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Agrément Certificate
14/5159
Product Sheet 2

SEMPRETHERM EXTERNAL WALL INSULATION SYSTEMS

SEMPRETHERM EPS EXTERNAL WALL INSULATION MECHANICAL SYSTEM

This Agrément Certificate Product Sheet(1) relates to SempreTherm EPS External Wall Insulation Mechanical System, comprising white or grey expanded polystyrene (EPS) insulation boards, mechanically-fixed with supplementary adhesive, with a reinforced basecoat and render finishes. It is suitable for use on the outside of external masonry walls in new and existing domestic and non-domestic buildings up to 18 metres in height.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

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

KEY FACTORS ASSESSED

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

Strength and stability — the system can adequately resist wind loads and impact-damage. The impact resistance is dependent on the finish chosen (see section 7).

Behaviour in relation to fire — the system has a reaction to fire classification of B-s1, d0 in accordance with BS EN 13501-1 : 2007 (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: 13 April 2015

Brian Chamberlain
Head of Technical Excellence

Claire Curtis-Thomas
Chief Executive

Certificate amended on 18 May 2018 to reflect changes in section 7.

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, SempreTherm EPS External Wall Insulation Mechanical System, if installed, used and maintained in accordance with the provisions of this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**A1**	**Loading**
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The system can satisfy this Requirement. See sections 8.1 to 8.5 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The system provides a degree of protection against rain ingress. See section10.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.1, 11.2 and 11.4 of this Certificate.
Requirement:	**L1(a)(i)**	**Conservation of fuel and power**
Comment:		The system can contribute to satisfying this Requirement. See sections 6.2 and 6.3 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**26**	**CO_2 emission rates for new buildings**
Regulation:	**26A**	**Fabric energy efficiency rates for new dwellings (applicable to England only)**
Regulation:	**26A**	**Primary energy consumption rates for new buildings (applicable to Wales only)**
Regulation:	**26B**	**Fabric performance values for new dwellings (applicable to Wales only)**
Comment:		The system can contribute to satisfying these Regulations when appropriate 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 the construction satisfying this Regulation. See sections 12.1 and 13.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	1.1	Structure
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system can satisfy this Standard, with reference to clauses 2.6.4[1][2], 2.6.5[1] and 2.6.6[2]. See sections 8.1 to 8.7 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] and 2.7.2[2], and Annex 2A[1]. See sections 8.1 to 8.7 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 section 10.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 3.15.1[1][2], 3.15.4[1][2] and 3.15.5[1][2]. See sections 11.3 and 11.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Buildings insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1[1], 6.1.2[1][2], 6.1.3[1][2], 6.1.6[1], 6.1.10[2], 6.2.1[1][2], 6.2.3[1], 6.2.4[2], 6.2.5[2], 6.2.6[1], 6.2.7[1], 6.2.8[2], 6.2.9[1][2], 6.2.10[1], 6.2.11[1], 6.2.12[2] and 6.2.13[1][2]. See sections 6.2 and 6.3 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4[1][2] [Aspect 1[1][2] and 2[1]], 7.1.6[1][2] [Aspect 1[1][2] and 2[1]] and 7.1.7[1][2] [Aspect 1[1][2]]. See section 6.2 of this Certificate.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		All comments given for this 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 *Installation* part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		Walls insulated with the system will satisfy this Regulation. See section 10.1 of this Certificate.
Regulation:	29	Condensation
Comment:		Walls insulated with the system will satisfy the requirements of this Regulation. See section 11.4 of this Certificate.
Regulation:	30	Stability
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system can meet this Regulation. See sections 8.1 to 8.5 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Comment:		The system can contribute to satisfying this Regulation. See sections 6.2 and 6.3 of this Certificate.
Regulation:	40	Target carbon dioxide emission rate
Comment:		The system can contribute to satisfying this Regulation. See sections 6.2 and 6.3 of this Certificate.

Construction (Design and Management) Regulations 2015

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

Information in this Certificate may assist the client, Principal Designer/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 SempreTherm EPS External Wall Insulation Mechanical 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 SempreTherm EPS External Wall Insulation Mechanical System consists of white or grey expanded polystyrene insulation boards, which are mechanically fixed to the substrate wall with supplementary adhesive, together with reinforcing glassfibre mesh embedded in the basecoat and various finish coats (see Figure 1). Once all the insulation boards have been secured to the wall with the required number of mechanical fixings, first layer of basecoat is applied to their surface to a uniform thickness and a single layer of the reinforcing mesh is immediately embedded (with its concave surface to the wall) and the surface smoothed with a trowel. An additional layer of basecoat is applied, as required, over the reinforced basecoat to achieve the nominal thickness. The system is left to dry before the primer is applied, where required, followed by the finishing coat (see section 16 *Installation*, which describes the installation method in more detail).

1.2 The system comprises the following components:

Adhesive (supplementary)

- 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 by 500 mm, in a range of thicknesses between 50 mm and 150 mm in 10 mm increments, 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. The declared thermal conductivity value (λ_D) is 0.038 W·m^{-1}·K^{-1}. It is manufactured to comply with BS EN 13163 : 2012
- SempreTherm grey expanded polystyrene (EPS 70) insulation boards — 1200 mm by 600 mm or 1000 mm by 500 mm in a range of thicknesses between 50 mm and 150 mm in 10 mm increments, 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. The declared thermal conductivity value (λ_D) is 0.031 W·m^{-1}·K^{-1}. It is manufactured to comply with BS EN 13163 : 2012.

Mechanical fixings

- mechanical fixings[1] — anchors with adequate length to suit the substrate and the insulation thickness, approved and supplied by the Certificate holder as follows:
  — EJOT NT-U — polyethylene, PE-HD ribbed or anchor sleeve with a stainless steel pin.

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

Basecoat

- 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. The basecoat is applied to a nominal thickness of 5 mm.

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·m^2 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·m^2 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[1]

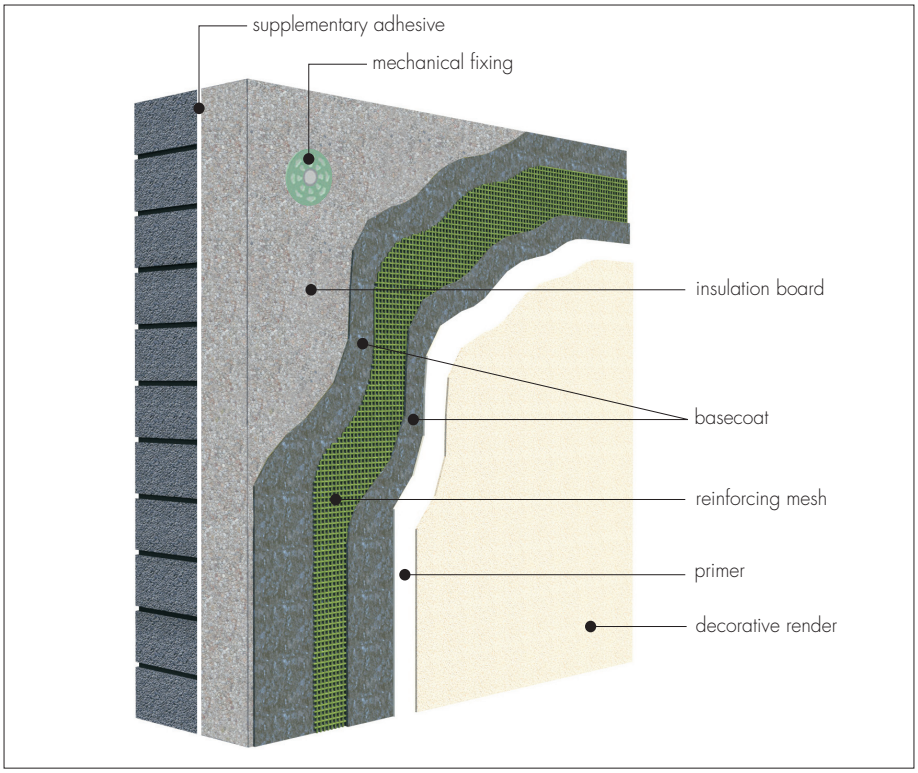
- Sempre Tesoro Tynk — acrylate binder, supplied as ready-to-use paste, applied to the primer basecoat. Available in particle sizes of 1.5 mm, 2 mm, 2.5 mm and 3 mm, and in white and light colours
- Sempre Maresil Tynk — poly-silicate render, supplied as ready-to-use paste, applied to the primer basecoat.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

(1) The thickness of the applied finish is controlled by the particle size specified.

1.3 Ancillary materials also used 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.
- profile connectors and fixings
- fungicidal wash
- sealants — silicone in accordance with BS EN ISO 11600 : 2003
- expansion foam — fire-rated polyurethane foam used for filling gaps between insulation boards.

Figure 1 SempreTherm EPS External Wall Insulation Mechanical System



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.

Table 1 Component supply details

Component	Quantity and package
Sempre Start TS-100 — adhesive (supplementary)	25 kg bag
Sempre Universal TU-200 — adhesive (supplementary)/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 wide x 50 m rolls
Sempre TG-16 Fibreglass Mesh	1 m wide 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

3.3 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.

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 Mechanical System.

Design Considerations

4 General

4.1 The SempreTherm EPS External Wall Insulation System, when installed in accordance with this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external masonry or concrete walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from treatment with the system (eg the insulation must be protected by an overhang, and window sills should be designed and installed so as to direct water away from the building).

4.2 For improved thermal/carbon-emissions performance of the structure, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of external walls of masonry, normal weight concrete, lightweight concrete, autoclaved concrete and no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render) up to 18 metres in height. Prior to the installation of the system, wall surfaces should comply with section 14 of this Certificate.

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

- BS EN 1992-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS 8000-2.2 : 1990
- BS 8000-0 : 2014
- BS 8000-3 : 2001.

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

4.6 Movement joints should be incorporated into the system in line with existing movement joints in the building structure and in accordance with the Certificate holder's recommendations for the specific installation.

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

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

4.9 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the system is outside the scope of this Certificate. See section 4.10 of this Certificate.

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

4.11 The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

4.12 It is essential that 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 (λ_D) values 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 national 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 values[1][2][3] given in the national Building Regulations

U value[4] ($W \cdot m^{-2} \cdot K^{-1}$)	Thickness of insulation[3] (mm)			
	215 mm Brickwork, λ = 0.56 $W \cdot m^{-1} \cdot K^{-1}$		200 mm dense blockwork, λ = 1.75 $W \cdot m^{-1} \cdot K^{-1}$	
	White EPS 70	Grey EPS 70	White EPS 70	Grey EPS 70
0.18	—[5]	—[5]	—[5]	—[5]
0.19	—[5]	—[5]	—[5]	—[5]
0.25	140	120	150	120
0.26	130	110	140	120
0.28	120	100	130	110
0.30	110	90	120	100
0.35	90	80	100	90

(1) Wall construction inclusive of 13 mm plaster (λ = 0.57 $W \cdot m^{-1} \cdot K^{-1}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar (λ = 0.88 $W \cdot m^{-1} \cdot K^{-1}$). Declared thermal conductivity of insulation values (λ_D) is as shown in Table 2. An adhesive layer of 5 mm thick with λ = 0.43 $W \cdot m^{-1} \cdot K^{-1}$ 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 λ = 1 $W \cdot m^{-1} \cdot K^{-1}$.

(2) Calculations based on a mechanically fixed system that included six galvanized steel fixings per m^2, with a point thermal transmittance (χ_p= 0.004 $W \cdot K^{-1}$) per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2007.

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

(4) U value calculations were based on having six galvanized steel fixings per m^2 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 of this Certificate.

6.3 The system can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between external walls and junctions. Details shown in section 16 will allow use of the default ψ-values (Psi) for Accredited Construction Details in Emission Rate calculations to SAP 2009 or the Simplified Building Energy Model (SBEM). Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Strength and stability

General

7.1 The Certificate holder is ultimately responsible for the design of the system and it is the responsibility of the company installing the system to accurately follow the installation instructions (see also section 5 of this Certificate). The Certificate holder must also verify that a suitably experienced and qualified individual (with adequate professional indemnity) establishes that:

- the wind loads on the different zones of the building's elevation for the specific geographical location have been calculated correctly (see section 7.3)
- the system can adequately resist and safely transfer the calculated loads, accounting for all possible failure modes, to the substrate wall and supporting structure (see sections 7.3 to 7.6).

7.2 The substrate and supporting structure must be capable of transferring all additional loading due to the installation of the system to the ground in a satisfactory manner. The adequacy of the substrate and supporting structure must be verified by the person or party responsible for the global stability of the building to which the system is applied. Any defects should be made good prior to the system being installed.

7.3 The wind loads on the walls should be calculated, taking into account all relevant factors such as location and topography, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. All of the factors affecting wind load on each elevation and specific zones of the building must be considered. In accordance with BS EN 1990 : 2002 and its UK National Annex, a partial factor of 1.5 must be applied to the calculated characteristic wind pressure values to establish the design wind load to be resisted by the system.

7.4 Installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight of the system, wind and impact.

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

7.6 Negative wind load is transferred to the substrate wall via[1][2]:

- the bond between the insulation and render system (see section 7.7)
- the pull-out resistance of the fixing from the substrate wall (see section 7.8)
- the pull-through resistance of the fixing (see section 7.9).

(1) For mechanically fixed systems with supplementary adhesive, the contribution of the adhesive is not considered when calculating resistance to wind load.

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

7.7 The characteristic bond resistance between the insulation and render interface derived from test results was 80 kN·m^{-2}. The design resistance of the bond between the insulation and render (N_{RD1}) should be taken as the characteristic bond resistance divided by a partial factor of 9.

7.8 Typical characteristic pull-out resistances for the fixings taken from the corresponding European Technical Assessment (ETA) are given in Table 4; the values are dependent on the fixing type and must be selected to suit the specific loads and substrate concerned. In situations where suitable data does not exist[1], the characteristic pull-out resistance must be established from site-specific pull-out tests conducted on the substrate of the building to ascertain the minimum resistance to pull-out failure of the fixings, and determined in accordance with the guidance given in EOTA TR051 (minimum test characteristic value = 0.6 x mean of 5 lowest test results). To obtain the design pull-out resistance of the fixings (N_{RD2}), this characteristic pull-out resistance should then be divided by the partial factor given in Table 4.

(1) To qualify as suitable data, the age and condition of the substrate must be equivalent to that used to establish the values in the ETA.

Table 4 Fixings — typical characteristic pull-out strengths

Fixing type [1]	ETA number	Substrate	Drill diameter (mm)	Effective anchorage depth (mm)	Characteristic pull-out resistance (kN)[2]	Partial safety factor
EJOT NT-U	05/0009	Concrete C12/15 Clay brickwork	8	25	1.2 1.5	2

(1) The minimum values for plate stiffness of fixings is 0.6 kN·mm and the load resistance is 2.43 kN.

(2) Values are determined in accordance with EAD 330196-00-0604 : 2016 and are dependent on the substrate. The use categories are defined in the corresponding ETA.

7.9 The characteristic pull-through resistance of the fixings was determined from tests using a 18 mm diameter fixing plate and minimum insulation thickness of 50 mm. The design resistance per fixing (N_{RD3}) is obtained by applying an appropriate partial factor as shown in Table 5.

Table 5 Design pull-through resistances

Factor (unit)	EPS 70 Insulation 1200 mm x 600 mm			
	Pull through data		Static foam block[6] (SFB)	
Tensile resistance of the insulation (kN·m^{-2})	≥ 100			
Fixing type[1]	EJOT NT-U			
Fixing plate diameter (mm)	≥ 60			
Insulation thickness (mm)	≥ 50			
Characteristic pull-through resistance[2] per fixing kN	At panel	0.376	At joint	0.190
Partial factor[3]	2.5			
Design pull-through resistance per fixing (N_{RD3}) kN	At panel	0.150	At joint	0.076
Design pull-through resistance per board kN (based on the minimum number of fixings)[4]	0.452			
Design pull-through resistance per board kN (based on maximum number of fixings)[5]	1.202			

(1) See Table 4 for typical characteristic pull-out resistance of the fixings.

(2) Characteristic pull-through resistance of insulation over the head of the fixing, in accordance with BS EN 1990 : 2002, Annex D7.2 and its UK National Annex.

(3) The partial factor is based on the assumption that all insulation boards are quality controlled and tested to establish tensile strength perpendicular to the face of the board.

(4) The minimum design pull through resistance per board is based on a minimum of 4 fixings per board (1200 mm x 600 mm), which equates to approximately 6 fixings per m^2. The design resistance for the minimum number of fixings is based on the fixing pattern provided in Figure 5 of this Certificate and minimum insulation thickness specified in Table 5. The fixing pattern and interaction of the fixings should be considered when calculating the design resistance per board.

(5) The maximum design pull through resistance per board is based on a maximum of 9 fixings per board (1200 mm x 600 mm), which equates to approximately 13 fixings per m^2. The design resistance for the maximum number of fixings is only applicable to the minimum insulation thickness tested and as specified in Table 5. The fixing pattern, insulation thickness and interaction of the fixings should be considered when calculating the design resistance per board.

(6) SFB test data only applicable for the system configuration tested as per fixing pattern shown in Figure 5 of the Certificate, ie 8 fixings (type EJOT NT-U with 60 mm fixing plate) applied through insulation board (50 mm thickness) – 2 fixings not at panel joints + 6 fixings at panel joints

7.10 The number and spacing of the fixings should be determined by the Certificate holder. The number of fixings must not be less than the minimum specified for the system and the fixings should be symmetrically positioned and evenly distributed about the centre of the board both vertically and horizontally, except at openings and building corners.

7.11 The data obtained from sections 7.7, 7.8 and 7.9 must be assessed against the design wind load and the following expression must be satisfied:

For safe design:

$Rd \geq W_e$

$Rd_{b.ins/rend} = A_r * N_{RD1}$

$Rd_{pull\text{-}out} = n * N_{RD2}$

$Rd_{pull\text{-}through} = (N_{RD3panel} * n_{panel}) + (N_{RD3joint} * n_{joint})/A_{board}$

Where:

Rd	is the design ultimate resistance ($kN \cdot m^{-2}$) taken as the minimum of $Rd_{b.ins/rend}$, $Rd_{pull\text{-}out}$ and $Rd_{pull\text{-}through}$
W_e	is the applied ultimate wind load ($kN \cdot m^{-2}$)
$Rd_{b.ins/rend}$	is the design bond resistance between the insulation and render ($kN \cdot m^{-2}$)
$Rd_{pull\text{-}out}$	is the design pull-out resistance of the insulation fixings per metre square ($kN \cdot m^{-2}$)
$Rd_{pull\text{-}through}$	is the design pull-through resistance of the insulation fixings per metre square ($kN \cdot m^{-2}$)
A_r	is the reinforced basecoat bond area (based on % area covered)
N_{RD1}	is the design adhesive bond resistance between the insulation and render, based on test ($kN \cdot m^{-2}$)
n	is the number of anchor fixings per m^2
N_{RD2}	is the design pull-out resistance per fixing based on test (kN)
$NR_{D3panel}$	is the design pull-through resistance per anchor not placed at the panel joint, based on test (kN)
$NR_{D3joint}$	is the design pull-through resistance per anchor placed at the panel joint, based on test (kN)
n_{panel}	is the number of internal anchors in a panel
n_{joint}	is the number of joint anchors in a panel
A_{board}	is the area of the board (m^2)

7.12 The insulation system is mechanically fixed to the substrate wall with a minimum of 4 fixings per board or approximately 6 fixings per square metre, as per the fixing patterns shown in Figure 5, and in conjunction with a minimum 40% coverage of supplementary adhesive (see section 16 of this Certificate). Additional fixings may be required, depending on the results of the calculations detailed above for the specific site.

Impact resistance

7.13 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Categories up to and including those specified in Table 6 of this Certificate.

Table 6 System impact resistance

Rendering system: Sempre Universal TU-200 (basecoat) + finishing coats indicated below	Use Category[1]	
	Single layer TG-15 Mesh (see section 1.2)	Single layer TG-16 Mesh (see section 1.2)
Sempre Tesoro Tynk (acrylate binder)	Category I	—
Sempre Maresil Tynk (silicate-silicone binder)	Category II	Category II

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

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

8 Behaviour in relation to fire

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

8.2 The fire classifications apply to the full range of insulation thicknesses covered by the Certificate (see section 1.2). Also, the classification only applies to white or light coloured finish coats.

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

8.4 The system is restricted for use in buildings up to 18 m in height.

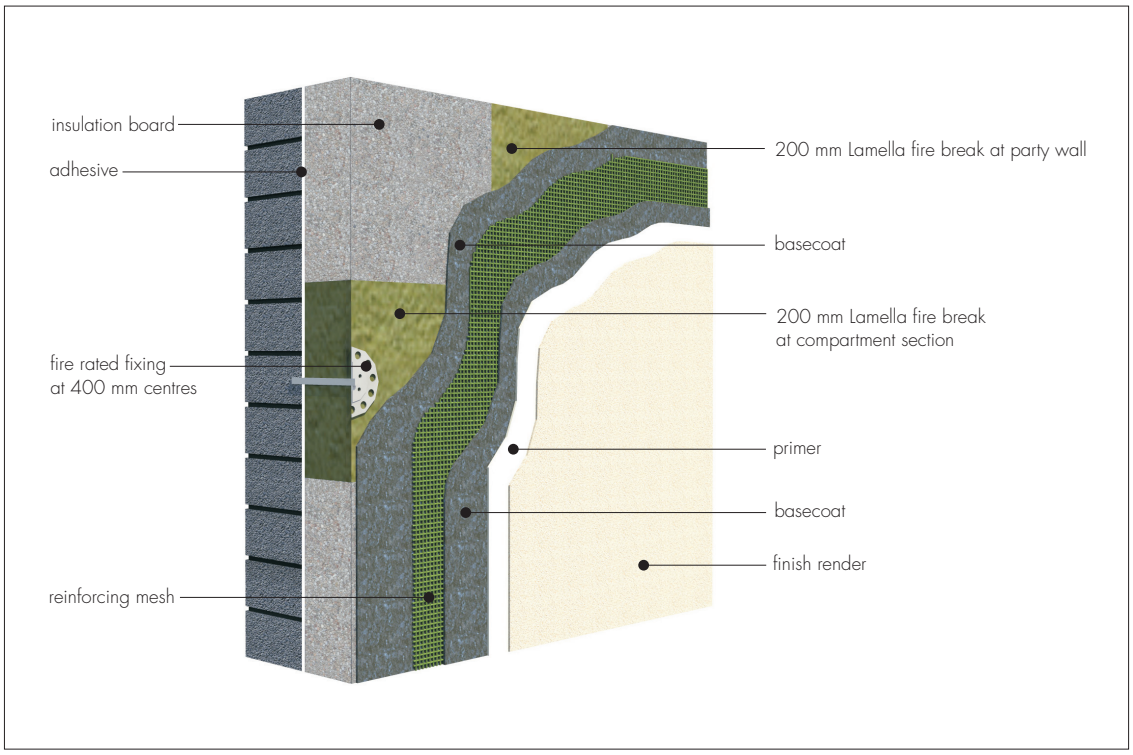
8.5 For houses in Scotland, and for all buildings in England and Wales and Northern Ireland, the system is suitable for use on, or at any distance from, the boundary.

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

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

8.8 For application to second storey walls and above, it is recommended that the designer considers at least one stainless steel fixing per m^2 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 rain ingress. However, care should be taken to ensure that walls are adequately watertight prior to the application of the system. The system shall only be installed where there are no signs of dampness on the inner surface of the substrate other than those caused solely by condensation.

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

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the watertightness of solid wall constructions. The designer should select a construction appropriate to the local wind-driven 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 junctions, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

Surface condensation

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

11.3 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point and detailing is in accordance with BS 5250 : 2011. Additional guidance may be obtained from 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 factor (μ), for the insulation boards, and equivalent air layer thickness (s_d) (for the render systems) is shown in Table 7.

Table 7 Water vapour resistance factor and equivalent air layer thickness

	Thickness (mm)	μ	s_d (m)
Expanded polystyrene white and grey EPS 70	50 to 150	20 to 40[1]	—
Rendering system[2]: Sempre Universal TU-200[3] (basecoat) + primer + finish coat (specific particle size) as indicated below:			
Sempre Tesoro Grunt (primer) + Sempre Tesoro Tynk (finish coat)	6.5 (particle size = 1.5)	—	0.65
Sempre Tesoro Grunt (primer) + Sempre Tesoro Tynk (finish coat)	8.0 (particle size = 3)	—	0.93
Sempre Maresil Grunt (primer) + Sempre Maresil Tynk (finish coat)	8.0 (particle size = 3)	—	0.22

(1) The water vapour resistance factor (μ) are taken from BS EN 13163 : 2012, Table F.2. It is recommended that the lower figure is used when assessing the interstitial condensation risk.

(2) Render system comprising of reinforced basecoat, key coat and finish coat. The render thickness value is based on using the nominal thickness of the basecoat.

(3) The basecoat is applied to a nominal thickness of 5 mm.

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 of this Certificate.

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

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
- where required, additional corner mesh and reinforcement
- areas where flexible sealants must be used
- any alterations to external plumbing, if required
- 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 (see section 15) to determine the pull-out tests for mechanical fixings for the appropriate substrate. 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). The advice of the Certificate holder should be sought to ensure the proposed bonding pattern (supplementary adhesive) is sufficient.

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 10 mm in one metre, 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 window 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 screed or plastering, should be completed and allowed to dry prior to the application of the system.

15 Approved installers

Application of the system, within the context of this Certificate, must be carried out by 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 and which 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.

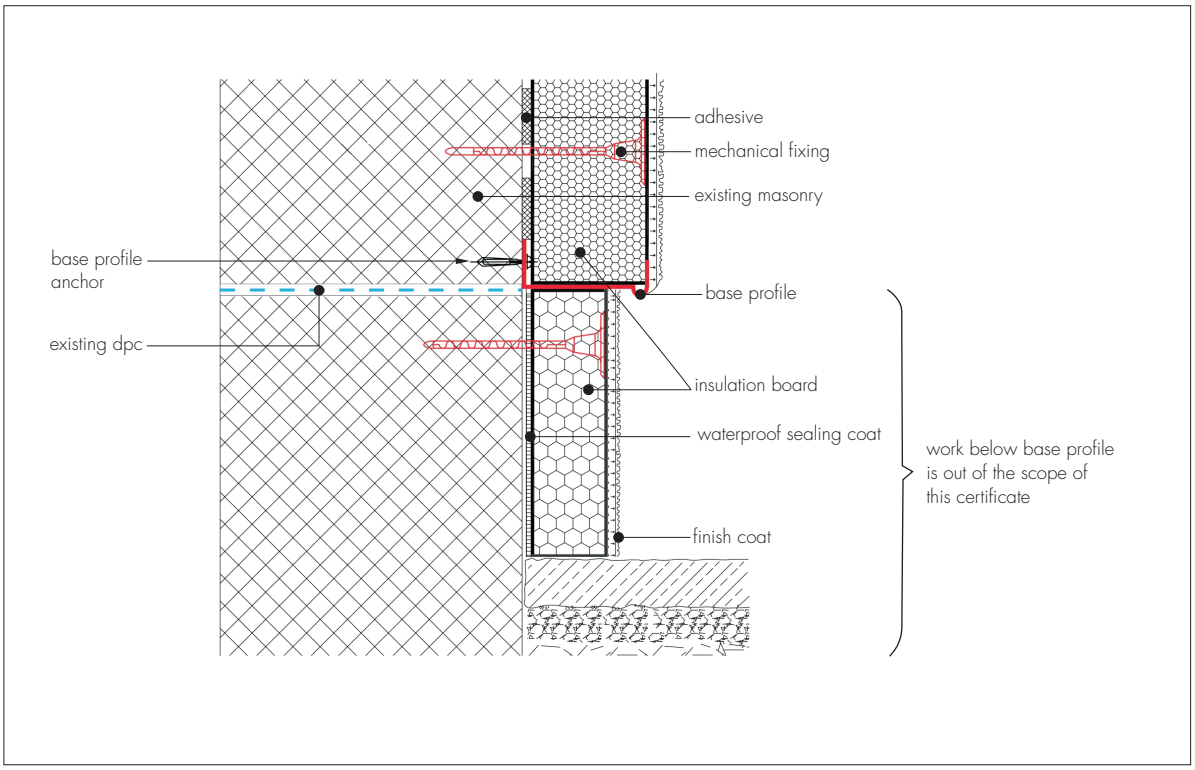
16.4 The primer should be used as required and appropriately selected for the type of finish coat used (see section 1.2).

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 profile connectors are inserted at all rail joints. Extension profiles are fixed to the front lip of the starter track or stop end channel where appropriate.

Figure 3 Typical section of base profile

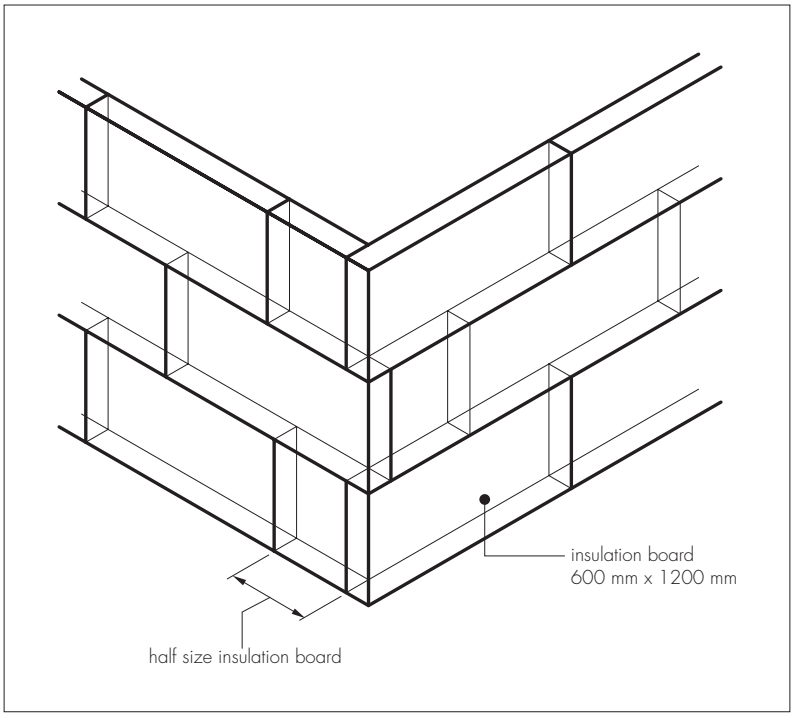


16.7 The adhesive is prepared by mixing each bag with the required amount of clean water in a suitable container using a paddle drill mixer to create a paste-like mortar in accordance with Certificate holder instructions (see section 1.2). The adhesive (supplementary) is applied in a continuous line around the perimeter of the board (at least 30 mm wide) with at least six additional dabs of adhesive (approximately 80 mm to 120 mm in diameter) distributed uniformly over the remaining surface — allowing to achieve 40% coverage after the board has been pressed against the wall. Alternatively, for even and smooth substrates, the whole insulation board can be coated with adhesive using a notched trowel to produce a coat 2 mm to 5 mm in thickness. The insulation board should be immediately placed on the substrate and pressed into place.

16.8 The first run of insulation boards are positioned on the base profile, pressed firmly against the wall. Care should be taken to ensure that all insulation board edges are butted tightly together, and alignment is checked as work proceeds to achieve a flush finish.

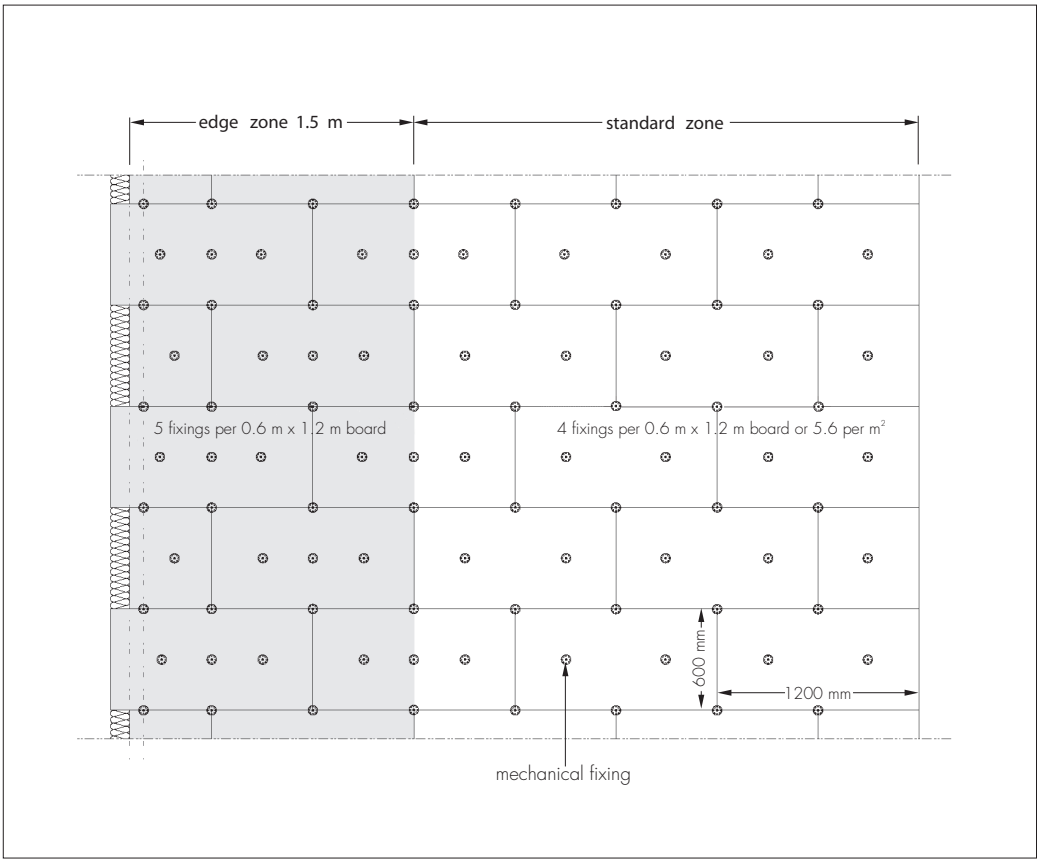
16.9 Subsequent rows of boards are positioned so that the vertical board joints are staggered (see Figure 4) and overlapped at the building corners, and the alignment should be constantly checked as work proceeds. Joints between boards greater than 2 mm can be filled with slivers of insulation board. Also, foam filler approved by the Certificate holder may be used for filling gaps up to 5 mm. However, larger gaps should be filled with strips of the ETICS insulation material.

Figure 4 Typical arrangement of insulation boards



16.10 Holes are drilled into the substrate to the required depth through the insulation at the corners of each board and two fixings within the insulation boards, which results to a minimum of seven fixings per square metre at edge zones and six 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 and approximately 100 mm from the reveal (see Figure 7). The mechanical fixings are inserted and tapped or screwed firmly into place, securing the insulation to the substrate.

Figure 5 Insulation board fixing pattern



16.11 Periodic checks should be carried out during the installation. Where existing render is on the wall or dubbing out render has been used, care should be taken when aligning the boards as the effective embedment will be reduced.

16.12 To fit around details such as doors and windows, the boards may be cut with a sharp knife or a fine-tooth saw. If required, a purpose-made powder coated aluminium window sills (complete with sill end caps) are installed in accordance with the Certificate holder's instructions. They are designed to prevent water ingress and incorporate drips to shed water clear of the system, but their performance is outside the scope of this Certificate.

16.13 Any high spots should be removed by lightly planning with a rasp. The surface of the boards should be smooth without high spots or irregularities. At all locations where there is a risk of insulant exposure, eg window reveals or eaves, the system must be protected, eg by an adequate overhang or by purpose made sub-sills, seals or flashing.

16.14 Building corners, door and window heads and jambs are formed using corner profiles in accordance with the manufacturer's instructions. Corner profiles are fixed to all building corners. For a 60 year durability system, any portion of the corner profile that remains exposed after the application of the finish coat, must be constructed from stainless steel material in order to protect the profile from atmospheric exposure.

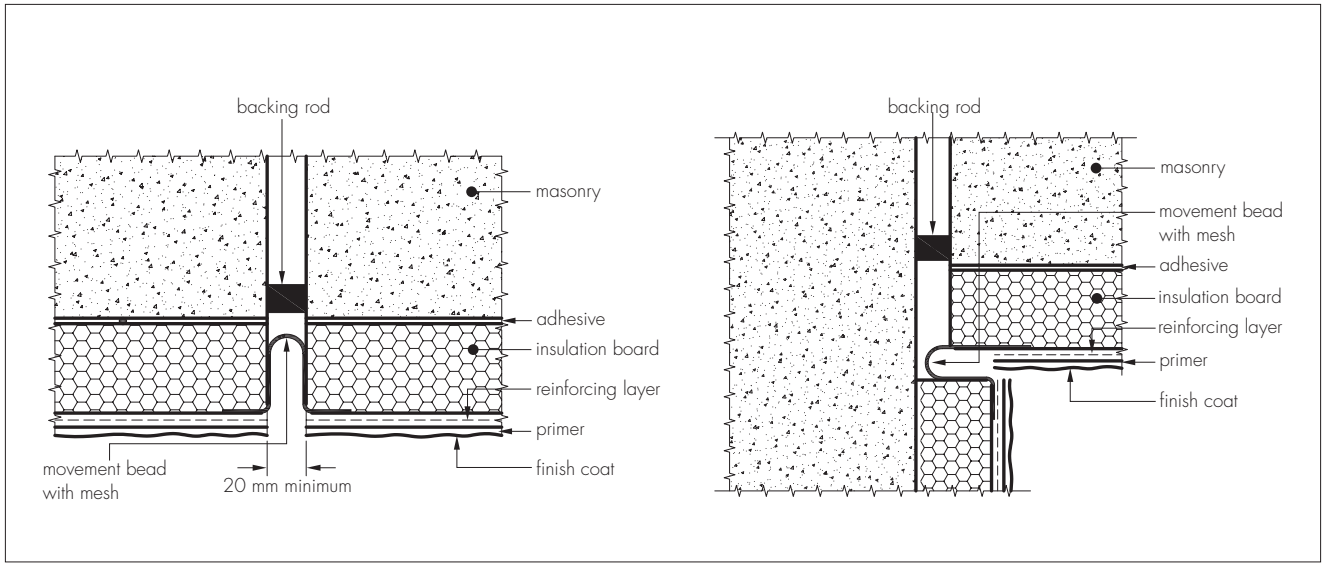
16.15 Window and door reveals should be insulated to minimise the effects of cold bridging. Where clearance is limited, strips of approved insulation should be installed to suit available margins and details.

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

Movement joints

16.17 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 Movement joint



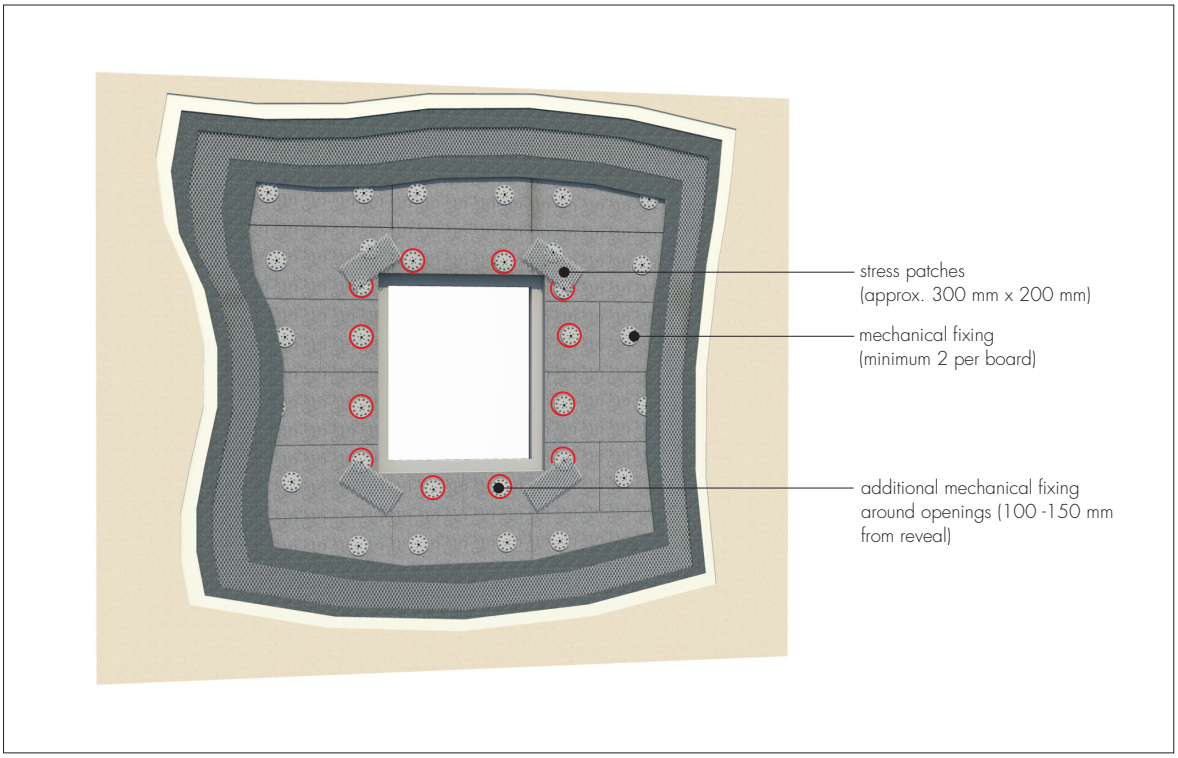
Application of basecoat and reinforcement mesh

16.18 After sufficient stabilisation of insulation board adhesive (normally 48 hours, during which time the insulation should be protected from exposure to extreme weather conditions to prevent degradation), the wall is ready for the application of the basecoat including reinforcement mesh.

16.19 The basecoat is prepared by mixing each bag with the required amount of clean water in a suitable container using a paddle drill mixer to create a paste-like mortar in accordance with Certificate holder instructions (see section 1.2).

16.20 Stress patches (approximately 300 mm by 200 mm) using reinforcement mesh are applied diagonally over the insulation with basecoat at the corners of openings to provide the necessary reinforcement (see Figure 7).

Figure 7 Additional reinforcement and fixings at opening



16.21 The first layer of the basecoat is applied over the insulation boards using a stainless steel trowel, and floated with a Darby float to an approximate thickness of 4 mm. Reinforcement mesh (with its concave surface to the wall) is immediately embedded into the basecoat by trowelling from the centre to the edge and an additional light coat of basecoat is applied (whilst the first coat is still wet) to ensure the mesh is free of wrinkles.

16.22 The reinforcement mesh should be overlapped at joints by at least 100 mm. Further basecoat is then applied as required, to ensure the mesh is completely covered and the required thickness of the basecoat is achieved whilst ensuring that the mesh is placed in the top one third of basecoat. The basecoat is applied to a minimum thickness of 5 mm.

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

16.24 Once the whole wall is completed, the reinforced basecoat is left to dry thoroughly before application of primer and the finish coat. The drying time will depend upon the conditions, but at least 48 hours should elapse before primer and finishing coats are applied.

Primer

16.25 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 coat

16.26 The basecoat and primer (if applicable) must be allowed to fully cure for stated period at each stage of installation covered in this certificate. Prior to the application of the finishing coat, sealant should be applied as required, as defined in the project specific site package.

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

16.28 The render finishes are applied to the required thicknesses (1.5 mm to 3 mm as controlled by the particle size specified – see section 1.2), 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.

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

16.30 Care should be taken in the detailing of the system around openings and projections and at eaves (see Figure 8, 9, 10 and 11) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.31 The finish coat should be allowed to dry thoroughly before painting any of the surrounding features.

Figure 8 Roof eaves details

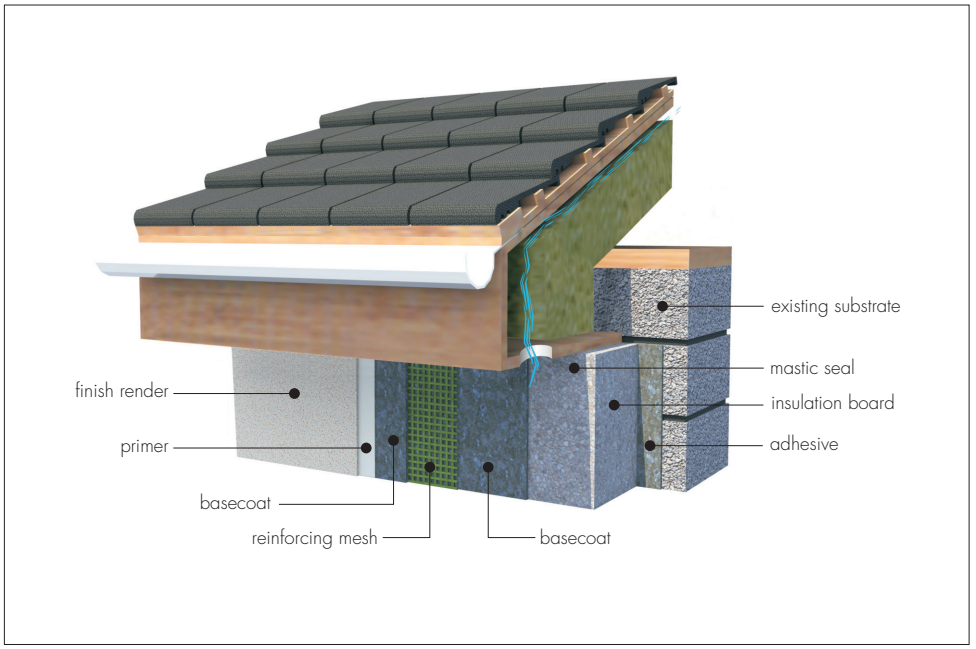


Figure 9 Window sill and reveal details

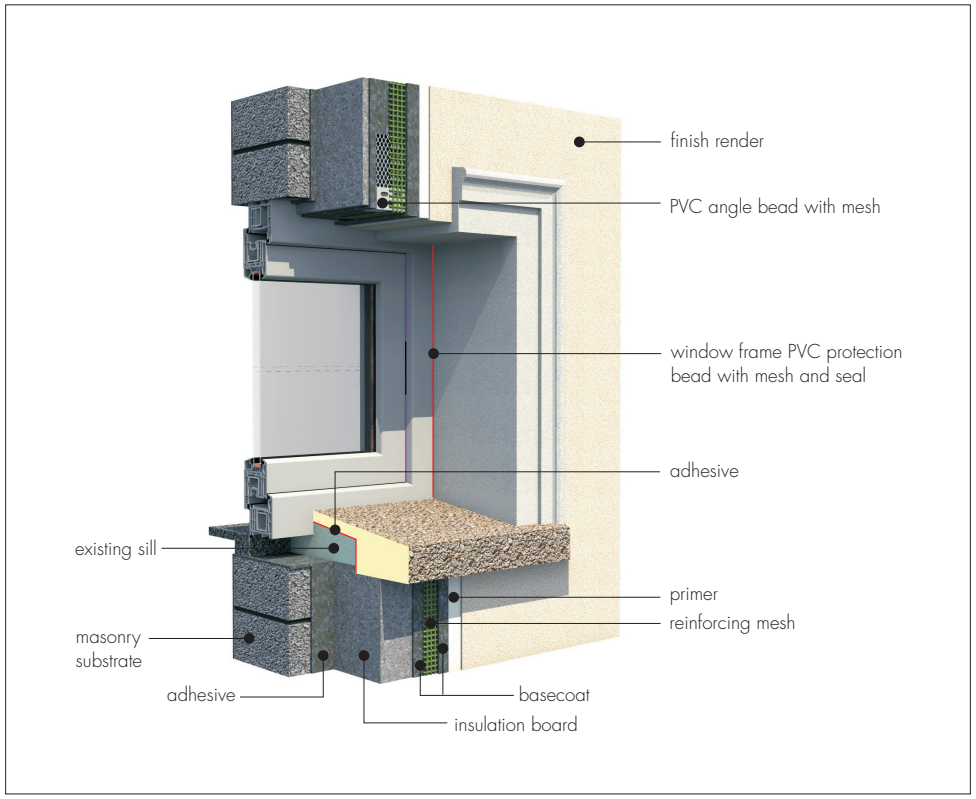


Figure 10 Window opening details

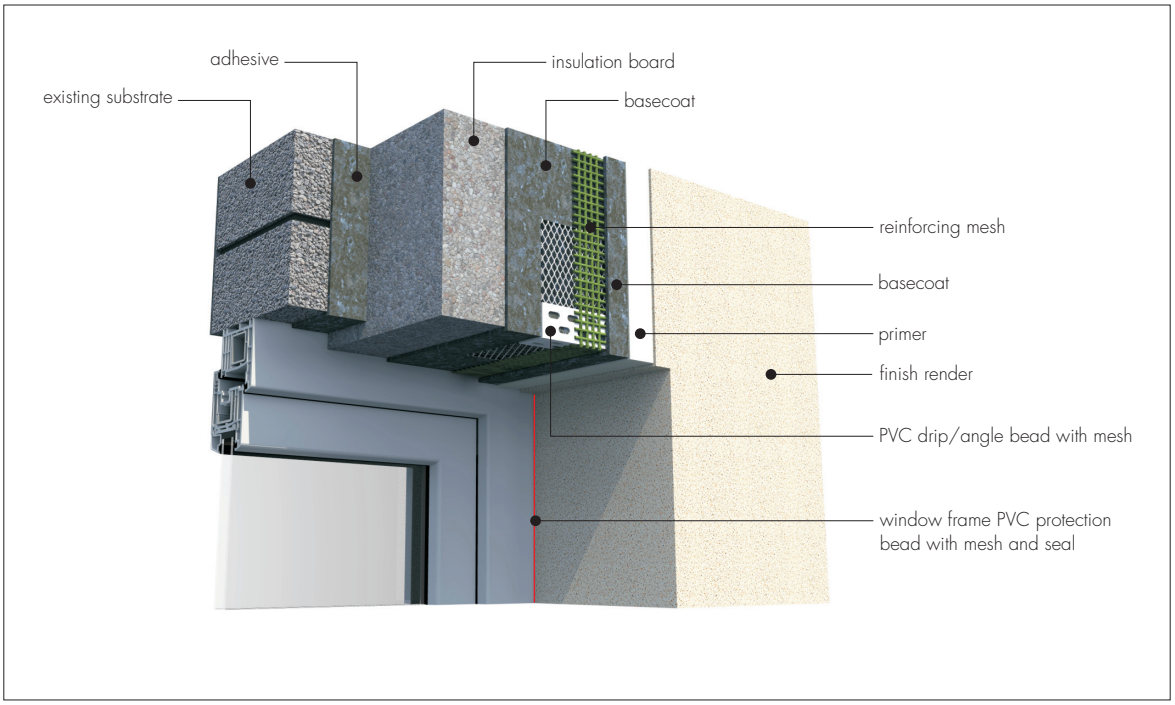
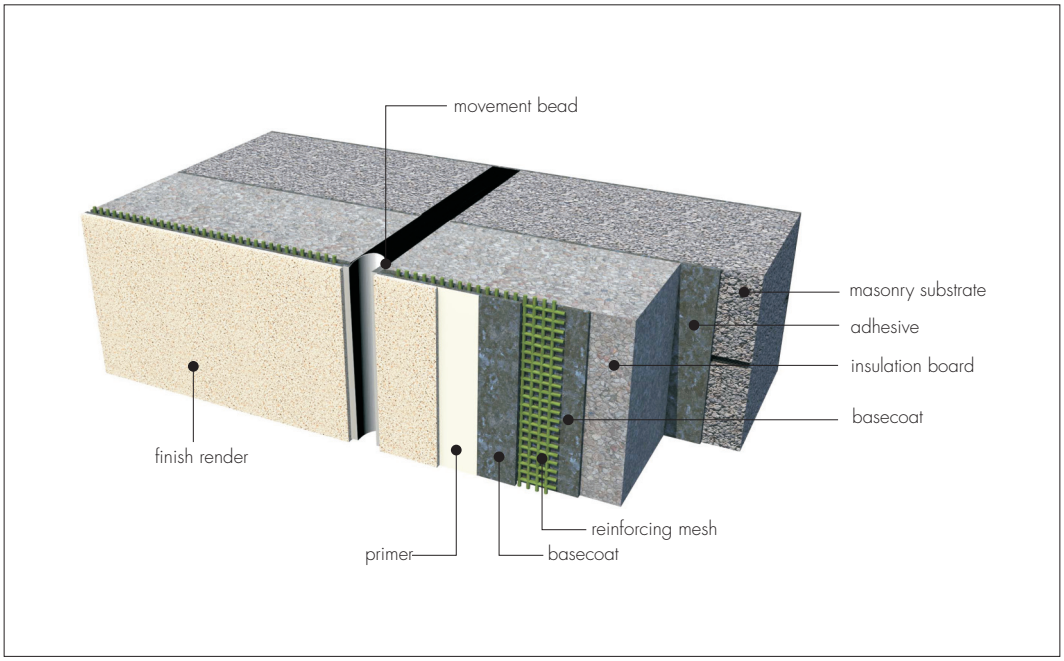


Figure 11 Expansion joint details



16.32 At the top of walls, the system must be protected by an adequate overhang or by an adequately sealed, purpose-made flashing.

16.33 On completion of the installation, external fittings, eg rainwater goods, are re-fixed through the system into the substrate in accordance with the Certificate holder's instructions.

Technical Investigations

17 Investigations

17.1 The system was examined to determine:

- fire performance
- bond strength
- hygrothermal performance and resistance to freeze thaw
- resistance to hard body impact

- water vapour permeability
- pull through of fixing over insulation
- durability
- adequacy of fixing system
- the risk of interstitial condensation
- thermal conductivity.

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

17.3 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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BRE Report BR 262 : 2002 *Thermal insulation : avoiding risk*

BRE Report BR 443 : 2006 *Conventions for U-value calculations*

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS 8000-2.2 : 1990 *Workmanship on building sites — Code of practice for concrete work — Sitework with in situ and precast concrete*

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

BS EN 1062-1 : 2004 *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Classification*

BS EN 1990 : 2002 *Eurocode — Basis of structural design*

BS EN 1991-1-4 : 2005 *Eurocode 1 — Actions on structures — General actions — Wind actions*
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BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*
NA to BS EN 1992-1-1 : 2004 + A1 : 2014 UK National Annex to *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

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NA to BS EN 1996-1-1 : 2005 UK National Annex to *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

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NA to BS EN 1996-2 : 2006 UK National Annex to *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 13163 : 2008 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2007 *Fire classification of construction products and building elements —Classification using test data from reaction to fire tests*

BS EN 13914-1 : 2005 *Design, preparation and application of external rendering and internal plastering — External rendering*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

ETAG 004 : 2013 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal Composite Systems with Rendering*

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.

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