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Agrément Certificate
14/5120
Product Sheet 3

LICATA EXTERNAL WALL INSULATION SYSTEMS

LICATATHERM MW EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Licatatherm MW External Wall Insulation System, comprising mechanically fixed mineral wool (MW) fibre insulation slabs, with supplementary adhesive, reinforced basecoat and render finishes. The system is suitable for use on the outside of external masonry walls in new and existing domestic and non-domestic buildings without height restriction.

(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 masonry walls and can contribute to satisfying the requirements of the national Building Regulations (see section 6).

Strength and stability — the system can adequately resist wind loads and has sufficient resistance to impact damage. The impact resistance is dependent on the finish chosen (see section 7).

Behaviour in relation to fire — the system has an A2-s1, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007 (see section 8).

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

Durability — when installed and maintained in accordance with the Certificate holder's recommendations and the terms of this 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

Date of Second issue: 23 April 2019

Originally certificated on 15 January 2015

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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

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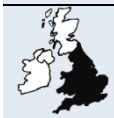
Regulations

In the opinion of the BBA, the Licatatherm MW 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 can satisfy this Requirement. See sections 8.1 to 8.4 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 11.1, 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 6.2 and 6.3 of this Certificate.
Regulation:	**7**	**Materials and workmanship (applicable to Wales only)**
Regulation:	**7(1)**	**Materials and workmanship (applicable to England only)**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**7(2)**	**Materials and workmanship (applicable to England only)**
Comment:		The system is unrestricted by this Regulation. See sections 8.1, 8.2 and 8.4 of this Certificate.
Regulation:	**26**	**CO_2 emission rate for new buildings**
Regulation:	**26A**	**Fabric energy efficiency rates for new dwellings (applicable to England only)**
Regulation:	**26A**	**Primary energy consumption rates for buildings (applicable to Wales only)**
Regulation:	**26B**	**Fabric performance values for new dwellings (applicable to Wales only)**
Comment:		The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
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:	**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 can satisfy this Standard, with reference to clauses $2.6.4^{(1)(2)}$, $2.6.5^{(1)}$ and $2.6.6^{(2)}$. See sections 8.1 to 8.4 of this Certificate.

Standard:	2.7	Spread on external walls
Comment:		The system can satisfy this Standard, with reference to clauses 2.7.1[(1)(2)] and 2.7.2[(2)] and Annex 2A[(1)]. See sections 8.1 to 8.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system can 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 satisfy the requirements of 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	Buildings insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1[(1)], 6.1.2[(1)(2)], 6.1.3[(1)(2)], 6.1.6[(1)], 6.1.10[(2)], 6.2.1[(1)(2)], 6.2.3[(1)], 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 6.2 and 6.3 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[(1)]], 7.1.6[(1)(2)] [Aspect 1[(1)(2)] and 2[(1)]] and 7.1.7[(1)(2)] [Aspect 1[(1)(2)]]. See section 6.2 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 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

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

Regulation:	**23**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part 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 can satisfy this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
Regulation:	**40**	**Target carbon dioxide emission rate**
Comment:		The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 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) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the Licatatherm MW 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*, Part 6 *Superstructure (excluding roofs),* Chapter 6.9 *Curtain walling and cladding.*

Technical Specification

1 Description

1.1 The Licatatherm MW External Wall Insulation System comprises MW insulation slabs, mechanically fixed to the substrate wall, with supplementary adhesive (ensuring a minimum 40% coverage), glass-fibre-reinforced basecoat, primer and render finishes (see Table 1 and Figure 1). After the insulation slabs have been secured to the wall with insulation adhesive and the required number of mechanical fixings, the basecoat is trowel-applied over the slabs to a uniform thickness, followed by the reinforcing mesh, which is fully embedded within the basecoat. A further layer of basecoat render is applied over the embedded reinforcing mesh to achieve the required overall thickness. After the basecoat has fully cured, the primer and render finishes are applied in accordance with the Certificate holder's installation instructions and this Certificate.

1.2 The system comprises:

Adhesive (supplementary)

- Raso Top 800 Grigio — cement-based powder requiring the addition of 5.25 litres of clean water per 25 kg bag. Applied to a minimum thickness of 5 mm, at a coverage of 3.5 to 4.0 kg·m^{-2}
- Raso Top 800 Bianco — cement-based elastic-fibre-reinforced powder requiring the addition of 6 litres of clean water per 25 kg bag. Applied to a minimum thickness of 5 mm, at a coverage of 3.5 to 4.0 kg·m^{-2}

Insulation(1)

MW Dual Density 036 — dual density MW slabs available in sizes up to 1200 by 600 mm and in a range of thicknesses from 60(2) to 240 mm, with nominal densities of 160/100 kg·m^{-3} (outer/inner layer), a minimum compressive strength of 10 kPa and a tensile resistance perpendicular to the faces of 10 kPa. Slabs comply with the requirements of BS EN 13162 : 2012

(1) For declared thermal conductivity (λ_D) values, see section 6.1.
(2) 50 mm insulation thickness is available, which is typically used in reveals.

Mechanical fixings

- Mechanical fixings(1) — fixing anchors with various lengths to suit the substrate and insulation thickness, approved and supplied by the Certificate holder, and selected from:
  - Fischer Termoz 8 U — (covered by ETA 02/0019) polyamide anchor sleeve, with stainless steel or galvanized steel screw
  - Fischer Termoz 8 UZ — (covered by ETA 02/0019) polypropylene anchor sleeve, with polyamide screw
  - Fischer Termoz 8 NZ — (covered by ETA 03/0019) polypropylene anchor sleeve, with galvanized steel pin

- Fischer Termoz PN 8 — (covered by ETA 09/0171) polypropylene anchor sleeve with glass-fibre-reinforced polyamide pin

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

Basecoats

- Raso Top 800 Grigio — cement-based powder requiring the addition of 5.25 litres of clean water per 25 kg bag, applied to a thickness of 3 to 5 mm in two layers, at a coverage of 6.0 to 6.5 kg·m^{-2}
- Raso Top 800 Bianco — cement-based elastic-fibre-reinforced powder requiring the addition of 6 litres of clean water per 25 kg bag, applied to a thickness of 3 to 5 mm in two layers, at a coverage of 6.0 to 6.5 kg·m^{-2}

Reinforcement

- Licatatherm Rete (ES-L 112) — 1 m wide mesh (4 by 5 mm grid size) of multi-strength glass fibre with a polymer coating, and nominal weight of 150 g·m^{-2}.
- Licatatherm Rete (RET01-1160) — 1 m wide mesh (3.5 by 4.5 mm grid size) of multi-strength glass fibre with a polymer coating, and nominal weight of 145 g·m^{-2}

Primers

- Islolante LG — ready-to-use pigmented universal primer, based on acrylic copolymers, and applied at a coverage of 0.2 kg·m^{-2}
- Acril Primer — primer, based on acrylic copolymers. Diluted with water in a 1:1 to 1:3 ratio (primer : water), and applied at a coverage of 0.2 kg·m^{-2}

Finishing coats

- Siloxan Color — ready-to-use silicone-based paste. Available in 1.2 and 2.0 mm particle grain sizes, with thickness regulated by particle size and applied at a coverage of 2.0 to 3.3 kg·m^2
- Lerici — ready-to-use acrylic-based paste. Available in 1.2 and 2.0 mm particle sizes, with thickness regulated by particle size and applied at a coverage of 2.0 to 3.3 kg·m^2
- LicataSil — ready-to-use silicate-based paste. Available in 1.2 and 2.0 mm particle sizes, with thickness regulated by particle size and applied at a coverage of 2.0 to 3.3 kg·m^2
- LicataSilSan — ready-to-use silicate-based paste. Available in 1.2 and 2.0 mm particle sizes, with thickness regulated by particle size and applied at a coverage of 2.0 to 3.3 kg·m^2.

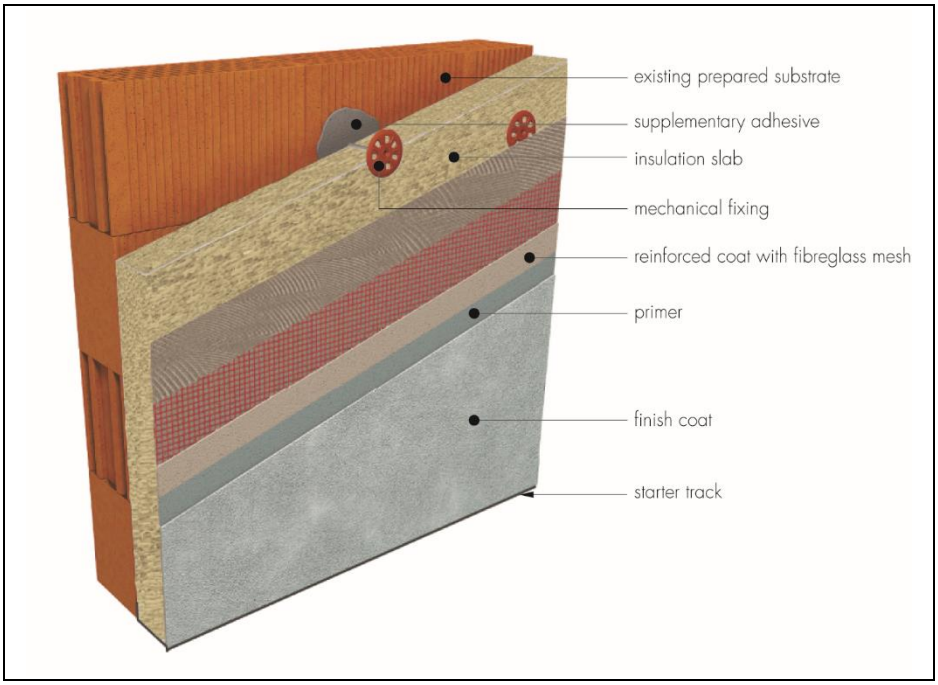
1.3 Ancillary materials used with the system are:

- a range of aluminium, PVC-U or stainless steel profiles, comprising:
  — base profile
  — edge profile
  — corner profile with optional PVC-U nosing
  — render stop profile
  — movement joint
  — expansion joint
- profile connectors and fixings.

1.4 Ancillary materials also used with the systems, but outside the scope of this Certificate, are:

- fungicidal wash
- silicone sealant in accordance with BS EN ISO 11600 : 2003
- expansion foam.

Figure 1 The Licatatherm MW External Wall Insulation System



2 Manufacture

2.1 The system components are 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 the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by Kiwa Cermet Italia S.p.A (Certificate 15400-A) and BS EN ISO 14001 : 2004 by Rina Services S.p.A. (Certificate EMS-5678/S).

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 batch number.

Table 1 Component supply details

Components	Quantity and packaging
MW Dual Density insulation	Shrink-wrapped in plastic film (on pallets)
Raso Top 800 Grigio (supplementary adhesive and basecoat)	25 kg bags
Raso Top 800 Bianco (supplementary adhesive and basecoat)	25 kg bags
Fixings	Boxed by manufacturer
Licatatherm Rete (RET01-1160)	50 m rolls
Licatatherm Rete (RET01-1160)	50 m rolls
Islolante LG primer	20 kg pails
Acril Primer	20 kg pails
Siloxan Color finishing coat	25 kg pails
Lerici finishing coat	25 kg pails
LicataSil finishing coat	25 kg pails
LicataSilSan finishing coat	25 kg pails

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

3.3 The insulation must be protected from prolonged exposure to sunlight, and should be stored indoors or under a waterproof cover, with opened packs stored under cover or covered with opaque polythene sheeting. Slabs that become damaged, soiled or wet should be discarded.

3.4 The powder and paste components must be stored in dry conditions between 5 and 30°C, off the ground and protected from moisture. Contaminated materials should be discarded.

3.5 The primer and finishes 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 Licatatherm MW External Wall Insulation System.

Design Considerations

4 General

4.1 The Licatatherm MW 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 and no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render) without height restriction. 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.

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 expansion joints in the building structure 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, it 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 may 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 (non-mandatory); 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) value of 0.036 $W \cdot m^{-1} \cdot K^{-1}$.

6.2 The U value of a completed wall will depend on the selected insulation thickness, fixing method and type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample constructions in accordance with the national Building Regulations are given in Table 2 and are based on the thermal conductivity value given in section 6.1.

Table 2 Insulation thickness required to achieve design U values[1][2][3] given in the national Building Regulations

U value[4] ($W \cdot m^{-2} \cdot K^{-1}$)	Thickness of insulation (mm)	
	215 mm brickwork $\lambda = 0.56\ W \cdot m^{-1} \cdot K^{-1}$	200 mm dense blockwork $\lambda = 1.75\ W \cdot m^{-1} \cdot K^{-1}$
0.18	190	200
0.19	180	190
0.25	130	140
0.26	130	140
0.28	120	120
0.30	110	120
0.35	90	100

(1) Wall construction inclusive of 13 mm plaster ($\lambda = 0.57\ W \cdot m^{-1} \cdot K^{-1}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88\ W \cdot m^{-1} \cdot K^{-1}$). Declared thermal conductivity (λ_D) of insulation is as given in section 6.1. A 5 mm thick layer of adhesive (with $\lambda = 0.43\ W \cdot m^{-1} \cdot K^{-1}$) covering 40% of the insulation surface, together with an external render thickness of 5 mm (with $\lambda = 1.0\ W \cdot m^{-1} \cdot K^{-1}$), is also included.

(2) Calculations based on a mechanically fixed system that included 7 galvanized steel fixings per m^2, with a point thermal transmittance (χ_p) of 0.002 $W \cdot K^{-1}$ per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017. A gap correction (ΔU) of zero is assumed.

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

(4) When applying the maximum available insulation thickness, these walls can achieve U values of 0.15 to 0.16 $W \cdot m^{-2} \cdot K^{-1}$.

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 of the factors affecting wind load on each elevation and specific zones of the building must be considered. In accordance with BS EN 1990 : 2002 and its UK National Annex, a partial factor of 1.5 must be applied to the calculated characteristic wind pressure values 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 pull-out resistance of the fixing from the substrate wall (see section 7.8)
- the pull-through resistance of the fixing (see section 7.9).

(1) For mechanically fixed systems with supplementary adhesive, the contribution of the adhesive is not considered when calculating resistance to wind load.
(2) Further guidance is available from BBA Guidance Note 1, available on the BBA website (www.bbacerts.co.uk).

7.7 The characteristic bond resistance between the insulation and render interface derived from test results was 10 $kN \cdot m^{-2}$. 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 Typical characteristic pull-out resistances for the fixings taken from the corresponding European Technical Assessment (ETA) are given in Table 3; the values are dependent on the fixing type and must be selected to suit the specific loads and substrate concerned. In situations where suitable data does not exist(1), the characteristic pull-out resistance must be established from site-specific pull-out tests conducted on the substrate of the building to ascertain the minimum resistance to pull-out failure of the fixings, and determined in accordance with the guidance given in EOTA TR051 : 2016 (minimum test characteristic value = 0.6 x mean of 5 lowest test results). To obtain the design pull-out resistance of the fixings (N_{RD2}), this characteristic pull-out resistance should then be divided by the partial factor given in Table 3.

(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.

Table 3 Fixings — typical characteristic pull-out resistances

Fixing type(1)	ETA number	Substrate	Drill diameter (mm)	Effective anchorage depth (mm)	Typical pull-out strength (kN)(2)	Partial factor
Fischer Termoz 8U	02/0019	Concrete(C12/15) Clay brickwork	8	70	1.5	2
Fischer Termoz 8UZ	02/0019	Concrete (C12/15) Clay brickwork	8	30	1.2 1.5	2
Fischer Termoz 8 NZ	03/0019	Concrete (C12/15) Clay brickwork	8	35	1.5	2
Fischer Termoz PN 8	09/0171	Concrete (C12/15) Clay brickwork	8	35	0.5 0.6	2

(1) The minimum value for plate stiffness of fixings is 0.4 $kN \cdot m^{-2}$ and the load resistance is 1.34 kN.
(2) Values are determined in accordance with EAD 330196-00-0604 : 2016 and are dependent on the substrate. The Use Categories are defined in the corresponding ETA.

7.9 The characteristic pull-through resistance of the fixings was determined from tests using a 60 mm diameter fixing plate, minimum insulation thickness 50 mm. The design resistance per fixing (N_{RD3}) is obtained by applying an appropriate partial factor as shown in Table 4.

Table 4 Design pull-through resistances

Factor (unit)	Insulation MW Dual Density 036	
Tensile resistance of insulation (kPa)	≥10	
Fixing type(1)	Fisher Termoz PN8	
Fixings plate diameter (mm)	60	
Insulation thickness (mm)	≥50	
Characteristic pull-through resistance(2) per fixing (kN)	At panel	0.20
Partial factor(3)	2.5	
Design pull-through resistance per fixing (kN)	At panel	0.08
Design pull-through resistance per slab(kN) (based on the minimum number of fixings(4))	At panel	0.40
Design pull-through resistance per slab (kN) (based on the maximum number of fixings(5)	At panel	0.64

(1) See Table 3 for typical characteristic pull-out resistance of the fixings.
(2) Characteristic pull-through resistance of insulation over the head of the fixing, in accordance with BS EN 1990 : 2002, Annex D7.2 and its UK National Annex.
(3) The partial factor is based on the assumption that all insulation slabs are quality controlled and tested to establish tensile strength perpendicular to the face of the slab.
(4) The minimum design pull-through resistance per slab is based on a minimum of 5 fixings per slab (1200 x 600 mm), which equates to approximately 7 fixings per m^2.
(5) The maximum design pull-through resistance per slab is based on a maximum of 8 fixings per slab (1200 x 600 mm), which equates to approximately 11 fixings per m^2.

7.10 The number and spacing of the fixings should be determined by the Certificate holder. The number of fixings must not be less than the minimum specified for the system and the fixings should be symmetrically positioned and evenly distributed both vertically and horizontally, except at openings and building corners.

7.11 The data obtained from sections 7.7 to 7.9 must be assessed against the design wind load and the following expression must be satisfied:

For safe design:

$Rd \geqslant W_e$

$Rd_{b.ins/rend} = A_r * N_{RD1}$
$Rd_{pull\text{-}out} = n * N_{RD2}$
$Rd_{pull\text{-}through} = (N_{RD3panel} * n_{panel}) + (N_{RD3joint} * n_{joint})/A_{slab}$

Where:
Rd is the design ultimate resistance ($kN \cdot m^{-2}$) taken as the minimum of $Rd_{b.ins/rend}$, $Rd_{pull\text{-}out}$ and $Rd_{pull\text{-}through}$
W_e is the maximum design wind load ($kN \cdot m^{-2}$)
$Rd_{b.ins/rend}$ is the design bond resistance between the insulation and render ($kN \cdot m^{-2}$)
$Rd_{pull\text{-}out}$ is the design pull-out resistance of the insulation fixings per metre square ($kN \cdot m^{-2}$)
$Rd_{pull\text{-}through}$ is the design pull-through resistance of the insulation fixings per metre square ($kN \cdot m^{-2}$)
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 test ($kN \cdot m^{-2}$)
n is the number of anchor fixings per m^2
N_{RD2} is the design pull-out resistance per fixing based on test (kN)
$N_{RD3panel}$ is the design pull-through resistance per anchor not placed at the panel joint, based on test (kN)
$N_{RD3joint}$ is the design pull-through resistance per anchor placed at the panel joint, based on test (kN)
n_{panel} is the number of internal anchors in a panel
n_{joint} is the number of joint anchors in a panel
A_{slab} is the area of the slab (m^2).

7.12 The insulation system is mechanically fixed to the substrate wall with a minimum of 5 fixings per slab or approximately 7 fixings per square metre, as per the fixing pattern shown in Figure 4, and in conjunction with a minimum 40% coverage of supplementary adhesive (see section 16). Additional fixings may be required, depending on the results of the calculations detailed above for the specific site.

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 5 of this Certificate:

Table 5 Licatatherm MW External Wall Insulation System — impact resistance

	Use Category(1)
	Single-layer mesh (see section 1.2 *Reinforcement*)
Rendering systems: **Raso Top 800 Grigio** (basecoat) + primer + any of the finishing coats indicated below:	
Lerici Siloxan Color LicataSil LicataSilSan	Category III
Rendering systems: **Raso Top 800 Bianco** (basecoat) + primer + any of the finishing coats indicated below:	
Lerici Siloxan Color LicataSil LicataSilSan	Category II

(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 reaction to fire classification(1) of the system is A2-s1, d0 in accordance with BS EN 13501-1 : 2007 where the maximum organic content of basecoat and finishing coat is less than 0.6%, and 5.8%, respectively. For specific colours included within these ranges, the advice of the Certificate holder must be sought.

(1) ETA-12/0096, issued by ZAG. Details are available from the Certificate holder.

8.2 The fire classification applies to the full range of thicknesses covered by this Certificate (see sections 1.2 and 8.1).

8.3 The MW insulation material in isolation is classified as ‘non-combustible’.

8.4 The system is suitable for use on, or at any distance from, the boundary, without height restriction.

8.5 For application to second storey walls and above, it is recommended that the designer includes at least one stainless steel fixing per square metre, as advised in BRE Report BR 135 : 2013.

9 Proximity of flues and appliances

Where the system is installed in close proximity to certain flue pipes, the relevant provisions of the national Building Regulations should be satisfied:

England and Wales — Approved Document J
Scotland — Mandatory Standard 3.19, clause 3.19.4[(1)(2)]

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L.

10 Water resistance

10.1 The system will provide a degree of protection against water ingress. However, care should be taken to ensure that substrate 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 rain ingress.

10.3 The guidance given in BRE Report 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 a coping, adequate overhang or other detail designed for use with this type of system (see section 16).

11 Risk of 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 penetrations at junctions between the insulation system and windows, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

Surface condensation

11.2 Walls will adequately limit the risk of surface condensation 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 adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2011 Section 4 and Annex G, and BRE Report 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 : 2011 Section 4, and Annexes D and G.

11.5 The water vapour resistance (μ) factor (for the insulation slabs) and equivalent air layer thickness (s_d) (for the render systems) are shown in Table 6.

Table 6 Water vapour resistance factor and equivalent air layer thickness

Layer	Thickness (mm)	μ	s_d (m)
MW slabs	40 to 240	1(2)	—
Rendering system: reinforced basecoat + finish coat (specific particle size) as indicated below			
Raso Top 800 Grigio(1) basecoat + Lerici finish coat	4.5 to 6.5	—	0.40(3)
Raso Top 800 Grigio(1) basecoat + Siloxan Color finish coat	4.5 to 6.5	—	0.42(3)
Raso Top 800 Grigio(1) basecoat + LicataSill finish coat	4.5 to 6.5	—	0.31(3)
Raso Top 800 Grigio(1) basecoat + LicataSilSan finish coat	4.5 to 6.5	—	0.32(3)

(1) Equivalent air layer thickness (S_d) value also applies to Raso Top 800 Bianco basecoat, which is of a similar composition to Raso Top 800 Grigio which was tested as part of the rendering system.
(2) This value is taken from BS EN 12524 : 2000.
(3) The S_d is only representative of the 1.5 mm particle size; for other particle sizes the Certificate holder should be contacted.

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 : 2016.

13 Durability

13.1 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 system-compatible coatings recommended by the Certificate holder and in accordance with BS EN 1062-1 : 2004. 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:

- the position of beads
- detailing around windows and doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints, if required
- areas where flexible sealants must be used
- any alterations to external plumbing.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers (see section 15) to determine the pull-out resistance of the proposed mechanical fixings. An assessment and recommendation is made on the type and number of fixings required to withstand the building's expected wind loading based on calculations using the test data and pull-out resistance (see 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 tool spanning the storey height. Any excessive irregularities, ie greater than 10 mm in 1 m, must be made good prior to installation, to ensure that the insulation slabs 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 (see Figure 11).

14.7 In new buildings, 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, recommended or recognised 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 should be carried out in accordance with the Certificate holder's current 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 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.

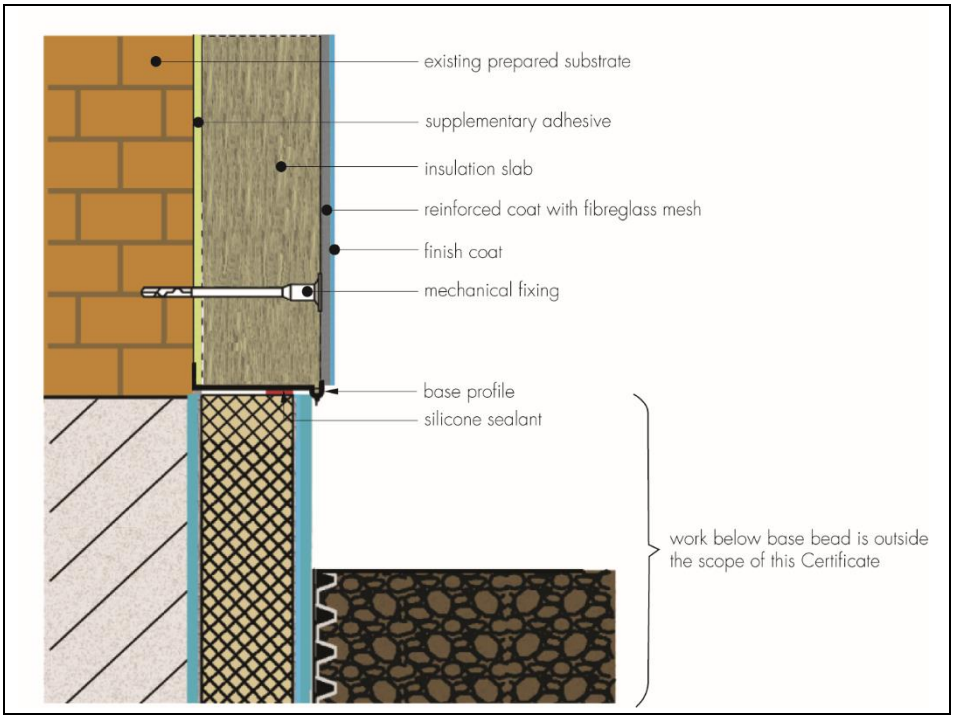
16.3 Where required, a fungicidal wash is applied to the entire surface of the external wall by brush, roller or spray.

16.4 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2016.

Positioning and securing insulation slabs

16.5 A base profile should be fixed to the external wall above the dpc to coincide with the lower edge of the insulation using the approved profile fixings at approximately 500 mm centres (see Figure 2). Base rail connectors are inserted at all rail joints. Extension profiles are fixed to the front lip of the base rail or stop end channel where appropriate. Stop profiles are positioned vertically, eg at party wall positions where the adjoining property does not require treatment.

Figure 2 Typical section at base profile

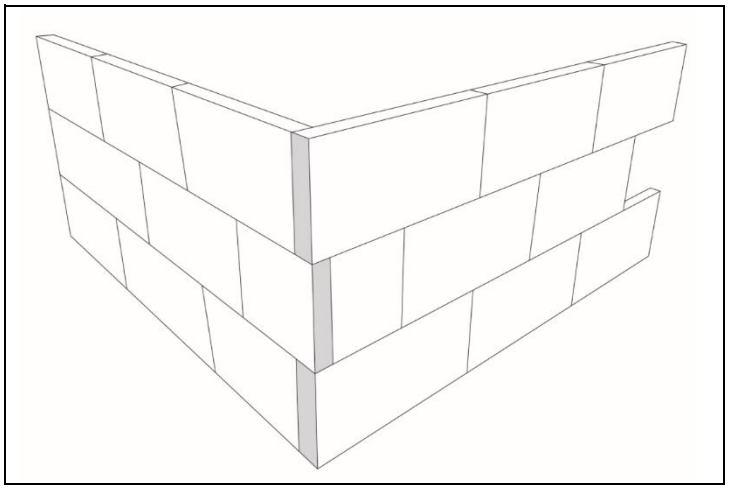


16.6 Insulation slabs should be installed with staggered joints, including at the building corners, from the base-profile upward (see Figure 3). The insulation slabs should be bonded to the wall using the adhesive (as described in section 1.2). The adhesive is prepared with the required amount of water, and mixed with a paddle mixer until the desired consistency is achieved. After allowing the adhesive to rest for 5 minutes, it is stirred again. The adhesive is applied in a continuous line around the perimeter of the slab with three additional dabs of adhesive distributed uniformly over the remaining surface; at least 40% of the slab should be covered, to a minimum thickness of 5 mm.

16.7 The first run of insulation slabs, with adhesive applied, is positioned on the base profile and pressed firmly against the wall, and butted tightly together and aligned to achieve a level finish.

16.8 Vertical joints must be staggered by at least 200 mm (see Figure 3). Joints between slabs should be maintained in a straight line and surfaces levelled. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting slabs to fit. Alignment should be checked as work proceeds.

Figure 3 Slab layout on the wall and at corners of a building



16.9 Holes are drilled into the substrate wall to the required depth through the insulation at the corners of each slab and in the middle (five fixings per slab, equating to seven fixings per square metre, as per the fixing pattern in Figure 4). for a slab size of 1200 x 600 mm. Around openings, additional fixings should be used at 300 mm centres (see Figure 5). The mechanical fixings are inserted and tapped or screwed firmly into place, securing the insulation to the substrate. Subsequent rows of slabs are positioned so that the vertical slab joints are overlapped at the building corners and so that slab joints do not occur within 200 mm of the corners of openings.

Figure 4 Mechanical fixing pattern

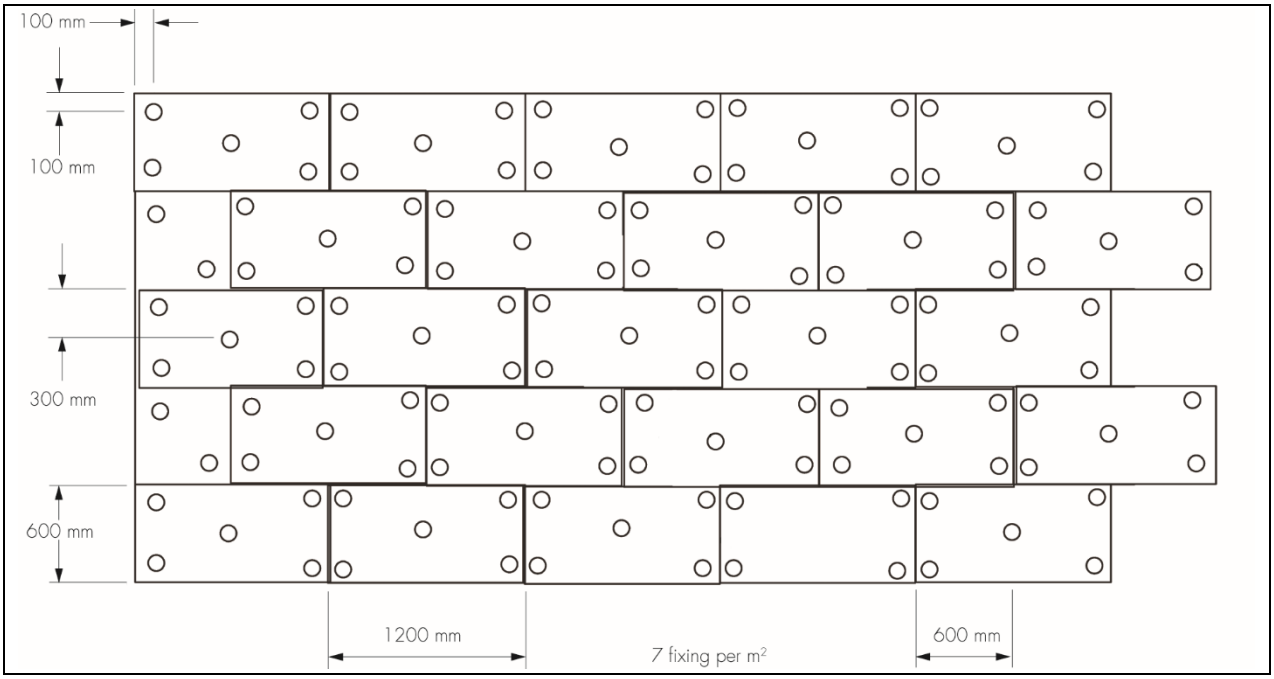
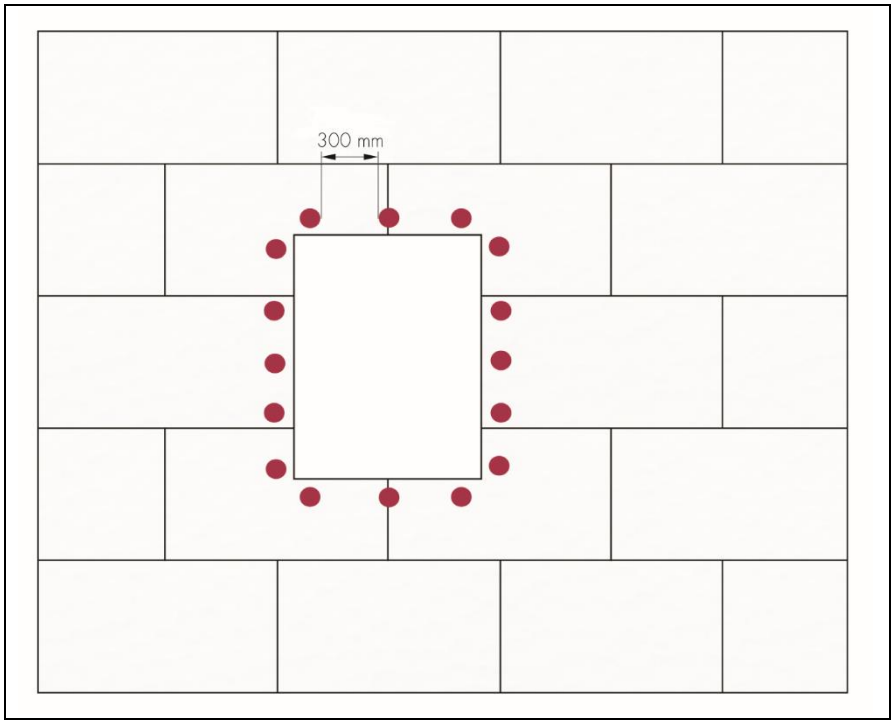


Figure 5 Window fixing detail



16.10 The surface of the slabs should be smooth without large protrusion or irregularities. Any gaps between the slabs should be filled with strips of the insulation material. After sufficient stabilisation of the installed insulation (normally three days, during which time the insulation should be protected from exposure to extreme weather conditions to prevent degradation, the insulated wall is ready for the application of the basecoat.

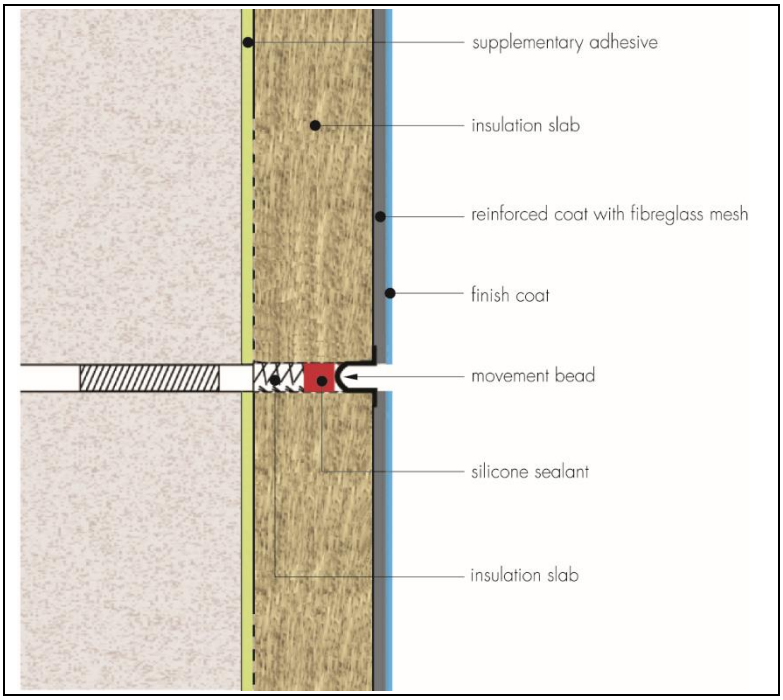
16.11 To fit around details such as doors and windows, insulation slabs may be cut with a sharp knife or a fine-tooth saw. If required, purpose-made window sills, designed to prevent water ingress and incorporating drips to shed water clear of the system, are fitted.

16.12 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 and details. Installation continues until the whole wall is completely covered including, where appropriate, the building soffits and eaves.

Movement joints

16.13 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 provided in the insulation system (see Figure 6).

Figure 6 Vertical movement joint



16.14 At all locations where there is a risk of insulant exposure, eg window reveals or eaves, the system must be protected by such features as an adequate overhang or by purpose-made sub-sills, seals or flashing. All corners are fixed with mesh angles installed with adhesive mortar to building corners, door and window heads and jambs before applying basecoat to form the corners in accordance with the Certificate holder's instructions. Where appropriate, the PVC angle with drip mesh is installed, to allow the rainwater to drain away.

16.15 Prior to the application of the render system, the relevant seals are positioned and installed at all openings (or a bead of joint sealant is gun-applied at window and door frames), overhanging eaves, gas and electric meter boxes, and wall vents, or where the render abuts any other building material or surface. This helps to reduce the risk of water ingress into the structure.

Application of basecoat and reinforcing mesh

16.16 The basecoat is prepared with the required amount of water (see section 1.2), and mixed with a paddle mixer until the desired consistency is achieved. After allowing the basecoat to rest for 5 minutes, it is stirred again before it is ready to use. The basecoat is applied over the insulation slabs using a stainless steel trowel at approximately two thirds of the final basecoat thickness (3 to 5 mm).

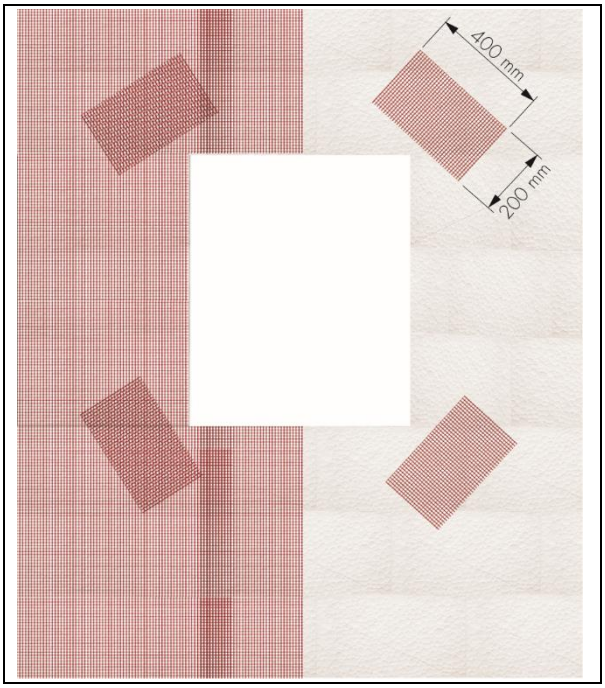
16.17 A layer of alkali-resisting glass-fibre reinforcing mesh is applied and immediately embedded (with its concave surface facing the wall). The mesh should be pressed into the basecoat using a float, taking care to avoid direct contact with the insulation. The remaining one third thickness of basecoat is then applied, ensuring the mesh is completely covered and maintaining a minimum basecoat thickness of 3 to 5 mm.

16.18 The mesh should be free of wrinkles and fully embedded in the basecoat (for areas requiring extra resistance to impact, two mesh layers should be used).

16.19 The basecoat is applied progressively, working in one-metre sections vertically or horizontally. Overlapping at all mesh joints should not be less than 100 mm.

16.20 Mesh patches (approximately 200 by 400 mm strips) are applied diagonally at a 45° angle to the corners of openings (prior to the application of the basecoat or, if applying a double layer of basecoat, prior to the application of the second coat) to provide the necessary reinforcement in the corners of window/door openings in accordance with the Certificate holder's instructions (see Figure 7).

Figure 7 Additional reinforcement of openings



16.21 The reinforced basecoat is left to dry for at least two days before applying a second coat, where required. The drying time will depend upon the conditions, but an additional 24 hours should elapse before the primer and finishing coats are applied. The overall thickness of the reinforced basecoat must be greater than 3 mm.

Primer

16.22 The primer is roller-applied, with a typical installed weight of 0.25 $kg \cdot m^{-2}$, and left to dry for a minimum of 12 hours, first making sure it is free from any irregularities and is in accordance with the Certificate holder's instructions. Islolante LG is applied as delivered whereas Acril Primer is diluted with clean water in a ratio of 1:1 up to 1:3 (primer : water) before it is applied.

Finishing coats

16.23 The finishing coat is applied using a stainless steel trowel to an approximate render thickness of between 1.2 and 2 mm (depending on particle size), then finished with a plastic trowel to create a textured finish. The drying time is dependent on conditions, but will typically be 24 hours, in accordance with the Certificate holder's instructions.

16.24 Continuous surfaces must be completed without a break, eg working to a wet edge. Care should be taken to prevent the basecoats and finish coats from either drying too rapidly or freezing.

16.25 Care should be taken in the detailing of the system around openings and projections and at eaves (see Figures 8 to 11) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.26 It is imperative that weather conditions are suitable for the application and curing of the finishing coats. In wet weather, the finished walls should be protected to prevent wash-off. It is also advisable that protective covers remain in place until required.

16.27 At the top of walls, the system should be protected by an adequate overhang (see Figure 8) or other detail designed for use with this type of system.

Figure 8 Typical detail – Eaves

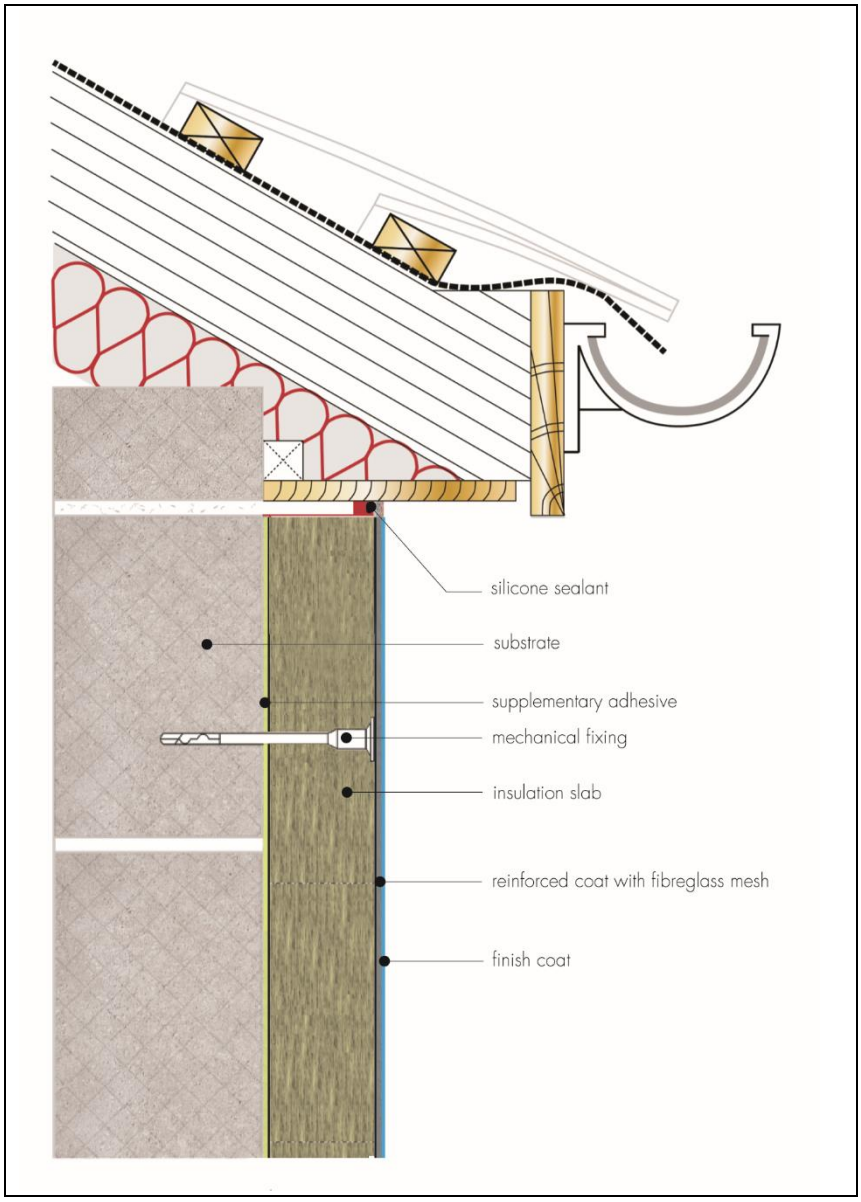


Figure 9 Building corner details

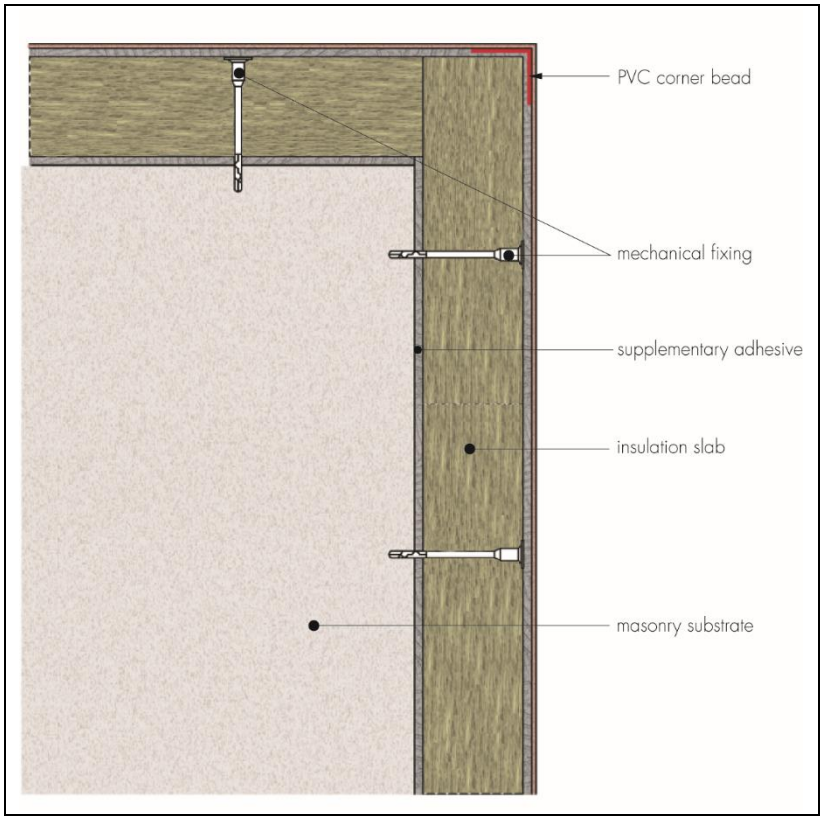


Figure 10 Insulated window reveal details

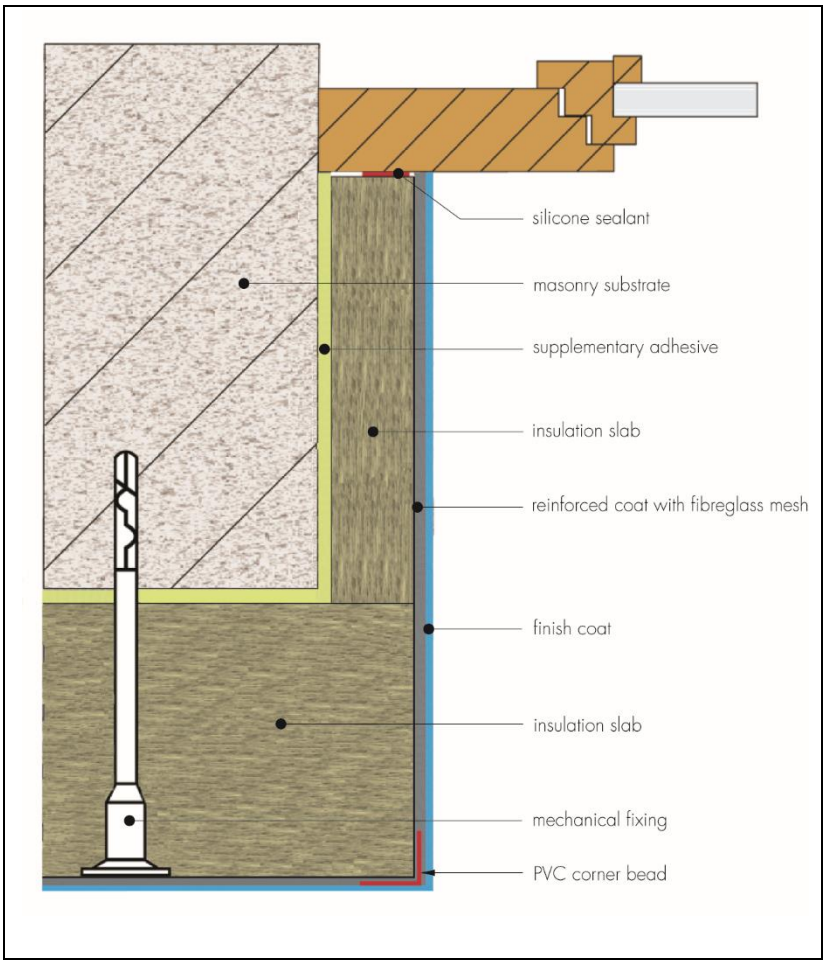
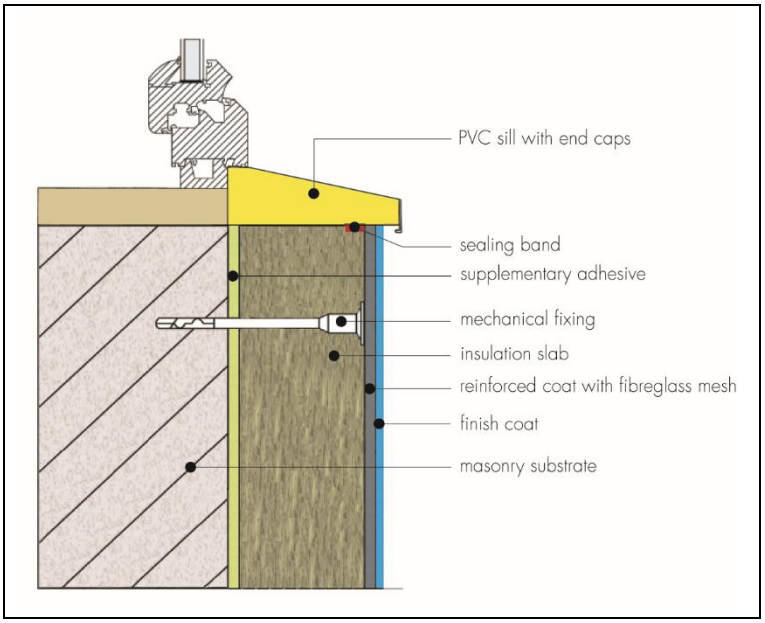


Figure 11 Window sill details



Technical Investigations

17 Tests

Results of tests were assessed to determine:

- reaction to fire classification in accordance with BS EN 13501-1 : 2007
- hygrothermal performance (heat/spray cycling)
- render/insulation bond strength
- resistance to hard body impact
- water vapour permeability
- water absorption
- pull through resistance of fixings.

18 Investigations

18.1 An examination was made of data relating to:

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

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

18.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

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BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

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BS EN ISO 14001 : 2004 *Environmental management systems — Requirements*

EAD 330196-00-0604 : 2016 *Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering*

EOTA TR051 : 2016 *Recommendations for job-site tests of plastic anchors and screws*

ETAG 004 : 2013 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal Composite Systems (ETICS) with Rendering*

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.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

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

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:

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

19.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.