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Agrément Certificate
15/5243
Product Sheet 3

SYNTHESIA INTERNACIONAL S.L.U

SYNTHESIA RANGE OF INSULATION FOR FLOORS

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Synthesia Range of Insulation for Floors, spray-applied in-situ thermal insulation for suspended timber ground floors and concrete ground floors of new and existing 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 — depending on their thickness, the products have a declared thermal conductivity (λ_p)* value of between $0.025 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ and $0.027 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for Poliuretán Spray RF-352D and between $0.026 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ and $0.028 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for Poliuretán Spray S-353E (see section 6).

Condensation risk — the products have a water vapour resistance factor (μ)* of 60 (resistivity of $300 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$) for Poliuretán Spray RF-352D and 80 (resistivity of $400 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$) for Poliuretán Spray S-353E. The risk of interstitial condensation will depend on the roof construction and should, therefore, be assessed for each project. A vapour control layer (VCL) must be used (see section 7).

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

Durability — the products will have a life equivalent to that of the structure in which they are incorporated (see section 13).

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 First issue: 20 August 2015

John Albon — Head of Approvals
Construction Products

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

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, the Synthesia Range of Insulation for Floors, 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 section 9.2 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 section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The products are acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
Regulation:	26	CO ₂ 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; however, compensating fabric/services measures may be required. See section 6 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 13 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(b)	Structure
Comment:		The products can contribute to satisfying this Standard, with reference to clause 1.1.1 ⁽¹⁾ . See section 9.2 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⁾ , 3.15.3 ⁽¹⁾⁽²⁾ , 3.15.5 ⁽¹⁾⁽²⁾ and 3.15.7 ⁽¹⁾⁽²⁾ . See sections 7.1 and 7.5 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products can contribute to satisfying these Standards, with reference to clauses, or parts of, 6.1.1 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽¹⁾⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾⁽²⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See section 6 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 meeting at least a bronze level of sustainability as defined in this Standard. See section 6 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments made in relation to these 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 13 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 can contribute to satisfying this Regulation. See section 9.2 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 section 6 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

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

See sections: 3 *Delivery and site handling* and 15 *Precautions* of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of the Synthesia Range of Insulation for Floors, if installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 5.1 *Substructure and ground bearing floors* Chapter 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 EN 14315-1 : 2013. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 The Synthesia Range of Insulation for Floors consists of Poliuretán Spray RF-352D and Poliuretán Spray S-353E, closed-cell polyurethane foams suitable for suspended timber ground floor joists, or ground-supported or suspended concrete ground-floors.

1.2 The products are prepared from two liquid components, isocyanate and resin, and are yellowish in colour.

1.3 The products are applied with a fixed ratio (1:1) volumetric displacement pump, up to a maximum thickness of 250 mm.

1.4 Ancillary items used with these products, but outside the scope of this Certificate include:

- non-breathable and breathable roof underlays
- vapour control layer (VCL)
- timber joists
- floor boards
- spray equipment.

2 Manufacture

2.1 Poliuretán Spray is produced by a simple blending of components in a given proportion. The data are introduced in a computer program and the addition of the different components is automatic and controlled by the software.

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 the manufacturer has been assessed and registered as meeting the requirements of ISO 9001 : 2008 by Bureau Veritas (Certificate ES056037-B1).

3 Delivery and site handling

3.1 The isocyanate and resin components are delivered to site in drums (up to 250 kg capacity) bearing the product name, batch number and BBA Certificate number.

3.2 Drums should be stored in a well-ventilated area, ideally above 10°C, and away from possible ignition sources. The drums must be protected from frost.

3.3 The isocyanate component is classified under the *Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*, and the packaging bears the appropriate hazard warning label(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Synthesia Range of Insulation for Floors.

4 Use

4.1 The Synthesia Range of Insulation for Floors is satisfactory for use in reducing the thermal transmittance (U value) of suspended timber ground floors and concrete ground floors of dwellings or similar buildings.

4.2 The products can be used:

- on the underside of a timber floor deck between the joists in ground floors
- on ground-supported or suspended concrete ground-floors.

4.3 Constructions must be designed in accordance with the relevant recommendations of:

- BS 5250 : 2011
- BS EN 351-1 : 2007
- BS EN 1995-1-1 : 2004 and its UK National Annex.

4.4 Ground-supported concrete and suspended concrete ground-floors incorporating the product must include a suitable damp-proof membrane (dpm) laid beneath the insulation, in accordance with the relevant clauses of CP 102 : 1973 and BS 8215 : 1991 (see sections 16.4 and 16.5 of this Certificate), or suitable ventilation of the sub floor as appropriate.

4.5 The overlay to the insulation should be:

- 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, or
- 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, 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 DD CEN/TS 12872 : 2007 and BS EN 12871 : 2010, or
- a concrete slab to BS EN 1992-1-1 : 2004.

4.6 It is essential that construction elements are designed and constructed to incorporate normal precautions against moisture ingress before the application of the product.

4.7 Existing constructions must be in a good state of repair with no evidence of damp. Defects must be made good prior to installation.

4.8 Installation must not be carried out until the moisture content of a timber floor construction is less than 20%.

4.9 The products must not come into direct contact with heat-producing appliances (see section 10).

4.10 The products form a strong bond with clean, dry substrates. This should be taken into account when specifying the product or anticipating future alterations.

4.11 The airspace void under the suspended ground floor must be a minimum of 150 mm deep and must be ventilated (see section 7.3). Care must be taken to ensure that ventilation grilles in the external walls are kept clear of foam insulation and there is no obstruction to the underfloor ventilation.

5 Practicability of installation

The products should only be installed by installers who have been trained and approved by the Certificate holder (see also section 14).

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 (λ_D)* in Table 1 of this Certificate.

Table 1 Thermal conductivity (λ_D)*

Insulation thickness (mm)	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)	
	Poliuretán Spray RF-352D	Poliuretán Spray S-353E
<80	0.027	0.028
80 to 120	0.026	0.027
>120	0.025	0.026

6.2 The U value of a completed suspended timber ground floor will depend on the insulation thickness, the perimeter/area ratio, the floor joist construction and the timber boarded finish. Example constructions are given in Tables 2 and 3 for certain p/a ratios.

Table 2 U values — Timber ground floor

Floor type	Insulation	Perimeter/ area ratio	Thickness requirement (mm)				
			Target U value (W·m ⁻² ·K ⁻¹)				
			0.13	0.15	0.20	0.22	0.25
Timber, suspended ⁽¹⁾	S-353E ⁽²⁾⁽³⁾⁽⁴⁾	0.2	— ⁽⁵⁾	185	115	95	75
		0.4	— ⁽⁵⁾	— ⁽⁵⁾	150	130	110
		0.6	— ⁽⁵⁾	— ⁽⁵⁾	165	145	125
		0.8	— ⁽⁵⁾	— ⁽⁵⁾	180	150	125
		1	— ⁽⁵⁾	— ⁽⁵⁾	185	155	130
	RF-352D ⁽²⁾⁽³⁾⁽⁴⁾	0.2	— ⁽⁵⁾	180	115	95	75
		0.4	— ⁽⁵⁾	— ⁽⁵⁾	145	130	105
		0.6	— ⁽⁵⁾	— ⁽⁵⁾	160	140	120
		0.8	— ⁽⁵⁾	— ⁽⁵⁾	165	145	125
		1	— ⁽⁵⁾	— ⁽⁵⁾	180	150	130

(1) Suspended ground floor assumptions: $\epsilon = 0.0015 \text{ m}^2/\text{m}$, height of floor above ground $h = 0.3 \text{ m}$, wall thickness $w = 0.3 \text{ m}$, thermal transmittance of underfloor wall $U_w = 1.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$, wind shielding factor $f_w = 0.05$, ground thermal conductivity, $\lambda = 1.5 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, wind speed $v = 5 \text{ m/s}$, deck underside surface resistance, $R_{se} = 0.17 \text{ m}^2\cdot\text{kW}^{-1}$.

(2) Thickness range of 30 mm to 200 mm with 5 mm increments.

(3) Construction inclusive of chipboard ($R = 0.091 \text{ m}^2\cdot\text{kW}^{-1}$), variable thickness of insulation bridged with softwood (18.8% $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

(4) It is assumed there is no air gap correction ($\Delta U_g = 0.00$).

(5) Improved thermal/carbon emission performance may be achieved for deeper floor joists.

Table 3 U value — Concrete ground floor

Floor type	Insulation	Perimeter/ area ratio	Thickness requirement (mm)				
			Target U value (W·m ⁻² ·K ⁻¹)				
			0.13	0.15	0.20	0.22	0.25
Concrete ⁽¹⁾	S-353E ⁽²⁾⁽³⁾⁽⁴⁾	0.2	110	85	45	35	—
		0.4	140	120	80	70	55
		0.6	155	130	90	80	65
		0.8	160	135	95	85	75
		1	165	140	100	90	80
	RF-352 ⁽²⁾⁽³⁾⁽⁴⁾	0.2	105	85	45	35	—
		0.4	135	115	75	65	55
		0.6	145	125	90	80	65
		0.8	155	130	95	85	70
		1	160	135	100	85	75

(1) Solid ground floor: height of floor above ground $h = 0.3 \text{ m}$, ground thermal conductivity, $\lambda = 1.5 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

(2) Thickness range of 30 mm to 200 mm with 5 mm increments.

(3) Construction inclusive of 13 mm particleboard ($\lambda = 0.18 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 65 mm screed ($\lambda = 1.4 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 0.5 mm VCL, variable thickness of insulation, 150 mm dense concrete ($\lambda = 1.7 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

(4) It is assumed there is no air gap correction ($\Delta U_g = 0.00$).

Junctions



6.3 Care must be taken in the overall design and construction of junctions with other elements 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 limit the risk of interstitial condensation adequately when they are designed and constructed in accordance with the relevant parts of BS 5250 : 2011. Further guidance may be obtained from BRE Report BR 262 : 2002.

7.2 For the purposes of assessing the risk of interstitial condensation, the insulation vapour resistance factor (μ)* may be taken as 60 (resistivity of $300 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$) for Poliuret看 Spray RF-352D and 80 (resistivity of $400 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$) for Poliuret看 Spray S-353E .

7.3 Voids below suspended timber ground floors should be ventilated. Ventilation may be achieved by installing vents not less than $1500 \text{ mm}^2/\text{m}$ run of external wall or $500 \text{ mm}^2/\text{m}^2$ of floor area, whichever is the greater. Ventilation openings should be arranged to prevent the ingress of rain, snow, birds and small mammals and the risk of subsequent blockage by other building operations.

Surface condensation



7.4 Floors will limit the risk of surface condensation adequately where the thermal transmittance (U value) of the floor does not exceed $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point and the junctions with other elements are designed in accordance with the guidance referred to in section 6.3 of this Certificate.



7.5 For buildings in Scotland, constructions will be acceptable where the thermal transmittance (U value) of the floor does not exceed $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point, and the floor is designed and constructed in accordance with the relevant parts of BS 5250 : 2011, Annexes D and 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 Poliuretán Spray S-353E is classified as Class E* and Poliuretán Spray RF-352D as D-s3,d0* to EN 13501-1 : 2007. The products are not classified as 'non-combustible' and must be protected from naked flames and other ignition sources during and after installation.

8.2 Once installed, the products will not add significantly to any existing fire hazard. The products will be contained within the floor by the overlay until the overlay itself is destroyed.

9 Floor loading

9.1 The Certificate holder has a declared designation code of CS(10\Y)200* in accordance with EN 14315-1 : 2013 (compressive stress at 10% deformation to EN 826 : 2013) for both Poliuretán Spray S-353E and Poliuretán Spray RF-352D.



9.2 The products are suitable for domestic occupancies defined in this Certificate when covered with a suitable floor overlay (see section 4.5), 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 its 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 overlay used (including thickness and strength). Where 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 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 Proximity of flues and appliances

10.1 When installing the product in close proximity to certain heat-producing appliances, the relevant provisions of the national Building Regulations are applicable:

England and Wales — Approved Document J

Scotland — Mandatory Standard 3.19⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

10.2 The product must not be installed within 50 mm of heat-emitting devices where the temperature is in excess of 93°C .

11 Materials in contact — wiring installations

11.1 The products are compatible with PVC materials in contact.

11.2 De-rating of electric cables should be considered in areas where the product restricts the flow of air. The use of suitable conduit or trunking is recommended.

12 Maintenance

Once installed, the products do not require any maintenance and have suitable durability (see section 13), provided the floor structure is maintained in a good condition, and the void below the floor is ventilated.

13 Durability



The products will have a life equivalent to that of the structure in which they are incorporated.

Installation

14 Approved installers

The Certificate holder operates an Approved Installer Scheme for these products, under which the installers are approved, registered and regularly reviewed by the Certificate holder to demonstrate that they are competent to carry out installation of the products in accordance with their instructions and this Certificate. Details of Approved Installers are available from the Certificate holder.

15 Precautions

15.1 To comply with the requirements of Section 4 of the *Health and Safety at Work Act 1974*, it is essential that there is an exchange of information between the client and the installer before spray operations commence on any site. Existing health hazards and those brought into the premises by the installer should be discussed and measures agreed to deal with them effectively.

15.2 The process for the installation of the products may produce a build-up of harmful vapours. Installers must wear full personal protection equipment (PPE) when working with the products, including full-face fresh-air-supplied respirators, protective clothing and chemical-resistant gloves. Other trades and personnel must be kept at least four metres away from the applicator while spraying is taking place. The requirements of the *Synthesia Installation and training manual* and the product safety data sheets issued to Installers must be followed at all times.

15.3 Vapours given off by certain components are generally heavier than air and will tend to move to lower parts of the building. These parts should be suitably ventilated.

15.4 If vapour levels need to be measured, methods should be those recommended by the Health and Safety Executive. Certain applications, eg confined roofs, require the use of extractor fans as recommended by the Certificate holder.

15.5 Whilst spraying, care should be taken to minimise the degree of 'overspray', a fine mist of particles that can travel considerable distances and adhere strongly to surfaces.

16 Procedure

General

16.1 Building elements to be insulated must be assessed for suitability and any necessary repairs carried out. The positioning and access to services should also be considered.

Concrete ground floors

16.2 All concrete 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.

16.3 In ground-supported concrete floors, the concrete floor slab over which the products are spray-applied 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.

16.4 Where the products are used over ground-supported 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 the products and be allowed to dry out fully prior to installation of the products.

16.5 Where the products are used on hardcore bases under 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 product).

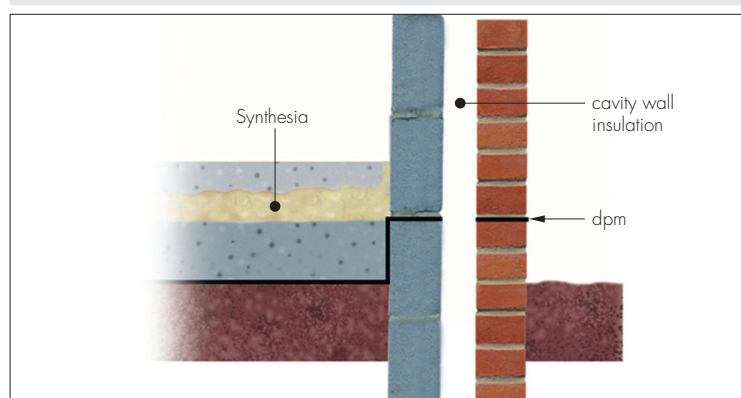
16.6 The products can be used on suitable beam-and-block suspended concrete floors, designed and installed to the precast and general loading codes.

16.7 Where a screed or concrete slab is laid over the insulation, vertical upstands of insulation should be provided and be of sufficient depth to fully separate the screed or slab from the wall. If used, a suitable cavity wall insulation material should be extended below the dpc level to provide edge insulation to the floor.

16.8 To limit the risk of damage from condensation and other sources of dampness, the insulation and overlays 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.

16.9 The products should be spray-applied to clean and dry substrates in a flash coat, <10 mm thick. Subsequent coats not exceeding 20 mm thick are applied once the foam reaction has occurred, and within 10 minutes of the previous coat, until the required total thickness is achieved.

Figure 1 Typical ground floor concrete ground floor application



Cement-based screed overlay

16.10 The product is spray-applied to the floor perimeter edges. 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 be turned up 100 mm at the walls. A properly compacted screed is then poured over to a depth of 65 mm for a domestic dwelling and 75 mm for others. The relevant clauses of BS 8204-1 : 2003 should be followed.

Concrete slab overlay (ground-bearing only)

16.11 The product is spray-applied to the floor perimeter edges. If required, 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 be 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 timber floors

16.12 The product is spray-applied to clean and dry substrates in a flash coat <10mm thick, to the underside of the floor deck between the floor joists. Subsequent coats not exceeding 20 mm thick are applied once the foam reaction has occurred, and within 10 minutes of the previous coat, until the required total thickness is achieved.

16.13 An air gap must be left between the joists and the ground to allow for sub-floor ventilation.

Technical Investigations

17 Investigations

17.1 An assessment was made of independent data relating to:

- thermal conductivity
- behaviour in relation to fire
- water vapour permeability
- compressive strength.

17.2 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

BS 5250 : 2011 *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 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 EN 300 : 2006 *Oriented strand boards (OSB) — Definitions, classification and specifications*

BS EN 312 : 2010 *Particleboards — Specifications*

BS EN 351-1 : 2007 *Durability of wood and wood-based products — Preservative-treated solid wood — Classification of preservative penetration and retention*

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*

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 *Eurocode 2: Design of concrete structures — General rules and rules for buildings*

BS EN 1995-1-1 : 2004 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

NA to BS EN 1995-1-1 : 2004 *UK National Annex to Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

BS EN 12871 : 2010 *Wood-based panels — Performance specifications and requirements for load bearing boards for use in floors, walls and roofs*

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 13370 : 2007 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*
EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
EN 826 : 2013 *Thermal Insulating Products for Building Applications — Determination of Compression Behaviour*
EN 14315-1 : 2013 *Thermal insulating products for buildings — In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products — Specification for the rigid foam spray system before installation*
ISO 9001 : 2008 *Quality management systems — Requirements*
BRE Report (BR 262 : 2002) *Thermal insulation: avoiding risks*
BRE Report (BR 443 : 2006) *Conventions for U-value calculations*
CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*
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*

Conditions of Certification

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 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.

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.

18.5 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.