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Agrément Certificate

91/2568

Product Sheet 1

SPRINGVALE FLOORING INSULATION FOR CONCRETE GROUND FLOORS

SPRINGVALE FLOORSHIELD AND SPRINGVALE PLATINUM FLOORSHIELD INSULATION

This Agrément Certificate Product Sheet⁽¹⁾ relates to Springvale Floorshield and Springvale Platinum Floorshield Insulation, rigid expanded polystyrene (EPS) boards for use as thermal insulation in ground-bearing or suspended concrete ground 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 products have declared thermal conductivities (λ_D) of between 0.038 and 0.030 $W \cdot m^{-1} \cdot K^{-1}$ depending on the grade (see section 6).

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

Floor loading — the products, when installed in accordance with this Certificate, can support a design loading for domestic and non-domestic applications (see section 9).

Durability — the products are dimensionally stable and, when installed with the overlays specified, will remain effective as an insulating material for the life of the building in which they are incorporated (see section 12).



The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Eighth issue: 14 July 2020

Originally certificated on 4 January 1991

Certificate amended on 1 December 2021 to remove section 8.2.

Hardy Giesler
Chief Executive Officer

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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, Springvale Floorshield and Springvale Platinum Floorshield Insulation, if installed, used and maintained in accordance with this Certificate, can satisfy or 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 products can contribute to satisfying this Requirement. See sections 9.2 and 9.3 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The products can contribute to satisfying this Requirement. See sections 7.1 and 7.4 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The products can contribute to satisfying this Requirement. See sections 6.1 and 6.3 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The products are acceptable. See section 12 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 products can contribute to satisfying these Regulations. See sections 6.1 and 6.3 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:		The products have adequate strength and stiffness, 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 products 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 7.5 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products can contribute to satisfying clauses, or parts of, 6.1.2 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾ , 6.2.11 ⁽¹⁾ and 6.2.13 ⁽¹⁾⁽²⁾ of these Standards. See sections 6.1 and 6.3 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction satisfying a bronze level of sustainability as defined in this Standard. In addition, the products 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⁾ [Aspects 1⁽¹⁾⁽²⁾ and 2⁽¹⁾⁽²⁾], 7.1.6⁽¹⁾ [Aspects 1⁽¹⁾⁽²⁾ and 2⁽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 the products 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 12 and the <i>Installation</i> part of this Certificate.
Regulation:	29	Condensation
Comment:		The products can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	30	Stability
Comment:		The products have adequate strength and stability. 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 products can contribute to satisfying these Regulations. See sections 6.1 and 6.3 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.3) of this Certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, Springvale Floorshield and Springvale Platinum Floorshield Insulation, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 5.1 *Substructure and groundbearing floors* and 5.2 *Suspended ground floors*.

CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard BS EN 13163 : 2012.

Technical Specification

1 Description

1.1 Springvale Floorshield and Springvale Platinum Floorshield Insulation comprise EPS boards in accordance with BS EN 13163 : 2012.

1.2 The nominal dimensions of the products are given in Table 1.

Table 1 Nominal characteristics

Edge	Board sizes (mm)	Thickness* (mm)
Square-edged	1200 x 600 ⁽¹⁾	20+ ⁽¹⁾⁽²⁾
	2400 x 1200 ⁽¹⁾	

(1) Other sizes can be supplied to order, with higher thicknesses available to suit the requirements.

(2) In 5 mm increments.

2 Manufacture

2.1 The boards are manufactured from EPS beads using conventional moulding techniques.

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

- agreed with the 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 through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Springvale EPS Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM/13871) and BS EN ISO 14001 : 2015 by QMS (Certificate 14130944).

3 Delivery and site handling

3.1 The boards are delivered to site in packs wrapped in polyethylene. Each pack contains a label bearing the trade name, product description, board dimensions and quantity of boards, CE mark and the BBA logo incorporating the number of this Certificate.

3.2 The boards must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polyethylene; where possible, packs should be stored inside. If outside, the boards should be raised above ground level, away from ground moisture.

3.3 The products must not be exposed to open flame or other ignition sources, or to solvents or other chemicals.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Springvale Floorshield and Springvale Platinum Floorshield Insulation.

Design Considerations

4 Use

4.1 Springvale Floorshield and Springvale Platinum Floorshield Insulation are satisfactory for use as floor insulation and are effective in reducing the thermal transmittance (U value) of ground-bearing or suspended concrete ground floors in new and existing domestic and non-domestic buildings which have a cement-sand screed, particle board or concrete slab overlay (see section 4.5).

4.2 Ground bearing floors should only be used where the depth of compacted fill is less than 600 mm and is defined as non-shrinkable. Shrinkable fills are defined as material containing more than 35% fine particles (silt and clay) and having a plasticity index of 10% or greater (shrinkable fills are susceptible to clay heave).

4.3 Ground bearing concrete and suspended concrete ground-floors incorporating the products must include a suitable damp-proof membrane (DPM), laid in accordance with the relevant clauses of CP 102 : 1973, BS 8102 : 2009 and BS 8215 : 1991, or suitable ventilation of the sub floor as appropriate (see sections 14.5 and 14.7 of this Certificate).

4.4 Suspended concrete floors incorporating the products must include suitable ventilation of the sub-floor void (minimum 150 mm void between the underside of the floor and the ground surface) or a DPM.

4.5 The overlay to the insulation boards should be an air and vapour control layer (AVCL)⁽¹⁾, and one of the following:

- a cement-based floor screed, of minimum 65 mm thickness, laid in accordance with the relevant clauses of BS 8204-1 : 2003 and/or BS 8204-2 : 2003
- 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, and installed in accordance with PD CEN/TR 12872 : 2014 and BS EN 12871 : 2013
- a concrete slab⁽²⁾ to BS EN 1992-1-1 : 2004.

(1) An AVCL is a continuous layer of impermeable material of at least 0.125mm thick (500 gauge). When used with a DPM in a ground-bearing floor construction, the AVCL should be of equal vapour resistance to the DPM

(2) NHBC only accepts ground-bearing floor slabs with at least 100 mm thick concrete, including monolithic screed.

4.6 If present, mould or fungal growth should be treated prior to the application of the product.

4.7 Any gaps between insulation boards or around service openings, visible prior to installing the concrete, must be filled with expanding foam or strips of insulation.

4.8 In locations where clay heave is anticipated (on the basis of geotechnical investigation analysed by a competent person), an additional void of up to 150 mm may be required to accommodate the possible expansion of the ground below the floor. In such cases, a total void of up to 300 mm may be required.

4.9 The external/internal load bearing walls must not be placed on the insulation.

4.10 Where buildings need to comply with *NHBC Standards*, specifiers should observe the requirements of that document.

5 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced with these types of products.

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 : 2017, BS EN ISO 13370 : 2017 and BRE Report BR 443 : 2006, using the insulation's declared thermal conductivities (λ_D), as given in Table 2.

Table 2 Declared thermal conductivity (λ_D) values

EPS grade	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
EPS 70	0.038
EPS 70E	0.037
EPS 100/EPS 100E	0.035
EPS 150/EPS 150E	0.034
EPS 200/EPS 200E	0.033
EPS 300/EPS 300E	0.033
Platinum EPS 70/Platinum EPS 70E	0.030
Platinum EPS 100/Platinum EPS 100E	0.030
Platinum EPS 150/Platinum EPS 150E	0.030

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

Table 3 Example U values – ground floor construction

Floor type	EPS Grade	Target U value (W·m ⁻² ·K ⁻¹)	P/A ratio (m/m ²)				
			Insulation thickness (mm)				
			0.2	0.4	0.6	0.8	1.0
Ground-bearing concrete floor ⁽¹⁾	EPS 70 and EPS 70E	0.13	160	210	225	235	240
		0.15	125	170	190	200	205
		0.20	70	110	130	140	145
		0.22	50	95	115	125	130
		0.25	35	80	95	105	110
	EPS 100 and EPS 100E	0.13	150	200	210	220	225
		0.15	125	160	180	185	190
		0.20	60	105	120	130	135
		0.22	50	90	105	115	120
		0.25	30	70	85	95	100
	EPS 150 and EPS 150E	0.13	150	200	205	215	215
		0.15	120	155	175	180	185
		0.20	60	100	115	125	130
		0.22	45	85	100	110	115
		0.25	30	70	85	95	100
	EPS 200, EPS 200E, EPS 300 and EPS 300E	0.13	150	185	200	205	210
		0.15	105	150	165	175	180
		0.20	60	95	115	120	125
		0.22	45	85	100	110	115
		0.25	30	70	80	90	95
	Platinum EPS 70, Platinum EPS 70E, Platinum EPS 100, Platinum EPS 100E, Platinum EPS 150 and Platinum EPS 150E	0.13	130	165	180	190	190
		0.15	100	135	150	160	165
		0.20	55	90	105	110	115
		0.22	40	75	90	100	105
		0.25	25	60	75	80	85
Suspended concrete ground floor ⁽²⁾	EPS 70 and EPS 70E	0.13	190	220	235	245	245
		0.15	155	185	200	205	205
		0.20	95	125	135	145	145
		0.22	75	110	120	125	130
		0.25	55	90	100	105	110
	EPS 100 and EPS 100E	0.13	175	205	215	220	225
		0.15	145	170	185	185	190
		0.20	85	115	125	130	140
		0.22	70	100	110	115	120
		0.25	55	80	90	100	100
	EPS 150 and EPS 150E	0.13	170	200	210	215	220
		0.15	140	165	175	180	185
		0.20	85	110	120	130	130
		0.22	70	95	110	115	115
		0.25	50	80	90	95	100
	EPS 200, EPS 200E, EPS 300 and EPS 300E	0.13	165	195	200	210	215
		0.15	135	160	170	175	180
		0.20	80	110	120	125	130
		0.22	65	95	105	110	115
		0.25	50	75	85	95	95
	Platinum EPS 70, Platinum EPS 70E, Platinum EPS 100, Platinum EPS 100E, Platinum EPS 150 and Platinum EPS 150E	0.13	155	175	185	190	195
		0.15	120	145	155	160	165
		0.20	75	100	110	115	115
		0.22	60	85	95	100	100
		0.25	45	70	80	85	85

(1) Ground-bearing concrete floor construction (Springvale Floorshield on top of slab, below screed finish): 65 mm concrete screed $\lambda = 1.15 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, AVCL, Springvale Floorshield insulation, DPM, 100 mm concrete oversite, 150 mm sand blinding hardcore.

(2) Suspended concrete ground-floor construction (Springvale Floorshield on top of beam and block, below screed finish): 65mm concrete screed $\lambda = 1.15 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, AVCL, Springvale Floorshield insulation, beam-and-block floor (12%), beam $\lambda = 2.00 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, dense block infill $\lambda = 1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, ventilated void.

Junctions



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 risk

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 and the relevant guidance.

7.2 For the purposes of assessing the risk of interstitial condensation, the products have a water vapour resistivity exceeding $250 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$.

7.3 When the products are used above the DPM on a ground-bearing floor, or on a suspended concrete floor, an AVCL is installed on the warm side of the insulation to inhibit the risk of interstitial condensation.

Surface condensation



7.4 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 section 6.3.



7.5 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. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

8 Behaviour in relation to fire

The reaction to fire classifications of the products in accordance with BS EN 13501-1 : 2007 are as follows:

Table 4 Reaction to fire classification of the product

Product grades	Classification
EPS 70/EPS 100/EPS 150/ EPS 200/EPS 300/ Platinum EPS 70/Platinum EPS 100/ Platinum EPS 150	NPD
EPS 70E	E ⁽¹⁾
EPS 100E	E ⁽²⁾
EPS 150E	E ⁽³⁾
EPS 200E	E ⁽⁴⁾
EPS 300E	E ⁽⁵⁾
Platinum EPS 70E/ Platinum EPS 100E	E ⁽⁶⁾
Platinum EPS 150E	E ⁽⁷⁾

(1) Exova Warringtonfire. Report No: 420419 (Issue 2). 19 Nov 2019

(2) Exova Warringtonfire. Report No: 420420 (Issue 2). 19 Nov 2019.

(3) Exova Warringtonfire. Report No: 420421 (Issue 2). 19 Nov 2019

(4) Exova Warringtonfire. Report No: 420422 (Issue 2). 19 Nov 2019

(5) Exova Warringtonfire. Report No: 420423 (Issue 2). 19 Nov 2019

(6) Exova Warringtonfire. Report No: 427169 (Issue 1). 31 Mar 2020

(7) Exova Warringtonfire. Report No: 366329 (Issue 2). 23 May 2016

9 Floor loading

9.1 The compressive strengths of the products at 10% deformation to BS EN 826 : 2013 are as follows:

Table 5 Compressive strengths of the product

Product grades	Compressive strength (kPa)
EPS 70/EPS 70E/Platinum EPS 70/Platinum EPS 70E	70
EPS 100/EPS 100E/Platinum EPS 100/Platinum EPS 100E	100
EPS 150/EPS 150E/Platinum EPS 150/Platinum EPS 150E	150
EPS 200/EPS 200E	200
EPS 300/EPS 300E	300



9.2 The products are suitable for the domestic and non-domestic occupancies defined in this Certificate when covered with a suitable floor overlay (see section 4.5). They are capable of resisting a uniformly distributed load of

- 1.5 kN·m⁻² for category A1 and A2 (domestic)
- 3 kN·m⁻² for category B (offices), and
- 4 kN·m⁻² for category C33 (non-domestic)

or a concentrated load of

- 2 kN for category A1 and A2 (domestic)
- 2.7 kN for category B (offices), and
- 4.5 kN for category C33 (non-domestic) situations

as defined in BS EN 1991-1-1 : 2002 and Table NA.2 of its UK National Annex. Further assessment is necessary in the case of duty walkways and floors subject to physical activities. Higher loadings may be achieved when the product is used below a suitably designed suspended structural concrete slab (see section 9.3)

9.3 With a 65 mm sand/cement screed overlay and fully supported by a concrete slab designed to resist the applied loading, the products are acceptable for use within areas with the maximum characteristic loads as shown in Table 6. The load must not exceed the compressive strength of the product at 1% strain. Where the loads exceed the maximum concentrated load values in Table 6, they must be resisted by a suspended structural concrete slab, designed by an appropriately competent and experienced engineer, to ensure that any stress transferred down into the EPS remains below the compressive strength at 1% strain value shown in Table 6.

Table 6 Maximum characteristic load

EPS grade	Maximum load defined by compressive strength at 1% strain (kN·m ⁻²)	Maximum concentrated load (kN) ⁽¹⁾
EPS 70/EPS 70E	25	5
EPS 100/EPS 100E	48	6.5
EPS 150/EPS 150E	70	6.5
EPS 200/EPS 200E	93	6.5
EPS 300/EPS 300E	150	6.5

(1) Maximum concentrated load (kN) for 65 mm screed only

9.4 The performance of the floor construction will depend on the insulation properties and type of floor overlay used (including thickness and strength). Where the products are used under a concrete slab, resistance to concentrated and distributed loads is a function of the slab specification. Further guidance on the suitability of floor overlays 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 Material in contact – wiring installation

10.1 Electrical cables that are likely to come into contact with the insulation must be protected with a suitable conduit or PVC-U trunking.

10.2 As with other forms of insulation, de-rating of electricity cables should be considered where the insulation restricts the air cooling of cables.

11 Maintenance

As the products are confined within the floor by the overlay and have suitable durability (see section 12), maintenance is not required.

12 Durability



The products are 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.

13 Reuse and recyclability

The products are made from EPS, which is fully recyclable.

Installation

14 General

14.1 Installation of Springvale Floorshield and Springvale Platinum Floorshield Insulation must be in accordance with the Certificate holder's installation instructions and the requirements of this Certificate.

14.2 Typical methods of installation of Springvale Floorshield and Springvale Platinum Floorshield Flooring Insulation are shown in Figures 1 to 7. Reference should be made to BRE Report BR 262 : 2002.

Figure 1 Typical installation details – screed overlay (DPM under concrete slab)

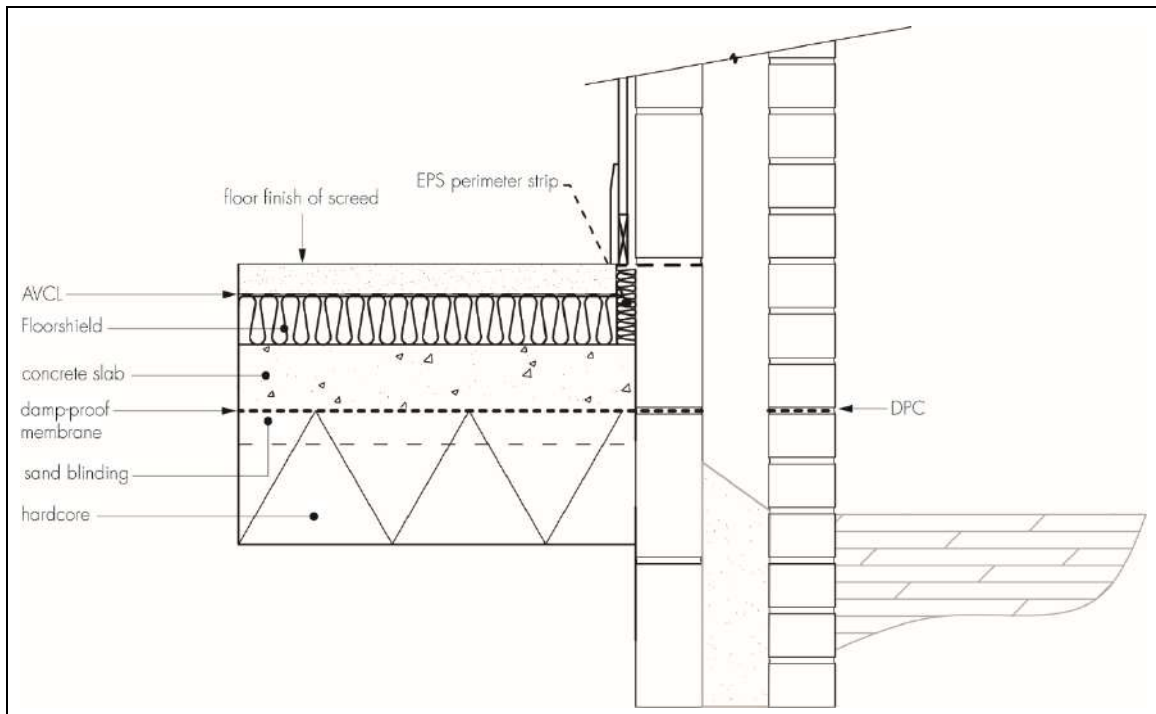
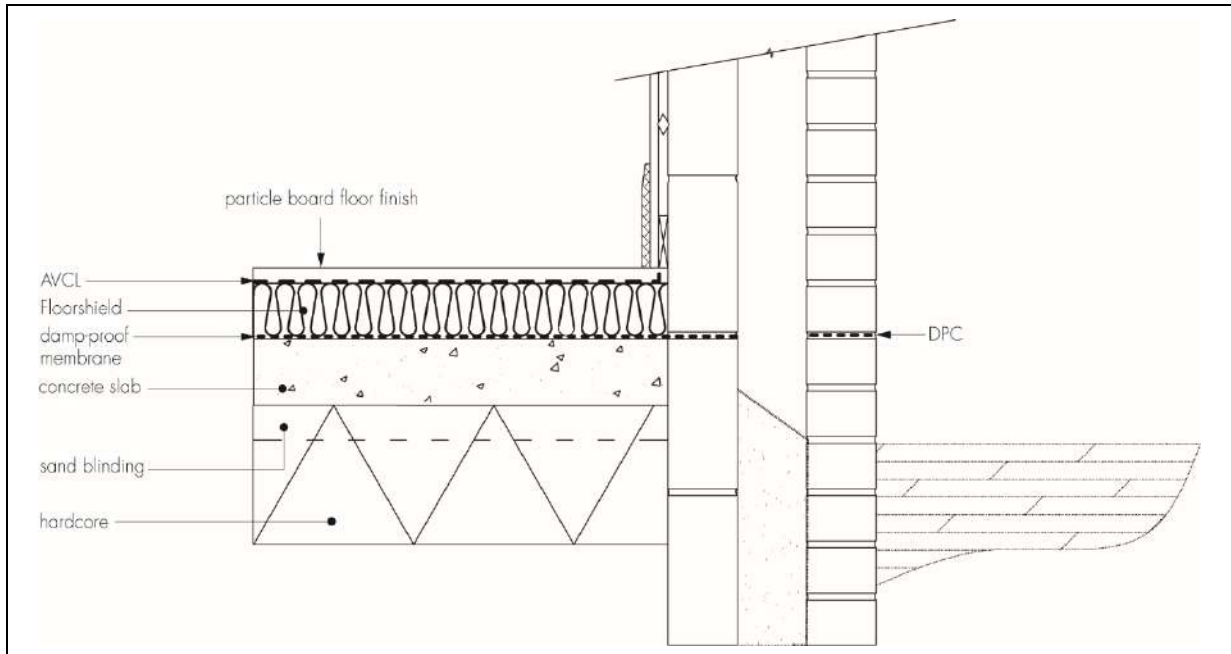


Figure 2 Typical installation details – particle board (DPM over concrete slab)



14.3 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.

14.4 In ground-supported concrete floors (see Figures 1 to 4), 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 : 2017, section 3.1.2.

14.5 Additionally, where the insulation is used over ground-bearing concrete floor slabs, a suitable DPM in accordance with CP 102 : 1973 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 EPS and allowed to dry out fully before laying the insulation.

14.6 Where required, a suitable radon barrier should be installed. Such a barrier must hold a current BBA Certificate and must be installed in accordance with, and within the limitations imposed by, that Certificate.

Figure 3 Typical installation details – particle board (DPM under concrete slab)

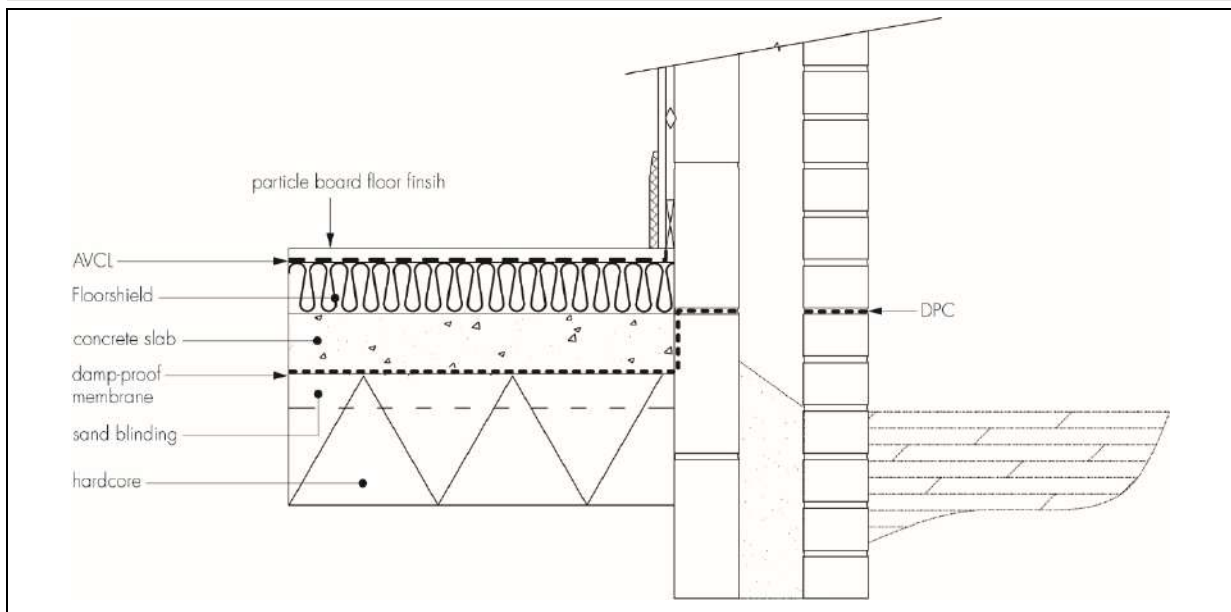
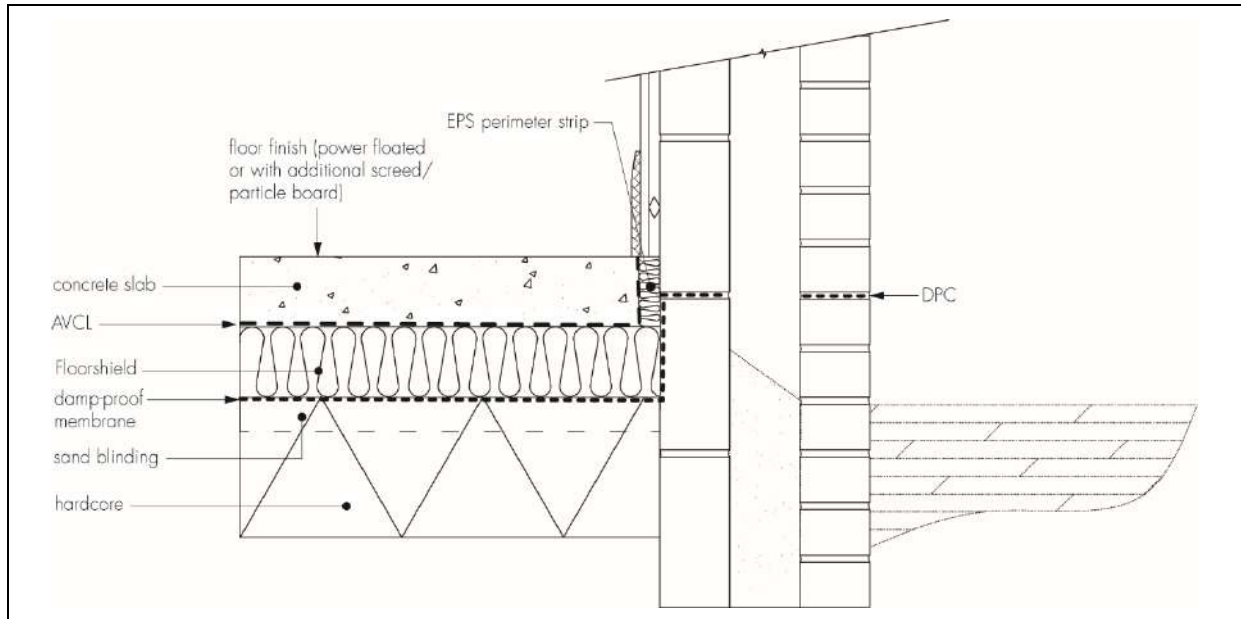


Figure 4 Typical installation details — under concrete slab (DPM under insulation)



14.7 Where the insulation is used on hardcore bases beneath ground-supported concrete slabs, the hardcore must be compacted and blinded with a thin layer of sand before application of the DPM, followed by the insulation boards.

14.8 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 applicable, a suitable cavity or external wall insulation material should be extended below the dpc level to provide edge insulation to the floor.

14.9 An AVCL is installed on the warm side of the insulation to inhibit the risk of interstitial condensation (see section 7.3).

14.10 The insulation can be used on suitable beam-and-block suspended concrete floors, designed and installed to the precast concrete and general loading codes.

14.11 To limit the risk of damage from condensation and other sources of dampness, the insulation and overlay should only be laid after the construction is made substantially weathertight, eg after glazing. During construction, the insulation and overlay must be protected from damage by traffic and moisture sources such as water spillage and plaster droppings.

14.12 To fit around service penetrations, the boards can be cut using a sharp knife or fine-toothed saw.

Figure 5 Typical installation details — suspended concrete ground floor with DPM and AVCL

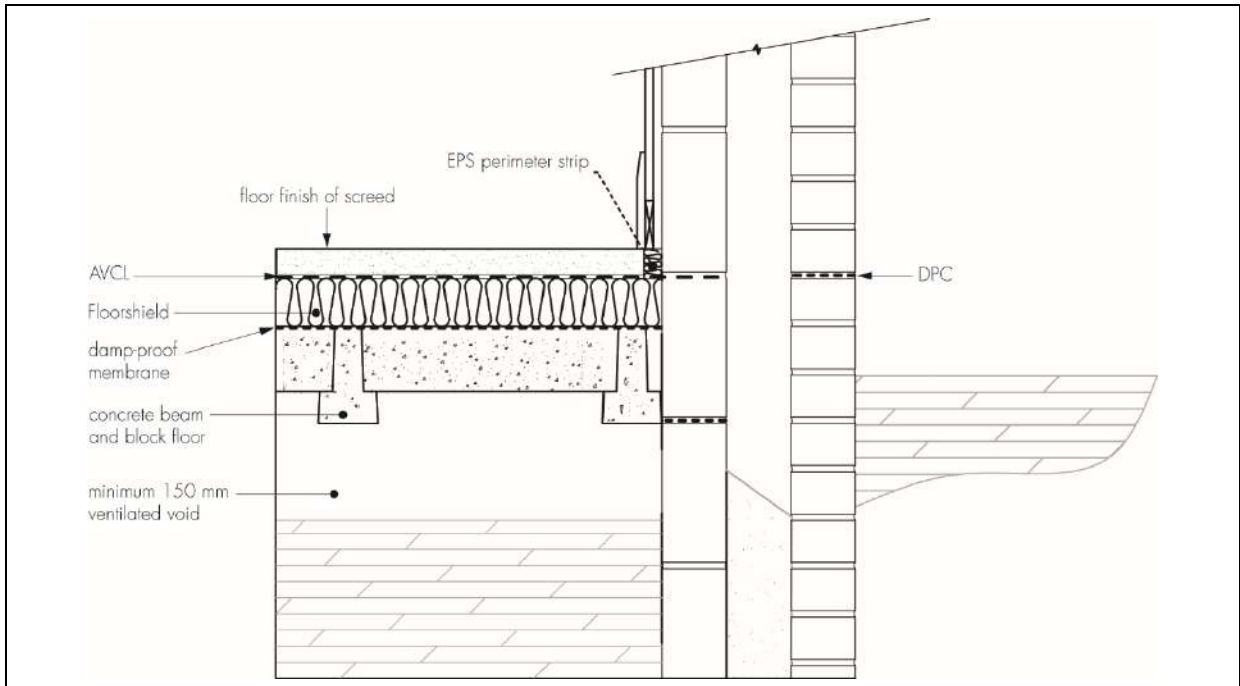


Figure 6 Typical installation details — suspended concrete ground floor with AVCL only (screed finish)

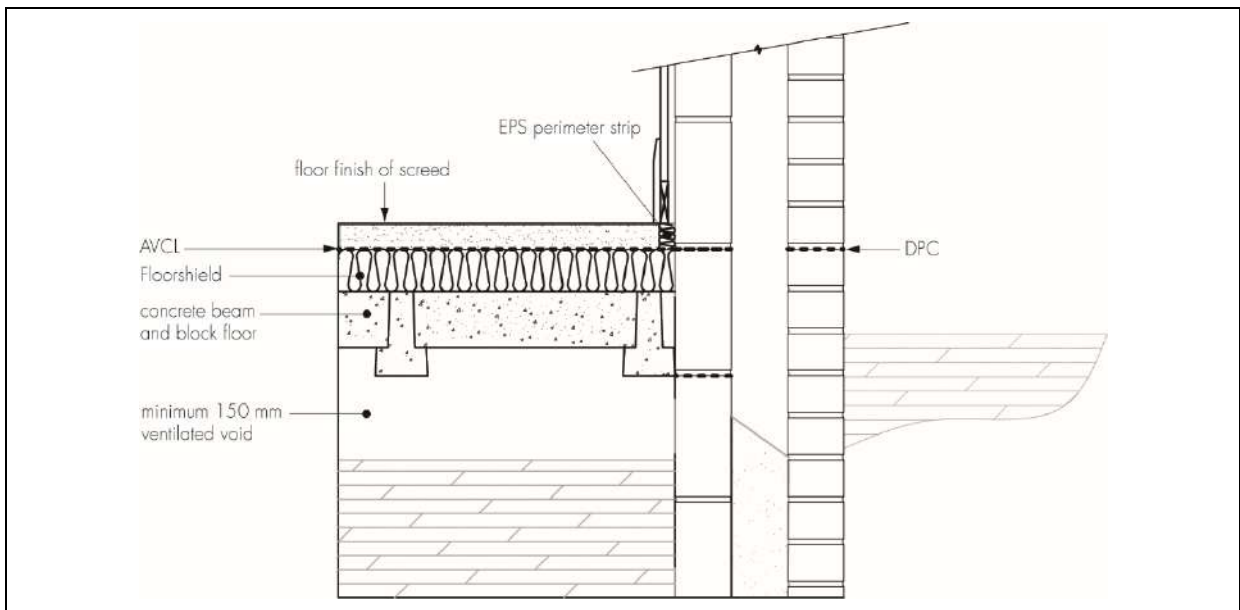
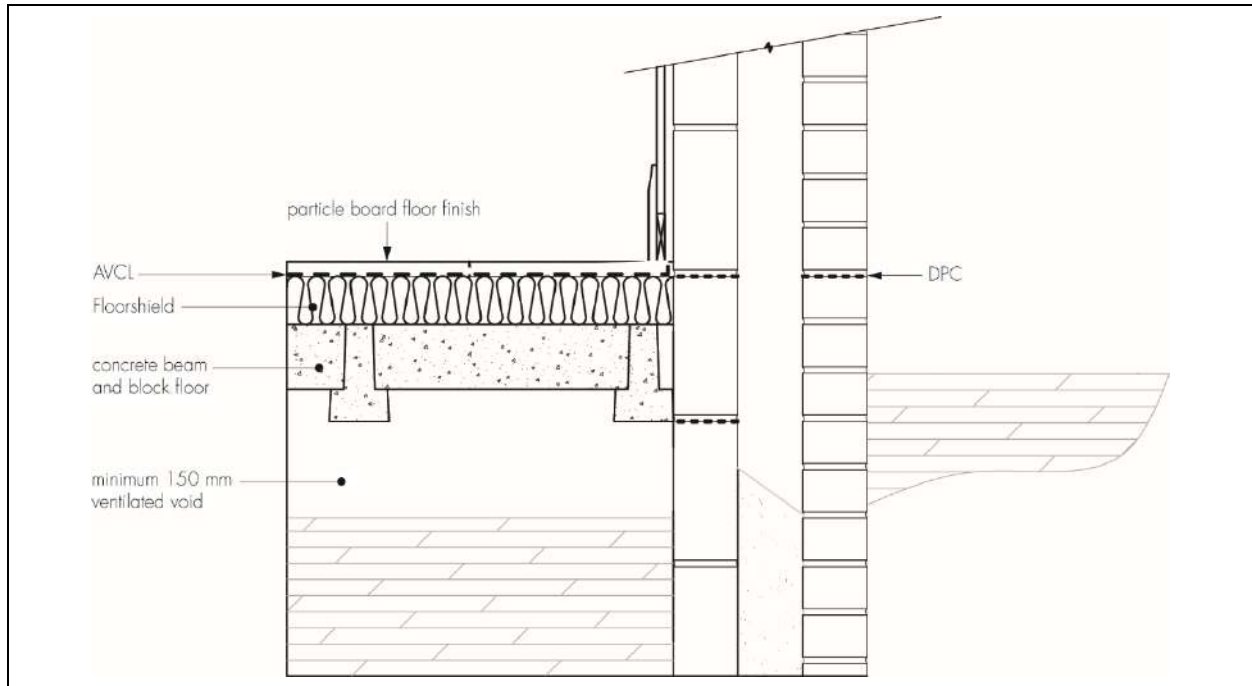


Figure 7 Typical installation details — suspended concrete ground floor with AVCL only (particle board finish)



15 Procedure

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

15.2 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 products.

Plywood, particle board or OSB overlay

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

15.4 Tongue-and-groove 18 mm thick (minimum) plywood, particle board (type P4 to P7) or OSB/2 to OSB/4 is laid with staggered cross-joints in accordance with PD CEN/TR 12872 : 2014.

15.5 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 greater.

15.6 Where there are long, uninterrupted lengths of floor (such as corridors), proprietary expansion joints should be installed at intervals on the basis of a 2 mm gap per metre run of overlay board.

15.7 Before the overlay boards are interlocked, either a PVA or panel adhesive is applied to the joints.

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

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

15.10 Where there is a likelihood of regular water spillage in rooms (eg in 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-sand screed overlay

15.11 Perimeter edge insulation is placed around the edges and an AVCL, at least 0.125 mm thick (500 gauge), is laid over the insulation. The AVCL must have minimum 150 mm overlaps, taped at the joints and turned up a minimum 100 mm at the walls. A properly compacted screed of at least 65 mm is laid. The relevant clauses of BS 8204-1 : 2003 should be followed.

Concrete slab overlay (ground-bearing only)

15.12 Perimeter edge pieces are cut and placed around the edges and an AVCL, at least 0.125 mm thick (500 gauge), is laid over the insulation. The AVCL must have 150 mm overlaps, taped at the joints and turned up 100 mm at the walls. The concrete slab is laid to the required thickness in accordance with BS 8000-9 : 2003 and BS 8204-1 : 2003.

Suspended concrete floor

15.13 When the products are being laid on a suspended floor of concrete beams with block infill, they should be laid as detailed for cement-sand screed or particle board overlay.

16 Incorporation of services

16.1 De-rating of electrical cables should be considered where the insulation restricts air cooling of cables. The products must not be used in direct contact with electrical heating cables or hot water pipes. Where underfloor heating systems are to be used, the advice of the Certificate holder should be sought.

16.2 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 due to the risk of damage to the PVC covering through plasticiser migration when in direct contact with polystyrene. With hot pipes, the insulation must be cut back to maintain an air space.

16.3 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.

16.4 Where the products are installed on a floor of a suspended beam-and-block design, all services must be installed in accordance with the BBA Certificate for that floor and/or with the relevant codes of practice.

16.5 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. The duct should be as narrow as possible, not exceeding 400 mm in width or the maximum particle board spans given in PD CEN/TR 12872 : 2014 without intermediate support. Services should be suitably fixed to the floor base and not to the insulation boards.

Technical Investigations

17 Tests

Tests were carried out to determine:

- compressive strength at 10% compression
- density
- dimensional accuracy
- moisture vapour transmission
- dimensional stability at 80°C
- thermal conductivity at 10°C
- cross-breaking strength failure
- maximum water vapour permeability at 38°C
- extent of burn.

18 Investigations

18.1 Existing data relating to the risk of interstitial condensation were examined.

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

Bibliography

- BRE Report BR 262 : 2002 *Thermal insulation : avoiding risk*
- BRE Report BR 443 : 2006 *Conventions for U-value calculations*
- BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*
- 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 : 2017 *Code of practice for installation of resilient floor coverings*
- BS 8204-1 : 2003 + A1 2009 *Screeds, bases and in situ floorings — Concrete bases and cementitious levelling screeds to receive floorings — Code of practice*
- BS 8204-2 : 2003 + A2 : 2011 *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 + A1 : 2014 *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 826 : 2013 *Thermal insulating products for building applications — Determination of compression behaviour*
- BS EN 1991-1-1 : 2002 *Eurocode 1 — Actions on structures — General actions*
- NA to BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 — Actions on structures — General actions*
- 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 : 2012 +A2 : 2016 *Thermal insulation products for buildings — Factory made expanded polystyrene (EPS) products — Specification*
- BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- BS EN 13810-1 : 2002 *Wood-based panels — Floating floors — Performance specifications and requirements*
- BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation methods*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- BS EN ISO 13370 : 2017 *Thermal performance of buildings — Heat transfer via the ground. Calculation methods*
- BS EN ISO 14001 : 2015 *Environmental management systems. Requirements with guidance for use*
- CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*
- DD CEN/TS 13810-2 : 2003 *Wood-based panels — Floating floors — Test methods*
- PD CEN/TR 12872 : 2014 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

19 Conditions

19.1 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.

19.2 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.

19.3 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.

19.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

19.5 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.

19.6 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.