

Quinn Lite Pac

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Agrément Certificate
05/4278
Product Sheet 1

QUINN LITE PAC EXPANDED POLYSTYRENE INSULATION BOARD

LITE PAC UNDERFLOOR INSULATION BOARD

This Agrément Certificate Product Sheet⁽¹⁾ relates to Lite Pac Underfloor Insulation Board comprising a range of expanded polystyrene board of various grades; EPS 70 Pearl and EPS 70 (for domestic only), EPS 100 Pearl, EPS 100, EPS 150 and EPS 200 (for both domestic and non-domestic) for use as thermal insulation on ground-supported or suspended concrete floors in new and existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Thermal performance — the product thermal conductivity (λ_p)* is between $0.038 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ and $0.031 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ depending upon the grade and floors incorporating the product can achieve typical design U values (see section 6).

Condensation — the product can contribute to limiting the risk of condensation (see section 7).

Floor loading — the product, when installed in accordance with this Certificate, can support a design loading without undue compression deflection (see section 9).

Durability — the product is dimensionally stable, and when installed with the overlays specified, will remain effective as an insulating material for the life of the building in which it is incorporated (see section 11).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'John Albon'.

Date of Second issue: 23 November 2015

John Albon — Head of Approvals
Construction Products

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas
Chief Executive

Originally certificated on 22 January 1996

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Lite Pac Underfloor Insulation Board, if installed, used and maintained in accordance with this Certificate, can contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	A1	Loading
Comment:		The product has adequate strength and stiffness. See sections 9.2 and 9.3 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can adequately limit the risk of surface condensation See sections 7.1 and 7.3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to meeting this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:		The product can contribute to satisfying these Regulations. See section 6.2 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(b)	Structure
Comment:		The product can contribute to satisfying this Standard, with reference to clause 1.1.1 ⁽¹⁾⁽²⁾ . See sections 9.2 and 9.3 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See sections 7.1 and 7.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to satisfying these Standards, with reference to clauses, or parts of, 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽¹⁾⁽²⁾ to 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽²⁾ . See section 6 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6.1 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments made in relation to this product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	29	Condensation
Comment:		The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	30	Stability
Comment:		The product can contribute to satisfying this Regulation. See sections 9.2 and 9.3 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The product can contribute to satisfying these Regulations. See section 6 of this Certificate.

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.4) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Lite Pac Underfloor Insulation Board, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.1, *Substructure and ground bearing floors*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13163 : 2013. An asterisk (*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Lite Pac Underfloor Insulation Board comprises of EPS Pearl (70 and 100), EPS 70, EPS 100, EPS 150 and EPS 200 expanded polystyrene boards manufactured into different grades depending on the compressive strength.

1.2 The product has the nominal characteristics as shown in Table 1.

EPS grade	Pearl 100	Pearl 70	70	100	150	200
Length ^{(1)*} and width ^{(1)*} (mm)	1200 x 600 2400 x 1200	1200 x 600 2400 x 1200	1200 x 600 2400 x 1200	1200 x 600 2400 x 1200	1200 x 600 2400 x 1200	2400 x 1200 1200 x 1200
Thickness ^{(1)*} (mm)	25 to 175	25 to 175	25 to 175	25 to 175	25 to 175	25 to 175
Nominal density* (kg·m ⁻³)	20	15	15	20	25	30
Edge detail	Square	Square	Square	Square	Square	Square
Compressive strength* at 10% deformation (kPa)	100	70	70	100	150	200
Bending strength* (kPa)	150	115	115	150	200	250
Dimensional stability*				DS(N)5		
Water vapour diffusion factor*	30 – 70	20 – 40	20 – 40	30 – 70	40 – 100	40 – 100
Water vapour permeability*	0.010 – 0.024	0.019 – 0.06	0.018 – 0.036	0.010 – 0.024	0.007 – 0.018	0.007 – 0.018
Long term water absorption* – total immersion – partial immersion				WL(T) 05 Less than 1%		
Fire classification*	E	E	E/F	E/F	E/F	E/F

(1) Other sizes available on request.

Ancillary items used with the product are:

- saddle clips
- galvanized nails
- pre-treated battens
- acrylic adhesive foil tape
- damp-proof membrane (dpm)
- vapour control layer (VCL).

2 Manufacture

2.1 The virgin bead is loaded into moulds and pre-expanded at high temperatures to the required density. The pre-expanded bead is then moulded into blocks.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the Certificate holder/manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities

- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis as part of a surveillance process to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Quinn Lite Pac has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by NSAI (Certificate 19.0628).

3 Delivery and site handling

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

3.2 To prevent surface degradation, the product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque, polythene sheeting.

3.3 The product must be stored flat, protected from high winds and raised above damp surfaces. When stored indoors, it is recommended that the building be ventilated to allow approximately two air changes per hour.

3.4 The product must not be exposed to open flame or other ignition sources. Care must be taken to avoid contact with solvents and liquid bitumen or mastic products. Damaged product must be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Lite Pac Underfloor Insulation Board.

Design Considerations

4 General

4.1 Lite Pac Underfloor Insulation Board is for use in new or existing ground floors. The EPS Pearl and EPS 70 boards are for use in domestic buildings only, but the EPS 100, EPS 150 and EPS 200 are for use in both domestic and non-domestic buildings.

4.2 The product is effective in reducing the thermal transmittance (U value) of new or existing ground-floors.

4.3 Ground-supported concrete floors incorporating the product must include a suitable dpm laid in accordance with the relevant clauses of CP 102 : 1973, BS 8102 : 2009 and/or BS 8215 : 1991.

4.4 Suspended concrete floors incorporating the boards must include a dpm or suitable ventilation of the sub-floor as appropriate.

4.5 The overlay to the insulation should be:

- a vapour control layer (VCL) (see section 7.2)
- a cement-based floor screed laid in accordance with the relevant clauses of BS 8204-1 : 2003 and/or BS 8204-2 : 2003, or
- the floor finish: a wood-based floor, eg tongue-and-groove plywood to BS EN 636 : 2012, flooring grade particle board (types P5 to P7) to BS EN 312 : 2010 or oriented strand board (OSB) of type OSB/3 or OSB/4 to BS EN 300 : 2006, of a suitable thickness to be determined by a suitably qualified and experienced individual, installed in accordance with BS EN 12871 : 2013, or
- a concrete slab in accordance with BS EN 1992-1-1 : 2004.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Thermal performance

6.1 Calculations of the thermal transmittance (U value) of a floor construction should be carried out in accordance with BS EN ISO 6946 : 2007, BS EN ISO 13370 : 2007 and BRE Report BR 443 : 2006, using the declared thermal conductivity (λ_D)* as given in Table 2.

Table 2 Declared thermal conductivity (λ_D values)

Grade	Thermal conductivity* (W·m ⁻¹ ·K ⁻¹)
EPS 70	0.038
EPS 100	0.036
EPS 150	0.035
EPS 200	0.034
EPS Pearl (70 and 100)	0.031

6.2 The U value of a floor will depend on the thickness of the product, the perimeter/area ratio and the floor type. When considering insulation requirements, designers should refer to the detailed guidance contained in the documents supporting the national Building Regulations. The U value shown in Table 3 indicate that the product can contribute to a floor achieving typical design U values referred to in those supporting documents.

Table 3 Example Floor, U values ($W \cdot m^{-2} \cdot K^{-1}$)

Floor type	Insulation	Perimeter/area ratio	Insulation thickness (mm)			
			75	100	150	175
Slab ground supported	EPS 70	0.2	0.20	0.17	0.14	0.13
		0.4	—	0.22	0.17	0.15
		0.6	—	0.25	0.19	0.17
		0.8	—	—	0.20	0.17
		1.0	—	—	0.20	0.18
	EPS 100	0.2	0.19	0.17	0.13	0.12
		0.4	0.25	0.21	0.16	0.15
		0.6	—	0.24	0.18	0.16
		0.8	—	0.25	0.19	0.17
		1.0	—	—	0.19	0.17
	EPS 150	0.2	0.19	0.17	0.13	0.12
		0.4	0.25	0.21	0.16	0.14
		0.6	—	0.23	0.18	0.16
		0.8	—	0.25	0.18	0.16
		1.0	—	—	0.19	0.17
	EPS 200	0.2	0.19	0.16	0.13	0.12
		0.4	0.25	0.21	0.16	0.14
		0.6	—	0.23	0.17	0.15
		0.8	—	0.24	0.18	0.16
		1.0	—	0.25	0.18	0.16
EPS Pearl	0.2	0.18	0.16	0.13	0.11	
	0.4	0.23	0.19	0.15	0.13	
	0.6	—	0.21	0.16	0.14	
	0.8	—	0.23	0.17	0.15	
	1.0	—	0.24	0.17	0.15	
Suspended beam and-block	EPS 70	0.2	0.20	0.18	0.15	0.14
		0.4	0.25	0.22	0.18	0.16
		0.6	—	0.23	0.19	0.17
		0.8	—	0.24	0.19	0.17
		1.0	—	0.25	0.19	0.17
	EPS 100	0.2	0.20	0.17	0.15	0.13
		0.4	0.24	0.21	0.17	0.15
		0.6	—	0.23	0.18	0.16
		0.8	—	0.24	0.18	0.16
		1.0	—	0.24	0.19	0.17
	EPS 150	0.2	0.20	0.17	0.15	0.13
		0.4	0.24	0.21	0.17	0.15
		0.6	—	0.22	0.17	0.16
		0.8	—	0.23	0.18	0.16
		1.0	—	0.24	0.18	0.16
	EPS 200	0.2	0.19	0.17	0.14	0.13
		0.4	0.24	0.20	0.16	0.14
		0.6	—	0.22	0.17	0.15
		0.8	—	0.23	0.18	0.16
		1.0	—	0.23	0.18	0.16
EPS Pearl	0.2	0.20	0.17	0.13	0.12	
	0.4	0.24	0.20	0.15	0.14	
	0.6	—	0.21	0.16	0.14	
	0.8	—	0.22	0.16	0.14	
	1.0	—	0.23	0.17	0.15	

6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Condensation

Interstitial condensation

7.1 Floors will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011 Annex F. The product has a water vapour resistivity exceeding $100 \text{ MN} \cdot \text{s} \cdot \text{g}^{-1} \cdot \text{m}^{-1}$.

7.2 A VCL on the warm side of the insulation, or the dpm (acting as a VCL) situated (as appropriate) on the warm side may be required to limit the risk of interstitial condensation.

Surface condensation



7.3 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ 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.



7.4 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2011 Annex F and BRE Report BR 262 : 2002.

8 Behaviour in relation to fire

8.1 The products have a Class F* 'reaction to fire' classification in accordance with BS EN 13501-1 : 2007, but can also be supplied as Class E* when requested.

8.2 When properly installed, the product will not add significantly to any existing fire hazard. The product will be contained within the floor by the overlay until the overlay itself is destroyed, therefore, the product will not contribute to the development stages of a fire or present a smoke or toxic hazard.

8.3 Electrical cables running within the polystyrene should be separated from it by enclosing them within a suitable conduit, eg rigid PVC.

9 Floor loading

9.1 The Certificate holder has declared designation codes of CS(10)70* to CS(10)200* for the product depending on the grades in accordance with BS EN 13163 : 2013.



9.2 The products with a compressive strength of 70 kPa are suitable for domestic occupancies defined in this Certificate when covered with a suitable floor overlay (see section 4.3) and are capable of resisting a uniformly distributed load of $1.5 \text{ kN}\cdot\text{m}^{-2}$ or a concentrated load of 2 kN for category A1 and A2 (domestic) situations, as defined in BS EN 1991-1-1 : 2002 and National Annex Table NA.2, or BS 6399-1 : 1996, Table 1.

9.3 The products with grades higher than the 70 kPa are suitable for both domestic and non-domestic occupancies defined in this Certificate when covered with a suitable floor overlay (see section 4.3) and is capable of resisting a uniformly distributed load of $3 \text{ kN}\cdot\text{m}^{-2}$ for category B (offices) and $4 \text{ kN}\cdot\text{m}^{-2}$ for category C33 (non-domestic, or a concentrated load of 2.7 kN for category B (offices) and 4.5 kN for category C33 (non-domestic) as defined in BS EN 1991-1-1 : 2002 and National Annex Table NA.2, or BS 6399-1 : 1996 Table 1.) Further assessment is necessary in the case of duty walkways and floors subject to physical activities.

9.4 The ability of the floor construction to resist the loads in service should be confirmed by the flooring overlay specification. The performance of the floor construction will depend on the insulation properties and type of floor covering used (including thickness and strength). Further guidance on the suitability of floor coverings can be found in BS EN 13810-1 : 2002, DD CEN/TS 13810-2 : 2003, BS 8204-1 : 2003 and BS EN 312 : 2010 and from the flooring manufacturer.

10 Maintenance

As the product is confined within the floor by the overlay and has suitable durability (see section 11), maintenance is not required.

11 Durability



The product is rot-proof, dimensionally stable and when installed with the overlays specified in this Certificate, will remain effective for the life of the building in which it is incorporated.

Installation

12 General

12.1 Installation of Lite Pac Underfloor Insulation Boards must be in accordance with the Certificate holder's installation instructions and the requirements of this Certificate.

12.2 Typical methods are shown in Figures 1 to 7. Reference to the methods should also be made to BRE Report BR 262 : 2002.

Figure 1 Concrete screed overlay

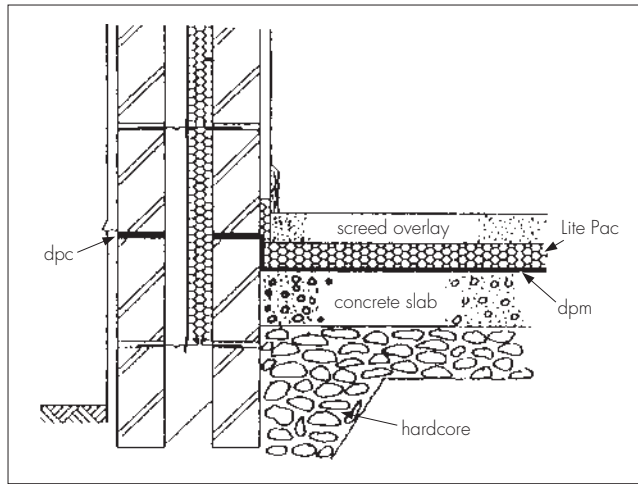


Figure 2 OSB overlay

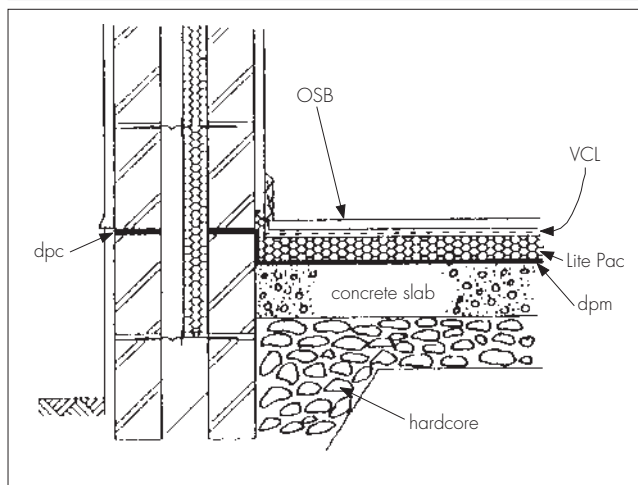


Figure 3 Concrete slab overlay

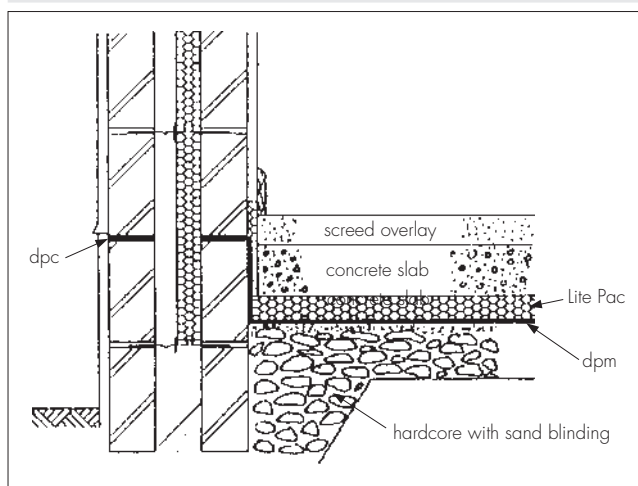


Figure 4 Concrete screed overlay on suspended concrete floor

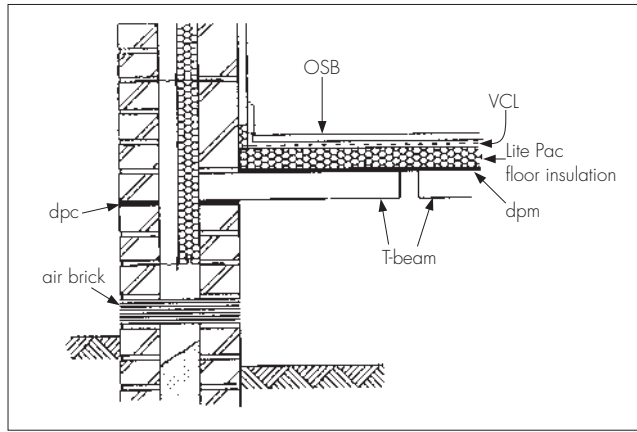


Figure 5 OSB overlay on suspended concrete floor

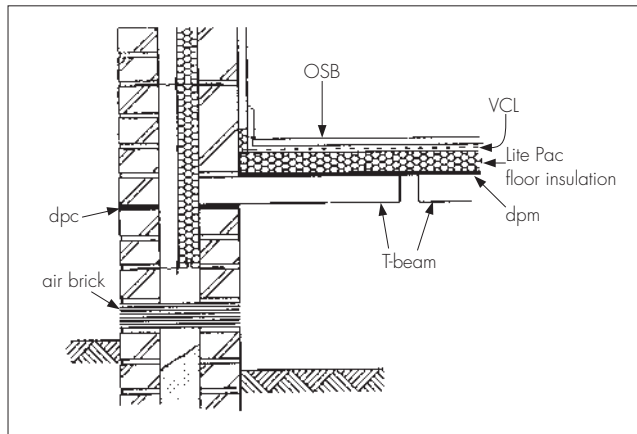


Figure 6 Partition detail with OSB overlay

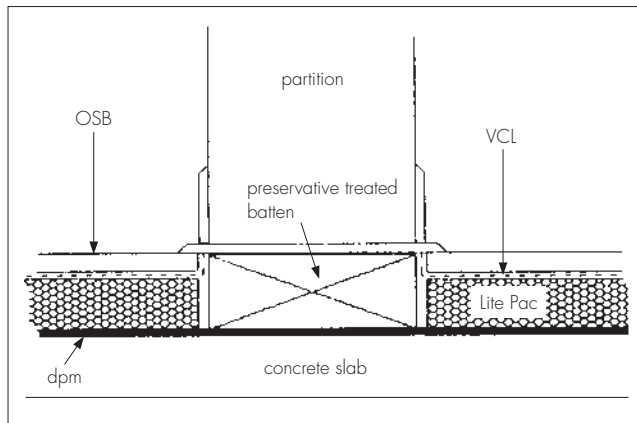
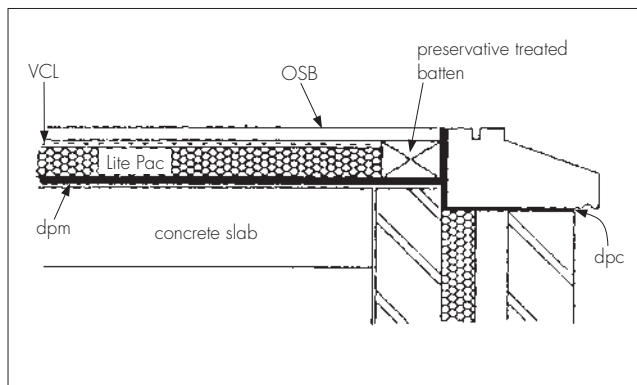


Figure 7 Threshold detail with OSB overlay



12.3 All concrete floor surfaces should be smooth, level and flat to within 5 mm when measured with a 2 m straight-edge. Minor irregularities (up to 10 mm deep) may be levelled with mortar or thin screed.

12.4 In ground-supported concrete floors, the concrete floor slab over which the product 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.

12.5 Where the product is used over ground-supported concrete floor slabs, a suitable dpm in accordance with CP 102 : 1973, Section 11 and BS 8204-1 : 2003 or BS 8204-2 : 2003 should be laid, to resist moisture from the ground. If a liquid-type dpm is applied to the slabs, it should be of a type compatible with the boards and be allowed to dry out fully prior to installation of the product.

12.6 Where the product is used on hardcore bases underground-supported concrete slabs, the hardcore must be compacted and blinded with a thin layer of sand before application of the dpm and product.

12.7 The product can be used on beam-and-block suspended concrete floors, that are 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 and general loading codes, that have been assessed as suitable.

12.8 Where a screed or concrete slab is laid over the product, vertical upstands of insulation should be provided and be of sufficient depth to fully separate the screed or slab from the wall and provide a minimum thermal resistance of $0.75 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$. Alternatively, a suitable partial fill cavity wall insulation material can be extended below the damp-proof course (dpc) level to provide edge insulation to the floor.

12.9 To limit the risk of damage from condensation and other sources of dampness, the product and overlays should only be laid after the construction is made substantially weathertight, eg after glazing. During construction the product must also be protected from water spillage, plaster droppings and traffic.

12.10 The product can be cut using a sharp knife or fine-toothed saw to fit around service penetrations.

13 Procedure

13.1 The product is cut to size, as necessary and laid with closely-butted, staggered cross-joints, ensuring that all spaces are completely filled.

13.2 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 product.

Timber-based board overlay

13.3 Before laying the particle board or OSB overlays, pre-treated timber battens, in accordance with BS 8417 : 2011, are positioned at doorways, access panels and to support partitions. Adequate time should be allowed for preservatives to be fixed and the solvents from solvent-based preservatives to evaporate.

13.4 The insulation product is laid on a dpm, a VCL of polyethylene sheet with a minimum thickness of 0.25 mm (1000 gauge), is laid between the insulation product and the overlay boards. The polyethylene sheet must have 150 mm overlaps taped at the joints and turned up 100 mm at the walls.

13.5 Tongue-and-groove with appropriate thickness plywood, particle board or timber floor covering must be laid with staggered cross-joints in accordance with BS EN 12871 : 2013.

13.6 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.

13.7 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.

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

13.9 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.

13.10 When the wedges are removed and before the skirting board is fixed, suitable compressible filler, eg foamed polyethylene, should be fitted around the perimeter of the floor between the overlay board and the walls.

13.11 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

13.12 Perimeter edge pieces are cut and placed around the edges and all floor joints taped, or a polythene VCL, minimum 0.125 mm thick, is laid over the boards with 150 mm laps. A properly-compacted screed of a minimum 65 mm or 75 mm thickness is then laid over. The relevant clauses of BS 8204-1 : 2003 or BS 8204-2 : 2003 should be followed and BRE Digest 224 : 1981 and BRE Digest 104 : 1973 should be consulted.

Concrete slab overlay (ground-bearing only)

13.13 Perimeter edge pieces are cut and placed around the edges and taped at joints. A VCL, minimum 0.125 mm thick, is laid over the product with 150 mm laps. The concrete slab is laid to the required thickness in accordance with BS 8000-9 : 2003 and BS 8204-1 : 2003.

14 Incorporation of services

14.1 De-rating of electrical cables should be considered where the insulation restricts air cooling of cables and the product must not be used in direct contact with electrical heating cables or hot water pipes.

14.2 Where the product is 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 and/or with the relevant current codes of practice.

14.3 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. With hot pipes the insulation must be cut back to maintain an air space.

14.4 Where water pipes are installed below the insulation they should be pre-lagged. Generally, insulation will be relatively thin so it would not be possible to install pipes within the insulation. Pipes installed above the insulation will not require lagging, although some provision needs to be made for expansion and contraction.

14.5 On board overlay 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. The duct should be as narrow as possible and not exceed 400 mm in width or the maximum particle board spans given in DD CEN/TS 12872 : 2007 and BS EN 12871 : 2013 without intermediate support. Services should be suitably fixed to the floor base and not to the insulation product.

Technical Investigations

15 Tests and investigations

15.1 As part of the assessment, the technical data from an independent laboratory was used for the Lite Pac Underfloor Insulation Boards to determine:

- density
- dimensional accuracy
- water vapour permeability
- water absorption
- compressive strength
- cross-breaking strength
- dimensional stability
- thermal conductivity (λ_D values)
- properties in relation to fire
- durability
- practicability of installation
- condensation risk analysis.

15.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and compositions of materials used.

Bibliography

- BS 5250 : 2011 *Code of practice for control of condensation in buildings*
- BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*
- BS 8000-9 : 2003 *Workmanship on building sites — Cementitious levelling screeds and wearing screeds - Code of practice*
- BS 8102 : 2009 *Code of practice for protection of below ground 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 cementitious 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 8417 : 2011 *Preservation of wood — Code of practice*
- BS EN 300 : 2006 *Oriented Strand Boards (OSB) — Definitions, classification and specifications*
- BS EN 312 : 2010 *Particleboards — Specifications*
- BS EN 636 : 2012 *Plywood — Specifications*
- BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
- BS EN 1992-1-1 : 2004 *Eurocode 2 : Design of concrete structures — General rules and rules for buildings*
- BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*
- BS EN 13163 : 2013 *Thermal insulation products for buildings — Factory made expanded polystyrene (EPS) products*
- BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*
- BS EN 13810-1 : 2002 *Wood-based panels — Floating floors — Performance specifications and requirements*
- BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- BS EN ISO 9001 : 2008 *Quality management systems — Requirements*
- BS EN ISO 13370 : 2007 *Thermal Performance of Buildings — Heat Transfer via the Ground - Calculation Methods*
- CP 102 : 1973 *Protection of Buildings Against Water from the Ground*
- BRE Digest 104 : 1973 *Floor screeds*
- BRE Digest 224 : 1981 *Cellular Plastics for Buildings. Floors*
- BRE Report (BR 262 : 2006) *Thermal insulation: avoiding risks*
- BRE Report (BR 443 : 2006) *Conventions for U-value calculations*
- BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*
- DD CEN/TS 12872 : 2007 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*
- DD/CEN/TS 13810-2 : 2003 *Wood-based panels — Floating floors — Test methods*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

16.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

16.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.