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Agrément Certificate
13/5018
Product Sheet 1

ATLAS/AVAL EXTERNAL WALL INSULATION SYSTEM

ATLAS/AVAL EPS EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Atlas/Aval EPS External Wall Insulation System, comprising adhesively fixed expanded polystyrene (EPS) insulation boards, with supplementary mechanical fixings, a reinforced basecoat and render finishes. The system is suitable for use, with height restrictions, on the outside of external masonry walls in new and existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

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

KEY FACTORS ASSESSED

Thermal performance — the system can be used to improve the thermal performance of external walls and can contribute to satisfying the requirements of the national Building Regulations (see section 6).

Strength and stability — the system can be designed to resist the wind loads experienced for a particular location and have adequate impact resistance. The impact resistance is dependent on the system chosen (see section 7).

Behaviour in relation to fire — depending on the system chosen, a reaction to fire classification of B-s1, d0; B-s2, d0; or C-s2,d0 in accordance with EN 13501-1 : 2010, may be achieved and its use is restricted (see section 8).

Condensation — the system can contribute to limiting the risk of interstitial and surface condensation (see section 11).

Durability — under normal service conditions, when installed and maintained in accordance with the Certificate holder's recommendations and the terms of the Certificate, the system will remain effective for at least 30 years (see section 13).

The BBA has awarded this Certificate to the company named above for the system described herein. This system 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

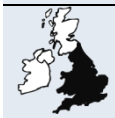
Hardy Giesler
Chief Executive Officer

Date of Fourth issue: 25 October 2022

Originally certificated on 1 July 2013

Regulations

In the opinion of the BBA, the Atlas/Aval EPS External Wall Insulation System, 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 system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The system is restricted by this Requirement. See sections 8.1 to 8.3 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.2 and 11.4 of this Certificate.
Requirement:	**L1(a)(i)**	**Conservation of fuel and power**
Comment:		The system can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**7(2)**	**Materials and workmanship**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.3 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 rates for new buildings (applicable to Wales only)**
Regulation:	**26B**	**Fabric performance values for new dwellings (applicable to Wales only)**
Regulation:	**26C**	**Minimum energy efficiency for new dwellings (applicable to England only)**
Comment:		The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Fitness and durability of materials and workmanship**
Comment:		The system can contribute to a construction satisfying this Regulation. See sections 12 and 13.1 and the *Installation* part of this Certificate.
Regulation:	**8(3)**	**Fitness and durability of materials and workmanship**
Comment:		The system is restricted by this Regulation. See sections 8.1, 8.2 and 8.4 of this Certificate**.**

Regulation:	**9**	**Building standards applicable to construction**
Standard:	1.1	Structure
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is restricted by this Standard, with reference to clauses 2.6.4(1)(2), 2.6.5(1) and 2.6.6(2). See sections 8.1, 8.2 and 8.4 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The system is restricted by this Standard, with reference to clause 2.7.1(1)(2). See sections 8.1, 8.2 and 8.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will contribute to a construction satisfying this Standard, with reference to clauses 3.10.1(1)(2) and 3.10.2(1)(2). See section 10.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 3.15.1(1)(2), 3.15.4(1)(2) and 3.15.5(1)(2). See sections 11.3 and 11.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1(1)(2), 6.1.2(1)(2), 6.1.3(1), 6.1.6(1), 6.1.10(2), 6.2.1(1)(2), 6.2.3, 6.2.4(2), 6.2.5(2), 6.2.6(1), 6.2.7(1), 6.2.8(2), 6.2.9(1)(2), 6.2.10(1), 6.2.11(1), 6.2.12(2) and 6.2.13(1(2). See sections 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4(1)(2) [Aspect 1(1)(2) and 2(2)], 7.1.6(1)(2) [Aspect 1(1)(2) and 2(1)] and 7.1.7(1)(2) [Aspect 1 and 2(1)(2)]. See section 6.1 of this Certificate.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		All comments given for the system 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(1)(a)(i)(ii)(iii)(b)(i)(ii)**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**23(2)**	**Fitness of materials and workmanship**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.3 of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.

Regulation:	**29**	**Condensation**
Comment:		The system can contribute to minimising the risk of interstitial condensation. See section 11.4 of this Certificate.
Regulation:	**30**	**Stability**
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Regulation:	**36(a)**	**External fire spread**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.3 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
Comment:		The system can contribute to satisfying this Regulation. See sections 6.1 and 6.2 of this Certificate.
Regulation:	**40(2)**	**Target carbon dioxide emission rate**
Regulation:	**43B**	**Nearly zero-energy requirements for new buildings**
Comment:		The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

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

See section: 3 *Delivery and site handling* (3.1 and 3.3) of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, the Atlas/Aval EPS External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*(1), Part 6 *Superstructure (excluding roofs),* Chapter 6.9 *Curtain walling and cladding*.

(1) There is a general requirement in *NHBC Standards* 2022, Chapter 6.9, for fire-retardant-treated insulation in accordance with BS EN 13163 : 2012.

Technical Specification

1 Description

1.1 The Atlas/Aval EPS External Wall Insulation System comprises EPS insulation boards primarily fixed with a minimum of 40% coverage of adhesive; supplementary mechanical fixings are applied through the insulation boards while the adhesive is setting. Basecoat is applied to the surface of the boards to a uniform thickness, along with the reinforcing mesh, and the surface smoothed with a trowel. When the basecoat is dry, the selected finishes are applied (see Figure 1).

1.2 The system comprises the following components:

Adhesives

- Atlas Stopter K-20, Atlas Hoter S (Aval KT 53) and Atlas Hoter U (Aval KT 55) — cementitious powder adhesives requiring the addition of 5 to 5.5 litres of clean water per 25 kg bag, with a coverage of 4.0 to 5.0 kg·m^{-2}

Insulation(1)

- white EPS insulation board — 1200 by 600 mm, in a range of thicknesses between 20(2) and 300 mm in 5 mm increments, with a nominal density of 15 kg·m^{-3}, a minimum compressive strength of 70 kN·m^{-2} and a declared thermal conductivity of 0.038 W·m^{-1}·K^{-1}. Boards are manufactured to comply with the requirements of BS EN 13163 : 2012 and are classified as E in accordance with BS EN 13501-1 : 2007.
- grey EPS insulation boards — 1200 by 600 mm in a range of thickness between 25(2) and 200 in 10 mm increments, with nominal density of 15 kg m^{-3}, a minimum compressive strength of 70 kNm^{-2} and a declared thermal conductivity of 0.032 W m^{-1} K^{-1}. Boards are manufactured to comply with the requirements of BS EN 13163 : 2012 and are classified as E in accordance with BS EN 13501-1 : 2007.

(1) For declared thermal conductivity (λ_D) value, see section 6.1.
(2) Insulation thicknesses of 20 to 50 mm would generally be used in reveals.

Supplementary mechanical fixings

- mechanical fixings(1) — anchors with adequate length to suit the substrate and the insulation thickness, approved and supplied by the Certificate holder, and selected from:
  — Wkret-MET- LFNΦ8 — polypropylene anchor sleeve with a glass fibre-reinforced polypropylene pin
  — Wkret-MET- LFMΦ8 — polypropylene anchor sleeve with a galvanized steel pin
  — Wkret-MET- LTXΦ8 — polypropylene anchor sleeve with a polyamide pin
  — Wkret-MET- LMXΦ8 — polypropylene anchor sleeve with a galvanized steel pin
  — Koelner KI-10 — polypropylene anchor sleeve with a glass fibre-reinforced polypropylene pin
  — Koelner KI-8M — polypropylene anchor sleeve with a galvanized steel pin
  — Koelner KI-10N — polypropylene anchor sleeve with a galvanized steel pin with a long expansion zone
  — Koelner TFIX-8S — screwed-in polypropylene anchor sleeve with a galvanized steel pin
  — Koelner TFIX-8ST — all-purpose polypropylene anchor sleeve with integrated thermal insulation plug

(1) Other fixings may be used provided they can be demonstrated to have equal or higher pull-out strength, plate diameter and plate stiffness characteristics.

Basecoats

- Atlas Stopter K-20 and Atlas Hoter U (Aval KT 55) — cementitious powder adhesives applied to a thickness of 2.0 to 5.0 mm (applied to 4.0 to 6.0 mm thickness when two layers of reinforcing mesh are used)

Reinforcing mesh

- Atlas 150 — an alkali- and slide-resistant glass fibre mesh with a 4.5 by 5.0 mm grid size, with a mass per unit area of 150 g·m^2
- Atlas 165 — an alkali- and slide-resistant glass fibre mesh with a 3.7 by 3.9 mm grid size, with a mass per unit area of 160 g·m^2

Key coats(1)

- Atlas Cerplast and Aval KT 16 — ready-to-use acrylic-based liquid binders, with mineral fillers and additives, to be used with Atlas Cermit Mineral, Atlas Acrylic Render and Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) finishing coats
- Atlas Silkat ASX — ready-to-use silicone-based liquid binders, with mineral fillers, pigments and additives, to be used with Atlas Silicate Render finishing coats
  Atlas Silkon ANX — ready-to-use silicone-based liquid binders, with mineral fillers, pigments and additives, to be used with Atlas Silicone Render and Atlas Silicone-Silicate Render.

(1) Applied to 0.25 to 0.35 k·gm^{-2} coverage.

Finishing coats(1)

Mineral

- Atlas Cermit Mineral (SN & DR, SN – MAL) — mineral-based powders, requiring the addition of 0.23 to 0.26 litres of clean water per kg, with particle sizes of 1.5, 2.0, 2.5 or 3.0 mm, and a coverage of 2.5 to 4.5 kg·m^{-2}

Acrylic

- Atlas Acrylic Render — a ready-to-use paste with particle sizes of 1.5, 2.0 or 3.0 mm, and a coverage of 2.5 to 5.0 $kg \cdot m^{-2}$

Acrylic-silicone

- Atlas Acrylic-Silicone Render (also known as Aval Acrylic-Silicone Render) — a ready-to-use paste with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 5.5 $kg \cdot m^{-2}$

Silicone

- Atlas Silicone Render — a ready to use paste silicone-based paste with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 3.5 $kg \cdot m^{-2}$

Silicate

- Atlas Silicate Render — a ready-to-use silicate-based paste with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 5.5 $kg \cdot m^{-2}$

Silicone-Silicate

- Atlas Silicone-Silicate Render — a ready to use silicone-silicate-based paste with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 3.0 $kg \cdot m^{-2}$

(1) Thicknesses are regulated by particle size.

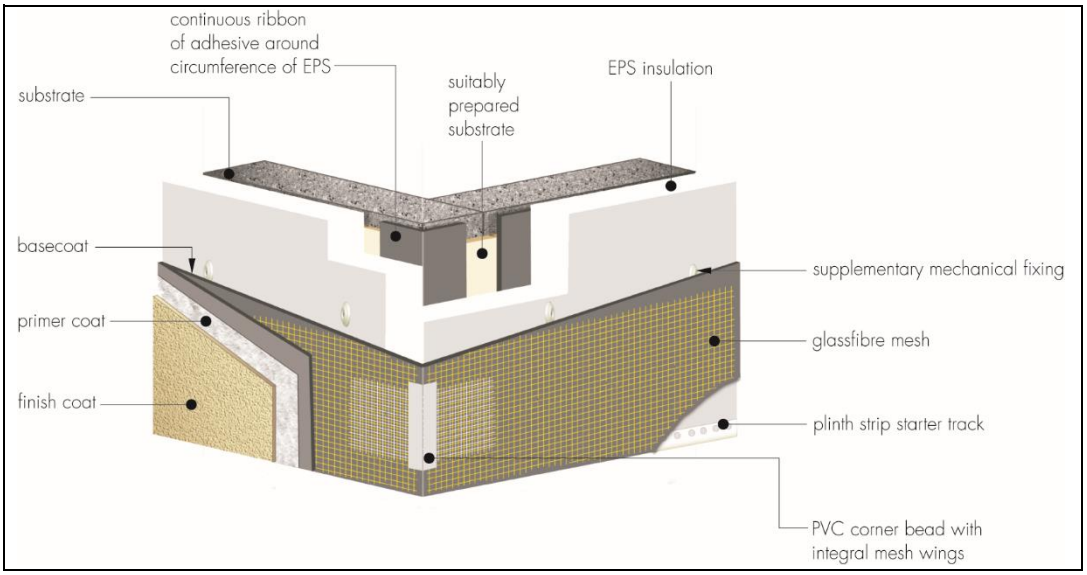
Primers

- Atlas Arkol SX — a ready-to-use liquid, silicone-emulsion-based binder with mineral fillers and additives, to be used with Atlas Salta S, with a coverage of 0.20 $kg \cdot m^{-2}$
- Atlas Arkol NX — a ready-to-use liquid, silicone-emulsion-based binder with mineral fillers and additives, to be used with Atlas Salta N and Atlas Salta, with a coverage of 0.20 $kg \cdot m^{-2}$

Paints

- Atlas Salta S — a ready-to-use silicate-based coating with pigments and additives to be used optionally with all finishing coats, with a coverage of 0.20 to 0.28 $kg \cdot m^{-2}$
- Atlas Salta N — a ready-to-use silicone-based coating, with pigments and additives, to be used optionally with all finishing coats, with a coverage of 0.12 to 0.25 $kg \cdot m^{-2}$
- Atlas Salta — a ready-to-use liquid, silicone-based resin with pigments and additives, to be used optionally with all finishing coats, with a coverage of 0.12 to 0.25 $kg \cdot m^{-2}$
- Atlas Salta E — a ready-to-use liquid, acrylic-based with pigments and additives, to be used optionally with all finishing coats, with a coverage of 0.12 to 0.25 $kg \cdot m^{-2}$.

Figure 1 The Atlas/Aval EPS External Wall Insulation System



1.3 Ancillary materials also used with the system are:

- a range of aluminium, PVC-U or stainless steel profiles, comprising:
  — base profile
  — edge profile
  — corner profile
  — render stop profile.

1.4 The Certificate holder recommends the following ancillary items for use with the system, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- movement (expansion) joints
- profile connectors and fixings
- fungicidal wash, water-based masonry cleaner and steriliser containing biocides
- expansion foam
- sealants — silicone or mastic silicone
- mineral wool cavity barrier.

2 Manufacture

2.1 The system components are either manufactured by the Certificate holder or bought in from suppliers, to an agreed specification.

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 Atlas sp. z o.o. has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by DQS GmbH (Certificate 062002 QM15/UM).

3 Delivery and site handling

3.1 The system components are delivered to site in the packaging and quantities listed in Table 1. Each package carries the product identification and the BBA logo incorporating the number of this Certificate.

Table 1 Component supply details

Component	Packaging/quantity/size
Insulation	Sealed packs, board sizes of 1200 x 600 mm
Atlas Stopter K-20, Atlas Hoter S (Aval KT 53) and Atlas Hoter U (Aval KT 55) adhesives	25 kg bags
Atlas 150 Atlas 160	50 m rolls, 1.0 m wide
Atlas Stopter K-20 and Atlas Hoter U (Aval KT 55) basecoats	25 kg bags
Atlas Cerplast and Aval KT 16 Atlas Silkat ASX Atlas Silkon ANX	5, 10, 15, 25 kg buckets 15 kg buckets 15 kg buckets
Atlas Cermit Mineral	25 kg bags
Atlas Acrylic Render Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) Atlas Silicone Render Atlas Silicate Render Atlas Silicone-Silicate Render Atlas Arkol SX Atlas Arkol NX	25 kg buckets
Atlas Salta S Atlas Salta N Atlas Salta Atlas Salta E	10 litre buckets
Supplementary mechanical fixings	Boxed by the manufacturer

3.2 The boards must be stored on a firm, clean and dry, level base, off the ground and under cover until required for use. Care must be taken when handling to avoid damage.

3.3 The boards must be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting. Care must be taken to avoid contact with solvents or materials containing volatile organic components. The boards must not be exposed to open flame or other ignition sources.

3.4 The adhesives, basecoats and topcoat renders, including the paints, must be stored in dry conditions within 5 and 30°C, off the ground and protected from moisture. Contaminated material must be discarded.

3.5 The primers should be stored in a safe area, under cover, and protected from excessive heat and frost at all times.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Atlas/Aval EPS External Wall Insulation System.

Design Considerations

4 General

4.1 The Atlas/Aval EPS External Wall Insulation System, when installed in accordance with this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external masonry or concrete walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from

treatment with the system (eg the insulation must be protected by an overhang, and window sills should be designed and installed so as to direct water away from the building).

4.2 For improved thermal/carbon-emissions performance of the structure, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of external walls of masonry, normal weight concrete, lightweight concrete, autoclaved concrete or no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render), with the height restrictions described in section 8. Prior to the installation of the system, wall surfaces should comply with section 14.

4.4 New walls subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1992-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS 8000-0 : 2014
- BS 8000-2.2 : 1990
- BS 8000-3 : 2001
- PD 6697 : 2019.

4.5 New walls not subject to Regulatory requirements should also be built in accordance with the Standards identified in section 4.4.

4.6 Movement joints should be incorporated into the system in line with existing movement joints in the building structure and in accordance with the Certificate holder's recommendations for the specific installation.

4.7 The system will improve the weather resistance of a wall and provide a decorative finish. However, for existing buildings, they should only be installed where there are no signs of dampness on the inner surface of the wall other than those caused solely by condensation.

4.8 The effect of the system on the acoustic performance of a construction is outside the scope of this Certificate.

4.9 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the system is outside the scope of this Certificate (see section 4.10).

4.10 External pipework and ducts should be removed before installation, and alterations made to underground drainage to accommodate repositioning of the pipework to the finished face of the system. The Certificate holder can advise on suitable fixing methods, but these are outside the scope of this Certificate.

4.11 The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

4.12 It is essential that the system is installed and maintained in accordance with the conditions set out in this Certificate.

5 Practicability of installation

The system should only be installed by specialist contractors who have successfully undergone training and registration by the Certificate holder (see section 15).

Note: The BBA operates a UKAS-accredited Approved Installer Scheme for external wall insulation; details of approved installer companies are included on the BBA's website (www.bbacerts.co.uk).

6 Thermal performance

6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006, using the declared thermal conductivity (λ_D) values of 0.038 and 0.032 $W \cdot m^{-1} \cdot K^{-1}$ for the white and grey EPS respectively.

6.2 The U value of a completed wall will depend on the selected insulation thickness, the type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample construction in accordance with the national Building Regulations are given in Table 2.

Table 2 Insulation thickness required to achieve design U values(1)(2)

U-value(3) ($W \cdot m^{-2} \cdot K^{-1}$)	Insulation thickness requirement (mm)			
	Grey EPS 0.032(4)		White EPS 0.038(5)	
	215 mm brickwork λ = 0.56 $W \cdot m^{-1} \cdot K^{-1}$	200 mm dense blockwork λ = 1.75 $W \cdot m^{-1} \cdot K^{-1}$	215 mm brickwork λ = 0.56 $W \cdot m^{-1} \cdot K^{-1}$	200 mm dense blockwork λ = 1.75 $W \cdot m^{-1} \cdot K^{-1}$
0.17	180	190	225	235
0.18	170	180	210	220
0.20	150	160	200	210
0.21	140	150	175	185
0.22	140	140	170	180
0.23	130	140	165	175
0.25	120	120	140	150
0.26	110	120	135	145
0.27	110	110	130	134
0.28	100	110	120	130
0.30	90	100	110	120
0.35	80	90	90	100

(1) Wall construction inclusive of 13 mm plaster (λ = 0.57 $W \cdot m^{-1} \cdot K^{-1}$) , μ = 10, 14 mm render (λ = 1.0 $W \cdot m^{-1} \cdot K^{-1}$), μ = 6 (wet), 215 mm brickwork (protected) μ = 10 with 17.1% mortar, or 200 mm dense blockwork μ = 100 with 6.7% mortar (λ = 0.88 $W \cdot m^{-1} \cdot K^{-1}$), and 5 mm adhesive ($\lambda$ = 0.43 $W \cdot m^{-1} \cdot K^{-1}$) covering 40% of the area. Internal boundary resistance (R_{si}) — 0.13 $m^2 \cdot K \cdot W^{-1}$ and external boundary resistance (R_{se}) — 0.04 $m^2 \cdot K \cdot W^{-1}$. Insulation λ_D as per section 6.1

(2) Calculations based on a system that included 4 fixings per m^2, with a point thermal transmittance (Xp) of 0.003 $W \cdot K^{-1}$ per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017

(3) When applying the maximum available insulation thickness, these walls can achieve a U value of 0.15 to 0.16 $W \cdot m^{-2} \cdot K^{-1}$ for grey EPS and 0.13 $W \cdot m^{-2} \cdot K^{-1}$ for white EPS

(4) Based upon an incremental insulation thickness of 10 mm.

(5) Based upon an incremental insulation thickness of 5 mm.

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

7 Strength and stability

General

7.1 The Certificate holder is ultimately responsible for the design of the system and it is the responsibility of the company installing the system to accurately follow the installation instructions (see also section 5). The Certificate holder must also verify that a suitably experienced and qualified individual (with adequate professional indemnity) establishes that:

- the wind loads on the different zones of the building's elevation for the specific geographical location have been calculated correctly (see section 7.3)
- the system can adequately resist and safely transfer the calculated loads, accounting for all possible failure modes, to the substrate wall and supporting structure (see sections 7.3 to 7.6).

7.2 The substrate and supporting structure must be capable of transferring all additional loading due to the installation of the system to the ground in a satisfactory manner. The adequacy of the substrate and supporting

structure must be verified by the person or party responsible for the global stability of the building to which the system is applied. Any defects should be made good prior to the system being installed.

7.3 The wind loads on the walls should be calculated, taking into account all relevant factors such as location and topography, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. All the factors affecting wind load on each elevation and specific zones of the building must be considered. In accordance with BS EN 1990 : 2002, a partial factor of 1.5 must be applied to the calculated characteristic wind load to establish the design wind load to be resisted by the system.

7.4 Installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight of the system, wind and impact.

7.5 Positive wind load is transferred to the substrate wall directly via compression through the render and insulation system.

7.6 Negative wind load is transferred to the substrate wall via(1)(2):

- the bond between the insulation and render system (see section 7.7)
- the tensile strength of the insulation (see section 7.8)
- the bond between the adhesive and the insulation interface(3) (see section 7.9)
- the bond between the substrate and adhesive interface(3) (see section 7.10).

(1) For an adhesively fixed system with supplementary mechanical fixings, the contribution of the fixings is not considered when calculating resistance to wind load.
(2) Further guidance is given in BBA Guidance Note 1, available on the BBA website (www.bbacerts.co.uk).
(3) The percentage of adhesive coverage should be considered.

7.7 The characteristic bond resistance between the insulation and render interface derived from test results was 80 $kN \cdot m^{-2}$. The design resistance of the bond between the insulation and render (N_{RD1}) should be taken as the characteristic bond resistance divided by a partial factor of 9.

7.8 The characteristic tensile resistance of the insulation material may be taken as 100 $kN \cdot m^{-2}$ and should be divided by a partial material factor of 2.5 to establish the ultimate design resistance of the insulation ($Rd_{t.ins}$).

7.9 The characteristic bond resistance between the adhesive and the insulation derived from test results was 30 $kN \cdot m^{-2}$(1). The design resistance of the bond between the adhesive and insulation (N_{RD2}) should be taken as this value divided by a partial factor of 9.

(1) The minimum bonded surface area (A_{min}) should not be less than 40%.

7.10 The characteristic bond resistance between the substrate and the adhesive derived from test results was 250 $kN \cdot m^{-2}$(1)(2)(3). The design resistance of the bond between the substrate and the adhesive (N_{RD3}) should be taken as the characteristic resistance divided by a partial factor of 9.

(1) The bond between the substrate and the adhesive from the test should have a minimum failure resistance of 250 $kN \cdot m^{-2}$ after the adhesive has fully cured and in dry conditions, in accordance with ETAG 004 : 2013. The minimum failure resistance value is based on a minimum 28 day curing time of the test sample.
(2) The results from tests carried out on site for the bond (while the adhesive is curing) between the substrate and the adhesive should be at least equal to 80 $kN \cdot m^{-2}$.
(3) The minimum bonded surface area (A_{min}) should not be less than 40%.

7.11 The number and spacing of the supplementary fixings should be determined by the Certificate holder. Provided the substrate wall is suitable and the supplementary fixings are covered by an appropriate ETA or UKTA, the fixings will initially transfer the weight of the insulation system to the substrate wall while the adhesive is curing. However, since the characteristic pull-out resistance values are dependent on the substrate type, the fixing must be selected to suit the specific loads and substrate(1).

(1) To qualify as suitable data, the age and condition of the substrate must be equivalent to that used to establish the values in the ETA. If this is not the case, site-specific pull-out tests must be carried out.

7.12 The data obtained from sections 7.7 to 7.10 must be assessed against the design wind load and the following expression must be satisfied:(1)(2).

For safe design:

$Rd \geq W_e$

$Rd_{b.ins/rend} = A_r * N_{RD1}$
$Rd_{t.ins}$ = characteristic tensile strength of insulation/2.5
$Rd_{b.adh/ins} = A_{min} * N_{RD2}$
$Rd_{b.sub/adh} = A_{min} * N_{RD3}$

Where:

Rd	is the design ultimate resistance ($kN \cdot m^{-2}$) taken as the minimum of $Rd_{b.ins/rend}$, $Rd_{t.ins}$, $Rd_{b.adh/ins}$ and $Rd_{b.sub/adh}$
W_e	is the maximum design wind load ($kN \cdot m^{-2}$)
$Rd_{b.ins/rend}$	is the bond design resistance between the insulation and render ($kN \cdot m^{-2}$)
A_r	is the reinforced basecoat bond area (based on % area covered)
N_{RD1}	is the design adhesive bond resistance between the insulation and render based on tests ($kN \cdot m^{-2}$)
$Rd_{b.adh/ins}$	is the bond design resistance between the insulation and adhesive ($kN \cdot m^{-2}$)
A_{min}	is the minimum bonded surface area (based on % area covered)
N_{RD2}	is the design bond resistance between insulation and adhesive based on tests ($kN \cdot m^{-2}$)
$Rd_{b.sub/adh}$	is the design bond resistance between the substrate and adhesive ($kN \cdot m^{-2}$)
N_{RD3}	is the design bond resistance between the substrate and adhesive based on tests ($kN \cdot m^{-2}$).

(1) If the minimum design resistance (Rd) calculated in sections 7.7 to 7.10 is less than design wind pressure, the bonded surface area (A_{min}) should be increased.
(2) If the minimum bonded surface area required to resist the design wind load is higher than 100%, the system would need to be mechanically fixed and therefore should not be installed: mechanically fixed system requirements have not been assessed with this Certificate.

Impact resistance

7.13 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Use Categories up to and including those specified in Table 3 of this Certificate.

Table 3 System impact resistance

Render systems: Basecoat + relevant primer/key coat	Finishing coat	Use Category(1)	
		Single mesh	Double mesh
EPS + basecoat Atlas Stopter K-20	Atlas Cermit Mineral	Category lll	Category ll
	Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render)		–
	Atlas Silicate Render		Category ll
	Atlas Acrylic Render	Category ll	–
	Atlas Silicone-Silicate Render		
EPS + basecoat Atlas Hoter U (Aval KT 55)	Atlas Cermit Mineral	Category lll	
	Atlas Acrylic-Silicone Render		
	Atlas Silicate Render	Category ll	
	Atlas Silicone Render		
	Atlas Acrylic Render		
	Atlas Silicone-Silicate Render		

(1) The Use Categories are defined in ETAG 004 : 2013 as:
- Category I — a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II — a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III — a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

8 Behaviour in relation to fire

8.1 The product may achieve the reaction to fire classifications in Table 4. These classifications may not be achieved by other thicknesses or other constructions and the classifications and permissible areas of use should therefore be confirmed in accordance with the requirements of the documents supporting the national Building Regulations

Table 4 Reaction to fire classification

Classification	Construction	Method/report reference[(1)]
B-s1, d0	● adhesives — Atlas Stopter K-20 — Atlas Hoter S (Aval KT 53) — Atlas Hoter U (Aval KT 55) ● EPS different types, in 250 mm maximum thickness ● basecoats — Atlas Stopter K-20 — Atlas Hoter U(Aval KT 55) ● reinforcing meshes — Atlas 150 mesh — Atlas 165 mesh ● key coats — Atlas Cerplast (Aval KT 16) — Atlas Silkat ASX ● finishing coats — Atlas Cermit Mineral — Atlas Silicate Render ● primer — Atlas Arkol NX — Atlas Arkol SX ● paints — Atlas Salta — Atlas Salta S — Atlas Salta N — Atlas Salta E	EN 13501-1 : 2010/ MPA Dresden, 2010-B-2628/01
B-s2, d0	● adhesives — Atlas Stopter K-20 — Atlas Hoter S (Aval KT 53) — Atlas Hoter U (Aval KT 55) ● EPS different types, in 250 mm maximum thickness ● basecoats — Atlas Stopter K-20 — Atlas Hoter U (Aval KT 55) ● reinforcing meshes — Atlas 150 mesh — Atlas 165 mesh ● key coats — Atlas Cerplast (Aval KT 16) — Atlas Silkon ANX ● finishing coat — Atlas Cermit Mineral — Silicone render ● paints — Atlas Salta E — Atlas Salta N — Atlas Salta	EN 13501-1 : 2010/ MPA Dresden, 2010-B-2628/04

Table 4 Reaction to fire classification (continued)

C-s2, d0	• adhesive — Atlas Stopter K-20 • EPS with highest density 20 kg·m^3, in 200 mm thickness • basecoats — Atlas Stopter K-20 • reinforcing mesh — Atlas 150 mesh • key coat — Atlas Silkon ANX • finishing coats — Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) • primer — Atlas Arkol NX • paints — Atlas Salta N	EN 13501-1 : 2010/ MPA Dresden, 20151187/041.1

(1) Copies available from the Certificate holder.

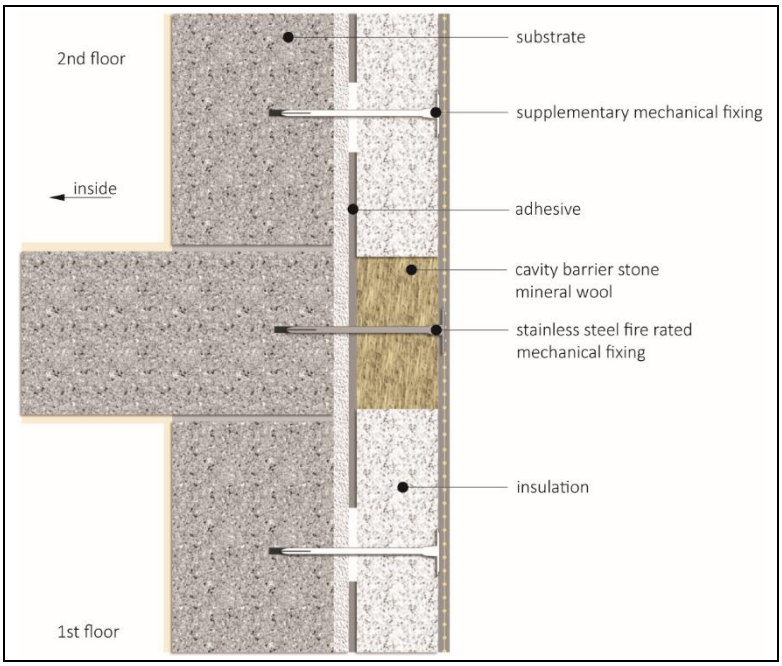
8.2 The insulation components in isolation are classified as E, to BS EN 13501-1 : 2007.

8.3 In England, Wales and Northern Ireland, the product should not be used on buildings that have a storey more than 18 m above ground level. The constructions achieving B-s2, d0 and B-s1, d0 in Table 4 may be used on buildings at any proximity to a boundary. The constructions achieving C-s2, d0 in Table 4 may be used 1 metre or more from a relevant boundary.

8.4 In Scotland, the product should not be used on buildings that have a storey 11 m or more above ground level or 1 m or less from a boundary. The constructions achieving B-s2, d0, B-s1, d0 and C-s2, d0 in Table 4 may be used on buildings more than 1 m from a boundary, with exceptions on some entertainment, assembly, hospital and residential care buildings.

8.5 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall wall construction (see Figure 2).

Figure 2 Example cavity barrier details



9 Proximity of flues and appliances

Detailed guidance can be found in the documents supporting the national Building Regulations for the provisions that are applicable when the system is installed in close proximity to certain flue pipes and/or heat-producing appliances.

10 Water resistance

10.1 The system will provide a degree of protection against rain ingress. However, care should be taken to ensure that walls are adequately watertight prior to application of the system. The system must only be installed where there are no signs of dampness on the inner surface of the substrate other than those caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of water ingress.

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the watertightness of solid wall constructions. The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

10.4 At the top of walls, the system should be protected by an adequate overhang or other detail designed for use with this type of system (see section 16).

11 Condensation

11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and junctions, to minimise the risk of condensation. The recommendations of BS 5250 : 2021 should be followed.

Surface condensation

11.2 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed 0.7 $W \cdot m^{-2} \cdot K^{-1}$ at any point and the junctions with other elements and openings comply with section 6.3.

11.3 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point and detailing is in accordance with BS 5250 : 2021. Additional guidance may be obtained from BRE Report BR 262 : 2002.

Interstitial condensation

11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2021 Section 4 and Annexes D and G.

11.5 The water vapour resistance factor (μ) (for the insulation boards) and equivalent air layer thickness (s_d) (for the render systems) is shown in Table 5.

Table 5 Water vapour resistance factor (μ) and equivalent air layer thickness (s_d)

	Thickness (mm)	Water vapour resistance factor (μ)	Equivalent air layer thickness, s_d (m)
White and Grey EPS	—	20 to 40[1]	—
Render system: Atlas Stopter K-20 basecoat (4 mm) + Atlas Silkon ANX key coat and finishing coat indicated			
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm)	7	—	0.23[2]
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Salta N	7	—	0.26[2]
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Salta E	7	—	0.24[2]
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Salta S	7	—	0.29[2]
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Arkol NX + Atlas Salta	7	—	0.30[2]
Atlas Silkat ASX + Atlas Silicate Render (2 mm)	7	—	0.17[2]
Atlas Silkat ASX + Atlas Silicate Render (2 mm) + Atlas Arkol SX + Atlas Salta S	7	—	0.20[2]
Atlas Silkat ASX Atlas Silicate Render (2 mm) + Atlas Salta N + Atlas Silicate Render (2 mm) + Atlas Salta	7	—	0.31[2]
	7	—	0.23[2]
Atlas Cerplast + Atlas Acrylic Render (2 mm)	7	—	0.35[2]
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm) + Atlas Salta N	7	—	0.35[2]
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm) + Atlas Salta E	7	—	0.36[2]
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm) + Atlas Salta	7	—	0.36[2]
Atlas Silkon ANX + Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) (2 mm)	6	—	0.34[2]
Atlas Silkon ANX + Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) (2 mm) + Atlas Salta N	6	—	0.35[2]
Atlas Silkon ANX Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) (2 mm) + Atlas Salta	6	—	0.35[2]
Atlas Silkon ANX + Atlas Silicone Render (2 mm)	6	—	0.36[2]
Atlas Silkon ANX + Atlas Silicone Render (2 mm) + Atlas Salta N	6	—	0.58[2]
Atlas Silkon ANX + Atlas Silicone Render (2 mm) + Atlas Salta S	6	—	0.36[2]
Atlas Silkon ANX + Atlas Silicone Render (2 mm) + Atlas Salta	6	—	0.38[2]
Atlas Silkon ANX + Atlas Silicone-Silicate Render(2 mm)	6	—	0.44[2]
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm) + Atlas Salta N	6	—	0.54[2]
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm) + Atlas Salta S	6	—	0.49[2]
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm) + Atlas Salta)	6	—	0.45[2]

Table 5 Water vapour resistance factor (μ) and equivalent air layer thickness (s_d) (continued)

Render system: Atlas S Hoter (Aval KT 55) basecoat (4 mm) + Atlas Cerplast (Aval KT 16) key coat and + finishing coats indicated			
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm)	7	—	0.20(2)
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Salta N	7	—	0.16(2)
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Salta E	7	—	1.18(2)
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Arkol SX) + Atlas Salta S	7	—	0.21(2)
Atlas Cerplast (Aval KT 16) + Atlas Cermit Mineral (3 mm) + Atlas Arkol NX + Atlas Salta	7	—	0.19(2)
Atlas Silkat ASX + Atlas Silicate Render (2 mm)	7	—	0.15(2)
Atlas Silkat ASX + Atlas Silicate Render (2 mm) + Atlas Salta N	7	—	0.24(2)
Atlas Silkat ASX + Atlas Silicate Render (2 mm) + Atlas Arkol SX + Atlas Salta S	7	—	0.15(2)
Atlas Silkat ASX + Atlas Silicate Render (Aval Silicate Render) (2 mm) + Atlas Arkol NX + Atlas Salta	7	—	0.23(2)
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm)	7	—	0.25(2)
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm) + Atlas Salta N	7	—	0.29(2)
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm) + Atlas Salta E	7	—	0.36(2)
Atlas Cerplast (Aval KT 16) + Atlas Acrylic Render (2 mm) + Atlas Salta	7	—	0.30(2)
Atlas Silkon ANX + Atlas Acrylic-Silicone Render	6	—	0.40(2)
Atlas Silkon ANX + Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) (2 mm) + Atlas Salta N	6	—	0.69(2)
Atlas Silkon ANX + Atlas Acrylic-Silicone Render (Aval Acrylic-Silicone Render) (2 mm) + Atlas Salta	6	—	0.69(2)
Atlas Silkon ANX + Atlas Silicone Render (2 mm)	6	—	0.34(2)
Atlas Silkon ANX + Atlas Silicone Render (2 mm) + Atlas Salta N	6	—	0.55(2)
Atlas Silkon ANX + Atlas Silicone Render (2 mm) + Atlas Salta S	6	—	0.35(2)
Atlas Silkon ANX (Aval KT 76) + Atlas Silicone Render (2 mm) + Atlas Salta	6	—	0.35(2)
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm)	6	—	0.44(2)
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm) + Atlas Salta N	6	—	0.45(2)
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm) + Atlas Salta S	6	—	0.54(2)
Atlas Silkon ANX + Atlas Silicone-Silicate Render (2 mm) + Atlas Salta	6	—	0.47(2)

(1) The water vapour resistance factors (μ values) are taken from BS EN 13163 : 2012, Table F.2. It is recommended that the lower figure is used when assessing the interstitial condensation risk.

(2) The values are obtained from tests including those on the basecoat, reinforcing mesh, primer and finishing coat.

12 Maintenance and repair

12.1 An initial inspection should be made within 12 months and regularly thereafter to include:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- examination of the sealant around openings and service entry points
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters; such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints (for example, between the insulation system and window and door frame).

12.2 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1 : 2005.

13 Durability

13.1 Under normal service conditions, the system will remain effective for at least 30 years, provided any damage to the surface finish is repaired immediately, and regular maintenance is undertaken as described in section 12.

13.2 Any render containing Portland cement may be subject to lime bloom. The occurrence of this may be reduced by avoiding application in adverse weather conditions. The effect is transient and less noticeable on lighter colours.

13.3 The render may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating.

13.4 To maintain a high quality aesthetic appearance, it may be necessary to periodically overcoat the building using a suitable masonry coating (ie one covered by a valid BBA Certificate for this purpose). Care should be taken not to adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

Installation

14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for treatment and the need for any necessary repairs to the building structure before application of the system. A specification is prepared for each elevation of the building indicating:

- additional corner mesh and reinforcement, where required
- the position of beads
- detailing around windows and doors and at eaves
- damp-proof course (dpc) level (not covered by this Certificate)
- exact position of expansion joints
- areas where flexible sealants must be used
- where required, the position of fire barriers.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the bond strength between the adhesive and the substrate and demonstrate that the pull-out resistance of the proposed supplementary mechanical fixings from the substrate is adequate. An assessment and recommendation should be made on the minimum bond strength, and type and number of fixings, required to withstand the building's expected wind loading based on calculations using the test site data in accordance with section 7.

14.3 All modifications, such as alterations to external plumbing and necessary repairs to the building structure, must be completed before installation of the system commences.

14.4 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight edge spanning the storey height. Any excessive irregularities, ie greater than 10 mm, must be made good prior to installation, to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

14.5 Where surfaces are covered with an existing render, it is essential that the bond between the background and the render is adequate. All loose areas should be hacked off and reinstated.

14.6 On existing buildings, purpose-made sills must be fitted to extend beyond the finished face of the system. New buildings should incorporate suitably deep sills.

14.7 Internal wet work, eg screeding or plastering, should be completed and allowed to dry prior to the application of the system.

15 Approved installers

Application of the system, within the context of this Certificate, must be carried out by installers approved by the Certificate holder. Such an installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member-operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

16 Procedure

General

16.1 Installation of the system must be carried out in accordance with the Certificate holder's installation instructions and this Certificate.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, or if exposure to frost is likely, and the coating must be protected from rapid drying. Installation should not take place during rainfall or if rain is anticipated. In addition, cementitious-based renders must not be applied if the temperature will fall below 0°C within 72 hours of completion.

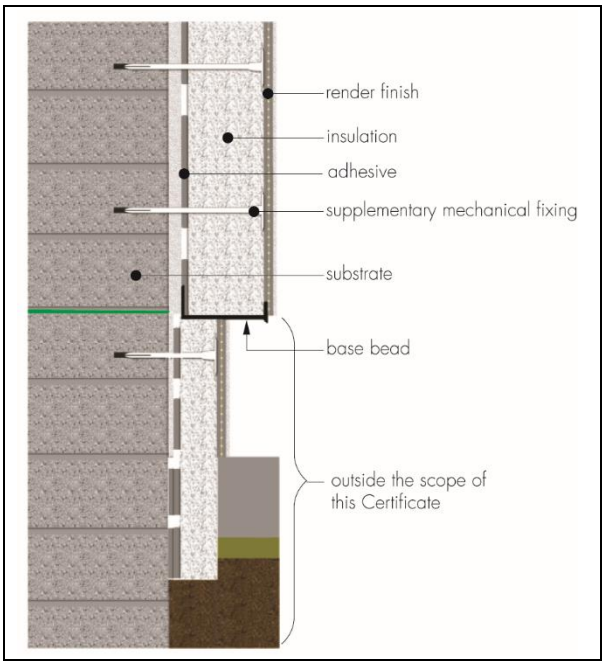
16.3 The planarity and condition of the substrate must be checked, and any protrusions exceeding 10 mm removed by lightly planing with a rasp.

16.4 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2005. Where required, a fungicidal wash is applied to the entire surface of the external wall by brush, roller or spray.

Positioning and securing insulation boards

16.5 The supporting base profile is secured to the external wall above the dpc using approved profile fixings at 300 mm maximum centres (see Figure 3). Base rail connectors are inserted at all rail joints. Extension profiles should be fixed to the front lip of the base rail or stop end channel where appropriate. High spots or irregularities should be removed by lightly rasping the entire area.

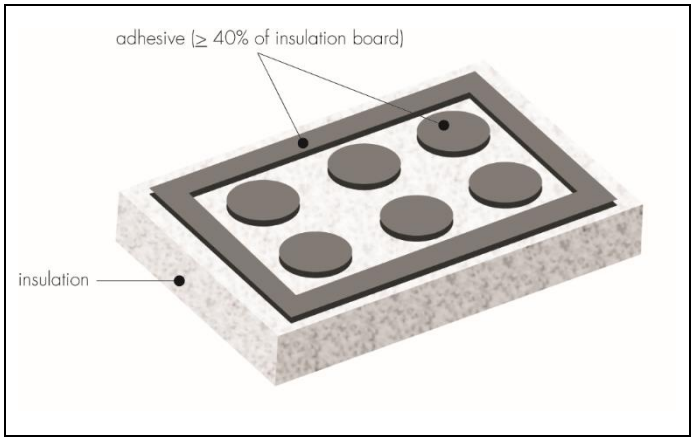
Figure 3 Typical section of base profile



16.6 The adhesive is prepared by mixing each bag with the required amount of clean water in a suitable container as described in section 1.2, using a paddle drill mixer to create a paste-like mortar until the desired consistency is achieved. After allowing the adhesive to rest for 5 minutes, it is stirred again in accordance with the Certificate holder's instructions.

16.7 The adhesive is applied in a circumferential ribbon of adhesive, at least 30 mm wide, is applied along with six to eight evenly distributed patches of adhesive, 80 to 120 mm in diameter, so that an adhesive surface of at least 40% is achieved. Alternatively, for even and smooth substrates, the whole board can be coated with adhesive using a notched trowel, to produce a coat 2 to 5 mm in thickness. The insulation board should be immediately placed on the substrate and pressed into place (see Figure 4).

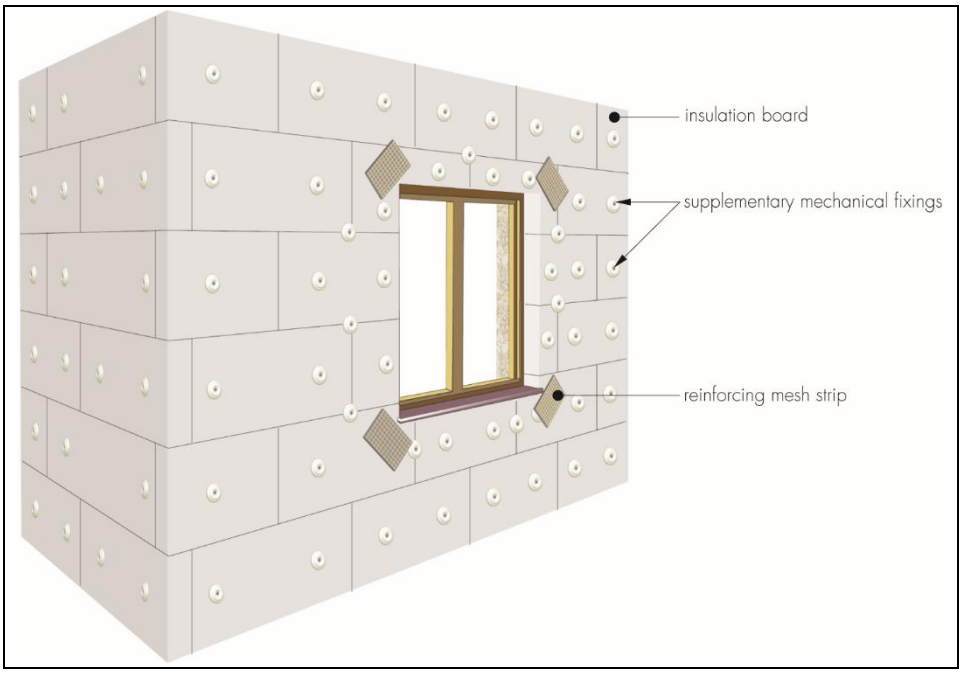
Figure 4 Insulation board ribbon adhesive pattern



16.8 The first run of insulation boards is positioned on the base profile and pressed firmly against the wall. Care should be taken to ensure that all board edges are butted tightly together and alignment checked as work proceeds (to achieve a flush finish). Where existing render is on the wall or dubbing out render has been used, care should be taken when aligning the boards as the effective embedment will be reduced.

16.9 Subsequent rows of boards are positioned so that the vertical board joints are staggered (see Figure 5) and overlapped at the building corners. Joints between boards greater than 2 mm can be filled with slivers of insulation board. Expansion foam approved by the Certificate holder may be used for filling gaps up to 5 mm.

Figure 5 Typical arrangement of insulation boards



16.10 Prior to the application of the main reinforcing mesh, additional pieces of reinforcing mesh (approximate size 300 by 200 mm) should be used diagonally at the corners of openings and at window reveals (see Figure 5).

16.11 To fit around details such as doors and windows, the boards may be cut with a sharp knife or a fine-toothed saw. If required, purpose-made aluminium-powder-coated window sills (complete with sill end caps), designed to prevent water ingress and incorporating drips to shed water clear of the system, are installed in accordance with the Certificate holder's instructions, but their performance is outside the scope of this Certificate.

16.12 At all locations where there is a risk of insulant exposure, eg window reveals or eaves, the system must be protected, eg by an adequate overhang or by purpose-made sub-sills, seals or flashing.

16.13 Building corners, door and window heads and jambs are formed using corner profiles in accordance with the manufacturer's instructions. Corner profiles are fixed to all building corners.

16.14 A minimum of two mechanical fixings per board (equivalent to 2.7 fixings per m^2) are applied through the boards into the substrate wall to prevent the board from collapsing or moving while the adhesive sets. The fixings are removed after the adhesive has set, but appropriate structural calculations should be undertaken by a competent person.

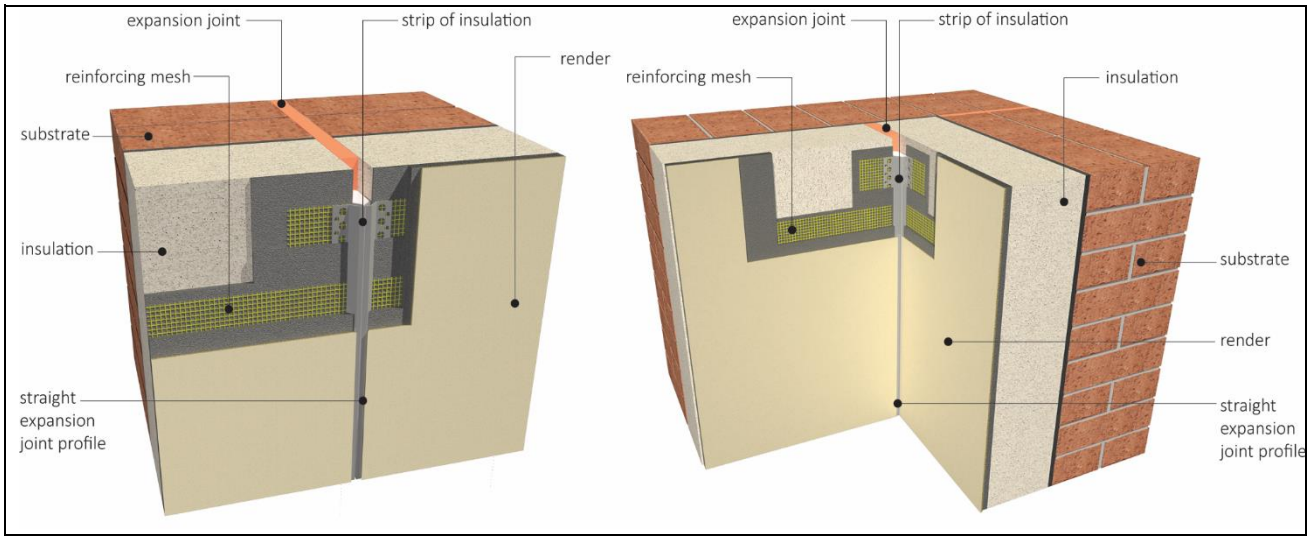
16.15 Installation continues until the whole wall is completely covered including, where appropriate, the building soffits.

16.16 Window and door reveals should be insulated to minimise the effects of cold bridging. Where clearance is limited, strips of approved insulation should be installed to suit available margins.

Movement joints

16.17 Generally, movement joints are not required in the system but, if an expansion joint is already incorporated in the substrate, a movement joint must be included with the system (see Figure 6). Specific types of joint have not been assessed as part of the system and advice should be sought from the Certificate holder.

Figure 6 Movement joint detail



Basecoat and reinforcement

16.18 The basecoat is prepared (as described previously for the adhesive – see section 16.6) and applied progressively, working in one-metre sections vertically or horizontally, over the boards (two days after installation of the insulation) using a notched steel trowel.

16.19 The reinforcing mesh is applied, overlapping at the joints by at least 100 mm, and immediately embedded into the basecoat; the mesh must be free of wrinkles. In situations where a second layer of mesh is required, additional basecoat, approximately 2 to 3 mm thick, is applied over the first layer of basecoat (3 mm thick) once it has dried, and the mesh embedded, with joints overlapped by a minimum of 100 mm in the opposite direction.

16.20 Additional basecoat (approximately 1 mm thick) may be applied, to achieve an overall thickness of between 3 and 5 mm when applying a single layer of mesh and 4 and 6 mm when applying a double layer of mesh, and to obtain a smooth and uniform surface for the render finish.

16.21 Once the application of the basecoat is completed, it is left to dry. The drying time will depend upon the weather conditions, but a minimum of 48 hours should elapse before the primer is applied (if required). The primed basecoat should be dry for at least 24 hours before application of the top or finishing coats.

Finishing coat

16.22 Prior to the application of the finishing coat, sealant should be applied as required, as per the Certificate holder's specification.

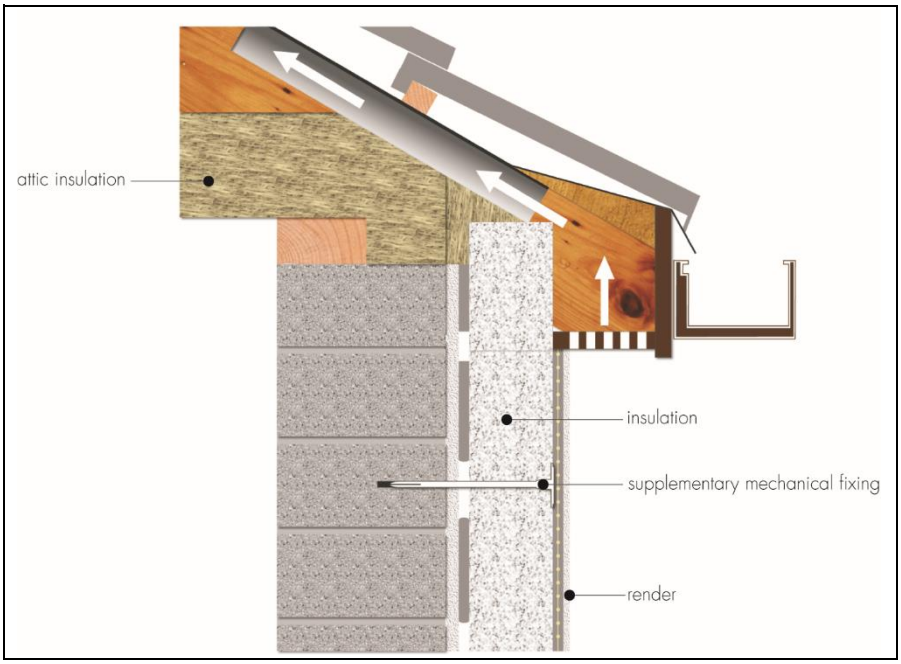
16.23 The application of the finishing coat is achieved by using a ready mixed paste applied using a stainless steel trowel, to a thickness of 1.5 to 3 mm or in accordance with the Certificate holder's instructions.

16.24 To prevent the finishing coat from drying too rapidly, it should not be applied in direct sunlight. Continuous surfaces must be completed without a break, and the finishing coats always applied to a wet edge.

16.25 The finishing coats should be allowed to dry thoroughly before the paints are applied, in accordance with the Certificate holder's instructions.

16.26 At the top of walls (see Figure 7), the system must be protected by an adequate overhang or by an adequately sealed, purpose-made flashing (see Figures 8 and 9).

Figure 7 Roof eaves detail



16.27 Care must be taken in the detailing of the system around openings and projections.

Figure 8 Typical window and door reveal details

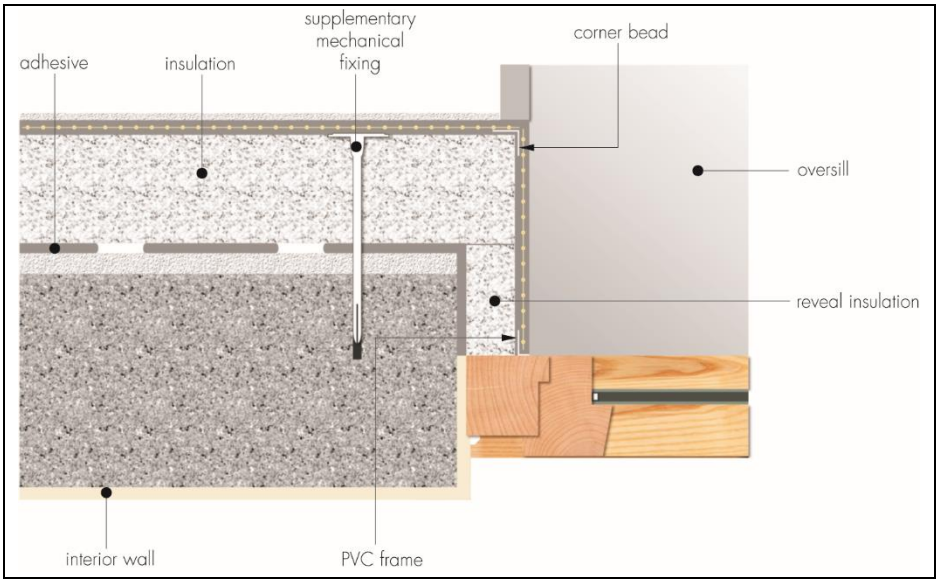
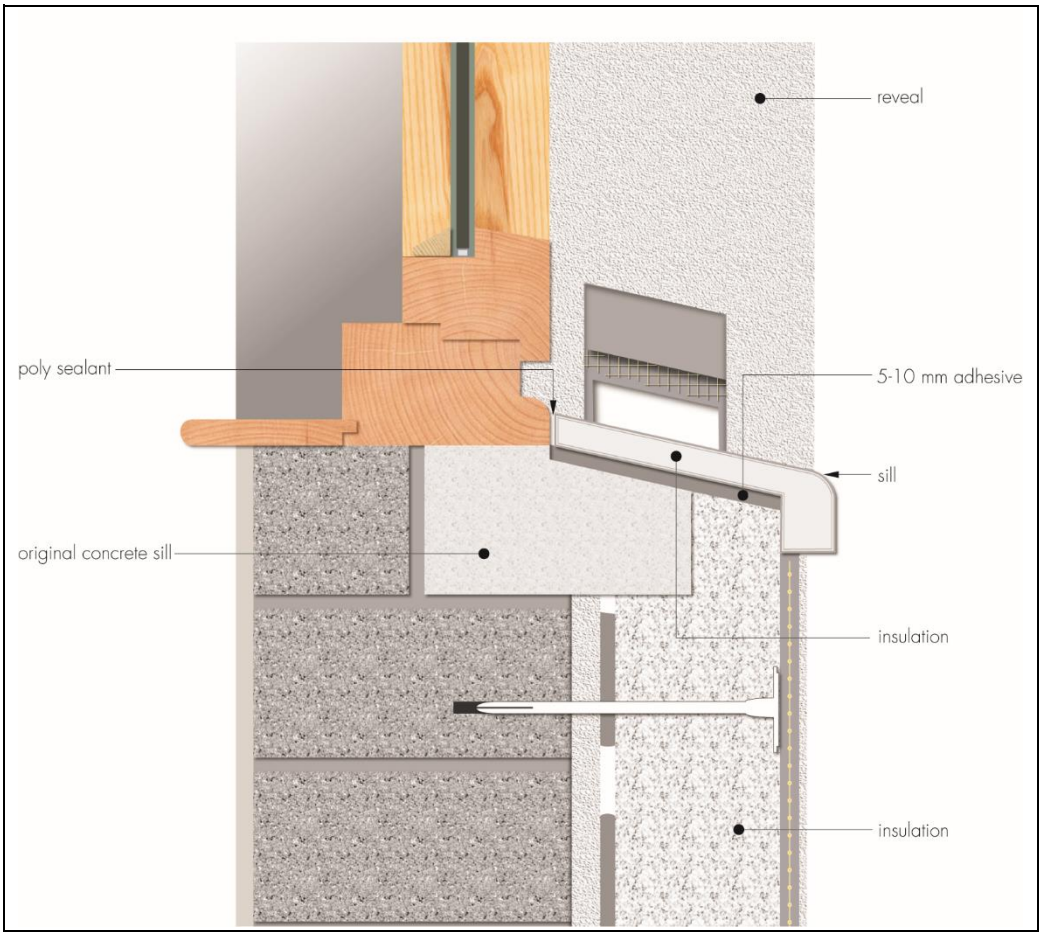


Figure 9 Window sill detail



16.28 On completion of the installation, external fittings, eg rainwater goods, are re-fixed through the system into the substrate.

Technical Investigations

17 Tests

Results of tests were assessed to determine:

- reaction to fire classification
- hygrothermal performance (heat/spray and freeze/thaw cycling)
- render bond strength
- resistance to hard body impact
- water vapour permeability
- water absorption
- pull through resistance of fixings.

18 Investigations

18.1 Investigations were carried out to determine:

- durability
- adequacy of the fixing system
- the risk of interstitial condensation
- thermal conductivity and example U-values
- system wind and dead load resistance.

18.2 The practicability of installation and the effectiveness of detailing techniques were assessed.

18.3 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.

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19 Conditions

19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

19.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

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- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

19.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

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- 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.

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