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Agrément Certificate

07/4444

Product Sheet 1

QUINN THERM

QUINN THERM QL INSULATED DRY LINING COMPOSITE BOARD

This Agrément Certificate Product Sheet⁽¹⁾ relates to Quinn Therm QL Insulated Dry Lining Composite Board, a rigid polyisocyanurate (PIR) foam board with composite foil or foil/kraft paper facings, factory-bonded to plasterboard, for use as an internal insulated dry lining to external masonry walls, and also as a lining to the underside of rafters in pitched roofs, of existing or new domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations

KEY FACTORS ASSESSED

Thermal performance — the insulation component of the product has a declared thermal conductivity (λ_D)* of $0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ (see section 6).

Condensation risk — the product can limit the risk of surface condensation; the risk of interstitial condensation should be assessed for each case (see section 7).

Behaviour in relation to fire — the product has a fire classification* of B-s1, d0 to BS EN 13501-1 : 2007 (see section 8).

Durability — the product is durable, rot-proof, and sufficiently stable to remain effective as an insulation for the life of the building (see section 14).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Third issue: 6 April 2016

John Albon – Head of Approvals
Construction Products

Originally certificated on 1 November 2007

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Quinn Therm QL Insulated Dry Lining Composite Board, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

| | | |
|---------------------|---|--|
| Requirement: | B2(1) | Internal fire spread (linings) |
| Comment: | The product is unrestricted under this Requirement. See section 8.1 of this Certificate. | |
| Requirement: | C2(c) | Resistance to moisture |
| Comment: | The product can contribute to satisfying this Requirement. See sections 7.1 and 7.7 of this Certificate. | |
| Requirement: | L1(a)(i) | Conservation of fuel and power |
| Comment: | The product can contribute to satisfying this Requirement. See section 6 of this Certificate. | |
| Requirement: | 7 | Materials and workmanship |
| Comment: | The product is acceptable. See section 14 and the <i>Installation</i> part of this Certificate. | |
| Regulation: | 26 | CO₂ emission rates for new buildings |
| Regulation: | 26A | Fabric energy efficiency rates for new dwellings (applicable to England only) |
| Regulation: | 26A | Primary energy consumption rates for new buildings (applicable to Wales only) |
| Regulation: | 26B | Fabric performance values for new dwellings (applicable to Wales only) |
| Comment: | The product can contribute to a building satisfying these Regulations; however, compensating fabric measures may need to be taken. See section 6 of this Certificate. | |



The Building (Scotland) Regulations 2004 (as amended)

| | | |
|--------------------|--|---|
| Regulation: | 8(1) | Durability, workmanship and fitness of materials |
| Comment: | The product is acceptable. See section 14 and the <i>Installation</i> part of this Certificate. | |
| Regulation: | 9 | Building standards applicable to construction |
| Standard: | 2.5 | Internal linings |
| Comment: | The product is unrestricted under this Standard, with reference to clause 2.5.1 ⁽¹⁾⁽²⁾ . See section 8.1 of this Certificate. | |
| Standard: | 3.15 | Condensation |
| Comment: | The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See sections 7.1 and 7.8 of this Certificate. | |
| Standard: | 6.1(b) | Carbon dioxide emissions |
| Standard: | 6.2 | Building insulation envelope |
| Comment: | The product can contribute to satisfying these Standards, with reference to clauses, or parts of, 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾⁽²⁾ , 6.2.4 ⁽¹⁾⁽²⁾ , 6.2.5 ⁽¹⁾⁽²⁾ , 6.2.6 ⁽¹⁾⁽²⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate. | |
| Standard: | 7.1(a)(b) | Statement of sustainability |
| Comment: | The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6 of this Certificate. | |

| | | |
|--------------------|-----------|---|
| Regulation: | 12 | Building standards applicable to conversions |
| Comment: | | Comments in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . |
| | | (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic). |



The Building Regulations (Northern Ireland) 2012 (as amended)

| | | |
|--------------------|-----------------|--|
| Regulation: | 23 | Fitness of materials and workmanship |
| Comment: | | The product is acceptable. See section 14 and the <i>Installation</i> part of this Certificate. |
| Regulation: | 29 | Condensation |
| Comment: | | The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate. |
| Regulation: | 34 | Internal fire spread — Linings |
| Comment: | | The product is unrestricted under this Regulation. See section 8.1 of this Certificate. |
| Regulation: | 39(a)(i) | Conservation measures |
| Regulation: | 40(2) | Target carbon dioxide emission rate |
| Comment: | | The product can contribute to a building satisfying these Regulations. See section 6 of this Certificate |

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.3) and 15 *General* (15.8) of this Certificate.

Additional Information

NHBC Standards 2016

NHBC accepts the use of Quinn Therm QL Insulated Dry Lining Composite Board, provided the bonded plasterboard facing is a minimum of 12.5 mm thick, with the product mechanically fixed back to the structure, and it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards 2016*, Chapter 6.1 *External masonry walls* and 7.2 *Pitched Roofs*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13950 : 2014. An asterisk (*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Quinn Therm QL Insulated Dry Lining Composite Board consists of PIR insulation⁽¹⁾ with either composite foil or foil/kraft paper facings, factory-bonded to tapered edge plasterboard⁽²⁾. The product is supplied in two different options as QL-Foil and QL-Kraft, with facings to suit different fixing methods.

(1) Manufactured in accordance with BS EN 13165 : 2012.

(2) Manufactured in accordance with BS EN 520 : 2004.

1.2 QL-Foil has composite foil-facings on both sides of the PIR insulation and is suitable for mechanical fixing only, either directly to the wall, or onto timber battens or metal furring systems.

1.3 QL-Kraft has foil/kraft paper-facings on both sides, and is suitable either for adhesive fixing to the wall using plaster adhesive dabs, or for mechanical fixing directly to the wall or onto timber battens or metal furring systems.

1.4 The nominal characteristics of both versions are given in Table 1.

Table 1 Nominal characteristics

| Product | Board size (mm) | Plasterboard ⁽¹⁾ thickness (mm) | PIR insulation thickness (mm) | Board facings | Fixing method |
|----------|---|--|-----------------------------------|--|--|
| QL-Foil | 2400 x 1200 2438 x 1200 2700 x 1200 2743 x 1200 3000 x 1200 | 9.5 or 12.5 | 17, 25, 30, 38, 50, 60, 70, 80 | Composite foil-facing each side, one side printed and bonded to plasterboard, other side unprinted | Mechanical fixing only |
| QL-Kraft | 2400 x 1200 2438 x 1200 2700 x 1200 2743 x 1200 3000 x 1200 | 9.5 or 12.5 | 17, 25, 30, 38, 50, 60, 70, 80 | Foil/kraft paper facing each side (no printing), one side bonded to plasterboard | Direct bonding (adhesive) or mechanical fixing |

(1) The plasterboard component comprises Type A tapered edge Gypsum plasterboard to EN 520 : 2010.

1.5 Ancillary items for use with the product, which are outside the scope of this Certificate, include:

- gypsum-based dry-lining adhesive compound (plaster dabs) to BS EN 14496 : 2005
- metal component furring systems to BS EN 14195 : 2005
- mechanical fasteners including dry wall screws, plasterboard nails and nailable plugs to BS EN 14566 : 2008
- metal edge and corner beads to BS EN 14353 : 2007
- jointing materials including scrim tape and jointing compound to BS EN 13963 : 2014
- softwood timber battens.

2 Manufacture

2.1 The insulation core of Quinn Therm QL Insulated Dry Lining Composite Board is manufactured by blending together polyol and MDI in a continuous foaming process aided by a blowing agent, and sandwiched between composite foil or foil/kraft paper facings, which is cut to its finished board size. The insulation board is in turn factory-bonded to plasterboard.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the Certificate holder/manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Quinn Therm Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by Certification Europe (Certificate 2500/262).

3 Delivery and site handling

3.1 The boards are delivered to site in polythene-wrapped packs on pallets. Each pack contains a label bearing the manufacturer's name, board dimensions and the BBA logo incorporating the number of this Certificate.

3.2 The product must be protected from prolonged exposure to sunlight, and stored dry, flat and raised above ground level (to avoid contact with ground moisture). Where possible, packs should be stored inside. If stored outside, the product should be under cover, or protected by opaque polythene sheeting.

3.3 Care must be taken when handling the boards to avoid crushing the edges or corners. The boards must not be exposed to open flame or other ignition sources, or solvents or other chemicals. If damaged, the product should be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Quinn Therm QL Insulated Dry Lining Composite Board.

Design Considerations

4 Use

4.1 Quinn Therm QL Insulated Dry Lining Composite Board is satisfactory for use as an insulated dry lining board to improve the thermal insulation of solid or cavity masonry walls of existing and new domestic and non-domestic buildings. It may also be used as an insulated dry lining to the underside of sloping rafters in pitched roofs. It should be installed in accordance with the Certificate holder's instructions.

4.2 The boards may be installed on masonry construction including clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks.

4.3 Walls should be designed and constructed in accordance with the relevant clauses of:

- BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, and their respective National Annexes
- BS 8000-3 : 2001.

4.4 Roofs should be designed and constructed in accordance with the relevant clauses of:

- BS 5250 : 2011, BS 5534 : 2104 and BS 8212 : 1995
- BS EN 1995-1-1 : 2004 and its National Annex.

4.5 The boards are not intended to offer resistance to rain penetration; walls/roofs, therefore, must be already rain resistant and show no signs of water ingress, rain penetration or damp from ground moisture.

4.6 It is essential that the boards are butted as close as possible to minimise any gaps between them (see section 16 of this Certificate).

4.7 Services which penetrate the dry lining, eg light switches and power outlets, should be kept to a minimum to limit damage to vapour checks. All perimeters of the board, around service penetrations, openings, junctions and around the perimeter of suspended timber floors must be sealed with a suitable sealant.

4.8 Where services have to be incorporated behind the dry lining, the wall should be chased rather than the insulation. Suitable isolation methods, such as conduit or capping, must be used to ensure cables do not come into contact with the insulation.

4.9 The installation of the system requires careful detailing around doors and windows to achieve a satisfactory surface for finishing. In addition, every attempt should be made to minimise the risk of thermal bridging at reveals and where heavy separating walls are attached to the external wall. New work must be designed to accommodate the thickness of the dry lining, particularly at reveals, heads and sills and in relation to ceiling height. Where the dimensions of fixtures are critical (eg bathrooms), these should be checked before installation.

4.10 If present, mould or fungal growth should be treated prior to the application of the product.

5 Practicability of installation

The product is designed to be installed by a competent builder, or contractor, experienced with this type of product.

6 Thermal performance



6.1 Calculations of thermal transmittance (U value) of a specific construction using insulated dry lining should be carried out in accordance with BS EN ISO 6946 : 2007, BRE Report BR 443 : 2006 and BRE Digest 465 : 2002, using the declared thermal conductivity (λ_D)* of $0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for the insulation component, a design value of $0.21 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for the plasterboard, and a tested aged emissivity (ϵ_D) (to BS 15976 : 2011) of 0.06 for the unprinted composite foil-facings, or 0.14 for the unprinted foil/kraft paper-facings.

6.2 The U value of a completed wall or roof construction will depend on the insulation thickness, number and type of fixings, the insulating value of the substrate masonry or roof structure and its finishes. Calculated U values for example constructions are given in Table 2. For improved thermal/carbon emissions performance, the designer should consider additional fabric and/or services measures.

Table 2 Example U values — Solid brickwork wall⁽¹⁾

| Quinn Therm QL Insulated Dry Lining Composite Board Thickness of insulation ⁽²⁾ (mm) | | |
|---|--|---|
| U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$) | 215 mm brickwork — adhesively fixed with dabs ⁽³⁾ | 215 mm brickwork — mechanically fixed on timber battens ⁽⁴⁾ |
| 0.18 | — | — |
| 0.19 | — | — |
| 0.25 | 80 | — |
| 0.26 | 70 | — |
| 0.27 | 70 | 80 |
| 0.28 | 70 | 80 |
| 0.30 | 60 | 70 |
| 0.35 | 50 | 60 |

(1) 215 mm thick existing solid brickwork wall ($0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ thermal conductivity).

(2) Thickness of insulation specified excludes plasterboard thickness of 9.5 mm and 12.5 mm.

(3) **QL-Kraft** – (12.5 mm thick plasterboard) Direct bonding with 15 mm plaster adhesive dabs (15 mm air cavity). Boards adhesively fixed in addition to 0.69 fully-penetrating steel fixings ($50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) per square metre with a cross-sectional area of 18.2 mm^2 (minimum of two nailable fixings, at midpoint of the board, 25 mm from board edge).

(4) **QL-Foil** – (12.5 mm thick plasterboard) Mechanical fixing to treated softwood timber battens, 22 mm batten cavity. Boards mechanically fixed with 10.35 fully penetrating steel fixings ($50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) per square metre with a cross-sectional area of 18.2 mm^2 (47 mm wide timber battens at 600 mm centres maximum).

Junctions



6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Condensation risk

Interstitial condensation



7.1 Walls and roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annexes D, G and H.

7.2 The risk of summer condensation on the foil component must be considered for solid masonry walls orientated from ESE through south to WSW, in accordance with BRE Report 262 : 2002, section 3.10.

7.3 For each construction, a condensation risk analysis should be carried out in accordance with BS EN ISO 13788 : 2012 and BS 5250 : 2011, using the values for each component given in Table 3.

Table 3 Water vapour transmission values

| Material | Water vapour resistance ($MN \cdot s \cdot g^{-1}$) | Water vapour resistivity ($MN \cdot s \cdot g^{-1} \cdot m^{-1}$) |
|----------------------------------|--|--|
| Plasterboard | — | 50 |
| PIR foam insulation | — | 300 |
| Foil and foil/kraft paper-facing | 1000 | — |

7.4 Where calculations to Annex D of BS 5250 : 2011 indicate a risk of persistent condensation, a site-specific dynamic analysis to BS EN 15026 : 2007 should be considered.

7.5 Where the product is installed in a pitched roof, a suitable vapour-permeable roof tile underlay may be laid over the rafters without ventilated air space. When using a high resistance (type HR) underlay, the space below it must be ventilated in accordance with BS 5250 : 2011, Annex H. Where the product is installed in a roof with a sloping ceiling (ie room-in-the-roof), a 'warm roof' space is created and ventilation should be designed in accordance with BS 5250 : 2011 Annex H. However, any insulation in a horizontal ceiling should be removed.

7.6 Provided all joints between the product are sealed (see section 4.6 and the *Installation* part of this Certificate) in accordance with the Certificate holder's instructions, the product can offer significant resistance to water vapour transmission.

Surface condensation



7.7 Walls and roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.7 and $0.35 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$ respectively at any point, and the junctions with other elements are designed in accordance with section 6.3 of this Certificate.



7.8 Walls and roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$ at any point, and the junctions with other elements are designed in accordance with the guidance referred to in BS 5250 : 2011, Annexes G and H. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

8 Behaviour in relation to fire



8.1 The product has a reaction to fire classification* of Class B-s1, d0 to BS EN 13501-1 : 2007 and is unrestricted with respect to surface spread of flame under the national Building Regulations.

8.2 When properly installed, the insulation will be contained between the wall or roof covering and the bonded plasterboard lining board until one is compromised. Therefore, the insulation will not contribute to the development of a fire.

9 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and or heat-producing appliances, the relevant provisions of the national Building Regulations are applicable:

England and Wales — Approved Document J

Scotland — Mandatory Standard 3.19, clauses 3.19.1⁽¹⁾⁽²⁾ to 3.19.4⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L.

10 Materials in contact — wiring installations

10.1 As with any form of insulation, de-rating of electrical cables should be considered where the insulation restricts the air cooling of cables.

10.2 Electrical cables that are likely to come into contact with the insulation component of the thermal liner must be protected by a suitable conduit or PVC-U trunking. The installation of electrical services must be carried out in accordance with BS 7671 : 2008.

11 Infestation

Use of the product does not in itself promote infestation. The creation of voids within the structure, for example gaps between the wall lining and the system, may provide habitation for insects or vermin in areas already infested. Care should be taken to ensure, wherever possible, that all voids are sealed, as any infestation may be difficult to eradicate. There is no food value in the materials used.

12 Wall-mounted fittings

The recommendations of the Certificate holder must be followed. Any objects fixed to the wall, other than lightweight items, are outside the scope of this Certificate.

13 Maintenance

The product, if damaged during use, can be readily removed and replaced.

14 Durability



The durability of the product is satisfactory. Provided the product is fixed to a satisfactory stable and durable substrate, it will have a life equal to the building in which it is installed. Under normal conditions of occupancy it is unlikely to suffer damage, but if damage does occur, the product can be repaired or replaced.

Installation

15 General

15.1 A qualified plumber is required to make alterations to heating systems. A qualified electrician must be used to make good the electrical wirings and services.

15.2 The building should be examined for the following:

- suitability of substrate
- detailing around windows and doors
- position and numbers of electrical sockets and switches
- wall fittings and fixtures – including coving and skirting
- areas where flexible sealants must be used
- ventilation plates.

15.3 Before starting to fit the product, the position of all main service cable and pipe runs must be clearly marked on the walls to avoid damage. All plaster coving, skirting board and laminate floor angle beads must be removed.

15.4 Before fixing the product, sufficient time must be allowed for damp-proofing treatments, where applied, to dry out (for information see BS 6576 : 2008 for dry-lining in conjunction with a chemical damp-proof course application).

15.5 Care must be taken when exposing electrical cables (see section 10).

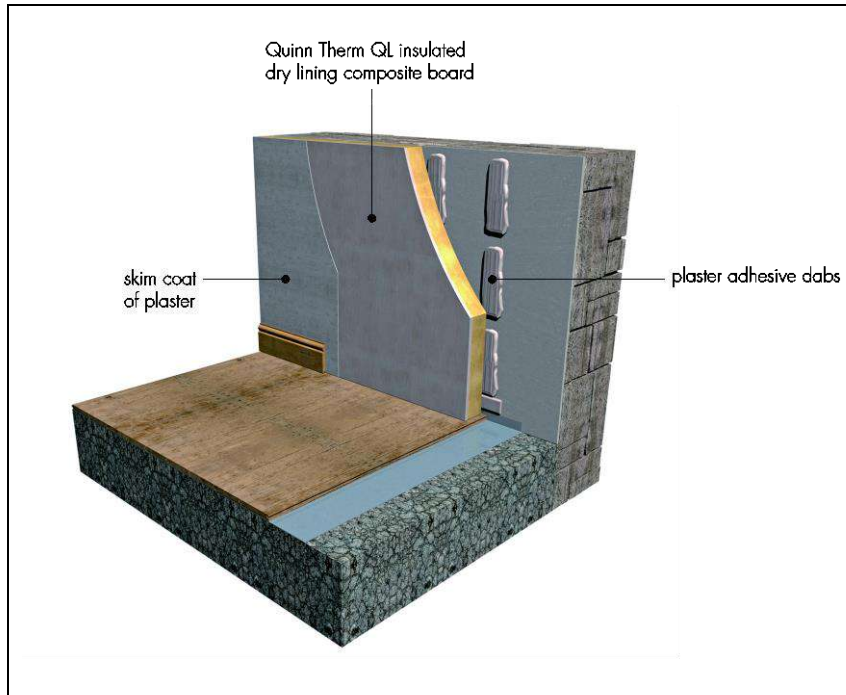
15.6 All insulated dry lining installations require careful planning and setting out. Installation should be in accordance with BS 8212 : 1995, good dry lining practice and the Certificate holder's instructions. A typical installation method (adhesively-fixed) is shown in Figure 1.

15.7 Additional consideration should also be given to the fixing of such features as cupboards and radiators.

15.8 The boards can be cut using a fine-toothed saw. Appropriate Personal Protective Equipment (PPE) must be used when cutting the boards, and cutting should be done in a ventilated space, outside or in an area with dust extraction.

15.9 To avoid thermal bridging, the boards should be used to line window reveals. Thinner insulation thicknesses are available (down to 17 mm) for specific use in door and window reveals. Suitable provisions will also need to be adopted at junctions and other details such as separating floors. Further guidance can be obtained from BRE Report BR 262 : 2002.

Figure 1 Typical installation (adhesively-fixed)



16 Procedure

16.1 For existing walls, the wallpaper, skirting, picture rails, gloss paint and projecting window boards should be removed to expose bare walls. The wall surface should be clean and dust free.

16.2 Dry-lining is commenced from a window/door reveal or internal corner. Walls are marked at 1200 mm centres to indicate board positioning.

Direct bonding to a wall using plaster adhesive dabs (QL-Kraft) — Figure 1

16.3 A continuous bed of adhesive should be applied around the perimeter of the wall as well as around any services or other openings. All conduits and piping should be installed prior to commencement of all works. The insulating backing of the laminates should not be removed to accommodate services.

16.4 Adhesive dabs should be applied in three or four rows (as appropriate, but minimum coverage 20% of the board area) together with intermediate dabs at ceiling level and a continuous band of adhesive at skirting level.

16.5 The boards are positioned with the bottom edge resting on plasterboard packing strips. The boards are tapped into position, lifted tight to the ceiling using a foot-lifter and supported until the adhesive sets. Further boards are installed, lightly butted together, to complete the lining.

16.6 When the adhesive/dabs are set, these should be complemented by the addition of two nailable plugs per board (with a minimum 25 mm penetration into the masonry wall, positioned at mid-height either side of the board and in the tapered edges of boards so they are covered by the finishing processes).

Mechanically fixed to timber battens or metal furrings (QL-Foil and QL-Kraft)

16.7 Using suitable mechanical fixings, minimum 25 mm thick by 47 mm wide, treated softwood timber battens or proprietary metal furrings are installed vertically at a maximum of 600 mm centres, along with horizontal battens at the top and bottom of the installation area. Additional lengths of timber batten or metal furring should be installed to coincide with horizontal board joints and around services, doors and windows. The framing must provide a minimum of 20 mm bearing at joints and be of sufficient depth to accommodate the fixings for the system. Metal furring systems can also be bonded to the wall in accordance with the manufacturer's recommendations, and the same preparation

and setting out procedure should be used. The adhesive dabs should be applied at centres suitable for the system, typically from 450 mm to 600 mm.

16.8 The boards are positioned against the timber battens or metal frame with the bottom edge resting on plasterboard packing strips, and the boards should be lifted to the ceiling edge using a floor lifter and supported with additional packing at the base of the board. The board is fixed to the timber battens or metal frame using appropriate dry wall screws. Fixings should be installed at 300 mm centres across the horizontal and vertical elements of the frame. Further boards are installed, closely butted together, to complete the lining.

Mechanically fixed direct to wall (QL-Foil and QL-Kraft)

16.9 The boards are positioned with the bottom edge resting on plasterboard packing strips. The boards are placed into position, lifted tight to the ceiling using a foot-lifter and supported with additional packing at the base of the board. The board should be fixed to the wall using suitable stainless steel mechanical fixings at 300 mm centres from the vertical and horizontal board edges with a minimum of 12 fixings per board. Further boards are installed, closely butted together, to complete the lining.

Insulated lining fixed to underside of sloping rafters (QL-Foil)

16.10 The boards should be fixed into the underside of the rafters. All board joints should be tightly butted against each other to prevent gaps. For guidance on roof tile underlay type and roof ventilation refer to section 7.5 of this Certificate and BS 5250 : 2011 Annex H.

17 Finishing

17.1 Jointing and finishing of the plasterboard lining are carried out in the appropriate manner in accordance with BS EN 13914-2 : 2005 applying plasterer's joint tape to all joints. A finishing skim coat of 2 mm of plaster should be applied to complete the installation.

17.2 Any gaps between the ceiling and the wall must be filled.

Technical Investigations

18 Tests

Results of tests were assessed to determine:

- thermal conductivity
- reaction to fire.

19 Investigations

19.1 An examination of data was made to analyse:

- dimensional accuracy
- squareness
- density
- flatness
- water vapour transmission.

19.2 A condensation risk analysis was carried out.

19.3 A series of U value calculations were carried out.

19.4 A calculation was undertaken to confirm the declared thermal conductivity.

19.5 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.

Bibliography

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 5534 : 2014 *Slating and tiling for pitched roofs and vertical cladding. Code of practice.*

BS 6576 : 2008 *Code of practice for diagnosis of rising damp in walls of buildings and installation of chemical damp-proof courses*

BS 7671 : 2008 *Requirements for electrical installations — IEE Wiring Regulations — Seventeenth Edition*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS 8212 : 1995 *Code of practice for dry lining and partitioning using gypsum plasterboard*

BS 15976 : 2011 *Flexible sheets for waterproofing — Determination of emissivity*

BS EN 520 : 2004 *Gypsum plasterboards — Definitions, requirements and test methods*

BS EN 1995-1-1 : 2014 *Eurocode 5 : Design of timber structures. General. Common rules and rules for buildings.*

NA to BA EN 1995-1-1 : 2014 *UK National Annex to Eurocode 5 : Design of timber structures. General. Common rules and rules for buildings.*

BS EN 1996-1-1 : 2005 *Eurocode 6 : Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

NA to BS EN 1996-1-1 : 2005 *UK National Annex to Eurocode 6 : Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

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20 Conditions

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- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold claim that this Certificate has been issued to them
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- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
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