



## S and B EPS Ltd

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**Agrément  
Certificate  
No 02/3943**  
Third issue\*

Designated by Government  
to issue  
European Technical  
Approvals

## S AND B EPS FLOORING INSULATION

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

## Product



- THIS CERTIFICATE RELATES TO S AND B EPS FLOORING INSULATION, AN EXPANDED POLYSTYRENE BOARD FOR INSULATING CONCRETE FLOORS.

- The insulation is for use on ground-supported or suspended concrete ground floors. The product may also be used on exposed or semi-exposed intermediate concrete floors.

- The insulation is used to reduce the thermal transmittance of new or existing floors of dwellings or buildings of similar occupancy, type and condition.

## Regulations — Detail Sheet 1

### 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, S and B EPS Flooring Insulation, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: <b>A1</b>	Loading
Comment:	Floors incorporating this product can meet this Requirement. See the tinted area of the <i>Floor loading</i> section of these Front Sheets.
Requirement: <b>C2(c)</b>	Resistance to moisture
Comment:	A concrete ground floor incorporating the insulation can meet this Requirement provided the floor complies with the conditions set out in the relevant tinted areas in the <i>Condensation</i> section of these Front Sheets.
Requirement: <b>L1(a)(i)</b>	Conservation of fuel and power
Comment:	The insulation can enable, or contribute to enabling, a floor to meet its Target Emission Rate. See the relevant tinted areas in the <i>Thermal performance</i> section of the accompanying Detail Sheets.
Requirement: <b>Regulation 7</b>	Materials and workmanship
Comment:	The insulation is acceptable. See the <i>Durability</i> section of these Front Sheets.

continued

continued

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

These Front Sheets must be read in conjunction with the relevant accompanying Detail Sheets, which provide information specific to different bead types.

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## 2 The Building (Scotland) Regulations 2004



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

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The insulation can contribute to a construction satisfying this Regulation. See the <i>Durability</i> section and <i>Installation</i> part of these Front Sheets.
Regulation:	9	Building standards — construction
Standard:	1.1(a)(b)	Structure
Comment:		Floors incorporating this product can satisfy this Standard, with reference to clause 1.1.1 <sup>(1)</sup> . See the tinted area of the <i>Floor loading</i> section of these Front Sheets.
Standard:	3.15	Condensation
Comment:		Floors incorporating the insulation can satisfy this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.3 <sup>(1)</sup> and 3.15.4 <sup>(1)</sup> . See the relevant tinted areas of the <i>Condensation</i> section of these Front Sheets.
Standard:	6.2	Building insulation envelope
Comment:		The insulation can enable or contribute to enabling a floor to satisfy this Standard, with reference to clauses 6.2.1 <sup>(1)</sup> (Table 1) to 6.2.4 <sup>(1)</sup> . See the <i>Thermal performance</i> section of the accompanying Detail Sheets.
Regulation:	12	Building standards — conversions
Comment:		All comments given for the insulation under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> .

(1) Technical Handbook (Domestic).

## 3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, S and B EPS Flooring Insulation, 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 insulation is acceptable. See the <i>Durability</i> section of these Front Sheets.
Regulation:	C5	Condensation
Comment:		Floors incorporating the insulation can satisfy this Regulation. See the relevant tinted areas in the <i>Condensation</i> section of these Front Sheets.
Regulation:	D1	Stability
Comment:		Floors incorporating this product can meet this Regulation. See the tinted area of the <i>Floor loading</i> section of these Front Sheets.
Regulation:	F2	Building fabric
Comment:		The insulation can satisfy this Regulation. See the tinted areas in the <i>Thermal performance</i> section of the accompanying Detail Sheets.

## 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 section: 6 *Delivery and site handling* (6.4) of these Front Sheets.

## Technical Specification

### 5 Description

S and B EPS Flooring Insulation consists of rigid, expanded polystyrene boards, as described in the accompanying Detail Sheets.

### 6 Delivery and site handling

6.1 The insulation is delivered to site in packs, wrapped in polythene. Each pack contains a label bearing the manufacturer's trade name, product description, board dimensions, number of boards and the BBA identification mark incorporating the number of this Certificate.

6.2 The insulation must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque light coloured polythene. Care must be taken to avoid contact with solvents and bitumen products.

6.3 The insulation must be stored fully supported and flat on a firm, level, dry base, protected from the weather and raised above damp surfaces.

6.4 The insulation must not be exposed to open flame or other ignition sources.

## Design Data

### 7 General

7.1 S and B EPS Flooring Insulation is effective in reducing the U value (thermal transmittance) of new or existing ground floors.

7.2 Ground-supported concrete floors incorporating the insulation must include a suitable damp-proof membrane laid in accordance with the relevant clauses of CP 102 : 1973, BS 8102 : 1990 and/or BS 8215 : 1991 (see section 9 of these Front Sheets).

7.3 Suspended ground floors incorporating the insulation must include a damp-proof membrane or suitable ventilation of the sub-floor as appropriate (see section 9 of this Certificate).

7.4 The overlay to the insulation should be:

- a cement-based floor screed laid in accordance with the relevant clauses of BS 8204-1 : 2003 and/or BS 8204-2 : 2003, or
- wood-based floor, eg tongue-and-groove plywood 16 mm thick (minimum) to BS EN 636 : 2003, flooring grade particle board (Types P4 to P7) to BS EN 312 : 2003 or oriented strand board types OSB/2 to OSB/4 to BS EN 300 : 1997, 18 mm thick (minimum), installed in accordance with DD ENV 12872 : 2000 or
- a concrete slab.

### 8 Behaviour in relation to fire

8.1 The insulation does not prejudice the fire resistance properties of the floor.

8.2 When properly installed, the insulation will not add significantly to any existing fire hazard. The insulation will be contained within the floor by the overlay until the overlay itself is destroyed. Therefore, the insulation 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 insulation is not a water vapour control layer. However, it will not allow moisture to cross the completed floor construction.

9.2 For floors subject to national Building Regulations, construction should be as detailed or designed in accordance with:

#### *England and Wales*

Approved Document C, Section 4

#### *Scotland*

Mandatory Standard 3.4, clauses 3.4.2<sup>(1)</sup>, 3.4.3<sup>(1)</sup> and 3.4.6<sup>(1)</sup>

(1) Technical Handbook (Domestic).

#### *Northern Ireland*

Technical Booklet C, Section 1.

### 10 Condensation

#### Interstitial condensation



10.1 Floors will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002, Section 8.5 and Appendix D.

10.2 When the product is used above the damp-proof membrane on a ground-supported floor, or on a beam-and-block floor, a vapour control layer is installed on the warm side of the insulation to inhibit the risk of interstitial condensation on the upper slab surface.

10.3 For a timber suspended ground floor, it is not necessary to introduce a vapour control layer as long as adequate sub-floor cross ventilation is provided.

#### Surface condensation



10.4 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.7 \text{ Wm}^{-2}\text{K}^{-1}$  at any point, and the junctions with walls are designed in accordance with the relevant requirements of *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*.

10.5 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $1.2 \text{ Wm}^{-2}\text{K}^{-1}$  at any point. Guidance may be obtained from Section 8 of BS 5250 : 2002 and BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks*.

## 11 Floor loading

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

intensity of distributed load (kPa)	1.5
concentrated load (kN)	1.4

11.2 The insulation, covered with particle board or screed, can support these design loadings without undue compression deflection of the insulant.

11.3 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*), indicates 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.

11.4 Where the insulation is used under a concrete slab, resistance to concentrated and distributed loads is a function of the slab specification.

## 12 Durability

The insulation is rot-proof, dimensionally stable and, when installed with the overlays specified in this Certificate, will remain effective as an insulating material for the life of the building in which they are incorporated.

## Installation

## 13 General

13.1 Installation of S and B EPS Flooring Insulation must be in accordance with the Certificate holder's installation instructions and the requirements of this Certificate.

13.2 Typical methods are shown in Figures 1 to 6. Reference should also be made to BRE report (BR 262 : 2002).

13.3 All floor surfaces should be smooth, level and flat to within 5 mm when measured with a two-metre straight-edge. Irregularities greater than this must be removed. Minor irregularities (up to 10 mm deep) may be levelled with mortar or thin screed.

13.4 In ground-supported concrete floors (see Figures 1, 3, 5 and 6), the concrete floor slab over which the insulation is laid should be left for as long as possible to maximise drying out and dissipation of constructional moisture, in accordance with BS 8203 : 2001, Section 3.1.2.

Figure 1 Ground-supported concrete floor — particle board overlay

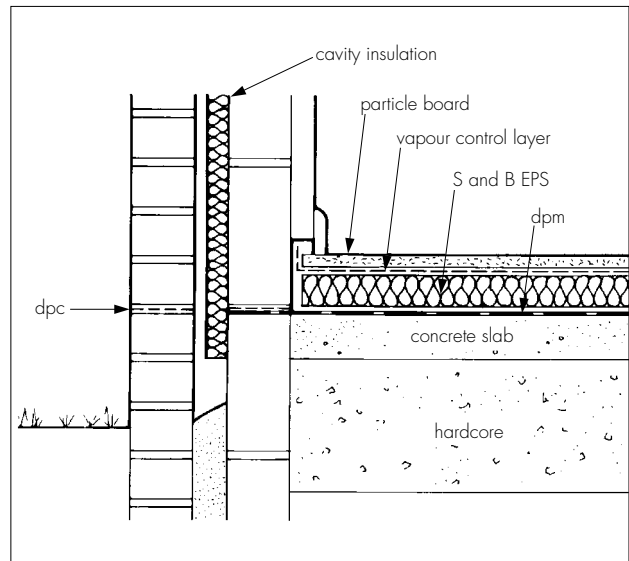


Figure 2 Suspended concrete floor — particle board overlay

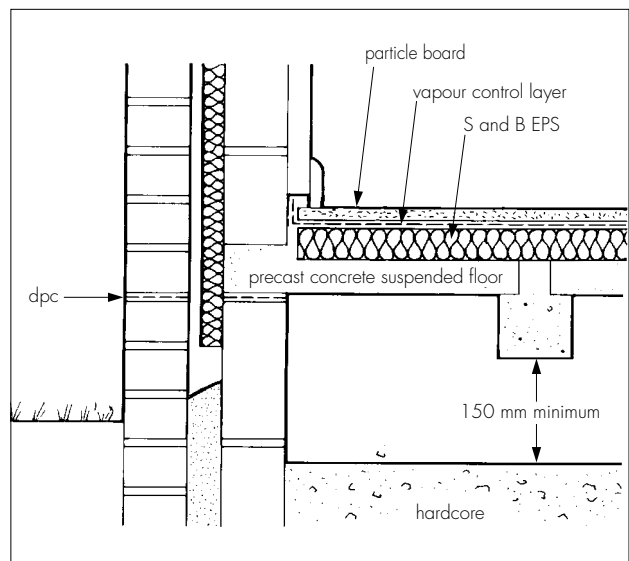


Figure 3 Ground-supported concrete floor — screed overlay

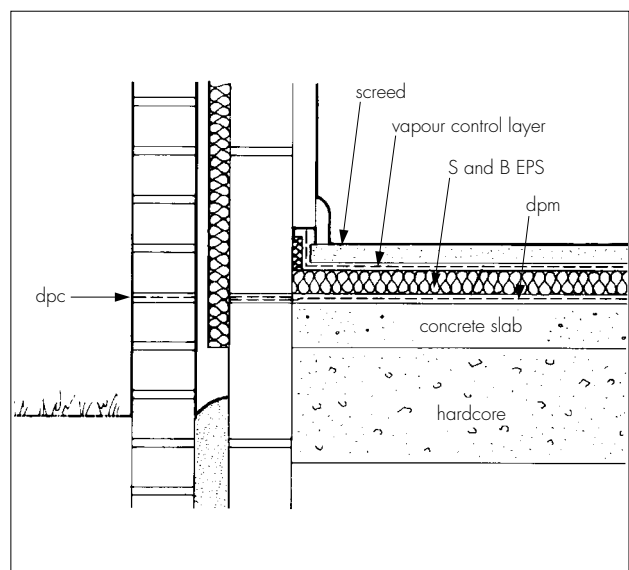


Figure 4 Suspended concrete floor — screed overlay

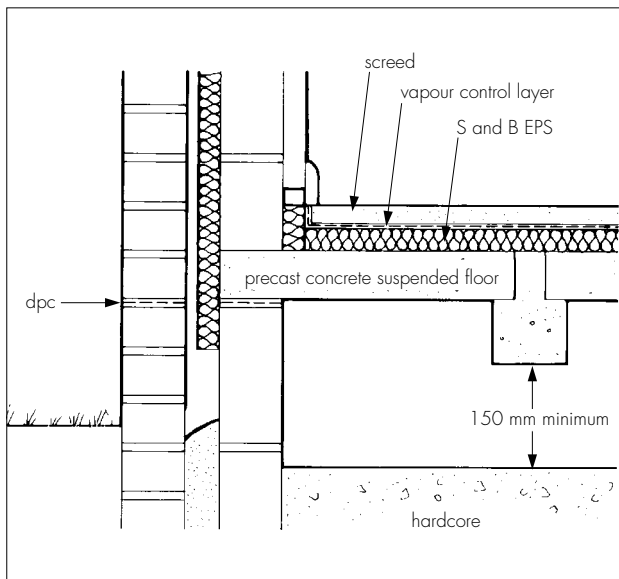


Figure 5 Particle board overlay — damp-proof membrane under concrete slab

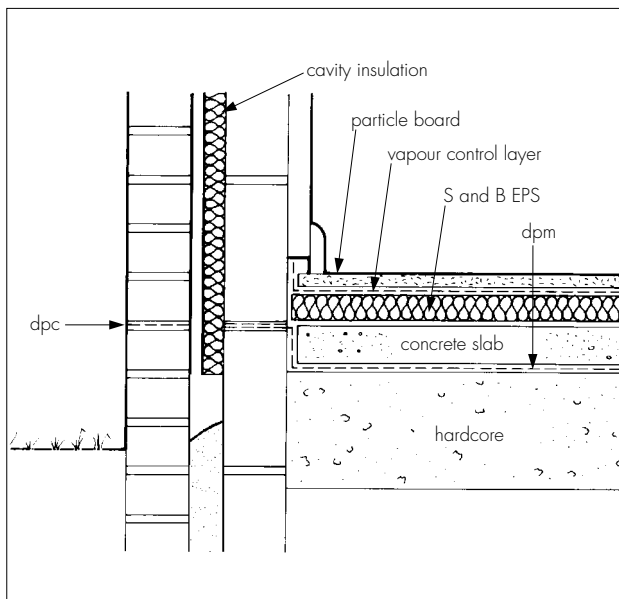
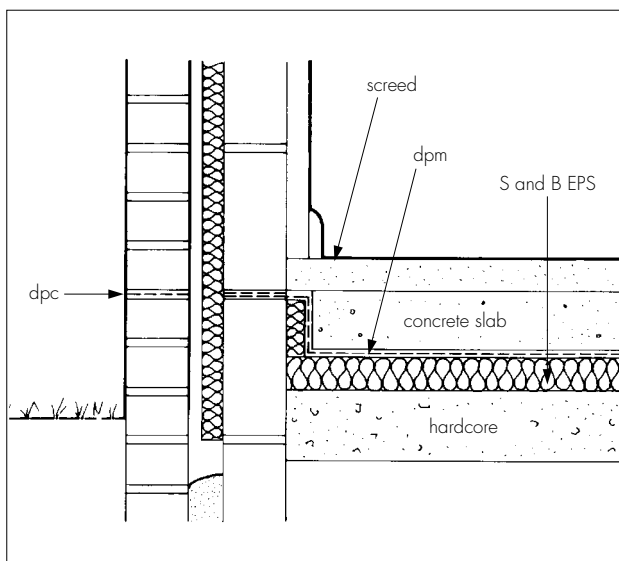


Figure 6 Concrete slab overlay



13.5 Where the insulation is used over ground-supported concrete floor slabs a suitable damp-proof membrane in accordance with BS 8102 : 1990, should be laid to resist moisture from the ground. If a liquid-type damp-proof membrane is applied to the slabs, it should be of a type compatible with expanded polystyrene and be allowed to dry out fully before laying the insulation.

13.6 Where the insulation is used on hardcore bases under ground-supported concrete slabs, the hardcore must be compacted and blinded before application of the insulation.

13.7 The insulation can be used on beam and block (see Figures 2 and 4) suspended concrete floors, that are the subject of a current Agrément Certificate and installed in accordance with, and within the limitations imposed by that Certificate, or those designed and installed to the precast concrete and general loading codes, that have been assessed as suitable.

13.8 Where a screed or concrete slab is laid over the insulation, vertical upstands of insulation should be provided and be of sufficient depth to fully separate the screed or slab from the wall. If used, a suitable partial fill cavity wall insulation material can be extended below the damp-proof course level to provide edge insulation to the floor.

13.9 During construction, the insulation and overlays must be protected from damage by traffic and moisture sources such as water spillage and plaster droppings.

## 14 Procedure

14.1 The insulation is cut to size, as necessary and laid with closely-butted, staggered cross-joints, ensuring that all spaces are completely filled. For rebate edged boards, one edge should be cut straight and laid next to the wall.

14.2 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. Spreader boards should be used to protect the insulation.

### Particle board and oriented strand board (OSB) overlays (Figures 1, 2 and 5)

14.3 Before laying the particle board or OSB overlays, preservative-treated battens, in accordance with BS 1282 : 1999, are positioned at doorways, access panels and to support partitions. Adequate time should be allowed for CCA-based preservatives to be fixed and the solvents from solvent-based preservatives to evaporate.

14.4 Where the insulation is laid on a dpm, a vapour control layer of polythene sheet with a minimum thickness of 0.25 mm (1000 gauge), is laid between the insulation and the particle board. The polythene sheet has 150 mm overlaps taped at the joints and is turned up 100 mm at the walls.

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14.5 Tongue-and-groove overlay boards, 18 mm thick, are laid with staggered cross-joints.

14.6 An expansion gap between the overlay board 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.

14.7 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 overlay board.

14.8 Before the overlay boards are interlocked, a waterproof PVA adhesive is applied to the joints.

14.9 Once the overlay board is laid, temporary wedges are inserted between the walls and the floor to maintain tight joints until the adhesive has set.

14.10 When the wedges are removed and before the skirting boards are fixed, suitable compressible filler, eg pieces of polystyrene, should be fitted around the perimeter of the floor between the overlay board and the walls.

14.11 Where there is a likelihood of regular water spillage, eg in rooms such as kitchens, bathrooms, shower and utility rooms, additional particle board protection should be considered, eg by a continuous flexible vinyl sheet flooring, with welded joints, turned up at abutments and cove skirting.

## **Cement-based screed overlay** (Figures 3, 4 and 6)

14.12 Perimeter edge pieces are cut and placed around the edges and all floor joints taped before a properly-compacted screed of a minimum thickness 65 mm is laid. The relevant clauses of BS 8204-1 : 2003 should be followed and BRE Digest 224 : 1981 *Cellular Plastics for Buildings. Floors* and BRE Digest 104 : 1979 *Floor Screeds* should be consulted.

## **Concrete slab overlay (ground bearing only)**

(Figure 6)

14.13 Perimeter edge pieces are cut and placed around the edges and taped at joints. The concrete slab is laid to the required thickness.

## **15 Incorporation of services**

15.1 The insulation must not be used in direct contact with electrical heating cables or hot water pipes.

15.2 Where possible, electrical conduits, gas and water pipes or other services should, be contained in ducts or channels within the concrete slab of ground-supported floors. 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. With hot pipes, the insulation must be cut back to maintain an air space.

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

15.4 Where the boards are installed on a floor of a suspended beam and block design, all services must be installed so as not to impair the floor performance in accordance with the Agrément Certificate (where appropriate) for that floor.

15.5 For exposed/semi-exposed intermediate concrete floors, all services should be incorporated beneath the existing floor.

15.6 On overlay board floors, 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. Services should be suitably fixed to the floor base and not to the insulation boards.

## Bibliography

BS 1282 : 1999 *Wood preservatives — Guidance on choice, use and application*

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

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

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

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 8204-1 : 2003 *Screeds, bases and in-situ floorings — Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*

BS 8204-2 : 2003 *Screeds, bases and in-situ floorings — Concrete wearing surfaces — Code of practice*

BS 8215 : 1991 *Code of practice for design and installation of damp-proof courses in masonry construction*

BS EN 300 : 1997 *Oriented Strand Boards (OSB) — Definitions, classification and specifications*

BS EN 312 : 2003 *Particleboards — Specifications*

BS EN 636 : 2003 *Plywood — Specifications*

DD ENV 12872 : 2000 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

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

## Conditions of Certification

### 16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

16.2 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, are references to such publication in the form in which it was current at the date of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

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

16.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product or system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does 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 information 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 manufacture, supply, installation, use and maintenance of this product/system.



In the opinion of the British Board of Agrément, S and B EPS Flooring Insulation is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 02/3943 is accordingly awarded to S and B EPS Ltd.

On behalf of the British Board of Agrément

Date of Third issue: 29th November 2006

A handwritten signature in black ink, appearing to read 'G. A. Cooper'.

Chief Executive

*\*Original Certificate issued on 16th August 2002. This amended version includes reference to revised national Building Regulations, conversion to Detail Sheet format to add the Low-Lambda and Lambda-Therm products and new Conditions of Certification.*

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For technical or additional information,  
contact the Certificate holder (see  
front page).  
For information about the Agrément  
Certificate, including validity and  
scope, tel: Hotline 01923 665400,  
or check the BBA website.



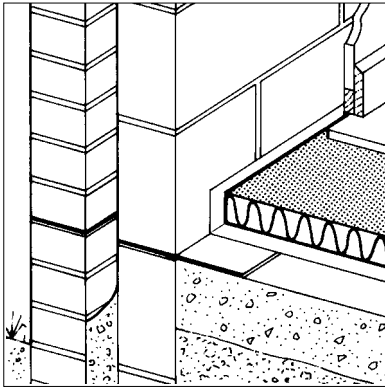
S and B EPS Ltd

Certificate No 02/3943

**DETAIL SHEET 2**

**S AND B EPS FLOORING BOARDS**

## Product



• THIS DETAIL SHEET RELATES TO S AND B EPS FLOORING BOARDS, AN EXPANDED POLYSTYRENE BOARD FOR INSULATING GROUND-SUPPORTED OR SUSPENDED CONCRETE GROUND FLOORS.

• It is essential that the boards are installed and maintained in accordance with the conditions set out in the Design Data Installation parts of the Front Sheets and this Detail Sheet.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, and the Conditions of Certification.

## Technical Specification

### 1 Description

1.1 S and B EPS Flooring Boards consist of rigid, expanded polystyrene boards, in four grades, manufactured without the use of HCFCs in accordance with Section 4.2 and the relevant parts of Section 4.3 of BS EN 13163 : 2001.

1.2 In relation to reaction-to-fire tests, the boards are classified as Class E in accordance with BS EN 13501-1 : 2002.

1.3 The boards are supplied with the characteristics given in Table 1.

out in accordance with BS EN ISO 6946 : 1997, BS EN ISO 13370 : 1998 and BRE report (BR 443 : 2006) *Conventions for U-value calculations*, using the declared thermal conductivity ( $\lambda_{90/90}$  value) as given in Table 2.

Table 2 Declared thermal conductivity ( $\lambda_{90/90}$  values)

Grade	Thermal conductivity ( $Wm^{-1}K^{-1}$ )
EPS 70	0.038
EPS 100	0.036
EPS 120	0.036
EPS 150	0.035

## Design Data

### 2 Thermal performance

2.1 Calculations of the thermal transmittance (U value) of a floor construction should be carried

2.2 Examples of U values achieved by different thicknesses of insulation used either in suspended or ground-supported floors are given in Table 3.

Table 1 Nominal characteristics

Characteristic (unit)	Grade			
	EPS 70	EPS 100	EPS 120	EPS 150
Length <sup>(1)</sup> (mm)	2400	2400	2400	2400
Width <sup>(1)</sup> (mm)	1200	1200	1200	1200
Thickness <sup>(1)</sup> (mm)	100	100	100	100
Bending strength (kPa)	115	150	170	200
Minimum compressive strength at 10% compression ( $kNm^{-2}$ )	70	100	120	150
Water vapour diffusion resistance factor ( $\mu$ )	20 to 40	30 to 70	30 to 70	30 to 70
Water vapour permeability [ $mg(Pa \text{ h m})^{-1}$ ]	0.018 to 0.036	0.010 to 0.024	0.010 to 0.024	0.010 to 0.024
Edge profile	square or rebated	square or rebated	square or rebated	square or rebated

(1) Other sizes supplied to order, with thickness to suit requirement.

Readers are advised to check the validity of this Detail Sheet by either referring to the BBA's website ([www.bbacerfs.co.uk](http://www.bbacerfs.co.uk)) or contacting the BBA direct (Telephone Hotline 01923 665400).

Table 3 Floor U values<sup>(1)</sup>

Floor type	Insulation	Perimeter/ area ratio	Slab thickness (mm)			
			25	50	75	100
Slab ground supported	EPS 70	0.2	0.27	0.23	0.20	0.17
		0.4	0.41	0.32	0.26	0.22
		0.6	0.50	0.37	0.29	0.25
		0.8	0.56	0.40	0.32	0.26
		1.0	0.61	0.43	0.33	0.27
	EPS 100 and EPS 120	0.2	0.27	0.22	0.19	0.17
		0.4	0.41	0.31	0.25	0.21
		0.6	0.49	0.36	0.29	0.24
		0.8	0.55	0.39	0.31	0.25
		1.0	0.59	0.42	0.32	0.26
	EPS 150	0.2	0.27	0.22	0.19	0.17
		0.4	0.40	0.31	0.25	0.21
		0.6	0.49	0.36	0.28	0.23
		0.8	0.55	0.38	0.30	0.25
		1.0	0.59	0.41	0.32	0.26
Suspended beam and block	EPS 70	0.2	0.28	0.23	0.20	0.18
		0.4	0.37	0.30	0.25	0.22
		0.6	0.43	0.34	0.28	0.23
		0.8	0.47	0.36	0.29	0.24
		1.0	0.50	0.37	0.30	0.25
	EPS 100 and EPS 120	0.2	0.27	0.23	0.20	0.17
		0.4	0.37	0.29	0.24	0.21
		0.6	0.42	0.33	0.27	0.23
		0.8	0.46	0.35	0.28	0.24
		1.0	0.49	0.36	0.29	0.24
	EPS 150	0.2	0.27	0.23	0.20	0.17
		0.4	0.37	0.29	0.24	0.21
		0.6	0.42	0.32	0.26	0.22
		0.8	0.46	0.34	0.28	0.23
		1.0	0.48	0.36	0.29	0.24

(1) Edge insulation is not included.



2.3 Subject to the selection of an appropriate insulation thickness, floor construction can improve on the U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  as required by the 2002 Regulations. Therefore the product can contribute to enabling a building to meet the Target Emission Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

2.4 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the floor and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO : 2002.

2.5 Compliance with the guidance referred to in section 2.4 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of SAP 2005 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, in Target

Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)<sup>(1)</sup>.

(1) Published by the Department for Communities and Local Government on its website: [www.communities.gov.uk](http://www.communities.gov.uk)

2.6 When installed in floors of existing buildings, the product can meet, or contribute to meeting, the relevant requirements of:

- Approved Document L1B, section 2
- Approved Document L2B, section 3.



2.7 Subject to the selection of an appropriate insulation thickness, a floor can satisfy the Elemental target U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Table 1 to clause 6.2.1<sup>(1)</sup>.

(1) Technical Handbook (Domestic).

2.8 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between floors and other building elements. Guidance in BRE report (BR 262: 2002) *Thermal insulation : avoiding risks* is acceptable.



2.9 Subject to the selection of an appropriate insulation thickness, floors in Northern Ireland can satisfy the Elemental target U value of  $0.35 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Tables 1.2 and 1.4 of Technical Booklet F.

## Technical Investigations

The following is a summary of the technical investigations carried out on S and B EPS Flooring Boards.

### 3 Tests

Tests were carried out by the BBA in accordance with BS EN 13163 : 2001 to determine:

- thickness
- compressive stress at 10% deformation
- long-term water absorption by immersion (total and partial)
- long-term water absorption by diffusion
- thermal conductivity ( $\lambda$  value)
- dimensional stability under constant normal laboratory conditions
- dimensional stability at specified temperature and humidity
- compressive creep
- freeze-thaw resistance.

### 4 Investigations

4.1 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.

4.2 An examination was made of test data to BS EN 13163 : 2001 relating to:

- dimensions
- squareness
- flatness
- density
- $\lambda$  value
- compressive strength at 10% compression
- bending strength.

## Additional Information

The Certificate holder's declared designation codes, level or class to BS EN 13163 : 2001 are shown in Table 4.

Table 4 Certificate holder's declared designation codes/level or class – BS EN 13163 : 2001

	Grade			
	EPS 70	EPS 100	EPS 120	EPS 150
Length	L1	L1	L1	L1
Width	W1	W1	W1	W1
Thickness	T1	T1	T1	T1
Squareness	S1	S1	S1	S1
Flatness	P2	P2	P2	P2
Compressive stress at 10% deformation	CS(10)70	CS(10)100	CS(10)120	CS(10)150
Dimensional stability at 23°C/50% RH	DS(N)2	DS(N)2	DS(N)2	DS(N)2
Dimensional stability at 23°C/90% RH	DS(23,90)1	DS(23,90)1	DS(23,90)1	DS(23,90)1
Water absorption by immersion <sup>(1)</sup>				
– total (%)	WL(T)3	WL(T)3	WL(T)5	WL(T)5
– partial (kgm <sup>-2</sup> )	0.12	0.1	0.08	0.09
Water absorption by diffusion	WD(V)10	WD(V)10	NPD	WD(V)10
Compressive creep (0.25 $\sigma_c$ )	CC(1.5/1/10)70	CC(1.5/1/10)100	CC(1.5/1/10)120	CC(1.5/1/10)150
Bending strength	BS115	BS150	BS170	BS200
Thermal conductivity ( $\lambda_{90/90}$ value) (Wm <sup>-1</sup> K <sup>-1</sup> )	0.038	0.036	0.036	0.035
Freeze/thaw (%)				
– wet	-1.06	-5.45	-1.54	-3.80
– dry	-1.06	-1.82	-4.62	-6.33

(1) For 50 mm thickness.

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## Bibliography

BS EN 13163 : 2001 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2002 *Fire classification of construction products and building elements. Classification using test data from reaction to fire tests*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 13370 : 1998 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*



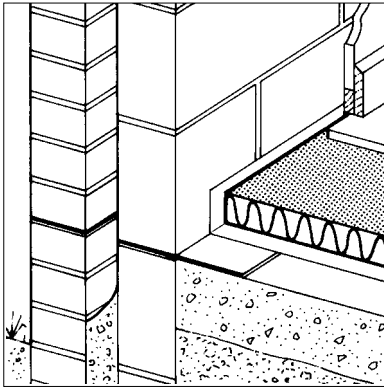
On behalf of the British Board of Agrément

Date of issue: 29th November 2006

Chief Executive


**S and B EPS Ltd**
**Certificate No 02/3943**
**S AND B EPS LOW-LAMBDA FLOORING  
BOARDS**
**DETAIL SHEET 3**

## Product



• THIS DETAIL SHEET RELATES TO S AND B EPS LOW-LAMBDA FLOORING BOARDS, AN EXPANDED POLYSTYRENE BOARD FOR INSULATING GROUND-SUPPORTED OR SUSPENDED CONCRETE GROUND FLOORS.

• It is essential that the boards are installed and maintained in accordance with the conditions set out in the Design Data Installation parts of the Front Sheets and this Detail Sheet.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, and the Conditions of Certification.

## Technical Specification

### 1 Description

1.1 S and B EPS Low-Lambda Flooring Boards consist of rigid, expanded polystyrene boards, manufactured without the use of HCFCs in accordance with Section 4.2 and the relevant parts of Section 4.3 of BS EN 13163 : 2001.

1.2 In relation to reaction-to-fire tests, the boards are classified as Class E in accordance with BS EN 13501-1 : 2002.

1.3 The boards are supplied with nominal characteristics of:

Length (mm)	2400
Width (mm)	1200
Thickness (mm)	50
Compressive Strength (kPa)	100

## Design data

### 2 Thermal performance

2.1 Calculations of the thermal transmittance (U value) of a floor construction should be carried out in accordance with BS EN ISO 6946 : 1997, BS EN ISO 13370 : 1998 and BRE Report (BR 443 : 2006) *Conventions for U-value calculations*, using the declared thermal conductivity ( $\lambda_{90/90}$  value) of  $0.034 \text{ Wm}^{-1}\text{K}^{-1}$ .

2.2 Examples of U values achieved by different thicknesses of insulation used either in suspended or ground-supported floors are given in Table 1

2.3 Subject to the selection of an appropriate insulation thickness, floor construction can improve on the U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  as required by the 2002 Regulations. Therefore the product can contribute to enabling a building to meet the Target Emission

Table 1 Floor U values<sup>(1)</sup>

Floor type	Insulation	Perimeter/ area ratio	Slab thickness (mm)			
			25	50	75	100
Slab ground supported	EPS Low-Lambda	0.2	0.27	0.22	0.19	0.16
		0.4	0.40	0.30	0.25	0.21
		0.6	0.48	0.35	0.28	0.23
		0.8	0.54	0.38	0.30	0.24
		1.0	0.58	0.40	0.31	0.25
Suspended beam and block	EPS Low-Lambda	0.2	0.27	0.23	0.19	0.17
		0.4	0.36	0.29	0.24	0.20
		0.6	0.42	0.32	0.26	0.22
		0.8	0.45	0.34	0.27	0.23
		1.0	0.47	0.35	0.28	0.23

(1) Edge insulation is not included.

Readers are advised to check the validity of this Detail Sheet by either referring to the BBA's website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)) or contacting the BBA direct (Telephone Hotline 01923 665400).

Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

2.4 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the floor and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO : 2002.

2.5 Compliance with the guidance referred to in section 2.4 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of SAP 2005 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, in Target Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)<sup>(1)</sup>.

(1) Published by the Department for Communities and Local Government on its website: [www.communities.gov.uk](http://www.communities.gov.uk)

2.6 When installed in floors of existing buildings, the product can meet, or contribute to meeting, the relevant requirements of:

- Approved Document L1B, section 2
- Approved Document L2B, section 3.



2.7 Subject to the selection of an appropriate insulation thickness, a floor can satisfy the Elemental target U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Table 1 to clause 6.2.1 of the Technical Handbook (Domestic).

2.8 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between floors and other building elements. Guidance in BRE report (BR 262: 2002) *Thermal insulation : avoiding risks* is acceptable.



2.9 Subject to the selection of an appropriate insulation thickness, floors in Northern Ireland can satisfy the Elemental target U value of  $0.35 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Tables 1.2 and 1.4 of Technical Booklet F.

## Technical Investigations

The following is a summary of the technical investigations carried out on S and B EPS Low-Lambda Flooring Boards.

### 3 Tests

Tests were carried out by the BBA in accordance with BS EN 13163 : 2001 to determine:

- compressive stress at 10% deformation
- long-term water absorption by partial immersion
- water absorption by total diffusion
- thermal conductivity ( $\lambda$  value).

### 4 Investigations

4.1 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.

4.2 An examination was made of test data to BS EN 13163 : 2001 relating to:

- dimensions
- density
- $\lambda$  value
- fire classification
- compressive strength at 10% compression
- bending strength.

## Additional Information

The Certificate holder's declared designation codes, level or class to BS EN 13163 : 2001 are shown in Table 2.

Table 2 Certificate holder's declared designation codes/level or class — BS EN 13163 : 2001

EPS Low Lambda	
Compressive stress at 10% deformation	CS(10)100
Water absorption by immersion <sup>(1)</sup>	
— total (%)	WL(T)5
partial ( $\text{kgm}^{-2}$ )	0.20
Bending strength (kPa)	150
Thermal conductivity ( $\lambda_{90/90}$ value) ( $\text{Wm}^{-1}\text{K}^{-1}$ )	0.034

(1) For 50 mm thickness.

## Bibliography

BS EN 13163 : 2001 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2002 *Fire classification of construction products and building elements. Classification using test data from reaction to fire tests*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 13370 : 1998 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*



On behalf of the British Board of Agrément



Date of issue: 29th November 2006

Chief Executive

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For information about the Agrément  
Certificate, including validity and  
scope, tel: Hotline 01923 665400,  
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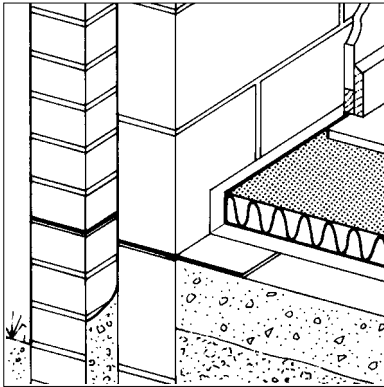
S and B EPS Ltd

Certificate No 02/3943

**S AND B EPS LAMBDA-THERM  
FLOORING BOARDS**

**DETAIL SHEET 4**

## Product



• THIS DETAIL SHEET RELATES TO S AND B EPS LAMBDA-THERM FLOORING BOARDS, AN EXPANDED POLYSTYRENE BOARD FOR INSULATING GROUND-SUPPORTED OR SUSPENDED CONCRETE GROUND FLOORS.

• It is essential that the boards are installed and maintained in accordance with the conditions set out in the Design Data Installation parts of the Front Sheets and this Detail Sheet.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, and the Conditions of Certification.

## Technical Specification

### 1 Description

1.1 S and B EPS Lambda-Therm Flooring Boards consist of rigid, expanded polystyrene boards, in two grades, manufactured without the use of HCFCs in accordance with Section 4.2 and the relevant parts of Section 4.3 of BS EN 13163 : 2001.

1.2 In relation to reaction-to-fire tests, the boards are classified as Class E in accordance with BS EN 13501-1 : 2002.

1.3 The boards are supplied each with a length of 2400 mm, width of 1200 mm and thickness of 50 mm, and with the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

	Lambda-Therm	
	EPS 70	EPS 90
Length(mm) <sup>(1)</sup>	2400	2400
Width (mm) <sup>(1)</sup>	1200	1200
Thickness (mm) <sup>(1)</sup>	25 to 100	25 to 100
Bending strength (kPa)	115	150

(1) Other sizes supplied to order, with thickness to suit requirement.

## Design Data

### 2 Thermal performance

2.1 Calculations of the thermal transmittance (U value) of a floor construction should be carried out in accordance with BS EN ISO 6946 : 1997, BS EN ISO 13370 : 1998 and BRE Report (BR 443 : 2006) *Conventions for U-value calculations*, using the declared thermal conductivity ( $\lambda_{90/90}$  value) as given in Table 2.

Table 2 Declared thermal conductivity ( $\lambda_{90/90}$  values)

Grade	Thermal conductivity (Wm <sup>-1</sup> K <sup>-1</sup> )
EPS 70 Lambda-Therm	0.032
EPS 90 Lambda-Therm	0.031

2.2 Examples of U values achieved by different thicknesses of insulation used either in suspended or ground-supported floors are given in Table 3.

Table 3 Floor U values<sup>(1)</sup>

Floor type	Insulation	Perimeter/ area ratio	Slab thickness (mm)			
			25	50	75	100
Slab ground supported	EPS 70 Lambda-Therm	0.2	0.26	0.21	0.18	0.16
		0.4	0.39	0.30	0.24	0.20
		0.6	0.47	0.34	0.27	0.22
		0.8	0.52	0.37	0.28	0.23
		1.0	0.56	0.39	0.30	0.24
	EPS 90 Lambda-Therm	0.2	0.26	0.21	0.18	0.16
		0.4	0.39	0.29	0.23	0.19
		0.6	0.46	0.33	0.26	0.21
		0.8	0.52	0.36	0.28	0.23
		1.0	0.55	0.38	0.29	0.24
Suspended beam and block	EPS 70 Lambda-Therm	0.2	0.27	0.22	0.19	0.16
		0.4	0.36	0.28	0.23	0.19
		0.6	0.41	0.31	0.25	0.21
		0.8	0.44	0.33	0.26	0.22
		1.0	0.46	0.34	0.27	0.22
	EPS 90 Lambda-Therm	0.2	0.26	0.22	0.19	0.16
		0.4	0.35	0.28	0.22	0.19
		0.6	0.40	0.30	0.24	0.20
		0.8	0.44	0.32	0.26	0.21
		1.0	0.46	0.34	0.26	0.22

(1) Edge insulation is not included.



2.3 Subject to the selection of an appropriate insulation thickness, floor construction can improve on the U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  as required by the 2002 Regulations. Therefore the product can contribute to enabling a building to meet the Target Emission Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

2.4 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the floor and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO : 2002.

2.5 Compliance with the guidance referred to in section 2.4 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of SAP 2005 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, in Target Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)<sup>(1)</sup>.

(1) Published by the Department for Communities and Local Government on its website: [www.communities.gov.uk](http://www.communities.gov.uk)

2.6 When installed in floors of existing buildings, the product can meet, or contribute to meeting, the relevant requirements of:

- Approved Document L1B, section 2
- Approved Document L2B, section 3.



2.7 Subject to the selection of an appropriate insulation thickness, a floor can satisfy the Elemental target U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Table 1 to clause 6.2.1<sup>(1)</sup>.

(1) Technical Handbook (Domestic).

2.8 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between floors and other building elements. Guidance in BRE report (BR 262: 2002) *Thermal insulation : avoiding risks* is acceptable.



2.9 Subject to the selection of an appropriate insulation thickness, floors in Northern Ireland can satisfy the Elemental target U value of  $0.35 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Tables 1.2 and 1.4 of Technical Booklet F.

## Technical Investigations

The following is a summary of the technical investigations carried out on S and B EPS Lambda-Therm Flooring Boards.

### 3 Tests

Tests were carried out by the BBA in accordance with BS EN 13163 : 2001 to determine:

- thickness
- compressive stress at 10% deformation
- long-term water absorption by immersion (total and partial)
- long-term water absorption by diffusion
- thermal conductivity ( $\lambda$  value)
- dimensional stability under constant normal laboratory conditions
- dimensional stability at specified temperature and humidity.

### 4 Investigations

4.1 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.

4.2 An examination was made of test data to BS EN 13163 : 2001 relating to:

- dimensions
- squareness
- flatness
- density
- $\lambda$  value
- compressive strength at 10% compression
- bending strength.

## Additional Information

The Certificate holder's declared designation codes, level or class to BS EN 13163 : 2001 are shown in Table 4.

*Table 4 Certificate holder's declared designation codes/level or class — BS EN 13163 : 2001*

	Lambda-Therm	
	EPS 70	EPS 90
Dimensional stability at 23°C/50% RH	DS(N)2	DS(N)2
Dimensional stability at 23°C/90% RH	DS(23.90)1	DS(23.90)1
Water absorption by immersion <sup>(1)</sup>		
— total (%)	WL(T)3	WL(T)3
— partial (kgm <sup>-2</sup> )	0.15	0.22
Water vapour diffusion resistance factor ( $\mu$ )	20 to 40	30 to 70
Compressive strength at 10% deformation	CS(10)70	CS(10)90
Thermal conductivity [declared ( $\lambda_{90/90}$ )] (Wm <sup>-1</sup> K <sup>-1</sup> )	0.032	0.031
Bending strength (kPa)	115	150

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## Bibliography

BS EN 13163 : 2001 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2002 *Fire classification of construction products and building elements. Classification using test data from reaction to fire tests*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 13370 : 1998 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*



On behalf of the British Board of Agrément

Date of issue: 29th November 2006

Chief Executive

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