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Agrément Certificate
17/5447
Product Sheet 3

SPS ENVIROWALL EXTERNAL WALL INSULATION SYSTEMS

SPS ENVIROWALL EXTERNAL WALL INSULATION SYSTEM (MW) FOR DIRECT-FIX TO TIMBER-FRAMED BUILDINGS

This Agrément Certificate Product Sheet(1) relates to the SPS Envirowall External Wall Insulation System (MW) for Direct-Fix to Timber-Framed Buildings, comprising mineral wool insulation slabs, mechanically fixed to a sheathed timber-framed building substrate; a reinforced basecoat; and render finishes. The system is suitable for use on the outside of new and existing domestic and non-domestic buildings of up to 18 metres.

(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 impact damage. The impact resistance is dependent on the finish chosen (see section 7).

Behaviour in relation to fire — the system can have a Class A2-s1, d0 surface spread of flame classification in accordance with BS EN 13501-1: 2007 (see section 8).

Water resistance — the system can contribute to providing a degree of protection against rain ingress (see section 9).

Risk of condensation — the system can contribute to limiting the risk of interstitial and surface condensation (see section 10).

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 12).

The BBA 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: 1 November 2018

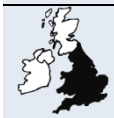
John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Certificate amended on 13 January 2020 to include Regulation 7(2) for England and associated text, and new regulatory guidance for fire in Scotland and Wales, and remove NHBC statement.

Regulations

In the opinion of the BBA, the SPS Envirowall External Wall Insulation System for Direct-Fix to Timber-Framed Buildings, 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 7.13 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The system is restricted by 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 sections 4.4 and 9.1 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 10.1, 10.2 and 10.4 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 12.1 and the *Installation* part of this Certificate.
Regulation:	**7(2)**	**Materials and workmanship**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.4 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; however, compensating fabric/services measures may need to be taken. 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 11 and 12.1 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 7.13 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is restricted by this Standard, with reference to clauses 2.6.4(1)(2), 2.6.5(1) and 2.6.6(2). See sections 8.1 to 8.4 of this Certificate.

Standard:	2.7	Spread on external walls
Comment:		The system is restricted by 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 will contribute to a construction satisfying this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.2[(1)(2)]. See sections 4.4 and 9.1 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 10.3 and 10.4 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 6.1.1[(1)(2)], 6.1.2[(1)(2)], 6.1.3[(1)], 6.1.6[(1)], 6.1.10[(2)], 6.2.1[(1)(2)], 6.2.3[(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 12.1 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 sections 4.4 and 9.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The system can contribute to minimising the risk of interstitial condensation. See section 10.4 of this Certificate.
Regulation:	**30**	**Stability**
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.13 of this Certificate.
Regulation:	**36(a)**	**External fire spread**
Comment:		The system is restricted by 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.

Technical Specification

1 Description

1.1 The SPS Envirowall External Wall Insulation System (MW) for Direct-Fix to Timber-Framed Buildings comprises insulation fixed to 11 mm (minimum) exterior grade sheathing board on timber-framed structures(1), a reinforced basecoat and finish coats (see Figure 1). After application of the breather membrane, insulation slabs are mechanically fixed to the substrate with the required number of fixings. The first layer of basecoat is trowel-applied over the insulation slabs, followed by the reinforcing mesh, which is fully embedded within a second layer of basecoat. After the basecoat has fully cured, primer and finishes are applied in accordance with the Certificate holder's installation guidelines.

(1) See section 4.6 and Table 2.

1.2 The system components are detailed below:

Breather membrane

Lightweight breather membrane — 1.5 m wide by 50 m long by 0.35 mm thick, light-grey flexible three-layer polypropylene sheet, with 100g.m^{-2} mass per unit and 0.093 m^3.(m^{-2} h.50 Pa) resistance to air permeability.

Insulation

Rockwool Dual Density insulation slabs (MWDD) — dual density mineral wool (MW DD 036) insulation slabs measuring 1200 by 600 mm, in a range of thicknesses(1)(2) between 60 and 200 mm, with nominal densities 160/100 kg·m^{-3} (outer/inner layer), a minimum compressive strength 20 kPa and tensile strength of 10 kPa perpendicular to the faces. The slabs are manufactured to comply with BS EN 13162 : 2012.

(1) For declared thermal conductivity values (λ_D), see Table 3.
(2) Insulation thicknesses of 20, 30, 40 and 50 mm are available which would generally be used in reveals.

Mechanical fixings(1)

Termofix 6H-NT fixings — anchors with various lengths to suit the timber-framed substrate and insulation thickness, approved and supplied by the Certificate holder.

Termofix fixings — carbon-coated self-drilling fixings available in lengths between 41 and 202 mm, with a diameter of 5.5 mm.

Termofix washers — 60 mm diameter polyamide glassfibre-reinforced (GF) anchor sleeve, with short cylinder (with a hole diameter of 5.6 mm).

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

Basecoat

- EnviroRend Basecoat — a factory-batched, polymer-modified basecoat, supplied as a powder to which 4 to 5 litres of clean water is added. Applied at a coverage of 4.5 to 6 kg·m^2 to give a finished thickness of 4 to 6 mm when dry.

- RetroBase Basecoat — a factory-batched, polymer-modified basecoat, supplied as a powder to which 4 to 5 litres of clean water is added. Applied at a coverage of 1.6 kg·m^2 to give a finished thickness of 5 to 7 mm.

Reinforcement mesh

- EnviroMesh Reinforcing Mesh — multi-stranded, alkali-resistant glassfibre with a polymer coating. Supplied in rolls 1 m wide (4 by 4 mm grid size) with a nominal weight of 165 g·m^{-2}.
- RetroMesh Reinforcing Mesh — multi-stranded, alkali-resistant glassfibre with a polymer coating. Supplied in rolls 1 m wide (4 by 4 mm grid size) with a nominal weight of 165 g·m^{-2}.

Primer

- Granosil Plus STF /Silicone primers — a silicone-based emulsion applied by hand or machine to a 0.2 mm thickness (NB used only with the silicone render).

Render finishes

EnviroDash Render

- EnviroDash Receiver — a polymer-modified cement-based dash aggregate render to which 4 to 5 litres of clean water is added, applied at a coverage of 1.5 kg·m^2 to give a finished thickness of 6 to 10 mm
- SparDash Aggregates — aggregates with a grain size of 3 to 6 mm, applied at a coverage of 2 kg·m^2.

EnviroBrick Render

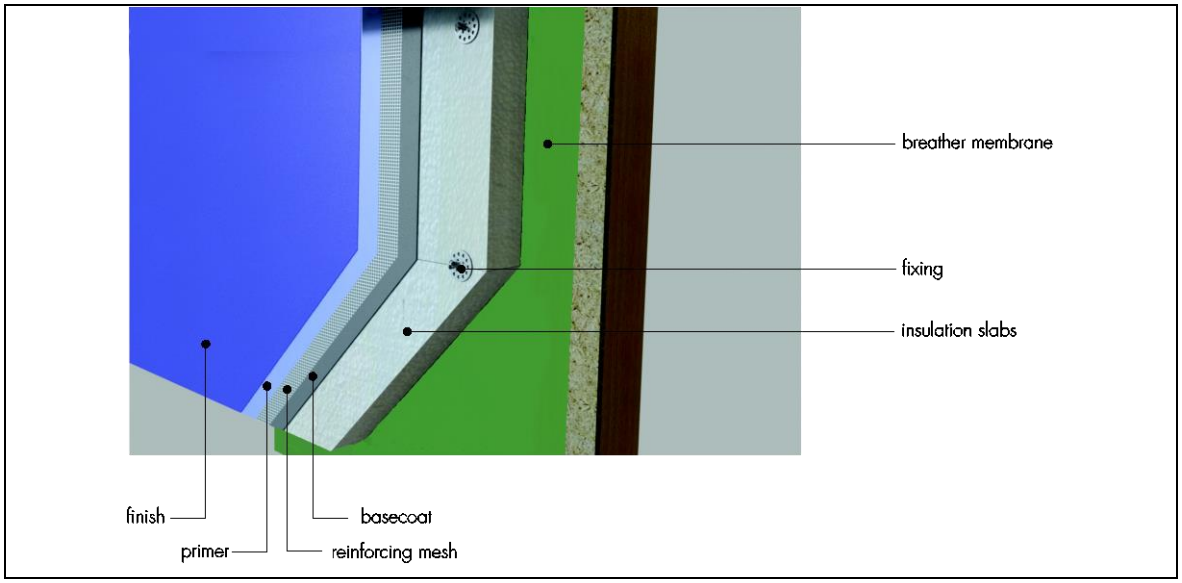
- EnviroBrick Render Base— a cement-based through-coloured ready-to-mix mortar layer to which 4 to 5 litres of water is added per 25 kg bag. Applied to a thickness of 8 to 10 mm with a coverage of 1.8 kg·m^2 per mm of thickness (when this starts to stiffen, Enviro Brick Render Face is applied).

- EnviroBrick Render Face — a polymer-modified, cement-based through-coloured face mortar layer to which 4 to 5 litres of clean water is added. Applied to a thickness of 3 to 5 mm, with a coverage of 1.8 kg·m^2 per mm of thickness. (The simulated mortar courses are made by cutting through the top coat of the render.)

Silicon Render KR finish

- Silicon Render KR finish — a silicone-resin-based, textured coating with 1.5 to 4 mm particle size, applied at a coverage of 1.7kg·m^2 per mm of thickness, to give a finished thickness regulated by particle size. Available in a range of colours.

Figure 1 SPS Envirowall External Wall Insulation System (MW) for Direct-Fix to Timber-Framed Buildings



1.3 Ancillary materials used with the system:

- breather membrane
- aluminium starter/base profile rail
- aluminium edge, corner profile with mesh and optional PVC-U nosing and render stop profile
- profile connectors and fixings
- basecoat adhesive – to fix the insulation around window reveals and openings.

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

- timber-frame sheathed construction, including the exterior grade sheathing board
- joint sealant
- polyurethane foam filler
- aluminium or PVC-U movement joint.

2 Manufacture

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

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of SPS Envirowall Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by CQS Ltd (Certificate SP240367).

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, manufacturer's batch number and the BBA logo incorporating the number of this Certificate.

Table 1 Component supply details

Component	Quantity/packaging
Breather membrane	50 m roll, 1.5 m wide
Insulation slabs	Wrapped in plastic film
EnviroRend Basecoat/RetroBase Basecoat/EnviroDash Receiver/EnviroBrick Base and Face Renders	25 kg bag
Granosil Plus STF /Silicone primers	20 kg tub
Silicon Render KR	25 kg tub
Termofix fixings	Box of 200
EnviroMesh and RetroMesh	50 m roll, 1 m wide
SparDash Dash Aggregates	20 to 25 kg bag

3.2 The insulation must be stored on a firm, clean, level base, off the ground and under a waterproof cover until required for use. Care must be taken when handling to avoid damage. Slabs that become damaged, soiled or wet should be discarded.

3.3 The basecoat and topcoats and all cementitious materials must be stored in dry conditions between 5°C and 30°C, off the ground and protected from moisture. Contaminated material must be discarded.

3.4 Synthetic textured finishes should be stored in a safe area, under cover, and protected from excessive heat and frost at all times.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the SPS Envirowall External Wall Insulation System for Direct-Fix to Timber-Framed Buildings.

Design Considerations

4 General

4.1 The SPS Envirowall External Wall Insulation System (MW) for Direct-Fix to Timber-Framed Buildings, when installed in accordance with the Certificate holder's instructions and this Certificate, is satisfactory for use in reducing the thermal transmittance (U-value) of external timber frame walls of new and existing domestic and non-domestic 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, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of the external face of timber frame substrates, on new or existing domestic and non-domestic buildings up to 18 m in height. The system is restricted for use to sheltered and moderate zones in accordance with Diagram 12 of Approved Document C to the Building Regulations 2010 (England and Wales) (as amended). Prior to installation of the system, wall surfaces should comply with section 13 of this Certificate.

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

- BS EN 1995-1-1 : 2004 and its UK National Annex
- BS EN 1995-1-2 : 2004
- BS 8000-0 : 2014
- BS EN 338 : 2016
- BS EN 14081-1 : 2016
- BS EN 300 : 2006.

4.5 New walls not subject to regulatory requirements should also be built in accordance with the Standards given in section 4.4 of this Certificate.

4.6 The system is direct fixed to the sheathed timber framed construction and does not provide a cavity between the sheathing board and the insulation panels. Care should be taken to ensure that the substrate walls are adequately weathertight and prior to installation of the system.

4.7 The structural frame of the building, including the sheathing boards, is the responsibility of the building designer and is outside the scope of this Certificate. However, the frame (and sheathing-associated fixings) should be structurally adequate, and must be designed to resist racking due to wind and other forces, be able to withstand the loads applied from the insulation system (see Table 2 for minimum specifications for system installations) and give an acceptable resistance to pull-out of the fixings (see Table 5).

Table 2 Minimum specifications for the timber frame construction

Item	Specifications
Timber-framed structure(1)	Exterior grade in accordance with BS EN 338 and BS EN 14081-1 and dry graded and marked in accordance with BS 4978. The timber structure should be no less than 37 mm thick with a minimum width of 72 mm or 0.026 times the panel height in mm, whichever is the greater
Sheathing board(1) (OSB)	11 mm thick minimum, with a minimum density of 600 kg·m^{-3} and modulus of elasticity in bending > 3500 (N·m^{-2}), 18N.mm^{-2} bending strength - major axis Manufactured to BS EN 300:2006 Class 3

(1) The board and the structural timber frame must be of an exterior grade and to the minimum acceptable specification given here. However, both components are outside the scope of this Certificate.

4.8 The system will improve the weather resistance of a wall and provide a decorative finish. However, care should be taken to ensure that walls are adequately watertight prior to application. The system 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.

4.9 The designer should make sure that windows, doors, flashings and other similar items have been specifically designed for use with this type of system – particular attention should be paid to the prevention of water ingress into the system. For example, junctions between the system and window and door openings must avoid creating a direct path that could facilitate the transfer of water from the external surface of the wall into the wall construction or to the internal surface. In addition, opening and penetration details should be designed to deflect water away from the insulation and onto the external face of the wall.

4.10 Where necessary, Movement joints should be incorporated into the system in accordance with the Certificate holder's recommendations for the specific installation in question.

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

4.12 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.

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

4.14 For timber frames, the moisture content of the timber should be established prior to installation. Levels between 14 and 18% may require further investigation as this could indicate the presence of a source of moisture ingress to the frame and any necessary corrective action taken prior to work commencing. Installations should not take place on structures found to be above this level unless the source of the moisture ingress is identified and eliminated.

5 Practicability of installation

The system should only be installed by specialised contractors who have successfully undergone training and registration by the Certificate holder (see section 14).

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 : 2007 and BRE Report BR 443 : 2006, using the insulation manufacturer's declared thermal conductivity (λ_D value), as given in Table 3 of this Certificate.

Table 3 Thermal conductivity of the insulation (λ_D value)

Insulation type	Thickness (mm)	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
MWDD Slab (036)	60 to 200(1)	0.036

(1) Insulation thicknesses of 20, 30, 40 and 50 mm are also available which would generally be used in reveals.

6.2 The U value of a completed wall will depend on the selected insulation thickness, profile/spline material, and the internal finish. Calculated U values for sample constructions in accordance with the national Building Regulations are given in Table 4 and are based on the thermal conductivity given in Table 3.

Table 4 Insulation thickness required to achieve design U values given in the national Building Regulations(1)(2)(3)

U-value ($W \cdot m^{-2} \cdot K^{-1}$)	Insulation thickness requirement (mm)
0.18	—
0.19	—
0.25	150
0.26	140
0.28	130
0.30	120
0.35	100

(1) Wall construction inclusive of 12.5 mm plasterboard (λ = 0.25 $W \cdot m^{-1} \cdot K^{-1}$), 500 gauge PE VCL, 89 mm timber frame (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$) bridged with air cavity (= 15%), 11 mm OSB (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$), breather membrane, MW insulation (λ = 0.036 $W \cdot m^{-1} \cdot K^{-1}$) and 6.5 mm external render (λ = 1.0 $W \cdot m^{-1} \cdot K^{-1}$).
(2) Assumes an air gap correction (ΔU) of 0.01 and incremental insulation thicknesses of 10 mm.
(3) A U value correction should be included for mechanical fixings – 5 fixings per slab – slab dimensions = 1200 mm x 600 mm with a point thermal conductivity of 0.004 per pin.

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 of this Certificate). 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 and wind.

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

7.6 Negative wind pressure (suction) is transferred to the substrate wall via(1):

- 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) Further guidance is available from BBA Guidance Note 1, available on the BBA website (www.bbacerts.co.uk).

7.7 The characteristic bond strength between the insulation and render interface derived from the tests 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 The design pull-out resistance of the fixings from the substrate obtained from site tests (N_{RD2}) must not be less than the maximum designed wind load (W_e). The characteristic pull-out resistance based on site tests is determined in accordance with the guidance given in EOTA TR051 (characteristic pull-out resistance = 0.6 x mean of 5 lowest test results). To obtain the site design pull-out resistance of the fixings, the characteristic site pull-out resistance should be divided by the partial factor given in Table 5 for a similar substrate.

7.9 The typical design pull-out resistance ($N_{rd.Typ}$) for the fixings taken from their corresponding European Technical Assessment (ETA) are given in Table 5. These values are dependent on the fixing type and must be selected to suit the specific loads and substrate concerned. This data can be used as a reference guide.

Table 5 Fixing typical characteristic pull-out strength

Fixing type	Substrate facing	Drill diameter (mm)	Effective anchorage depth (mm)	Characteristic pull-out resistance(1) (kN)	Partial safety factor
Termofix 6H-NT fixings: self-drilling fixing, with washer(1)	Through insulation and 11 mm (minimum) sheathing board	5.5	25 mm (timber studs) 12 mm (sheathing board)	0.47 (2)	3

(1) The minimum anchor plate stiffness is **0.6** $kN \cdot mm^{-2}$, with a load resistance of **1.7** kN
(2) Figure obtained from tests or from fixing's datasheet.

7.10 The characteristic pull-through resistance of the fixings was determined from tests using a 60 mm diameter fixing plate and minimum insulation thickness of 60 mm, 80 mm and 100 mm. The design resistance per fixing (N_{RD3}) is obtained by applying an appropriate partial factor as shown in Table 6.

Table 6 Design pull through resistances

Factor (unit)	Mineral wool DD insulation 1200 mm x 600 mm Pull through		
Tensile resistance of the insulation (kPa)	10		
Fixing type[1]	Termofix 6H-NT fixings (timber)		
Fixing plate diameter (mm)	60		
Insulation thickness (mm)	≥ 60	≥ 80	≥ 100
Characteristic pull through resistance[2] per fixing (N)	At panel 0.33	0.29	0.53
Partial material factor[3]	2.5		
Design pull through resistance per fixing (N) or per m^2	0.132	0.11	0.21
Design pull through resistance per slab (N) (based on the minimum number of fixings (x)[4]	0.66	0.58	1.05
Design pull through resistance per slab (N) (based on maximum number of fixings (y) [5]	1.17	0.99	1.89

(1) See Table 5 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 material factor of 2.5 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 mm 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 of this Certificate and minimum insulation thickness specified in Table 6. The fixing pattern and interaction of the fixings should be considered when calculating the design resistance per slabs.
(5) The maximum design pull through resistance per slab is based on a maximum of 9 fixings per slab (1200 mm x 600 mm), which equates to approximately 11 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 Table 5. The fixing pattern, insulation thickness and interaction of the fixings should be considered when calculating the design resistance per slabs.

7.11 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 in vertical and horizontal directions except at openings and building corners.

7.12 The data derived from sections 7.6 to 7.9 must be assessed against the design wind load and the following expression must be satisfied:

For safe design:
$Rd_{Test} \geq W_e$ and $N_{RD2} \geq W_e$

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

Where:

Rd	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	applied ultimate wind load ($kN \cdot m^{-2}$)
$Rd_{b.ins/rend}$	the design bond resistance between the insulation and render ($kN \cdot m^{-2}$)
$Rd_{pull\text{-}out}$	the design pull-out resistance of the insulation fixing ($kN \cdot m^{-2}$)
$Rd_{pull\text{-}through}$	the design pull-through resistance of the insulation fixing ($kN \cdot m^{-2}$)
A_r	reinforced basecoat bond area (based on % area covered)
N_{RD1}	the design basecoat/adhesive bond resistance ($kN \cdot m^{-2}$)
n	number of anchor fixings per m^2
N_{RD2}	the design pull out resistance (kN) per fixing
$N_{RD3panel}$	the design pull-through resistance per anchor not placed at the panel joint (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).

(1) Designed value derived from the test at the critical joint location. For a different location at the panel joint $N_{RD3joint}$ should be calculated accordingly (ie multiples of the test value).
(2) Value should be converted if required to represent anchors at the same panel joint location.

7.13 The insulation system is mechanically fixed to the substrate wall with a minimum of five fixings per slab or approximately seven fixings per square metre, as per the fixing patterns shown in Figures 4 and 5 and the suitability of the system must be assessed in conjunction with the combined shear and dead loads (see section 16 of this Certificate). Additional fixings may be required, depending on the results of the calculations detailed above for the specific site.

Impact resistance

7.14 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for the use in Categories listed in Table 7 of this Certificate.

Table 7 Impact resistance

Render systems: Basecoat + (primer) + finishing coats indicated below:	Category[1] Single mesh
EnviroRend/RetroBase Basecoat + EnviroDash Dash Receiver + spar aggregates	Category II
EnviroRend/RetroBase Basecoat + Granosil Plus STF /Silicone primers + Silicon Render KR	
EnviroRend/RetroBase Basecoat + EnviroBrick Base and Face renders	Category I

(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 system can have a reaction to fire classification of A2-s1,d0 in accordance with BS EN 13501-1 : 2007[1].

(1) Exova, Warrington. 355643.

8.2 The fire classification applies to the full range of thicknesses covered by this Certificate and the colours RAL 5023 (blue) for the acrylic top coat and E79 for the decorative brick-slips. The classification of other colours of the system should be confirmed by reference to the documents supporting the national Building Regulations.

8.3 The mineral wool insulation material in isolation is classified as non-combustible, but the system in any case is restricted for use in building up to 18 metres in height (see section 4.3 of this Certificate).

8.4 The system is suitable for use on, or at any distance from, the boundary.

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

9 Water resistance

9.1 The system will provide a degree of protection against rain ingress. However, care should be taken to ensure that walls and openings 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.

9.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress (see section 4.10 of this Certificate).

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

9.4 At the top of walls, the system should be protected by a coping, overhang or other detail designed for use with this type of system (see section 15). On flat roofs, waterproofing and drainage must be adequate and in good condition.

10 Risk of condensation

10.1 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

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

10.3 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 BR 262 : 2002.

Interstitial condensation

10.4 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) and section 11.5 of this Certificate.

10.5 The water vapour resistance factor (μ) for the insulation and the equivalent air layer thickness (s_d) of the reinforced basecoat with finish coat may be taken from Table 8.

Table 8 Water vapour resistance factor and equivalent air layer thickness

Material	Thickness (mm)	S_d (m)	μ
MWDD (036)	60 to 200	—	1(1)
Lightweight breather membrane	0.35	0.016	—
EnviroRend basecoat/RetroBase Basecoat + Granosil Plus STF /Silicone primers + Silicon KR	6.5	0.16(2)	—
EnviroRend basecoat/RetroBase Basecoat + EnviroDash dash receiver	11	0.13(2)	—
EnviroRend basecoat/RetroBase Basecoat + EnviroBrick Base and Face Render coats	5	0.08(2)	—

(1) The insulation values were obtained from BS EN ISO 10456 : 2007, Table 4.
(2) These values were obtained with 2 mm grain particle size.

11 Maintenance and repair

11.1 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.

11.2 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.

12 Durability

12.1 The system will have a service life of not less than 30 years, provided any damage to the surface finish is repaired immediately and regular maintenance is undertaken, as described in section 12.

12.2 Renders 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 in lighter colours.

12.3 The renders 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.

12.4 To maintain a high-quality aesthetic appearance, it may be necessary to periodically overcoat the building using system-compatible coatings as described in section 1.2, and as recommended by the Certificate holder, and in accordance with BS EN 1062-1 : 2004. Care should be taken not to adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

Installation

13 Site survey and preliminary work

13.1 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 must be prepared for each elevation of the building indicating:

- the position of beads
- detailing around windows, doors and at eaves
- damp-proof course (DPC) level
- confirmation that the timber frame has a moisture content of less than 20%
- the exact position of expansion joints, if required
- areas where flexible sealants must be used
- any alterations to external plumbing
- the position of fire and cavity stop barriers.

13.2 The survey should include tests conducted on the external surface of the sheathed structure of the building by the Certificate holder or their approved installers (see section 14) to determine the pull-out resistance of the specified mechanical fixings for the substrate to withstand the building's expected wind loading, based on calculations using the fixing's pull-off resistance test data. In addition, the type and minimum number of fixings are selected (see section 7). The advice of the Certificate holder should be sought to ensure the proposed fixing pattern is sufficient.

13.3 Before the system is applied, the timber should be dry (as near as is practicable to the moisture content appropriate to its climatic condition in the completed structure). Higher moisture contents may be accepted during erection providing the timber can dry to the desired moisture content after installation.

13.4 The flatness of surfaces must be checked; this may be achieved using a straight edge spanning the storey height. Any irregularities must be made good prior to installation to ensure that the insulation slabs are installed with a smooth, in-plane finished surface.

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

13.6 For new buildings, internal wet work (eg screed or plastering) should be completed and allowed to dry prior to the installation of the system.

13.7 All modifications and necessary repairs to the building structure must be completed before installation commences.

14 Approved installers

Application of the system, within the context of this Certificate, must be carried out by approved installers 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.

15 Procedure

General

15.1 Application must be carried out in accordance with this Certificate and the Certificate holder's current installation instructions.

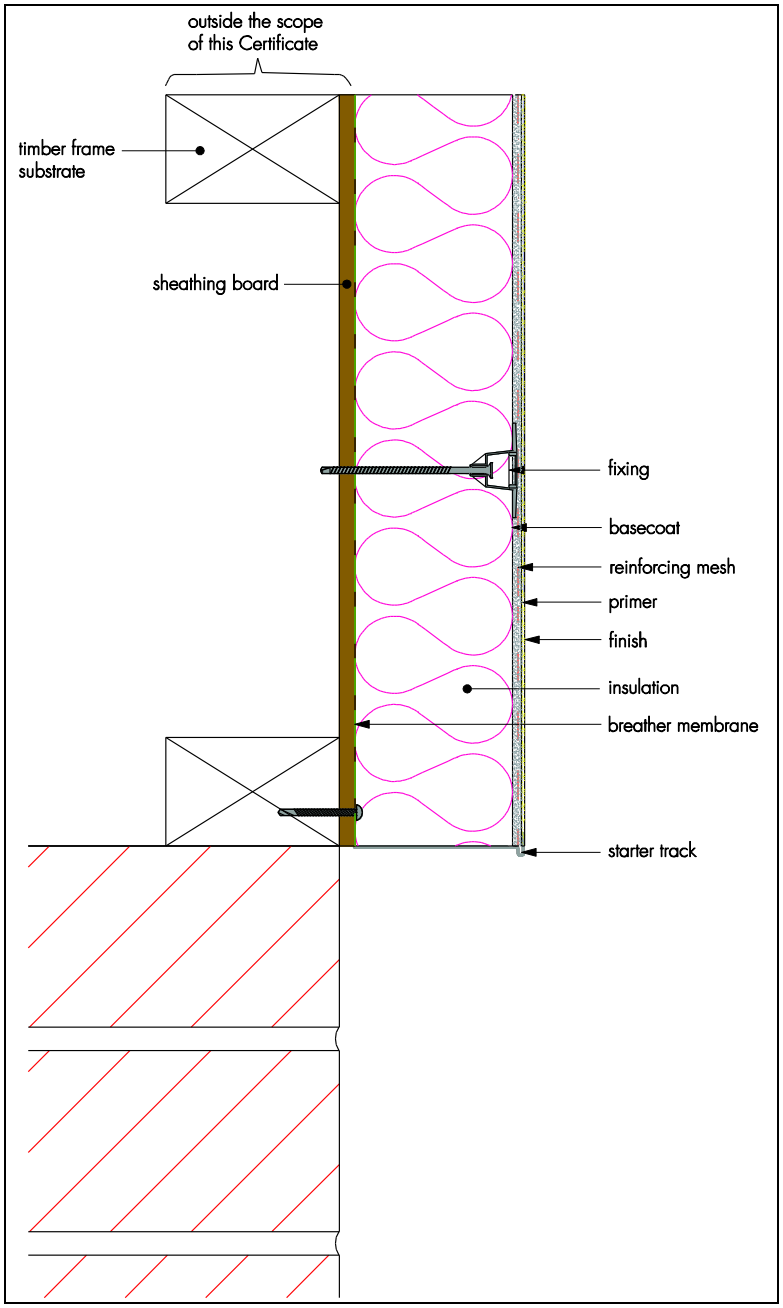
15.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, or if exposure to frost is likely. The coating must be protected from rapid drying. In addition, cementitious-based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

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

Positioning and securing insulation slabs

15.4 The starter/base profile is secured to the sheathing board above the damp proof course (dpc) (see Figure 2) using 6.3 diameter x 51 mm length Spit fixings at approximately 300 mm centres. Starter/base profile connectors are inserted at the base of the system's joints. Extension profiles are fixed to the front lip of the starter/base profile. Stop end profiles are installed where required. A plastic clip of mesh bead must be clipped over the edge of the bead.

Figure 2 Typical section of starter/base

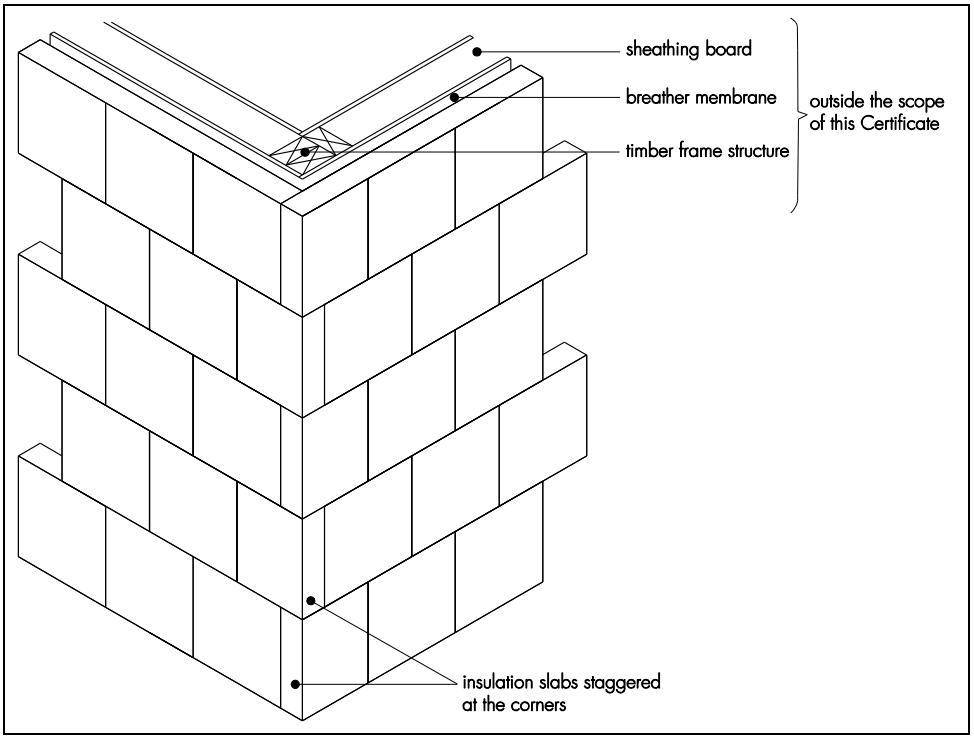


15.5 The first run of insulation slabs is placed (one by one) on the base profile. The slabs must be pressed firmly against the wall and care should be taken to ensure that all slab edges are butted tightly together; alignment must be checked as work proceeds.

15.6 Joints of up to 10 mm between slabs should be filled with slivers of mineral wool insulation. Gaps greater than 10 mm should be closed by re positioning or, where appropriate, by cutting slabs to fit.

15.7 Subsequent slabs are positioned so that the joints are staggered by a minimum of 100 mm and any open joints in the insulation system filled and overlapped at the building corners (see Figure 3). Installation continues until the whole wall is completely covered including, where appropriate, the building soffits.

Figure 3 Typical arrangement of insulation slabs at corners

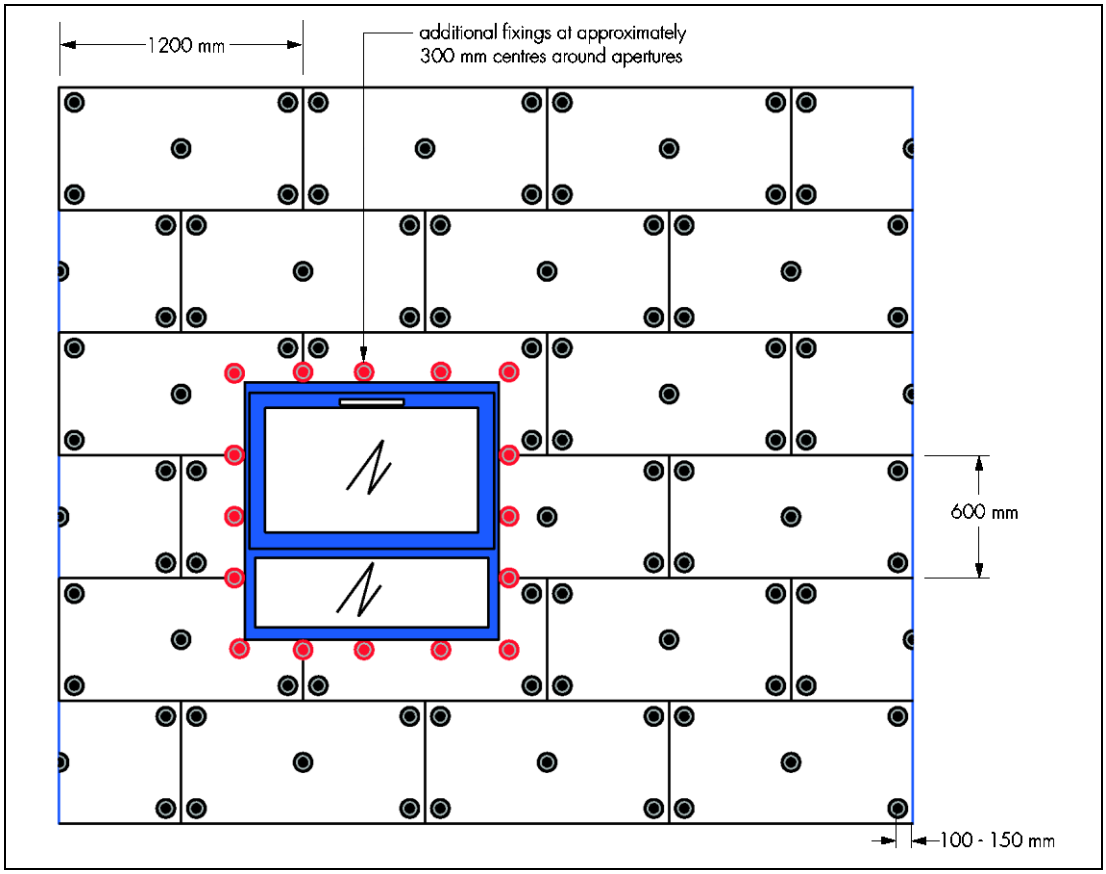


Mechanical fixings

15.8 The insulation slabs are mechanically fastened to the substrate using the fixing pattern as shown in Figure 4, which represents 7 fixings per square metre. At building corners, additional fixings should be positioned inwards from the edge in a horizontal direction (approximately 100 mm plus the distance from the edge of the wall) and vertically at 300 mm centres. Around openings, additional fixings should be positioned 75 mm from the edge and at 300 mm centres (see Figure 4). The designer must ensure that the proposed system and associated fixing layout provides adequate resistance to negative wind loads, based on the results of site investigation and the values in Table 5.

15.9 Care should be taken when aligning the slabs not to overdrive the fixings and to ensure alignment is checked as work proceeds.

Figure 4 Fixing pattern



15.10 To fit around details such as doors and windows, insulation slabs may be cut with a sharp knife or a fine-tooth saw. Purpose-made window-sills, seals and deflection channels are fitted; these are designed to prevent or manage water ingress and allow water to be shed clear of items bridging the cavity. Corner profiles are fixed to all building corners and to door and window heads and jambs.

15.11 All corners are fixed with mesh angles installed with adhesive mortar. Where appropriate, application-specific profiles are installed, to allow rainwater to drain away.

15.12 The surface of the slabs should be smooth without high spots or irregularities. At all locations where there is a risk of insulant exposure (eg window reveals or eaves), the system must be protected (eg by an adequate overhang or by purpose-made sub-sills, seals or flashing).

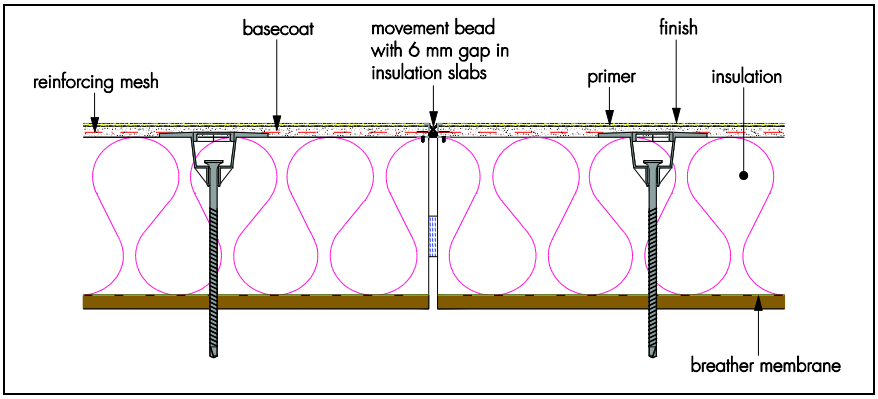
15.13 Building corners, door and window heads and jambs are formed using corner profiles, in accordance with the Certificate holder's instructions. Window and door reveals should be insulated to minimise the effects of cold bridging. Where clearance is limited, strips of insulation should be installed to suit available margins and details.

Movement joints

15.14 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 through the system, using an expansion joint profile (see Figure 5).

15.15 Render surface-mounted vertical movement joints should extend through render system where required.

Figure 5 Vertical movement joint detail



15.16 Expansion beads are fixed vertically in predetermined positions where necessary, according to the installation specification and the individual requirements of each job.

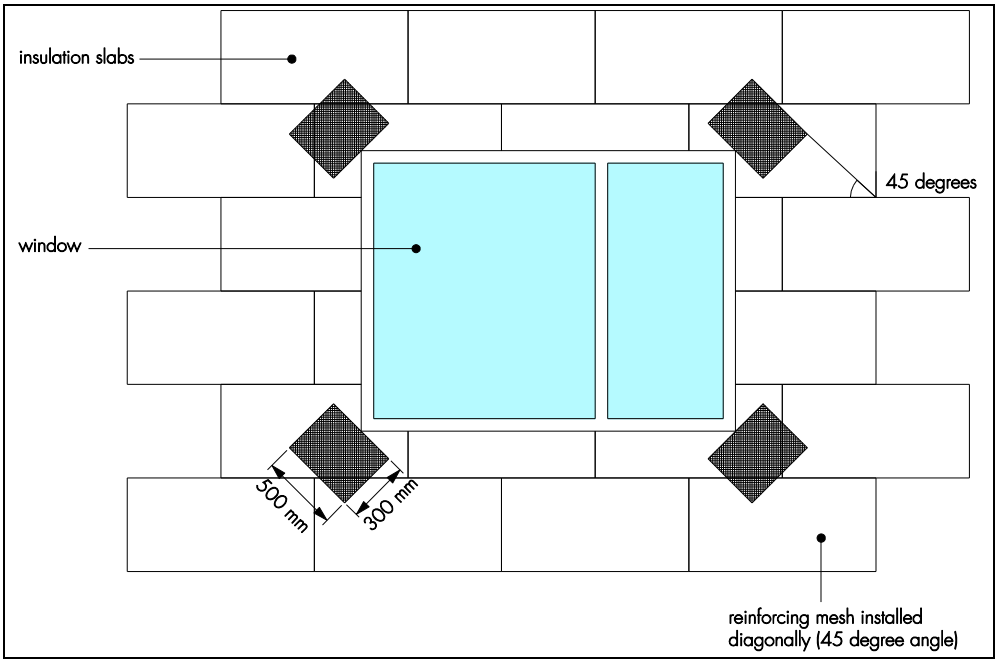
Application of basecoat and reinforcement mesh

15.17 Prior to the application of the basecoat, precompressed sealing tape is inserted to window and door frames, overhanging eaves, gas and electric meter boxes, and wall vents. Alternatively, gun-applied joint sealants or proprietary sealing beads can be used in accordance with the Certificate holder's instructions.

15.18 The basecoat is prepared by mixing the contents of each 25 kg bag with approximately 4 to 5 litres of cold, clean water, using a paddle mixer. Mixing time should be at least five minutes after the addition of the last bag of render, to allow an even dispersion of resins. The basecoat is applied over the insulation slabs using a stainless steel trowel and floated with a Darby float to an approximate 3 to 4 mm thickness. Reinforcement mesh is applied (with its concave surface to the wall) and is 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 and completely covered and that the required minimum thickness of basecoat is achieved. The mesh must be placed in the top one third of the basecoat.

15.19 In all cases, additional pieces of reinforcing mesh (500 mm by 300 mm) are used diagonally at the corners of openings, as shown in Figure 6. The mesh angles are installed with adhesive mortar before the application of the basecoat.

Figure 6 Additional reinforcement at openings



15.20 The first layer of basecoat should be left to harden.

15.21 PVC mesh corner beads are bedded into the basecoat at external corners and around openings as required.

15.22 The second layer of basecoat is applied to a thickness of between 3 and 4 mm to achieve an overall thickness of 6 mm when dry, ensuring all mesh is covered before the application of the finish render. The drying time will depend upon weather conditions, but will typically be at least 12 hours, before primer is applied.

Primer

15.23 After the basecoat is totally dry, the Granosil Plus STF /Silicone primers is hand or spray applied and left it dry, prior to the application of the Silicon Render KR finish. Primer is applied (if using Silicon Render KR), not used for the other finishes.

Decorative finishes

EnviroDash Dash Render

15.23 The EnviroDash Receiver is mixed until the correct workability is achieved and trowelled onto the basecoat to a thickness of between 6 and 10 mm according to the thickness of the dash receiver. While the receiver is still soft, washed aggregate is thrown or sprayed on, ensuring a uniform covering. Where necessary, the aggregate can be lightly tampered with a wooden float to ensure a good bond is achieved.

EnviroBrick Render

15.24 The EnviroBrick Render is applied in two stages. The mortar-coloured EnviroBrick Render Base is trowelled onto the basecoat to a thickness of 8 to 10 mm and, when starting to stiffen, the brick-coloured EnviroBrick Render Finish is applied to a thickness of 3 to 5 mm. To simulate a brick texture, the second coat can be lightly brushed. The simulated mortar courses are made by cutting through the topcoat to expose the lower coat. Spirit levels and straight edges should be used to ensure accuracy when cutting into the surface. Any loose material can be removed with a stiff brush once the cutting process is complete.

Silicon Render KR

15.25 Prior to setting, the finish is textured with a plastic float to give an even texture and to remove all trowel lines applied to a thickness of 1.5 to 4 mm.

General

15.26 Elevations should be completed in one application and finished to natural breaks in the render, ie beads or building corners.

15.27 Generally, the drying time of the renders is dependent on ambient conditions, but will typically be 12 hours.

15.28 Care should be taken in the detailing of the system around such features as openings, projections and at eaves (see Figures 7, 8, 9 and 10) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

15.29 On completion of the installation, external fittings, eg rainwater goods, must be securely fixed to timber grounds and extended to the face of the system during installation.

Figure 7 Roof eaves detail

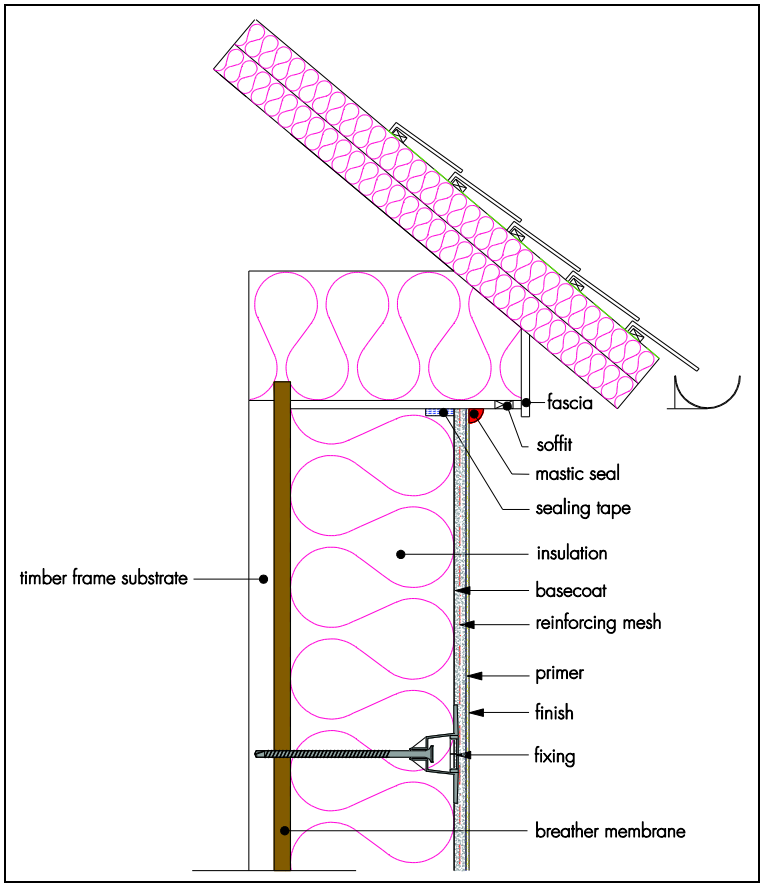


Figure 8 Insulated window head detail

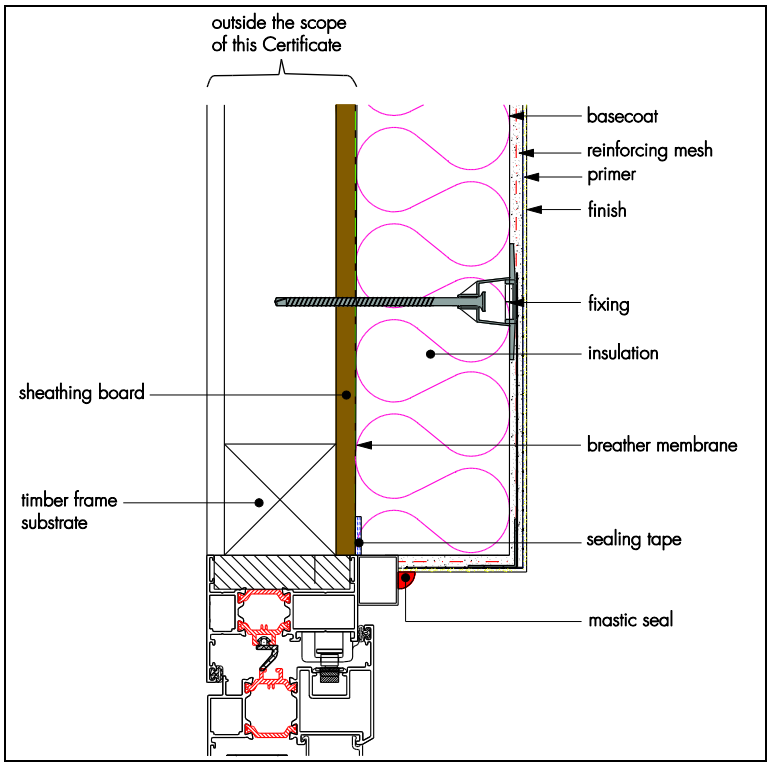


Figure 9 Window sill detail

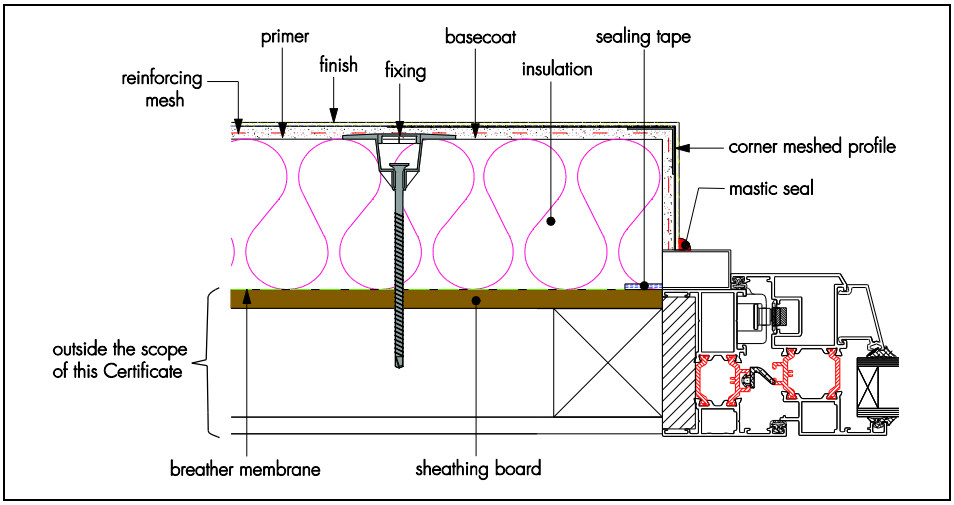
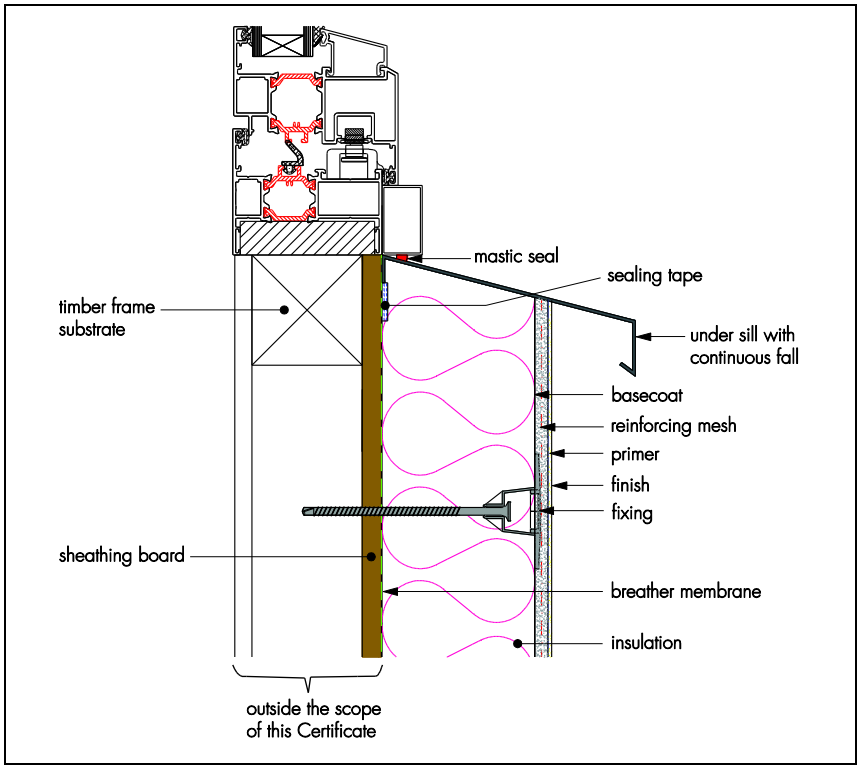


Figure 10 Insulated window reveal detail



16 Investigations

16.1 Tests were conducted and the results assessed to determine:

- reaction to fire render bond strength
- hygrothermal performance and resistance to freeze-thaw
- resistance to hard body impact
- water absorption of render and water vapour permeability
- wind load resistance
- pull-through resistance of fixings
- water penetration test
- soft body impact.

16.2 An assessment was made of data relating to:

- durability
- adequacy of fixing system
- the risk of interstitial condensation including WUFI analysis (transient heat and moisture transport)
- thermal conductivity.

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

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

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BS EN 1995-1-1 : 2004 + A1 : 2008 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*
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BS EN 1995-1-2 *Eurocode 5 : Design of timber structures – General – Structural fire design*

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17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.