

## Dow Chemical Company Limited

Diamond House  
Lotus Park  
Kingsbury Crescent  
Staines  
Middlesex TW18 3AG

Tel: 08707 104 553 Fax: 020 3139 4013

E-mail: fkltech@dow.com

Website: www.styrofoam.co.uk



**Agrément Certificate**

**13/5060**

Product Sheet 1

### DOW CHEMICAL INSULATION

### FLOORMATE 300-A FLOOR INSULATION

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Floormate 300-A Floor Insulation, an extruded polystyrene board for use as thermal insulation of ground-supported or suspended concrete floors, in new and existing domestic or similar 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 has a declared thermal conductivity ( $\lambda_D$ ) of  $0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  for board thicknesses ranging from 100 to 120 mm, and  $0.036 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  for thicknesses greater than 120 mm (see section 6).

**Condensation risk** — 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 for domestic applications (see section 9).

**Behaviour in relation to fire** — the product has a reaction to fire classification of Class E to BS EN 13501-1 : 2007 (see section 8).

**Durability** — the product will have a life equivalent to that of the floor structure 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

Date of Second issue: 25 May 2017

John Albon – Head of Approvals  
Construction Products

Originally certificated on 23 October 2013

Claire Curtis-Thomas  
Chief Executive

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](http://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.

#### British Board of Agrément

Bucknalls Lane  
Watford  
Herts WD25 9BA

tel: 01923 665300

fax: 01923 665301

[clientservices@bbacerts.co.uk](mailto:clientservices@bbacerts.co.uk)

[www.bbacerts.co.uk](http://www.bbacerts.co.uk)

©2017

## Regulations

In the opinion of the BBA, Floormate 300-A Floor 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)

<b>Requirement:</b>	<b>A1</b>	<b>Loading</b>
Comment:		The product can contribute to satisfying this Requirement. See section 9.2 of this Certificate.
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:		The product can contribute to satisfying this Requirement. See sections 7.1 and 7.5 of this Certificate.
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
Comment:		The product can contribute to satisfying this Requirement. See sections 6.1 and 6.3 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship</b>
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy consumption rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
Comment:		The product can contribute to satisfying these Regulations. See section 6 of this Certificate.



### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	1.1(b)	Structure
Comment:		The product can contribute to satisfying this Standard, with reference to clause 1.1.1 <sup>(1)(2)</sup> . See section 9.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See sections 7.1 and 7.6 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 part of, 6.1.1 <sup>(1)</sup> , 6.1.6 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)(2)</sup> , 6.2.4 <sup>(1)(2)</sup> , 6.2.5 <sup>(1)(2)</sup> , 6.2.6 <sup>(1)(2)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)</sup> , 6.2.11 <sup>(1)(2)</sup> , 6.2.12 <sup>(2)</sup> and 6.2.13 <sup>(1)(2)</sup> . 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<sup>(1)(2)</sup> [Aspects 1<sup>(1)(2)</sup> and 2<sup>(1)</sup>], 7.1.6<sup>(1)</sup> [Aspects 1<sup>(1)(2)</sup> and 2<sup>(1)</sup>] and 7.1.7<sup>(1)(2)</sup> [Aspect 1<sup>(1)(2)</sup>]. See section 6.1 of this Certificate.

<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)</sup> and Schedule 6 <sup>(1)(2)</sup> .
		(1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

<b>Regulation:</b>	<b>23</b>	<b>Fitness of materials and workmanship</b>
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
Comment:		The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
<b>Regulation:</b>	<b>30</b>	<b>Stability</b>
Comment:		The product can contribute to satisfying this Regulation. See section 9.2 of this Certificate.
<b>Regulation::</b>	<b>39(a)(i)</b>	<b>Conservation measures</b>
<b>Regulation:</b>	<b>40(2)</b>	<b>Target carbon dioxide emission rate</b>
Comment:		The product can contribute to a building satisfying these Regulations. See section 6 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 2017

NHBC accepts the use of Floormate 300-A Floor Insulation provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 5.1 *Substructure and ground bearing floors* and 5.2 *Suspended ground floors*.

### CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13164 : 2012. An asterisk (\*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

## Technical Specification

### 1 Description

Floormate 300-A Floor Insulation consists of rigid, extruded polystyrene boards, in accordance with BS EN 13164 : 2012, and with the characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Value
Minimum density (kg·m <sup>-3</sup> )	33
Compressive strength* (kPa)	> 300
Length and width (mm)	2500 x 600
Thickness* (mm)	100, 125, 150 and 200
Flatness (mm/m)	< 6
Edge profile	Butt edge
Colour	Blue

## 2 Manufacture

2.1 The product is manufactured on a continuous automated production line. Raw materials are transferred from storage silos and fed into individual weigh-hoppers in which the prescribed raw material quantities are automatically check-weighed. Ingredients are mixed/transferred in a horizontal screw conveyor to the extruder. A plastic melt is formed in the extruder into which a blowing agent is injected. The melt is extruded through a die to form a continuous board.

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 Dow Chemical Company Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI Quality Management Systems, and BS EN ISO 14001 :2004 by BSI Environmental Management Systems (Certificates Q05968 and EMS547690 respectively).

## 3 Delivery and site handling

3.1 The product is delivered to site in polythene shrink-wrapped packs incorporating a label with the manufacturer's trade name, product description and characteristics, and the BBA logo incorporating the number of this Certificate.

3.2 The product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polythene. Where possible, packs should be stored inside. If outside, the boards should be raised above ground level, and not be in contact with ground moisture.

3.3 The product 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 Floormate 300-A Floor Insulation.

## Design Considerations

## 4 Use

4.1 Floormate 300-A Floor Insulation is effective in reducing the thermal transmittance (U value) of ground bearing or suspended concrete ground floors in new or existing domestic or similar buildings.

4.2 The product can be used both on suitable beam-and-block floors incorporating concrete infill blocks and suspended concrete floors (see Figure 3) covered by a current BBA Certificate and installed in accordance with, and within the limitations imposed by, that Certificate or designed and installed to the precast and general loading codes and assessed as suitable.

4.3 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).

4.4 Ground-supported concrete and suspended concrete ground floors incorporating the insulation 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. Suspended concrete ground floors incorporating the insulation boards must include suitable ventilation of the sub-floor void or a dpm.

4.5 The overlay to the insulation boards should be one of the following:

- a vapour control layer (VCL) (see section 7.2)
- a cement-based floor screed, of minimum 65<sup>(1)</sup> mm thickness, laid in accordance with the relevant clauses of BS 8204-1 : 2003 and/or BS 8204-2 : 2003, and BS 8000-9 : 2003
- a wood-based floor, eg tongue-and-groove plywood to BS EN 636 : 2012, flooring grade particle board (Types P4 or P7) to BS EN 312 : 2010 or oriented strand board 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 DD CEN/TS 12872 : 2007 and BS EN 12871 : 2010
- a concrete slab in accordance with BS EN 1992-1-1 : 2004.

(1) NHBC only accept ground bearing floor slabs with at least 100 mm thick concrete, including any monolithic screed.

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

4.7 A void of at least 150 mm deep for the system must be provided between the underside of the floor and the ground surface (for suspended floors).

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.

## 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 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 ( $\lambda_D$  value) as given in Table 2.

Table 2 Declared thermal conductivity ( $\lambda_D$  values)

Thickness (mm)	Thermal conductivity* ( $W \cdot m^{-1} \cdot K^{-1}$ )
100	0.034
150 and 200	0.036

6.2 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)(2)</sup>

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

(1) Constructions and boundary conditions are in accordance with BRE Report BR 443 : 2006, Chapters 9.1 and 9.2.

(2) Where a construction is used with the dpm above the insulation on a slab on the ground, a moisture correction factor should be considered for the thermal conductivity used, in accordance with BS EN ISO 10456 : 2007.

## 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 When the product is used above the dpm on a ground-supported floor or on a suspended concrete floor, a VCL is installed on the warm side of the insulation to inhibit the risk of interstitial condensation, unless a risk assessment shows this is not necessary.

7.3 For suspended ground floors, it is not necessary to introduce a VCL as long as adequate sub-floor cross ventilation is provided.

7.4 For the purposes of assessing the risk of interstitial condensation, the product's water vapour resistivity value may be taken as  $750 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$ .

### Surface condensation



7.5 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 of this Certificate.



7.6 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

8.1 The product has a Class E reaction to fire classification\* in accordance with BS EN 13501-1 : 2007.

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 the fire or present a smoke or toxic hazard.

## 9 Floor loading

9.1 The compressive strength\* of the product (compressive stress at 10% deformation to BS EN 826 : 2013) is declared as >300 kPa.



9.2 The product is suitable for domestic occupancies defined in this Certificate when covered with a suitable floor overlay (see section 4.5), and is 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, National Annex Table NA.2. Further assessment is necessary in the case of duty walkways and floors subject to physical activities.

9.3 The performance of the floor construction will depend on the insulation properties and type of floor covering used (including thickness and strength). When the product is 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 component of the thermal liner are required to be protected by a suitable conduit or PVC-U trunking.

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

## 11 Maintenance

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

## 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 it is incorporated.

## Installation

### 13 General

13.1 Installation of Floormate 300-A Floor Insulation must be in accordance with the Certificate holder's installation instructions and the requirements of this Certificate.

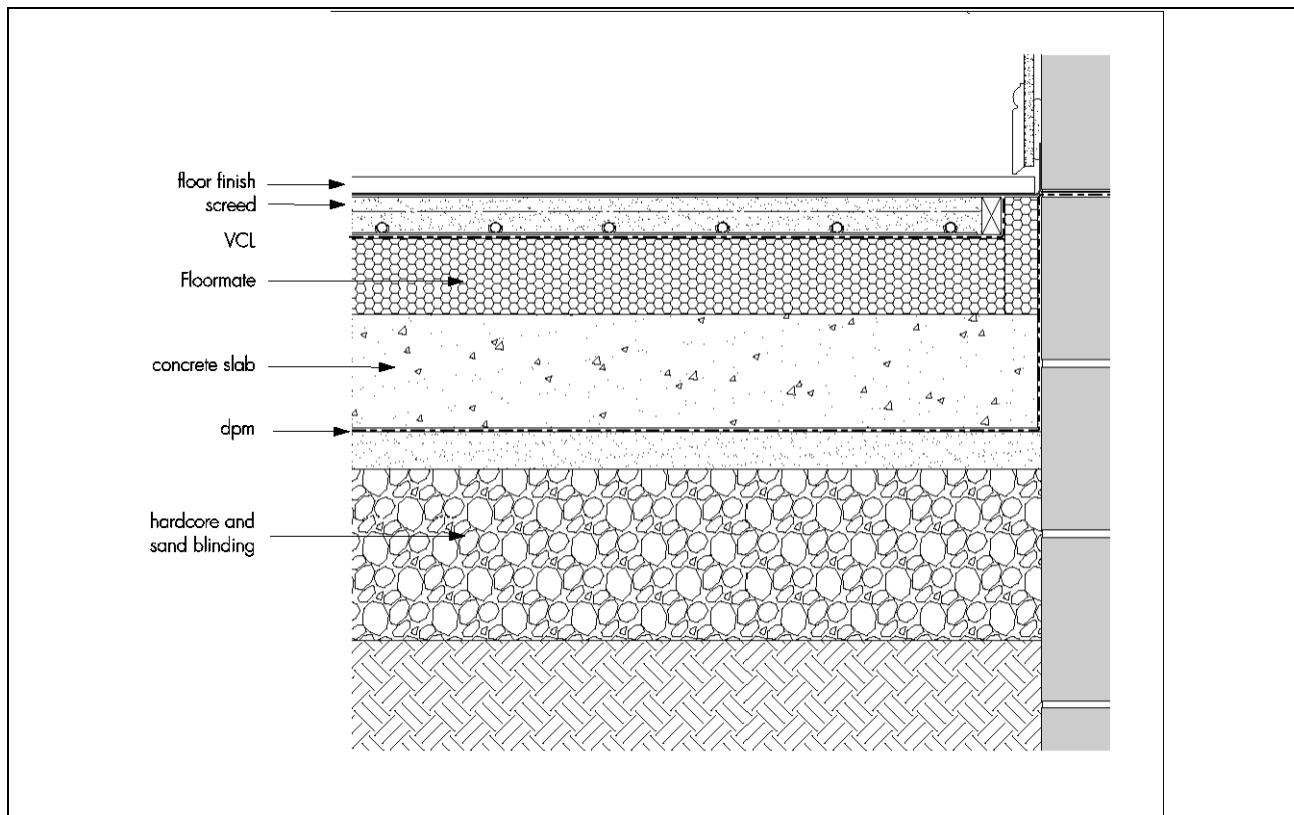
13.2 Typical methods of installation are shown in Figures 1 to 3. Reference should also be made to BRE Report BR 262 : 2002.

13.3 All concrete floor surfaces should be smooth, level and flat to within 5 mm when measured with a 2-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, the concrete floor slab over which the product is to be 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.

13.5 Where the insulation is used over ground-supported concrete floor slabs (see Figure 1), 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 type compatible with the insulation product and be allowed to dry out fully before laying the insulation.

Figure 1 Floormate above ground-supported concrete slab



13.6 Where required, a suitable radon barrier should be installed under the insulation. Such a barrier should be the subject of a current BBA Certificate and must be installed in accordance with, and within the limitations imposed by, that Certificate.

13.7 Where the insulation is used on hardcore bases, beneath ground-supported concrete slabs (see Figure 2), the hardcore must be compacted and blinded with a thin layer of sand before application of the dpm, followed by the insulation boards.



Figure 2 Floormate beneath ground-supported concrete slab

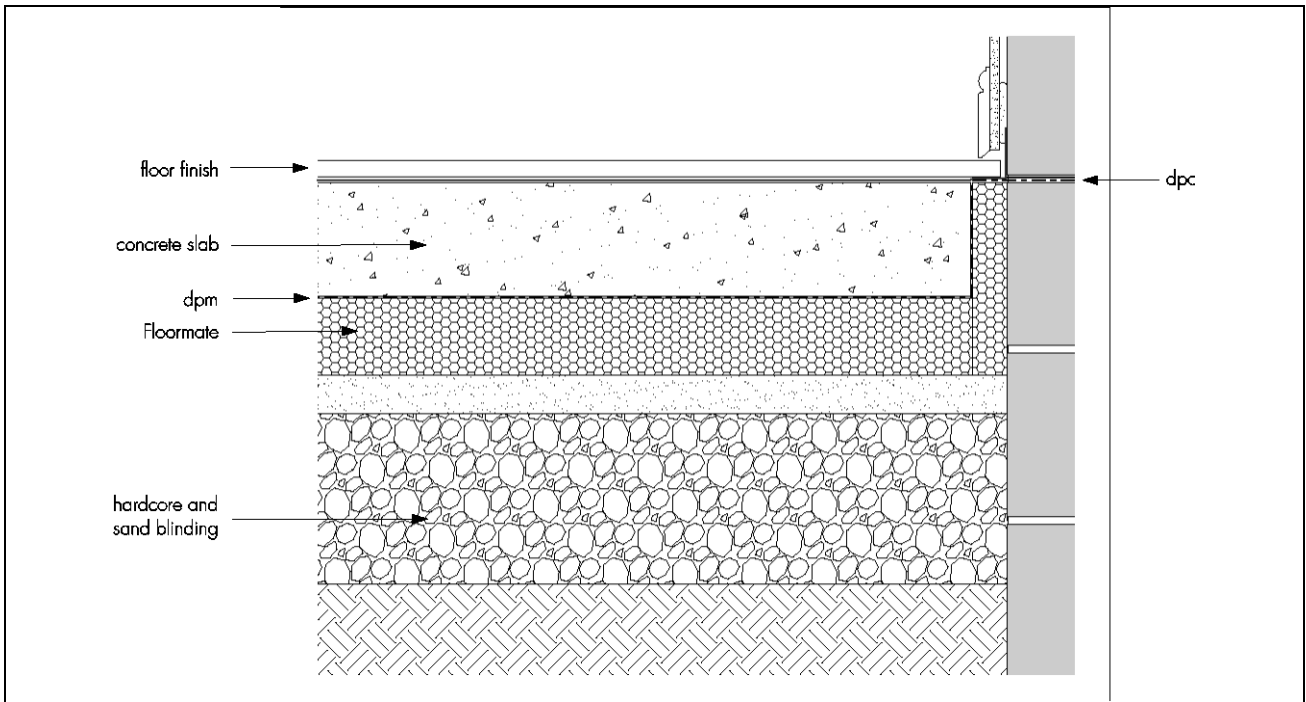
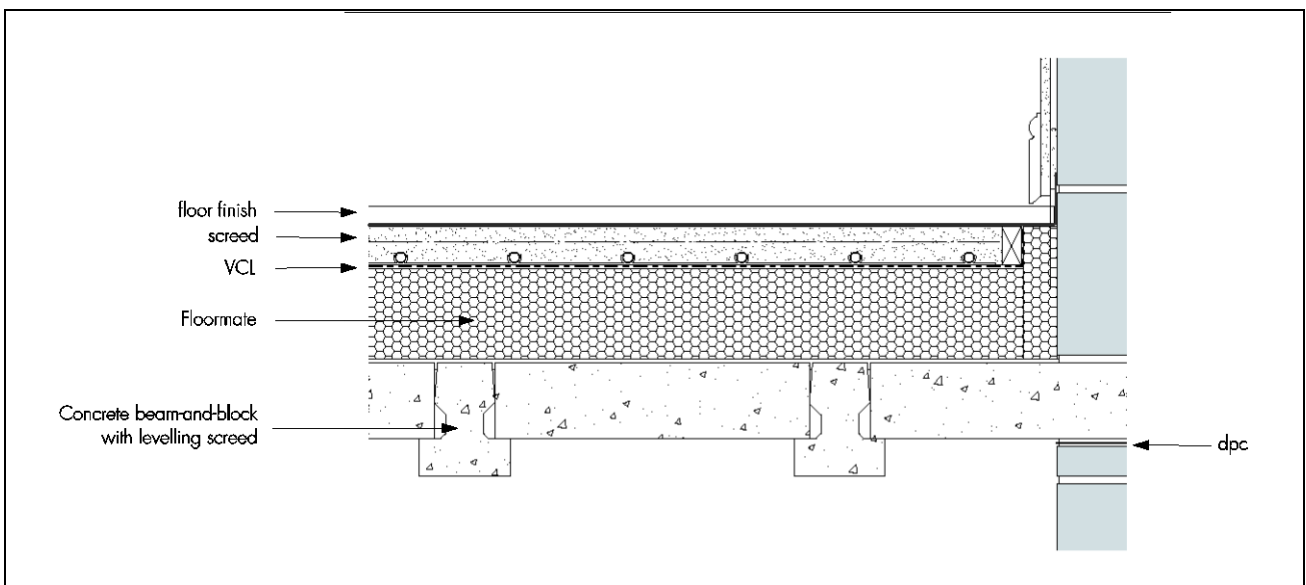


Figure 3 Floormate above suspended beam-and-block concrete floor



13.8 Where screed or concrete slabs are 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 (dpc) level to provide edge insulation to the floor.

13.9 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 and overlay must also be protected from damage by traffic and moisture sources such as water spillage and plaster droppings.

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

13.11 Where screed or concrete slabs are used, to prevent concrete ingress where a VCL, gas membrane, dpm or any separating layer is not placed above the insulation panels, the following procedures should be followed:

- the joints between the insulation should be taped, with a minimum width of 75 mm and/or
- any gaps between insulation panels or around service openings, visible prior to installing the concrete, must be filled with expanding foam or strips of insulation.

## 14 Procedure

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

14.2 The laying pattern should ensure that all cut edges are at the perimeter of the floor or some other feature, eg matwells, thresholds or access ducts. Spreader boards should be used to protect the product.

### Timber-based board overlay

14.3 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 the solvent-based preservatives to evaporate.

14.4 When the dpc is laid below the slab, a VCL of polyethylene sheet with a minimum thickness of 250 µm is laid between the 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.

14.5 Tongue-and-groove 18 mm thick plywood, particle board (type P4 to P7) or OSB/2 to OSB/4 is laid with staggered cross-joints in accordance with DD CEN/TS 12872 : 2007.

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, either a PVA or panel 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, a suitable compressible filler, eg foamed polyethylene, 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 in rooms (eg in kitchens, bathrooms, shower and utility rooms), additional overlay 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

14.12 Perimeter edge pieces are cut and placed around the edges and all floor joints taped. A polyethylene VCL, at least 0.125 mm thick (500 gauge), is laid over the insulation. The VCL should have 150 mm overlaps taped at the joints and turned up 100 mm at the walls. A properly compacted screed with a minimum thickness of 65 mm is then laid. Guidance given in the relevant clauses of BS 8204-1 : 2003 should be followed.

### Concrete slab overlay (ground bearing only)

14.13 Perimeter edge pieces are cut and placed around the edges and taped at joints. A polyethylene VCL, at least 0.125 mm thick (500 gauge), is laid over the insulation. The VCL should 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 accordance with BS 8000-9 : 2003 and BS 8204-1 : 2003.

## 15 Incorporation of services

15.1 De-rating of electrical cables should be considered where the insulation restricts air cooling of cables. The product 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.

### Ground-supported concrete floors

15.2 Where possible, electrical conduits, gas and water pipes or other services should be contained within ducts or channels within the concrete slab of ground-bearing 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 product is 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.

15.5 Where water pipes are installed below the product, they should be pre-lagged. Pipes installed above the product do not require lagging, although some provision may be needed for expansion and contraction.

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 product to provide support for a particle board cover. The duct should be narrow and not exceed 400 mm in width or the maximum particle board spans given in DD CEN/TS 12872 : 2007 without intermediate support. Services should be suitably fixed to the floor base and not to the product (see section 6.3 with regard to limiting heat loss).

## Technical Investigations

## 16 Tests

Tests were carried out 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 ( $\lambda_D$  value)
- dimensional stability under constant normal laboratory conditions
- dimensional stability at specified temperature and humidity
- compressive creep
- freeze-thaw resistance.

## 17 Investigations

17.1 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.

17.2 An examination was made of test data to BS EN 13164 : 2012 relating to:

- dimensions
- squareness
- flatness
- density
- thermal conductivity ( $\lambda_D$  value)
- compressive strength at 10% compression
- bending strength.

## Bibliography

- 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 : 2001 + A1 : 2009 *Code of practice for installation of resilient floor coverings*
- BS 8204-1 : 2003 + A1 : 2009 *Screeds, bases and in-situ floorings — Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*
- BS 8204-2 : 2003 + A2 : 2011 *Screeds, bases and in-situ flooring — 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 312 : 2010 *Particleboards — Specifications*
- BS EN 300 : 2006 *Oriented strand boards (OSB) — Definitions, classification and specifications*
- BS EN 636 : 2012 + A1 : 2015 *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 — Densities, self-weight, imposed loads for buildings*
- NA to BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
- BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*
- BS EN 12871 : 2010 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*
- BS EN 13164 : 2012 + A1 : 2015 *Thermal insulation products for buildings — Factory made extruded polystyrene foam (XPS) products*
- 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 : 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 14001 : 2004 *Environmental management systems — Requirements*
- BS EN ISO 10456 : 2007 *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values*
- BS EN ISO 13370 : 2007 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*
- CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*
- BRE Report BR 262 : 2002 *Thermal insulation : avoiding risks*
- BRE Report BR 443 : 2006 *Conventions of U-value calculations*
- 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*

### 18 Conditions

#### 18.1 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 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.

18.2 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.

18.3 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.

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

17.5 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.

18.6 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.