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Agrément Certificate
15/5192
Product Sheet 2

WETHERBY EXTERNAL WALL INSULATION SYSTEMS

EPSICOAT STONE WOOL EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet(1) relates to the EpsiCoat Stone Wool External Wall Insulation System, comprising mechanically fixed mineral wool (MW) fibre insulation slabs, with supplementary adhesive, reinforced basecoat and render finishes. It is suitable for use on the outside of external 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 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 : 2018 (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.

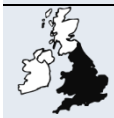
On behalf of the British Board of Agrément

Date of First issue: 15 April 2020

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, the EpsiCoat Stone Wool 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(1)**	**Materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate
Regulation:	**7(2)**	**Materials and workmanship**
Comment:		The system is unrestricted by this Regulation. See sections 8.1 to 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 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 2B[(1)]. See sections 8.1 to 8.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system can contribute to 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:		Walls insulated with the system will satisfy this Regulation. See section 10.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		Walls insulated with the system will satisfy the requirements of this Regulation. 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**
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 will contribute to satisfying the building's target emission rate. 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* (3.2) of this Certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, the EpsiCoat Stone Wool 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 EpsiCoat Stone Wool External Wall Insulation System comprises mineral wool (MW) insulation slabs, mechanically fixed to the substrate wall with supplementary adhesive (ensuring a minimum of 40% coverage of adhesive is achieved), 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 finishes are applied in accordance with the Certificate holder's installation instructions and this Certificate.

1.2 The system comprises:

Insulation(1)

- MWDD 036 — dual density mineral wool (MW) slabs available in sizes up to 1200 by 600 mm and in a range of thicknesses from 80(2) to 250 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 BS EN 13162 : 2012

(1) For declared thermal conductivity values (λ_D) see section 6.1 of this Certificate.
(2) Lower thicknesses are for use on existing reveals.

Mechanical fixings

- Mechanical fixings(1)(2) — fixing anchors with various lengths to suit the substrate and insulation thickness, approved and supplied by the Certificate holder, and selected from:
  - Ejotherm STR U, STR U 2G — high-density polyethylene (HDPE) anchor sleeve and polystyrene anchor cap with galvanized steel centre pin
  - Bravoll PTH-KZ 60/8, Bravoll PTH 60/8 — polyamide PA6 anchor sleeve with stainless steel or electro-galvanized pins
  - Bravoll PTH-S — polyamide PA6 anchor sleeve with stainless steel or electro-galvanized pins
  - Koelner TFIX-8S — polyamide PA6 anchor sleeve with stainless steel or electro-galvanized pins
  - Fischer Termoz CN 8 — polyamide PA6 anchor sleeve with stainless steel or electro-galvanized pins
  - SPIT ISO — polypropylene plastic expansion sleeve with a polypropylene or polyamide 6 plastic nail

(1) Other fixings may be used provided it can be demonstrated that they have equal or higher pull-out resistance, plate diameter and plate stiffness characteristics.
(2) RAWL KWL 90 / 140 mm diameter extension washer can be used in conjunction with TFIX-8S fixings to enhance the pull-through strength capacity.

Adhesive (supplementary)

- Styrofix — factory-batched, cementitious adhesive, supplied as a powder requiring the addition of 5 litres of clean water per 25 kg bag, mixed with a high-speed mixer for 3 to 5 minutes. Applied at a coverage rate of between 4.0 and 5.0 $kg \cdot m^{-2}$ in ribbon and dabs, to cover at least 40% of the slab. The adhesive can also be applied with a notched trowel with a layer of up to 5 mm depth, to cover the slab surface
- Styrobond DP — factory-batched, lime cementitious adhesive, supplied as a powder requiring the addition of 5 litres of clean water per 25 kg bag, mixed with a high-speed mixer for 3 to 5 minutes. Applied at a coverage rate of between 4.0 and 5.0 $kg.m^{-2}$ in ribbon and dabs, to cover at least 40% of the slab. The adhesive can also be applied with a notched trowel with a layer of up to 5 mm depth, to cover the slab surface

Basecoat

- Styrobond DP — factory-batched, lime/cement-based mortar, supplied as a powder requiring the addition of 5 litres of clean water per 25 kg bag, mixed with a high-speed mixer for 3 to 5 minutes. Applied to the slab face to an approximate total thickness of 6 to 8 mm, with a coverage of 5 to 8 $kg \cdot m^{-2}$

Reinforcement

- WBS Reinforcing Scrim — alkali- and slide-resistant glass fibre mesh, with a mass per unit area of approximately 160 $g \cdot m^2$ and a grid size of approximately 4 by 4 mm. Applied in one or two layers

Primer/key coat

- EpsiCoat Primer — pigmented acrylic primer for use with acrylic and mineral finish coats, at a coverage of approximately 0.15 to 0.2 $kg \cdot m^{-2}$
- EpsiCoat Premium Primer — acrylic-siloxane primer for use with silicone finish coats, at a coverage of approximately 0.1 to 0.2 $kg \cdot m^{-2}$

Finishing coats

Acrylic finishes

- EpsiCoat Acrylic 'R' Finish and EpsiCoat Acrylic 'K' Finish — factory-batched, acrylic finishing coats, supplied as a ready to use paste applied to the primer basecoat. Available in particle sizes of 2 and 3 mm (EpsiCoat Acrylic 'R' Finish), and 1 and 2 mm (EpsiCoat Acrylic 'K' Finish), with applied thickness regulated by particle size

Silicone finishes

- EpsiCoat Silicone 'R' Finish and EpsiCoat Silicone 'K' Finish — factory-batched, silicone finishing coats, supplied as ready to use paste applied to the basecoat. Available in particle sizes of 1 to 3 mm (EpsiCoat Silicone 'R' Finish), and 1 and 2 mm (EpsiCoat Silicone 'K' Finish), with applied thickness regulated by particle size

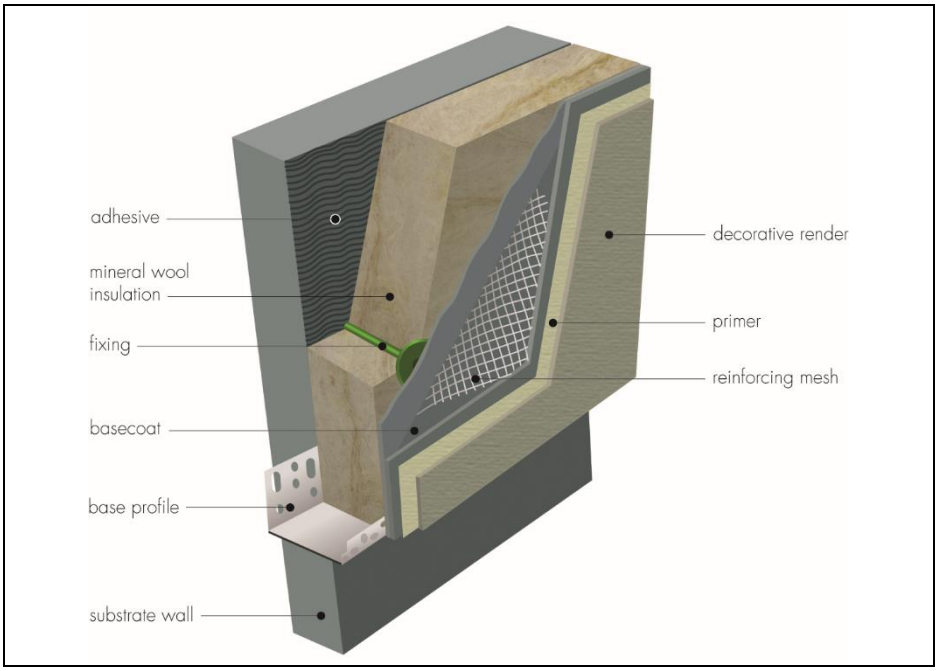
Mineral finishes

- EpsiCoat Mineral Render Plus — factory batched, polymer-modified coloured mineral renders, consisting of cementitious powder requiring the addition of approximately 20% water and applied to the basecoat. Available in particle sizes of 1, 1.5 and 2 mm, with applied thickness regulated by particle size
- EpsiCoat Mineral Render and EpsiCoat Mineral Render Decor — factory-batched, cementitious render coats, requiring the addition of approximately 20% water and applied to the basecoat. Available in particle sizes of 1 and 2 mm (EpsiCoat Mineral Render), and 2 and 3 mm (EpsiCoat Mineral Render Decor), with applied thickness regulated by particle size

Top coat

- EpsiCoat Colour Stain — final colour coat for overcoating EpsiCoat Mineral Render and EpsiCoat Mineral Render Decor, roller applied at a coverage of 0.20 to 0.30 kg·m^2 in two coats.

Figure 1 EpsiCoat Stone Wool *External Wall Insulation System*



1.3 Ancillary materials used with the system:

- 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 system, but outside the scope of this Certificate:

- fungicidal wash
- water-based masonry cleaner
- steriliser containing biocides
- silicone or mastic silicone sealant in accordance with BS EN ISO 11600 : 2003
- expansion foam — polyurethane foam used for filling gaps between insulation slabs
- cementitious or polymer-based mortar to repair the substrate surface.

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.

3 Delivery and site handling

3.1 The insulation is delivered to site shrink-wrapped in polythene packs bearing the manufacturer's and product identification and batch number.

3.2 The other system components are delivered in the quantities and packages listed in Table 1. Each package carries the manufacturer's and product identification and batch number. The basecoat and render finish also include the BBA logo incorporating the number of this Certificate.

Table 1 Component supply details

Components	Quantity and packaging
Mineral Wool (MW) Dual Density Insulation	Shrink-wrapped in plastic film (on pallets)
Styrofix – adhesive	25 kg bags
Styrobond DP	25 kg bags
Fixings	Boxed by manufacturer
WBS Reinforcing Scrim	50 by 1 m rolls
EpsiCoat Primer	20 kg pails
EpsiCoat Premium Primer	20 kg pails
EpsiCoat Acrylic 'R' Finish	25 kg pails
EpsiCoat Acrylic 'K' Finish	25 kg pails
EpsiCoat Silicone 'R' Finish	25 kg pails
EpsiCoat Silicone 'K' Finish	25 kg pails
EpsiCoat Mineral Render Plus	20 kg pails and 25 kg bags
EpsiCoat Mineral Render	25 kg bags
EpsiCoat Mineral Render Decor	25 kg bags
EpsiCoat Colour Stain	20 kg pails

3.3 The insulation slabs 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.

3.4 The insulation slabs must be protected from prolonged exposure to sunlight, either by storing opened packs under cover re-covering with opaque polythene sheeting. Care must be taken to avoid contact with solvents or materials containing volatile organic components.

3.5 The adhesive, basecoat, topcoat and all cementitious materials must be stored in dry conditions between 5 and 30°C, off the ground and protected from moisture. Contaminated materials should be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the EpsiCoat Stone Wool External Wall Insulation System.

Design Considerations

4 General

4.1 The EpsiCoat Stone Wool 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 installation of the system, wall surfaces should comply with section 14.

4.4 New walls subject to 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, 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, quality of work 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 value (λ_D) 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. Calculated U values for sample construction 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]

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

(1) Wall construction inclusive of 13 mm plaster (λ = 0.57 $W \cdot m^{-1} \cdot K^{-1}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar (λ = 0.88 $W \cdot m^{-1} \cdot K^{-1}$). Declared thermal conductivity (λ_D) of insulation is as shown in section 6.1. A 5 mm thick layer of adhesive (with λ = 0.43 $W \cdot m^{-1} \cdot K^{-1}$) covering 40% of the insulation surface, together with an external render thickness of 4.2 mm (with λ = 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 0.004 $W \cdot K^{-1}$ per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017. 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 0.17 $W \cdot m^{-2} \cdot K^{-1}$.

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 zone 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 (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)	Characteristic pull-out resistance (kN)[2]	Partial factor
Ejotherm STR U	04/0023	Concrete C12/15 Clay bricks	8	65	1.5	2
Ejotherm STRU U 2G	04/0023	Concrete C12/15 Clay bricks	8	25	1.2 1.5	2
Bravoll PTH-KZ 60/8	05/0055	Concrete C12/15 Clay bricks	8	70	1.5	2
Bravoll PTH 60/8	05/0055	Concrete C12/15 Clay bricks	8	25	1.5	2
Bravoll PTH-S	08/0267	Concrete C12/15 Clay bricks	8	25	1.5	2
Koelner TFIX-8S	11/0144	Concrete C12/15 Clay bricks	8	25	1.2	2
Fischer Termoz CN 8	09/0394	Concrete C12/15 Clay bricks	8	35	0.9	2
Spit ISO	04/0076	Concrete C12/15 Clay bricks	10	30	0.2 0.3	2

(1) The minimum value for plate stiffness of fixings is 0.6 $kN \cdot m^{-2}$ and the load resistance is 2 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 with a 90 and 140 mm diameter extension washer, and minimum insulation thickness of 80 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)	Mineral Wool (MW) insulation (1200 x 600 mm)		
	Pull-through		
Tensile resistance of the insulation (kPa)	≥ 10		
Fixing type(1)	TFIX-8S		
Fixing plate diameter (mm)	60	60 + KWL 90	60 + KWL 140
Insulation thickness (mm)	80	100	
Characteristic pull-through resistance(2) per fixing kN (at panel)	0.294	0.464	0.532
Partial factor(3)	2.5		
Design pull-through resistance per fixing (N_{RD3}) kN (at panel)	0.117	0.185	0.213
Design pull-through resistance per slab kN (based on minimum number of fixings)(4)	0.59	0.93	1.06
Design pull-through resistance per slab kN (based on maximum number of fixings)(5)	1.40	2.22	2.56

(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. The design resistance for the minimum number of fixings is based on the fixing pattern provided in Figure 4 and minimum insulation thickness tested and as specified in this table. The fixing pattern and interaction of the fixings should be considered when calculating the design resistance per slab.

(5) The maximum design pull-through resistance per slab is based on a maximum of 9 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.

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 slabs both vertically and horizontally, except at openings and building corners.

7.11 The data derived from sections 7.6 to 7.8 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 5 fixings per slab or approximately 7 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

Rendering systems: basecoat and primer, plus finishing coat as indicated below:	Use Category(1)
	Single-layer mesh (see section 1.2 – Reinforcement)
EpsiCoat Silicone 'K' Finish EpsiCoat Acrylic 'K' Finish EpsiCoat Mineral Render Plus	Category I
EpsiCoat Acrylic 'R' Finish EpsiCoat Silicone 'R' Finish EpsiCoat Mineral Render EpsiCoat Mineral Render Decor	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 for the system is A2-s1, d0 in accordance with BS EN 13501-1 : 2018.

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

8.3 The mineral wool (MW) insulation material in isolation is classified as non-combustible.

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

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, quality of work 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 thicknesses (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)	S_d (m)	μ
Mineral Wool (MW)	50 - 250	—	1
Rendering system: Basecoat and primer coat, plus finish coat as indicated below:			
Styrobond DP(1)		0.08	
EpsiCoat Acrylic 'R' Finish		0.23	
EpsiCoat Acrylic 'K' Finish		0.30	
EpsiCoat Silicone 'R' Finish		0.16	
EpsiCoat Silicone 'K' Finish		0.11	
EpsiCoat Mineral Render Plus		0.16	
EpsiCoat Mineral Render		0.34	
EpsiCoat Mineral Render Decor		0.30	

(1) Basecoat, in isolation.

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, 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:

- additional corner mesh and reinforcement, where required
- the position of beads
- detailing around windows, doors and at eaves
- damp-proof course (dpc) level (not covered by this Certificate)
- 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 10).

14.7 In new buildings, internal wet work (eg screeding or plastering) should be completed and allowed to dry prior to 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. Installation should not take place during rainfall or if rain is anticipated. Application of the coating materials must not be carried out at

temperatures below 5 or above 35°C, or if exposure to frost is likely. The coating must be protected from rapid drying. In addition, cementitious renders must not be applied if the temperature will fall below 0°C within 48 hours of completion.

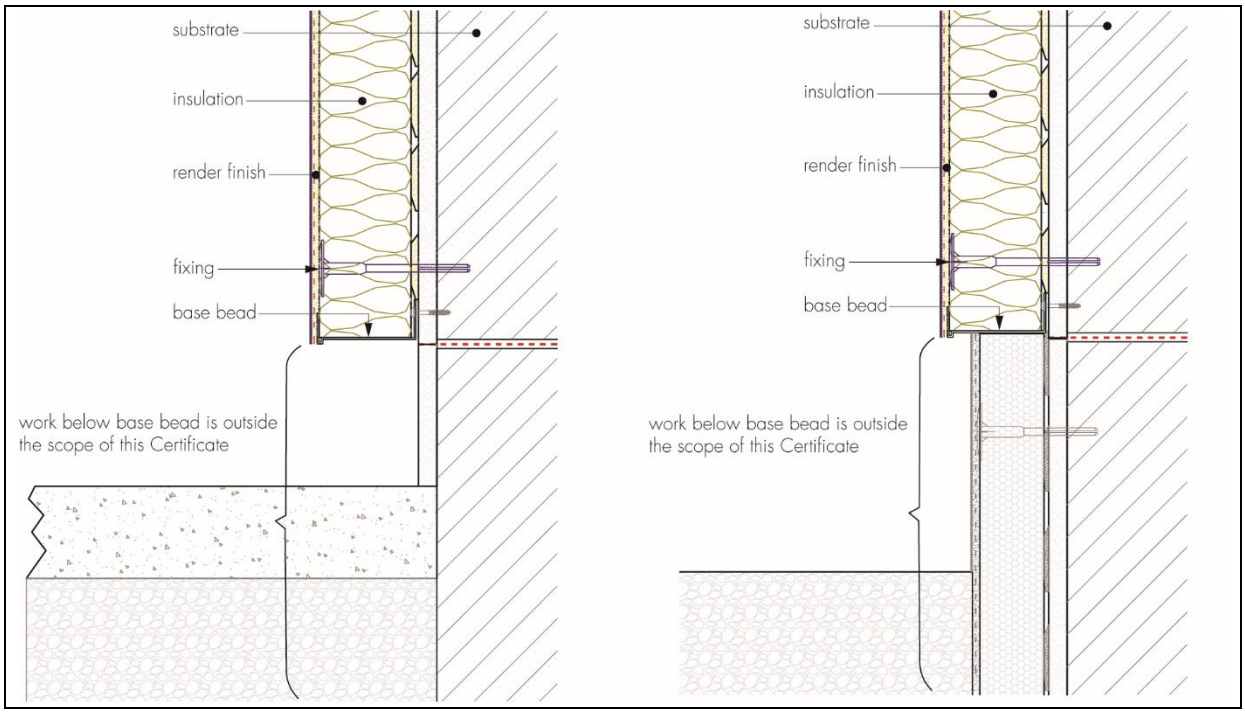
16.3 The planarity and condition of the substrate must be checked, and any protrusions exceeding 10 mm removed.

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 300 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.

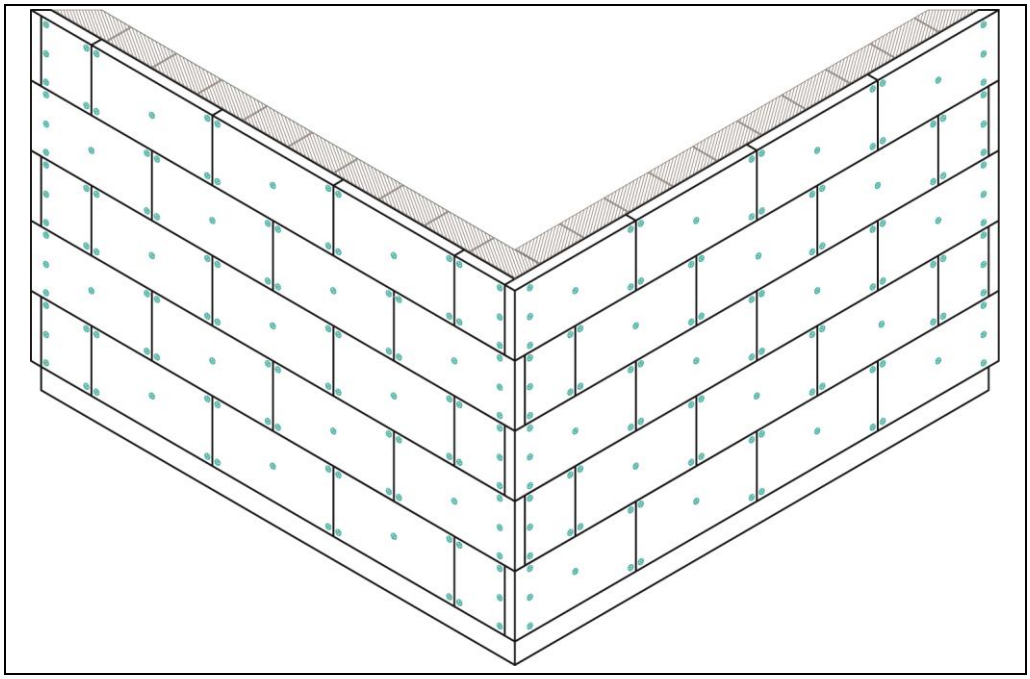
Figure 2 Typical section at base level



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 bordering strip around the perimeter of the slab with three additional dabs (approximately 10 to 40 mm wide) distributed uniformly over the remaining surface to a minimum thickness of 5 mm, ensuring a 40% minimum coverage of adhesive is achieved.

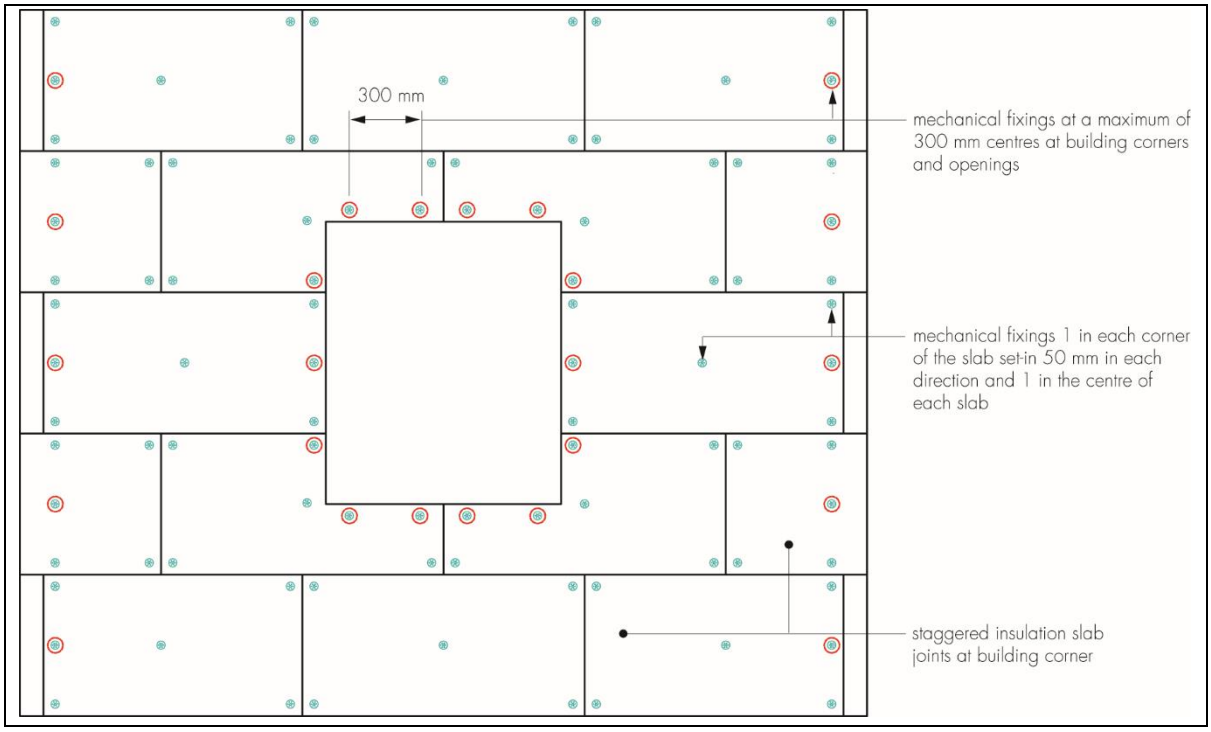
16.7 The first run of insulation slabs, with adhesive applied, is positioned on the base profile. The slabs must be pressed firmly against the wall and butted tightly together and aligned to achieve a level finish. Subsequent rows of slabs are positioned so that the vertical slab joints are staggered and overlapped at the building corners and so that the slab joints do not occur within 200 mm of the corners of openings (see Figure 3). Between slabs, joints greater than 2 mm should be filled with mineral wool slithers. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting slabs to fit. Any high spots or irregularities should be removed. Alignment should be checked as work proceeds.

Figure 3 Typical arrangement of the insulation slabs



16.8 Holes are drilled into the substrate wall to the required depth through the insulation at the corners of each slab and at positions which would result in a minimum of five fixings per slab (equating to seven fixings per square metre). The fixing pattern is shown in Figure 4 for a slab size of 1200 by 600 mm. Around openings, additional fixings should be used at 300 mm centres. The mechanical fixings are inserted and tapped or screwed firmly into place, securing the insulation to the substrate.

Figure 4 Mechanical fixing pattern



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

16.10 Installation continues until the whole wall is completely covered including, where appropriate, the building soffits and eaves. Periodic checks should be carried out as work proceeds.

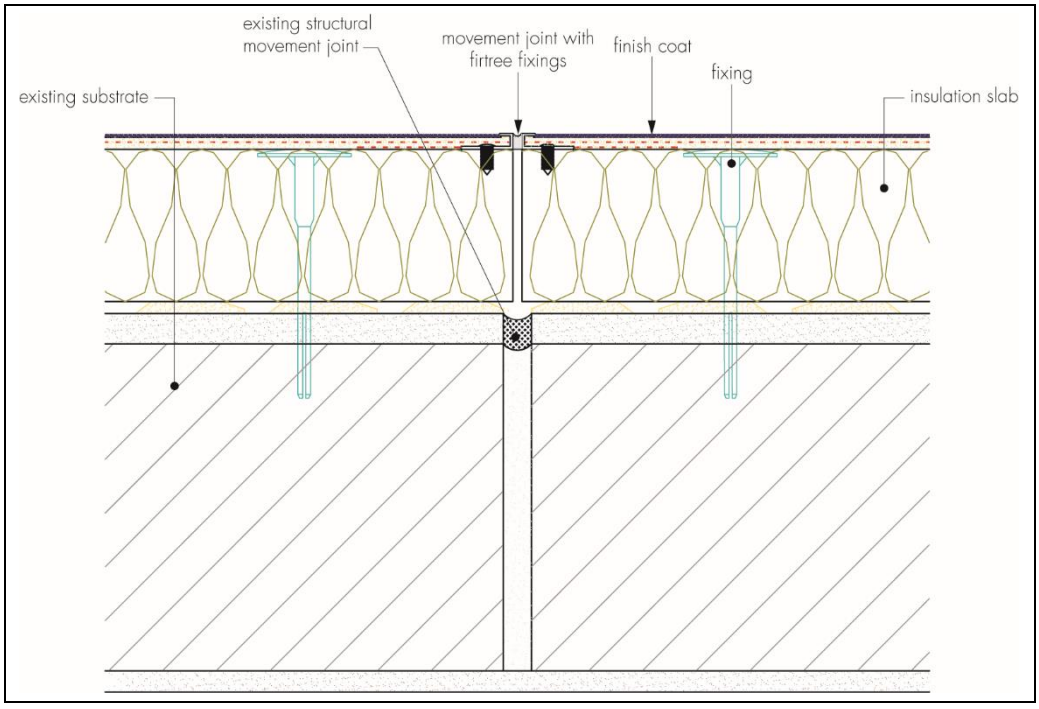
16.11 Window and door reveals should be insulated to minimise the effects of cold bridging. Where clearance is limited, strips of approved insulation should be installed to suit available margins and details.

16.12 At all locations where there is a risk of insulant exposure, eg window reveals or eaves, the system must be protected by such features by an adequate overhang or purpose-made sub-sills, seals or flashing. All corners are protected using PVC corner beads, with wing mesh installed with adhesive mortar to all 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, PVC corner beads with drip nose are installed, to allow the rainwater to drain away.

Movement joints

16.13 Generally, movement joints are not required in the system but, if such a joint is already incorporated in the substrate, a movement joint must be provided in the insulation system (see Figure 5).

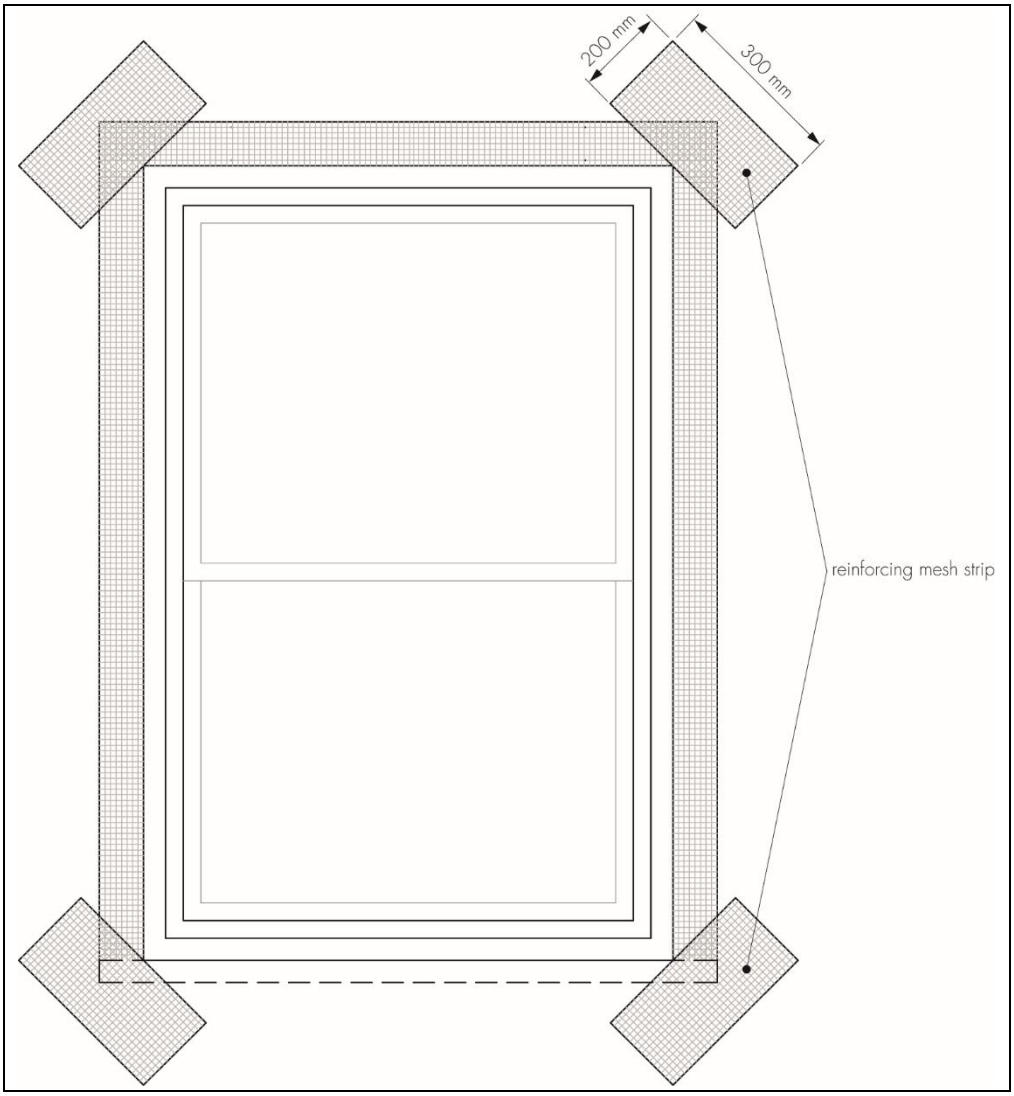
Figure 5 Vertical movement joint



Application of basecoat and reinforcing mesh

16.14 Pieces of reinforcing mesh (approximate size 300 by 200 mm) should be used diagonally at the corners of windows and doors and other building openings so that they extend equally either side of the corner (see Figure 6). These stress patches are applied after the main mesh layer has been applied.

Figure 6 Reinforcement at openings



16.15 The basecoat is prepared with the required amount of water (see section 1.2), then applied over the insulation slabs using a stainless steel trowel, and floated with a Darby float to an approximate 4 to 6 mm thickness. The reinforcing mesh is applied and immediately embedded into the basecoat by trowelling from the centre to the edge; an additional light coat of basecoat is applied (whilst the first coat is still wet) to ensure the mesh is free of wrinkles; overlapping at all mesh joints should not be less than 100 mm. The first layer of basecoat should then be allowed to cure.

16.16 A further layer of basecoat is then applied as required, to ensure the mesh is completely covered and the minimum 6 mm thickness of basecoat is achieved.

16.17 The basecoat is applied progressively, working in one-metre sections vertically or horizontally.

16.18 The embedded reinforcing mesh should be sized and fitted to fully overlap the corner bead mesh.

16.19 The reinforced basecoat is left to dry for at least two days before the primer and finishing coats are applied.

Primer

16.20 The primer coat is roller-applied, first making sure the basecoat is free from any irregularities (trowel-marks, exposed mesh, etc).

Finishing coats

16.21 Finishes are applied directly over the primed basecoat to an approximate render thickness of between 1 and 3 mm.

16.22 Prior to setting, the render is rubbed up with a plastic float to give an even texture and to remove all trowel lines. Continuous surfaces should be completed in one application, finished to natural breaks in the render (ie beads or building corners) and always applied to a wet edge.

16.23 When EpsiCoat Colour Stain finish is specified as a coloured paint top coat over EpsiCoat Mineral and EpsiCoat Mineral Render Décor mineral renders, before applying, the Terol finish coat must be completely dry (minimum of 72 hours, weather dependent). Application of EpsiCoat Colour Stain should be to the Certificate holder's guidelines.

16.24 Care should be taken in the detailing of the system around openings and projections and at eaves (see Figures 7 to 10) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.25 At the top of walls, the system should be protected by an adequate overhang (see Figure 7) or by an adequately sealed purpose-made flashing. The Certificate holder's instructions should be followed in relation to the specification, location and installation of approved sealants.

Figure 7 Typical roof eaves detail

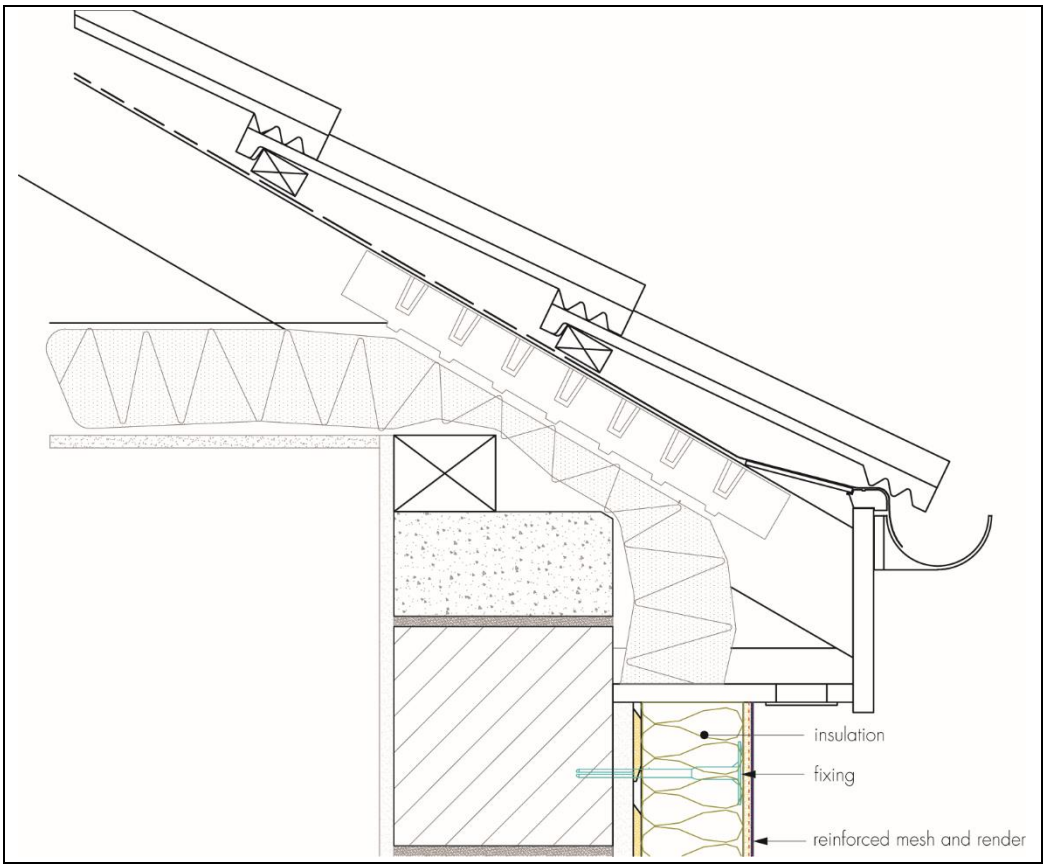


Figure 8 Insulated window reveal detail

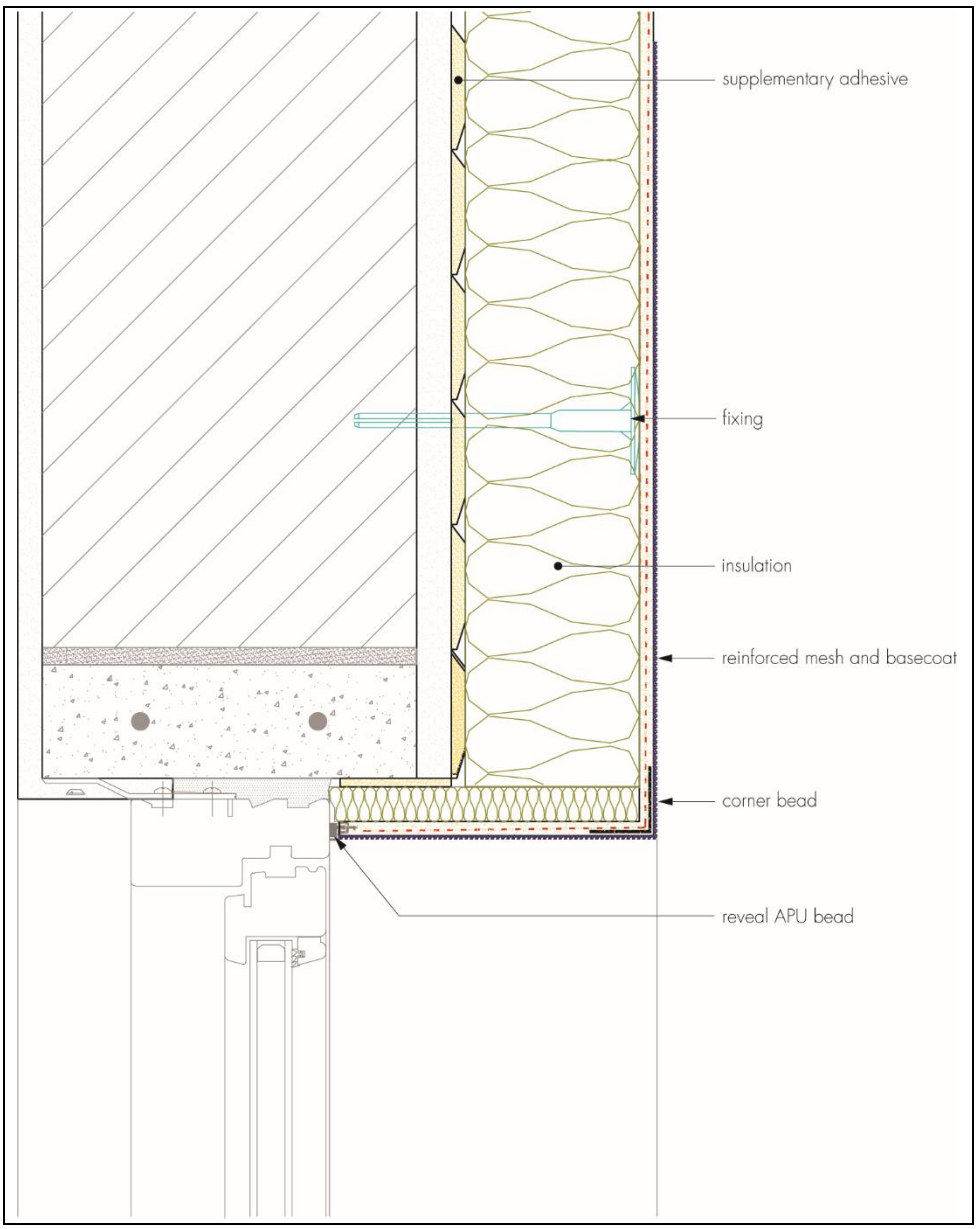


Figure 9 External corner detail

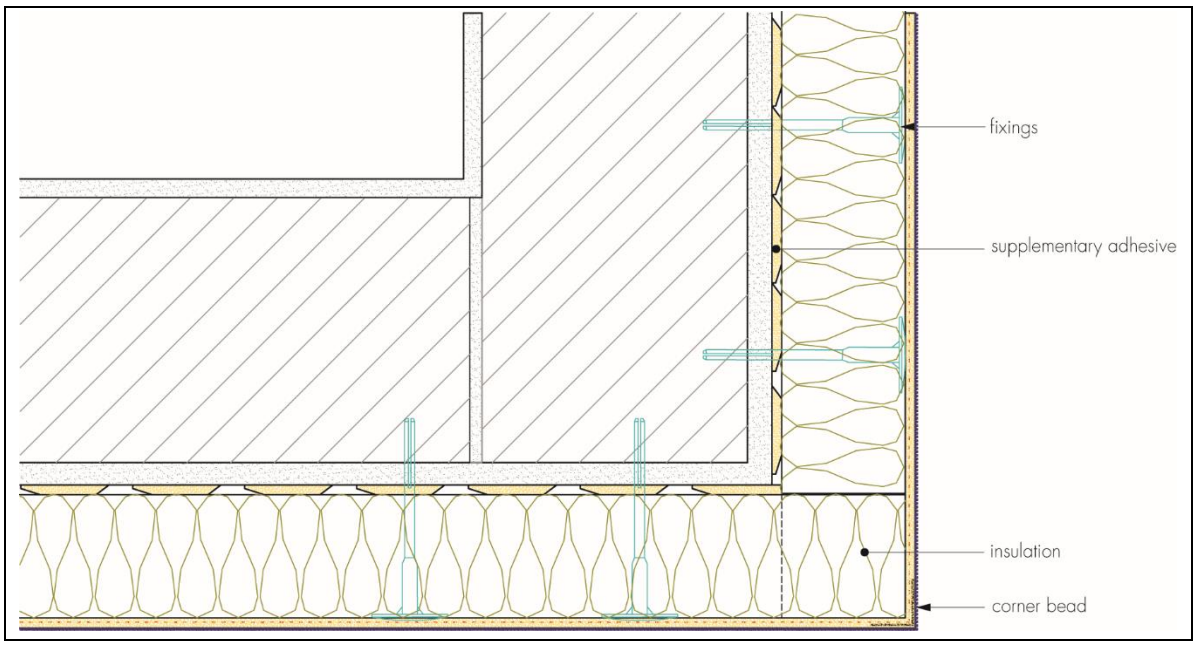
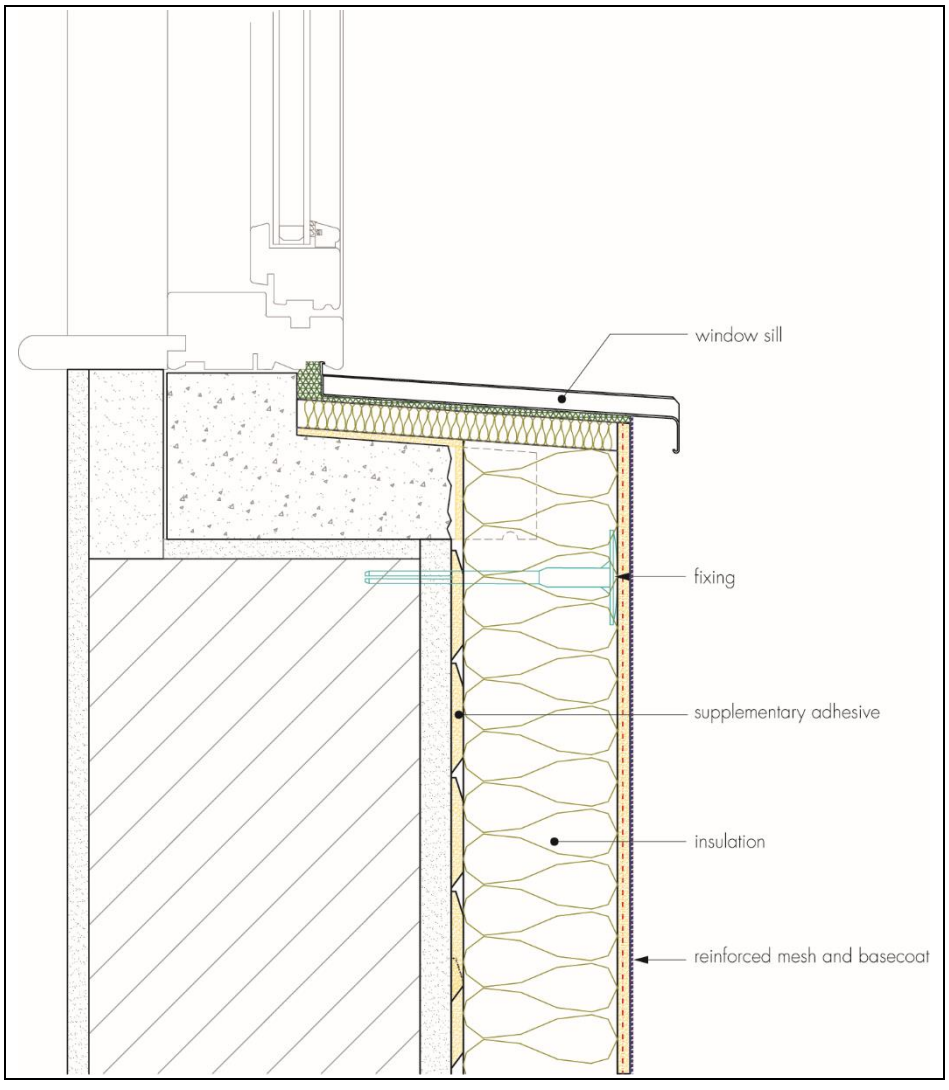


Figure 10 Window sill detail



16.26 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 : 2018
- 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 the materials used.

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BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

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BS EN 1990 : 2002 + A1 : 2005 *Eurocode — Basis of structural design*
NA to BS EN 1990 : 2002 + A1 : 2005 UK National Annex to *Eurocode — Basis of structural design*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
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ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems with Rendering*

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

EAD 330196-00-0604 : 2016 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal Insulation Composite Systems with Rendering*, June 2016.

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.