

Detail Sheet 3 / Ballytherm BTDL Dry Lining Board Insulation



PRODUCT DESCRIPTION:

This Certificate relates to Ballytherm BTDL dry lining, as defined in IAB Certificate No 05/0220

USE:

Ballytherm BTDL dry lining is used for the thermal insulation of existing or new, solid or cavity masonry walls of dwellings or buildings of similar occupancy type and conditions. It may also be used to line ceilings. It also facilitates the control of surface and interstitial condensation in walls and ceilings.

MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:

Ballytherm Limited
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1.1 PRODUCT DESCRIPTION

Ballytherm BTDL Dry Lining is a composite panel consisting of a closed cell rigid Polyisocyanurate (PIR) insulation bonded to tapered edge plasterboard for internal applications. The plasterboard is 12.5 mm thick manufactured to BS 1230 – Gypsum plasterboard, and accepts dry-jointing materials, plaster skim or direct decoration. Ballytherm BTDF Dry lining has Kraft paper with a polythene membrane on both faces, which acts as an integral vapour check. Polyisocyanurate (PIR) foam core is a thermoset closed cell rigid foam insulation manufactured in accordance with I.S. EN 13165: 2001 *Thermal insulation products for buildings – Factory made products of polyurethane foam (PUR) Specification*.

Ballytherm BTDL Dry Lining board does not contain either CFC or HCFC gases and has zero Ozone Depletion Potential (ODP).

Table 1 shows the Ballytherm BTDL Dry Lining, product range.

Table 1: Product Range

The boards are available in the following sizes:

Length	2400m
Width	1200mm
Thickness	20, 25, 30, 35, 40, 45, 50, 60, 70, and 80mm
Grade	PIR

1.2 MANUFACTURE

Ballytherm BTDL Dry Lining is manufactured from a formulation of chemicals, which is sprayed onto the kraft paper facer and subsequently plasterboard is adhesive bonded to the insulation core. The plasterboard face provides a durable surface to accept traditional finishing techniques.

1.3 INSTALLATION PROCEDURE

1.3.1 Ballytherm BTDL Dry Lining board is for installation on the internal surface of walls and ceilings of new or existing buildings. The fixing method depends on the substrate.

Installation should be in accordance with good drylining practice and the manufacturer's instructions. All installations require careful planning and setting out. Refer to clauses 0.6 and 1.5 of TGD Part-L to Building Regulations 2002.

Before fixing the product, sufficient time must be allowed to disperse the solvents contained in wood preservatives and damp proofing treatments where applied.

Ceiling plaster slabs should be fixed in place before dry lining commences.

1.3.2 Systems and Fixings

Thermal Bridging

Walls should be insulated to full height and returned at door/window reveals to prevent cold bridging. The margins of window and door reveals should be sufficient to accommodate the thickness of Ballytherm BTDL Dry Lining board being employed. The possibility of a cold bridge occurring via the window boards should also be considered and provision made to insulate this area. Services should be fixed in place before drylining commences. The void between the wall and the Thermal Liner can accommodate certain services however the PIR insulation should not be chased. The area around any services that penetrate the Thermal Liner must be sealed to prevent air leakage and thermal looping.

Thermal Looping/Fire Stops

When required fire stops must be provided using proprietary methods or by applying a continuous 50 mm ribbon of dry wall adhesive to the top and bottom edge of each sheet. A treated timber batten will also suffice.

Adhesive Bonding

This method is for application to sound, plane concrete or plastered wall surfaces on cavity walls. Adhesive is applied to the wall surface in strips to a pre-determined pattern that coincides with the edges of the board; a further strip is applied horizontally at the mid point of the board. Suitable approved mechanical fixings are recommended to complement the adhesive bond, these are normally applied at a rate of 3 No. per board, after the adhesive has set. Two fixings positioned at the top of each board and one at the board centre. Allow for expansion at the top and bottom of the panel. The certificate holder's advice should be sought in relation to the type of adhesive and the choice of fixings.

Mechanical Fixing

This method is for application to fair finished brick, block and concrete cavity walls where Ballytherm BTDL Dry Lining board is to be finished with gypsum plaster. The wall should be sound, dry and level. (Surface irregularities may impede the fixing of the board).

The board should be fully restrained using mechanical fixings. There should be 18 No. fixings per 2400 x 1200 board, three of which should be type TID – M anchors. Other fixings should be in accordance with the fixing supplier's recommendations, and should be evenly distributed over the whole area of the board. Fixings should not overlap board's edges and should penetrate at least 30mm into the masonry.

Linings (Horizontal and sloping)

Ballytherm BTDL Dry Lining board may be used to line ceilings. Insulation is fixed in a similar way to standard plasterboard. Boards must always be placed with the long edge running across the joists, rafters or battens and all edges must be supported. Timbers must offer a minimum 20 mm support to all four edges of the board. This will necessitate the use of noggins placed between the joists to coincide with the long edges of the board. Large headed galvanised clout or sheradised nails should be used to fix the board. These must be long enough to allow a minimum 25 mm penetration of the supporting timber, and be placed not less than 10 mm from the edges of the board and be spaced at 150 mm intervals along all supporting timbers.

1.3.3 Cutting

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. Cutting BTDL panels is also easy to execute by using a trimming knife to cut through the insulation and paper backing of the plasterboard layer, then snapping the board face down over a straight edge and cutting the paper facing of the plasterboard on the other side.

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.

1.3.4 Finishing

Tapered edged boards are jointed and finished in accordance with standard dry lining procedure offering a surface suitable for paper hanging and paint finishes. A plaster skim finish can also be applied to the boards. The finishing should be carried out in accordance with the specified manufacturer's instructions, particularly in relation to the need to allow thorough drying of the plaster prior to decoration.

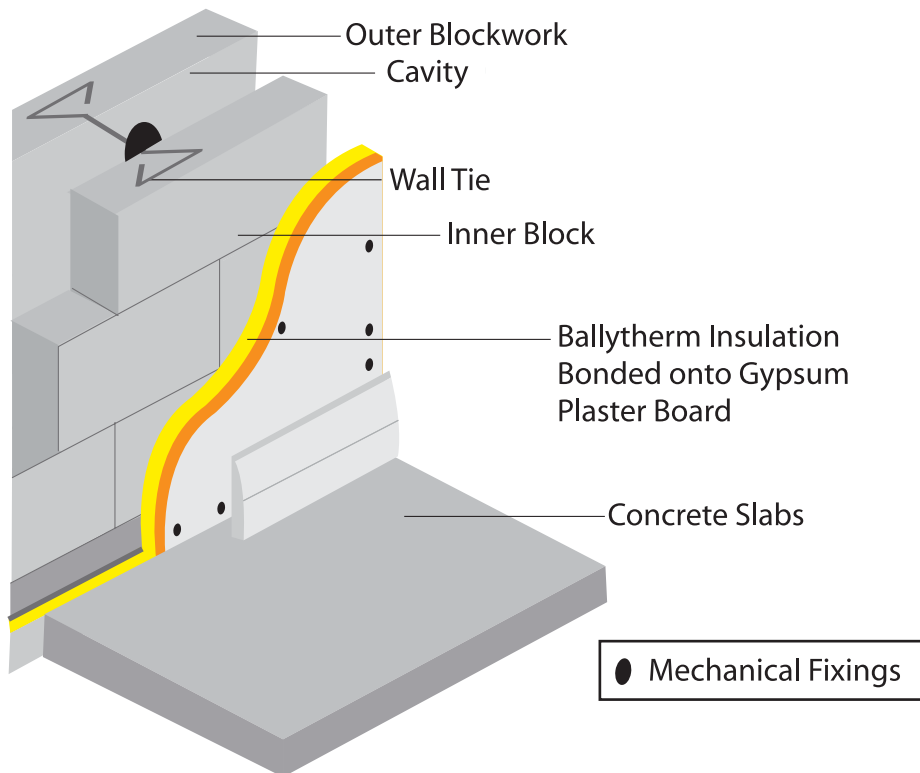


Figure 1: Ballytherm BTDL Dry Lining- Mechanically Fixed.

2 GENERAL

- 2.1** Ballytherm BTDL Dry Lining board when installed in accordance with this Certificate, is effective in reducing the 'U' value (thermal transmittance) of new or existing walls and ceilings.
- Ballytherm BTDL Dry Lining board may be used to insulate clay or calcium silicate bricks, concrete blocks, or natural and reconstituted stone blocks. It is essential that such walls are designed and constructed to prevent moisture penetration having regard to the Driving Rain Index.
- 2.2** Buildings subject to the relevant requirements of the Building Regulations 1997 to 2002 should be constructed in accordance with I.S. 325: Part 1: 1986 Use of Masonry, Part 1: Structural Use of Unreinforced Masonry, and BS 5628: Part 3: 1995 Code of Practice for use of Masonry: Materials and Components, Design and Workmanship. Particular attention should be paid to the exclusion of moisture in that the designer should select a construction appropriate to the local wind driven rain index, paying due regard to the design detailing, workmanship and materials to be used. Where reinforced masonry is involved, the design should be in accordance with BS 5628: Part 2: 1985, Code of Practice for use of Masonry, Structural Use of Reinforced and Prestressed Masonry. The relevant recommendations of Section 3 of BS 5390: 1976 (1984), Code of Practice for Stone Masonry, should be followed where the wall incorporates stone or cast stone.
- 2.3** With dry lining installations forming a void of 20 mm or more, services can be incorporated behind the dry lining, making the chasing of the wall unnecessary. When using adhesive systems, or where the services have a greater depth than the void, the wall should be chased rather than the insulation.
- 2.4** All mould or fungal growth should be treated prior to the application of the product.
- 2.5** When bonding is by adhesives, it is essential that a satisfactory bond is achieved between the walling material and the adhesives. Backgrounds of high suction will behave differently to those of low suction. The Certificate holder's advice should be sought in case of difficulty.

3.1 BEHAVIOUR IN FIRE

The plasterboard used in the Ballytherm BTDL Dry Lining board is deemed to be Class 'O' in accordance with the Building Regulations, 1997 – 2002 and so the insulated board qualifies as the highest product performance classification as defined in Technical Guidance Document B - Fire Safety (paragraph A10 of Annex A). The insulation component of the board should be isolated from possible sources of combustion. To achieve this Ballytherm BTDL Dry Lining board should be installed in accordance with the following: -

- (i) Combustible material shall be separated by solid non-combustible material not less than 200 mm thick from a flue pipe to an oil, solid fuel or gas heating appliance as indicated in Section 2 of Technical Guidance Document J – Heat Producing Appliances.
- (ii) Ballytherm BTDL Dry Lining board should be separated by a minimum distance of 150 mm from an oil, solid fuel or gas heating appliance as indicated in Diagram 8 of Technical Guidance Document J - Heat Producing Appliances, of Building Regulations 1997.
- (iii) Ballytherm BTDL Dry Lining board when installed with a residual cavity between the board and the wall, will require the provision of cavity barriers and may be used in buildings of any purpose group provided: -
 - (a) direction on the provision and spacing of cavity barriers is given in Tables 3.2 and 3.3 of Technical Guidance Document B – Fire Safety to the Building Regulations.
 - (b) every such cavity shall be closed by a cavity barrier around the whole perimeter of the wall or ceiling element and around the perimeter of any opening through such elements; and
 - (c) cavity barriers in spaces between a floor and ceiling are provided at maximum distances of 20 m for any class of surface exposed to the cavity.
 - (d) where any wall or ceiling containing a cavity meets another such element, the cavities shall be closed so that they do not communicate with one another.
 - (e) cavity barriers in walls are provided at maximum distances apart of 10 m unless a Class 1 material is exposed to the cavity when a spacing of 20 m may be adopted.

3.2 WATER PENETRATION

- 3.2.1** Ballytherm BTDL Dry Lining board closed cell structure does not allow water uptake by capillary action.

- 3.2.2** Ballytherm BTDL Dry Lining board, when used in accordance with this Certificate, presents no significant risk of water penetration.

3.3 THERMAL INSULATION

The aged/design thermal conductivity 'λ' value of Ballytherm BTDL Dry Lining board when measured in accordance with I.S. EN 12667: 2000 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, is 0.026 W/mK. The high thermal resistance of Ballytherm BTDL Dry Lining board ensures that cold bridging and extra heat loss around the edges of openings can be avoided. Refer to Appendix A of Technical Guidance Document L to Building Regulations 2002.

Lintel jamb and cill designs similar to those shown in Diagram 3 of the TGD to Part L – Conservation of Fuel and Energy DWELLINGS, (Building Regulations 2002), 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 Section 1.6 of TGD Part L (DWELLINGS), to the Building Regulations 2002.

The maximum U-values which can be achieved with Ballytherm BTDL dry lining should be determined in accordance with the procedures of Appendix A, clauses A3.1- A3.3 of Technical Guidance Document L to Building Regulations 2002.

3.4 MATERIALS IN CONTACT WITH ELECTRICAL WIRING

Electrical installations should be in accordance with the ETCI publication ET 207: 2003 *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 luminaires, 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 Ballytherm BTDL Dry Lining Board.

3.5 CONDENSATION RISK

Ballytherm BTDF Dry lining has Kraft paper with a polythene membrane on both faces, which acts as an integral vapour check. It is therefore unlikely to be affected by surface or interstitial condensation, provided the correct thickness of Ballytherm BTDL Dry Lining board is chosen and all joints between boards are filled and taped in accordance with Standards Dry Lining practice. Correct use of the heating and ventilation system is important. Interstitial condensation analysis for average winter environmental conditions for cavity wall constructions indicate no condensation risk. When insulating buildings the recommendations of BS 5250: 2002 Code of practice for control of condensation in buildings, should be followed to minimise the risk of condensation within the building elements and structures.

3.6 RESISTANCE TO SOLVENTS, FUNGI AND RODENTS

Ballytherm BTDL Dry Lining board panels 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.

3.7 WALL MOUNTED FITTINGS

The recommendations of the manufacturer should be followed. Any object fixed to the wall, other than lightweight items, e.g. framed pictures, should be fixed through the lining board into the wall behind, using proprietary fixings.

3.8 MAINTENANCE

Damaged boards can be easily replaced and no maintenance of the insulation will be required provided that the plasterboard layer remains intact.

3.9 DURABILITY

Ballytherm BTDL Dry Lining board 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 certificate. Its durability depends upon the supporting structure and the conditions of use.

3.10 LIMITATIONS

Ballytherm BTDL Dry Lining board has a gypsum plasterboard face, it should therefore not be used to isolate dampness nor be used in continuously damp or humid conditions.

3.11 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. Ballytherm BTDL Dry Lining board does not contain CFC or HCFC gas.
- (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.
- (iv) A condensation risk analysis was performed.

Table 2: *PHYSICAL PROPERTIES of Ballytherm BTDL Dry Lining Board*

Property	Declared Value	Test Method
Water Absorption	Foil 1.2% Kraft Paper 2.1%	EN 12087
Dimensional Stability	DS(TH) 6	EN 1604
Thermal conductivity 'λ' value	0.026 W/mK	I.S. EN 12667
Thermal Resistance		
20 mm	0.769 m ² K/W	
25 mm	0.962 m ² K/W	
30 mm	1.154 m ² K/W	
35 mm	1.346 m ² K/W	
40 mm	1.538 m ² K/W	
45 mm	1.731 m ² K/W	
50 mm	1.923 m ² K/W	
60 mm	2.308 m ² K/W	
70 mm	2.692 m ² K/W	
75 mm	2.885 m ² K/W	
Compressive strength	Foil: CS (10\Y)50 Kraft Paper: CS (10Y)100	EN 826