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Agrément Certificate

07/4427

Product Sheet 2

BALLYTHERM INSULATION

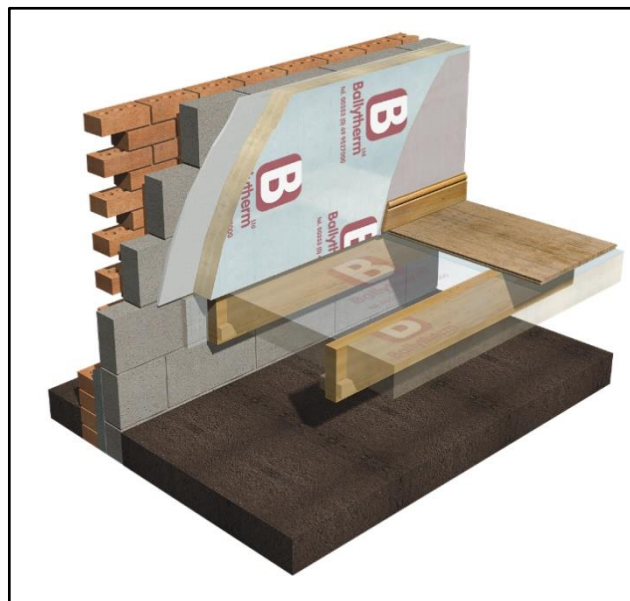
BALLYTHERM BTDL DRY LINING BOARD INSULATION

This Agrément Certificate Product Sheet⁽¹⁾ relates to Ballytherm BTDL Dry Lining Board Insulation, comprising rigid polyisocyanurate (PIR) foam board bonded to plasterboard. The product is for use, with height restrictions in some cases, as an insulated dry lining for solid or cavity masonry walls and timber-framed walls with a masonry outer leaf, and to the underside of ceilings, in new and existing 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
- installation guidance
- regular surveillance of production
- formal three-yearly review.



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 — the product can contribute to limiting the risk of surface condensation; however, the risk of interstitial condensation should be assessed for each case (see section 7).

Behaviour in relation to fire — the product has a reaction to fire classification of B-s1, d0 to BS EN 13501-1 : 2007 and its use is restricted in some cases under the national Building Regulations (see section 8).

Durability — the product is durable, rot proof and sufficiently stable to remain effective 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 Second issue: 7 May 2020

Originally certificated on 27 March 2007

Hardy Giesler
Chief Executive Officer

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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

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Regulations

In the opinion of the BBA, Ballytherm BTDL Dry Lining Board Insulation, 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 restricted under this Requirement. See section 8.1 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The product is restricted by this Requirement. See sections 8.1, 8.2 and 8.4 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See sections 7.1 and 7.5 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.
Regulation:	7(1)	Materials and workmanship
Comment:		The product is acceptable. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation:	7(2)	Materials and workmanship
Comment:		The product is restricted by this Regulation. See sections 8.1, 8.2 and 8.4 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 satisfying these Regulations. 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 can contribute to satisfying this Regulation. 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 restricted by this Standard, with reference to clause 2.5.1 ⁽¹⁾⁽²⁾ . See sections 8.1 and 8.3 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 7.6 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⁾ , 6.1.3 ⁽¹⁾ , 6.1.4 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.1.8 ⁽²⁾ , 6.1.10 ⁽²⁾ , 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 ⁽²⁾ , 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 sections 8.1 and 8.4 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) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.3) and 16 *General* (16.4 and 16.8) of this Certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, Ballytherm BTDL Dry Lining Board Insulation, if installed, used and maintained in accordance with this Certificate – and provided the bonded plasterboard facing is a minimum of 12.5 mm thick, with the product mechanically fixed back to the structure – can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 6.1 *External masonry walls* and 9.2 *Wall and ceiling finishes*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13950 : 2014.

Technical Specification

1 Description

1.1 Ballytherm BTDL Dry Lining Board Insulation consists of polyisocyanurate (PIR) insulation⁽¹⁾ with bi-laminate foil/paper facings on both sides, with one side factory-bonded to plasterboard⁽²⁾. See Table 1 for the nominal characteristics.

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

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

Length (mm)	2400 or 2438
Width (mm)	1200
Thickness ⁽¹⁾ of PIR (mm)	20 to 80 (in 10 mm increments)
Plasterboard thickness (mm)	12.5 or 15
Board facings	Bi-laminate foil/kraft paper-facing
Edge detail	Square or Tapered Edge
Minimum compressive stress at 10% deformation (kPa)	100

(1) Other thicknesses within this range are available subject to quantity.

1.2 Ancillary items, which are outside the scope of this Certificate, include:

- gypsum-based dry-lining adhesive compound (plaster dabs) to BS EN 14496 : 2017
- metal component furring systems to BS EN 14195 : 2014
- 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 : 2017
- jointing materials including scrim tape and jointing compound to BS EN 13963 : 2014
- pre-treated softwood timber battens.

2 Manufacture

2.1 The insulation core of Ballytherm BTDL Dry Lining Board Insulation is manufactured by blending together raw materials in a continuous foaming process aided by a blowing agent, and sandwiching between bi-laminate foil/kraft paper facings and 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 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 Ballytherm Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by EQA (Ireland) Ltd (certificates Q3874 and E3874).

3 Delivery and site handling

3.1 The boards are delivered to site in polythene-wrapped packs. 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 boards must be protected from prolonged exposure to sunlight and moisture and should be stored inside, under cover and protected with opaque polythene sheeting. The boards should be stacked flat and raised above ground level and out of contact with ground moisture.

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 to 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 Ballytherm BTDL Dry Lining Board Insulation.

Design Considerations

4 Use

4.1 Ballytherm BTDL Dry Lining Board Insulation is satisfactory for use as an insulating dry lining to improve the thermal insulation of solid or cavity masonry walls, timber framed walls with a masonry outer leaf and to the ceiling of pitched roofs of new and existing, domestic and non-domestic buildings. Ballytherm BTDL has composite foil/kraft paper-facings allowing it to be installed by direct bonding to the wall using plaster adhesive dabs, or by mechanical fixing directly to the wall, to pitched roof joists or onto timber wall battens or metal wall furring systems (see section 15 of this Certificate). The boards should be installed in accordance with the Certificate holder's instructions and this Certificate.

4.2 The product may be installed on masonry construction including clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks. It is essential that the construction of walls takes account of the local wind-driven rain index.

4.3 The product is not intended to offer resistance to rain penetration; walls, therefore, must already be rain resistant and show no signs of water ingress, rain penetration or damp from ground moisture, and be at least two bricks, or 200 mm, in thickness.

4.4 It is essential that the boards are butted as close as possible to minimise any gaps between them (see section 17 of this Certificate).

4.5 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, and around service penetrations, openings and junctions, must be sealed with a suitable sealant.

4.6 It is essential that proper care and attention is given to maintaining the integrity/continuity of the insulation and facings.

4.7 With installations that form a void of 20 mm or more (ie timber batten or metal furring systems), services can be incorporated behind the dry lining, making the chasing of the wall unnecessary. Where the services have a greater depth than the void, 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.

4.8 The installation of the product 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. Thinner boards should be selected to suit site-specific door and window reveal conditions. All 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.

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

Pitched roofs

4.10 Pitched roofs should be designed and constructed in accordance with BS 5534 : 2014 and incorporate normal precautions against moisture ingress.

4.11 In tiled or slated pitched roofs designed and constructed as stated in section 4.10, the product is suitable for use beneath the rafters in conjunction with a BBA-approved breathable membrane and, when necessary, a vapour control layer (VCL) (see section 7.3).

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a 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 : 2017, BRE Report BR 443 : 2006 and BRE Digest 465 : 2002, using the declared thermal conductivity (λ_D) value of $0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for the insulation component, a design value of $0.19 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for the plasterboard, and an aged emissivity (ϵ_D) of 0.9 (to BS 15976 : 2011) for the outer bi-laminate foil/kraft paper-facing.

6.2 The U value of a completed wall construction will depend on the selected insulation thickness, number and type of fixings and the insulating value of the substrate masonry and its internal finish. Calculated U values for example wall constructions are given in Tables 2 and 3.

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

Target U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	Ballytherm BTDL Thickness of insulation ⁽²⁾ (mm), as dry lining	
	Direct bond (plaster dabs) ⁽³⁾	Mechanical fixing to timber battens ⁽⁴⁾
0.18	—	—
0.19	—	—
0.25	80	—
0.26	80	—
0.27	70	80
0.28	70	70
0.30	70	70
0.35	60	60

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

(2) Thickness of insulation specified excludes plasterboard thickness of 12.5 mm ($\lambda = 0.19 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

(3) Direct bonding with 15 mm plaster adhesive dabs (15 mm air cavity). Boards adhesively fixed in addition to 0.69 (per square metre) fully-penetrating steel fixings ($\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a cross-sectional area of 18.2 mm^2 (minimum of two nailable fixings).

(4) Mechanical fixing to treated softwood timber battens, 22 mm timber ($\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ at 11.8%) batten cavity. Boards mechanically fixed with 15.6 fully penetrating stainless steel fixings ($\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) per square metre with a cross-sectional area of 18.2 mm^2 (stainless steel fixings at 300 mm centres).

Table 3 Example U values — new-build timber frame with external masonry wall

Target U value (W·m ⁻² ·K ⁻¹)	Insulation thickness ⁽¹⁾ (mm)
	Ballytherm Timber and Steel frame board ⁽⁵⁾ between the timber frame with Ballytherm BTDL Dry Lining Board Insulation over the front ⁽²⁾⁽³⁾
0.18	110 + 25
0.19	100 + 25
0.25	95 ⁽⁴⁾
0.26	90 ⁽⁴⁾
0.27	80 ⁽⁴⁾
0.28	80 ⁽⁴⁾
0.30	70 ⁽⁴⁾
0.35	50 ⁽⁴⁾

(1) 102 mm brick ($\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 50 mm clear cavity, breather membrane over 9 mm OSB sheathing board ($\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

(2) 140 mm deep timber frame, 15% bridged ($\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$). Steel ($\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) wall ties at 3.7 fixings per square metre with a cross-sectional area of 18 mm².

(3) Fixings for the BTDL assumed to be 11 fully penetrating steel ($\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) fixings per square metre (150 mm centres) with a cross-sectional area of 13.2 mm² (screw diameter of 4.1 mm).

(4) Ballytherm BTDL Dry Lining Board Insulation not required.

(5) Ballytherm Timber and Steel Frame Board – BTT&SFB ($\lambda = 0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)

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

Interstitial condensation



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

7.2 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 water vapour transmission values for each component given in Table 4 for each layer.

Table 4 Water vapour transmission factors

Material	Water vapour resistance (MN·s·g ⁻¹)	Water vapour resistivity (MN·s·g ⁻¹ ·m ⁻¹)
Plasterboard	—	50
PIR foam insulation	—	300
Composite foil/kraft paper-facing	1000	—

7.3 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.

7.4 Provided all joints between the product are sealed in accordance with the Certificate holder's instructions, the product can offer significant resistance to water vapour transmission.

Surface condensation



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



7.6 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. Guidance may be obtained from BS 5250 : 2011, Annexes G and H, and BRE Report BR 262 : 2002.

8 Behaviour in relation to fire



8.1 The product has been classified as Class B-s1, d0 to BS EN 13501-1 : 2007⁽¹⁾.

(1) BRE Global Test report no. 289565-3. Copies can be obtained from the Certificate holder.



8.2 In England and Wales, the product should not be used on buildings with a storey more than 18 m above the ground but may be used on buildings at any proximity to a boundary.



8.3 In Scotland, the product should not be used on any buildings with a storey at least 11 m above ground level.



8.4 Any cavities formed by the product must have appropriate fire stopping as required by the documents supporting the national Building Regulations.

9 Proximity of flues and appliances

When the product is installed in close proximity to certain flue pipes and/or heat-producing appliances, the relevant provisions of the national Building Regulations should be met:

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, sections 1 to 5.

10 Materials in contact — wiring installations

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

10.2 Electrical cables likely to come into contact with the insulation component of the thermal liner are not required to be protected by a suitable conduit or PVC-U trunking. The installation of electrical services must be carried out in accordance with BS 7671 : 2018.

11 Infestation

The 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 product), 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 object fixed to the wall, other than lightweight items, is outside the scope of this Certificate.

13 Maintenance

If the product is damaged during use, it 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, repairs are easily carried out.

Installation

15 Pre-installation survey

15.1 The Certificate holder's instructions must be followed.

15.2 A detailed survey of the property should be carried out before work starts. The walls must be made good if required and be dry and structurally sound with no evidence of damp, contamination or frost damage, before the product and its ancillary items are installed.

15.3 The survey should include a detailed examination of the internal and external fabric of the building, ensuring that any leaking external pipework and blocked gutters are made good. The efficiency, type and continuity of existing damp-proof course materials (if any) should be checked. For existing buildings where there is no dpc, the requirement for one must be determined.

15.4 The suitability of projecting window sills, verge and eaves overhangs should be checked. Mortar joints should also be examined and repointed, if required.

15.5 The existing ventilation provision should be assessed and updated if necessary.

15.6 There should be no gaps at the perimeter (such as floors and ceilings) or junctions (such as internal corners), or around openings or service penetrations. Existing gaps should be sealed before installation commences.

15.7 A detailed inspection of existing timbers for dry or wet rot and insect attack should also be carried out, eg the timber floor joists. Existing metal studs or joists should be inspected for corrosion. Decayed timbers or corroded metal must be replaced before installation commences.

16 General

16.1 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.

16.2 The building should be examined for the following:

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

16.3 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.

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

16.5 Before fixing the product, sufficient time must be allowed for damp-proofing treatments, where applied, to dry out (for information see BS 6576 : 2005 for dry-lining in conjunction with a chemical damp-proof course application).

16.6 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.

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

16.8 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.

16.9 To avoid thermal bridging, the boards should be used to line window reveals. Thinner insulation is available (down to 20 mm) for specific use in door and window reveals. A 400 mm return is suggested on the internal / external wall junction. 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.

17 Procedure

17.1 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.

17.2 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 using plaster adhesive dabs

17.3 A continuous bead of adhesive should be applied around the perimeter of the wall as well as around any services or other openings. This is especially important when considering the airtightness of the building. 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.

17.4 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.

17.5 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.

17.6 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. A typical installation method is shown in Figure 1.

Figure 1 Ballytherm BTDL Dry Lining, direct bonded using plaster adhesive dabs



Mechanically fixed to timber battens or metal furrings

17.7 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 must 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 for the metal furring system should be applied at centres suitable for the system, typically from 450 to 600 mm.

17.8 The boards are positioned against the timber or metal frame, with the bottom edge resting on plasterboard packing strips. The boards should be lifted to the ceiling edge using a floor lifter and supported with additional packing at the base of the board, and 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 with a minimum of 12 fixings per board. Further boards are installed, closely butted together, to complete the lining. A typical installation method is shown in Figure 2.

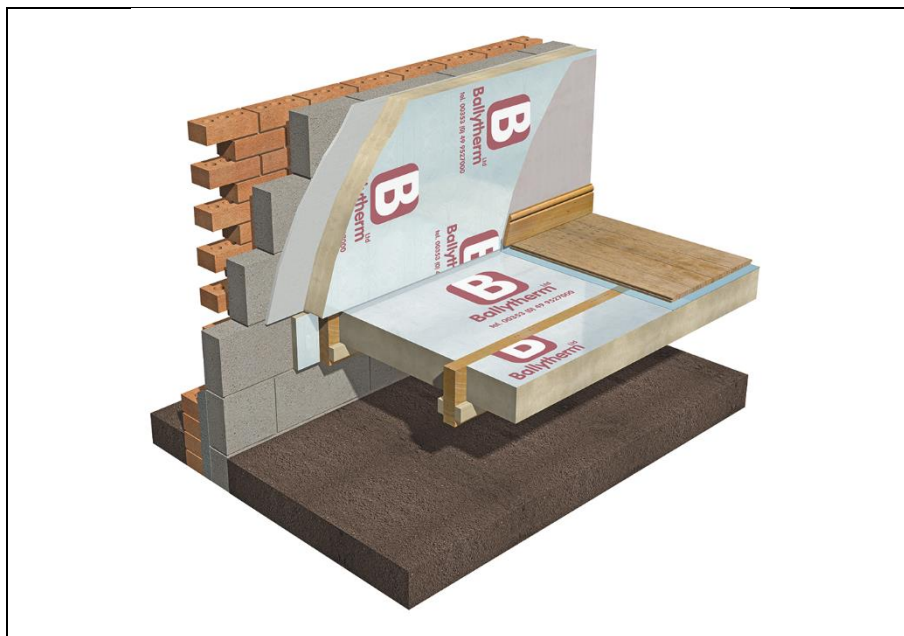
Figure 2 Ballytherm BTDL Dry Lining, mechanically fixed to timber battens



Mechanically fixed direct to wall

17.9 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. A typical installation method is shown in Figure 3.

Figure 3 Ballytherm BTDL Dry Lining, mechanically fixed direct to the wall



Mechanically fixed direct to the timber frame

17.10 The boards should be butted tightly against each other over the timber studs in order to prevent gaps. To satisfy the requirements of NHBC Standards, a VCL should be placed on the warm side of the wall insulation system. Any service penetrations should be tightly sealed with expanding polyurethane foam, flexible sealant or other proprietary product.

17.11 The boards are secured with conventional nails or drywall screws at nominal 150 mm centres, and finished in accordance with conventional good practice.

Mechanically fixed direct to the underside of ceilings

17.12 The boards must be tightly butted and supported at least 20 mm into the timber, and finished in accordance with conventional good practice. Screw fixings should extend at least 25 mm into the timber. The fixings must be at least 10 mm from the board edges and at nominal 150 mm centres.

17.13 To satisfy the requirements of NHBC Standards, a VCL should be placed on the warm side of the wall insulation system. Any service penetrations should be tightly sealed with expanding polyurethane foam, flexible sealant or other proprietary product.

18 Finishing

18.1 Jointing and finishing of the plasterboard lining are carried out in the appropriate manner in accordance with BS EN 13914-2 : 2016, applying plasterer's tape to all joints. A finishing skim coat of 2 mm of plaster should be applied to complete the installation.

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

19 Tests

Results of tests were assessed to determine:

- thermal conductivity
- impact resistance
- squareness
- density
- dimensional accuracy
- water vapour transmission
- flatness
- thermal conductivity.

20 Investigations

20.1 Existing data on durability and properties in relation to fire were evaluated.

20.2 A calculation was undertaken to confirm the thermal conductivity (λ_D value).

20.3 A series of U value calculations was carried out.

20.4 A condensation risk analysis was carried out

20.5 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.

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21 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 or claim that this Certificate has been issued to them
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