for use in damp environments;
- is light, robust and easy to handle; it may be worked using a saw or sharp knife;
- is durable and will perform for the service life of the building.

MEETING REGULATIONS

Thickness of Quinn Therm QRFR to meet required U-value (W/m²K)

Required U-value (W/m²K)	0.25	0.22	0.20	0.18	0.16
Thickness of Quinn Therm (mm)	85	100	110	120	135

Results based on roof construction of:

150 mm concrete deck, 50 mm cement/sand screed, Quinn Therm QRFR, waterproofing membrane. 5 fixings/m².

Calculations performed to BS EN ISO 9646:1997, taking account of repeating thermal bridges.

INSTALLATION GUIDANCE

1. Lay the vapour control layer over the deck with laps sealed and edges bonded to the roof perimeter.
2. Either:
   (i) Apply adhesive and lay Quinn Therm boards. Lay boards in brick bond pattern.
   Or
   (ii) Fix Quinn Therm boards to the deck with mechanical fixings, which should be at least 50mm from board edges. Lay boards in brick bond pattern.
3. Lay and fix the waterproofing membrane.

NOTES

- Butt boards tightly together to form a continuous layer of insulation.
- Cut boards neatly at penetrations. Seal gaps with expanding foam.
- Avoid high point loads on boards during installation.

HANDLING AND STORAGE

Quinn Therm QRFR boards are supplied in shrink-wrapped packs. Store boards under cover and out of direct sunlight, keeping boards flat.

When handling Quinn Therm QRFR do not knock corners and edges. Cut Quinn Therm QRFR with a fine tooth saw or trimming knife.

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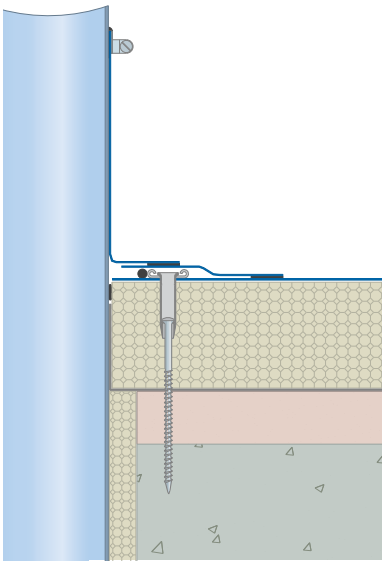
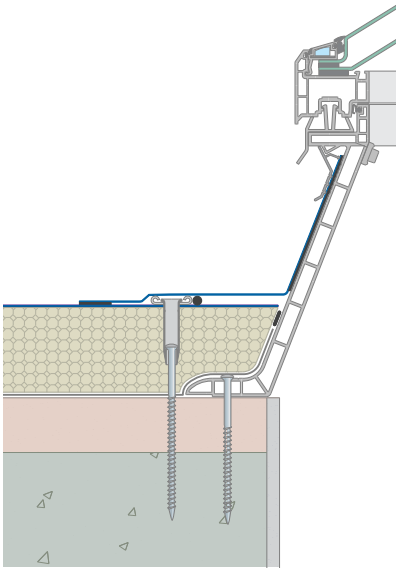
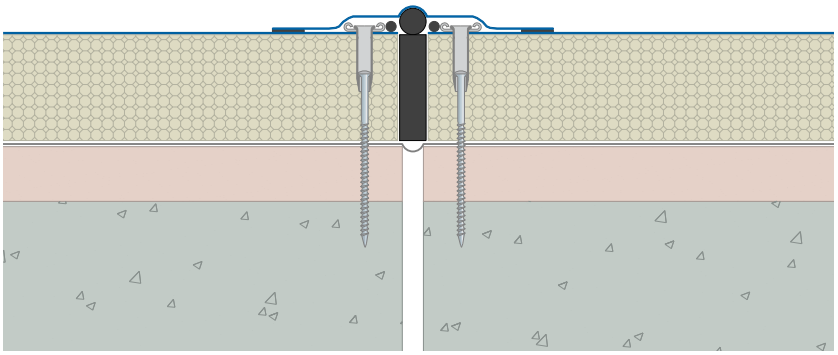


Pipe penetration



Rooflight penetration



Movement joint

	Properties	Value	Quinn Therm QRFR
PRODUCT DATA	Board width x length	mm	2400 x 1200**
	Board thickness	mm	60 - 200
	Board density	kg/m³	30 - 34
	Area per board	m²	2.88
	Edge profiles available		Butt edged

	Properties	Value	QuinnTherm QRFR
PERFORMANCE DATA	Thermal conductivity*	W/mK	0.022 - 0.023
	Water vapour resistivity	MNs/gm	~ 400
	Compressive strength	kPa	> 150

* quoted in accordance with BS EN 13165:2001 'Thermal insulation for Buildings - factory made polyurethane foam products'.

** other sizes may be available upon request.