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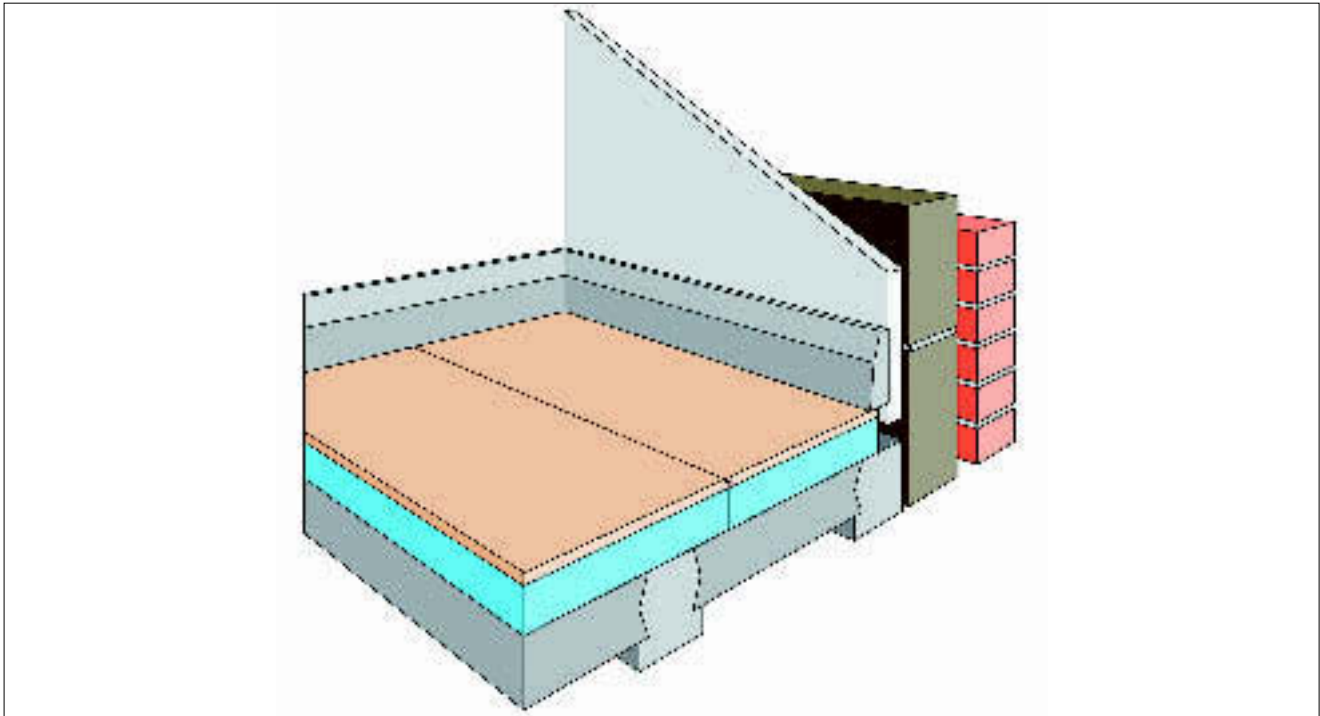
**Agrément
Certificate
No 92/2783**
Second issue*

Designated by Government
to issue
European Technical
Approvals

STYROFLOOR FLOORING INSULATION BOARDS

Isolation en polystyrène pour planchers en béton
Wärmedämmung aus Polystyrol für Betonfußboden

Product



- THIS CERTIFICATE REPLACES CERTIFICATE No 85/1444 AND RELATES TO STYROFLOOR FLOORING INSULATION BOARDS, LAMINATED PARTICLE BOARD AND EXTRUDED POLYSTYRENE INSULATION BOARDS FOR USE ON CONCRETE FLOORS.

- The product is for use on ground supported or suspended concrete ground floors in dwellings and buildings of similar use.

- The product is used to reduce the thermal transmittance of new or existing floors and can eliminate the need for wet screeds in new floor constructions.

- It is essential that the floors comply with the conditions set out in the Design Data and Installation parts of this Certificate.

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of floor insulation with the Building Regulations. In the opinion of the BBA, Styrofloor Flooring Insulation Boards, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: C4

Resistance to weather and ground moisture

Comment:

A concrete floor covered with the product will meet this Requirement. See sections 7.2 and 7.3 of this Certificate. See also section 9.2.

Requirement: L1

Dwellings

Requirement: L2

Buildings other than dwellings

Comment:

The product can contribute to limiting heat loss through a floor and meeting these Requirements. See sections 11.1 to 11.3 of this Certificate.

Requirement: Regulation 7

Materials and workmanship

Comment:

The product is acceptable. See sections 13.1 and 13.2 of this Certificate.

Electronic Copy

2 The Building Standards (Scotland) Regulations 1990 (as amended)



In the opinion of the BBA, Styrofloor Flooring Insulation Boards, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	10	Fitness of materials and workmanship
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product can contribute to a construction meeting this Standard.
Standard:	B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is acceptable. See sections 13.1 and 13.2 of this Certificate.
Regulation:	17	Resistance to moisture
Standard:	G2.6	Preparation of a site and resistance to moisture from the ground — Resistance to moisture from the ground
Comment:		A concrete ground floor covered with the product will meet this Standard. See sections 7.2 and 7.3 and 9.2 of this Certificate.
Regulation:	18	Resistance to condensation
Standard:	G4.1	Condensation — Interstitial condensation
Standard:	G4.2	Condensation — Surface condensation
Comment:		A concrete ground floor covered with the product can satisfy these Standards. See section 10 of this Certificate.
Regulation:	22	Conservation of fuel and power
Standard:	J3.1	Buildings in purpose group 1 — Building fabric
Standard:	J8.1	Buildings in purpose groups 2 to 7
Comment:		The product can contribute to satisfying these Standards. See sections 11.1 to 11.3 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Styrofloor Flooring Insulation Boards, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See sections 13.1 and 13.2 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		A floor system covered with the product satisfies this Regulation. See sections 7.2 and 7.3 and 9.2 of this Certificate.
Regulation:	C5	Condensation
Comment:		A concrete floor covered with the product can satisfy this Regulation. See section 10 of this Certificate.
Regulation:	F2	Building fabric
Comment:		The product can contribute to limiting heat loss through a floor and satisfying this Regulation. See sections 11.1 to 11.3 of this Certificate.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections: 5 *Description* (5.2), and 6 *Delivery and site handling* (6.2 to 6.3) of this Certificate.

Technical Specification

ventilation or a damp-proof membrane (see section 9 of this Certificate).

5 Description

5.1 Styrofloor Flooring Insulation Boards are a laminate of 18 mm thick DG classification tongue-and-groove particle board, meeting the requirements of BS 7331 : 1990 or BS EN 312-5 : 1997 bonded to Styrofoam (IB-X or LB-X grade) extruded polystyrene.

5.2 The boards are supplied with the standard characteristics of:

length (mm)	2440
width (mm)	600
overall thickness ⁽¹⁾ (mm)	34, 38, 43, 50 and 68
Insulation thickness (mm)	16, 20, 25, 32 and 50
weight (kgm ⁻²)	13–15 ⁽²⁾
nominal density of insulation (kgm ⁻³)	30

(1) Other thicknesses available on request.

(2) Weight varies depending on the thickness.

6 Delivery and site handling

6.1 The boards are delivered to site in packs wrapped in polythene. Each pack contains a label with the manufacturer's trade name, the BBA identification mark incorporating the number of this Certificate, and identifies the board type and size.

6.2 The boards must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polythene. The boards must be stored flat, in stockpiles no higher than one metre, protected from high winds and raised above damp surfaces.

6.3 The boards must not be exposed to open flame or other ignition sources. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, pitch, timber newly treated with creosote.

Design Data

7 General

7.1 Styrofloor Flooring Insulation Boards are effective in reducing the U value (thermal transmittance) of new or existing concrete floors (see Figure 1).



7.2 Ground supported floors incorporating the boards must include a suitable damp-proof membrane laid in accordance with BS 8102 : 1990 (see section 9 of this Certificate).

7.3 Suspended concrete ground floors incorporating the boards must include suitable

8 Behaviour in relation to fire

8.1 The boards do not prejudice the fire resistance properties of the floor.

8.2 When properly installed the boards will not add significantly to any existing fire hazard. The polystyrene will be contained within the floor by the particle board until the particle board itself is destroyed. The boards, therefore, will not contribute to the development stages of a fire or present a smoke or toxic hazard. Electrical cables running within the polystyrene should be separated from it by enclosing them within a suitable conduit, eg rigid PVC.

9 Moisture penetration

9.1 The boards should not be considered as a vapour control layer; however, they will not allow water to cross the completed floor construction.



9.2 Floors subject to the national Building Regulations should be detailed in accordance with:

England and Wales

Approved Document C, Technical Solutions 3.4 to 3.8 or 3.13 to 3.14

Scotland

Technical Standards, Standard G2.6, Section A, C or D

Northern Ireland

Technical Booklet C, Section 1.

10 Condensation



Floor constructions subject to the Building Regulations in Scotland and Northern Ireland assessed satisfactorily in accordance with BS 5250 : 2002, clauses 8.5.3.2 and 8.5.4, are acceptable.

11 Thermal insulation



11.1 For the purpose of U value calculations to determine if the requirements of the Building, or other statutory, Regulations are met, the thermal conductivity⁽¹⁾ (λ values in Wm⁻¹K⁻¹) may be taken as:

- 0.033 for IB-X grade Styrofoam
- 0.027 for LB-X grade Styrofoam
- 0.14 for particle board.

(1) The thermal resistance of the Styrofloor boards is given in Table 1.

Table 1 Thermal resistance of Styrofloor boards

Board thickness (mm)	Thermal resistance (m ² KW ⁻¹)	
	LB-X grade	LB-X grade
34	0.61	0.72
38	0.74	0.87
43	0.89	1.06
50	1.10	1.31
68	1.64	1.98



11.2 The requirement for limiting heat loss through the building fabric can be satisfied if the U values of the building elements, including thermal bridging, do not exceed the maximum values in the relevant Elemental Methods given in the national Building Regulations:

England and Wales

Approved Documents L1 and L2

Scotland

Technical Standard J3.2, Table 1, and J8.2, Table

Northern Ireland

Technical Booklet F, Table 1.2 or 1.4.

11.3 Guidance is also given in these documents on selecting the thickness of insulation required to enable a floor to achieve the desired U value. Alternative approaches to the Elemental Method are also described which allow for some flexibility in design of U values for individual construction elements.

12 Floor loading

12.1 The design loadings for self-contained dwelling units, as defined in BS 6399-1 : 1996 are:

intensity of distributed load	1.5 kPa
concentrated load	1.4 kN

12.2 The boards can support these design loadings without undue deflection.

12.3 A BRE survey of imposed floor loading in domestic buildings (see BRE current paper No 2/77 *Floor loadings in domestic buildings — the results of a survey*) indicated that loadings in flats are commonly in the region of 0.6 kPa and loadings of 1.5 kPa are normally associated with fixed items.

13 Durability



13.1 The Styrofoam is rot-proof and dimensionally stable and will remain effective as an insulating material for the life of the building in which it is incorporated.

13.2 The particle board component of Styrofloor, will remain effective for the life of the building in which it is incorporated.

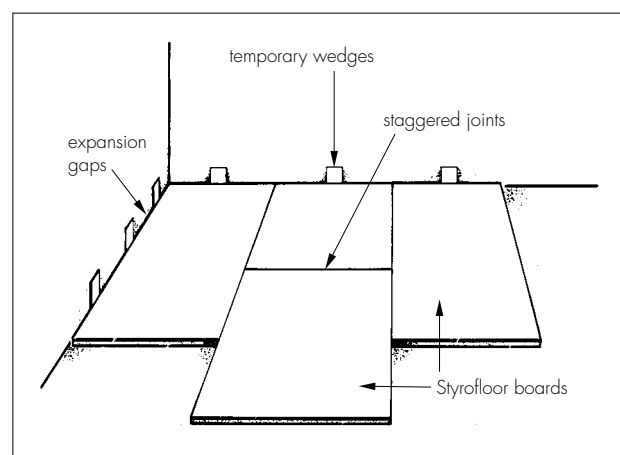
Installation

14 General

Typical methods of installation (see Figures 1 to 3)

14.1 To limit the risk of damage from condensation and other sources of dampness, Styrofloor should only be laid after the construction is glazed and/or substantially weathertight. The boards must also be protected from water spillage, plaster droppings, traffic, during construction.

Figure 1 Layout pattern

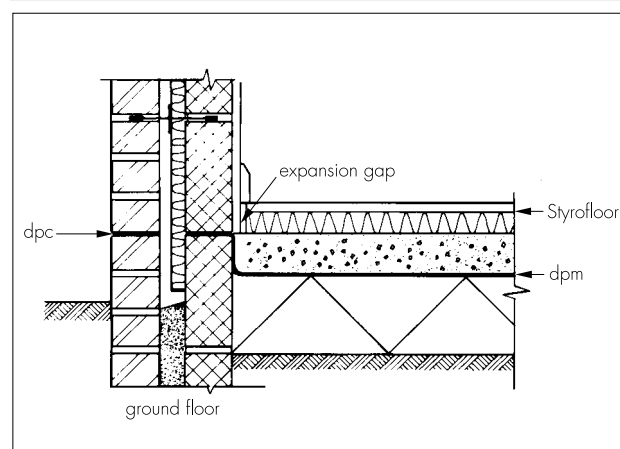


14.2 To protect the particle board in rooms such as kitchens, bathrooms, shower and utility rooms, where there is a likelihood of regular water spillage, consideration should be given to protection by a continuous flexible vinyl sheet flooring turned up at abutments.

Suspended beam and block floor

14.3 The boards can be used on a beam and block suspended concrete floor that is the subject of a current Agrément Certificate and installed in accordance with, and within the limitations imposed by, that Certificate. The surface of the floor should be smooth and flat to within 5 mm when measured with a three-metre straight-edge. Irregularities greater than this must be removed in accordance with the Certificate for that floor.

Figure 2 Typical installation detail for new construction

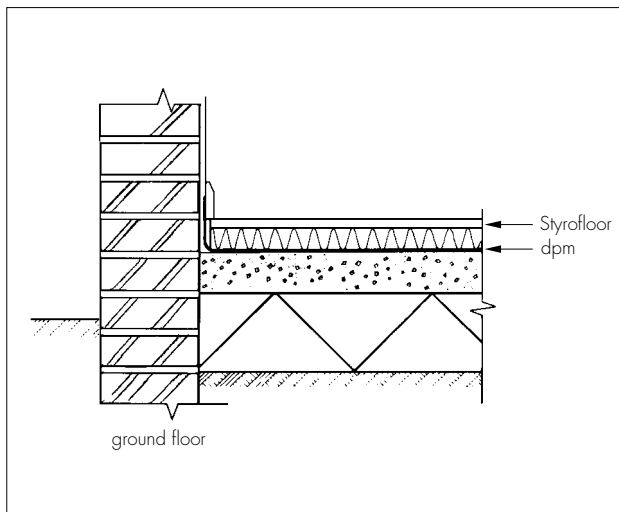


Other types of concrete floor

14.4 The concrete floor over which the boards are to be laid should be left for as long as possible to maximise drying out of moisture in accordance with the recommendations of BS 8203 : 2001, Section 11.3. The surface of the floor should be smooth and flat to within 5 mm when measured with a three-metre straight-edge. Irregularities greater than this must be removed. Minor irregularities (up to 10 mm deep) may be levelled with mortar.

14.5 Where Styrofloor is used over ground-supported concrete floor slabs, a suitable damp-proof membrane, in accordance with CP 102 : 1973, should be incorporated to resist moisture from the ground (see Figure 3). If a liquid-type damp-proof membrane is applied to the slabs it should be of a type compatible with extruded polystyrene and be allowed to dry completely before laying the boards.

Figure 3 Typical installation detail for existing construction



15 Procedure

15.1 Before laying Styrofloor, preservative-treated battens are fixed at doorways and to support partitions in accordance with BS 5268-5 : 1989. Adequate time should be allowed for CCA-based preservative to be fixed and the solvents from preservatives to evaporate.

15.2 The boards are laid with staggered cross-joints.

15.3 The laying pattern should ensure that all cut edges are at the perimeter of the floor or some other feature, eg mat wells, thresholds or access ducts.

15.4 An expansion gap between the boards and the perimeter walls should be provided at the rate

of 2 mm per metre run or a minimum of 10 mm, whichever is the greater.

15.5 Where there are long, uninterrupted lengths of floor, eg corridors, proprietary expansion joints should be installed at intervals on the basis of a 2 mm gap per metre run of board.

15.6 As each board is laid, a PVA adhesive is applied continuously to the top and bottom of the particle board joints and the boards are then interlocked.

15.7 Once the floor has been laid, temporary wedges are inserted between the walls and the floor to maintain tight joints until the adhesive has set.

15.8 A suitable compressible filler, eg pieces of extruded expanded polystyrene, should be fitted around the perimeter of the floor between the boards and the walls when the wedges are removed and before the skirting boards are affixed.

16 Incorporation of services

16.1 The maximum continuous working temperature of the insulation is 75°C. The product must not be used in direct contact with electrical heating cables or hot water pipes.

Suspended beam and block floors

16.2 Where the boards are installed on a floor of a suspended beam and block design, all services must be installed in accordance with the Agrément Certificate for that floor.

Other types of concrete floor

16.3 Where possible, electrical conduits, gas and water pipes or other services should be contained within ducts or channels within the concrete slab. Where this is not possible the services may be accommodated within the insulation provided they are securely fixed to the concrete slab. Electrical cables should be enclosed in a suitable conduit (see section 8.2). With hot pipes, the insulation must be cut back to maintain an air space.

16.4 Where water pipes are installed, either within the slab or the insulation, they must be lagged with close fitting pipe insulation, eg extruded polyethylene foam.

16.5 In situations where access to the services is desirable, a duct may be formed by mechanically fixing, to the floor, timber bearers of the same thickness as the insulation to provide support for a particle board cover. The duct should be as narrow as possible and not exceed 400 mm in width without intermediate support.

Technical Investigations

The following is a summary of the technical investigations carried out on Styrofloor Flooring Insulation Boards.

17 Tests

Tests were carried out to determine:

On the extruded polystyrene

- thermal conductivity
- compressive strength at 10% compression
- flexural strength
- dimensional stability with temperature
- water vapour permeance
- density
- burning characteristics

On the laminated boards

- dimensional accuracy
- laminate bond strength.

18 Investigations

18.1 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.

18.2 Assessments were made to determine:

- risk of interstitial condensation
- behaviour in fire of the product
- the durability of the laminate.

Bibliography

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5268-5 : 1989 *Structural use of timber — Code of practice for the preservative treatment of structural timber*

BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*

BS 7331 : 1990 *Specification for direct surfaced wood chipboard based on thermosetting resins*

BS 8102 : 1990 *Code of practice for protection of structures against water from the ground*

BS 8203 : 2001 *Code of practice for installation of resilient floor coverings*

BS EN 312-5 : 1997 *Particleboards — Specifications — Requirements for load-bearing boards for use in humid conditions*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

Conditions of Certification

19 Conditions

19.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

19.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

- (b) continue to be checked by the BBA or its agents; and

- (c) are reviewed by the BBA as and when it considers appropriate.

19.4 In granting this Certificate, the BBA makes no representation as to:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature of individual installations of the product, including methods and workmanship.

19.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.



In the opinion of the British Board of Agrément, Styrofloor Flooring Insulation Boards are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 92/2783 is accordingly awarded to Panel Systems Ltd.

On behalf of the British Board of Agrément

Date of Second issue: 29th August 2003

A handwritten signature in black ink, appearing to read 'P. C. Hewitt', is written over the printed name of the Chief Executive.

Chief Executive

**Original Certificate issued on 27th March 1992. This amended version includes reference to revised national Building Regulations and Standards, addition of CDM Regulations, additional product thicknesses and new Conditions of Certification.*

British Board of Agrément

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Certificate, including validity and
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or check the BBA website.