



NSAI
Agrément

**IRISH AGREMENT BOARD
CERTIFICATE NO. 07/0273**

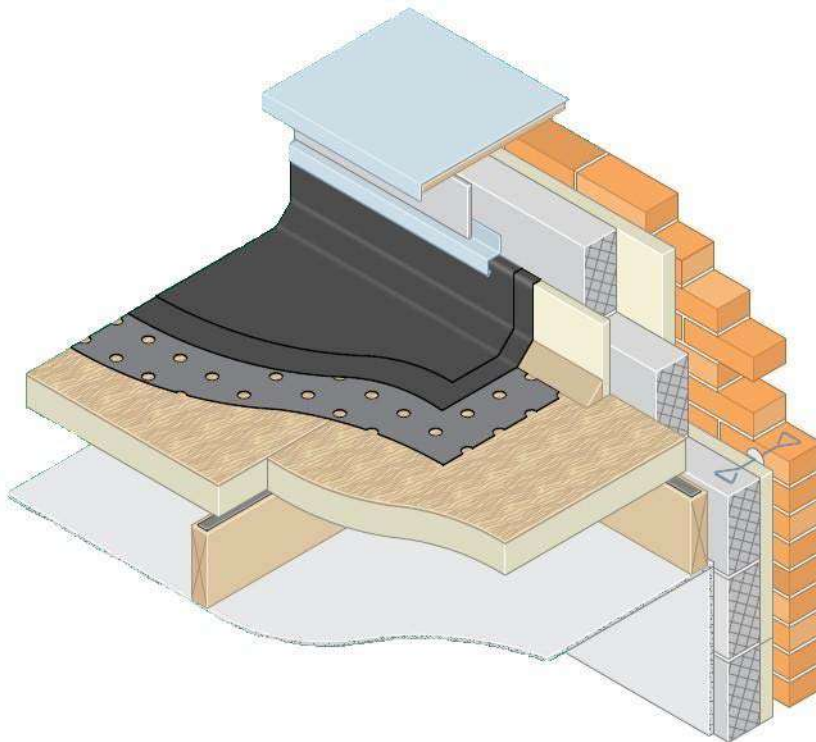
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Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products

Isolation de murs Wärmedämmung

NSAI Agrément (Irish Agrément Board) is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2017**.



PRODUCT DESCRIPTION:

This Certificate relates to the following products:

- Quinn Therm PlyDeck (Detail Sheet 1)
- Quinn therm QR FR Flat Roof Insulation (Detail Sheet 2)

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2017.

USE:

This is covered in each individual Detail Sheet.

MANUFACTURE AND MARKETING:

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1.1 ASSESSMENT

In the opinion of NSAI Agrément, Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products if used in accordance with this Certificate and in conjunction with the relevant Detail Sheet, can meet the requirements of the Building Regulations 1997 to 2017, as indicated in Section 1.2 of this Irish Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2017

REQUIREMENTS:

Part D – Materials and Workmanship

D3 – Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products, as certified in this Certificate, are comprised of 'proper materials' fit for their intended use (see Part 4 of this Certificate).

D1 – Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products, as certified in this Certificate, meet the requirements of the building regulations for workmanship.

Part B – Fire Safety

B2 – Internal Fire Spread (Linings)

Part B Vol 2 – Fire Safety

B7 – Internal Fire Spread (Linings)

Quinn Therm PlyDeck is considered to be Class 1. Quinn Therm QR FR Flat Roof Insulation can be considered as Class 0 when installed with a suitable waterproofing membrane.

B3 – Internal Fire Spread (Structure)

B8 – Internal Fire Spread (Structure)

Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products faced with low emissivity aluminium foil facings are declared to be Class 1 to BS 476-7:1997 *Fire tests on building materials and structures – Method of test to determine the classification of the surface spread of flame of products.*

Part C – Site Preparation and Resistance to Moisture

C4 – Resistance to Weather and Ground Moisture

Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products referred to in this Certificate when installed in compliance with the conditions indicated in Part 3 of the relevant Detail Sheet will not promote the passage of moisture and will minimise the risk of surface or interstitial condensation.

Part J – Heat Producing Appliances

J3 – Protection of Building

In the opinion of NSAI Agrément, the Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products, if used in accordance with this Certificate and the relevant Detail Sheet, can meet the requirements of Part J of the Building Regulations 1997 to 2017.

Part L – Conservation of Fuel and Energy

L1 – Conservation of Fuel and Energy

Based on the measured thermal conductivity of Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products, the products can contribute to complying with the requirements of this Regulation.

2.1 PRODUCT DESCRIPTION

Each of the Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products is given a detailed description in the relevant Detail Sheet.

2.2 DELIVERY, STORAGE AND MARKING

Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products are supplied palletised in labelled packs and shrink wrapped in polyethylene. Each pack carries a label bearing the CE Marking together with the product description, product characteristics (λ and R values), size, thickness, batch number and date of manufacture, the manufacturer's name, NSAI Agrément identification mark and NSAI Agrément Certificate number for the system.

The product packaging must not be considered adequate for outside protection. Ideally boards should be stored inside the building. If stored outside, the products should be stacked flat on a level base raised off the ground on skids and should be covered with a polythene sheet or protected with weatherproof tarpaulins.

Boards should be protected in transit and in storage from damage caused by ropes and tie straps.

The boards must not be exposed to a naked flame or other ignition sources.

On-site cutting of boards where it is necessary to maintain continuity of insulation around doors, windows or other openings is easily executed using a fine tooth saw or by cutting through the insulation, and paper backing of any plasterboard layer, then snapping the boards face down over a straight edge and cutting the paper facing of the plasterboard on the other side.

Tapered edged boards are jointed and finished in accordance with standard dry lining procedure offering a surface suitable for paper hanging and paint finishes.

Good workmanship and appropriate site procedures are necessary to achieve expected thermal and air tightness performance. Ensure accurate trimming to achieve close butting joints and continuity of insulation.

Adequate protection and safety precautions should be taken.

3.1 GENERAL

This matter is dealt with for each product in their Detail Sheet.

4.1 BEHAVIOUR IN FIRE

Each Detail Sheet contains the relevant information.

4.2 WATER PENETRATION

Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products referred to in this Certificate are of a closed cell structure, which does not allow water uptake by capillary action. When used in accordance with this Certificate, the products present no significant risk of water penetration.

4.3 THERMAL INSULATION

The aged/design thermal conductivity ' $\lambda_{90/90}$ ' value' of the Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products has been measured in accordance with I.S. EN 12667:2001 *Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meters method – Products of high and medium thermal resistance* (see each individual Detail Sheet). The high thermal resistance of the Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products ensures that cold bridging and extra heat loss around the edges of openings can be avoided.

Lintel jamb and cill designs similar to those shown in Diagram 3 of the TGD to Part L of the Building Regulations 1997 to 2017 will be satisfactory to limit thermal bridging.

Uncontrolled leakage of air through the fabric of a building and/or cracks in and around door and window frames, sills, jambs etc. can occur due to wind pressure or air movement due to thermal effects. Details of how to avoid the infiltration of cold air are given in TGD to Part L of the Building Regulations 1997 to 2017, Section 1.6 page 14.

The required maximum U-values for roofs can be obtained from the relevant Detail Sheet.

4.4 LIMITING THERMAL BRIDGING

The linear thermal transmittance ' ψ ' (Psi) describes the heat loss associated with junctions and around openings. Junction design used with Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products have been assessed and when detailed in accordance with this Certificate can meet the requirements of Table D2 of TGD to Part L of the Building Regulations 1997 to 2017.

When **all** bridged junctions within a building comply with the requirements of Table D2 of TGD to Part L, the improved ' γ ' factor of 0.08 can be entered into the DEAP building energy rating

(BER) calculation. If **all** junctions can be shown to be equivalent or better than Acceptable Construction Details published by the DECLG, then the values published in Table D2 apply.

Where either of the above options are shown to be valid, or when the required values cannot be achieved, all relevant details should be recorded on the 'Certificate of Compliance' for that project for use in future BER calculations.

' ψ ' values for other junctions outside the scope of this Certificate should be assessed in accordance with BRE IP1/06 *Assessing the effects of thermal bridging at junctions and around openings* and BRE BR 497 *Conventions for calculating linear thermal transmittance and temperature factors* in accordance with Appendix D of TGD to Part L of the Building Regulations 1997 to 2017.

As per Acceptable Construction Details, a minimum thermal resistance of 0.6m²K/W should be provided at window reveals, heads and sills.

4.5 MATERIALS IN CONTACT WITH ELECTRICAL WIRING

Electrical installations should be in accordance with the ETCI publication ET 207 *Guide to the National Rules for Electrical Installations as Applicable to Domestic Installations*. It is recommended that cables should not be buried in the insulation and carried in a conduit. In relation to recessed spotlights and other luminaries, ET 207 requires they be not less than the minimum distances from combustible materials as specified in clause 559.3.2 of the TCI National rules of the Electro Technical Council of Ireland (ET 101). For extra low voltage (ELV) it is recommended that only surface mounted ELV lighting be permitted in conjunction with QL Dry Lining with Plasterboard Laminate.

4.6 CONDENSATION RISK

The Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products referred to in this Certificate have a high vapour resistance and are therefore unlikely to be affected by surface or interstitial condensation, provided all joints between boards are filled and taped in accordance with standard dry lining practice. Interstitial condensation analysis for average winter environmental conditions for cavity wall constructions indicate no condensation risk. When insulating buildings the recommendations of BS 5250:2011+A1:2016 *Code of Practice for control of condensation in buildings* should be followed to minimise the risk of condensation within the building elements and structures.

4.7 RESISTANCE TO SOLVENTS, FUNGI AND RODENTS

The Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products referred to in this Certificate do not promote infestation, as there is no food value in the materials used. They also resist attack by mould and microbial growth. The insulation core is resistant to dilute acids, alkalis, mineral oil and petrol. It is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with the boards. Boards which have been in contact with harsh solvents, petrol, mineral oil or acids or boards that have been damaged in any other way should not be used.

4.8 MAINTENANCE

This matter is dealt with in the Detail Sheets.

4.9 DURABILITY

The Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products referred to in this Certificate are rot-proof and durable. As insulation for cavity walls, floors and roofs and as dry lining, such products are judged to be stable and will remain effective as an insulation system for the life of the building, so long as it is installed in accordance with this Certificate. Quinn Therm QL Dry Lining with Plasterboard Laminate should not be used to isolate dampness nor be used in continuously damp or humid conditions.

4.10 CE MARKING

The manufacturer has taken responsibility of CE marking the Quinn Therm PlyDeck & QR FR Rigid PIR Insulation Products in accordance with harmonised European Standard IS EN 13165:2012+A2:2016 *Thermal insulation products for buildings – Factory made rigid polyurethane foam (PU) products - Specification*. An asterisk (*) appearing in this Certificate indicates that data shown is an essential characteristic of the product and declared in the manufacturer's Declaration of Performance (DoP).

Reference should be made to the latest version of the manufacturer's DoP for current information on any essential characteristics declared by the manufacturer.

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2017 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to NSAI are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.3 In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate holder to market, install or maintain the product/process; or

(c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

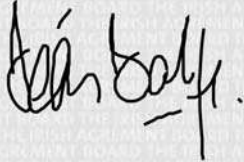
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **07/0273** is accordingly granted by the NSAI to **Quinn Therm Ltd** on behalf of NSAI Agrément.

Date of Issue: **May 2007**

Signed



Seán Balfe
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.n Sai.ie

Revisions: 8th January 2018

- References to Building Regulations and standards updated, product specifications updated to reflect manufacturer's DoP.

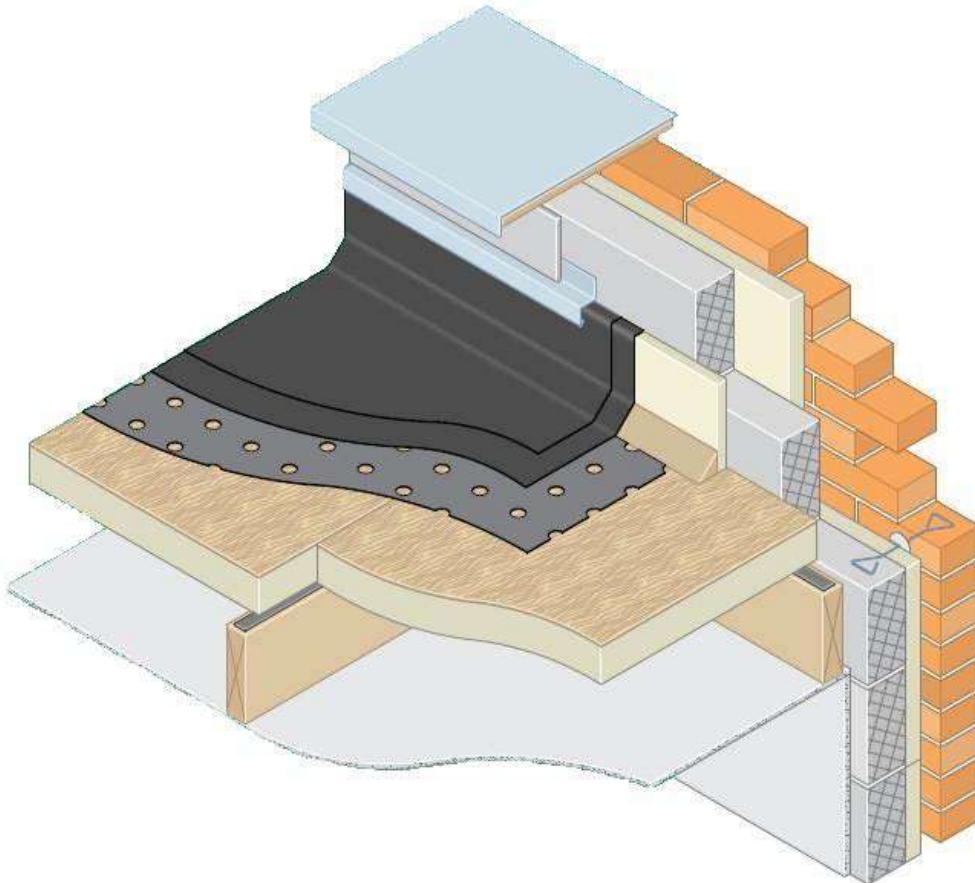


NSAI

Agrément

CERTIFICATE NO. 07/0273
DETAIL SHEET 1

Quinn Therm PlyDeck



PRODUCT DESCRIPTION:

This Detail Sheet relates to Quinn Therm PlyDeck, as defined in NSAI Agrément Certificate 07/0273.

USE:

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. It is intended for use on roof decks which comply with BS 6229:2003 *Code of practice for flat roofs with continuously supported coverings*.

MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:
Quinn Therm Ltd.,
Scotchtown,
Ballyconnell,
Co. Cavan.
T: +353 (0)49 9525600
F: +353 (0)49 9525601
E: info@quinn-buildingproducts.com
W: www.quinn-buildingproducts.com

1.1 ASSESSMENT

In the opinion of NSAI Agrément, Quinn Therm PlyDeck, if used in accordance with this Detail Sheet, meets the requirements of the Building Regulations 1997 to 2017 as indicated in Section 1.2 of Certificate 07/0273.

1.2 BUILDING REGULATIONS 1997 to 2017

This matter is dealt with in NSAI Agrément Certificate 07/0273.

2.1 PRODUCT DESCRIPTION

This Detail Sheet relates to Quinn Therm PlyDeck, a composite insulation board using a Polyisocyanurate (PIR) closed cell rigid insulation manufactured in accordance with IS EN 13165:2012+A2:2016. A layer of 6mm thick 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. During the manufacturing process, liquid raw materials expanded by blowing agents are applied between low emissivity composite foil facings. Quinn Therm PlyDeck is CFC and HCFC free and therefore has zero ozone depletion potential (zero ODP).

This Detail Sheet certifies compliance with the requirements of the Building Regulations 1997 to 2017.

Length	2400mm
Width	1200mm
Thickness⁺	60-200mm
PIR core density	28-34kg/m ³
Area per board	2.88m ²
Edge profiles	Butt edged
Thermal conductivity*	0.022W/mK
Water vapour resistivity	>300MNs/gm
Compressive strength*	≥150kPa
⁺ Does not include 6mm plywood board Other sizes are available on request	

Table 1: Product Range & Physical Properties

2.2 MANUFACTURE

Quinn Therm PlyDeck is manufactured from a formulation of chemicals, which is poured onto low emissivity composite foil facings subsequently autohesively bonded to the insulation core during manufacture.

2.3 DELIVERY, STORAGE AND MARKING

This matter is dealt with in Section 2.2 of NSAI Agrément Certificate 07/0273.

2.4 INSTALLATION

2.4.1 General

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

Quinn Therm PlyDeck boards must be supported at all edges, including cut edges at penetrations. 50x50mm 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 (300 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 0.20W/m²K and lower should be achieved by fitting additional Quinn Therm QR insulation between the joists (Figure 1). The Quinn Therm QR boards should be cut to fit tightly between the

joists and restrained by battens or part-driven nails.

Thermal bridging at roof-wall junctions must be avoided. At eaves and verges (Figure 2), the joist space should be packed with insulation. At parapets (Figure 3), 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. Insulation on the surrounds of roof windows (Figure 4) should be continuous with Quinn Therm PlyDeck.

To prevent condensation building up beneath the waterproofing, a vapour control layer must be provided on the warm side of the insulation. The foil facing on the underside of Quinn Therm PlyDeck has a very high vapour resistance and can be formed into a vapour control layer by sealing the joints between the boards. The simplest way to seal the joints is to set the boards onto a wide (30mm) bead of vapour resistant sealant applied to the upper surface of all the joists and cross noggins.

2.4.2 Procedure

Plan the layout of Quinn Therm PlyDeck boards.
Cut and fit cross noggins.

Apply vapour resistant sealant in a 30mm wide strip to the upper surface of the joists and cross noggins.

Lay Quinn Therm PlyDeck boards with long edges following joists and board edges in broken bond.

Fix with screws at 200mm centres around board edges, 300mm at any other cross timbers.

Lay the waterproofing system.

Fixings for adjacent boards should be staggered to the same joist or noggin.

Screw heads should finish flush with the surface of the plywood.

The period between installation of Quinn Therm PlyDeck and of the waterproofing system should be minimised. In poor weather, polyethylene sheeting should be used as temporary protection of Quinn Therm PlyDeck.

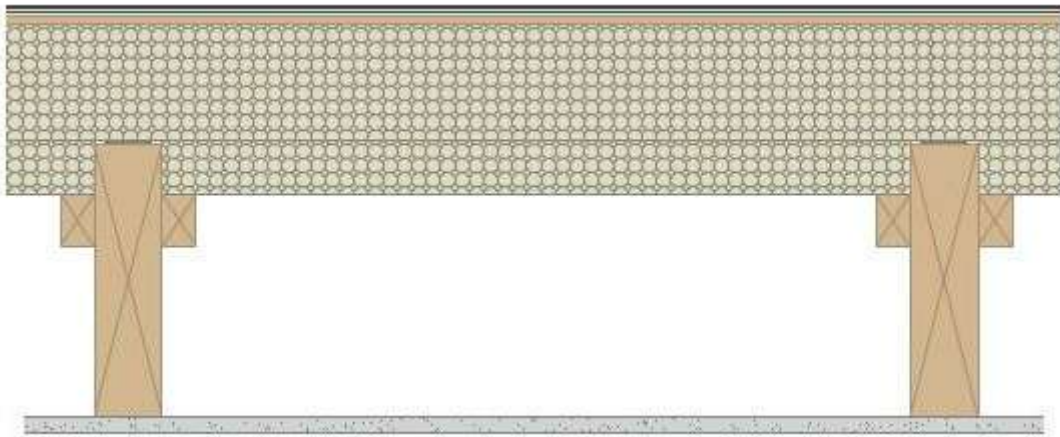


Figure 1: Insulation between joists

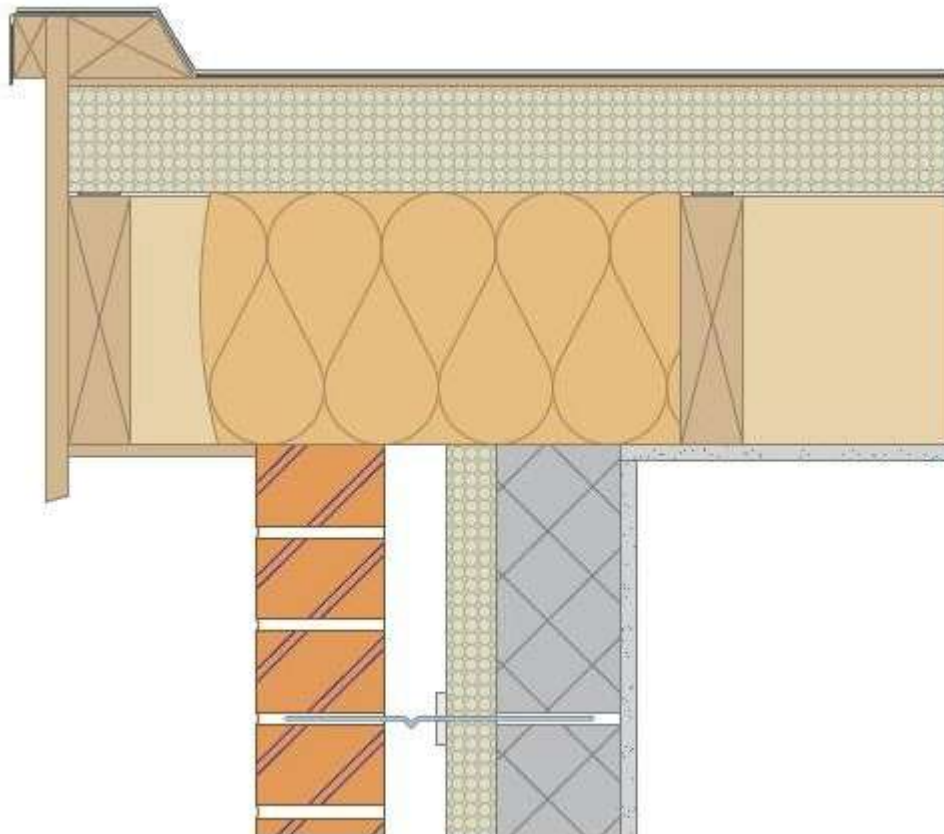


Figure 2: Verge

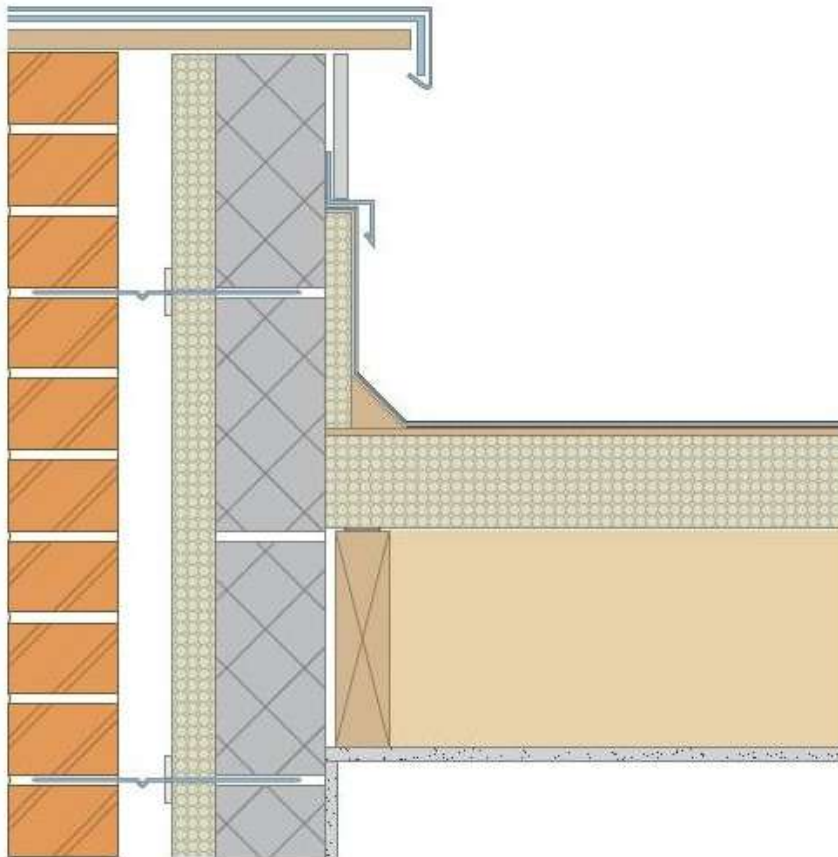


Figure 3: Parapet

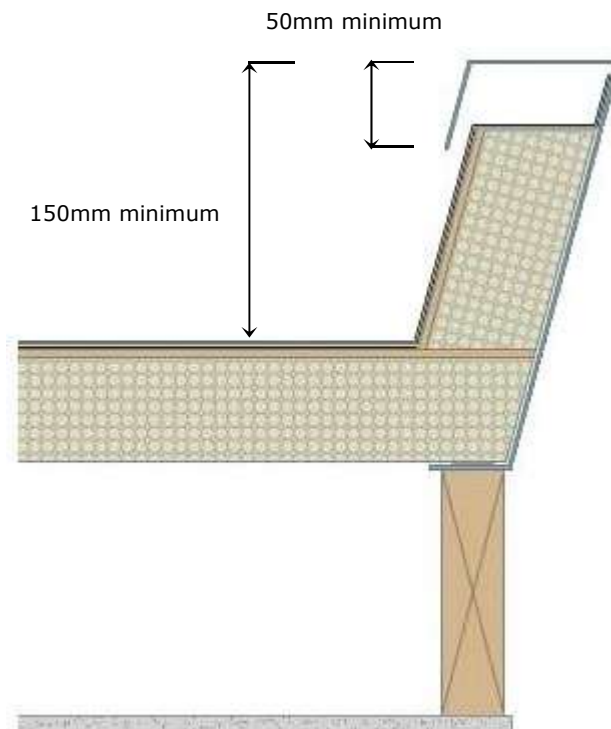


Figure 4: Rooflight penetration

3. GENERAL

3.1 Quinn Therm PlyDeck, when installed in accordance with this Detail Sheet, is effective in reducing the U-value (thermal transmittance) of new external flat roof constructions. It is essential that such roofs are designed and constructed to prevent moisture penetration having regard to the Driving Rain Index.

3.2 Roofs subject to the relevant requirements of the Building Regulations 1997 to 2017 should be constructed in accordance with BS 6229:2003.

3.3 During installation, boards must not be walked on except over supporting timbers. The boards have insufficient nail holding ability to be considered as an alternative to timber sarking.

3.4 Roof tile underlays must be approved by the manufacturer or hold a current NSAI Agrément Certificate for such use. Underlays should be installed with and within the limits of that Certificate.

4.1 BEHAVIOUR IN FIRE

Combustibility – Although Quinn Therm PlyDeck is a product of limited combustibility, when used in the context of this Certificate the increase in fire load in the building consequent to its use is negligible.

The use of Quinn Therm PlyDeck will not affect the fire rating obtained by the tiled/slatted roof when assessed or tested to BS 476-3:2004 *Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs*.

Toxicity – Negligible when used in a protected roof situation.

Quinn Therm PlyDeck is manufactured without the use of CFCs or HCFCs, and there is no release of such gas on burning.

4.2 STRENGTH

Quinn Therm PlyDeck, when installed in accordance with the manufacturer's instructions and this Detail Sheet, will resist the loads likely to be met during installation and in service.

4.3 RESISTANCE TO WIND LOAD

The resistance to wind uplift depends on many factors peculiar to each project. The effect of wind loading should be calculated in accordance with IS EN 1991-1-4:2005 AMD 1:2010 *Eurocode 1: Actions on structures – Part 1-4: General actions – Wind actions (including Irish National Annex using the appropriate basic wind speed shown on the map in Diagram 15 of TGD to Part A of the Building Regulations 1997 to 2017*.

When installed in accordance with this Detail Sheet, Quinn Therm PlyDeck will have sufficient resistance to wind uplift.

4.4 RESISTANCE TO MOISTURE

Quinn Therm PlyDeck will not be adversely affected by rain during installation for a limited time scale or by wind driven snow or rain penetrating the tiling in service.

4.5 CONDENSATION RISK

Quinn Therm PlyDeck has a vapour resistivity of greater than 400MNs/gm. The Certificate holder should be contacted for the purpose of calculating a project specific condensation risk analysis.

The risk of condensation on the underside of the sarking will be minimal under normal conditions of use.

4.6 THERMAL INSULATION

The aged/design thermal conductivity ' $\lambda_{90/90}$ ' value of Quinn Therm PlyDeck when measured in accordance with IS EN 12667:2001 is 0.022W/mK.

The required maximum U-values for flat roof constructions can be obtained with Quinn Therm PlyDeck as indicated in Table 2. For the purpose of the calculations below, all examples are based on a roof construction of 3 layer built-up felt roofing, Quinn Therm PlyDeck board, unvented low emissivity cavity, and 12.5mm plasterboard. Calculations were performed to IS EN ISO 6946:2007 *Building components and building*

elements – Thermal resistance and thermal transmittance – Calculation method.

4.7 RESISTANCE TO SOLVENTS, FUNGI AND RODENTS

Quinn Therm PlyDeck boards do not promote infestation, as there is no food value in the materials used. They also resist attack by mould and microbial growth. The insulation is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with the boards. Boards which have been in contact with harsh solvents, petrol, mineral oil or acids, or boards that have been damaged in any other way should not be used.

4.8 DURABILITY

Quinn Therm PlyDeck is rot proof and durable. As roof insulation, Quinn Therm PlyDeck is judged to be stable and will remain effective as an insulation system for the life of the building, so long as it is installed in accordance with this Detail Sheet. Its durability depends upon the supporting structure and the conditions of use.

U-value (W/m ² K)	Joists @ 400mm centres	Joists @ 600mm centres
0.25	70+6mm*	70+6mm*
0.22	90+6mm*	90+6mm*
0.20	110+6mm*	110+6mm*
0.18	110+6mm*	110+6mm*
0.16	125+6mm*	125+6mm*
* Insulation + 6mm plywood		
Concrete Slab Roof		
0.25	85mm	85mm
0.22	100mm	100mm
0.20	110mm	110mm
0.18	120mm	120mm
0.16	135mm	135mm
Metal Deck		
0.25	90mm	90mm
0.22	100mm	100mm
0.20	110mm	110mm
0.18	125mm	125mm
0.16	140mm	140mm

Table 2: Required Thickness of PlyDeck for different U-values

4.9 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour resistance
- Long term water absorption
- Dimensional accuracy
- Compressive and cross breaking strength
- Dimensional stability
- Thermal conductivity
- Efficiency of the construction process

4.10 OTHER INVESTIGATIONS

- Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed. Quinn Therm QW does not contain CFC or HCFC gas and has zero ODP.
- The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.



NSAI

Agrément

CERTIFICATE NO. 07/0273
DETAIL SHEET 2

Quinn Therm QR FR Flat Roof Insulation

PRODUCT DESCRIPTION:

This Detail Sheet relates to Quinn Therm QR FR Flat Roof Insulation, as defined in NSAI Agrément Certificate 07/0273.

USE:

Quinn Therm QR FR Flat Roof Insulation is used for the thermal insulation of flat roof decks which comply with BS 6229:2003 *Code of practice for flat roofs with continuously supported coverings*.

MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:

Quinn Therm Ltd.,

Scotchtown,

Ballyconnell,

Co. Cavan.

T: +353 (0)49 9525600

F: +353 (0)49 9525601

E: info@quinn-buildingproducts.com

W: www.quinn-buildingproducts.com

1.1 ASSESSMENT

In the opinion of NSAI Agrément, the Quinn Therm QR FR Flat Roof Insulation product, if used in accordance with this Detail Sheet, meets the requirements of the Building Regulations 1997 to 2017 as indicated in Section 1.2 of Certificate 07/0273.

1.2 BUILDING REGULATIONS 1997 to 2017

This matter is dealt with in NSAI Agrément Certificate 07/0273.

2.1 PRODUCT DESCRIPTION

This Detail Sheet relates to Quinn Therm QR FR Flat Roof Insulation using a Polyisocyanurate (PIR) closed cell rigid insulation manufactured in accordance with IS EN 13165:2012+A2:2016. During the manufacturing process, liquid raw materials expanded by blowing agents are applied between low emissivity composite foil facings. FFR is a foil faced flat roof board, GFFR is a glass fibre flat roof board and DPFR is a dual purpose flat roof board consisting of glass fibre on one side and a bitumen fleece facing the other side. QR FR products are CFC and HCFC free and therefore have zero ozone depletion potential (zero ODP).

This Detail Sheet certifies compliance with the requirements of the Building Regulations 1997 to 2017.

Length	2400mm
Width	1200mm
Thickness	60-200mm
Board density	30-34kg/m ³
Area per board	0.72 or 2.88m ²
Thermal conductivity*	FFR: 0.022W/mK GFFR & DPFR: 20-79mm: 0.026W/mK 80-119mm: 0.025W/mK 120-150mm: 0.024W/mK
Water vapour resistivity	>300MNs/gm
Compressive strength*	≥150kPa
Other sizes are available on request	

Table 1: Product Range & Physical Properties

2.2 MANUFACTURE

Quinn Therm QR FR is manufactured from a formulation of chemicals, which is poured onto low emissivity composite foil facings subsequently autohesively bonded to the insulation core during manufacture.

2.3 DELIVERY, STORAGE AND MARKING

This matter is dealt with in Section 2.2 of NSAI Agrément Certificate 07/0273.

2.4 INSTALLATION

2.4.1 Procedure

Quinn Therm QR FR Flat Roof Insulation should be installed over a suitable vapour control barrier. The flat roof structure should be clean and free from any large gaps or projections. The decks should be designed in such a way to allow sufficient falls to all rainwater outlets.

The sides and ends of the boards should be sealed using a suitable sealant. All joints should be lightly butted.

The boards should be installed using suitable mechanical fixings. The fixings should be no less than 50mm and no more than 150mm from the edges of the boards. A minimum of 11 fixings should be used per board. The requirement for extra fixings should be assessed in accordance with IS EN 1991-1-1:2002 NA:2013 *Eurocode 1: Actions on structures – Part 1-1: General actions – Densities, self-weight, imposed loads for buildings (including Irish National Annex 2013)*.

All boards should be waterproofed soon after fixing. In the case of the boards being left overnight, a night joint should be made to prevent water vapour penetrating the roof structure.

2.4.2 Cutting

On-site trimming of boards where necessary is easily executed using a fine tooth saw or by cutting through the insulation, then snapping the board face down over a straight edge.

Good workmanship and appropriate site procedures are necessary to achieve expected thermal and air tightness performance. Ensure accurate trimming to achieve close butting joints and continuity of insulation.

2.4.3 Vapour Permeable Membranes

Vapour permeable membranes for the purposes of this Detail Sheet should be approved for use with the system by the Certificate holder, or may be any other NSAI Agrément certified breather membrane.

3.1 GENERAL

Quinn Therm QR FR Flat Roof Insulation, when installed in accordance with this Detail Sheet, is effective in reducing the U-value (thermal transmittance) of new and existing flat roof constructions. It is essential that such roofs are designed and constructed to prevent moisture penetration having regard to the Driving Rain Index.

Roofs subject to the relevant requirements of the Building Regulations 1997 to 2017 should be constructed in accordance with BS 6229:2003.

During installation, boards must not be walked on, except over supporting timbers. The boards have insufficient nail holding ability to be considered as an alternative to timber sarking.

Roof tile underlays must be approved by the manufacturer or hold a current NSAI Agrément Certificate for such use. Underlays should be installed with and within the limits of that Certificate.

4.1 BEHAVIOUR IN FIRE

Combustibility – Although Quinn Therm QR FR Flat Roof Insulation is a product of limited combustibility, when used in the context of this Certificate the increase in fire load in the building consequent to its use is negligible.

The use of Quinn Therm QR FR will not affect the fire rating obtained by the tiled/slatted roof when assessed or tested to BS 476-3:2004 *Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs*.

Toxicity – Negligible when used in a protected roof situation.

Quinn Therm QR FR is manufactured without the use of CFCs or HCFCs, and there is no release of such gas on burning.

4.2 STRENGTH

Quinn Therm QR FR, when installed in accordance with the manufacturer's instructions and this Detail Sheet, will resist the loads likely to be met during installation and in service

4.3 RESISTANCE TO WIND LOAD

The resistance to wind uplift depends on many factors peculiar to each project. The effect of wind loading should be calculated in accordance with IS EN 1991-1-4:2005 AMD 1:2010 *Eurocode 1: Actions on structures – Part 1-4: General actions – Wind actions (including Irish National Annex using the appropriate basic wind speed shown on the map in Diagram 15 of TGD to Part A of the Building Regulations 1997 to 2017*.

When installed in accordance with this Detail Sheet, Quinn Therm QR FR will have sufficient resistance to wind uplift.

4.4 RESISTANCE TO MOISTURE

Quinn Therm QR FR will not be adversely affected by rain during installation for a limited time scale or by wind driven snow or rain penetrating the tiling in service.

4.5 CONDENSATION RISK

Quinn Therm QR FR has a vapour resistivity of greater than 400MNs/gm. The Certificate holder should be contacted for the purpose of calculating a project specific condensation risk analysis.

The risk of condensation on the underside of the sarking will be minimal under normal conditions of use.

4.6 THERMAL INSULATION

The aged/design thermal conductivity ' $\lambda_{90/90}$ ' value of Quinn Therm QR FR products when measured in accordance with IS EN 12667:2001 is 0.022W/mK for FFR, and either 0.026W/mK, 0.025W/mK or 0.024W/mK for GFFR and DPFR depending on the insulation thickness.

The required maximum U-values for flat roof constructions can be obtained with Quinn Therm QR FR as indicated in Table 2. Calculations were performed to IS EN ISO 6946:2007 *Building components and building elements – Thermal resistance and thermal transmittance – Calculation method*.

Metal Deck*	
U-value (W/m²K)	Thickness (mm)
0.25	95
0.22	105
0.20	115
0.18	130
0.16	145
* Lightweight metal deck, Quinn Therm QR FR, waterproofing membrane, 5 fixings per m ²	
Concrete Deck**	
0.25	85
0.22	100
0.20	110
0.18	125
0.16	140
** 150mm concrete deck, 50mm screed, Quinn Therm QR FR, waterproofing membrane, 5 fixings per m ²	

Table 2: Required Thickness of QR FR for different U-values

4.7 RESISTANCE TO SOLVENTS, FUNGI AND SOLVENTS

Quinn Therm QR FR boards do not promote infestation, as there is no food value in the materials used. They also resist attack by mould and microbial growth. The insulation is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with the boards. Boards which have been in contact with harsh solvents, petrol, mineral oil or acids, or boards that have been damaged in any other way should not be used.

4.8 DURABILITY

Quinn Therm QR FR is rot proof and durable. As roof insulation, Quinn Therm QR FR is judged to be stable and will remain effective as an insulation system for the life of the building, so long as it is installed in accordance with this Detail Sheet.

4.9 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour transmission
- Long term water absorption
- Dimensional accuracy
- Compressive and cross breaking strength
- Dimensional stability
- Thermal conductivity
- Efficiency of the construction process

4.10 OTHER INVESTIGATIONS

- (i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed. Quinn Therm QR FR does not contain CFC or HCFC gas and has zero ODP.
- (ii) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- (iii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

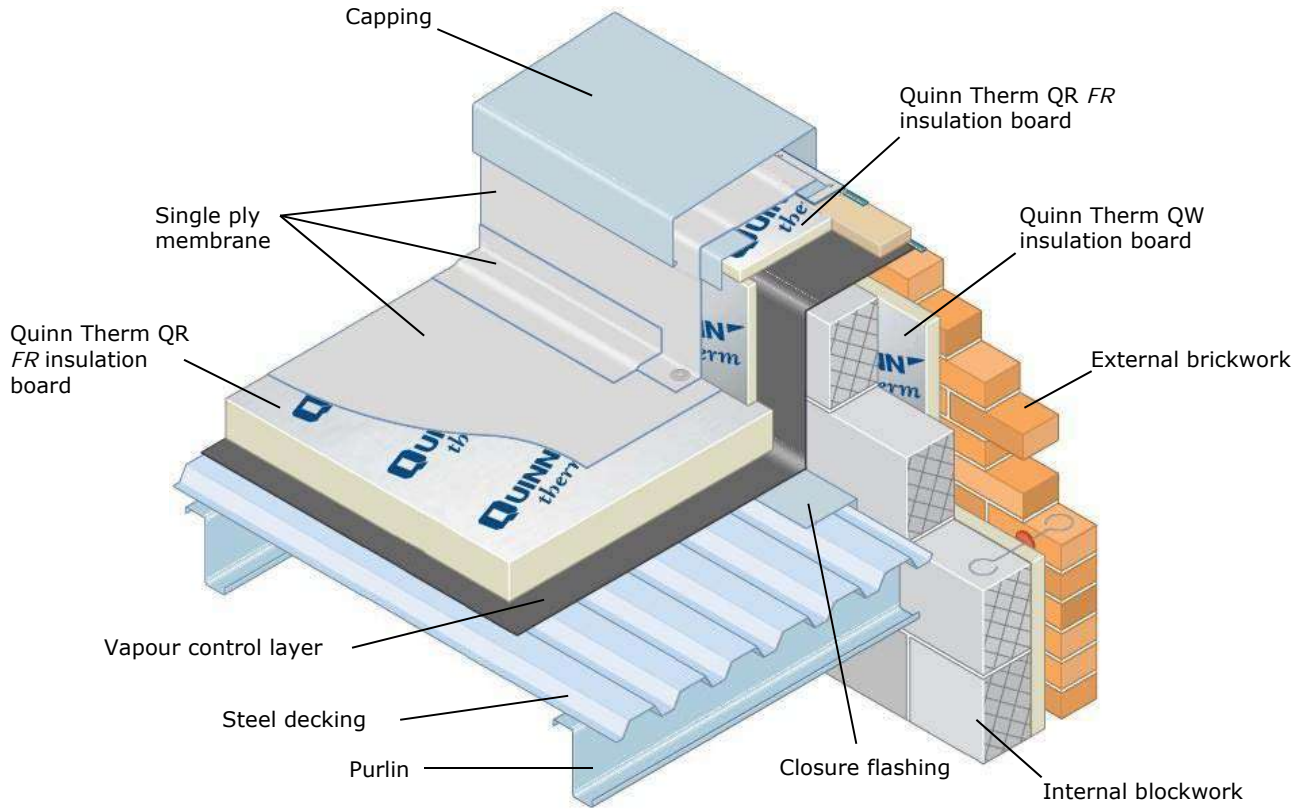


Figure 1: Metal Deck Roof

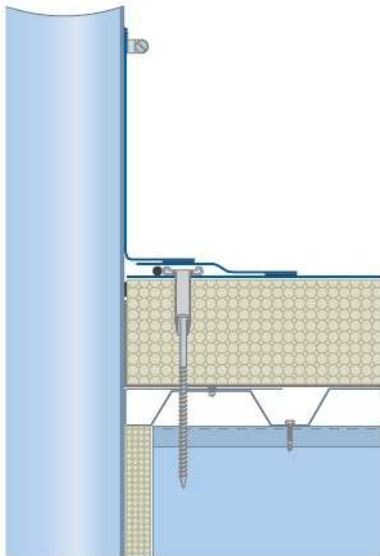


Figure 2: Pipe Penetration

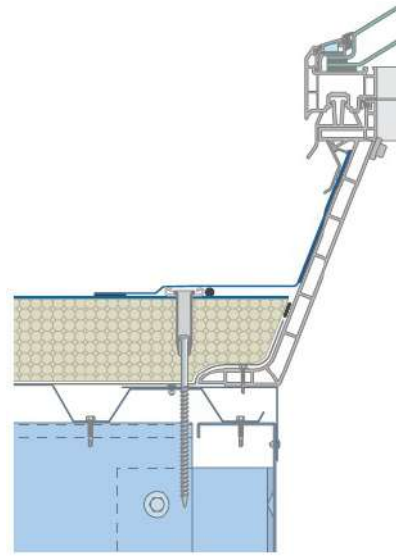


Figure 3: Rooflight Penetration

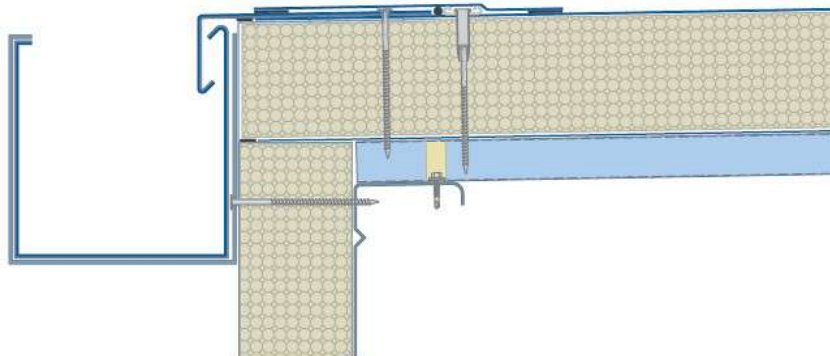


Figure 4: Eaves Gutter

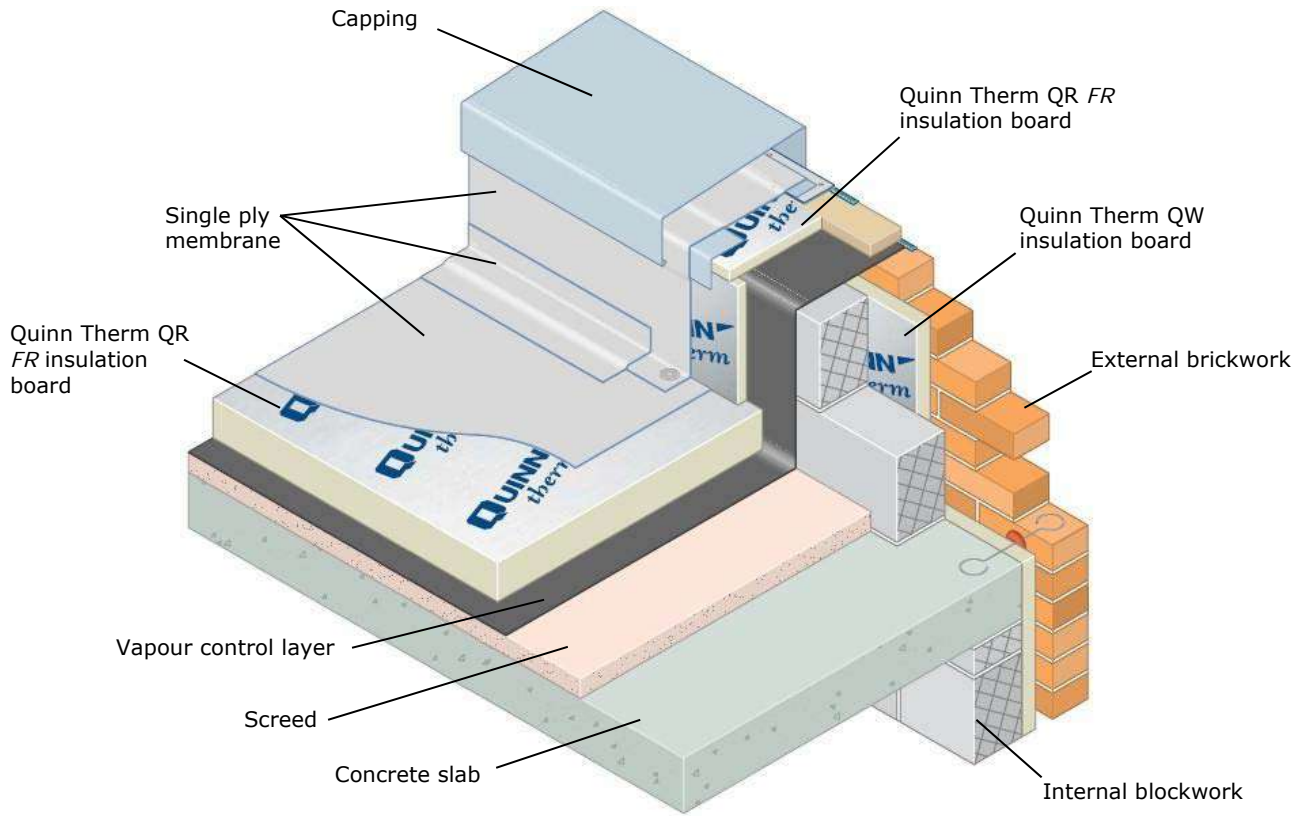


Figure 5: Concrete Deck Roof

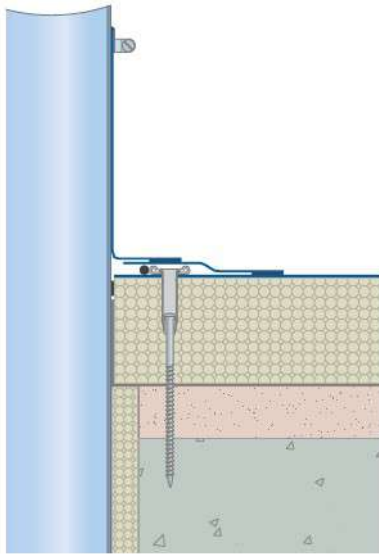


Figure 6: Pipe Penetration

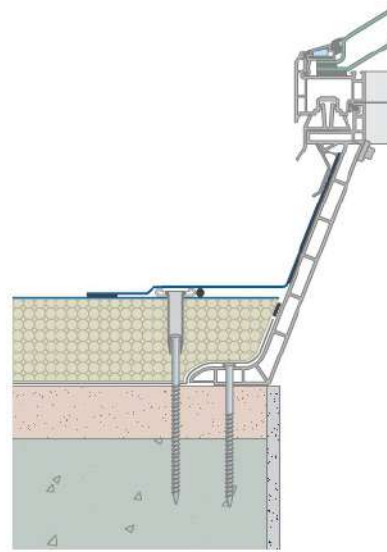


Figure 7: Rooflight Penetration

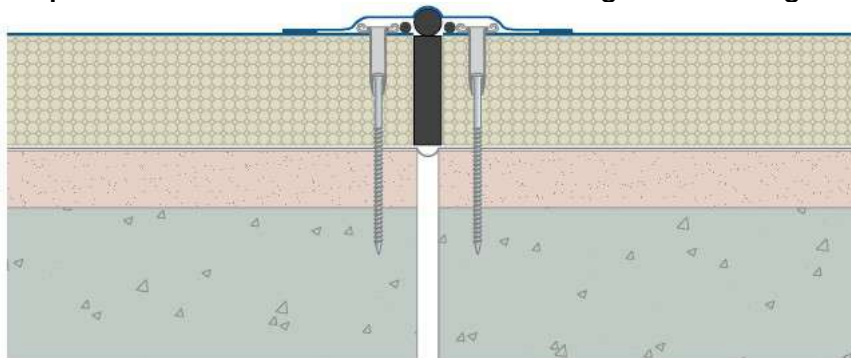


Figure 8: Movement Joint