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Agrément Certificate
13/5018
Product Sheet 2

ATLAS/AVAL EXTERNAL WALL INSULATION SYSTEM

ATLAS/AVAL ROKER MW EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Atlas/Aval Roker MW External Wall Insulation System, comprising mechanically fixed mineral wool (MW) insulation slabs with supplementary adhesive, with a glassfibre-mesh-reinforced basecoat and render finishes. This system is suitable for use on the outside of external masonry walls in new or existing domestic and non-domestic buildings, with no 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 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 a Class A2-s2, d0 reaction to fire classification and can satisfy the requirements of the national Building Regulations (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 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

Date of Second issue: 10 December 2018

Originally certificated on 15 October 2014

John Albon – Head of Approvals Construction Products

Claire Curtis-Thomas
Chief Executive

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

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

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

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

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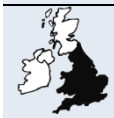
Regulations

In the opinion of the BBA, the Atlas/Aval Roker 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 7.11 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**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**26**	**CO_2 emission rates for new buildings**
Regulation:	**26A**	**Fabric energy efficiency rates for new dwellings (applicable to England only)**
Regulation:	**26A**	**Primary energy consumption rates for new buildings (applicable to Wales only)**
Regulation:	**26B**	**Fabric performance values for new dwellings (applicable to Wales only)**
Comment:		The 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 7.11 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 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), 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 clause 0.12.1(1)(2) and Schedule 6(1)(2).

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

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

Regulation:	**23**	**Fitness of materials and workmanship**
Comment:		The 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 7.11 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**
Comment:		The system can contribute to satisfying this Regulation. See sections 6.2 and 6.3 of this Certificate.
Regulation:	**40**	**Target carbon dioxide emission rate**
Comment:		The system can contribute to satisfying this Regulation. 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 2018

In the opinion of the BBA, the Atlas/Aval Roker 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 Atlas/Aval Roker External Wall Insulation System comprises mineral wool insulation slabs, glassfibre-reinforced basecoat, key coats and render finishes (see Figure 1). The insulation slabs are fixed to the external surface of the wall using mechanical fixings and supplementary adhesive, ensuring a minimum of 40 % coverage of adhesive is achieved. The basecoat is applied over the insulation surface to a uniform thickness and the reinforcing mesh is embedded immediately. After the basecoat has cured, primer (depending on the finishing coat) is applied, followed by the finishing coat.

1.2 The system is made up of the following components:

Supplementary adhesive

- Atlas Roker W-20 (Aval KT 190) — cement-based powder, sand, minerals and synthetic resin additives, requiring the addition of 5 to 6.25 litres of clean water per 25 kg bag, with a coverage of 4.5 to 5.5 kg.m^{-2}

Insulation(1)

- MW fibre insulation (MW Slab 036) — 1200 by 600 mm, in a range of thicknesses from 50(2) to 250 mm, with a nominal density of 105 kg·m^{-3}, minimum compressive strength of 30 kN·m^{-2} and tensile resistance perpendicular to the faces of 10 kN·m^{-2}. Slabs are manufactured to comply with the requirements of BS EN 13162 : 2012

(1) For declared thermal conductivity (λ_D) value, see section 6.1.
(2) Insulation thicknesses of 30 to 40 mm would generally be used in reveals.

Mechanical fixings

- mechanical fixings(1) — anchors with adequate length to suit the substrate and the insulation thickness, and selected from:
  - — Wkret-met LTX 10 — polypropylene with polyamide-fibre-reinforced expansion pin
  - — Ejot STR U/ SDK U — polyethylene with steel or electro-galvanized nails
  - — Ejot NT U/ NK U — polyamide with steel or electro-galvanized nails
  - — Ejot SDMT Plus U — polyamide with steel or electro-galvanized nails
  - — Termoz 8N/ 8NZ — polyamide with steel or electro-galvanized nails
  - — Koelner TFIX-8M — polypropylene with steel or electro-galvanized nails
  - — Koelner KI-10N — polypropylene with steel or electro-galvanized nails

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

Basecoats

- Atlas Roker W-20 (Aval KT 190) — cement-based powders requiring the addition of 5 to 6.25 litres of clean water per 25 kg bag, applied to a thickness of 4 to 5 mm, with a coverage of 5.5 to 6.5 kg·m^{-2}.

Reinforcing mesh

- SSA 1363 SM (150) — an alkali- and slide-resistant glassfibre mesh with a 3.6 by 4.3 mm grid size, with a mass per unit area of 150 g·m^2
- Vertex 145/AKE145/R117 A — alkali- and slide-resistant glassfibre meshes with a 4.0 by 4.5 mm grid size, with a mass per unit area of 145 g·m^2
- Atlas 150 — an alkali- and slide-resistant glassfibre 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 glassfibre 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 (Aval KT 16) — ready-to-use acrylic-based liquid binders, with mineral fillers and additives, to be used with Atlas Cermit Mineral (Aval Mineral)
- Atlas Silkat ASX (Aval KT 15) — ready-to-use silicone-based liquid binders, with mineral fillers, pigments and additives, to be used with Atlas Silicate Render and Aval Silicate Render finishing coats
- Atlas Silkon ANX (Aval KT 76) — ready-to-use silicone-based liquid binders, with mineral fillers, pigments and additives, to be used with Atlas Silicone Render (Aval Silicone Render) and Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) finishing coats.

(1) Applied to 0.25 to 0.35 kg.m^{-2} coverage.

Finishing coats(1)

Mineral

- Atlas Cermit Mineral (Aval Mineral) — 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}

Silicone

- Atlas Silicone Render (Aval Silicone Render) — with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 3.5 kg·m^{-2}

Silicate

- Atlas Silicate Render (Aval Silicate Render) — ready-to-use silicate-based pastes with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 5.5 kg·m^{-2}

Silicone-Silicate

- Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) — with 1.5 to 2.0 mm particle grain sizes, and a coverage of 2.5 to 3.0 kg·m^{-2}

(1) Thicknesses are regulated by particle size.

Primers

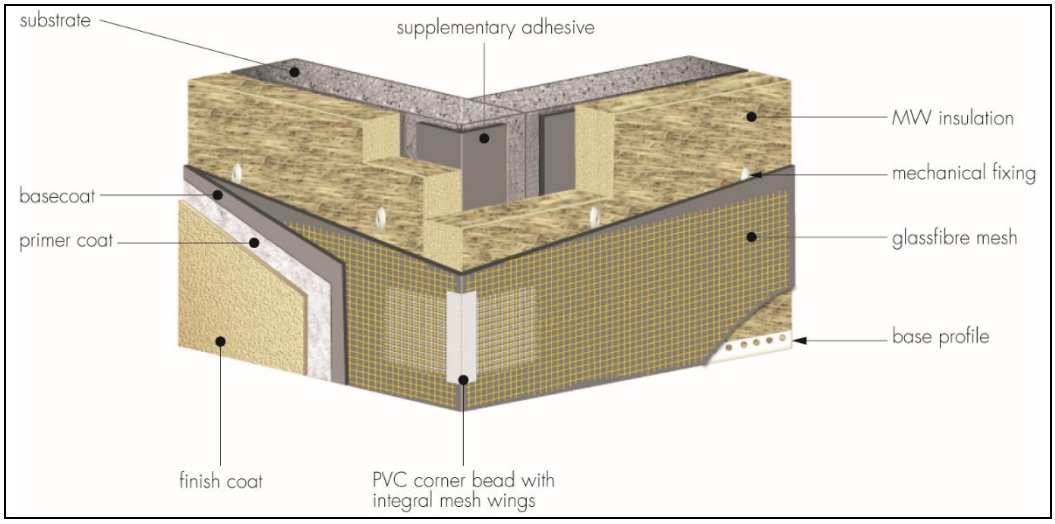
- Atlas Arkol SX (Aval KT 52) — ready-to-use liquid, silicone-emulsion-based binders with mineral fillers and additives, to be used with Atlas Salta S (Aval KT 54), with a coverage of 0.20 kg·m^{-2}
- Atlas Arkol NX (Aval KT 47) — ready-to-use liquid, silicone-emulsion-based binders with mineral fillers and additives, to be used with Atlas Salta N (Aval KT 48) and Atlas Salta (Aval KT 46, Aval Silicone Paint), with a coverage of 0.20 kg·m^{-2}

Paints

- Atlas Salta S (Aval KT 54) — 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·m^{-2}
- Atlas Salta N (Aval KT 48) — 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·m^{-2}
- Atlas Salta (Aval KT 46, Aval Silicone Paint) — ready-to-use liquid, silicone-based resin with pigment and additives to be used optionally with all finishing coats, with a coverage of 0.12 to 0.25 kg·m^{-2}.

(1) Thicknesses are regulated by particle size.

Figure 1 Atlas/Aval Roker MW 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
  — profile connectors and fixings.

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

- movement (expansion) joints
- fungicidal wash, water-based masonry cleaner and steriliser containing biocides
- expansion foam
- sealants — silicone or mastic silicone in accordance with BS EN ISO 11600 : 2003.

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 ATLAS SP. Z O.O. has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by DQS GmbH (Certificate 062002 QM08/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
Atlas Roker W-20 adhesive Atlas Aval KT 190 adhesive	25 kg bags
SSA 1363 SM (150) Vertex 145/AKE 145/R 117 A101 Atlas 150 Atlas 165	50 m rolls, 1.0 m wide
Atlas Cerplast (Aval KT 16) Atlas Silkat ASX (Aval KT15) Atlas Silkon ANX (Aval KT76)	5 kg, 10 kg, 15 kg, 25 kg buckets 15 kg buckets 15 kg buckets
ATLAS CERMIT mineral (AVAL mineral)	25 kg bags
ATLAS Silicate Render (AVAL Silicate Render) ATLAS Silicone Render (AVAL Silicone Render) Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render)	25 kg buckets
Atlas Arkol SX (Aval KT 52) Atlas Arkol NX (Aval KT 47)	5 kg plastic containers
Atlas Salta S (AVAL KT 54) Atlas Salta N (Aval KT 48) Atlas Salta (Aval KT 46, Aval Silicone)	10 litre buckets
Mechanical fixings	Boxed by manufacturer

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

3.3 The powder and paste render components must be stored in dry conditions, off the ground, and protected from moisture. Contaminated materials should be discarded.

3.4 The primer and paint 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 Roker MW External Wall Insulation System.

Design Considerations

4 General

4.1 The Atlas/Aval Roker 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) with no 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 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, 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.

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 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, the type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Figures for typical design U values, calculated in accordance with section 6.1, are given in Table 2.

Table 2 Insulation thickness required to achieve design U values[1][2][3]

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	220	230
0.19	210	210
0.25	150	150
0.26	140	150
0.28	130	140
0.30	120	130
0.35	100	110

(1) Wall construction inclusive of 13 mm plaster ($\lambda = 0.57\ W \cdot m^{-1} \cdot K^{-1}$), $\mu = 10$, 5 mm render ($\lambda = 1.0\ W \cdot m^{-1} \cdot K^{-1}$), $\mu = 6$ (wet), brickwork (protected) $\mu = 10$ with 17.1% mortar or dense blockwork $\mu = 100$ with 6.7% mortar ($\lambda = 0.88\ W \cdot m^{-1} \cdot K^{-1}$), and 5 mm adhesive ($\lambda = 0.43\ W \cdot m^{-1} \cdot K^{-1}$) covering 40% of the area. Internal boundary resistance (Rsi) — 0.13 $m^2 \cdot K \cdot W^{-1}$ and external boundary resistance (Rse) — 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 8 galvanized steel fixings per m^2, with a point thermal transmittance (*Xp*) of 0.004 $W \cdot K^{-1}$ per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017

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

(4) When applying the maximum available insulation thickness, these walls can achieve a U value of 0.17 $W \cdot m^{-2} \cdot K^{-1}$.

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 this 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 a mechanically fixed system 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	Substrates	Drill diameter (mm)	Effective anchorage depth (mm)	Typical pull-out resistance (kN)(2)	Partial factor
Wkret-MET LTX 10	08/0172	Concrete C12/15 Clay brickwork	10	50	0.60 0.60	2
Ejot STR U	04/0023	Concrete C12/15 Clay brickwork	8	25	1.50 1.50	2
Ejot NT U	05/0009	Concrete C12/15 Clay brickwork	8	25	1.20 1.50	2
Ejot SDM T Plus U	04/0064	Concrete C12/15 Clay brickwork	8	70	1.50 1.50	2
TERMOZ 8N	03/0019	Concrete C16/20 Clay brickwork	8	50	1.50 1.20	2
TERMOZ 8NZ	03/0019	Concrete C12/15 Clay brickwork	8	35	1.50 1.50	2
Koelner TFIX-8M	07/0336	Concrete C12/15 Clay brickwork	8	25	1.20 1.20	2
Koelner KI-10N	07/0221	Concrete C12/15 Clay brickwork	10	60	- 0.75	2

(1) The minimum values for plate stiffness of fixings is 0.4 $kN \cdot mm^{-1}$ and the load resistance is 1.64 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 and minimum insulation thickness of 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)	MW Insulation 1200 x 600 mm			
	Pull-through		Static foam block[6] (SFB)	
Tensile resistance of the insulation ($kN \cdot m^{-2}$)	10			
Fixing type[1]	WKRET-MET LMX 10			
Fixing plate diameter (mm)	≥ 60			
Insulation thickness (mm)	≥ 50			
Characteristic pull-through resistance[2] per fixing kN	At panel	0.324	At joint	0.368
Partial factor[3]	2.5			
Design pull-through resistance per fixing (N_{RD3}) kN	At panel	0. 130	At joint	0.147
Design pull-through resistance per slab (kN) (based on the minimum number of fixings)[4]	0.780		0.882	
Design pull-through resistance per slab (kN) (based on maximum number of fixings)[5]	1.170		1.323	

(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 6 fixings per slab (1200 x 600 mm), which equates to approximately 8 fixings per m^2. The design resistance for the minimum number of fixings is based on the fixing pattern provided in Figure 4 and the minimum insulation thickness specified in this Table.
(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 12 fixings per m^2. The design resistance for the maximum number of fixings is only applicable to the minimum insulation thickness tested and as specified in this Table. The fixing pattern, insulation thickness and interaction of the fixings should be considered when calculating the design resistance per slab.
(6) SFB test data is only applicable for the system configuration tested using a fixings with 60 mm fixing plate, applied through insulation slab (50 mm thickness) – 3 fixings not at panel joints + 8 fixings at panel joints.

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 about the centre of the slab 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:

$Rd \geq W_e$

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

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 6 fixings per slab or approximately 9 fixings per square metre, as per the fixing patterns 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 System impact resistance

Render systems: **Atlas Roker W-20 (Aval KT 190) basecoat + key coat or primer and the finish indicated below:**	**Thickness**	**Use Category**(1)
Atlas Roker W-20 (Aval KT 190) basecoat + Atlas Cerplast (Aval KT 16) key coat ATLAS CERMIT mineral (AVAL mineral)	7	Category lll
Atlas Roker W-20 (Aval KT 190) basecoat + Atlas Silkat ASX (Aval KT 15) key coat ATLAS Silicate Render (AVAL Silicate Render)	6	Category l
Atlas Roker W-20 (Aval KT 190) basecoat ATLAS SILKON ANX (AVAL KT 76) key coat + ATLAS Silicone Render (AVAL Silicone Render)	6	Category ll
Atlas Silkon ANX (Aval KT 76) key coat + ATLAS Silicone Render (AVAL Silicone Render)	6	Category lll
Atlas Silkon ANX (Aval KT 76) key coat + Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render)	6	Category l

(1) 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 system has a reaction to fire classification of A2-s1, d0 in accordance with BS EN 13501-1 : 2007 (see Table 6 of this Certificate).

Table 6 Reaction to fire classification

Rendering system : basecoat + keycoat(1) + finish coat + primer(2) + (decorative coat)	Reaction to fire class
Adhesive Atlas Roker W-20 (Aval KT 190) **Basecoat** Atlas Roker W-20 (Aval KT 190) **Meshes** Atlas 150 Atlas 165 SSA 1363 SM (150) **Key coats** Atlas Cerplast (Aval KT 16) Atlas Silkat ASX (Aval KT15) Atlas Silkon ANX (Aval KT76) **Finish coats** ATLAS Silicone Render (AVAL Silicone Render) Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) ATLAS CERMIT mineral (AVAL mineral) ATLAS Silicate Render (AVAL Silicate Render) **Primer** Atlas Arkol SX (Aval KT 52) Atlas Arkol NX (Aval KT 47) **Decorative coat (paints)** Atlas Salta S (AVAL KT 54) Atlas Salta N (AVAL KT 48) Atlas Salta (AVAL KT 46, Aval Silicone Paint)	A2-s2, d0

(1) All the combination tested to be used with the relevant keycoat, as in section 1.1.
(2) The optional primers were used in accordance with section 1.1.

8.2 The fire classification applies to the full range of insulation thicknesses covered by this Certificate.

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

8.4 The system is considered suitable for use on, or at any distance from, the boundary and there is no height restriction on its use.

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

9 Proximity of flues and appliances

As the insulation is mineral wool and the system has an A2-s2, d0 reaction to fire classification, no national Building Regulations need to be satisfied:

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 the 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 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, 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 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 this Certificate.

11.5 The water vapour resistance factor (μ) for the insulation slabs is 1. The equivalent air layer thicknesses (s_d) of the various reinforced basecoats with finishing coats are as listed in Table 7.

Table 7 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)
MW	—	1	—
Render system: Atlas Roker W-20 (AVAL KT 190) basecoat (4 mm) + ATLAS CERPLAST (AVAL KT 16) and Key coats + finishing coats indicated			
ATLAS CERPLAST (AVAL KT 16) + ATLAS CERMIT mineral (AVAL mineral)	7	—	0.21
ATLAS CERPLAST (AVAL KT 16) + ATLAS CERMIT mineral (AVAL mineral) (3mm) + Atlas Salta N (Aval KT 48)	7	—	0.24
ATLAS SILKAT ASX (AVAL KT 15) + ATLAS Silicate Render (AVAL Silicate Render) (3 mm)	7	—	0.20
ATLAS SILKAT ASX (AVAL KT 15) + ATLAS Silicate Render (AVAL Silicate Render (3 mm) + Atlas Salta N (Aval KT 48)	7	—	0.35
ATLAS SILKON ANX (AVAL KT 76) + ATLAS Silicone Render (AVAL Silicone Render) (2 mm)	6	—	0.51
ATLAS SILKON ANX (AVAL KT 76) + ATLAS Silicone Render (AVAL Silicone Render) (2 mm) + Atlas Salta N (Aval KT 48)	6	—	0.59
ATLAS SILKON ANX (AVAL KT 76) + ATLAS Silicone Render (AVAL Silicone Render (2 mm) + Atlas Salta S (Aval KT 46)(Aval Silicone Paint)	6	—	0.39
ATLAS SILKON ANX (AVAL KT 76) + ATLAS Silicone Render (AVAL Silicone Render (2 mm) + Atlas Salta (Aval KT 46) (Aval Silicone Paint)	6	—	0.52
ATLAS SILKON ANX (AVAL KT 76) + Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) (2 mm)	6	—	0.52
ATLAS SILKON ANX (AVAL KT 76) + Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) + (2 mm) + Atlas Salta N (Aval KT 48)	6	—	0.62
ATLAS SILKON ANX (AVAL KT 76) + Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) (2 mm) + Atlas Salta S (Aval KT 54, Aval Silicate Paint)	6	—	0.59
ATLAS SILKON ANX (AVAL KT 76) + Atlas Silicone-Silicate Render (Aval Silicone-Silicate Render) + (2 mm) + Atlas Salta (Aval KT 46, Aval Silicone Paint)	6	—	0.57

12 Maintenance and repair

12.1 Regular checks should be made on the installed system, including:

- 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 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 is 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 any repairs necessary 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, where required.

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 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 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 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.

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 current installation instructions and this Certificate.

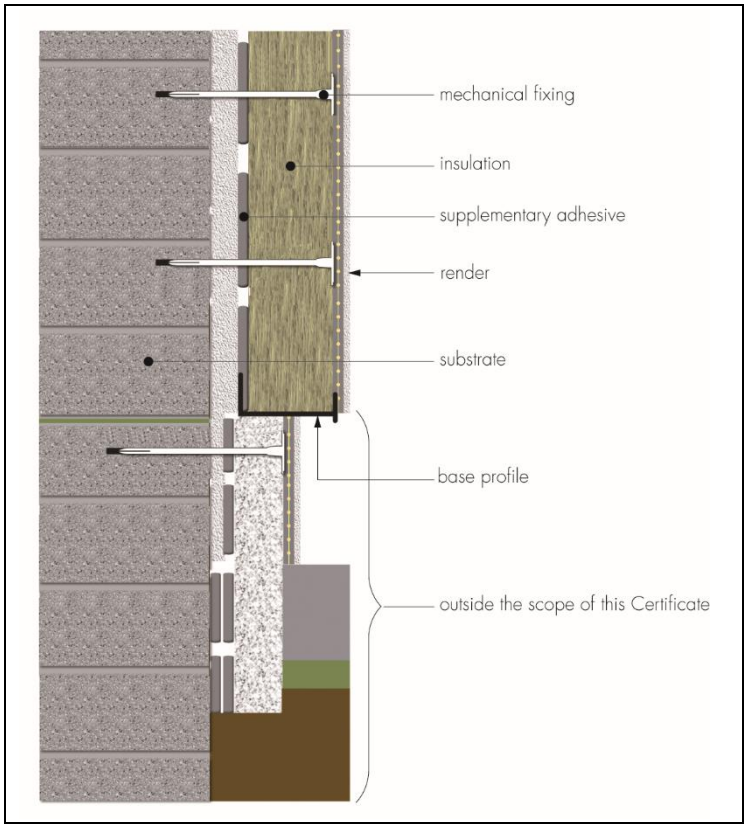
16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, or if exposure to frost is likely, and the coating must be protected from rapid drying. Installation should not take place during rainfall or if rain is anticipated.

16.3 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2005.

Positioning and securing insulation slabs

16.4 The supporting base profile is secured to the external wall above the dpc using approved profile fixings at 300 mm maximum centres (see Figure 2). Beads and expansion joints are incorporated as specified. 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.

Figure 2 Typical section of base profile



16.5 Supplementary adhesive is prepared with approximately 6 litres of clean water per 25 kg bag, and mixed with a slow speed mixer for three to four minutes until homogeneous. The adhesive is applied in a continuous ribbon at least 3 cm wide around the perimeter of the slab, with six to eight evenly distributed patches of adhesive (8 to 12 cm in diameter) over the remaining surface. A minimum of 40% of the slab should be achieved. Alternatively, the adhesive can be applied over the entire face of the insulation slab using a notched trowel, to produce a coat 2 to 5 mm thick.

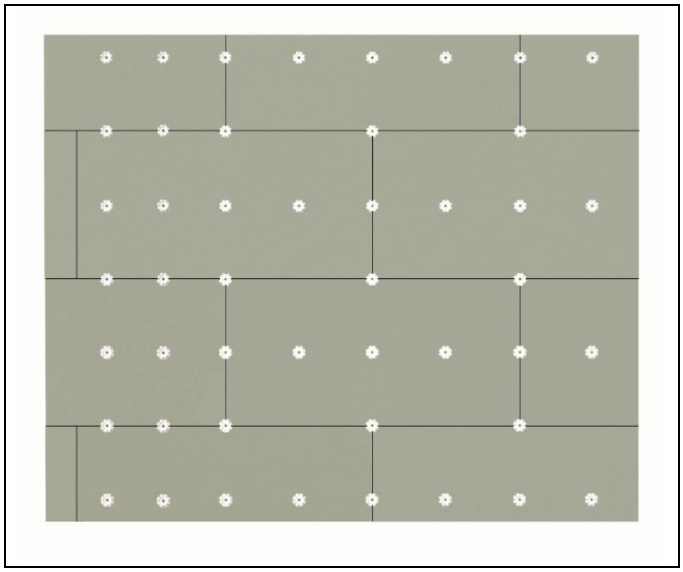
16.6 The slabs must be pressed firmly against the wall and butted tightly together with the vertical joints staggered by at least 200 mm and overlapped at building corners (see Figure 3). Joints between slabs greater than 2 mm should be filled. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting slabs to fit. Alignment should be checked as work proceeds.

Figure 3 Typical arrangement of insulation slabs

16.7 The first run of slabs, with the adhesive applied, is positioned on the base profile and pressed firmly against the wall.

16.8 Holes are drilled into the substrate wall to the required depth through the slabs, and fixings are inserted and tapped or screwed firmly into place, at positions which would allow a minimum of eight fixings per square metre and at a minimum of six fixings per insulation slab, in the main area of the wall (see Figure 4). Around openings, additional fixings should be used at 300 mm centres.

Figure 4 Insulation slab fixing pattern



16.9 Any high spots or irregularities should be levelled by pressing the adhesive into place until a level surface is achieved. This will ensure the application of an even thickness of basecoat.

16.10 To fit around details such as doors and windows, the 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.

16.11 Installation continues until the whole wall is completely covered including, where appropriate, the building soffits and eaves. After sufficient stabilisation of the installed insulation (normally two 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.

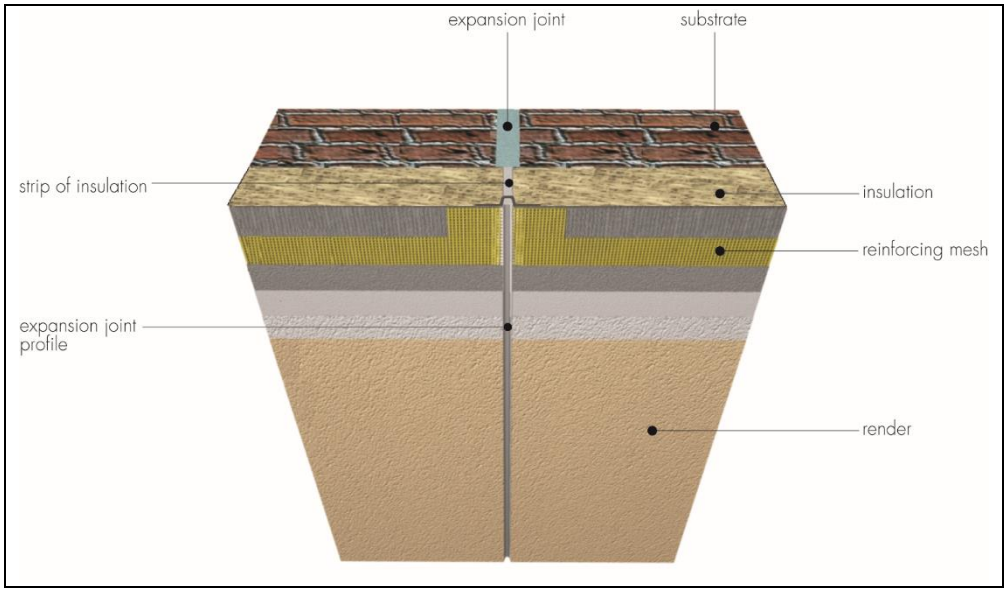
16.12 Prior to application of the basecoat, the relevant seals are positioned and installed at all openings (eg windows and doors), overhanging eaves, gas and electric meter boxes, wall vents or where the render abuts any other building material or surface. This helps to reduce the risk of water ingress into the structure.

16.13 Beads are fixed to all building corners and to door and window heads and jambs using the basecoat renders. 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

16.14 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 5). Specific types of joint have not been assessed as part of the system and advice should be sought from the Certificate holder.

Figure 5 Vertical movement joint



16.15 The basecoat is prepared with approximately 6 litres of clean water per 25 kg bag, mixed with a mechanical mixer and trowel-applied to the surface of the insulation slabs at approximately two thirds of the final basecoat thickness.

16.16 A 10 mm toothed trowel, held at 45° to the insulation slab, is used to leave castellations in the basecoat. A layer of alkali-resisting glassfibre mesh is then applied either vertically or horizontally, ensuring the mesh is overlapped at joints by a minimum of 100 mm, and 150 mm in quoins. The mesh should be pressed into the basecoat using a notched float, taking care to avoid direct contact with the insulation.

16.17 The remaining one third thickness of basecoat is then applied, ensuring the mesh is completely covered and free of wrinkles and that the minimum basecoat thickness is achieved.

16.18 Where a second layer of mesh is needed to achieve the required impact resistance, application of the basecoat and mesh layers should be performed in two operations. The first layer of the mesh is applied as described above. After a minimum of 24 hours, a second layer of basecoat and mesh is applied, to provide a combined total basecoat thickness of approximately 8 mm.

16.19 Additional pieces of reinforcing mesh (approximately 300 by 200 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 3).

16.20 The basecoat must be allowed to dry for between 24 and 72 hours before application of the keycoat and finishing coat.

Key coats

16.21 The keycoat is roller-applied 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.

Finishing

16.22 Finishes are applied directly over the keycoat to an approximate render thickness of between 1.5 and 3.0 mm, depending on the finishes and reinforcing mesh application.

16.23 All rendering should be in accordance with the relevant recommendations of BS 8000-2 : 2014, BS EN 13914-1 : 2005 and the Certificate holder's instructions.

16.24 Continuous surfaces should be completed without a break to minimise colour shade variations and to avoid dry line jointing. If breaks cannot be avoided, they should be made where services or architectural features, such as reveals or lines of doors and windows, help mask cold joints. Where long, uninterrupted runs are planned, containers of the finishing coat should be checked for batch numbers. Bags with different batch numbers should be checked for colour consistency.

16.25 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.

16.26 At the top of walls, the system should be protected by an adequate overhang (see Figure 6) or by an adequately sealed purpose-made flashing. Care should be taken in the detailing of the system around openings and projections (see Figures 7 and 8).

Figure 6 Roof eaves detail

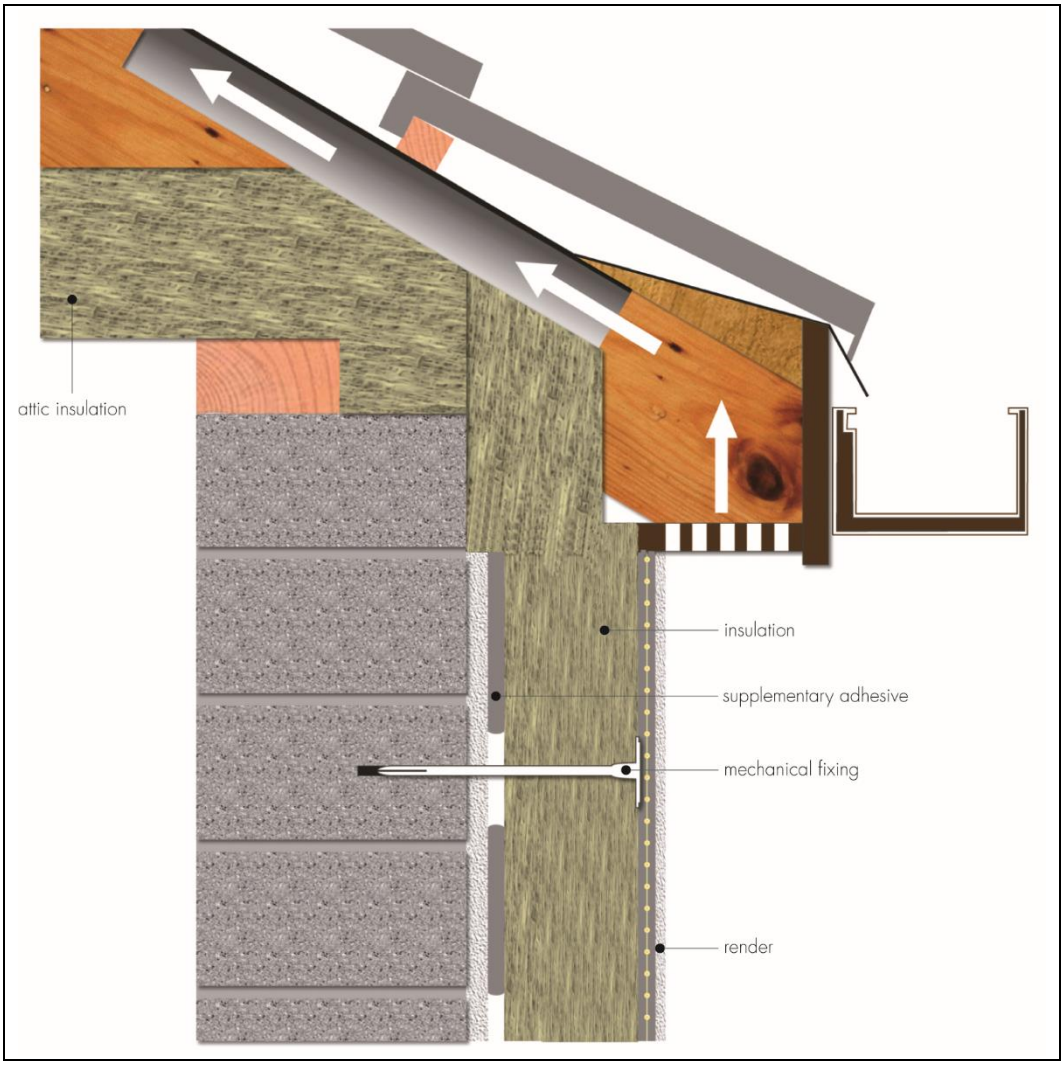


Figure 7 Typical window and door reveal details

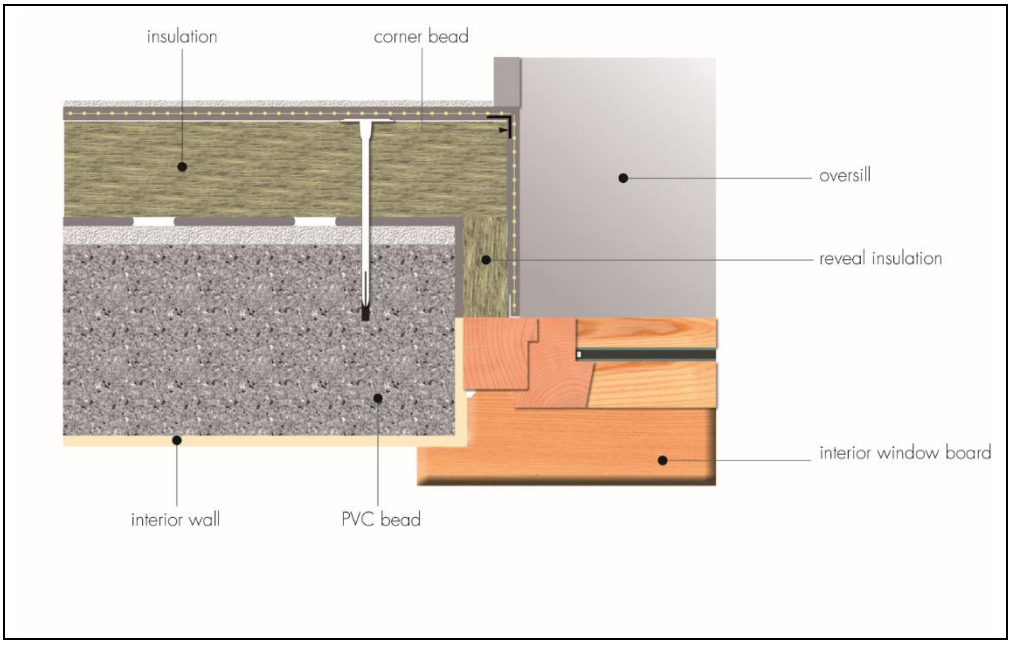
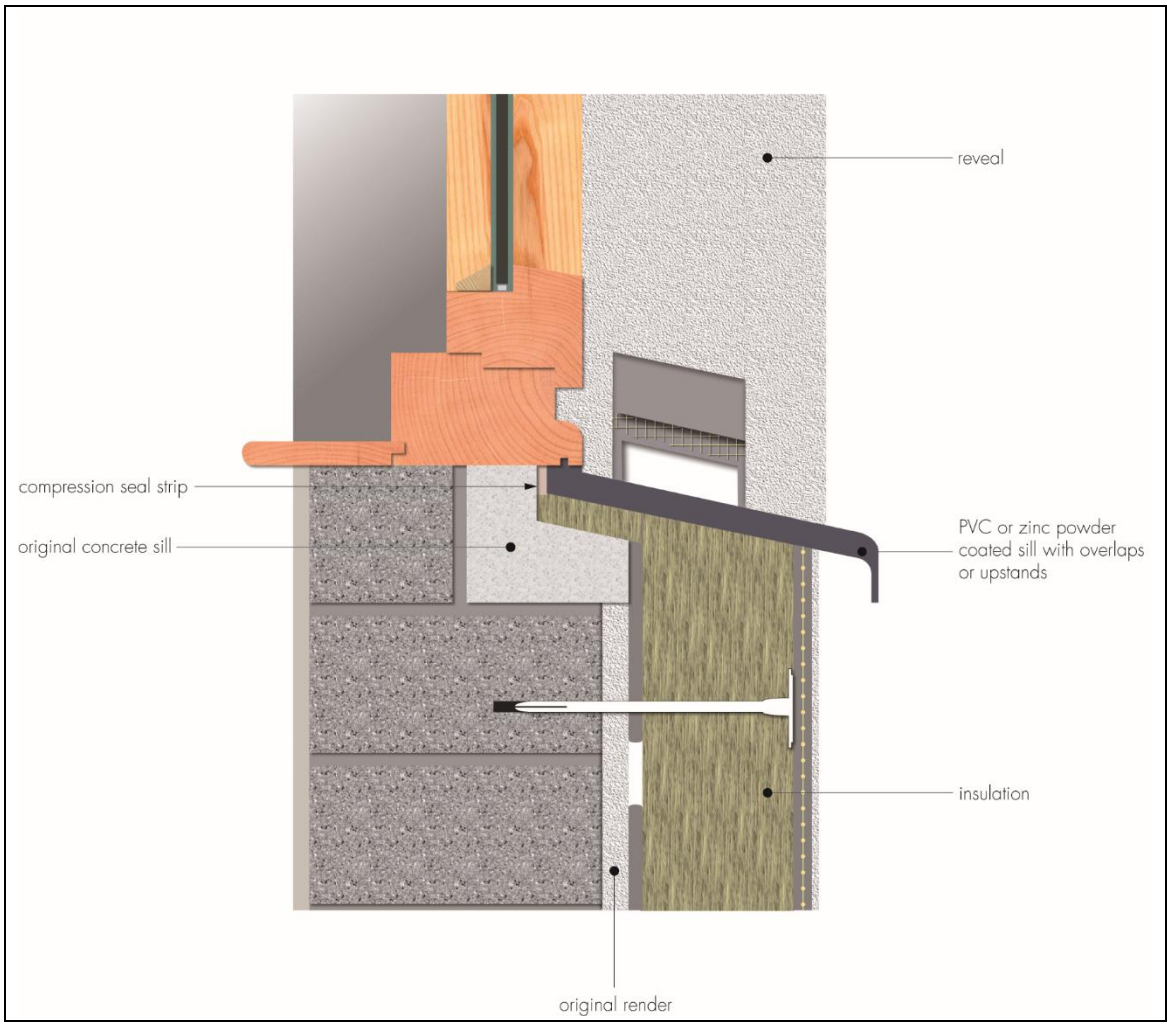


Figure 8 Window sill detail



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

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) and resistance to freeze/thaw
- 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 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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BS EN ISO 11600 : 2003 + A1 : 2011 *Building construction — Jointing products — Classification and requirements for sealants*

EAD 330196-00-0604 *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 External Thermal Insulation Composite Systems 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.

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