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Agrément Certificate
87/1796
Product Sheet 3

VENCEL RESIL JABFLOOR BOARDS

JABCORE 70 AND 100

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Jabcore 70 and 100, expanded polystyrene beadboards for use for use as a structural support on domestic and non-domestic solid ground floors.

AGRÉMENT CERTIFICATION INCLUDES:

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



KEY FACTORS ASSESSED

Thermal performance — the products can contribute to enabling a building to achieve the requirement of notional target carbon emission rates. The thermal conductivity ($\lambda_{90/90}$ value) of the product is declared by the Certificate holder (see section 5).

Condensation — the products can adequately limit the risk of surface condensation on floors (see section 6).

Behaviour in relation to fire — the products will be contained within the floor by the overlay until the overlay itself is destroyed (see section 7).

Floor loading — the products, covered with a timber-based board or screed overlay, can support design loadings for self-contained dwelling units as defined in BS 6399-1 : 1996 without undue compression deflection (see section 8).

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

The BBA has awarded this Agrément 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

Chris Hunt

Head of Approvals — Physics

Greg Cooper

Chief Executive

Date of First issue: 12 August 2009

Originally certificated on 10 November 2000

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, Jabcore 70 and 100, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	A1	Loading
Comment:		Floors incorporating the products can meet this Requirement. See section 8.1 of this Certificate.
Requirement:	C2(a)(c)	Resistance to moisture
Comment:		Floors incorporating the products can meet this Requirement. See sections 6.1 and 6.3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The products can contribute to meet its Target Emission Rate. See sections 5.3 to 5.6 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 11 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The products can contribute to a construction satisfying this Regulation. See sections 10 and 11 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1(a)(b)	Structure
Comment:		Floors incorporating the products can satisfy this Standard, with reference to clause 1.1.1 ⁽¹⁾ . See section 8.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		Floors incorporating the products can satisfy this Standard, with reference to clauses 3.15.1 ⁽¹⁾ and 3.15.4 ⁽¹⁾ . See sections 6.1 and 6.4 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products can contribute to satisfying clauses, or parts of, 6.1.2 ⁽¹⁾ , 6.1.3 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾ , 6.2.3 ⁽¹⁾ , 6.2.6 ⁽²⁾ and 6.2.9 ⁽¹⁾⁽²⁾ to 6.2.12 ⁽¹⁾⁽²⁾ of these Standards. See sections 5.3 to 5.6 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for the products under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾ and Schedule 6 ⁽¹⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The products are acceptable. See section 10 of this Certificate.
Regulation:	C5	Condensation
Comment:		The products can contribute to minimising the risk of condensation. See section 6.1 of this Certificate.
Regulation:	D1	Stability
Comment:		Floors incorporating the products can meet this Regulation. See section 8.1 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3	Target carbon dioxide Emissions Rate
Comment:		The products can contribute to a building satisfying its Target Emission Rate. See sections 5.3 to 5.6 of this Certificate.

Construction (Design and Management) Regulations 2007

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

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

See section: 2 *Delivery and site handling* (2.1 and 2.2).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Jabcore 70 and 100, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.1, *Substructure and ground bearing floors*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Jabcore 70 and 100, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual, Section 3 Substructure, Sub-section Floors*.

General

This Certificate relates to Jabcore 70 and 100, expanded polystyrene beadboards for use for use as a structural support on domestic and non-domestic solid ground floors.

Technical Specification

1 Description

1.1 Jabcore 70 and 100 comprises EPS 70 and EPS 100 expanded polystyrene boards manufactured in accordance with BS EN 13163 : 2001 for use as a structural support on domestic and non-domestic solid ground floors.

1.2 In relation to reaction to fire tests, the boards are classified as Class F in accordance with BS EN 13501 -1 : 2007. However, when requested, the products can be supplied as Class E.

1.3 The boards have the nominal characteristics shown in Table 1.

Table 1 Nominal characteristics

Size (mm)	1200 by 2400, 1200 by 1200, 1200 by 1800
Edge	plain
Thickness (mm)	75, 100 and 150
Density (kgm ⁻³)	15 and 20
At 10% compression (kPa)	70 and 100

2 Delivery and site handling

2.1 The products are delivered to site wrapped in polythene. Each pack contains a label with the manufacturer's trade name and the BBA identification mark, incorporating the number of this Certificate.

2.2 The products must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with polyethylene. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, pitch or timber newly treated with creosote.

2.3 The products must be stored flat, protected from high winds and raised above damp surfaces.

2.4 The products must not be exposed to open flame or other ignition sources.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Jabcore 70 and 100.

Design Considerations

3 General

3.1 Jabcore 70 and 100 are effective in reducing the thermal transmittance (U value) of new or existing ground floors.

3.2 Ground-supported concrete floors incorporating the products must include a suitable damp-proof membrane laid in accordance with the relevant clauses of CP 102 : 1973, BS 8102 : 1990 and/or BS 8215 : 1991 (see section 9).

3.3 The overlay to the boards should be a concrete slab.

4 Practicability of installation

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

5 Thermal Performance

5.1 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) *Conventions for U-value calculations* using the declared thermal conductivity ($\lambda_{90/90}$ value) of 0.038 Wm⁻¹K⁻¹ for Jabcore 70 and 0.036 Wm⁻¹K⁻¹ for Jabcore 100.

5.2 The U value of a complete floor will depend on the selected insulation thickness, the perimeter/area ratio and the floor type. Calculated U values for example constructions are given in Table 2 and Table 3.

Table 2 Example ground supported floor U values ($Wm^{-2}K^{-1}$) for Jabcore 70

	Perimeter/area ratio	Insulation thickness (mm)		
		75	100	150
Slab on ground	0.2	0.20	0.17	0.14
	0.4	0.26	0.22	0.17
	0.6	0.29	0.25	0.19
	0.8	0.32	0.26	0.20
	1.0	0.33	0.27	0.20

Table 3 Example ground supported floor U values ($Wm^{-2}K^{-1}$) for Jabcore 100

	Perimeter/area ratio	Insulation thickness (mm)		
		75	100	150
Slab on ground	0.2	0.19	0.16	0.13
	0.4	0.25	0.21	0.16
	0.6	0.28	0.23	0.18
	0.8	0.30	0.25	0.19
	1.0	0.32	0.26	0.19



5.3 When considering insulation requirements, designers should refer to the detailed guidance contained in the documents supporting the national Building Regulations. The U values shown in Table 1 indicate that the products can enable, or contribute to enable, a floor to achieve the following typical design U values referred to in those supporting documents (see Table 4 and Table 5).

Table 4 Typical design U values for floors — England and Wales and Northern Ireland

$Wm^{-2}K^{-1}$	Construction type
0.22	Mean for new extensions ⁽¹⁾
0.25	'Notional' mean in SAP and SBEM and limit mean for new build
0.25	Mean for replacement, renovated and retained floors and non-domestic consequential improvements ⁽¹⁾
0.70	Individual limit for new build and flexible approaches ⁽¹⁾

(1) Refer to relevant document supporting the national Building Regulations for alternative or flexible approaches.

Table 5 Typical design U values for floors — Scotland

$Wm^{-2}K^{-1}$	Construction type
0.20	'Notional' mean for new dwellings in SAP and the 'simplified' approach: – solid fuel, packages 3 and 6
0.22	– other fuels, packages 1, 2, 4 and 5
0.22	Mean for conversion of unheated buildings and stand alone buildings of less than 50 m ²
0.22	Mean for extensions and alterations ⁽¹⁾
0.25	'Notional' mean for non-domestic in SBEM and limit mean for all new build and stand alone buildings of 50 m ² or more
0.70	Individual limit for new build, new extensions, and alterations ⁽¹⁾ and conversions of heated buildings and stand alone buildings of less than 50 m ²

(1) Refer to relevant documents supporting the national Building Regulations for alternative or flexible approaches.

New buildings

5.4 Floors with U values lower than (or the same as, for dwellings in Scotland) the relevant 'notional' value specified in Tables 4 or 5 will contribute to a building meeting its Target Emission Rate. Floors with higher U values will require additional energy saving measures in the building envelope and/or services.

5.5 The products can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between floors and external walls. Details shown in Figure 1 will allow use of the default psi values for Accredited Construction details in Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM). Detailed guidance in this respect and on limiting heat loss by air infiltration can be found in:

England and Wales — TSO 2002 publication *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings* or Accredited Construction Details (version 1.0).

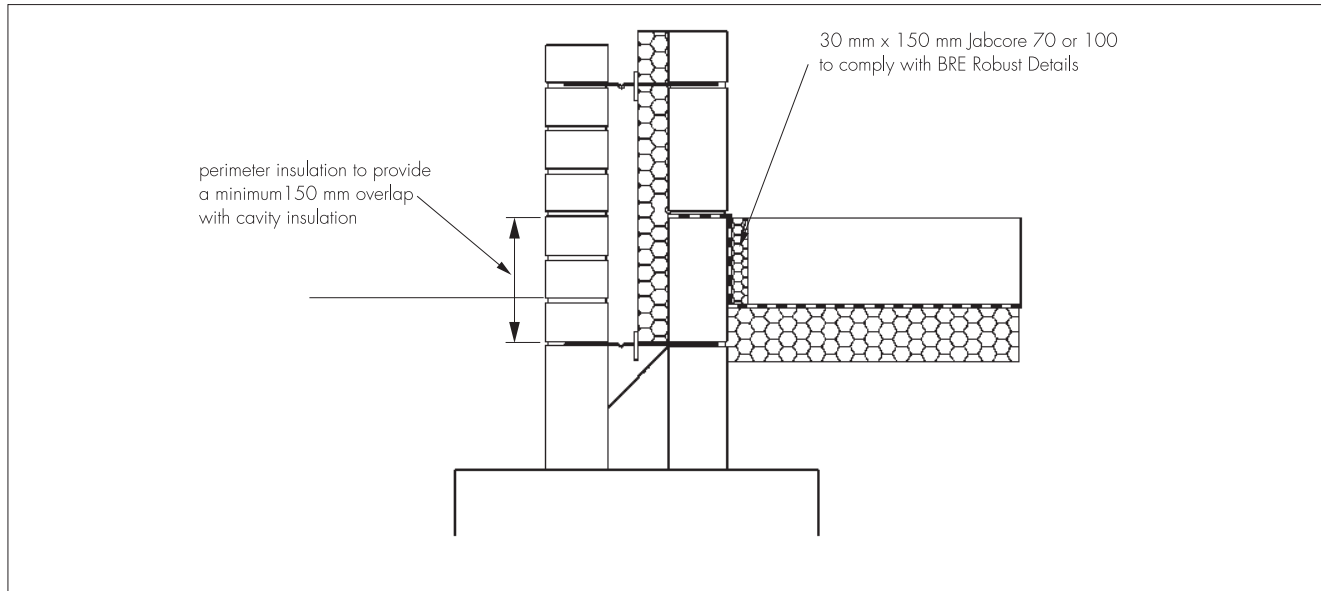
Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

Existing buildings

5.6 For existing buildings, extensions or conversions, floors will be acceptable where they do not exceed the relevant U value in Tables 4 or 5 and junctions comply with section 5.5.

Figure 1 Junction between the floor and the wall



6 Condensation

Interstitial condensation



6.1 Floors will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002, Section 8.5 and Appendix D. The products have a water vapour resistivity exceeding $145 \text{ MNsg}^{-1}\text{m}^{-1}$.

6.2 A vapour control layer in the warm side of the insulation, or the damp-proof membrane (acting as a VCL) situated (as appropriate) in the warm side might be required to limit the risk of interstitial condensation.

Surface condensation



6.3 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ Wm}^{-2}\text{K}^{-1}$ at any point, and the junctions with walls are designed in accordance with the relevant requirements of TSO publication *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings*, 2002 or BRE Information Paper IP 01/06.



6.4 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ Wm}^{-2}\text{K}^{-1}$ at any point. Guidance may be obtained from Section 8 of BS 5250 : 2002 and BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks*.

7 Behaviour in relation to fire

7.1 The products do not prejudice the fire-resistance properties of the floor provided they are used in accordance with BS 6203 : 2003.

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

8 Floor Loading



8.1 The compressive strength of the Jabcore at 1% nominal strain is 20 kNm^{-2} for grade 70 and 45 kNm^{-2} for grade 100.

8.2 The products are suitable for occupancies defined in this Certificate (see section 3.3) when covered with a suitable floor covering and are capable of resisting a uniformly distributed load of $<4 \text{ kNm}^{-2}$ and a concentrated load of $<1.5 \text{ kN}$ for category A and B and type A and B situations for domestic and residential activities as defined in NA to BS EN 1991-1-1 : 2002, Table NA.2 and BS 6399-1 : 1996, Table 1 respectively. Further assessment is necessary in the case of duty walkways and floors subject to physical activities.

8.3 Where the products are used in non-domestic situations or where the floor is subject to:

- loads greater than those defined in section 8.2
- point loads (particularly at edges and corners)
- impact loads.

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

9 Moisture penetration

9.1 The products can be used above or below the dpm.

9.2 For floors subject to national Building Regulations, construction should be as detailed or designed in accordance with:

England and Wales — Approved Document C, Section 4

Scotland — Mandatory Standard 3.4, clauses 3.4.2⁽¹⁾ to 3.4.4⁽¹⁾ and 3.4.6⁽¹⁾

⁽¹⁾ Technical Handbook (Domestic).

Northern Ireland — Technical Booklet C, Section 1.

10 Maintenance



As the products are confined within the floor and they have suitable durability (see section 11), maintenance is not required.

11 Durability



The products are rot-proof, dimensionally stable and, when installed with the overlays specified in this Certificate, will remain effective as an insulating material for the life of the building in which they are incorporated.

Installation

12 General

12.1 Installation of Jabcore 70 and 100 must be in accordance with the Certificate holder's installation instructions and the requirements of this Certificate.

12.2 The products are laid over a sub-base that should be left as long as possible to maximise drying out. The sub-base surface should be compacted smooth, flat and blinded with a 50 mm thickness of compacted sand. Reference to the methods should also be made to BRE report (BR 262 : 2002).

12.3 The products are easily handled and can be cut to size as necessary with a sharp knife or fine-toothed saw.

12.4 A suitable dpm should be incorporated to resist moisture from the ground. It can be placed either above or below the product or above the concrete slab. Care should also be taken to ensure that the integrity of the dpm is maintained.

12.5 If the presence of hydrocarbons and other organic chemical are considered a possibility, the product must be fully protected with a suitable impermeable membrane.

13 Procedure

13.1 The products are cut to size, as necessary and laid in a single or double layer with closely butted joints. If a double layer is used, through-joints must be avoided. See Figure 2.

13.2 The top board joints should be covered with 75 mm wide masking tape to prevent the ingress of concrete between the products.

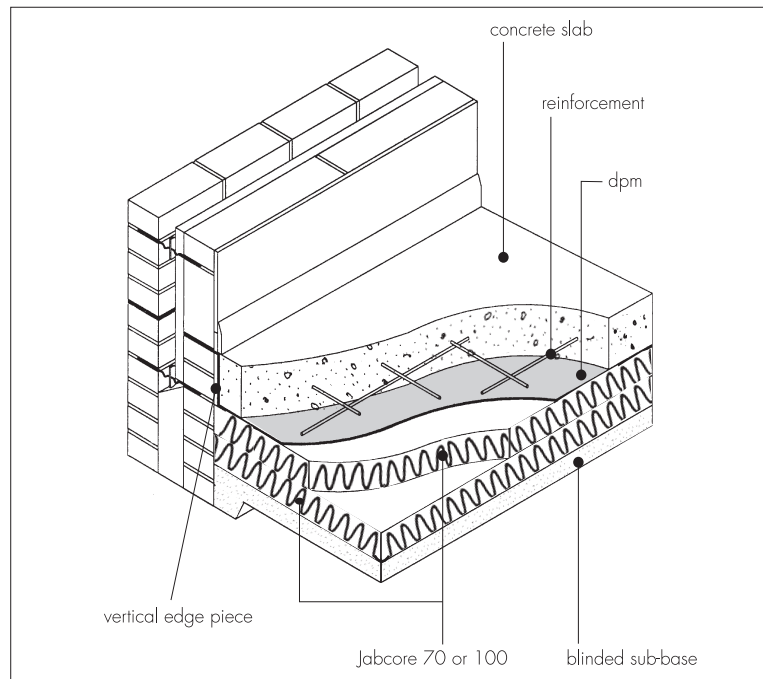
13.3 Vertical edge pieces of insulation should be placed around the perimeter and taped at joints to prevent cold bridging.

13.4 A type A98 steel-mesh reinforcement to BS 4483 : 2005, or other suitable reinforcement as required by the design, should be incorporated in the concrete slab. If reinforcement-spacing blocks are used, they should spread the reinforcement and working loads sufficiently to prevent penetration, or damage to, the product or the dpm.

13.5 The concrete slab is laid to the required thickness and either tamped or power-floated to provide the required finish. During these operations, the surface of the product or the dpm should be protected from impact should be protected from impact damage or excessive trafficking by the use of spreader boards.

13.6 The concrete slab is finished as required.

Figure 2 Concrete slab overlay



14 Incorporation of services

14.1 The products must not be used in direct contact with PVC-sheathed cable electrical heating cables or hot water pipes.

14.2 Electrical cables should be enclosed in a suitable conduit. Where possible, electrical conduits, gas and water pipes or other services should be contained within ducts or channels within the concrete slab.

14.3 Where water pipes are installed either within the slab or the product they must be pre-lagged.

Technical Investigations

15 Tests

15.1 Tests were carried out on Jabcore 70 and 100 to determine:

- compressive strength at 1% nominal strain
- density
- dimensional accuracy.

15.2 Existing data on which previous Certificates were based was examined relating to:

- thermal insulation properties
- equilibrium moisture content
- density and dimensional accuracy
- compressive strength at 10% compression.

16 Investigations

16.1 An assessment of the risk of interstitial condensation was made.

16.2 An assessment of the resistance to imposed loads was made.

Bibliography

BS 4483 : 2005 *Steel fabric for the reinforcement of concrete — Specification*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 6203 : 2003 *Guide to fire characteristics and fire performance of expanded polystyrene materials (EPS and XPS) used in building applications*

BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*

BS 8000-9 : 2003 *Workmanship on building sites — Cementitious levelling screeds and wearing screeds — Code of practice*

BS 8102 : 1990 *Code of practice for protection of structures against water from the ground*

BS 8204-1 : 2003 *Screeds, bases and in-situ floorings — Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*

BS 8215 : 1991 *Code of practice for design and installation of damp-proof courses in masonry construction*

BS EN 1991-1-1 : 2002 *UK National Annex to Eurocodes 1: Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*

BS EN 13163 : 2001 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2007 *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 13370 : 1998 *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*

DD CEN/TS 13810-2 : 2003 *Wood-based panels — Floating floors — Test methods*

Conditions of Certification

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

17.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

17.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

17.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.