

S and B EPS Limited

Grievs Row
Dudley
Cramlington
Tyne & Wear NE23 7PY

Tel: 0191 250 0818

e-mail: company@sandbeps.com

website: www.sandbeps.com



Agrément Certificate

02/3943

Product Sheet 1 Issue 4

S AND B EXPANDED POLYSTYRENE INSULATIONS

S AND B EPS FLOORING INSULATION

This Agrément Certificate Product Sheet⁽¹⁾ relates to S and B EPS Flooring Insulation, comprising a range of expanded polystyrene (EPS) boards for use as insulation in ground-bearing or suspended concrete floors, and also with exposed, or semi-exposed, intermediate concrete floors, in new and existing domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

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 Fourth issue: 6 February 2024

Originally certified on 16 August 2002

Certificate amended on 30 July 2024 to revise section 9.1.7

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

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

British Board of Agrément

1st Floor, Building 3, Hatters Lane
Croxley Park, Watford
Herts WD18 8YG

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tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that S and B EPS Flooring 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 Building Regulations 2010 (England and Wales) (as amended)

| | | |
|---------------------|-----------------|--|
| Requirement: | A1 | Loading |
| Comment: | | The product can contribute to satisfying this Requirement. See section 1 of this Certificate. |
| Requirement: | C2(c) | Resistance to moisture |
| Comment: | | The product can contribute to satisfying this Requirement. See section 3 of this Certificate. |
| Requirement: | L1(a)(i) | Conservation of fuel and power |
| Comment: | | The product can contribute to satisfying this Requirement. See section 6 of this Certificate. |
| Regulation: | 7(1) | Materials and workmanship |
| Comment: | | The product is acceptable. See sections 8 and 9 of this Certificate. |
| Regulation: | 25B | Nearly zero-energy requirements for new buildings |
| 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 rates for new buildings (applicable to Wales only) |
| Regulation: | 26B | Fabric performance values for new dwellings (applicable to Wales only) |
| Regulation: | 26C | Target primary energy rates for new buildings (applicable to England only) |
| Regulation: | 26C | Energy efficiency rating (applicable to Wales only) |
| Comment: | | The product can contribute to satisfying these Regulations. See section 6 of this Certificate. |



The Building (Scotland) Regulations 2004 (as amended)

| | | |
|--------------------|---------------------|--|
| Regulation: | 8(1) | Fitness and durability of materials and workmanship |
| Comment: | | The product is acceptable. See sections 8 and 9 of this Certificate. |
| Regulation: | 9 | Building standards – construction |
| Standard: | 1.1(b) | Structure |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clause 1.1.2 ⁽¹⁾ . See section 1 of this Certificate. |
| Standard: | 3.15 | Condensation |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾ . See section 3 of this Certificate. |
| Standard: | 6.1(b)(c)(d) | Energy demand and carbon dioxide emissions |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clause 6.1.1 ⁽¹⁾ . See section 6 of this Certificate. |

| | | |
|------------------------------------|-----------|---|
| Standard: | 6.2 | Building insulation envelope |
| Comment: | | The product can contribute to satisfying these Standards, with reference to clauses or parts of clauses, 6.2.1 ⁽¹⁾ , 6.2.3 ⁽¹⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽¹⁾ , 6.2.9 ⁽¹⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾ and 6.2.12 ⁽¹⁾ . 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 at least 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 7.1.2 ⁽¹⁾ , 7.1.4 ⁽¹⁾ , 7.1.6 ⁽¹⁾ and 7.1.7 ⁽¹⁾ . See section 6 of this Certificate. |
| (1) Technical Handbook (Domestic). | | |



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

| | | |
|--------------------|------------------------|--|
| Regulation: | 23(1)(a)(i) | Fitness of materials and workmanship |
| Comment: | (iii)(b)(i)(ii) | The product is acceptable. See sections 8 and 9 of this Certificate. |
| Regulation: | 29 | Condensation |
| Comment: | | The product can contribute to satisfying this Regulation. See section 3 of this Certificate. |
| Regulation: | 30 | Stability |
| Comment: | | The product can contribute to satisfying this Regulation. See section 1 of this Certificate. |
| Regulation: | 39(a)(i) | Conservation measures |
| Regulation: | 40(2) | Target carbon dioxide emission rate |
| Regulation: | 43(1)(2) | Renovation of thermal elements |
| Regulation: | 43(b) | Nearly zero-energy requirements for new buildings |
| Comment: | | The product can contribute to satisfying these Regulations. See section 6 of this Certificate. |

Additional Information

NHBC Standards 2024

In the opinion of the BBA, S and B EPS Flooring 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 ground-bearing floors* and 5.2 *Suspended ground floors*.

Fulfilment of Requirements

The BBA has judged S and B EPS Flooring Insulation to be satisfactory for use as described in this Certificate. The product has been assessed for use as insulation in ground-bearing or suspended concrete floors, and also with exposed, or semi-exposed, intermediate concrete floors, in new or existing domestic buildings.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the product under assessment. S and B EPS Flooring Insulation consists of rigid EPS boards and is available in six grades.

The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

| Characteristic (unit) | Grade of EPS | | | | | |
|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| | EPS 70 E | EPS 100 E | EPS 120 E | EPS 150 E | Lambdatherm ⁽¹⁾ | |
| | | | | | EPS 70 E | Elite |
| Length (mm) | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 |
| Width (mm) | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |
| Thickness ⁽²⁾ (mm) | 50 to 300 (in 5 mm increments) | 50 to 300 (in 5 mm increments) | 50 to 300 (in 5 mm increments) | 50 to 300 (in 5 mm increments) | 50 to 300 (in 5 mm increments) | 50 to 300 (in 5 mm increments) |
| Edge profile | Square or rebated | Square or rebated | Square or rebated | Square or rebated | Square or rebated | Square or rebated |
| Flatness (board length ≤ 2.5 m; area > 0.75 m ²) | Deviation ≤ 10 mm | Deviation ≤ 10 mm | Deviation ≤ 10 mm | Deviation ≤ 10 mm | Deviation ≤ 10 mm | Deviation ≤ 10 mm |

(1) Lambdatherm is a registered trademark.

(2) Other sizes within the ranges above are available on request.

The product is intended for use as floor insulation in new and existing domestic buildings:

- ground-bearing concrete floors
- suspended concrete ground floors
- exposed or semi-exposed intermediate concrete floors.

Ancillary Items

The Certificate holder recommends that a suitable damp-proof membrane (DPM), laid in accordance with the relevant sections of CP 102 : 1973, BS 8102 : 2009 and BS 8215 : 1991, where the product is used on ground-bearing concrete and suspended concrete ground floors, but this material has not been assessed by the BBA and is outside the scope of this Certificate.

Applications

The overlay to the products should be:

- an air and vapour control layer (AVCL) where necessary (see section 3) and
- a cement-based floor screed of minimum 65 mm⁽¹⁾ thickness, laid in accordance with the relevant clauses of BS 8204-1 : 2003 and/or BS 8204-2 : 2003, and BS 8000-9 : 2003 or
- wood-based floor [eg tongue-and-groove plywood to BS EN 636 : 2012, flooring grade particle board (Type P4 or P7) to BS EN 312 : 2010 or oriented strand board (type OSB/3 to OSB/4) to BS EN 300 : 2006], of a thickness to be determined by a suitably experienced and competent individual, and installed in accordance with PD CEN/TR 12872 : 2014 and BS EN 12871 : 2013 or
- a concrete slab to BS EN 1992-1-1 : 2004 and its UK National Annex.

(1) The NHBC only accepts ground-supported floor slabs with at least 100 mm thick concrete including a monolithic screed.

Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Data were assessed for the following characteristics.

1.1 Floor loading

1.1.1 The product was tested for compressive strength and the results are given in Table 2.

Table 2 Compressive strength

| Grade of EPS assessed | Assessment method | Requirement | Result |
|-----------------------|-------------------|---|---------|
| EPS 70 E | BS EN 826 : 2013 | Declared minimum compressive strength of the product at 10% deformation | 70 kPa |
| EPS 100 E | | | 100 kPa |
| EPS 120 E | | | 120 kPa |
| EPS 150 E | | | 150 kPa |
| Lambdatherm EPS 70 E | | | 70 kPa |
| Lambdatherm Elite | | | 100 kPa |

1.1.2 On the basis of data assessed, the product is suitable for the occupancies defined in this Certificate when covered with a suitable floor overlay, 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 the UK National Annex to BS EN 1991-1-1 : 2002, Table NA.2. Further assessment by a suitably experienced and competent individual is necessary in the case of duty walkways and floors subject to physical activities.

1.1.3 The performance of a specific floor construction will depend on the insulation properties and type of floor overlay 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, although the latter is outside the scope of this Certificate.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 Reaction to fire

2.1.1 The product was tested for reaction to fire and the classifications are given in Table 3.

Table 3 Reaction to fire classification

| Grade of EPS assessed | Assessment method | Requirement | Result |
|-----------------------|----------------------|---------------------------------|------------------|
| EPS 70 E | BS EN 13501-1 : 2018 | Reaction to fire classification | E ⁽¹⁾ |
| EPS 100 E | | | E ⁽²⁾ |
| EPS 120 E | | | E ⁽³⁾ |
| EPS 150 E | | | E ⁽⁴⁾ |
| Lambdatherm EPS 70 E | | | E ⁽⁵⁾ |
| Lambdatherm Elite | | | E ⁽⁶⁾ |

(1) BTTG. Report no. 27/06169G/06/23, dated 4 July 2023. Copies can be obtained from the Certificate holder.

(2) BTTG. Report no. 27/06169F/06/23, dated 4 July 2023. Copies can be obtained from the Certificate holder.

(3) BTTG. Report no. 27/06169B/06/23, dated 4 July 2023. Copies can be obtained from the Certificate holder.

(4) BTTG. Report no. 27/06169A/06/23, dated 4 July 2023. Copies can be obtained from the Certificate holder.

(5) BTTG. Report no. 27/06169C/06/23, dated 4 July 2023. Copies can be obtained from the Certificate holder.

(6) BTTG. Report no. 27/06169K/06/23, dated 4 July 2023. Copies can be obtained from the Certificate holder.

2.1.2 Where an intermediate floor incorporating the product is required to achieve a period of fire resistance, its performance must be confirmed by a suitably experienced and competent individual or by a test from a suitably accredited laboratory.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Water vapour permeability

For the purpose of assessing the risk of interstitial condensation, the water vapour resistivity value may be taken as stated in Table 4.

| Material | Assessment method | Requirement | Result |
|----------------------|--------------------|----------------|---|
| EPS 70 E | BS EN 13163 : 2012 | Value achieved | 100 – 200 MN·s·g ⁻¹ ·m ⁻¹ |
| EPS 100 E | | | |
| EPS 120 E | | | 150 – 350 MN·s·g ⁻¹ ·m ⁻¹ |
| EPS 150 E | | | |
| Lambdatherm EPS 70 E | | | 100 – 200 MN·s·g ⁻¹ ·m ⁻¹ |
| Lambdatherm Elite | | | 150 – 350 MN·s·g ⁻¹ ·m ⁻¹ |

3.2 Condensation

3.2.1 The BBA has assessed the product for the risk of interstitial condensation, and the following factors must be implemented.

3.2.2 When the product is used on a ground-bearing floor or a suspended concrete floor, an AVCL must be installed on the warm side of the insulation to inhibit the risk of interstitial condensation, unless a risk assessment shows this is not necessary.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Data were assessed for the following characteristics.

6.1 Thermal conductivity

The product was tested for thermal conductivity and the results are given in Table 5.

| Grade of EPS assessed | Assessment method | Requirement | Result |
|-----------------------|--------------------|--------------------------------|--|
| EPS 70 E | BS EN 13163 : 2012 | Declared value (λ_D) | 0.038 W·m ⁻¹ ·K ⁻¹ |
| EPS 100 E | | | 0.036 W·m ⁻¹ ·K ⁻¹ |
| EPS 120 E | | | 0.036 W·m ⁻¹ ·K ⁻¹ |
| EPS 150 E | | | 0.035 W·m ⁻¹ ·K ⁻¹ |
| Lambdatherm 70 E | | | 0.031 W·m ⁻¹ ·K ⁻¹ |
| Lambdatherm Elite | | | 0.030 W·m ⁻¹ ·K ⁻¹ |

6.2 Thermal performance

6.2.1 The U value of a completed floor will depend on the insulation thickness, the perimeter/area ratio, and the floor type. Example U values are given in Table 6.

Table 6 Example U values – ground-floor construction

| Floor type | Grade of EPS assessed | Target U value (W·m ⁻² ·K ⁻¹) | Insulation thickness (mm) | | | | |
|---|-------------------------|---|--------------------------------|-----|-----|-----|-----|
| | | | P/A ratio (m·m ⁻²) | | | | |
| | | | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 |
| Ground-bearing concrete floor ⁽¹⁾⁽³⁾ | EPS 70 E | 0.11 | 205 | 255 | 275 | 285 | 290 |
| | | 0.12 | 180 | 230 | 250 | 260 | 265 |
| | | 0.13 | 160 | 210 | 225 | 235 | 240 |
| | | 0.15 | 125 | 170 | 190 | 200 | 205 |
| | | 0.18 | 85 | 130 | 150 | 160 | 165 |
| | | 0.22 | 50 | 95 | 115 | 125 | 130 |
| | | 0.25 | 50 | 80 | 95 | 105 | 100 |
| | EPS 100 E and EPS 120 E | 0.11 | 190 | 245 | 260 | 270 | 275 |
| | | 0.12 | 170 | 220 | 235 | 245 | 250 |
| | | 0.13 | 150 | 195 | 215 | 225 | 230 |
| | | 0.15 | 115 | 165 | 180 | 190 | 195 |
| | | 0.18 | 80 | 125 | 145 | 150 | 155 |
| | | 0.22 | 50 | 90 | 110 | 115 | 125 |
| | | 0.25 | 50 | 75 | 90 | 100 | 105 |
| | EPS 150 E | 0.11 | 185 | 235 | 255 | 265 | 270 |
| | | 0.12 | 165 | 210 | 230 | 240 | 245 |
| | | 0.13 | 145 | 190 | 210 | 220 | 225 |
| | | 0.15 | 115 | 160 | 175 | 185 | 190 |
| | | 0.18 | 80 | 120 | 140 | 150 | 155 |
| | | 0.22 | 50 | 90 | 105 | 115 | 120 |
| | | 0.25 | 50 | 70 | 85 | 95 | 100 |
| | Lambdatherm 70 E | 0.11 | 165 | 210 | 225 | 235 | 240 |
| | | 0.12 | 145 | 190 | 205 | 210 | 215 |
| | | 0.13 | 130 | 170 | 185 | 195 | 200 |
| | | 0.15 | 100 | 140 | 155 | 165 | 170 |
| | | 0.18 | 70 | 110 | 125 | 130 | 135 |
| | | 0.22 | 50 | 80 | 95 | 100 | 105 |
| | | 0.25 | 50 | 65 | 75 | 85 | 90 |
| Lambdatherm Elite | 0.11 | 160 | 205 | 220 | 225 | 230 | |
| | 0.12 | 140 | 180 | 195 | 205 | 210 | |
| | 0.13 | 125 | 165 | 180 | 185 | 190 | |
| | 0.15 | 100 | 135 | 150 | 160 | 165 | |
| | 0.18 | 70 | 105 | 120 | 125 | 130 | |
| | 0.22 | 50 | 75 | 90 | 100 | 105 | |
| | 0.25 | 50 | 60 | 75 | 80 | 85 | |

Table 6 Example U values – ground-floor construction (continued)

| Floor type | Grade of EPS assessed | Target U value (W·m ⁻² ·K ⁻¹) | Insulation thickness (mm) | | | | |
|---|-----------------------|---|-------------------------------|-----|-----|-----|-----|
| | | | P/A ratio (m·m ²) | | | | |
| | | | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 |
| Suspended concrete ground-floor ⁽²⁾⁽³⁾ | EPS 70 E | 0.11 | 235 | 265 | 280 | 285 | 290 |
| | | 0.12 | 210 | 240 | 255 | 260 | 265 |
| | | 0.13 | 185 | 220 | 230 | 235 | 240 |
| | | 0.15 | 150 | 180 | 195 | 200 | 205 |
| | | 0.18 | 110 | 140 | 155 | 160 | 165 |
| | | 0.22 | 70 | 105 | 120 | 125 | 130 |
| | | 0.25 | 55 | 85 | 100 | 105 | 110 |
| | EPS 100 E & EPS 120 E | 0.11 | 220 | 255 | 265 | 270 | 275 |
| | | 0.12 | 195 | 230 | 240 | 245 | 250 |
| | | 0.13 | 175 | 205 | 220 | 225 | 230 |
| | | 0.15 | 140 | 175 | 185 | 190 | 195 |
| | | 0.18 | 105 | 135 | 145 | 150 | 155 |
| | | 0.22 | 70 | 100 | 110 | 120 | 120 |
| | | 0.25 | 50 | 80 | 95 | 100 | 100 |
| | EPS 150 E | 0.11 | 215 | 245 | 255 | 265 | 265 |
| | | 0.12 | 190 | 220 | 235 | 240 | 240 |
| | | 0.13 | 170 | 200 | 210 | 220 | 220 |
| | | 0.15 | 135 | 170 | 180 | 185 | 190 |
| | | 0.18 | 100 | 130 | 140 | 150 | 150 |
| | | 0.22 | 65 | 95 | 110 | 115 | 120 |
| | | 0.25 | 50 | 80 | 90 | 95 | 100 |
| | Lambdatherm 70 E | 0.11 | 190 | 220 | 230 | 235 | 235 |
| | | 0.12 | 170 | 195 | 205 | 210 | 215 |
| | | 0.13 | 150 | 180 | 190 | 195 | 195 |
| | | 0.15 | 120 | 150 | 160 | 165 | 165 |
| 0.18 | | 90 | 115 | 125 | 130 | 135 | |
| 0.22 | | 60 | 85 | 95 | 100 | 105 | |
| 0.25 | | 50 | 70 | 80 | 85 | 90 | |
| Lambdatherm Elite | 0.11 | 185 | 210 | 220 | 225 | 230 | |
| | 0.12 | 165 | 190 | 200 | 205 | 210 | |
| | 0.13 | 145 | 175 | 180 | 185 | 190 | |
| | 0.15 | 120 | 145 | 155 | 160 | 160 | |
| | 0.18 | 85 | 115 | 120 | 125 | 130 | |
| | 0.22 | 60 | 85 | 95 | 100 | 100 | |
| | 0.25 | 50 | 70 | 80 | 85 | 85 | |

(1) Ground-bearing concrete floor construction (S and B EPS Flooring Insulation on top of the slab, under the screed finish) – 65 mm concrete screed ($\lambda = 1.15 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), polyethylene separating layer, S and B EPS Flooring Insulation, DPM, 100 mm concrete oversite, 150 mm sand-blinded hardcore.

(2) Suspended concrete ground-floor construction (S and B EPS Flooring Insulation on top of beam and block, below screed finish) – 65 mm concrete screed $\lambda = 1.15 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, polyethylene separating layer, S and B EPS Flooring 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.

(3) 25 mm edge insulation of EPS ($\lambda = 0.035 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 65 mm deep.

(4) See section 6.2.3.

6.2.2 The product can contribute towards a construction satisfying the national Building Regulations in respect of energy economy and heat retention.

6.2.3 For improved energy or carbon savings, designers must consider appropriate fabric/services measures.

7 Sustainable use of natural resources

Not applicable.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the product were assessed.

8.2 Data were assessed for the characteristics shown in Table 7.

Table 7 Dimensional stability and compressive creep

| Grade of EPS assessed | Assessment method | Requirement | Result |
|-----------------------|---|--|-------------------|
| All | Dimensional stability to BS EN 1603 : 1997 (23°C and 50% RH) | Length, width and thickness ≤ 0.2 % change | Pass |
| All | Dimensional stability to BS EN 1604 : 1996 (23°C and 90% RH for 48 hours) | Length, width and thickness ≤ 1 % change | Pass |
| EPS 70 E | Compressive creep to EN 1606 : 1999 (70 kPa at 23°C and 50% RH) | Extrapolated long term deformation after 10 years value achieved | < 1 % deformation |
| EPS 100 E | Compressive creep to EN 1606 : 1999 (100 kPa at 23°C and 50% RH) | Extrapolated long term deformation after 10 years value achieved | < 1 % deformation |
| EPS 120 E | Compressive creep to EN 1606 : 1999 (120 kPa at 23°C and 50% RH) | Extrapolated long term deformation after 10 years value achieved | < 1 % deformation |
| EPS 150 E | Compressive creep to EN 1606 : 1999 (150 kPa at 23°C and 50% RH) | Extrapolated long term deformation after 10 years value achieved | < 1 % deformation |

8.3 Service life

Under normal service conditions, the product will have a life equivalent to the building in which it is incorporated, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed by the BBA, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 The product can be used on suitably designed beam-and-block floors incorporating Type R2 semi-resisting or resisting blocks to BS EN 15037-2 : 2009 and self-bearing beams to BS EN 15037-1 : 2008.

9.1.3 Ground-bearing floors must 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) with a plasticity index of 10% or greater (shrinkable fills are susceptible to clay heave).

9.1.4 Ground-bearing concrete and suspended concrete ground-floors incorporating the product must include a suitable DPM, laid beneath the insulation, in accordance with the relevant sections of CP 102 : 1973, BS 8102 : 2009 and BS 8215 : 1991 (see section A.5 of this Certificate).

9.1.5 Suspended concrete ground-floors incorporating the insulation boards 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. For suspended floors in locations where clay heave is anticipated, 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 where the risk of clay heave has been confirmed by geotechnical investigations by a suitably experienced and competent individual, a total void of up to 300 mm may be required.

9.1.6 Where a concrete screed or slab finish is to be laid directly over the product, a polyethylene separating layer/AVCL must be installed between the insulation and the concrete to prevent chemical attack and seepage between the boards (see section A.6 of this Certificate). 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.

9.1.7 External and internal walls must not be built on the insulation. If this is not possible and it is assumed that external walls are constructed on the insulation, then creep testing or an extended stress assessment will be necessary.

9.1.8 Calculations of the thermal transmittance (U value) of a floor must be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2019.

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

Interstitial condensation

9.1.10 Floors will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2021.

9.1.11 When the product is used above the DPM on a ground-bearing or suspended floor, an AVCL is installed on the warm side of the insulation to limit the risk of interstitial condensation, unless a risk assessment shows this is not necessary.

Surface condensation

9.1.12 In England and Wales, 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 9.1.9 of this Certificate.

9.1.13 For buildings in Scotland, 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 and the floor is designed and constructed in accordance with the relevant parts of BS 5250 : 2021. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 9.1.9 of this Certificate.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance are provided in Annex A of this Certificate.

9.2.3 De-rating of electrical cables must 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, but such advice is outside the scope of this Certificate.

9.2.4 Where possible, electrical conduits, gas and water pipes or other services must 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 that are likely to come into contact with the insulation must be protected by a suitable conduit or PVC-U trunking. With hot pipes, the insulation must be cut back to maintain an air space.

9.2.5 Where water pipes are installed below the insulation, they must be pre-lagged with close-fitting pipe insulation.

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

9.2.7 To provide support for a particle board cover on overlay board floors 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. The duct must be as narrow as possible and not exceed 400 mm in width or the maximum particle board spans given in PD CEN/TR 12872 : 2014 without intermediate support. Services must be suitably fixed to the floor base and not to the insulation boards (see section 9.1.9 of this Certificate regarding limiting heat loss).

9.3 Workmanship

Practicability of installation was assessed by the BBA on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must be carried out by a competent general builder, or a contractor, experienced with this type of product.

9.4 Maintenance and repair

As the product is confined within the floor by the overlay and has suitable durability, maintenance is not required.

10 Manufacture

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review 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.

11 Delivery and site handling

11.1 The Certificate holder stated that the product is delivered to site in packs wrapped in polythene. Each pack contains a label bearing the Certificate holder's name, product description, board dimensions, number of boards and the BBA logo incorporating the number of this Certificate.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 The product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque light-coloured polythene.

11.2.2 The product must be stored fully supported and flat on a firm, level, dry base, protected from the weather and raised above damp surfaces. The product must be discarded if damaged or wet.

11.2.3 The product must not be exposed to open flame or other ignition sources or to solvents or other chemicals.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the 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.

CE marking

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

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by the BBA (Certificates 03/Q001 and 12/E013 respectively).

Additional information on installation

A.1 Typical methods of installation are shown in Figures 1 to 6. Reference should also be made to BRE Report BR 262 : 2002.

Figure 1 Ground-bearing concrete floor – particle board overlay

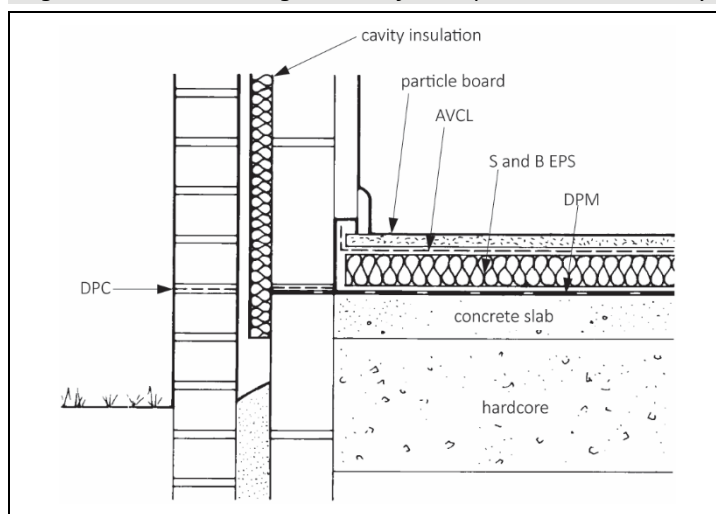


Figure 2 Suspended concrete floor – particle board overlay

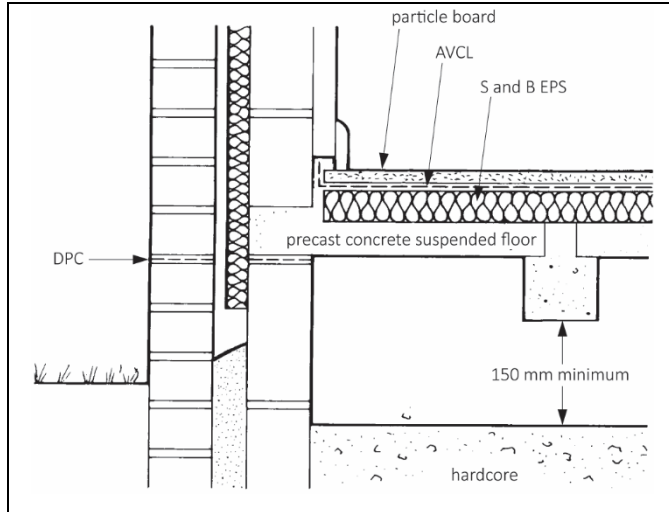


Figure 3 Ground-bearing concrete floor – screed overlay

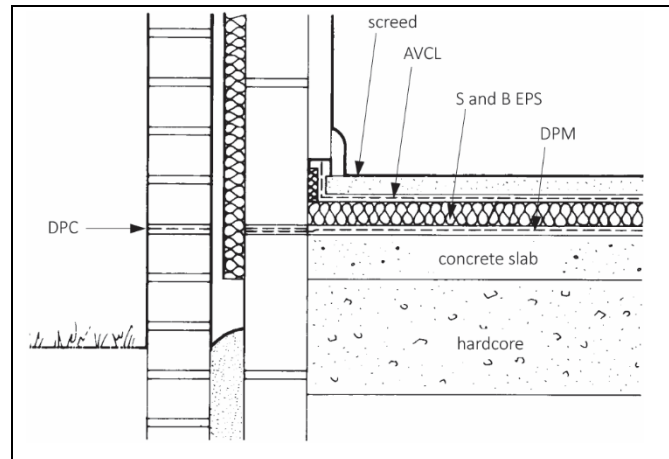


Figure 4 Suspended concrete floor – screed overlay

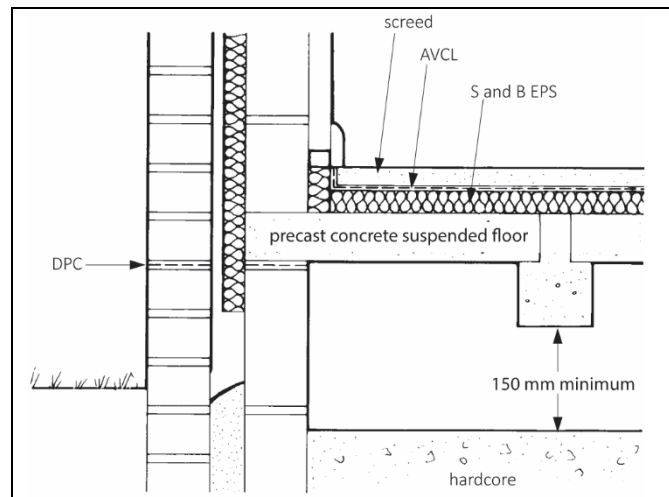


Figure 5 Ground-bearing concrete floor – particle board overlay (DPM under concrete slab)

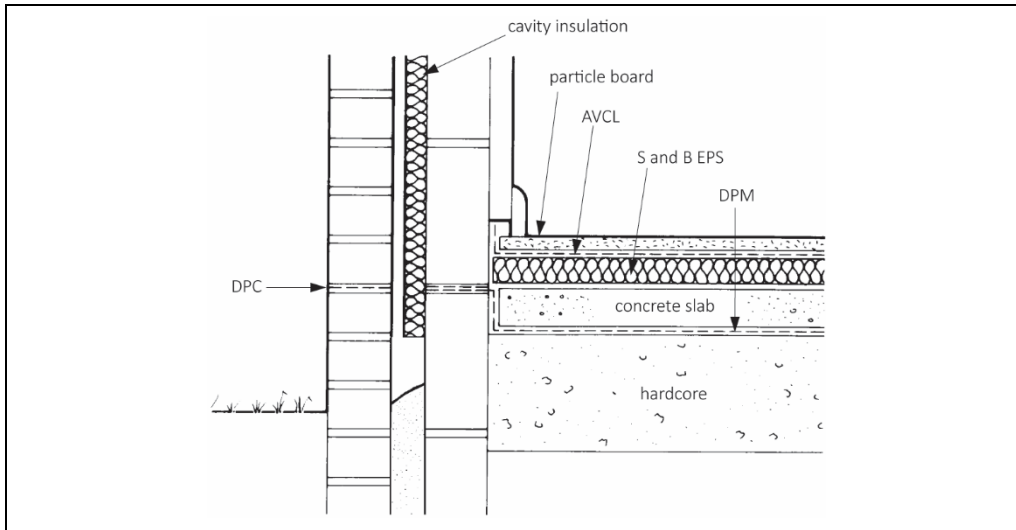
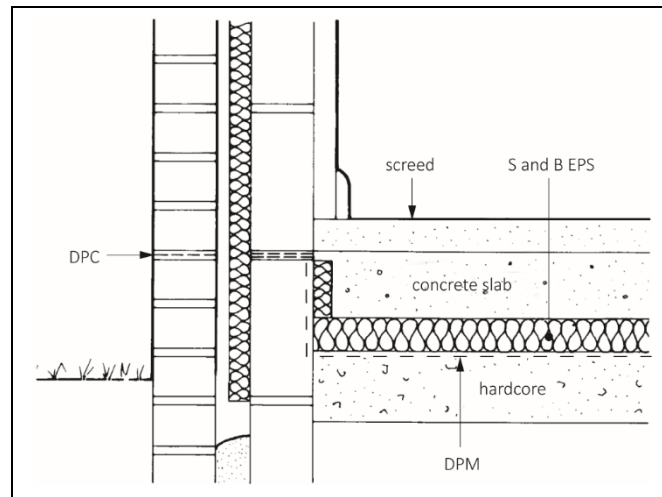


Figure 6 Concrete slab overlay



A.2 In ground-bearing concrete floors, the concrete floor slab over which the boards are 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 : 2017, Section 3.1.2.

A.3 The concrete floor surface 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.

A.4 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 the product and be allowed to dry out fully before laying the insulation.

A.5 Where the insulation is used on hardcore bases beneath ground-bearing 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.

A.6 An AVCL is installed on the warm side of the insulation to inhibit the risk of interstitial condensation if necessary (see section 3). Where a concrete screed or slab finish is to be laid directly over the product, a polyethylene separating layer/AVCL must be installed between the insulation and the concrete to prevent chemical attack and seepage between the boards.

A.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.

A.8 To limit the risk of 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.

Procedure

A.9 The product is cut to size (using a sharp knife or fine-toothed saw), as necessary, and laid with closely butted, staggered cross-joints, ensuring all spaces are completely filled.

A.10 The laying pattern should ensure that all cut edges are at the perimeter of the floor or some other feature, eg, mat wells, thresholds or access ducts. Spreader boards should be used to protect the insulation.

Timber-based board overlay

A.11 Before laying the plywood, particle board or OSB overlay, 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.

A.12 Where the insulation is laid above a DPM, a polyethylene AVCL of at least 0.125 mm (500 gauge) thickness is laid between the insulation and the timber board overlay. The AVCL should have 150 mm overlaps, taped at the joints and turned up 100 mm at the walls.

A.13 Timber based overlay boards as specified in section 9 of this Certificate are laid with staggered cross-joints, in accordance with PD CEN/TR 12872 : 2014 and BS EN 12871 : 2013.

A.14 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.

A.15 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.

A.16 Before the overlay boards are interlocked, a water-resistant PVA adhesive is applied to the joints.

A.17 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.

A.18 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.

A.19 Where there is a likelihood of regular water spillage (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

A.20 Perimeter edge pieces are cut and placed around the edges and taped at joints. A polyethylene AVCL, at least 0.125 mm thick (500 gauge), is laid over the insulation. The AVCL should have 150 mm overlaps, taped at the joints and turned up 100 mm at the walls. A properly compacted screed of minimum thickness 65 mm is then laid over. The relevant clauses of BS 8204-1 : 2003 should be followed.

Concrete slab overlay (ground-bearing only)

A.21 Perimeter edge pieces are cut and placed around the edges and taped at the joints. A polyethylene AVCL, minimum 0.125 mm thick (500 gauge), is laid over the insulation. The AVCL 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 in accordance with BS 8000-9 : 2003 and BS 8204-1 : 2003.

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- BRE Report BR 443 : 2019 *Conventions for U-value calculations*
- BS 5250 : 2021 *Management of moisture in buildings — Code of practice*
- 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 cement sand 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 + A1 : 2015 *Plywood — Specifications*
- BS EN 826 : 2013 *Thermal insulating products for building applications — Determination of compression behaviour*
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- BS EN 13810-1 : 2002 *Wood-based panels — Floating floors — Performance specifications and requirements*
- BS EN 15037-1 : 2008 *Precast concrete products — Beam-and-block floor systems — Beams*
- BS EN 15037-2 : 2009 + A1 : 2011 *Precast concrete products — Beam-and-block floor systems — Concrete blocks*
- BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
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PD CEN/TR 12872 : 2014 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product 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.

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.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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.

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

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

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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.

British Board of Agrément

1st Floor, Building 3, Hatters Lane
Croxley Park, Watford
Herts WD18 8YG

©2024

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk