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Agrément Certificate  
**13/5065**  
Product Sheet 1

## ENVIROWALL WALL EXTERNAL WALL INSULATION SYSTEMS

### ENVIROWALL WALL SYSTEM 2 EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Envirowall Wall System 2 External Wall Insulation System, comprising mechanically fixed enhanced expanded polystyrene (EPS) insulation boards with a glassfibre reinforcing mesh and render finishes, and suitable for use on new or existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

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

#### KEY FACTORS ASSESSED

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

**Strength and stability** — the system can adequately resist wind loads and impact-damage (see section 7).

**Behaviour in relation to fire** — the enhanced expanded polystyrene is combustible; however, the external surface rating classification is B-s1, d0 (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 should 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

A handwritten signature in black ink, appearing to read 'John Albon'.

Date of First issue: 4 November 2013

John Albon — Head of Approvals  
Energy and Ventilation

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas  
Chief Executive

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)*

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

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# Regulations

In the opinion of the BBA, the Envirowall Wall System 2 External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, will 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)

<b>Requirement:</b> A1	<b>Loading</b>
Comment:	The system can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
<b>Requirement:</b> B4(1)	<b>External fire spread</b>
Comment:	The system can contribute to satisfying this Requirement. See sections 8.1 to 8.4 and 8.7 of this Certificate.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
Comment:	The system provides a degree of protection against rain ingress. See sections 4.4 and 10.1 of this Certificate.
<b>Requirement:</b> C2(c)	<b>Resistance to moisture</b>
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.
<b>Requirement:</b> L1(a)(i)	<b>Conservation of fuel and power</b>
Comment:	The system can contribute to satisfying this Requirement. See sections 6.2 to 6.3 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 26	<b>CO<sub>2</sub> emission rates for new buildings</b>
Comment:	The system can enable, or contribute to enabling, a wall to satisfy the U value requirement. See sections 6.2 to 6.3 of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b> 8(1)(2)	<b>Durability, workmanship and fitness of materials</b>
Comment:	The system can contribute to a construction satisfying this Regulation. See sections 12.1, 13.1 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building standards applicable to construction</b>
<b>Standard:</b> 1.1	<b>Structure</b>
Comment:	The system can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
<b>Standard:</b> 2.6	<b>Spread to neighbouring buildings</b>
Comment:	The system is regarded as 'low risk' and, therefore, can satisfy this Standard, with reference to clauses 2.6.4 <sup>(1)(2)</sup> , 2.6.5 <sup>(1)</sup> and 2.6.6 <sup>(2)</sup> . See sections 8.1 to 8.3, 8.5 to 8.7 of this Certificate.
<b>Standard:</b> 2.7	<b>Spread on external walls</b>
Comment:	The system can satisfy the requirements of this Standard, with reference to clauses 2.7.1 <sup>(1)(2)</sup> and 2.7.2 <sup>(2)</sup> . See sections 8.1 to 8.3, 8.5 to 8.7 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
Comment:	The system can contribute to a construction satisfying this Standard with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.2 <sup>(1)(2)</sup> . See sections 4.4 and 10.1 of this certificate.
<b>Standard:</b> 3.15	<b>Condensation</b>
Comment:	The system can satisfy the requirements of this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See sections 11.3 and 11.4 of this Certificate.
<b>Standard:</b> 6.1(b)	<b>Carbon dioxide emissions</b>
<b>Standard:</b> 6.2	<b>Buildings insulation envelope</b>
Comment:	The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1 <sup>(1)</sup> , 6.1.2 <sup>(1)(2)</sup> , 6.1.3 <sup>(1)(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.1.10 <sup>(2)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.5 <sup>(2)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)</sup> , 6.2.11 <sup>(1)</sup> , 6.2.12 <sup>(2)</sup> and 6.2.13 <sup>(1)(2)</sup> . See sections 6.2 and 6.3 of this Certificate.
<b>Standard:</b> 7.1(a)(b)	<b>Statement of sustainability</b>
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 clause 7.1.4 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See sections 6.2 and 6.3 of this Certificate.
<b>Regulation:</b> 12	<b>Building standards applicable to conversions</b>
Comment:	All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2012

<b>Regulation:</b> 23	<b>Fitness of materials and workmanship</b>
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> 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 10.1 of this Certificate.
Regulation:	29	Condensation
Comment:		The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.2 and 11.4 of this Certificate.
Regulation:	30	Stability
Comment:		The system can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system can satisfy or contribute to satisfying this Regulation. See sections 8.1 to 8.4 and 8.7 of this Certificate.
Regulation:	39(a)(i)	Conservation measures.
Regulation:	40	Target carbon dioxide emission rate
Comment:		The system can contribute to satisfying these Regulations. See sections 6.2 to 6.3 of this Certificate.

## Construction (Design and Management) Regulations 2007

## Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.2 and 3.4) of this Certificate.

## Additional Information

### NHBC Standards 2013

NHBC accepts the use of the Envirowall Wall System 2 External Wall Insulation System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 6 Superstructure (excluding roofs), Chapter 6.9 Curtain walling and cladding.*

## Technical Specification

### 1 Description

1.1 Envirowall Wall System 2 External Wall Insulation System comprises enhanced expanded polystyrene insulation boards mechanically fixed to the substrate wall, and glassfibre reinforcing mesh with render finishes.

1.2 The system (see Figure 1) consists of:

#### Insulation

- enhanced expanded polystyrene slabs — 1200 mm by 600 mm, in a range of thicknesses between 20 mm and 200 mm in increments of 10 mm, with a nominal density of  $15 \text{ kg}\cdot\text{m}^{-3}$ , a minimum compressive strength of  $70 \text{ kN}\cdot\text{m}^{-2}$  and a minimum tensile strength perpendicular to the faces of  $100 \text{ kN}\cdot\text{m}^{-2}$ , in accordance with BS EN 1607 : 1997. Boards are manufactured to comply with the requirements of EPS 70 Class E (flame retardant) material to BS 13163 : 2012.

#### Fixings

- mechanical fixings — proprietary external wall insulation fixings of adequate length to suit the substrate and insulation thickness and supplied by the Certificate holder:
  - Rawlplug KI-10
  - Rawlplug T Fix 8M/8S
  - Ejotherm NT U
  - Ejotherm STR U
  - ETA approved anchors of similar or better characteristics.

#### Basecoat

- Retrobase Basecoat — polymer-modified, cement-based, comprising limestone aggregate and specially selected fillers. Supplied as a dry powder to which clean water is added.

#### Reinforcement

- EnviroMesh and Retromesh — 1.0 metre-wide alkali-resisting glassfibre reinforcing mesh with a nominal weight of  $165 \text{ g}\cdot\text{m}^{-2}$  and an aperture size of approximately 4 mm by 4 mm. Supplied in 50 metre lengths.

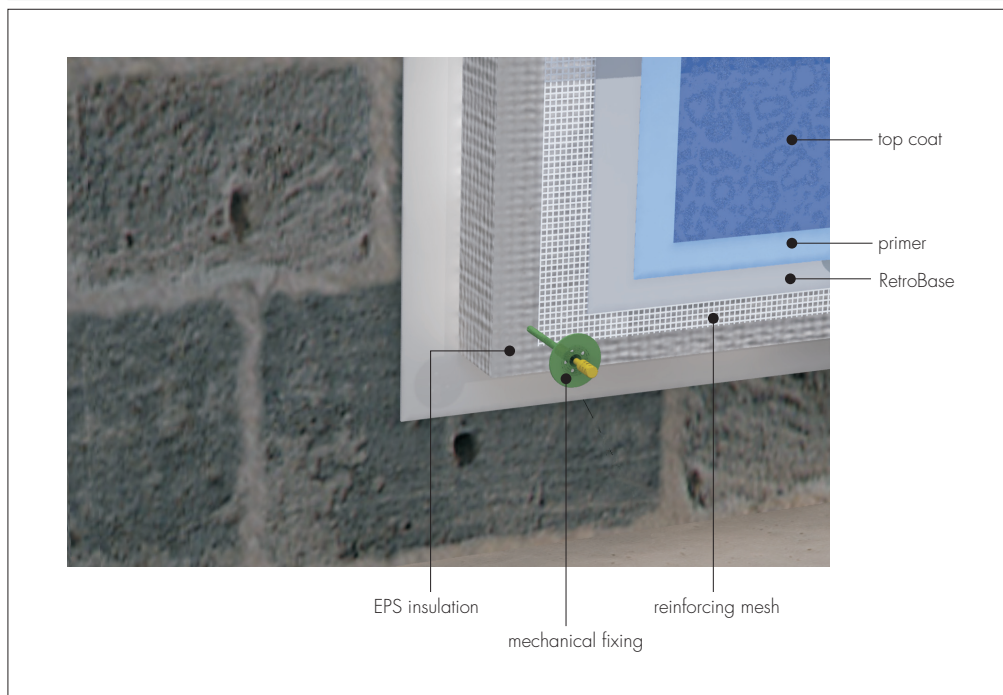
#### Primer

- Envirocryl Acrylic Primer — available in a range of colours to suit the colour of selected finish.

## Finishes

- Enviroend Dash Receiver Render — polymer-modified, cement binder system containing selected fillers, for use as a wet receiver coat for a graded aggregate dash finish. Supplied in powder form to which clean water is added
- EnviroBrick — polymer-modified two-coat cement binder system containing selected fillers, designed to provide a coursed and bonded traditional brickwork appearance. Supplied in powder form to which clean water is added
- EnviroCryl — acrylic thin coat, textured render finish. Supplied in paste form.

Figure 1 Envirowall Wall System 2 External Wall Insulation System



1.3 Ancillary materials, which are outside the scope of this Certificate, include:

- profiles, including: bellcast base bead, stop bead, corner bead and expansion joint/movement joints, produced in either stainless steel grade 304 (1.4301) to BS EN 10088-1 : 2005 or galvanized steel to BS EN 10346 : 2009, with a polyester powder coating to BS 13438 : 2013. Aluminium and rigid PVC-U profiles are also available. Profiles are provided to the specifier's requirements and approved by the Certificate holder
- profile-connecting plates and fixings
- silicone sealant and sealing tape
- polyester powder coated aluminium over or under sills, parapet cappings, standard and special profiles
- selected stainless steel fixings, grade 304 (1.4301)
- fungicidal wash.

1.4 The insulation boards are mechanically fixed to the external surface of the substrate. Basecoat render is trowel-applied to the board face to an approximate thickness of 4 mm, the reinforcing mesh embedding immediately, and then a further basecoat render applied to a total thickness of approximately 6 mm. When dry, either a decorative finish coat is applied, or the basecoat is primed for the application of EnviroCryl.

## 2 Manufacture

2.1 As part of the assessment and ongoing surveillance of the quality of the system components, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing regime to be undertaken
- assessed and agreed the quality control operated over batches of incoming material
- 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.

2.2 The management system of SPS Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 (Certificate SP240367) by CQS Ltd.

## 3 Delivery and site handling

3.1 The enhanced EPS boards are delivered to site shrink-wrapped in polythene packs. Each pack carries the product identification and batch numbers.

3.2 Components are delivered in the quantities and packages listed in Table 1. Each package carries the manufacturer's product identification and batch number, and the BBA logo incorporating the number of this Certificate.

Component	Quantity and packaging
Mechanical fixings	boxed by manufacturer — 100 per box
Retrobase Basecoat	25 kg paper bag with polythene lining
EnviroMesh/Retromesh	1 m wide rolls x 50 m length
EnviroRend Dash Receiver	25 litre drum
EnviroBrick	25 kg paper bag with polythene lining
EnviroCryl	25 litre drum

3.3 The insulation boards should be stored on a firm, clean and level base, off the ground. They must be protected from prolonged exposure to sunlight, either by storing opened packs under cover in dry conditions or re-covering with opaque polythene sheeting.

3.4 Care must be taken when handling the insulation boards to avoid both damage and contact with solvents or bitumen products. The boards must not be exposed to open flame or other ignition sources. Boards that become damaged, soiled or wet should be discarded.

3.5 The powder components should be stored in dry conditions, off the ground, and protected from frost at all times. Bags of unopened render will have a shelf-life of 12 months when stored correctly.

3.6 Cementitious render and synthetic finishes should be stored in dry conditions, off the ground and protected from frost at all times. Damaged, wet or contaminated products should not be used and must be discarded.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Envirowall Wall System 2 External Wall Insulation System.

## Design Considerations

### 4 General

4.1 The Envirowall Wall System 2 External Wall Insulation System, when installed in accordance with this Certificate, is effective in reducing the thermal transmittance (U value) of 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 the system. Only details specified by the Certificate holder should be used.

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

4.3 The system is for application to the outside of external walls of masonry, or dense or no-fines concrete construction on new or existing domestic and non-domestic buildings up to 18 m in height. Prior to installation of the system, the wall surfaces should comply with section 14 of this Certificate.

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

- BS EN 1996-2 : 2006 — the designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used
- BS 8000-3: 2001.

4.5 Other new buildings, not subject to any of the previous requirements, should also be built in accordance with BS EN 1996-2 : 2006 and its UK National Annex.

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

4.7 The fixing of rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items is outside the scope of this Certificate.

4.8 External plumbing should be removed before installation and alterations made to underground drainage, where appropriate, to accommodate repositioning of the plumbing to the finished face of the system.

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

## 5 Practicability of installation

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

Note: The BBA operates a UKAS-accredited Approved Installer Scheme for external wall insulation; details of approved installer companies are included on the BBA's website ([www.bbacerts.co.uk](http://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 ( $\lambda_D$  value) of  $0.032 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ .



6.2 The U value of a completed wall will depend on the selected insulation thickness and fixing method, the insulation value of the substrate masonry and its internal finish. Figures for typical design U values, calculated in accordance with section 6.1, are given in Table 2.

Table 2 Insulation thickness required to achieve some typical design values<sup>(1)(2)</sup>

U-value ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ )	Insulation thickness requirement (mm) <sup>(3)</sup>	
	215 mm Brickwork, $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	200 mm Dense blockwork, $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
0.19	170	180
0.26	120	130
0.28	110	120
0.30	100	110
0.35	90	100

(1) The following values for other elements of the construction were used:

- external boundary resistance ( $R_{se}$ ) —  $0.04 \text{ m}^2\cdot\text{K}\cdot\text{W}^{-1}$
- render (14 mm sand and cement) —  $\lambda = 1.0 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ,  $\mu = 6$  (wet)
- EPS 70E (215 mm) — 93.3%
- 215 mm brickwork (protected) —  $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  ( $\mu = 10$ ) [or 200 mm blockwork,  $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  ( $\mu = 100$  and 6.7%)]
- mortar —  $\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
- plaster (13 mm) —  $\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ,  $\mu = 10$
- internal boundary resistance ( $R_{si}$ ) —  $0.13 \text{ m}^2\cdot\text{K}\cdot\text{W}^{-1}$ .

(2) Fixing regime 6.944 fixings per  $\text{m}^2$  (5 fixings per board) with a point thermal transmittance,  $\chi = 0.003 \text{ W}\cdot\text{K}^{-1}$ .

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



6.3 The system can contribute to maintaining continuity of thermal insulation at junctions between elements and openings. For Accredited Construction Details, the corresponding  $\psi$ -values ( $\psi_i$ ) in BRE Information Paper IP 1/06, Table 3, may be used in carbon emission calculations in Scotland and Northern Ireland. Detailed guidance for other junctions and on limiting heat loss by air infiltration can be found in:

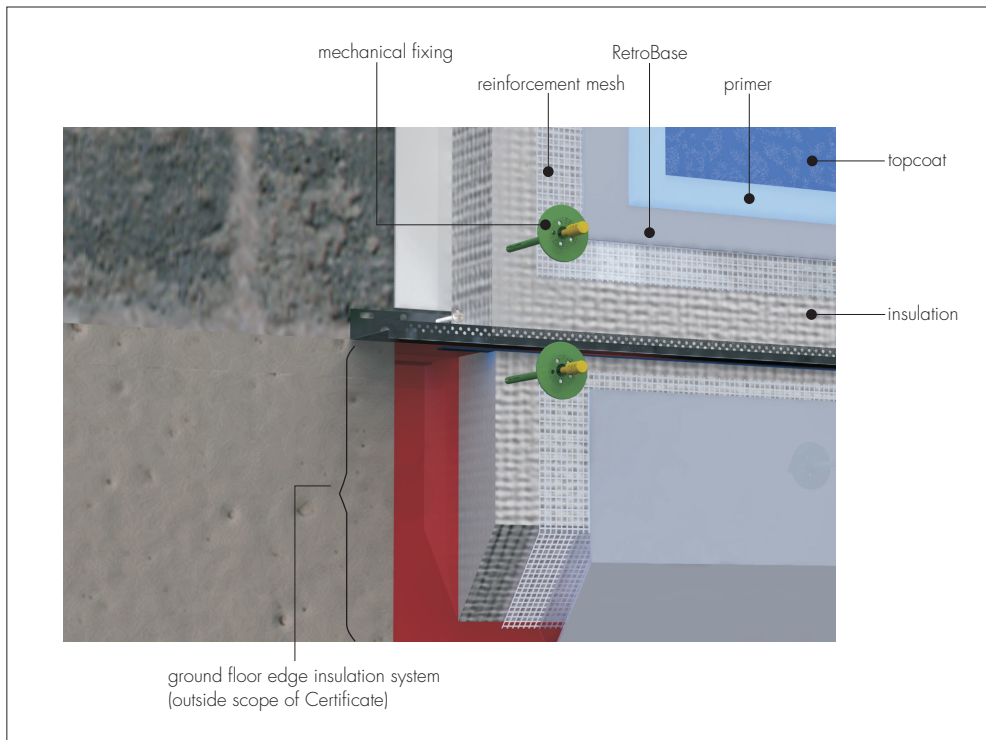
**England and Wales** — Approved Documents to Part L and, for new thermal elements to existing buildings, Accredited Construction Details (version 1.0). For new-build, also see SAP 2009, Appendix K, and the *iSBEM User Manual*

**Scotland** — Accredited Construction Details (Scotland)

**Northern Ireland** — Accredited Construction Details (version 1.0).



Figure 2 Typical section at base



## 7 Strength and stability

7.1 When installed on suitable walls, the system can adequately transfer to the wall the self-weight and negative (suction) and positive (pressure) wind loads normally experienced in the United Kingdom.

7.2 Positive wind load is transferred to the substrate wall directly via bearing and compression of the render and insulation.

7.3 Negative wind pressure is resisted by the bond between each component. The insulation boards are retained by the external wall insulation system anchors.

7.4 The wind loads on the wall should be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Special consideration should be given to locations with high wind-load pressure coefficients as additional fixings may be necessary. In accordance with BS EN 1990 : 2002 and its UK National Annex, it is recommended that a load factor of 1.5 is used to determine the ultimate wind load to be resisted by the system.

7.5 Assessment of structural performance for individual buildings must be carried out by a suitably qualified and experienced individual to confirm that:

- the substrate wall has adequate strength to resist additional loads that may be applied as a result of installing the system, ignoring any contribution that may occur from the system
- the proposed system, and associated fixing layout, provides adequate resistance to negative wind loads based on the results of the site investigation and test results
- an appropriate number of site-specific pull-out tests are conducted on the substrate of the building to determine the minimum resistance to failure of the fixings. The characteristic pull-out resistance should be determined in accordance with the guidance given in ETAG 014 : 2011, Annex D.

7.6 The number and centres of fixings should be determined by the system designer. Provided the substrate wall is suitable and an appropriate fixing is selected, the mechanical fixings will adequately support and transfer the weight of the render system to the substrate wall.

7.7 Typical characteristic pull-out strengths for the fixings taken from the corresponding European Technical Approvals (ETAs) are given in Table 3 of this Certificate; however, these values are dependent on the substrate and the fixing must be selected to suit the loads and substrate concerned.

Table 3 Fixings — typical characteristic pull-out strengths

Fixing type	ETA No.	Substrate	Typical pull-out strength (N)
Ejotherm STR-U	04/0023	Concrete C12/15/clay bricks	1500
Ejotherm NT-U	05/009	Concrete C12/15/clay bricks	1200/1500
Rawlplug KI-10	07/0291	clay bricks	500
Rawlplug TFIX-8M/8S	07/0336/11/0144	Concrete C12/15/clay bricks	1200

7.8 The pull-through resistances determined by the BBA from tests on anchors are given in Table 4.

**Table 4 Pull-through resistances**

Factor (unit)	Expanded polystyrene insulation
Insulation thickness (mm)	90
Plate diameter of anchor (mm)	60
Characteristic pull-through resistance <sup>(1)</sup> (per anchor) (N)	1279
Factor of safety	2.5
Design pull-through resistance <sup>(2)</sup> (N)	512

(1) Characteristic value in accordance with BS EN 1990 : 2002, Annex D7.2.

(2) The safety factor of 2.5 is applied and based on the assumption that all insulation boards are quality-control tested to establish tensile strength perpendicular to the face of the boards.

### Impact resistance

7.9 Hard body impact tests were carried out in accordance with ETAG 004 : 2011. The system is suitable for use in the categories listed in Table 5 (see section 7.10).

**Table 5 Envirowall Wall System 2 External Wall Insulation System impact resistance**

Rendering systems: insulation and basecoat, with finishing coat as indicated	Finishing coat	Impact resistance
Enhanced EPS + Envirocyl Acrylic primer + Retrobase basecoat	EnviroCryl Acrylic Topcoat	Category III
Enhanced EPS + Retrobase basecoat	Brickrend Brick Effect Finish	Category II
	Envirodash – Receiver finish + spar aggregate	Category II

7.10 The use categories are defined in ETAG 004 as:

- Use 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
- 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
- Use 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 overall spread of flame classification for the rendering system is B-s1, d0 in accordance with BS EN 13501-1 : 2007.

8.2 The classification applies to the full range of finishes covered by the Certificate.

8.3 The EPS insulation material is not classified as non-combustible.



8.4 The system is considered suitable for use on, or at any distance from, the boundary. It is restricted for use in buildings up to 18 m in height.



8.5 The system is classified as 'low risk' and must not be used within 1 m of the boundary. It is restricted for use in buildings up to 18 m in height.

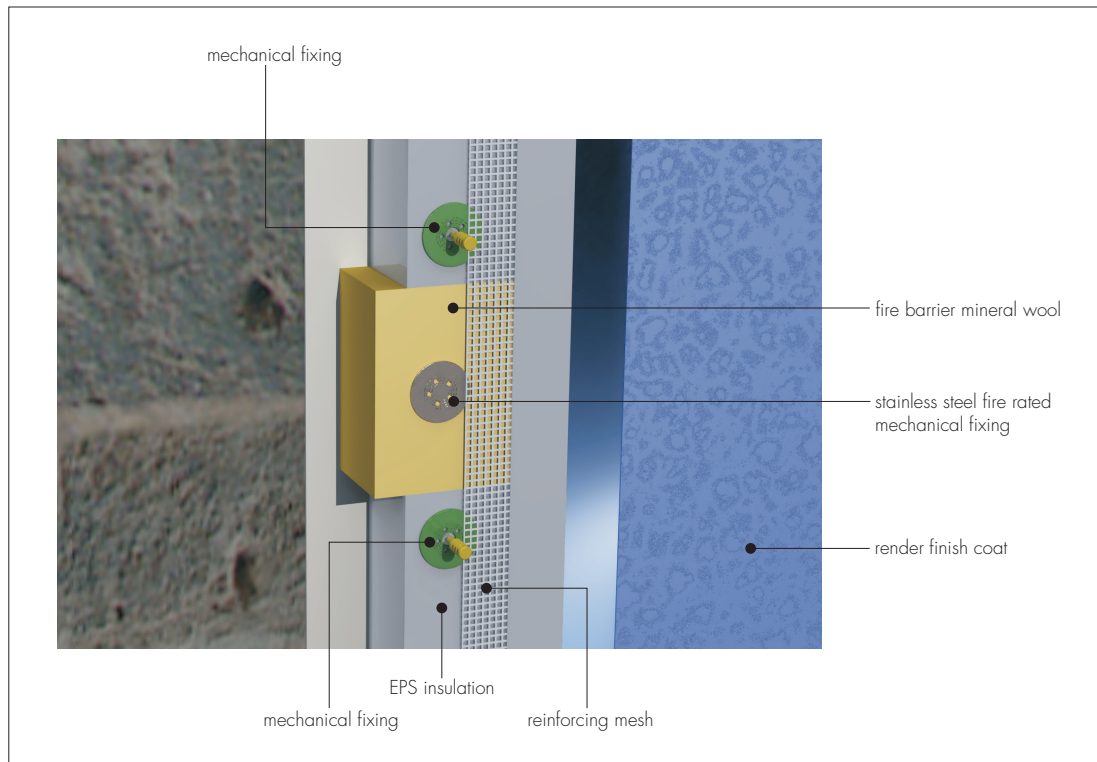
8.6 The system is not classified as 'non-combustible'; therefore, calculations for unprotected areas apply, with some minor exceptions.



8.7 Application to second storey walls and above should include at least one stainless steel mechanical fixing per square metre and fire barriers in line with compartment walls and floors (see Figure 3). For installation of fire barriers and steel fixings, reference should be made to the guidance in BRE Report BR 135 : 2013.



Figure 3 Fire break detail



## 9 Proximity of flues

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

**England and Wales** — Approved Document J

**Scotland** — Mandatory Standard 3.19, clause 3.19.4<sup>(1)(2)</sup>

(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 rain ingress. However, care should be taken to ensure that walls are adequately weathertight prior to application of the insulation system. The insulation system may 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 minimize the risk of rain ingress. Only details approved by the Certificate holder should be used.

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the weathertightness of solid 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.

10.4 At the top of walls, the system should be protected by an adequate overhang or other detail designed for use with these types of system (see section 16.26).

## 11 Risk of Condensation



11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of construction, including openings and penetrations at junctions between the insulation system, to minimise the risk of condensation. The recommendations given in 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  $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  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  $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point. Guidance may be obtained from BS 5250 : 2011 (Section 8, Annex D) and BRE Report BR 262 : 2002.

## Interstitial condensation



11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with this Certificate.

11.5 The render systems have an equivalent air layer of thickness ( $S_d$ ) as shown in Table 6.

Table 6 Equivalent air layer of thickness ( $S_d$ ) and water vapour resistance factor,  $\mu$

Render system (basecoat + topcoat)	Thickness (mm)	Equivalent air layer of thickness, $S_d$ (m)	Water vapour resistance factor, $\mu$
Acrylic	7.5	0.20	27
Brick effect	11	0.10	9
Dash receiver	12	0.16	13

11.6 The water vapour resistance factors ( $\mu$ ) for enhanced expanded polystyrene is 60, as taken from BS EN ISO 10456 : 2007, Table 4.

## 12 Maintenance and repair



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

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

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

## 13 Durability



13.1 The system should remain effective for at least 30 years, provided any damage to the surface finish is repaired immediately, and regular maintenance is undertaken. This includes checks on joints in the system and external plumbing fittings to prevent leakage of rainwater into the system, enabling steps to be taken to correct the defects.

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

13.3 The finishes may break up the flow of water on the surface and reduce the risk of discoloration by water runs. The finish may become discoloured with time, the rate depending on locality, 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 over coating.

## 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 Envirowall Wall System 2 External Wall Insulation System. A specification is prepared for each elevation of the building indicating:

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

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved applicators (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, the relevant wind speed data for the site and pull-out resistances (see section 7).

14.3 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge spanning the storey height. Any excessive irregularities, ie greater than 10 mm in 1 m, must be made good prior to installation to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

14.4 On existing buildings, purpose-made window sills must be fitted to extend beyond the finished face of the system (see Figure 6). New buildings should incorporate suitably deep sills.

14.5 Where surfaces are covered with an existing rendering, 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 Internal wet work, eg screeding or plastering, should be completed and allowed to dry prior to the application of a system.

14.7 All modifications, such as provision for fire stopping (see section 8) and necessary repairs to the building must be completed before installation commences.

## 15 Approved Installers

Application of the system, within the context of this Certificate, is 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 requirements 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 Application of the system is carried out in accordance with the Certificate holder's current installation instructions.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. The insulation board adhesive, adhesive basecoat and rendering must not be applied when exposure to frost is likely, in damp/wet conditions or at temperatures below 5°C or above 30°C. During the curing period, the render must be protected from rapid drying and should not be applied on elevations in direct sunlight or where the substrate is hot.

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

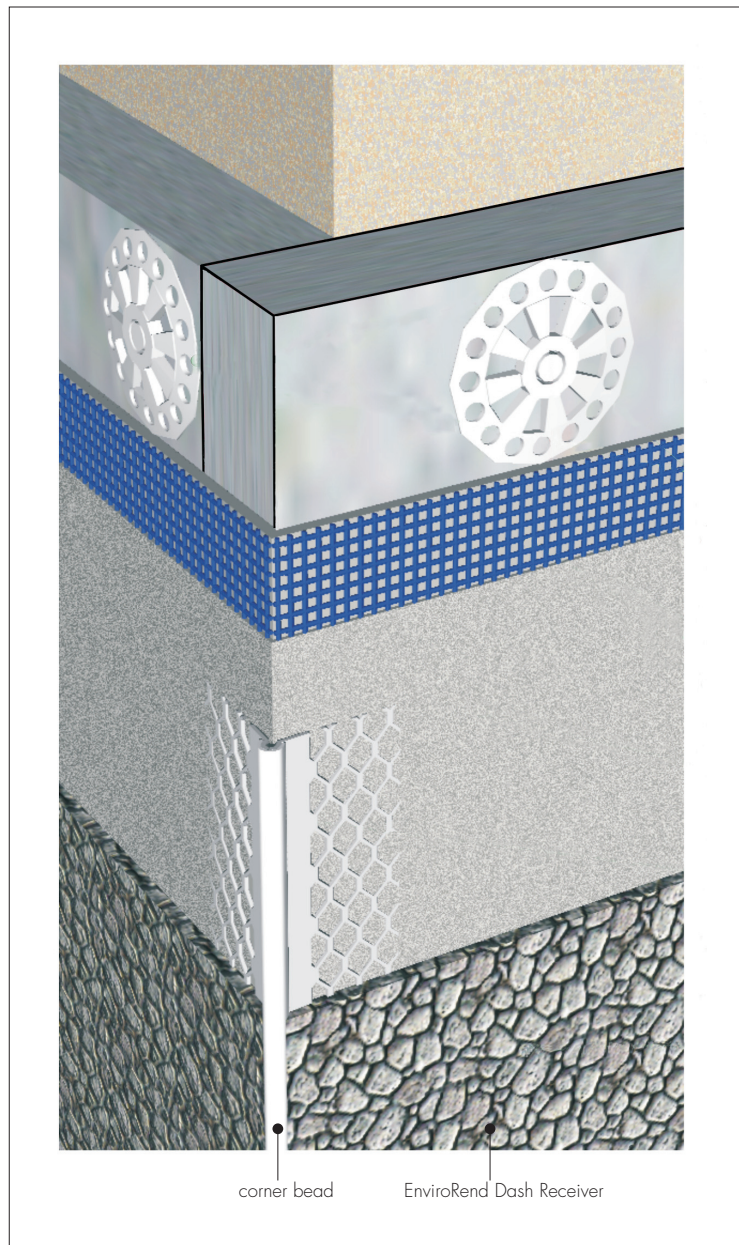
16.4 Before installation takes place, the building designer must confirm where items such as rainwater goods, satellite dishes, clothes lines and hanging baskets will be placed. The fixing points for these items must be specifically designated and built into the system as the insulation is installed. This is outside the scope of this Certificate.

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

### Positioning and securing insulation boards

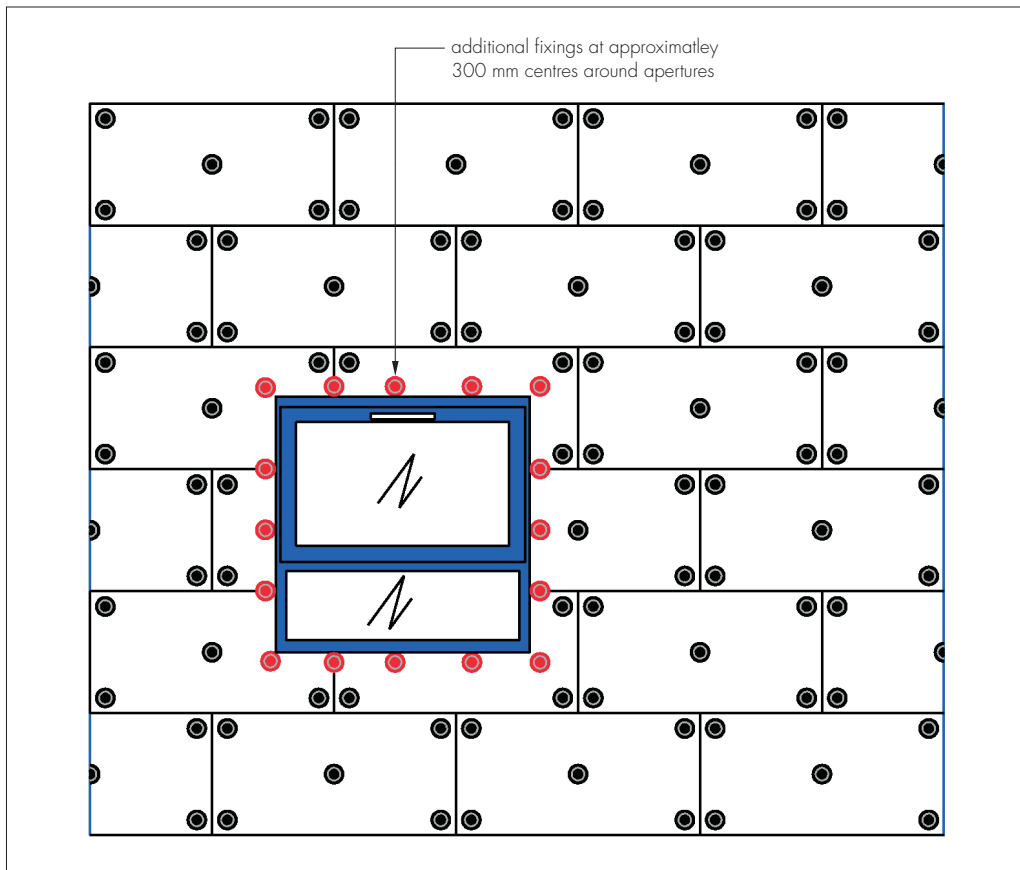
16.6 The base profile is secured to the external wall above the dpc using the profile fixings at approximately 300 mm centres (see Figure 2). Base rail connectors are inserted at all rail joints. Extension profiles are fixed to the front lip of the base rail or stop channel where appropriate. Beads and expansion joints are incorporated as specified.

Figure 4 Typical arrangement at external corner



16.7 The first run of insulation boards is positioned on the base profile. Holes are drilled into the substrate to the required depth through the insulation, equidistantly at the corners of each board and at positions which will allow a minimum of six fixings per square metre at edge zones and eight fixings per square metre in the main area of the wall (see Figure 5). Around openings, additional fixings should be used at 300 mm centres. The primary mechanical fixings are inserted and tapped or screwed firmly into place, securing the insulation to the substrate. Subsequent rows of boards are positioned so that the vertical board joints are staggered and overlapped at the building corners, and so that the board joints do not occur within 200 mm of the corners of openings.

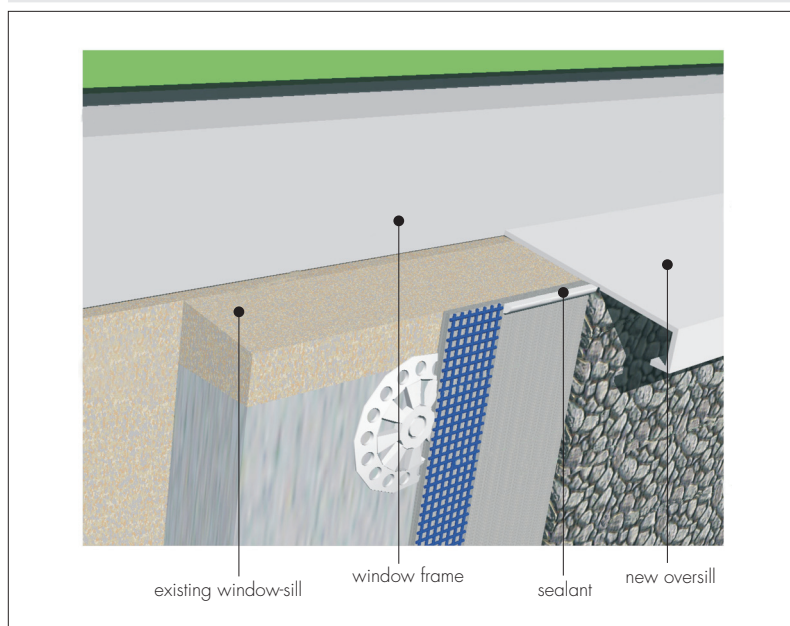
Figure 5 Insulation board fixing pattern



16.8 The insulation slabs must be pressed firmly against the wall and butted tightly together with the vertical joints staggered by at least 200 mm (see Figure 5). Alignment should be checked as the work proceeds.

16.9 To fit around details such as doors and windows, the boards may be cut with a sharp knife or fine-tooth saw, and positioned so that the board joints do not occur within 200 mm of the corners of the opening. If required, purpose-made window sills are fitted (see Figure 6). These are designed to prevent water ingress and incorporate drips to shed water clear of the system.

Figure 6 Typical window sill details



16.10 Insulation continues until the whole wall is completely covered including, where appropriate, the building soffits.

16.11 Prior to the reinforcement coat, expanding foam sealing tape is inserted at window and door frames, overhanging eaves, gas and electric meter boxes, and wall vents, or where the render abuts any other building material or surface.

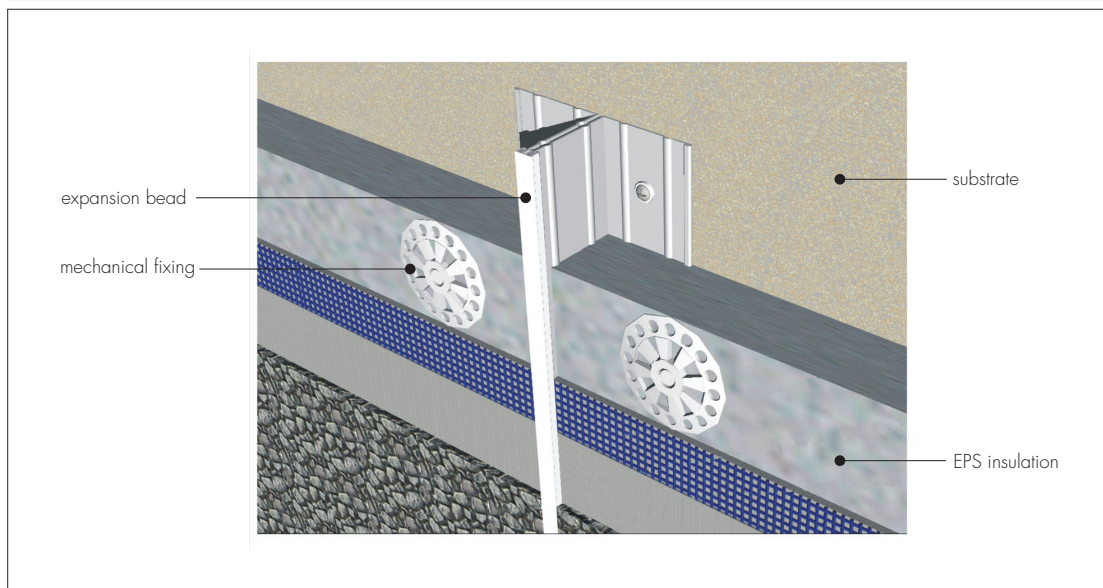


16.12 Angle beads are fixed to all building corners and to door and window heads and jambs using the basecoat renders.

### Movement joints

16.13 Movement joints are fixed vertically in agreed positions, depending upon the individual requirements of each job. Where a movement joint is incorporated into the substrate, an expansion joint must be provided in the insulation system (see Figure 7).

Figure 7 Vertical expansion joint



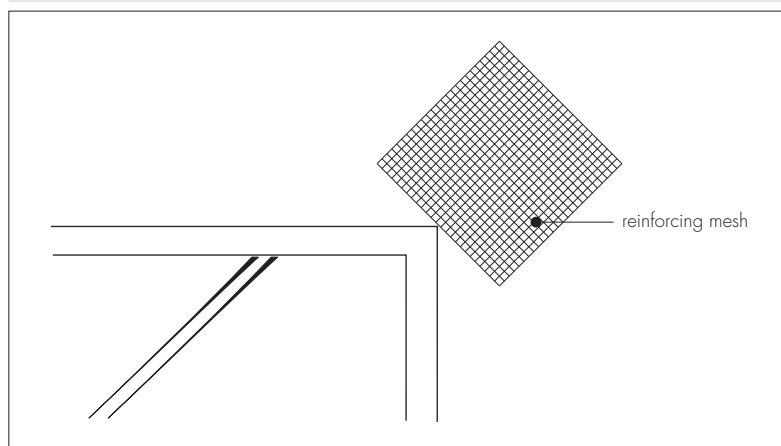
### Reinforcing

16.14 Retrobase Basecoat Render is prepared by mixing each 25 kg bag with 4.5 litres of clean water. The basecoat is applied over the insulation boards, using a notched trowel and floated with a Darby float to an approximate minimum thickness of 4 mm. The reinforcement mesh is immediately embedded and a further layer of basecoat is applied and smoothed-off to remove trowel lines. After application and smoothing, the overall thickness should be a minimum of 6 mm.

16.15 Overlapping at all mesh joints should not be less than 100 mm.

16.16 Additional pieces of reinforcing mesh, 300 mm by 500 mm, are used diagonally at the corners of openings, as shown in Figure 8.

Figure 8 Additional reinforcement at openings



16.17 The mesh should be free of wrinkles and fully embedded in the basecoat.

16.18 Prior to the render coat, a bead of joint sealant is gun-applied at window and door frames, overhanging eaves, gas and electric meter boxes, and wall vents, or where the render abuts any other building material or surface.

### Render finish

16.19 The basecoat should be left to dry thoroughly before application of the finish coat. Depending on conditions, the drying time should be at least 48 hours before application of the finish coats.

16.20 Depending on the system, and if required, primer of the appropriate colour to match the top coat should be thoroughly mixed and applied to 100% of the area with a roller.



16.21 The finish coats should be mixed gently with an electric paddle mixer to disperse the additives before application over the dried basecoat.

16.22 The finish coats are applied to the thicknesses as in Table 7; notional thin-coat thicknesses are indicated by the grain size for each specific finish, using a stainless steel trowel and float and finished with a plastic float to create the required finish texture.

*Table 7 Finish coat thicknesses*

Finish coat	Thickness (mm)
EnviroRend Dash Receiver	6 mm to 8 mm
EnviroBrick	11 mm
EnviroCryl	2 mm to 4 mm

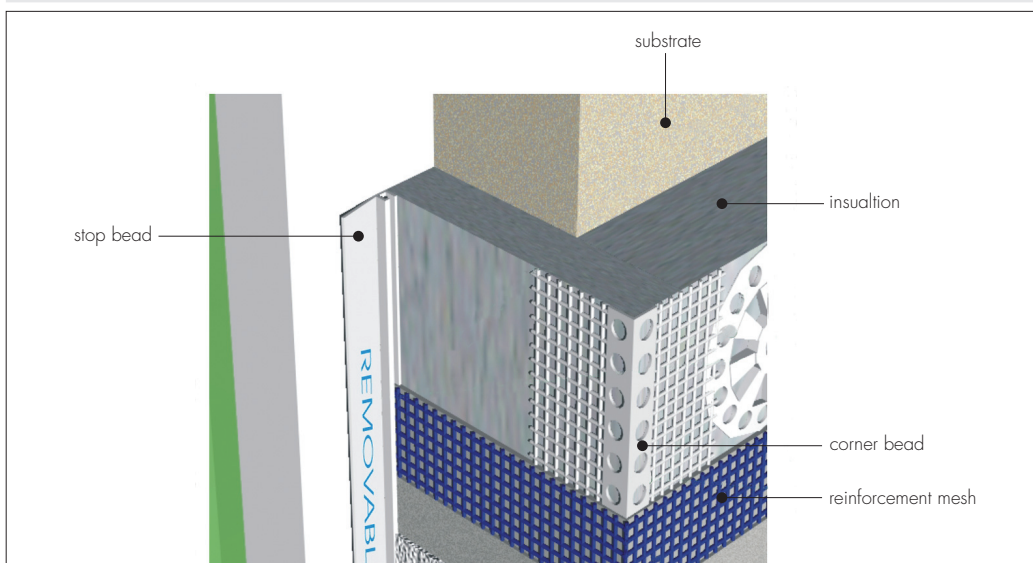
16.23 For thick coat dash finishes, a coloured dash receiver coat is applied over the complete basecoat using a stainless steel trowel, to the thickness specified, and floated off. Whilst the dash receiver is still wet, a selected and graded, decorative aggregate dash is evenly thrown on to the wet surface, to provide a close textured finish. On completion, the surface is lightly tamped to ensure an adequate bond has been achieved. All adjacent surfaces should be protected during aggregate application.

16.24 For brick effect render applications, the initial 'mortar' layer is applied over the completed basecoat to a uniform thickness, using a stainless steel trowel and floated off. At the precise level of cure, the top coat render layer is applied to the whole surface and a selected 'brickwork' bonding 'pattern' is formed by careful cutting out of the surface layer to expose the visual 'mortar' layer beneath.

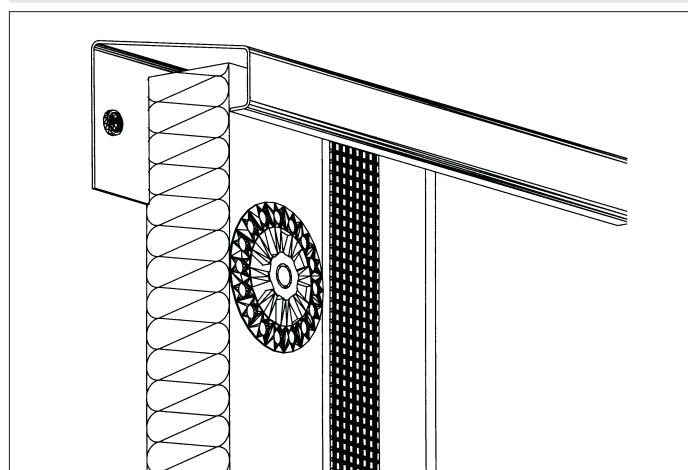
16.25 Continuous surfaces should be completed without a break and care should be taken in the detailing of the system around openings and projections to prevent water ingress (see Figure 9).

16.26 At the tops of walls, the system should be protected by an adequate overhang (see Figure 10) or by an adequately sealed purpose-made flashing.

*Figure 9 Typical detail at window reveal*



*Figure 10 Typical detail at parapet capping/eaves detail*



16.27 On completion of the installation, external fittings, eg rainwater goods, are securely fixed to timber grounds or extended fixings that have been built in to the system during installation.

## Technical Investigations

### 17 Investigations

The system was examined and assessed to determine:

- fire performance
- hygrothermal behaviour
- impact resistance
- water vapour permeability
- bond strength
- pull through resistance.

17.2 An examination was made of data relating to:

- fire propagation tests to BS EN 13501-1 : 2007
- thermal conductivity to BS EN 13163 : 2012.

17.3 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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ETAG 014 : 2011 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal Insulation Composite Systems with Rendering*

## 18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.