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Agrément Certificate

16/5319

Product Sheet 1

SOLTHERM EXTERNAL WALL INSULATION SYSTEMS

SOLTHERM P EXTERNAL WALL INSULATION SYSTEMS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Soltherm P External Wall Insulation Systems, comprising grey EPS insulation boards, adhesively fixed with supplementary mechanical fixings if required, reinforced basecoat and render finishes. They are 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 systems can be used to improve the thermal performance of external walls and contribute to satisfying the requirements of the national Building Regulations (see section 6).

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

Behaviour in relation to fire — the systems have a reaction to fire classification of B-s1, d0 in accordance with BS EN 13501-1 : 2007 (see section 8).

Risk of condensation — the systems 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 systems will remain effective for at least 30 years (see section 13).

The BBA has awarded this Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 4 May 2016

John Albon – Head of Approvals
Construction Products

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

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Regulations

In the opinion of the BBA, Soltherm P External Wall Insulation Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



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

Requirement:	A1	Loading
Comment:		The systems can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.5 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The systems can satisfy this Requirement. See sections 8.1 to 8.4 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The systems 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 systems 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 systems can contribute to satisfying this Requirement. See sections 6.2 and 6.3 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The systems are 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 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 systems can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The systems can contribute to a construction satisfying this Regulation. See sections 12 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 systems can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.5 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The systems 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 systems can satisfy this Standard, with reference to clauses 2.7.1 ⁽¹⁾⁽²⁾ and 2.7.2 ⁽²⁾ . See sections 8.1 to 8.6 of this Certificate.

Standard: Comment:	3.10	Precipitation The systems 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: Comment:	3.15	Condensation The systems 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: Standard: Comment:	6.1(b) 6.2	Carbon dioxide emissions Building insulation envelope The systems 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: Comment:	7.1(a)(b)	Statement of sustainability The systems 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: Comment	12	Building standards applicable to conversions All comments given for the systems 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 (as amended)

Regulation: Comment:	23	Fitness of materials and workmanship The systems are acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation: Comment:	28(b)	Resistance to moisture and weather Walls insulated with the systems will satisfy this Regulation. See sections 4.4 and 10.1 of this Certificate.
Regulation: Comment:	29	Condensation Walls insulated with the systems will satisfy the requirements of this Regulation. See section 11.4 of this Certificate.
Regulation: Comment:	30	Stability The systems can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.5 of this Certificate.
Regulation: Comment:	36(a)	External fire spread The systems can satisfy this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation: Regulation: Comment:	39(a)(i) 40	Conservation measures Target carbon dioxide emission rate The systems can contribute to satisfying these Regulations. 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 2016

NHBC accepts the use of Soltherm P External Wall Insulation Systems, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards 2016, Part 6 Superstructure, Chapter 6.9 Curtain walling and cladding*.

Technical Specification

1 Description

1.1 Soltherm P External Wall Insulation Systems consists of grey EPS insulation boards which are adhesively fixed to the substrate wall, with supplementary mechanical fixings if required. After the boards have been secured to the wall, basecoat is trowel-applied to the required thickness, and the reinforcing mesh is applied and fully embedded. After the reinforced basecoat has cured, primer is applied followed by the render and (if required) paint finish.

1.2 The systems are made up of the following components:

Adhesives

A range of cement-based adhesives, supplied as powder to which clean water is added, and should cover at least 40% of the bonded area of the insulation board. The range comprises:

- Soltherm UB adhesive — requiring the addition of approximately 0.18 litres to 0.20 litres of clean water per kg of adhesive
- Soltherm SA adhesive — requiring the addition of approximately 0.19 litres to 0.21 litres of clean water per kg of adhesive
- Soltherm WB adhesive — requiring the addition of approximately 0.21 litres to 0.23 litres of clean water per kg of adhesive
- Soltherm BC-P adhesive — requiring the addition of approximately 0.21 litres to 0.23 litres of clean water per kg of adhesive.

Insulation

- Enhanced graphite expanded polystyrene EPS 70 (grey) insulation boards — 1200 mm by 600 mm or 1000 mm by 500 mm, in a range of thicknesses between 20 mm and 250 mm in 10 mm increments, with a nominal density of $16.5 \text{ kg}\cdot\text{m}^{-3}$, minimum compressive strength of $70 \text{ kN}\cdot\text{m}^{-2}$, tensile strength perpendicular to the faces of $100 \text{ kN}\cdot\text{m}^{-2}$ and declared thermal conductivity value (λ_D) of $0.032 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$. Boards are manufactured to comply with BS EN 13163 : 2012, and classified as Euroclass E in accordance with BS EN 13501-1 : 2007.

Mechanical fixings (supplementary)

Mechanical fixings — anchors of adequate length to suit the substrate and insulation thickness, supplied by the Certificate holder, and selected from:

- Fischer Termoz 8N — polyamide 6 anchor sleeve with a stainless steel or electro-galvanized centre pin
- Ejothorm NT U — polyethylene, PE-HD anchor sleeve with a stainless steel or electro-galvanized centre pin

- Ejotherm STR U — polyethylene, PE-HD anchor sleeve with a stainless steel or electro-galvanized centre screw
- Koelner KI-10N — polypropylene anchor sleeve with an electro-galvanized centre screw (with head coating of polyamide PA6)
- Koelner TFIX-8M — polypropylene anchor sleeve with an electro-galvanized centre pin (with head coating of polyamide PA6)
- WKTherm \varnothing 8 — polyethylene anchor sleeve with an electro-galvanized centre pin (with head coating of polyamide PA6)
- Fischer Termofix CF 8 — polypropylene anchor sleeve with a stainless steel or electro-galvanized centre pin
- Fixplug \varnothing 8 — polyethylene anchor sleeve with a polyamide PA6 GF 30 centre pin
- Fixplug \varnothing 10 — polyethylene anchor sleeve with a polyamide PA6 GF 30 centre pin.

Basecoats

- Soltherm UB basecoat — a cement-based powder requiring the addition of approximately 0.18 litres to 0.20 litres of clean water per kg of basecoat. The basecoat is applied to a thickness of between 3 mm and 5 mm (4 mm to 6 mm when used with the Soltherm SDR dash finishing coat)
- Soltherm WB basecoat — a cement-based powder requiring the addition of approximately 0.21 litres to 0.23 litres of clean water per kg of basecoat. The basecoat is applied to a thickness of between 3 mm and 5 mm (4 mm to 6 mm when used with the Soltherm SDR dash finishing coat)
- Soltherm BC-P basecoat — a cement-based powder requiring the addition of approximately 0.21 litres to 0.23 litres of clean water per kg of basecoat. The basecoat is applied to a thickness of between 3 mm and 5 mm (4 mm to 6 mm when used with the Soltherm SDR dash finishing coat).

Reinforcement

- Soltherm HD 145/P — 1.0 m wide alkali-resistant glassfibre mesh with a nominal weight of 145 g·m⁻² and a mesh size of 4 mm by 4 mm
- Soltherm HD 160/P — 1.0 m wide alkali-resistant glassfibre mesh with a nominal weight of 160 g·m⁻² and a mesh size of 4 mm by 4 mm
- Soltherm HD 174/P — 1.0 m wide alkali-resistant glassfibre mesh with a nominal weight of 174 g·m⁻² and a mesh size of 3.8 mm by 3.2 mm.

Primers

- Soltherm AP — ready to use liquid acrylic primer, for use with any mineral or acrylic render finish
- Soltherm AP Colour — ready to use liquid acrylic primer, for use with any mineral or acrylic render finish
- Soltherm STP — ready to use liquid silicate primer, for use with any silicate render finish
- Soltherm STP Colour — ready to use liquid silicate primer, for use with any silicate render finish
- Soltherm SNP — ready to use liquid silicone primer, for use with any silicone or silicone-acrylic render finish
- Soltherm SNP Colour — ready to use liquid silicone primer, for use with any silicone or silicone-acrylic render finish.

Finishing coats⁽¹⁾

Acrylic finishing coats

- Soltherm AFC 20 — an acrylic render available in a range of colours, with a 2.0 mm grain size
- Soltherm AFC 10 — an acrylic render available in a range of colours, with a 1.0 mm grain size
- Soltherm AFC 15 — an acrylic render available in a range of colours, with a 1.5 mm grain size
- Soltherm AFC 25 wt — an acrylic render available in a range of colours, with a 2.5 mm grain size
- Soltherm AFC 15 wt — an acrylic render available in a range of colours, with a 1.5 mm grain size

- Soltherm AFC s — an acrylic render available in a range of colours, with a 1.0 mm grain size
- Soltherm AMC — an acrylic render available in a range of colours, with 1.0 and 2.0 mm grain sizes.

Silicone finishing coats

- Soltherm SFC-P 15 — a silicone render available in a range of colours, with a 1.5 mm grain size
- Soltherm SFC-P 20 — a silicone render available in a range of colours, with a 2.0 mm grain size
- Soltherm SFC-P 25 wt — a silicone render available in a range of colours, with a 2.5 mm grain size.

Silicone/acrylic finishing coats

- Soltherm AF-P 15 — a silicone/acrylic render available in a range of colours, with a 1.5 mm grain size
- Soltherm AF-P 20 — a silicone/acrylic render available in a range of colours, with a 2.0 mm grain size.

Mineral finishing coats

- Soltherm MTC 15 — a mineral render available in a range of colours, with a 1.5 mm grain size
- Soltherm MTC 20 — a mineral render available in a range of colours, with a 2.0 mm grain size
- Soltherm MTC 30 — a mineral render available in a range of colours, with a 3.0 mm grain size
- Soltherm MTC 25 wt — a mineral render available in a range of colours, with a 2.5 mm grain size
- Soltherm MTC 15 g — a mineral render available in a range of colours, with a 1.5 mm grain size
- Soltherm MTC 25 wt g — a mineral render available in a range of colours, with a 2.5 mm grain size.

Silicate finishing coats

- Soltherm STF 10 — a silicate render available in a range of colours, with a 1.0 mm grain size
- Soltherm STF 15 — a silicate render available in a range of colours, with a 1.5 mm grain size
- Soltherm STF 20 — a silicate render available in a range of colours, with a 2.0 mm grain size.

(1) Thickness is regulated by the grain size.

Dash Receiver finishing coat

Soltherm SDR — a polymer-modified cement based render supplied in powder form requiring the addition of 5 litres to 5.5 litres of clean water per 25 kg of render. To be used with Soltherm Spar-dash Aggregate. The product is applied to a thickness between 6 mm and 10 mm.

Aggregates

Soltherm Spar-dash Aggregate — available in 3 mm to 8 mm particle sizes for a Soltherm SDR thickness of 6 mm, and particle sizes of 6 mm to 12 mm for a Soltherm SDR thickness of 10 mm and available in a range of colours to suit the Soltherm SDR dash receiver.

Primers⁽¹⁾ (for decorative coats)

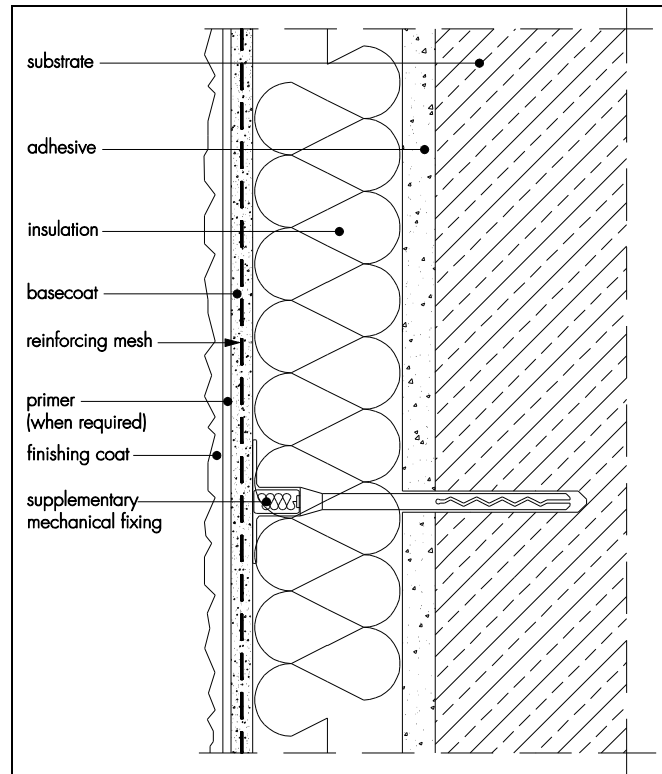
- Soltherm AP — ready to use liquid acrylic primer, for use with Soltherm ACP decorative coat
- Soltherm STP — ready to use silicate primer, for use with Soltherm STPT decorative coat
- Soltherm SNP — ready to use silicone primer, for use with Soltherm STC-P decorative coat
- Soltherm SP — ready to use acrylic primer, for use with Soltherm ACP decorative coat.

Decorative coats⁽¹⁾

Soltherm ACP — ready to use acrylic coating, available in a range of colours
 Soltherm STPT — ready to use silicate coating, available in a range of colours
 Soltherm STC-P — ready to use silicone coating, available in a range of colours.

(1) Decorative coats and their associated primers must be used with mineral finishing coats (MTC) and optionally with other finishing coats.

Figure 1 Soltherm P External Wall Insulation Systems



1.3 Ancillary materials used with the system:

- A range of aluminium or PVC-U profiles, comprising:
 - starter/base profile
 - edge, corner and render stop profiles
 - connector profile and fixings.

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

- algae and fungicidal wash
- silicone sealant
- extruded polystyrene insulation boards (for use under the dpc level)
- stainless steel mechanical fixing for fire barrier application.

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 Bolix S.A has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by the Global Group (Certificate 26Q15059).

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 packaging
Soltherm adhesives and basecoats Soltherm mineral finishing coats Soltherm SDR dash receiver	25 kg bags
All Soltherm finishing coats except mineral finishing coats	15 kg and 30 kg tubs
Soltherm primers for finishing coats	5 kg, 10 kg and 25 kg tubs
Soltherm decorative coats	5 kg, 10 kg and 18 kg tubs
Soltherm primers for decorative coats	1 kg, 5 kg and 10 kg tubs
Reinforcement mesh	1 m wide x 50 m length rolls
Supplementary mechanical fixings	boxed by manufacturer

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

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

3.5 The powder adhesive, mineral renders and Soltherm SDR dash receiver must be stored in dry conditions, off the ground, and protected from moisture. Contaminated materials should be discarded.

3.6 The primers and renders must be stored in tightly-closed original packaging in cool dry conditions and protected from excessive heat and frost at times.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Soltherm P External Wall Insulation Systems.

Design Considerations

4 General

4.1 Soltherm P External Wall Insulation Systems, when installed in accordance with this Certificate, are effective in reducing the thermal transmittance (U value) of external masonry walls of new and existing buildings (see section 4.3). 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 – see section 16, and window sills should be designed and installed so as to direct water away from the building). 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 systems are 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 systems, 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 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 New walls not subject to regulatory requirements should also be built in accordance section 4.4.

4.6 The systems will improve the weather resistance of a wall and provide a decorative finish. However, they 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.

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

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

4.9 External pipework and ducts should be removed before installation and alterations made to underground drainage, where appropriate, to accommodate repositioning of the pipework to the finished face of the system. The Certificate holder should be contacted for further advice.

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

5 Practicability of installation

The systems should only be installed by specialised contractors who have successfully undergone training and registration by the Certificate holder (see section 15).

Note: The BBA operates a UKAS Accredited Approved Installer Scheme for external wall insulation (non-mandatory); details of approved installer companies are included on the BBA's website (www.bbacerts.co.uk).

6 Thermal performance

6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the insulation declared thermal conductivity value (λ_D) of $0.032 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.



6.2 The U value of a completed wall will depend on the insulation thickness, the type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample construction in accordance with the national Building Regulations are given in Table 2, and are based on the thermal conductivity given in section 6.1 of this Certificate.

Table 2 Insulation thickness required to achieve design U values⁽¹⁾⁽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, $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
0.18	170	180
0.19	160	170
0.25	120	130
0.26	110	120
0.28	100	110
0.30	100	100
0.35	80	90

- (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 value (λ_D) is as shown in section 6.1. An adhesive layer, 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 4.16 polyethylene fixings per square metre with a point thermal transmittance (X_p) of 0.003 W·K⁻¹ per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2007. A gap correction ($\Delta U''$) of zero is assumed.
- (3) Based upon an incremental insulation thickness of 10 mm.
- (4) When applying the maximum available insulation thickness, these walls can achieve U values of 0.13 W·m⁻²·K⁻¹.



6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Strength and stability

General



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

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

7.3 Negative wind load is resisted by the bond between each component (resistance $\geq 80 \text{ kN}\cdot\text{m}^{-2}$ and using a safety factor of 9). The insulation boards are retained by the external wall insulation system adhesive and supplementary mechanical fixings.

7.4 The wind loads on the wall should be calculated in accordance with BS EN 1991-1-4 : 2005 and its National Annex. Special consideration should be given to locations with high wind-load pressure coefficients, as additional fixings may be necessary. In accordance with BS EN 1990 : 2002, 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 the additional loads that may be applied as a result of installing the system, ignoring any positive contribution that may occur from the system itself
- the proposed system (with associated supplementary fixing layout) 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 is suitable and the supplementary fixings are covered by an appropriate ETA, the fixings will initially transfer the weight of the insulation system to the substrate wall, while the adhesive is curing.

Impact resistance

7.10 Hard body impact tests were carried out in accordance with ETAG 004 : 2000 (amended 2013). The systems are suitable for the Use Categories listed in Table 3 of this Certificate.

Table 3 Soltherm P External Wall Insulation Systems impact resistance

Finishing coats	Category ⁽¹⁾	
	System with Soltherm UB basecoat + single mesh + finishing coats indicated in column one	System with Soltherm WB basecoat or Soltherm BC-P basecoat + single mesh + finishing coats indicated in column one
<ul style="list-style-type: none"> ● Soltherm AFC 20 ● Soltherm AFC 10 ● Soltherm AFC 15 ● Soltherm AFC 25 wt ● Soltherm AFC 15 wt ● Soltherm AFC s ● Soltherm AMC 	III	III
<ul style="list-style-type: none"> ● Soltherm SFC-P 15 ● Soltherm SFC-P 20 ● Soltherm SFC-P 25 wt 	III	III
<ul style="list-style-type: none"> ● Soltherm AF-P 15 ● Soltherm AF-P 20 	III	III
<ul style="list-style-type: none"> ● Soltherm MTC 15 ● Soltherm MTC 20 ● Soltherm MTC 30 ● Soltherm MTC 25 wt ● Soltherm MTC 15 g ● Soltherm MTC 25 wt g 	III	III
<ul style="list-style-type: none"> ● Soltherm STF 10 ● Soltherm STF 15 ● Soltherm STF 20 	II	II
<ul style="list-style-type: none"> ● Soltherm SDR dash receiver 	III	III

(1) These categories are defined in ETAG 004 : 2000 (amended 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 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 systems are restricted for use in buildings up to 18 metres in height.

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

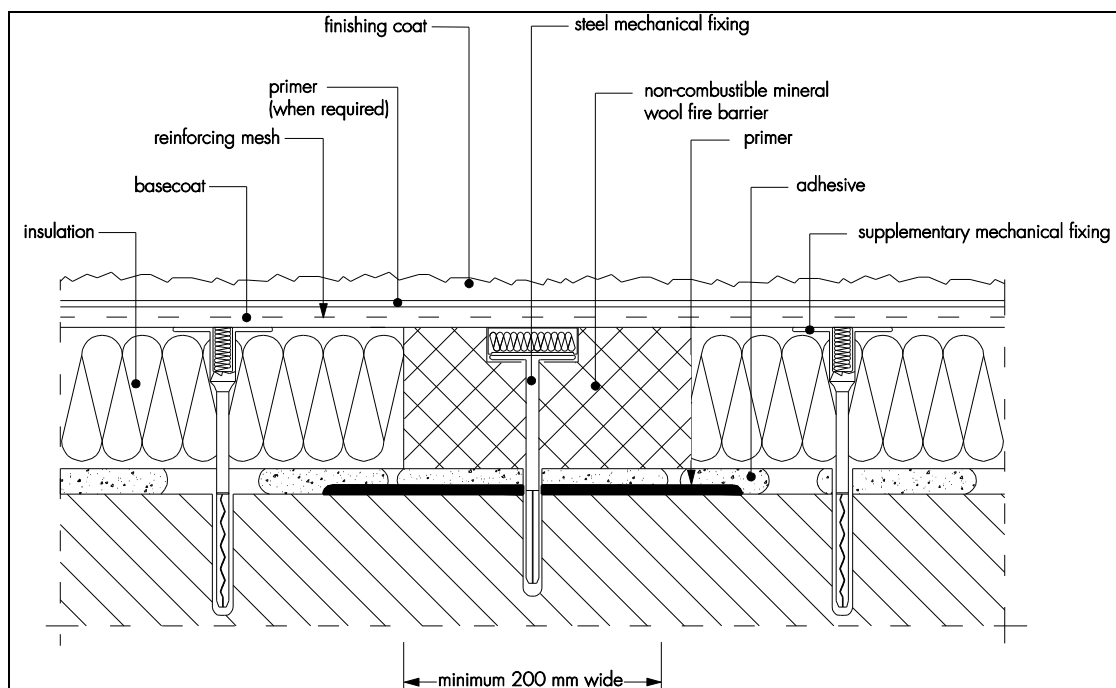


8.5 For flats and maisonettes and non-domestic building in Scotland, the systems are suitable only for use more than one metre from the boundary.

8.6 The systems are 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 systems are 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 systems 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 systems. The systems 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 tops of walls, the systems should be protected by an adequate coping, overhang or other detail designed for use with these types of systems (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 systems 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 systems will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, section 4 and Annexes D and G and Table 6.

11.5 The water vapour resistance (μ) factor (for the insulation board) and equivalent air layer thickness (s_d) (for the render systems) is shown in Table 4 of this Certificate.

Table 4 Water vapour resistance factor and equivalent air layer thickness

	S_d (m)	(μ)
Expanded polystyrene – insulation thickness 20 mm to 250 mm (grey EPS 70)	—	20 – 40 ⁽¹⁾
Rendering system: Soltherm UB basecoat ⁽²⁾ + primer + finish coat (specific particle size) ⁽³⁾ + primers (for decorative coats) + decorative coats, as indicated below		
Soltherm AP Colour + Soltherm AFC 15 (particle size 1.5 mm) + Soltherm SNP + Soltherm STC-P	1.39	—
Soltherm AP Colour + Soltherm AFC 15 (particle size 1.5 mm) + Soltherm SP + Soltherm ACP	1.60	—
Soltherm AP Colour + Soltherm AMC (particle size 2.0 mm)	0.39	—
Soltherm SNP + Soltherm SFC-P 20 (particle size 2.0 mm) + Soltherm SNP + Soltherm STC-P	1.36	—
Soltherm SNP Colour + Soltherm SFC-P 20 (particle size 2.0 mm) + Soltherm SNP + Soltherm STC-P	1.20	—
Soltherm SNP + Soltherm SFC-P 20 (particle size 2.0 mm)	0.74	—
Soltherm SNP + Soltherm AF-P 15 (particle size 1.5 mm) + Soltherm SP + Soltherm ACP	1.64	—
Soltherm SNP + Soltherm AF-P 15 (particle size 1.5 mm) + Soltherm SNP + Soltherm STC-P	1.40	—
Soltherm SNP + Soltherm AF-P 15 (particle size 1.5 mm)	0.89	—
Soltherm AP Colour + Soltherm MTC 25 wt (particle size 2.5 mm) + Soltherm ACP	0.51	—
Soltherm AP Colour + Soltherm MTC 25 wt (particle size 2.5 mm)	0.26	—
Soltherm STP + Soltherm STF 20 (particle size 2.0 mm) + Soltherm STP + Soltherm STPT	0.24	—
Soltherm SDR dash receiver (thickness 10 mm)	0.23	—
Rendering system: Soltherm BC-P basecoat ⁽²⁾ + primer + finish coat (specific particle size) ⁽³⁾ + primers (for decorative coats) + decorative coats, as indicated below		
Soltherm AP Colour + Soltherm AFC 15 (particle size 1.5 mm) + Soltherm SNP + Soltherm STC-P	1.34	—
Soltherm AP Colour + Soltherm AFC 15 (particle size 1.5 mm) + Soltherm SP + Soltherm ACP	1.40	—
Soltherm AP Colour + Soltherm AFC 15 (particle size 1.5 mm)	0.70	—
Soltherm AP Colour + Soltherm AMC (particle size 2.0 mm)	0.50	—
Soltherm SNP + Soltherm SFC-P 20 (particle size 2.0 mm) + Soltherm SNP + Soltherm STC-P	0.91	—
Soltherm SNP Colour + Soltherm SFC-P 20 (particle size 2.0 mm) + Soltherm SNP + Soltherm STC-P	0.84	—
Soltherm SNP + Soltherm AF-P 15 (particle size 1.5 mm) + Soltherm SP + Soltherm ACP	1.32	—
Soltherm SNP + Soltherm AF-P 15 (particle size 1.5 mm) + Soltherm SNP + Soltherm STC-P	1.17	—
Soltherm SNP + Soltherm AF-P 15 (particle size 1.5 mm)	0.74	—
Soltherm AP Colour + Soltherm MTC 25 wt (particle size 2.5 mm) + Soltherm ACP	0.67	—
Soltherm STP + Soltherm STF 20 (particle size 2.0 mm) + Soltherm STP + Soltherm STPT	0.25	—
Soltherm SDR dash receiver (thickness 10 mm)	0.27	—

Rendering system: Soltherm WB basecoat ⁽²⁾ + primer + finish coat (specific particle size) ⁽³⁾ + primers (for decorative coats) + Decorative coats, as indicated below		
Soltherm SNP + Soltherm SFC-P 25 wt (particle size 2.5 mm)	0.32	—
Soltherm SNP + Soltherm SFC-P 25 wt (particle size 2.5 mm) + Soltherm SP + Soltherm ACP	0.64	—
Soltherm SNP + Soltherm SFC-P 25 wt (particle size 2.5 mm)	0.48	—
Soltherm SNP + Soltherm SFC-P 25 wt (particle size 2.5 mm) + Soltherm SP + Soltherm ACP	0.94	—
Soltherm AP Colour + Soltherm MTC 30 (particle size 3.0 mm)	0.18	—
Soltherm AP Colour + Soltherm MTC 30 (particle size 3.0 mm) + Soltherm SP + Soltherm ACP	0.42	—
Soltherm STP + Soltherm STF 20 (particle size 2.0 mm)	0.15	—
Soltherm STP + Soltherm STF 20 (particle size 2.0 mm) + Soltherm SP + Soltherm ACP	0.28	—
Soltherm SDR dash receiver (thickness 10 mm)	0.27	—

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

(2) The basecoat was applied to a thickness between 3 mm and 5 mm. A basecoat thickness of 5 mm was applied to the Soltherm SDR dash receiver.

(3) These S_d values apply to finishes with particle sizes up to those stated in this Table. S_d values for finishes with larger particle sizes should be determined by test.

12 Maintenance and repair



12.1 An initial inspection should be made within 12 months and regularly thereafter to include:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- examination of the sealant around openings and service entry points
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters; such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints, for example between the insulation systems 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 systems 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 renders and paint finishes 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, provided the coating does 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 systems. 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 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight edge spanning the storey height. Any excessive irregularities, ie greater than 10 mm in one metre, must be made good prior to installation to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

14.4 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.

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

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

14.7 All modifications, such as provision for fire barriers and necessary repairs to the building structure, must be completed before installation of the system commences.

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 systems
- 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. The systems should not be applied at temperatures below 5°C or above 25°C, except for all the silicate finishing coats, Soltherm STP primer

and Soltherm STPT decorative coat which are applied from 10°C to 25°C. If exposure to frost is likely or in damp/wet conditions, the render must be protected from rapid drying.

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

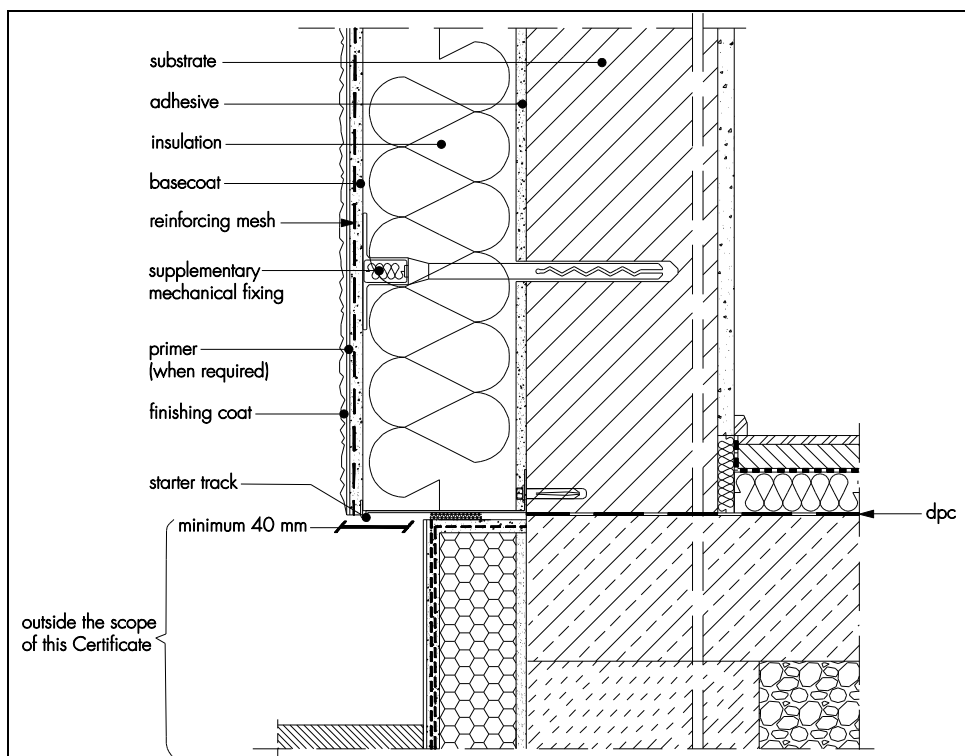
16.4 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2005.

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

Positioning and securing insulation boards

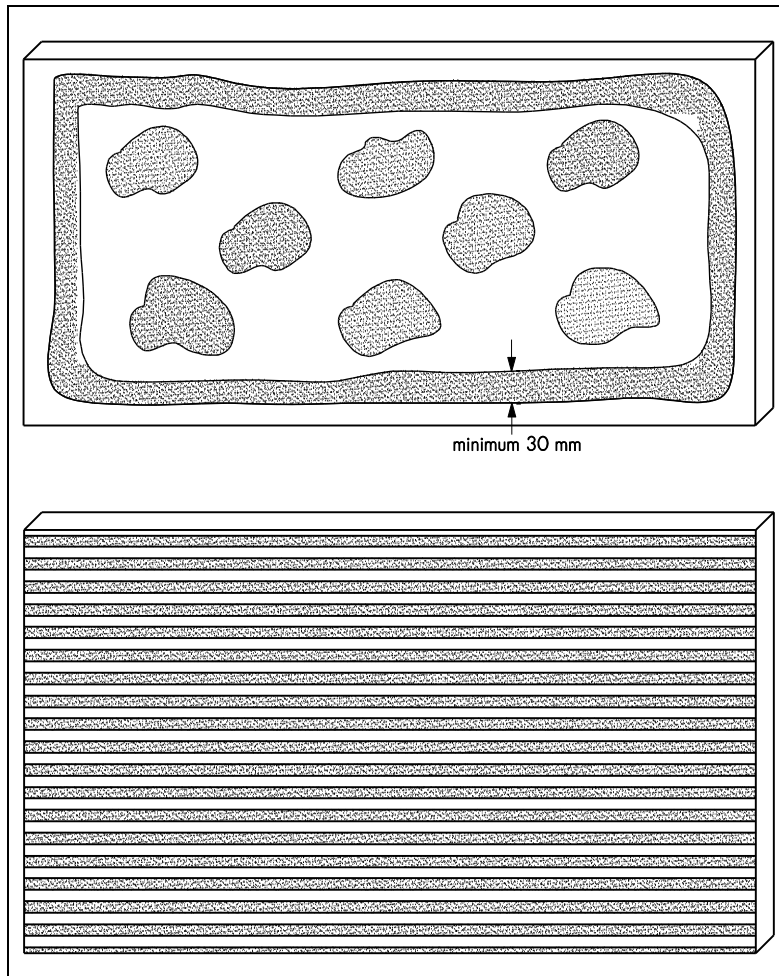
16.6 The base profile is secured to the external wall above the dpc using mechanical fixings at approximately 300 mm centres. Profiles and expansion joints are fitted as specified (see Figure 3).

Figure 3 Typical section of base profile



16.7 The adhesive is mixed in a suitable container using potable water and a high power drill and mixer spiral to create a paste-like mortar, whilst ensuring there are no lumps in the mixed material in accordance with Certificate holder instructions (see section 1.2). The material must rest for 5 minutes before being mixed again to the required consistency. The insulation boards are positioned on the starter track and bonded to the wall by applying the approved adhesive to the boards using the strip and dot method or full surface application using a notched trowel. A circumferential strip of adhesive at least 3 cm wide is applied to the insulation boards, starting 3 cm from the edges. Six to eight evenly distributed patches of adhesive 8 mm to 10 cm in diameter are then applied to the boards so that an adhesive surface of at least 40% is achieved (see Figure 4). The insulation panel should be immediately placed on the substrate and pressed into place.

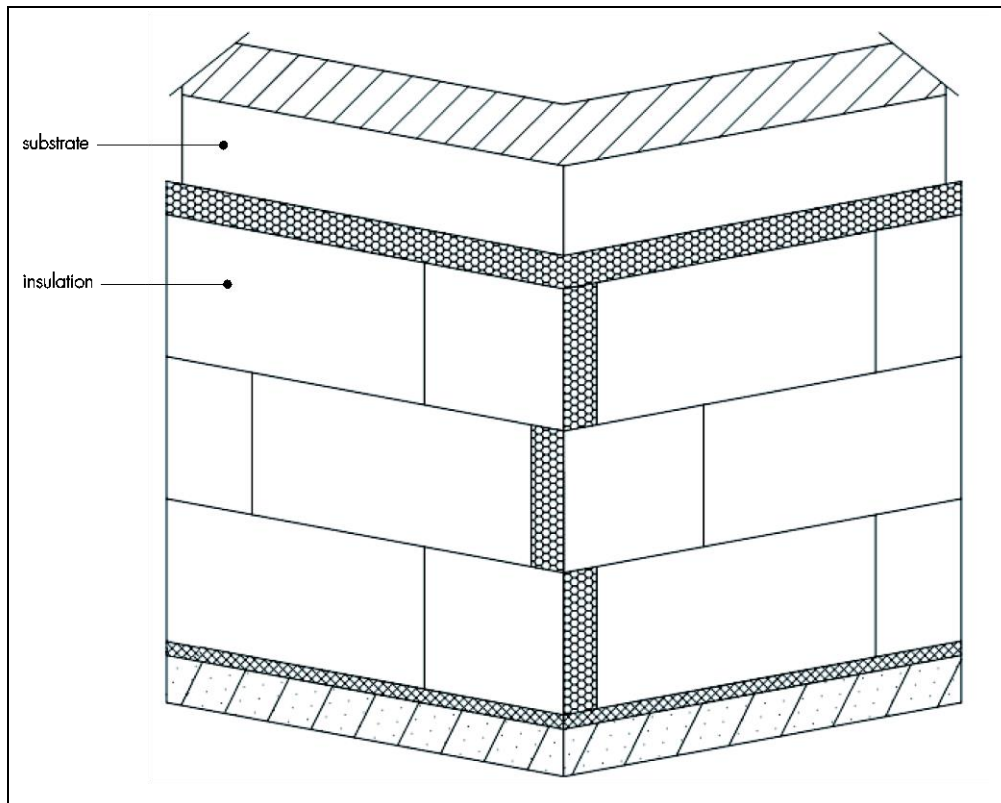
Figure 4 Insulation boards adhesive pattern



16.8 The first run of insulation boards are positioned on the base profile and pressed firmly against the wall. Care should be taken to ensure that all insulation board edges are butted tightly together, and alignment 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 and overlapped at the building corners (see Figure 4); the alignment should be constantly checked as work proceeds. Gaps should be filled with strips of the insulation material or foam filler approved by the Certificate holder.

Figure 5 Typical arrangement of insulation boards



16.10 After the adhesive has fully set (after 48 hours), supplementary mechanical fixings are applied through the insulation board into the substrate wall if required, at a frequency of three fixings per 1200 mm by 600 mm board size or 2 fixings per 1000 mm by 500 mm board size, resulting in approximately four fixings per square metre. The mechanical fixings are inserted and tapped or screwed firmly into place, securing the boards to the substrate.

16.11 The surface of the boards should be smooth without high spots or irregularities. Any high spots or irregularities should be removed by lightly planing with a rasp. After sufficient stabilisation of the installed insulation (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.

16.12 To fit around details such as doors and windows, insulation boards may be cut with a sharp knife or a finetooth saw. Purpose-made window sills, seals and deflection channels designed to prevent or manage water ingress and allow water to be shed clear of items bridging the cavity should be fitted. The performance of these components is outside the scope of this Certificate.

16.13 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.

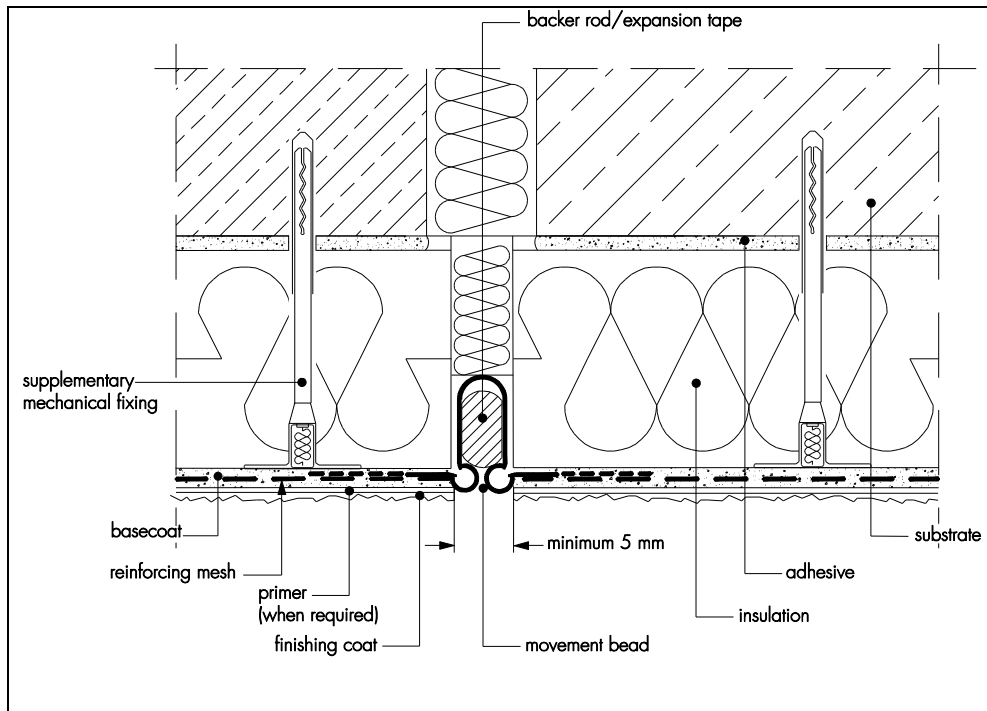
16.14 Building corners, door and window heads and jambs are formed using corner profiles in accordance with the manufacturer's instructions. Corner profiles are fixed to all building corners.

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

Movement joints

16.16 Movement joints should be incorporated where required. Existing structural expansion joints should be extended through to the surface of the insulation systems (see Figure 6).

Figure 6 Movement joint detail

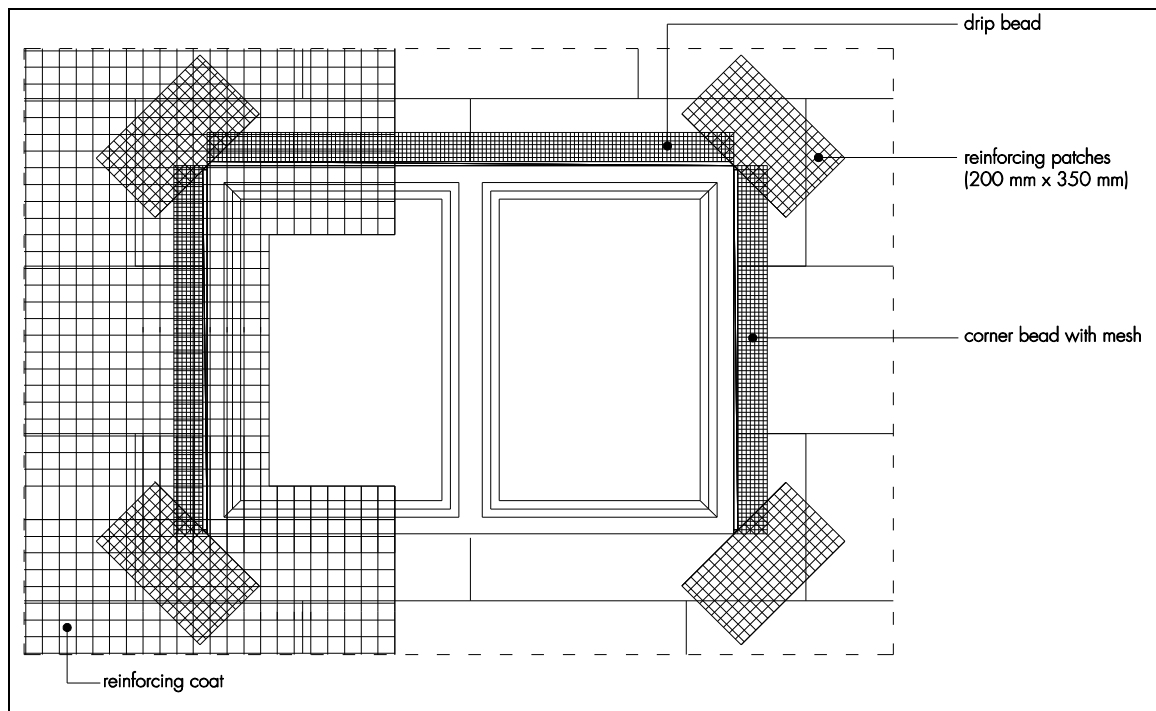


Application of basecoat and reinforcement mesh

16.17 The basecoat is prepared as described previously for the adhesive. The material is applied over the insulation boards, using a notched steel trowel to a thickness between 3 mm and 4 mm (4 mm to 6 mm for the Soltherm SDR dash receiver application). The reinforcement mesh is immediately embedded into the coat, ensuring the mesh is overlapped at joints by a minimum coverage of 100 mm. The mesh is embedded half way in the basecoat for the Soltherm SDR dash receiver application. Once the first coat has dried, a second coat of approximately 1 mm thickness is applied to obtain a smooth and uniform surface for all other rendering systems (excluding the Soltherm SDR dash receiver application). For the Soltherm SDR dash receiver application the surface of the basecoat is then scored with a toothed comb to provide a good key for the next coat.

16.18 Additional pieces of reinforcing mesh are applied diagonally at the corners of openings to provide the necessary reinforcement in accordance with the Certificate holder's instructions (see Figure 7).

Figure 7 Additional reinforcement at openings



Rendering and finishing

16.19 Prior to the render coat, the relevant seals are positioned and installed at all openings (eg windows and doors), overhanging eaves, gas and electric meter boxes, wall vents or where the render abuts any other building material or surface.

16.20 The basecoat must be allowed to dry/cure (approximately two days) prior to the application of the primer/finish coat. Prior to the application of the finishing coat, sealant should be applied as required, as defined in the project-specific site package in accordance with the Certificate holder's instructions.

16.21 Primers (see section 1.2 for list of primers and their compatibility with the finishing coats) should be applied in accordance with the Certificate holder's instructions and allowed to dry for approximately 24 hours for Soltherm STP primers and approximately 4 to 6 hours for all other primers prior to the application of the finishing coat. The Soltherm SDR dash receiver is applied over the basecoat without primer

16.22 Soltherm SDR dash receiver is applied to the required thicknesses (see section 1.2 *Finishing coats*), using a stainless steel trowel. While the render is still soft, Soltherm Spar-dash Aggregate of the appropriate size is thrown onto the surface and should be lightly tapped with a timber float to ensure that a good bond is achieved. On completion, the surface must be checked to ensure an even coverage of spar dash has been achieved.

16.23 The other render finishes are applied to the required thicknesses (see section 1.2 *Finishing coats*), using a stainless steel trowel and finished with a plastic float to create a textured finish. The drying time is dependent on conditions, but will typically be 4 to 6 hours. Mineral renders once dry must be primed and painted — these are optional for other finishing coats (see section 1.2 *Decorative coats*). The application of Soltherm SP primer and Soltherm ACP decorative coat on mineral renders must commence no earlier than 14 days from application of the mineral render, and other primers and decorative coats are applied no earlier than 4 days from application of the mineral render.

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

16.25 The system should be allowed to dry thoroughly before painting any of the surrounding features.

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

Figure 8 Typical roof eaves detail

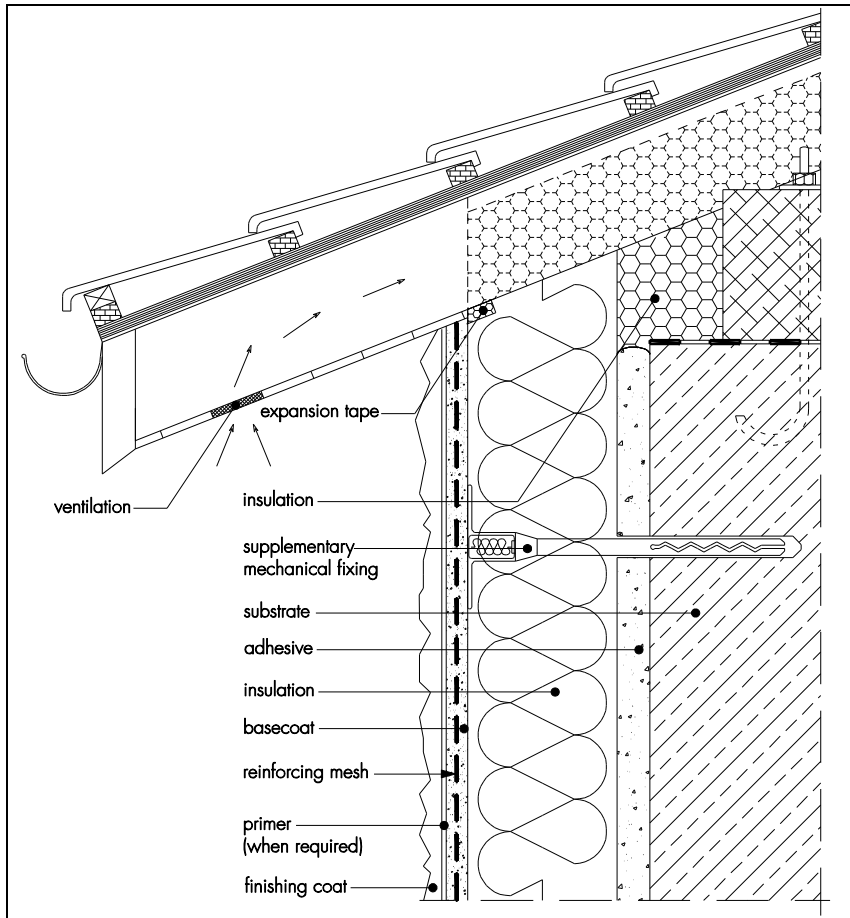


Figure 9 Insulated reveal detail

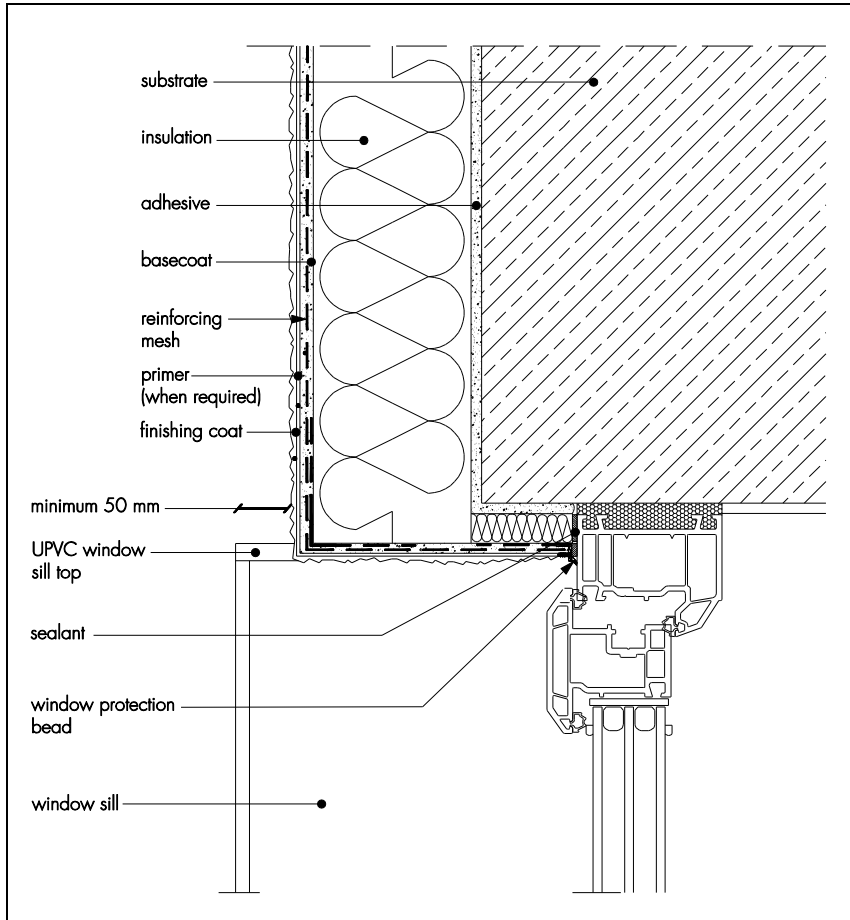


Figure 10 Insulated window head detail

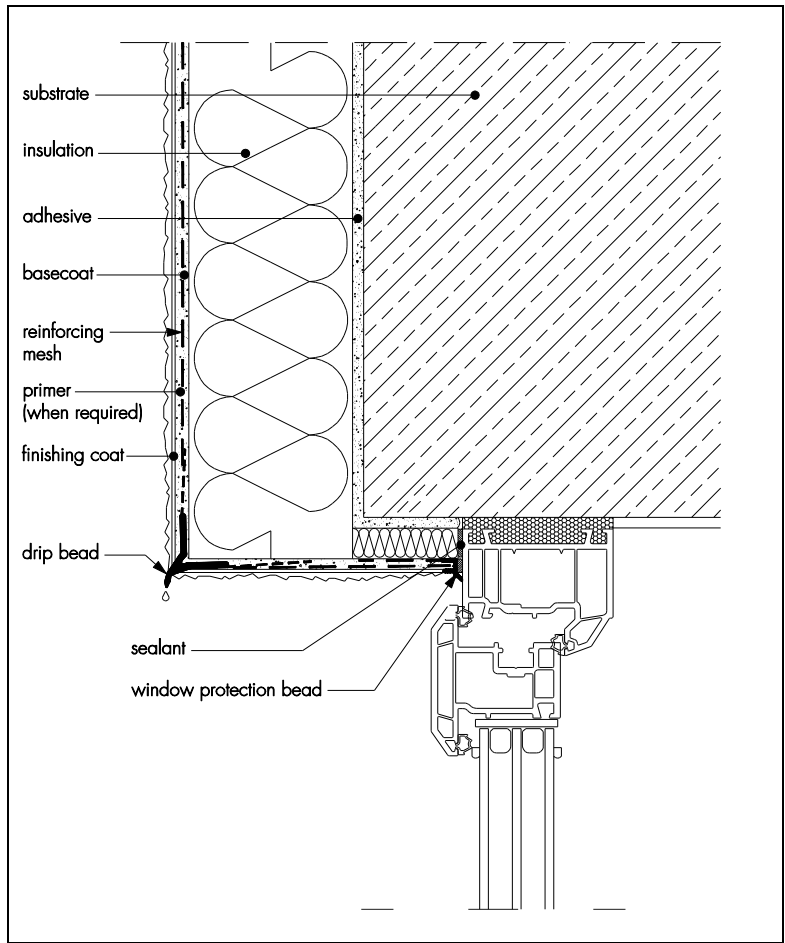
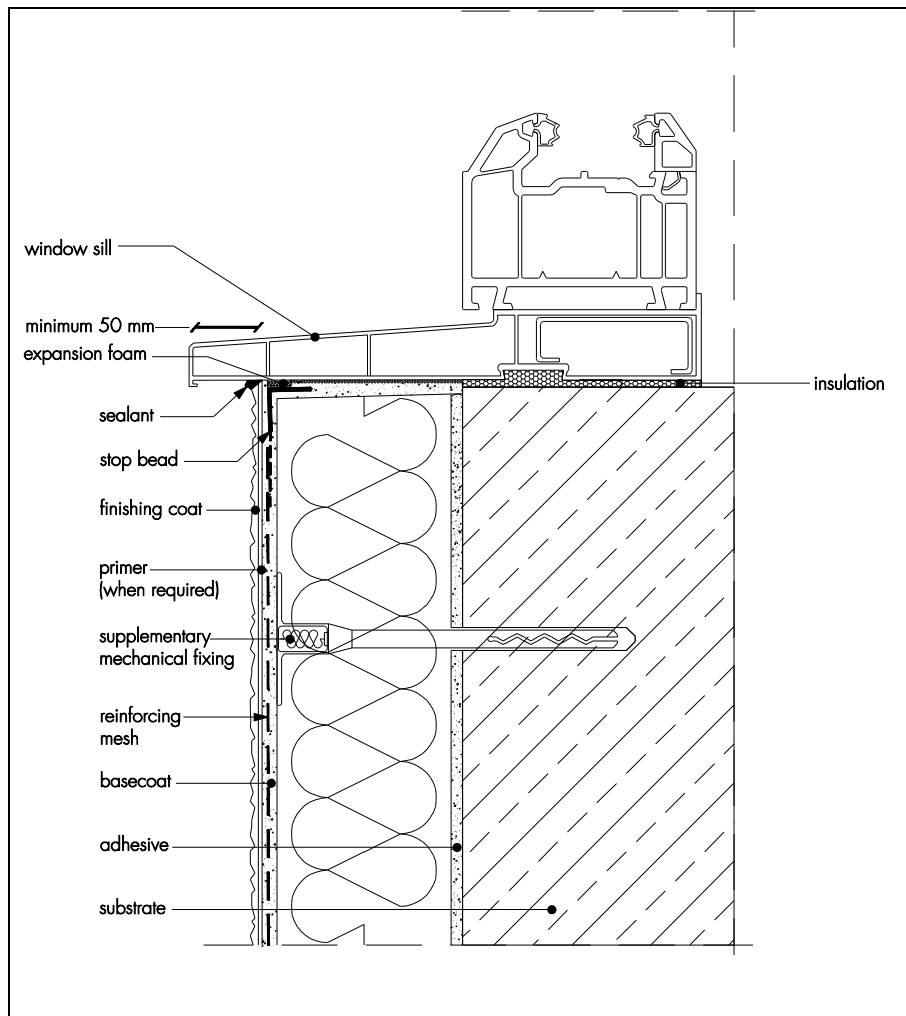


Figure 11 Window sill detail



Technical Investigations

17 Tests

17.1 An examination was made of data relating to:

- component characterisation
- water vapour permeability
- water absorption
- bond strength
- reaction to fire
- durability of finish coatings
- heat/spray cycling
- impact resistance.

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

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

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

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

BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*

NA to BS EN 1991-1-4 : 2005 *Eurocode 1 — Actions on structures — General actions — Wind actions*

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

BS EN 13163 : 2012 *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*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

ETAG 004 : 2000 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with Rendering*

ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with Rendering*

BRE Report 262 (BR 262 : 2002) *Thermal insulation: avoiding risks*

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

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 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.