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Agrément Certificate
14/5159
Product Sheet 1

SEMPRE THERM EXTERNAL WALL INSULATION SYSTEMS

SEMPRE THERM EPS EXTERNAL WALL INSULATION BONDED SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the SempreTherm EPS External Wall Insulation Bonded System comprising white or grey EPS insulation boards, adhesively fixed with supplementary mechanical fixings, with a reinforced basecoat and render finishes. It is suitable for use on the outside of external walls in new and existing domestic and non-domestic buildings.

(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 meeting the requirements of the national Building Regulations (see section 6).

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

Behaviour in relation to fire — the system has a Bs1, d0 reaction to fire classification and can meet the requirements the national Building Regulations (see section 8).

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

Durability — when installed and maintained in accordance with the Certificate holder's recommendations and the terms of this Certificate, the system will remain effective for at least 30 years (see section 13).



The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 12 September 2014

John Albon — Head of Approvals
Energy and Ventilation

Claire Curtis-Thomas
Chief Executive

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

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

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Regulations

In the opinion of the BBA, the SempreTherm EPS External Wall Insulation Bonded System, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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 section 7.4 of this Certificate.
Requirement: B4(1)	External fire spread
Comment:	The system can satisfy this Requirement. See sections 8.1 to 8.4 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The system can provide a degree of protection against rain ingress. See sections 4.4 and 10.1 of this Certificate.
Requirement: C2(c)	Resistance to moisture
Comment:	The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.1, 11.2 and 11.4 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The system can contribute to satisfying this Requirement. See sections 6.2 and 6.3 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation: 26	CO₂ emission rates for new buildings
Regulation: 26A	Fabric energy efficiency rates for new buildings (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 when compensating fabric/services measures are 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 12.1 and 13.1 and the <i>Installation</i> 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 section 7.4 of this Certificate.
Standard: 2.6	Spread to neighbouring buildings
Comment:	The system can satisfy this Standard, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See sections 8.1 to 8.6 of this Certificate.
Standard: 2.7	Spread on external walls
Comment:	The system can satisfy this Standard and is acceptable for use more than one metre from a boundary, with reference to clauses 2.7.1 ⁽¹⁾⁽²⁾ , 2.7.2 ⁽²⁾ and Annex 2A ⁽¹⁾ . See sections 8.1 to 8.6 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 10.1 of this Certificate.
Standard: 3.15	Condensation
Comment:	The system can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See sections 11.3 and 11.4 of this Certificate.
Standard: 6.1(b)	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾⁽²⁾ , 6.1.3 ⁽¹⁾⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.1.10 ⁽²⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See sections 6.2 and 6.3 of this Certificate.
Standard: 7.1(a)(b)	Statement of sustainability
Comment:	The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6.2 of this Certificate.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation:	23	Fitness of materials and workmanship
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:		Walls insulated with the system will satisfy this Regulation. See sections 4.4 and 10.1 of this Certificate.
Regulation:	29	Condensation
Comment:		Walls insulated with the system will satisfy the requirements of this Regulation. 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 has a low risk surface and can satisfy this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40	Target carbon dioxide emission rate
Comment:		The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.

Construction (Design and Management) Regulations 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 2014

NHBC accepts the use of the SempreTherm EPS External Wall Insulation Bonded System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 6 Superstructure, Chapter 6.9 Curtain Walling and Cladding*.

Technical Specification

1 Description

1.1 SempreTherm EPS External Wall Insulation Bonded System consists of insulation boards, adhesively fixed direct to the substrate wall, with supplementary mechanical fixings, reinforced basecoat and render finishes (see Figure 1). It is made up of the following components:

Adhesive

- Sempre Start TS-100 — a cement-based powder requiring the addition of clean water (from 0.2 litre/kg to 0.22 litre/kg) and mixed with a high-speed mixer for 3 to 5 minutes
- Sempre Universal TU-200 — a cement-based powder requiring the addition of clean water (from 0.22 litre/kg to 0.24 litre/kg) and mixed with a high-speed mixer for 3 to 5 minutes.

Insulation

- SempreTherm white expanded polystyrene (EPS 70) insulation boards — 1200 mm by 600 mm or 1000 mm x 500 mm, in a range of thicknesses between 50 mm and 150 mm, with a nominal density of 15 kg·m⁻³, a minimum compressive strength of 70 kPa and a nominal tensile strength perpendicular to the face of 100 kPa. It is manufactured to comply with BS EN 13163 : 2008
- SempreTherm grey expanded polystyrene (EPS 70) insulation boards — 1200 mm by 600 mm or 1000 mm x 500 mm, in a range of thicknesses between 50 mm and 150 mm, with a nominal density of 15 to 17 kg·m⁻³, a minimum compressive strength of 70 kPa and a nominal tensile strength perpendicular to the face of 100 kPa. It is manufactured to comply with BS EN 13163 : 2008.

Supplementary fixings

Mechanical fixings — anchors with adequate length to suit the substrate and the insulation thickness, approved and supplied by the Certificate holder as follows:

- Ejotherm NT U⁽¹⁾.

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

Basecoat

- Sempre Universal TU-200 — a cement-based powder requiring the addition of clean water (from 0.22 litre/kg to 0.24 litre/kg) and mixed with a high-speed mixer for 3 to 5 minutes.

Reinforcement

- Sempre TG-15 Fibreglass Mesh — alkali-resistant, slip-proof, tear-proof and algae-/fungi-resistant glassfibre mesh, with a mass per unit area of approximately 165 g·m² and a mesh size of approximately 4.0 mm by 4.0 mm
- Sempre TG-16 Fibreglass Mesh — alkali-resistant, slip-proof, tear-proof and algae-/fungi-resistant glassfibre mesh, with a mass per unit area of approximately 230 g·m² and a mesh size of approximately 7.0 mm by 7.0 mm.

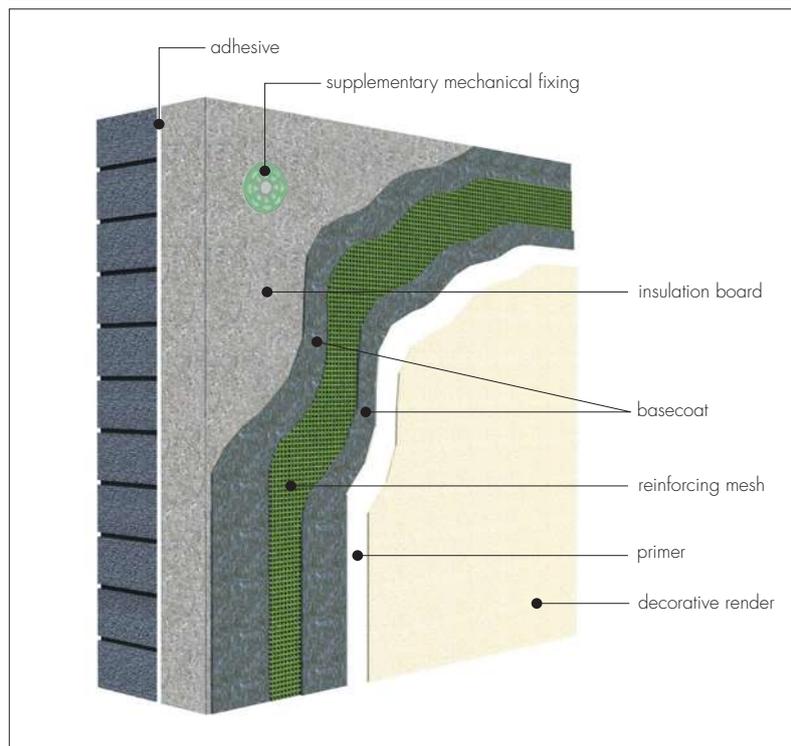
Primer

- Sempre Tesoro Grunt — ready-to-use pigmented liquid for use on highly absorbent masonry and concrete substrates (such as brick/concrete block) prior to the application of adhesive and basecoat
- Sempre Maresil Grunt — polysilicate primer suitable for mineral substrates and used with Sempre Maresil Tynk.

Finishing coats

- Sempre Tesoro Tynk — acrylate binder, supplied as ready-to-use paste, applied to the primer basecoat. Available in particle sizes of 1.5 mm, 2 mm, 2.5 mm and 3 mm
- Sempre Maresil Tynk — silicate-silicone binder, supplied as ready-to-use paste, applied to the primer basecoat. Available in particle sizes of 1.5 mm, 2 mm, 2.5 mm and 3 mm.

Figure 1 SempreTherm External Wall Insulation Bonded System



1.2 Ancillary items supplied with the system but outside the scope of this Certificate:

- Range of aluminium, PVC-U or stainless steel profiles, comprising:
 - base profiles (starter track)
 - edge profiles — (PVC corner bead with mesh, and drip beads)
 - corner profiles with optional PVC-U nosing
 - render stop profiles (stop bead with mesh)
 - movement joints (V and E version)
 - expansion joints
 - PVC clip-on starter track beads
 - window frame seal beads
 - aluminium insulated window sills with PVC end caps
 - flashings
 - spiral fixings
 - fungicidal wash
 - algae remover
 - sealants
 - expansion foam
 - sealers.

1.3 The insulation boards are primarily bonded to the external surfaces of the walls using at least 60% coverage of adhesive (applied at a minimum 40% coverage), which is achieved when the boards have been pressed against the wall. Supplementary mechanical fixings are applied to support the boards in place while the adhesive is setting. When all the boards have been secured to the wall, basecoat is applied to their surface to a uniform thickness and the reinforcing mesh immediately embedded and the surface smoothed with a trowel. A further layer of basecoat render is applied over the embedded reinforcing mesh in order to achieve the required overall thickness. When the basecoat is dry, primer is applied and the surface is then ready for the application of the selected finishes.

2 Manufacture

2.1 Components are manufactured by the Certificate holder or bought in from suppliers, to an agreed specification.

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

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

2.3 The management system of the SEMPRE Farby Sp. z.o.o. production facility (J. Kustronia 60 43-301 Bielsko-Biała, Poland) has been assessed and registered as meeting the requirements of ITB AT-15-6383/2013 (Certificate F-013-BG-031) by PCBC S.A.

3 Delivery and site handling

3.1 The insulation boards are delivered in sealed packs, with the product identification and manufacturer's batch numbers.

3.2 The other components are delivered in the quantities and packaging listed in Table 1. Each package carries the product identification and manufacturer's batch number.

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

Component	Quantity and package
Sempre Start TS-100 — adhesive	25 kg bag
Sempre Universal TU-200 — adhesive/basecoat	25 kg bag
SempreTherm (white and grey) EPS	Shrink-wrapped in polythene (1200 mm x 600 mm or 1000 mm x 500 mm)
Mechanical fixings	Boxed by manufacturer
Sempre TG-15 Fibreglass Mesh	1 m x 50 m rolls
Sempre TG-16 Fibreglass Mesh	1 m x 50 m rolls
Sempre Tesoro Grunt — primer/keycoat	10 litre tubs
Sempre Maresil Grunt — primer/keycoat	10 litre tubs
Sempre Tesoro Tynk — finish coat	25 kg tubs
Sempre Maresil Tynk — finish coat	25 kg tubs

3.4 The boards must be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting. Care must be taken to avoid contact with solvents or materials containing volatile organic components. The boards must not be exposed to open flame or other ignition sources.

3.5 The adhesive, 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.

3.6 The primer 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 SempreTherm EPS External Wall Insulation Bonded System.

4 General

4.1 SempreTherm EPS External Wall Insulation Bonded System, when installed in accordance with this Certificate, is effective in reducing the thermal transmittance (U value) of external masonry walls of new and existing buildings above the damp proof course (dpc) level. 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 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 external walls of masonry, or dense or no-fines concrete construction on new or existing domestic and non-domestic buildings (with or without existing render) up to 18 metres in height. Prior to installation of the system, the wall should comply with section 14 of this Certificate.



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

- BS EN 1996-2 : 2006, in that 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 regulatory requirements, should also be built in accordance with the Standards identified in section 4.4.

4.6 The system will improve the weather resistance of a wall and provide a decorative finish. However, it should only be installed where there is no sign of dampness on the inner surface of the wall, other than that caused solely by condensation.

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

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

4.9 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.

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

5 Practicability of installation

The system should only be installed by 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; details of approved installer companies are included on the BBA 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 declared thermal conductivities values (λ_D) of the insulations given in Table 2.

Table 2 Declared thermal conductivities values (λ_D) and available thicknesses

Insulation types	Thickness (mm)	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
White EPS 70	50 to 150	0.038
Grey EPS 70		0.031



6.2 The U value of a completed wall will depend on the selected insulation type and thickness, fixing method and type of fixing, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample construction in accordance with the Building Regulations are given in Table 3, and are based on the thermal conductivities given in Table 2.

Table 3 Insulation thickness required to achieve design U values¹⁾(2)(3) given in the national Building Regulations

U value ⁽⁴⁾ (W·m ⁻² ·K ⁻¹)	Thickness of insulation (mm)			
	215 mm Brickwork, $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$		200 mm dense blockwork, $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	
	White EPS 70	Grey EPS 70	White EPS 70	Grey EPS 70
0.18	— ⁽⁵⁾	— ⁽⁵⁾	— ⁽⁵⁾	— ⁽⁵⁾
0.19	— ⁽⁵⁾	150	— ⁽⁵⁾	— ⁽⁵⁾
0.25	130	110	140	120
0.26	130	100	140	110
0.28	120	100	130	100
0.30	110	90	120	100
0.35	90	80	100	80

- (1) Wall construction inclusive of 13 mm plaster ($\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$). Declared thermal conductivity of insulation values (λ_p) is as shown in Table 2. An adhesive layer of 5 mm thick with $\lambda = 0.43 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ covering 40% of the area is also included and a board emissivity of 0.9, together with an external render thickness of 5 mm with $\lambda = 1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.
- (2) Calculations based on a bonded system that included 3 galvanized steel fixings per square metre with 8 mm diameter sleeve and with a point thermal transmittance ($X_p = 0.004 \text{ W}\cdot\text{K}^{-1}$) per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2007.
- (3) Based upon incremental insulation thickness of 10 mm.
- (4) U value calculations were based on having 3 fixings per square metre on the main section of the wall. However, by having an increased number of fixings on the edge zone would result in slightly worse U values.
- (5) See section 4.2.

6.3 The system can contribute to maintaining continuity of thermal insulation at junctions between elements and openings. For Accredited Construction Details, the corresponding ψ -values (Psi) 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). See also SAP 2009 Appendix K and the *iSBEM User Manual* for new-build

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

7 Strength and stability

General

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 by 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 adhesive and supplementary fixings.

 7.4 The wind loads on the wall should be calculated in accordance with BS EN 1991-1-4 : 2005. 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, 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 installations should 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 positive contribution from the system itself
- the proposed system (with associated supplementary fixing layout) provides adequate resistance to negative wind loads until the adhesive is set, and thereafter associated bond strength between adhesive and substrate provides adequate resistance to negative wind loads
- an appropriate number of site-specific pull-off (bond strength) tests have been conducted on the substrate of the building to determine the minimum resistance to failure of the bond strength.

7.6 The bond strength between the adhesive and the substrate should be determined on site and taken as the mean of the five results divided by a safety factor of nine and multiplied by the minimum bond area.

7.7 The minimal admissible calculated bonded surface area (S) for the system is 40%⁽¹⁾, in accordance with ETAG 004 : 2013.

(1) This bonded area should be increased if the bond strength between the adhesive and the substrate is less than the ultimate wind load.

7.8 The initial adhesive bond between the insulation and the substrate will have a minimum failure resistance of $\geq 30 \text{ KN}\cdot\text{m}^{-2}$. For calculating the design resistance, a minimum bonded area should be considered and a safety factor of nine applied.

7.9 The number of supplementary fixings and the span between them should be determined by the system designer. Provided the substrate wall and fixings are covered by an appropriate ETA, the mechanical fixings will initially transfer the weight of the system to the substrate wall. The fixing must be selected to give adequate support to the weight of the system at the minimum spacing.

Impact resistance

7.10 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Use Category listed in Table 4.

Table 4 SempreTherm EPS External Wall Insulation Bonded System impact resistance

	Use Category ⁽¹⁾	
Rendering system: Sempre Universal TU-200 (basecoat) + finishing coats indicated hereafter	Single layer TG-15 Mesh (see section 1.1)	Single layer TG-16 Mesh (see section 1.1)
Sempre Tesoro Tynk (acrylate binder – particle size 1.5 mm)	I	–
Sempre Maresil Tynk (silicate-silicone binder – particle size 1.5 mm)	II	II

(1) Use Categories are defined in ETAG 004 : 2013 as:

- Category I – a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II – a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III – a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

8 Behaviour in relation to fire



8.1 The reaction to fire classification is class B-s1, d0 in accordance with BS EN 13501-1 : 2007.

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

8.3 The system is restricted for use in buildings up to 18 metres in height.

8.4 For houses in Scotland, and for all buildings in England and Wales and Northern Ireland, the system is considered suitable for use on, or at any distance from, the boundary.

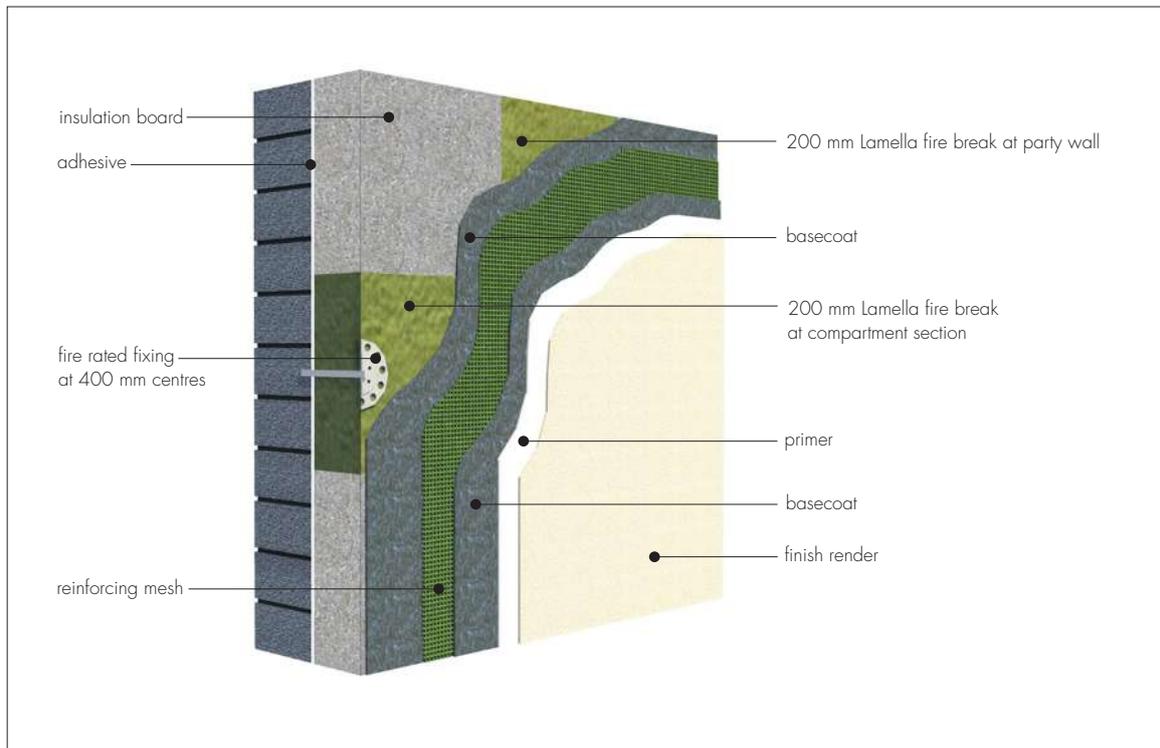


8.5 For flats and maisonettes and non-domestic building in Scotland, the system is suitable only for use more than one metre from the boundary.

8.6 The system is not classified as 'non-combustible', therefore calculations for unprotected areas may apply dependent on the fire resistance characteristics of the wall.

8.7 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 fire barriers in line with compartment walls and floors as advised in BRE Report BR 135 : 2013 (see Figure 2 of this Certificate).

Figure 2 Fire barrier details



9 Proximity of flues and appliances

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⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L.

10 Water resistance



10.1 The system will provide a degree of protection against water ingress. However, care should be taken to ensure that walls are adequately watertight prior to application of the system. The system must only be installed where there is no sign of dampness on the inner surface of the substrate other than that caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of water ingress.

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

10.4 At the top of walls, the system should be protected by an adequate overhang or other detail designed for use with this type of system (see section 16).

11 Risk of condensation



11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and penetrations at junctions between the insulation system and windows, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

Surface condensation



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



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 4 and Annex G, 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 BS 5250 : 2011, Section 4 and Annexes D and G.

11.5 The water vapour resistance (μ) factor (for the insulation boards) and equivalent air layer thickness (S_d) (for the render systems) is shown in Table 5.

Table 5 Water vapour resistance factor and equivalent air layer thickness

	S_d (m)	μ
Expanded polystyrene (white/grey)	—	20 to 40 ⁽³⁾ (EPS 70)
Sempre Universal TU-200 ⁽¹⁾ (basecoat) + Sempre Tesoro Grunt (keycoat) + Sempre Tesoro Tynk (finish coat - particle size 1.5 mm) ⁽²⁾	0.65	—
Sempre Universal TU-200 ⁽¹⁾ (basecoat) + Sempre Tesoro Grunt (keycoat) + Sempre Tesoro Tynk (finish coat - particle size 3.0 mm) ⁽²⁾	0.93	—
Sempre Universal TU-200 ⁽¹⁾ (basecoat) + Sempre Maresil Grunt (keycoat) + Sempre Maresil Tynk (finish coat - particle size 3.0 mm) ⁽²⁾	0.22	—

(1) The basecoat is applied to a minimum thickness of 3.5 mm.

(2) Render system comprises basecoat, reinforcing mesh, key coat and finish coat (minimum thickness = 5 mm, which is based on particle size of 1.5 mm and maximum thickness = 6.5 mm based on particle size of 3 mm).

(3) It is recommended that the lower figure is used when assessing the interstitial condensation risk.

12 Maintenance and repair



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

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

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

13 Durability



13.1 The system will 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.

13.2 The render may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating.

13.3 To maintain a high quality appearance, it may be necessary to periodically overcoat the building using a suitable masonry coating (ie one covered by a valid BBA Certificate for this purpose). Care should be taken not to adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for treatment and the need for any necessary repairs to the building structure before application of the system. A specification is prepared for each elevation of the building indicating:

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

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the pull-out resistance of the proposed supplementary mechanical fixings. An assessment and recommendation is made on the type and number of fixings required to withstand the building's expected wind loading based on calculations using the test data and pull-out resistance (see section 7).

14.3 All modifications, such as provision for fire barriers (see section 8) and necessary repairs to the building structure, must be completed before installation of the system commences.

14.4 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge tool spanning the storey height. Any excessive irregularities, ie greater than 20 mm, must be made good prior to installation, to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

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

14.7 Internal wet work, eg screeding or plastering, should be completed and allowed to dry prior to the application of a system.

15 Approved Installers

Application of the system, within the context of this Certificate, must be carried out by installers approved by the Certificate holder. A Certificate holder approved installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system and has operatives who, upon completion of their training, have been issued with an appropriate identification card by the Certificate holder
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

16 Procedure

General

16.1 Installation of the system must be carried out in accordance with the Certificate holder's current installation instructions.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, nor if exposure to frost is likely, and the coating must be protected from rapid drying. Installation should not take place during rainfall or if rain is anticipated. In addition, cementitious-based renders must not be applied if the temperature will fall below 0°C within 72 hours of completion.

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

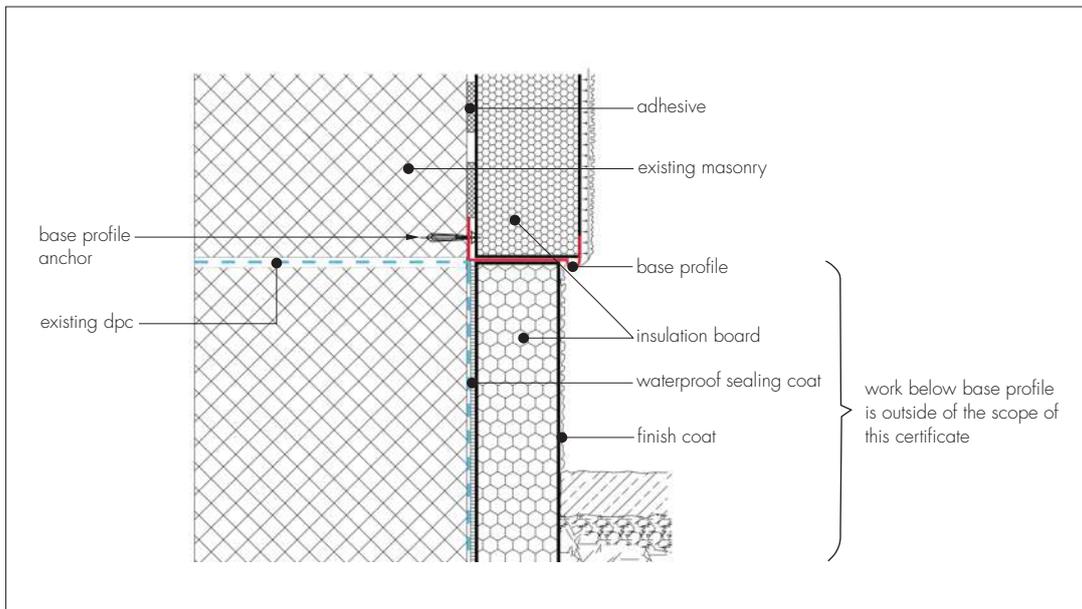
16.4 The primers should always be used, and diluted as necessary (see section 1).

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

Positioning and securing insulation boards

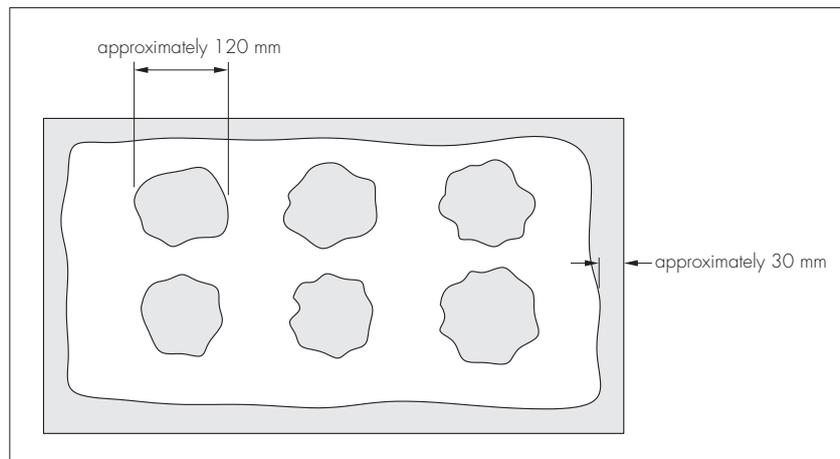
16.6 The base profile is secured to the external wall above the dpc using the approved profile fixings at approximately 300 mm centres (see Figure 3). Base rail connectors are inserted at all rail joints. Extension profiles are fixed to the front lip of the base rail or stop end channel where appropriate.

Figure 3 Typical section of base profile



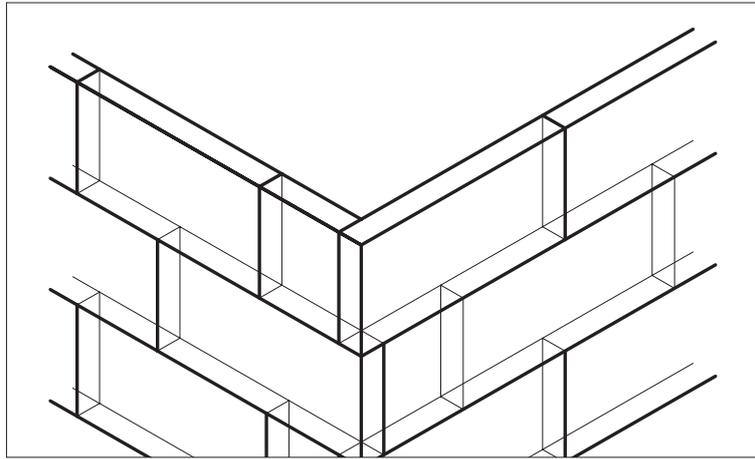
16.7 The adhesive is prepared with the required amount of water (see section 1), and mixed with a paddle mixer until the desired consistency is achieved. After allowing the adhesive to rest for 5 minutes, it is stirred again. The adhesive is applied in a continuous line around the perimeter of the board with six additional dabs of adhesive distributed uniformly over the remaining surface — at least 40% of the board should be covered (see Figure 4). Alternatively, it can be applied over the entire face of the insulation board using a notched trowel.

Figure 4 Insulation boards adhesive pattern



16.8 The first run of insulation boards are placed on the base profile with adhesive applied. The boards must be pressed firmly against the wall and butted tightly together and aligned to achieve a level finish. 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 (see Figure 5). Joints between boards greater than 2 mm should be filled with slivers of insulation board or low density polyurethane foam. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting boards to fit. Any high spots or irregularities are removed by lightly planing with a rasp over the whole surface. Alignment should be checked as work proceeds.

Figure 5 Typical arrangement of insulation boards



16.9 Supplementary mechanical fixings are applied through the insulation board into the substrate wall with two fixings through the insulation on the entire wall, resulting in three fixings per square metre. Additional fixings are applied at each corner of the insulation in the edge zone (at the corners of the building).

16.10 Holes are drilled into the substrate to the required depth through the insulation board and, within the edge zone, additional holes are drilled at the corners of each board (resulting in six fixings per square metre within the edge zones). Around openings, additional fixings should be installed as determined by the system designer (see Figure 7). The mechanical fixings are inserted and tapped firmly into place, securing the boards to the substrate.

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

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

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

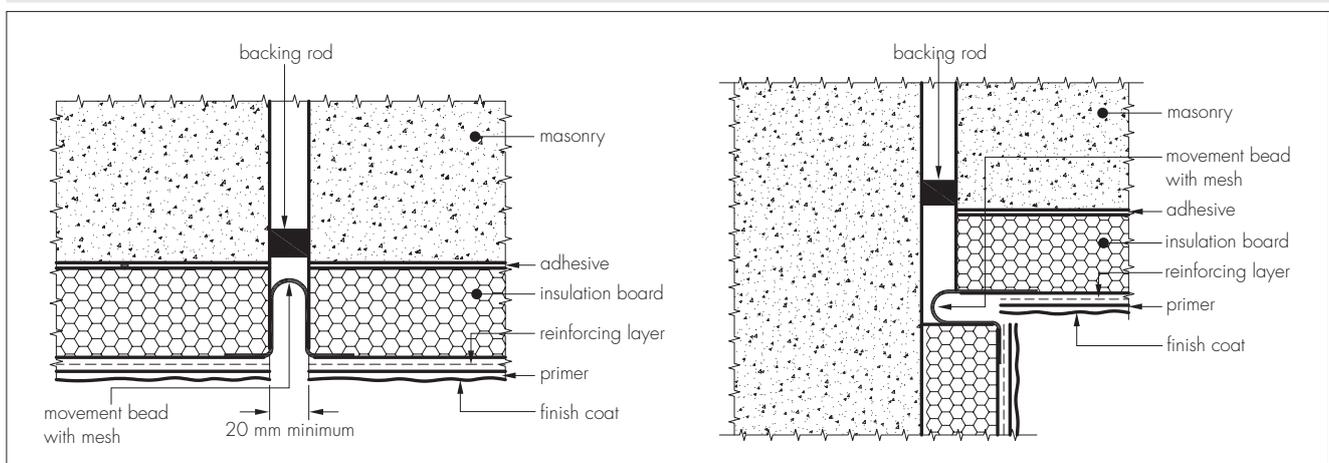
16.14 Prior to the application of the render system, a bead of joint sealant is gun-applied at window and door frames, overhanging eaves, gas and electric meter boxes, and wall vents, or where the render abuts any other building material or surface.

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

Movement joints

16.16 Generally, movement joints are not required in the system but, if an expansion joint is already incorporated in the substrate, a movement joint must be provided in the insulation system (see Figure 6).

Figure 6 Vertical movement joint



Application of basecoat and reinforcement mesh

16.17 The basecoat is prepared with the required amount of water (see section 1) then applied over the insulation boards using a stainless steel trowel, and floated with a Darby float to an approximate thickness of 3 mm. The reinforcement mesh (with its concave surface to the wall) is immediately embedded into the basecoat by trowelling from the centre to the edge and a light coat of basecoat is applied whilst still wet to ensure the mesh is free of wrinkles.

Additional basecoat is then applied as required, to ensure the mesh is completely covered and the required minimum thickness of basecoat is achieved whilst ensuring that the mesh is placed in the top one third of basecoat.

16.18 The basecoat is applied progressively, working in one-metre sections in a vertical or horizontal direction.

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

16.20 In all cases, additional pieces of reinforcing mesh (200 mm by 300 mm) should be used diagonally at the corners of openings, as shown in Figure 7. For areas requiring extra resistance to impact, two mesh layers should be used in two stages.

16.21 The overall thickness of the reinforced basecoat must be greater than 3.5 mm. Once the whole wall is completed, the basecoat (with mesh) is left to dry thoroughly before application of primer and the finish coat. The drying time will depend upon the conditions, but at least 24 hours should elapse before primer and finishing coats are applied.

Primer

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

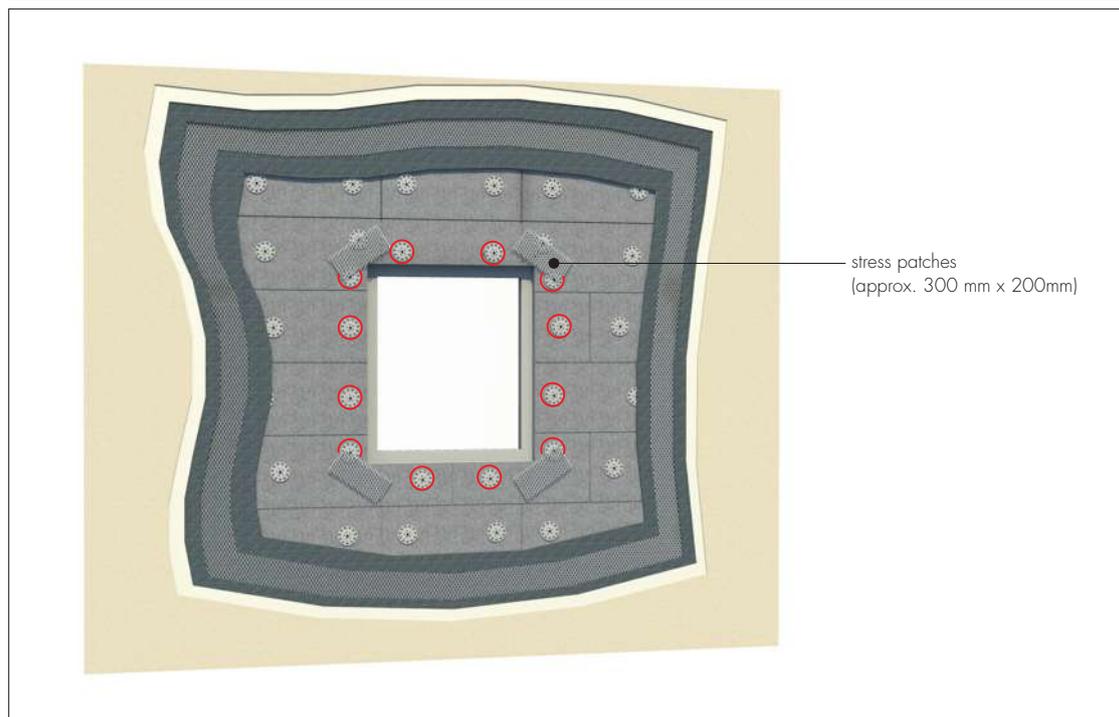
Finishing

16.23 Stop beads are positioned vertically, eg at party wall positions where the adjoining house does not require treatment.

16.24 The basecoat should be left to dry thoroughly before application of the finish coat. The drying time will depend upon the conditions, but at least 24 hours should elapse before applying the finish coats.

16.25 The render finishes are applied to the required thicknesses (1.5 mm to 3 mm as determined by the particle size – see section 1), using a stainless steel trowel and finished with a plastic trowel to create a textured finish. The drying time is dependent on conditions, but will typically be 24 hours in accordance with the Certificate holder's instructions.

Figure 7 Additional reinforcement and fixings at opening



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

16.27 At the tops of walls, the system should be protected by an adequate overhang (see Figure 8) or by an adequately-sealed purpose-made flashing. Care should be taken in the detailing of the system around openings and projections (see Figures 9, 10 and 11).

Figure 8 Roof eaves details

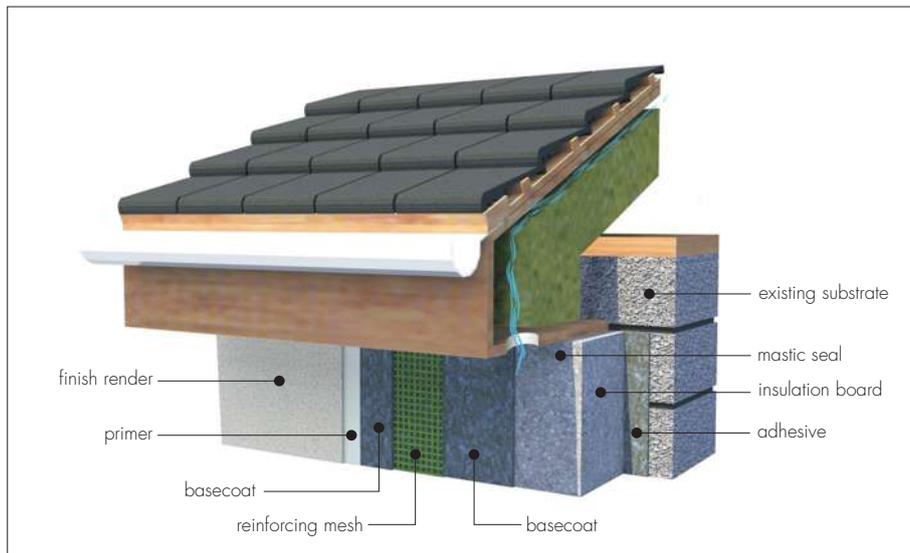


Figure 9 Window sill and reveal detail

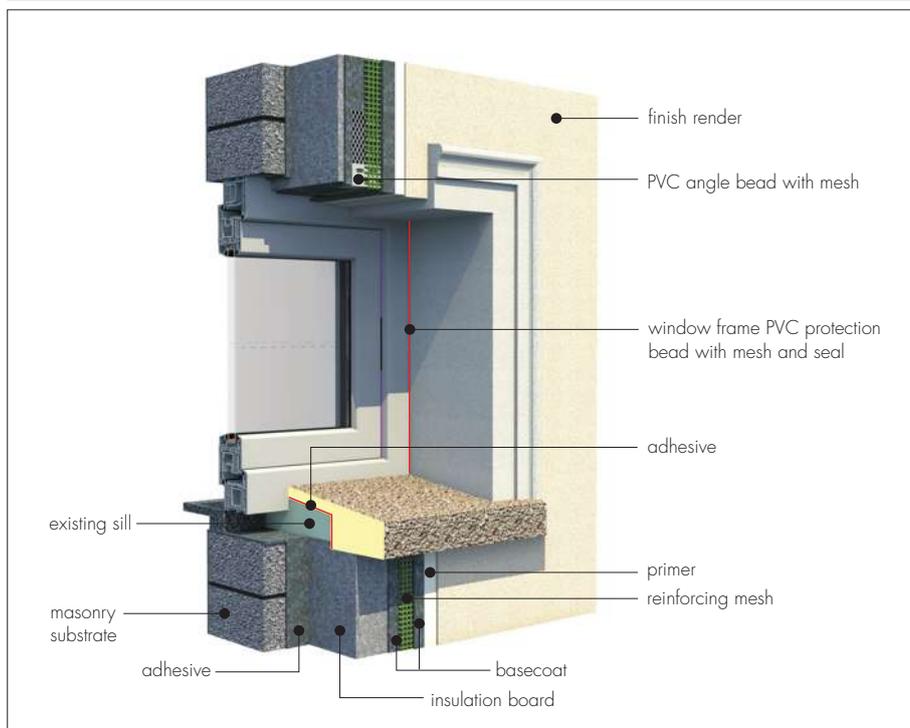


Figure 10 Window opening detail

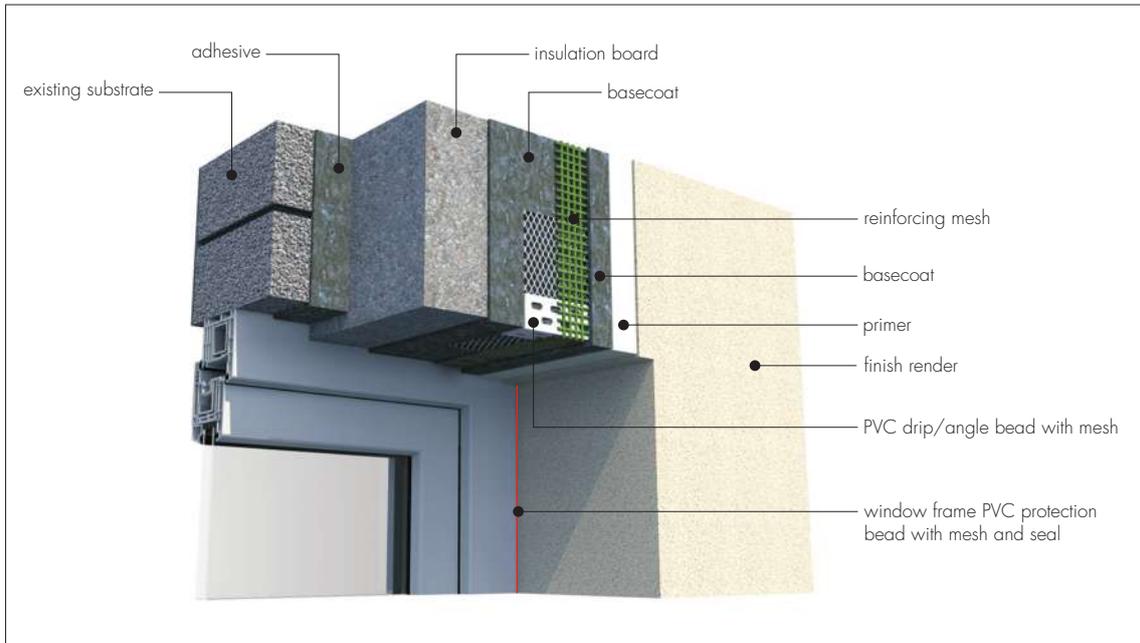
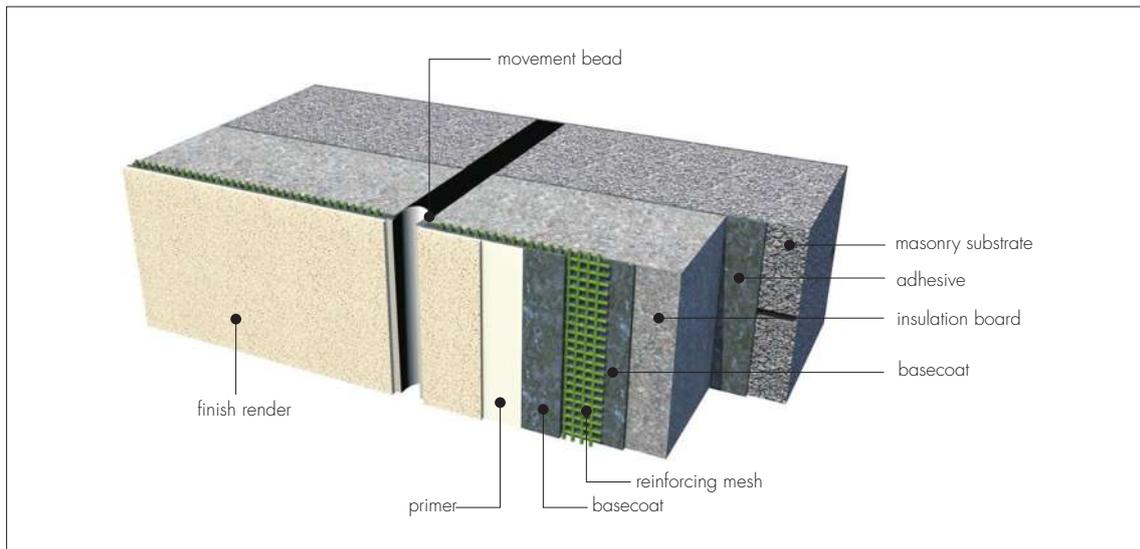


Figure 11 Expansion joint detail



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

17 Investigations

17.1 The system was examined and assessed by an independent laboratory to determine:

- fire performance
- bond strength
- hygrothermal performance
- resistance to frost
- resistance to impact
- water vapour permeability.

17.2 An examination was made of data relating to:

- reaction to fire
- thermal conductivity
- the risk of interstitial condensation.

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

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

Bibliography

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- BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
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- BRE Report BR 443 : 2006 *Conventions for U-value calculations*
- ETAG 004 : 2013 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal 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.