

Detail Sheet 1 / Ballytherm BTF Floor Insulation



PRODUCT DESCRIPTION:

This Certificate relates to Ballytherm BTF floor insulation, as defined in IAB Certificate No. 05/0220.

USE:

Ballytherm BTF floor insulation is used for the thermal insulation in ground supported and suspended floors and may be installed:

1. Below a concrete floor slab, or
2. Below a cement based floor screed on a concrete slab with a hardcore base.
3. Above a suspended concrete floor (e.g. block and beam) with a cement based screed.
4. Between the joists of a suspended timber floor.

MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:

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1.1 PRODUCT DESCRIPTION

This Certificate relates to the Ballytherm BTF floor insulation using Polyisocyanurate (PIR), 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*. During the manufacturing process, liquid raw materials expanded by blowing agents are applied between low emissivity tri-laminate foil facings. Ballytherm BTF floor insulation boards are CFC and HCFC free and therefore have zero ozone depletion potential.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2002.

Table 1 shows the Ballytherm BTF floor insulation, product range.

Table 1: *Product Range*

The boards are available in the following sizes:

Length	2400m
Width	1200mm
Thickness	25, 30, 35, 40, 45, 50, 60, 70, and 75mm
Grade	PIR

1.2 MANUFACTURE

Ballytherm BTF floor insulation is manufactured from a formulation of chemicals, which are sprayed onto low emissivity composite foil facings subsequently autohesively bonded to the insulation core during manufacture.

1.3 INSTALLATION

1.3.1 General

Ballytherm BTF floor insulation boards are placed below the slab or between the slab and the screed. Boards can also be used to provide insulation to suspended timber floors. Vertical upstands of insulation (perimeter insulation strips) should be used to separate the screed/slab from the wall to reduce thermal bridging at the wall/floor junction. Refer to clause 0.6 (General) and 1.5 (Thermal Bridging) of Technical Guidance Document L to Building Regulations 2002 – Conservation of Fuel and Energy

1.3.2 Procedure – Laying below the floor screed

Where Ballytherm BTF floor insulation board is used below the floor screed, it is simply laid loose over the concrete floor slab with the necessary water and vapour protection. Board joints should be lightly

butted, staggered and laid to break-bonded pattern. The floor slab should be uniformly flat without steps or gaps to provide continuous bearing support to the Ballytherm BTF floor insulation board. A strip of board 25 mm thick should be used around the perimeter of the floor area being insulated. This should be placed vertically against the abutting wall so that it connects with the insulation laid over the slab and protects the edge of the screed, so preventing cold bridging of the floor screed. Boards are overlaid with a separating layer of polythene sheet (not less than 500 gauge) or building paper to BS 1521: 1972 – Specification for Waterproof Building Papers, Grade B1F, between the screed and the Ballytherm BTF floor insulation board to prevent the wet screed penetrating joints between the boards. The minimum thickness of sand and cement screed is 65 mm for domestic construction and 75 mm for most other buildings.

Floor loading on non domestic applications should be verified by a Chartered Engineer.

The concrete floor over which the insulation is to be laid should be left as long as possible to maximise drying out in accordance with the relevant recommendations of BS 8203: 2001, *Code of practice for the installation of resilient floor coverings*.

1.3.3 Procedure –Laying below the floor slab

Where Ballytherm BTF floor insulation board is used below the floor slab, lay the hardcore in layers; min 150 – 225 mm; each layer should be well compacted, with the surfaced blinded with a thin layer of sand to provide a suitable surface for laying a damp proof membrane (dpm) or radon barrier.

A damp proof membrane e.g. 1200 gauge polythene or a Radon Barrier, subject to site conditions and statutory requirements, should be laid over the well compacted hardcore and blinding with joints taped and folded to prevent the passage of ground moisture. The dpm should be carried up the surrounding foundation walls until it meets and seals with the damp proof course.

Ballytherm BTF floor insulation board should be laid staggered to break-bonded pattern with closely butted joints, fitted tightly at the edges and around any service penetrations.

A strip of board 25 mm thick should be used around the perimeter of the floor slab in order to prevent cold bridging of the slab. Boards are overlaid with a separating layer of polythene sheet (not less than 500 gauge) or building paper to BS 1521: 1972 – Specification for Waterproof Building Papers, Grade B1F.

Care should be taken to avoid damage to the insulation or damp proof membranes and radon barriers as the slab is being poured and operatives should make use of barrow runs and walkways whilst installation progresses.

A vapour barrier is to be provided over the insulation board to prevent condensation damage from cold bridging.

1.3.4 Procedure – Laying on precast block and beam floor

All surfaces should be level to accept the Ballytherm BTF floor insulation board. The floor surface should be smooth, uneven surfaces should be levelled prior to laying of the floor and flat irregularities should be removed by a levelling screed. Lay a Damp Proof Membrane, ensure that it is correctly positioned and turned up to meet the seal with the dpc.

Ballytherm BTF floor insulation board should be laid with joints tightly butted. During construction the boards must be protected from damage by moisture sources, water spillage, plaster droppings etc. Use scaffold boards to prevent wheelbarrow and other traffic damage to the boards. Ballytherm BTF floor insulation board should be overlaid with 500 gauge polythene sheet to prevent the wet screed from penetrating the joints between the insulation boards.

As in the case with solid ground floors, attention should be given to detailing to avoid thermal bridging.

1.3.5 Laying in suspended timber floors

The application of Ballytherm BTF floor insulation board in suspended floor constructions should be

carried out before commencement of floor boarding. Ballytherm BTF floor insulation board should be cut to fit snugly between the timber joists. It should be supported on softwood timber battens, proprietary galvanised steel saddle clips or galvanised nails partly driven into the side of the joists. Battens/nails should be placed at an appropriate height to suit the thickness of board being employed and nails should remain 40 mm proud of the joist. The board should then be laid between the joists so that they are supported by the battens, clips or nails. Any narrow gaps between the joist and perimeter walls should be insulated by specially cut pieces of board. Ballytherm BTF floor insulation board is not suitable for laying over timber joists.

Where services need to be accommodated below the floor, an insulated duct can be created by lowering the Ballytherm BTF floor insulation board.

Install flooring grade chipboard, ply or softwood timber flooring directly onto the joists fixing in the normal manner.

Ensure that the void below the insulated suspended floor is well ventilated and that the airflow is not restricted by sleeper walls.

1.3.6 Cutting

On-site trimming of Ballytherm BTF floor insulation board where necessary to maintain continuity of insulation or to fit around openings is easily executed using a fine tooth saw or by scoring with a sharp knife and cutting snapping the board face down over a straight edge and cutting the foil facing on the other side.

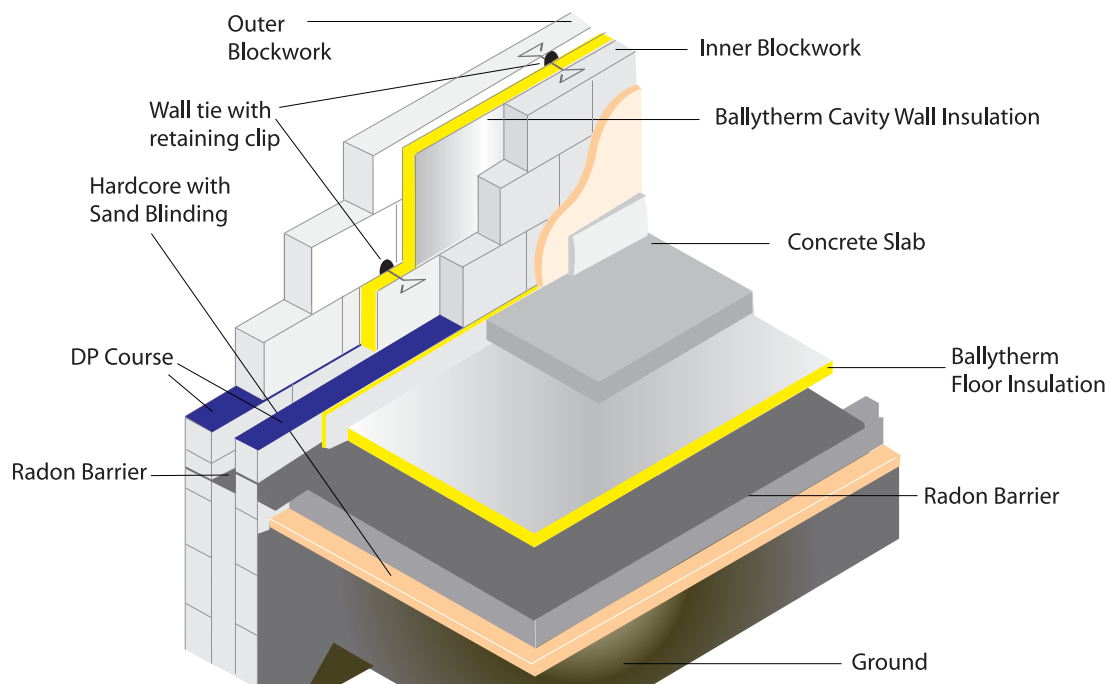


Figure 1: Ballytherm BTF Floor Insulation below floor slab.

2 GENERAL

2.1 Ballytherm BTF floor insulation board when installed in accordance with this Certificate, is effective in reducing the 'U' value (thermal transmittance) of new and existing floor constructions.

Ground supported floors incorporating Ballytherm BTF floor insulation board must include a suitable damp proof membrane laid in accordance with BS CP 102: 1973 Code of Practice for the protection of buildings against water from the ground. (As read with AMD 1511; AMD 2196; and AMD 2470)

Suspended concrete ground floors incorporating Ballytherm BTF floor insulation board must include suitable ventilation.

Except in the case of use in a timber floor, the overlay to Ballytherm BTF floor insulation board should be: -

1. A cement based floor, or
2. A concrete slab.

2.2 Floor Loading

The design loadings for self contained single family dwelling units as defined in BS 6399: Part 1: 1996 Loading for buildings – code of practice for dead and imposed loads, are

- Uniformly distributed load – 1.5 kPa.
- Concentrated load 1.4 kPa.
- Ballytherm BTF floor insulation board covered with chipboard, OSB or similar material or a screed can support these design loadings without undue deflection.
- Where Ballytherm BTF floor insulation board is used under a concrete slab, resistance to concentrated and distributed loads is a function of the slab specification.

2.3 Underfloor services

The maximum continuous working temperature of PIR is 100°C. Where underfloor heating systems are to be used; the advice of the certificate holder should be sought.

2.4 Waterproofing

If an overlay of chipboard, OSB or similar material is to be used in bathrooms or kitchens, a continuous waterproof finish (e.g. vinyl) must be provided to protect it.

3.1 BEHAVIOUR IN FIRE

- (i) Combustibility - Although Ballytherm BTF floor insulation board is combustible, when used in the context of this Certificate the increase in fire load in the building consequent to its use, is negligible.

The boards when in proximity to a constructional hearth must be protected by 250 mm of solid concrete or a detailed in Diagram 4 of TGD – J: Heat Producing Appliances.

- (ii) Toxicity - Negligible when used in a ground floor construction.
- (iii) Ballytherm BTF floor insulation board is manufactured without the use of CFC's and HCFC's, there is no release of such gas on burning.

3.2 STRENGTH

Ballytherm BTF floor insulation board exceeds 140 kPa at 10% yield and when installed in accordance with the manufacturer's instructions, and this certificate, will resist the loads likely to be met in service.

3.3 RESISTANCE TO MOISTURE

Ballytherm BTF floor insulation board will not allow moisture to cross the floor construction provided it is installed in accordance with this Certificate. See section 1.3.

3.4 CONDENSATION RISK

- 3.4.1 Ballytherm BTF floor insulation board has a vapour resistivity exceeding $250 \text{ MNsg}^{-1}\text{m}^{-1}$. It has significant resistance to the passage of water vapour when used in ground floor construction using a suitable damp proof membrane.

- 3.4.2 Capillary Action – The closed cell structure does not allow water uptake by capillary action.

3.5 THERMAL INSULATION

The aged/design thermal conductivity 'λ' value of Ballytherm BTF floor insulation 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 0.022 W/mK.

The maximum U-values for ground floors which can be obtained with Ballytherm BTF floor insulation board constructions 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. See Table 2 for typical U-values (indicative values only).

3.6 RESISTANCE TO SOLVENTS, FUNGI AND RODENTS

Ballytherm BTF floor insulation 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 DURABILITY

Ballytherm BTF floor insulation board are rot-proof and durable. As floor insulation, Ballytherm BTF floor insulation 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.

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

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

3.9 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 BTF floor insulation 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: Ground Floor Construction – Typical U-Values

 Typical Thickness to achieve 0.25 W/m²K

P/A Ratio (Perimeter/area)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Thickness	40	50	60	65	65	70	70	75	75

* These values are indicative only. Each design should be dealt with on a case by case basis. Design should be carried out by a competent person, in accordance with the Building Regulations Technical Guidance Document Part L 2002

Table 3: Physical Properties of Ballytherm BTF Floor Insulation

Property	Declared Value	Test Method
Water Absorption	Foil 1.2%	EN 12087
Dimensional Stability	DS(TH) 6	EN 1604
Thermal conductivity 'λ' value	0.022 W/mK	I.S. EN 12667
Thermal Resistance		
25 mm	1.136 m ² K/W	
30 mm	1.364 m ² K/W	
35 mm	1.590 m ² K/W	
40 mm	1.818 m ² K/W	
45 mm	2.045 m ² K/W	
50 mm	2.273 m ² K/W	
60 mm	2.727 m ² K/W	
70 mm	3.182 m ² K/W	
75 mm	3.409 m ² K/W	
Compressive strength	>140 kPa	EN 826