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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
14/5142
Product Sheet 3

HENKEL CERESIT CERETHERM EXTERNAL WALL INSULATION SYSTEMS

CERESIT CERETHERM EXPRESS EPS EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Ceresit Ceretherm Express EPS External Wall Insulation System comprising white or grey EPS insulation boards, adhesively fixed with supplementary mechanical fixings, with a reinforced basecoat and render finishes. It is suitable for use on the outside of external walls in new and existing domestic and non-domestic buildings 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 meeting the requirements of the national Building Regulations (see section 6).

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

Behaviour in relation to fire — the system has a 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 the 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: 6 October 2014

John Albon — Head of Approvals
Energy and Ventilation

Claire Curtis-Thomas
Chief Executive

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

Regulations

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

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

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 8.4 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system can provide a degree of protection against rain ingress. See section 10.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.1, 11.2 and 11.4 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The system can contribute to satisfying this Requirement. See sections 6.2 and 6.3 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	26	CO_2 emission rate 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. See sections 6.2 and 6.3 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The system can contribute to a construction satisfying this Regulation. See sections 12.1 and 13.1 and the *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 meet this Standard, with reference to clauses 2.6.4[1][2], 2.6.5[1] and 2.6.6[2]. See sections 8.1 to 8.6 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The system can meet 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 8.6 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will contribute to a construction satisfying this Standard, with reference to clauses 3.10.1[1][2] and 3.10.2[1][2]. See 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	Building insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1[1], 6.1.2[1][2], 6.1.3[1][2], 6.1.6[1], 6.1.10[2], 6.2.1[1][2], 6.2.3[1], 6.2.4[2], 6.2.5[2], 6.2.6[1], 6.2.7[1], 6.2.8[2], 6.2.9[1][2], 6.2.10[1], 6.2.11[1], 6.2.12[2] and 6.2.13[1][2]. See sections 6.2 and 6.3 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4[1][2] [Aspect 1[1][2] and 2[1]], 7.1.6[1][2] [Aspect 1[1][2] and 2[1]] and 7.1.7[1][2] [Aspect 1[1][2]]. See section 6.2 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment		All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1[1][2] and Schedule 6[1][2].

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012

Regulation:	23	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 13.1 and the *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 sections 11.2 and 11.4 of this Certificate.
Regulation:	30	Stability
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system has a low risk surface and can satisfy this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40	Target carbon dioxide emission rate
Comment:		The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.

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

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

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

Additional Information

NHBC Standards 2014

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

Technical Specification

1 Description

1.1 Ceresit Ceretherm Express EPS External Wall Insulation System consists of insulation boards, adhesively fixed direct to the substrate wall, with supplementary mechanical fixings, reinforced basecoat and render finishes (see Figure 1). Ceramic tiles may be used as decorative features around details (see section 1.2). The system is made up of the following components:

Adhesive

- Ceresit CT 84 — ready to use, one-component, low-pressure polyurethane adhesive applied by gun from a can and used for fixing EPS insulation boards
- Ceresit CM 17 — a cement-based adhesive mortar for bonding ceramic and stone tiles, available in powder form requiring the addition of 0.36 litres of clean water per kg.

Insulation

- expanded polystyrene EPS 70 (white and grey) insulation boards — 1200 mm by 600 mm in a range of thicknesses from 50 mm to 250 mm, with a nominal density of 15 to 18.5 $kg \cdot m^{-3}$, compressive strength of 70 $kN \cdot m^{-2}$, and a minimum tensile strength of 100 kPa. Boards are manufactured in accordance with BS EN 13163 : 2012, and classified as Euroclass E in accordance with BS EN 13501-1 : 2007.

Supplementary fixings

Mechanical fixings — anchors with adequate length to suit the substrate and insulation thickness and selected from:

- Ejot EjoTherm NT U — polyethylene, PE-HD with stainless steel or electro-galvanized pins
- Ejot EjoTherm STR U 2G — polyethylene, PE-HD with stainless steel or electro-galvanized pins
- Ejot EjoTherm TID MR 8/35 — stainless steel.

Basecoat

- Ceresit CT 85 — reinforcing mortar, a cement-based powder requiring the addition of 0.26 litres to 0.28 litres of clean water per kg and applied to a thickness of approximately 4 mm and used with one of the two Primers below
- Ceresit CT 87 — white reinforcing mortar, a cement-based powder requiring 0.29 litres to 0.31 litres of clean water per kg which does not require priming prior to the application of the finishing coat and applied to a thickness of approximately 4 mm.

Reinforcement

Ceresit CT 325 — either a 1.0 m or 1.1 m wide standard mesh (various grid sizes and mass per unit area) of multi-strength glassfibre with a polymer coating, and selected from:

- OMFA 122 — 4.0 mm by 4.0 mm, 165 $g \cdot m^{-2}$
- ST-112-100/7 — 3.8 mm by 3.2 mm, 174 $g \cdot m^{-2}$
- Vertex AKE 145 A — 3.5 mm by 4.0 mm, 150 $g \cdot m^{-2}$
- ST 2924-100/7 KM — 3.9 mm by 4.0 mm, 158 $g \cdot m^{-2}$
- SKLOTEX A2-101/145 — 5.0 mm by 5.0 mm, 145 $g \cdot m^{-2}$
- SSA-5433 SM (150) — 4.0 mm by 4.0 mm, 150 $g \cdot m^{-2}$

Primer

- Ceresit CT 15 — ready to use primer to be used with silicate finishing coats
- Ceresit CT 16 — ready to use primer to be used with mineral, acrylic, silicone and silicate-silicone finishing coats.

Finishing coats

Mineral finishing coats:

- Ceresit CT 35 — cement-based powder, requiring the addition of 0.2 litres to 0.22 litres of water per kg. Available in 2.5 mm and 3.5 mm particle sizes, with the applied thickness being regulated by particle size
- Ceresit CT 136 — polymer-modified cement-based dash receiver applied to a thickness of 6 mm to 8 mm and used with a spar dash finish requiring the addition of 0.21 litres to 0.23 litres of water per kg
- Ceresit CT 137 — cement-based powder, requiring the addition of 0.22 litres to 0.23 litres of water per kg for maximum particle sizes of 1.5 mm or 2 mm, and 0.17 litres to 0.19 litres of water per kg for maximum particle size of 2.5 mm. The applied thickness is regulated by particle size.

Acrylic finishing coats:

- Ceresit CT 60 — ready to use paste, grained structure with maximum particle sizes of 1.5 mm, 2 mm or 2.5 mm. The applied thickness is regulated by particle size
- Ceresit CT 63 — ready to use paste, ribbed structure with maximum particle size of 3 mm. The applied thickness is regulated by particle size
- Ceresit CT 64 — ready to use paste, ribbed structure with maximum particle size of 2 mm. The applied thickness is regulated by particle size.

Silicate finishing coats:

- Ceresit CT 72 — ready to use paste, grained structure with maximum particle sizes of 1.5 mm or 2.5 mm. The applied thickness is regulated by particle size
- Ceresit CT 73 — ready to use paste, ribbed structure with maximum particle sizes of 2 mm or 3 mm. The applied thickness is regulated by particle size.

Silicone finishing coats:

- Ceresit CT 74 — ready to use paste, grained structure with maximum particle sizes of 1.5 mm or 2.5 mm. The applied thickness is regulated by particle size
- Ceresit CT 75 — ready to use paste, ribbed structure with maximum particle sizes of 2 mm or 3 mm. The applied thickness is regulated by particle size.

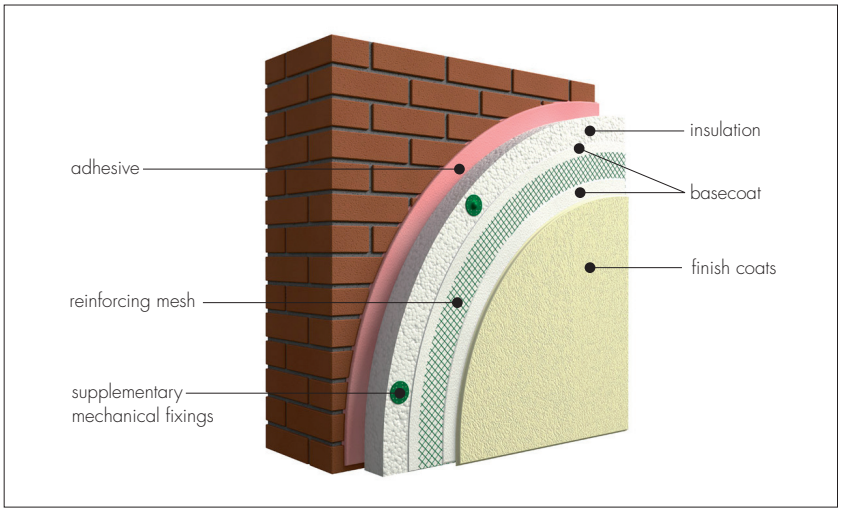
Silicate-silicone finishing coats:

- Ceresit CT 174 — ready to use paste, grained structure with maximum particle sizes of 1.5 mm or 2 mm. The applied thickness is regulated by particle size
- Ceresit CT 175 — ready to use paste, ribbed structure with maximum particle size of 2 mm. The applied thickness is regulated by particle size.

Decorative coats

- Spar dash aggregate — available in a range of sizes and colours
- Ceresit CT 42 — ready to use acrylic coating (optional), which can be used with all mineral and acrylic finishing coats. Available in various colours within Ceresit Colours of Nature product range
- Ceresit CT 44 — ready to use acrylic coating (optional), which can be used with all mineral and acrylic finishing coats. Available in various colours within Ceresit Colours of Nature product range
- Ceresit CT 48 — ready to use silicone coating (optional), which can be used with all mineral, acrylic and silicone based finishing coats. Available in various colours within Ceresit Colours of Nature product range
- Ceresit CT 54 — ready to use silicate paint (optional), which can be used with all mineral, silicate and silicate-silicone finishing coats. Available in various colours within Ceresit Colours of Nature product range
- Ceresit CT 32 — cement mortar for pointing, which is available in various colours
- Ceresit CE 43 — water-resistant flexible grout used for grouting ceramic tiles (see section 1.2). Available in various colours.

Figure 1 Ceresit Ceretherm Express EPS External Wall Insulation System



1.2 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 profile
  - edge profile
  - corner profile with optional PVC-U nosing
  - render stop profile
  - movement joint
  - expansion joint
- 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
- ceramic tiles.

1.3 The insulation boards are primarily bonded to the external surfaces of the wall with a minimum of 40% coverage of adhesive (achieved after the boards have been pressed against the wall). When the adhesive has fully set (approximately 2 hours), supplementary mechanical fixings are applied through the insulation boards. When all boards have been fixed to the wall, the basecoat is applied to their surface to a uniform thickness and the reinforcing mesh immediately embedded and the surface smoothed with a trowel. A further layer of basecoat render is applied over the embedded reinforcing mesh to achieve the required overall thickness. When the basecoat is dry, the primer is applied, where required (see section 1.1 Basecoat), before the application of the selected finish.

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 Henkel Polska Spolka z.o.o. has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by PCA (Certificate 335/A/2007 AQAP 2110 : 2006).

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
Ceresit CT 84 polyurethane (PU) adhesive	850 ml spray container
Expanded polystyrene (white and grey) insulation boards	Wrapped in polythene
Supplementary fixings	Boxed by manufacturer
Ceresit CT 85 basecoat	25 kg bag
Ceresit CT 87 basecoat	25 kg bag
Ceresit CT 325 reinforcement mesh	Roll, 1.0 m or 1.1 m wide by 50 m length
Ceresit CT 15 primer	10 litre plastic bucket
Ceresit CT 16 primer	5 and 10 litre plastic bucket
Ceresit CT 35 finishing coat (mineral)	25 kg bag
Ceresit CT 136 dash receiver (mineral)	25 kg bag
Ceresit CT 137 finishing coat (mineral)	25 kg bag
Ceresit CT 60 finishing coat (acrylic)	25 kg plastic container
Ceresit CT 63 finishing coat (acrylic)	25 kg plastic container
Ceresit CT 64 finishing coat (acrylic)	25 kg plastic container
Ceresit CT 72 finishing coat (silicate)	25 kg plastic container
Ceresit CT 73 finishing coat (silicate)	25 kg plastic container
Ceresit CT 74 finishing coat (silicone)	25 kg plastic container
Ceresit CT 75 finishing coat (silicone)	25 kg plastic container
Ceresit CT 174 finishing coat (silicate-silicone)	25 kg plastic container
Ceresit CT 175 finishing coat (silicate-silicone)	25 kg plastic container
Ceresit CT 42 decorative coats (acrylic paint)	15 litre plastic container
Ceresit CT 44 decorative coats (acrylic paint)	15 litre plastic container
Ceresit CT 48 decorative coats (silicone paint)	3.5 and 15 litre plastic container
Ceresit CT 54 decorative coats (silicate paint)	3.5 and 15 litre plastic container
Spar dash aggregate	25 kg bag
Ceresit CM 17 ceramic and stone tiles adhesive	25 kg polythene bag
Ceresit CT 32 pointing and brick laying mortar	25 kg bag
Ceresit CE 43 ultra-resistance grout	5 kg plastic container and 25 kg paper bag

3.3 The boards must 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 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 primers 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 Ceresit Ceretherm Express EPS External Wall Insulation System.

Design Considerations

4 General

4.1 The Ceresit Ceretherm Express 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 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 the installation of the system, wall surfaces should comply with section 14 of this Certificate.

4.4 New walls subject to the 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.

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 can 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'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 declared thermal conductivities (λ_D) values of the insulations given in Table 2.

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

Insulation types	Thickness (mm)	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
EPS 70 white 038		0.038
EPS 70 grey 031	50 to 250	0.031
EPS 70 grey 030		0.030

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 (mm)					
	215 mm brickwork, λ = 0.56 ($W \cdot m^{-1} \cdot K^{-1}$)			200 mm dense blockwork, λ = 1.75 ($W \cdot m^{-1} \cdot K^{-1}$)		
	EPS 70 white 038	EPS 70 grey 031	EPS 70 grey 030	EPS 70 white 038	EPS 70 grey 031	EPS 70 grey 030
0.18	210	170	160	210	180	170
0.19	190	160	150	200	160	160
0.25	140	110	110	150	120	120
0.26	130	110	100	140	120	110
0.28	120	100	100	130	110	100
0.30	110	90	90	120	100	90
0.35	90	70	70	100	80	80

(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, 10 mm thick with λ = 0.04 $W \cdot m^{-1} \cdot K^{-1}$ 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 bonded system that included 4.6 galvanized steel fixings per square metre with a point thermal transmittance (χ_p) of 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. A gap correction (ΔU) 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 from 0.13 to 0.16 $W \cdot m^{-2} K^{-1}$ depending on insulation type and wall type.

6.3 The system can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between external walls and other elements. 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, a partial factor of 1.5 must be applied to the calculated characteristic wind load 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 tensile strength of the insulation (see section 7.8)
- the bond between the adhesive and the insulation interface(3) (see section 7.9)
- the bond between the substrate and adhesive interface[3] (see section 7.10).

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

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

(3) The percentage of adhesive coverage should be considered.

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 The characteristic tensile resistance of the insulation material may be taken as 100 kN·m^{-2} and should be divided by a partial material factor of 2.5 to establish the ultimate design resistance of the insulation ($Rd_{t.ins}$).

7.9 The characteristic bond resistance between the adhesive and the insulation derived from test results was 80 kN·m^{-2}(1). The design resistance of the bond between the adhesive and insulation (N_{RD2}) should be taken as this value divided by a partial factor of 9.

(1) The minimum bonded surface area (A_{min}) should not be less than 40%.

7.10 The characteristic bond resistance between the substrate and the adhesive derived from test results was 80 kN·m^{-2}(1)(2)(3). The design resistance of the bond between the substrate and the adhesive (N_{RD3}) should be taken as the characteristic resistance divided by a partial factor of 9.

(1) The bond between the substrate and the adhesive from the test should have a minimum failure resistance of 250 kN·m^{-2} after the adhesive has fully cured and in dry conditions, in accordance with ETAG 004 : 2013. The minimum failure resistance value is based on a minimum 28 day curing time of the test sample.

(2) The results from tests carried out on site for the bond (while the adhesive is curing) between the substrate and the adhesive should be at least equal to 80 kN·m^{-2}.

(3) The minimum bonded surface area (Amin) should not be less than 40%.

7.11 The number and spacing of the supplementary fixings should be determined by the Certificate holder. 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. However, since the characteristic pull-out resistance values are dependent on the substrate type, the fixing must be selected to suit the specific loads and substrate(1).

(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. If this is not the case, site-specific pull out tests must be carried out.

7.12 The data obtained from sections 7.7 to 7.10 must be assessed against the design wind load and the following expression must be satisfied(1)(2):

For safe design:

$Rd \geq W_e$

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

$Rd_{t.ins}$ = characteristic tensile strength of insulation/2.5

$Rd_{b.adh/ins} = A_{min} * N_{RD2}$

$Rd_{b.sub/adh} = A_{min} * N_{RD3}$

Where:

Rd	is the design ultimate resistance (kN·m^{-2}) taken as the minimum of $Rd_{b.ins/rend}$, $Rd_{t.ins}$, $Rd_{b.adh/ins}$ and $Rd_{b.sub/adh}$
W_e	is the applied ultimate wind load (kN·m^{-2})
$Rd_{b.ins/rend}$	is the bond design resistance between the insulation and render (kN·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 tests (kN·m^{-2})
$Rd_{b.adh/ins}$	is the bond design resistance between the insulation and adhesive (kN·m^{-2})
A_{min}	is the minimum bonded surface area (based on % area covered)
N_{RD2}	is the design bond resistance between insulation and adhesive based on tests (kN·m^{-2})
$Rd_{b.sub/adh}$	is the design bond resistance between the substrate and adhesive (kN·m^{-2})
N_{RD3}	is the design bond resistance between the substrate and adhesive based on tests (kN·m^{-2})

(1) If the minimum design resistance (Rd) calculated in 7.7 to 7.10 is less than the design wind pressure, the bonded surface area (A_{min}) should be increased.

(2) If the minimum bonded surface area required to resist the design wind load is higher than 100%, the system would need to be mechanically fixed and therefore should not be installed: mechanically fixed system requirements have not been assessed with this Certificate.

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 4 of this Certificate.

Table 4 System impact resistance

	Category[1]
Rendering system: Ceresit CT 85 (basecoat) + finishing coats indicated below:	Ceresit CT 325 Single-layer mesh (see section 1.1 – Reinforcement)
Ceresit CT 35, Ceresit CT 136, Ceresit CT 137 (mineral finishing coats)	Category III
Ceresit CT 60, Ceresit CT 63, Ceresit CT 64 (acrylic finishing coats)	Category II
Ceresit CT 72, Ceresit CT 73 (silicate finishing coats)	Category II
Ceresit CT 74, Ceresit CT 75 (silicone finishing coats)	Category II
Ceresit CT 174, Ceresit CT 175 (silicate-silicone finishing coats)	Category II
Rendering system: Ceresit CT 87 (basecoat) + finishing coats indicated below:	
Ceresit CT 136 (mineral finishing coat)	Category III
Ceresit CT 136 (mineral finishing coat)	Category III
Ceresit CT 60 (acrylic finishing coat) + Ceresit CT 42 (paint)	Category II
Ceresit CT 72 (silicate finishing coat)	Category II
Ceresit CT 72 (silicate finishing coat) + Ceresit CT 54 (paint)	Category II
Ceresit CT 74 (silicone finishing coat) + Ceresit CT 48 (paint)	Category III
Ceresit CT 174 (silicate/silicone finishing coat)	Category III

(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 of the system is class B-s1, d0 in accordance with BS EN 13501-1 : 2007.

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

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

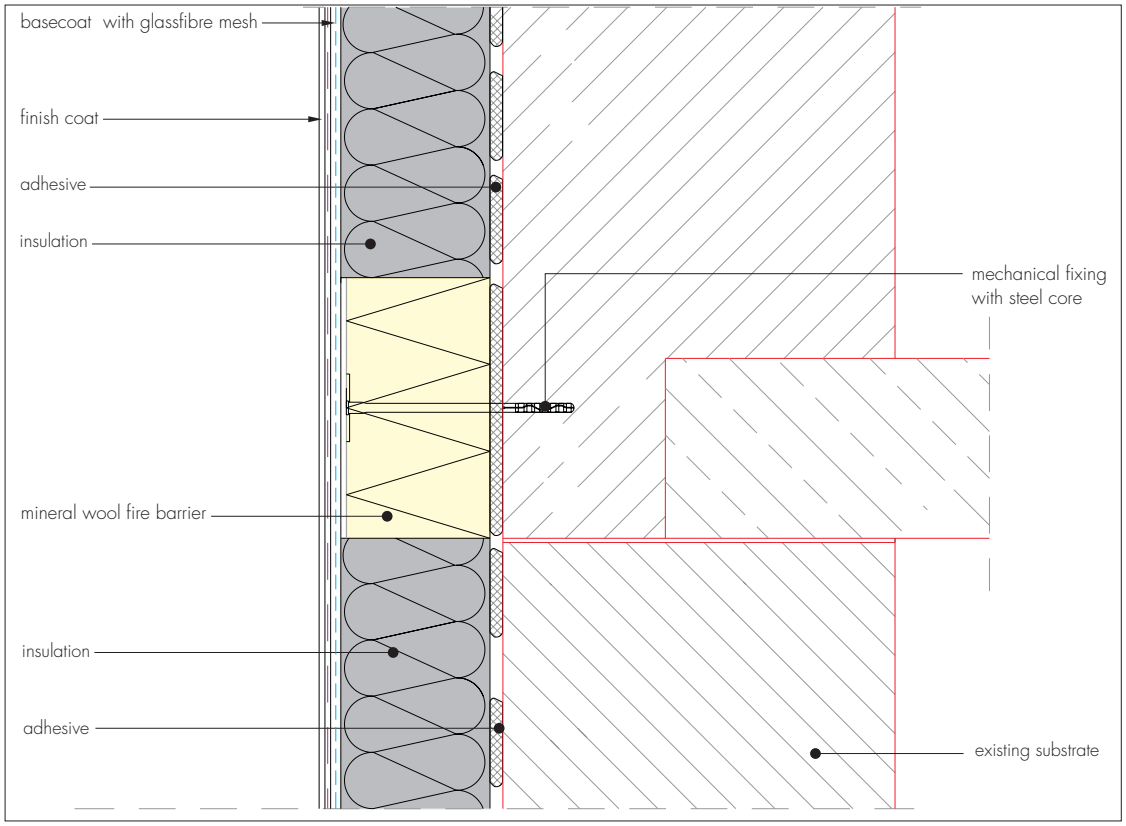
8.4 For houses in Scotland, and for all buildings in England and Wales and Northern Ireland, the system is considered suitable for use on, or at any distance from, the boundary.

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

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

8.7 For application to second storey walls and above, it is recommended that the designer considers at least one stainless steel fixing per square metre and fire barriers in line with compartment walls and floors as advised in BRE Report BR 135 : 2013 (see Figure 2 of this Certificate).

Figure 2 Fire barrier details



9 Proximity of flues and appliances

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

England and Wales — Approved Document J

Scotland — Mandatory Standard 3.19, clause 3.19.4[1][2]

(1) Technical Handbook (Domestic)

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L

10 Water resistance

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

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

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

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

11 Risk of condensation

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

Surface condensation

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

11.3 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2011, Section 4 and Annex G, and BRE Report BR 262 : 2002.

Interstitial condensation

11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, section 4 and Annexes D and G.

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

Table 5 Water vapour resistance factor and equivalent air layer thickness

	s_d (m)	μ
Expanded polystyrene - insulation thickness 50 mm to 250 mm (white and grey EPS 70)	—	20 – 40[1]
Rendering system: Ceresit CT 85 basecoat[2] plus, as appropriate, primer + finish coat (specific particle size) + decorative coat[3] indicated below		
Ceresit CT 16 + Ceresit CT 35 (particle size 3.5 mm)	0.23	—
Ceresit CT 136 (excluding spar dash)	0.23	—
Ceresit CT 16 + Ceresit CT 137 (particle size 2.5 mm)	0.17	—
Ceresit CT 16 + Ceresit CT 60 (particle size 2.5 mm)	0.32	—
Ceresit CT 16 + Ceresit CT 60 (particle size 1.5 mm)	0.41	—
Ceresit CT 16 + Ceresit CT 63 (particle size 3 mm) + Ceresit CT 44 (paint)	0.43	—
Ceresit CT 16 + Ceresit CT 64 (particle size 2 mm)	0.26	—
Ceresit CT 15 + Ceresit CT 72 (particle size 2.5 mm)	0.15	—
Ceresit CT 15 + Ceresit CT 73 (particle size 3 mm)	0.16	—
Ceresit CT 16 + Ceresit CT 74 (particle size 1.5 mm)	0.26	—
Ceresit CT 16 + Ceresit CT 74 (particle size 2.5 mm)	0.28	—
Ceresit CT 16 + Ceresit CT 75 (particle size 3 mm)	0.34	—
Ceresit CT 16 + Ceresit CT 174 (particle size 2 mm)	0.19	—
Ceresit CT 16 + Ceresit CT 175 (particle size 2 mm)	0.20	—
Ceresit CT 16 + Ceresit CT 175 (particle size 2 mm) + Ceresit CT 54 (paint)	0.21	—
Ceresit CT 16 + Ceresit CT 175 (particle size 2 mm) + Ceresit CT 48 (paint)	0.29	—
Ceresit CT 16 + Ceresit CT 175 (particle size 2 mm) + Ceresit CT 44 (paint)	0.37	—
Rendering system: Ceresit CT 85 basecoat[2], + decorative coat[3] indicated below		
Ceresit CT 42 (acrylic paint)	0.14	—
Ceresit CT 44 (acrylic paint)	0.17	—
Ceresit CT 48 (silicone paint)	0.09	—
Ceresit CT 54 (silicate paint)	0.08	—
Rendering system: Ceresit CT 87 basecoat[2] + finish coat (specific particle size), + decorative coat[3] as indicated below		
Ceresit CT 72 (particle size 1.5 mm)	0.17	—
Ceresit CT 72 (particle size 1.5 mm) + Ceresit CT 54 (paint)	0.17	—
Ceresit CT 174 (particle size 1.5 mm)	0.20	—
Ceresit CT 174 (particle size 1.5 mm) + Ceresit CT 44 (paint)	0.46	—

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

(2) Applied to a thickness of between 3 mm to 4 mm.

(3) Results based on 2 coats of decorative paint finish, with a nominal thickness of 80 to 120 microns.

12 Maintenance and repair

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

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

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

13 Durability

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

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

13.3 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.

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

Installation

14 Site survey and preliminary work

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

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

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the bond strength between the adhesive and the substrate and be satisfied that the pull-out resistance of the proposed supplementary mechanical fixings from the substrate is adequate. An assessment and recommendation should be made on the minimum bond strength and type and number of fixings required to withstand the building's expected wind loading based on calculations using the test site data in accordance with section 7 of this Certificate.

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

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

14.5 Where surfaces are covered with an existing rendering, it is essential that the bond between the background and the render is adequate. All loose areas should be hacked off and reinstated.

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

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

15 Approved Installers

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

- employing operatives who have been trained and approved by the Certificate holder to install the system and 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[1] or above 30°C[1], 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.

(1) Ceresit CT 84 polyurethane adhesive can be applied within a temperature range of 0°C to 40°C.

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

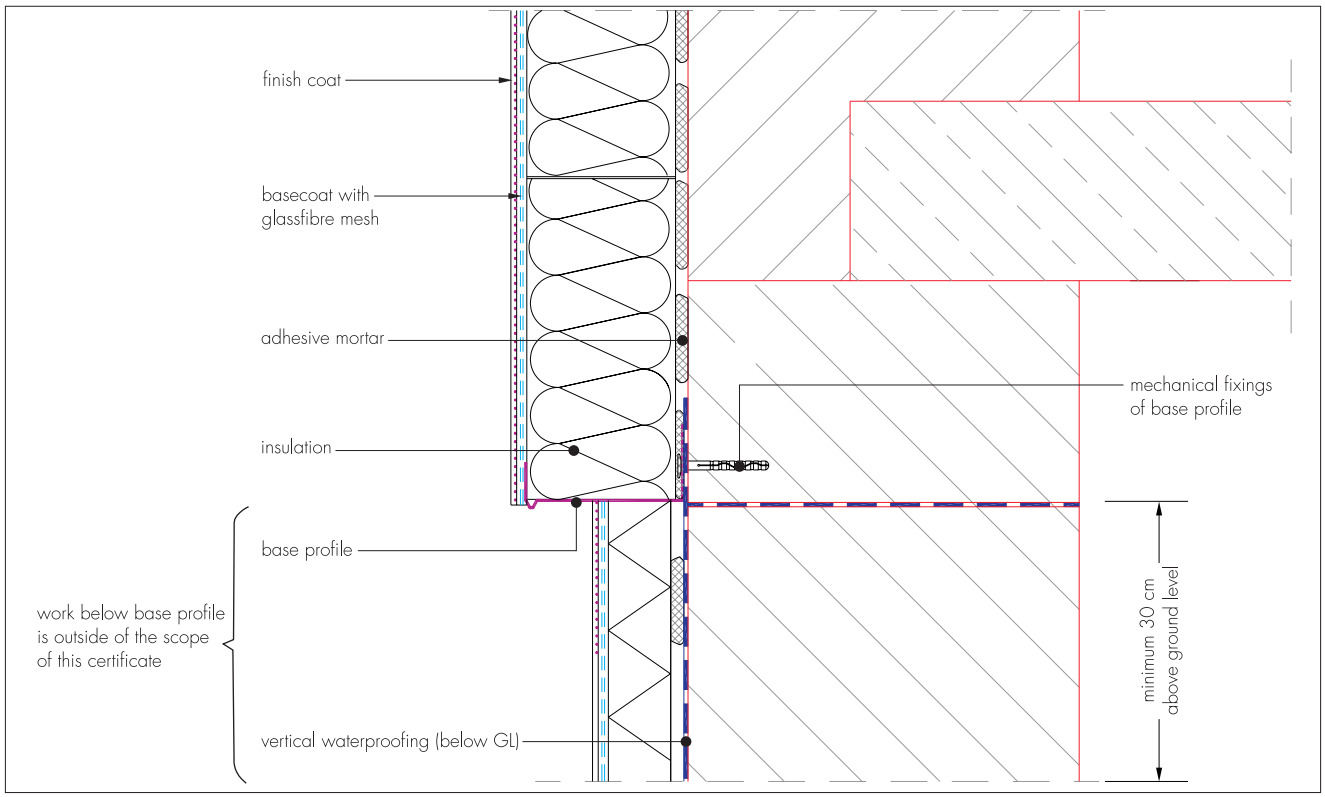
16.4 The primers should be used where required (see section 1.1 Basecoat).

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

Positioning and securing insulation boards

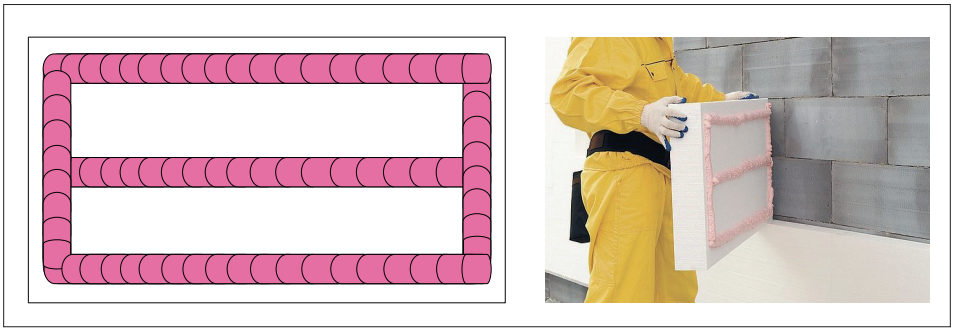
16.6 The base profile is secured to the external wall above the dpc using the approved profile fixings at approximately 300 mm centres (see Figure 3). Base rail connectors are inserted at all rail joints. Extension profiles are fixed to the front lip of the base rail or stop end channel where appropriate.

Figure 3 Typical section of base profile



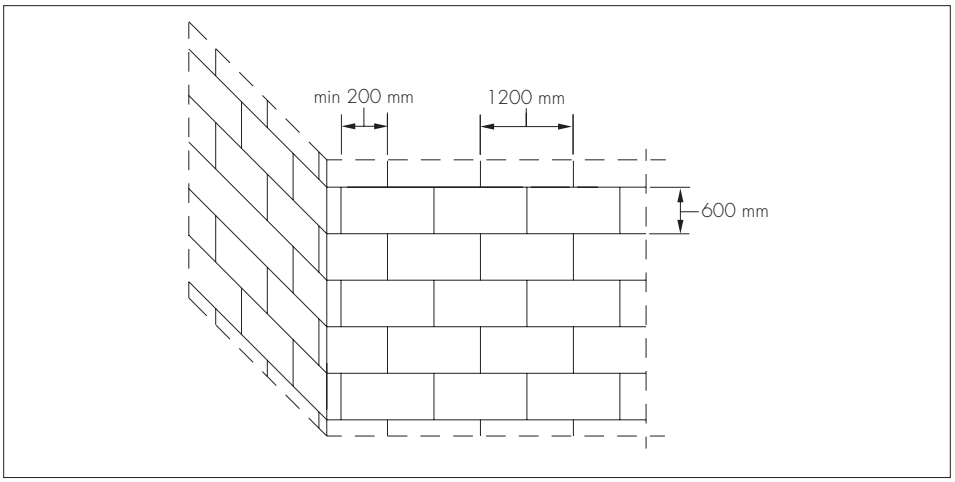
16.7 The insulation board adhesive is a polyurethane foam adhesive, which is applied by gun (after intensively shaking the container for several seconds). The adhesive is applied in a continuous line around the perimeter of the board, approximately 20 mm from the edge, with an additional single strip running along the centre for the full length of the board (see Figure 4). The amount of adhesive should cover at least 40% of the board after boards have been pressed against the wall.

Figure 4 Insulation boards adhesive pattern



16.8 The first run of insulation boards (with adhesive applied) are placed one by one on the base profile. The boards must be pressed firmly against the wall and butted tightly together and aligned to achieve a level finish. Subsequent rows of boards are positioned so that the vertical board joints are staggered and overlapped at the building corners and so that the board joints do not occur within 200 mm of the corners of openings (see Figure 5). Joints between boards greater than 2 mm should be filled with slivers of insulation board or low density polyurethane foam. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting boards to fit. Any high spots or irregularities are removed by lightly planing with a rasp over the whole surface. Alignment should be checked as work proceeds.

Figure 5 Typical arrangement of insulation boards



16.9 After the adhesive has fully set (approximately 2 hours), supplementary mechanical fixings are applied through the insulation board into the substrate wall as described in section 16.10. The number of fixings should be increased as required (such as in corner zones of the building), depending on the location of the building, wind load calculation and the installation height. Details of supplementary mechanical fixings (including their layout on the insulation boards) are based on pull-out test results, substrate type and wind loading data.

16.10 Holes are drilled through the insulation into the substrate wall to the required depth, one fixing in the centre of the insulation board and one on either side of this fixing, in a horizontal line. For a typical installation, after allowing for extra fixings in the end zones of the building, the average number of supplementary mechanical fixings is equal to 4.6 fixings per square metre for an installation height of up to 15 metres. Around openings, additional fixings should be installed as determined by the system designer. The mechanical fixings are inserted and tapped firmly into place, securing the boards to the substrate.

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

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

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

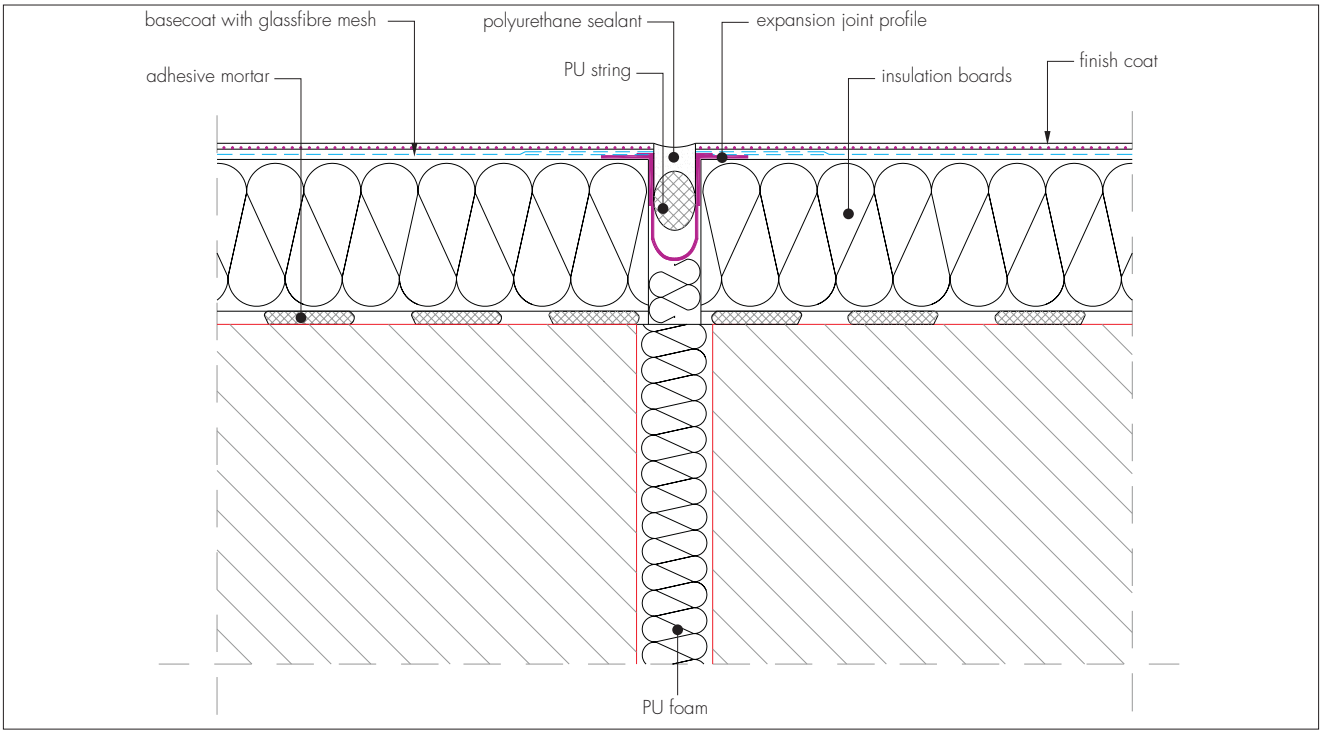
16.14 Prior to the application of the render system, a bead of joint sealant is gun-applied at window and door frames, overhanging eaves, gas and electric meter boxes, and wall vents, or where the render abuts any other building material or surface.

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

Movement joints

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

Figure 6 Vertical movement joint details



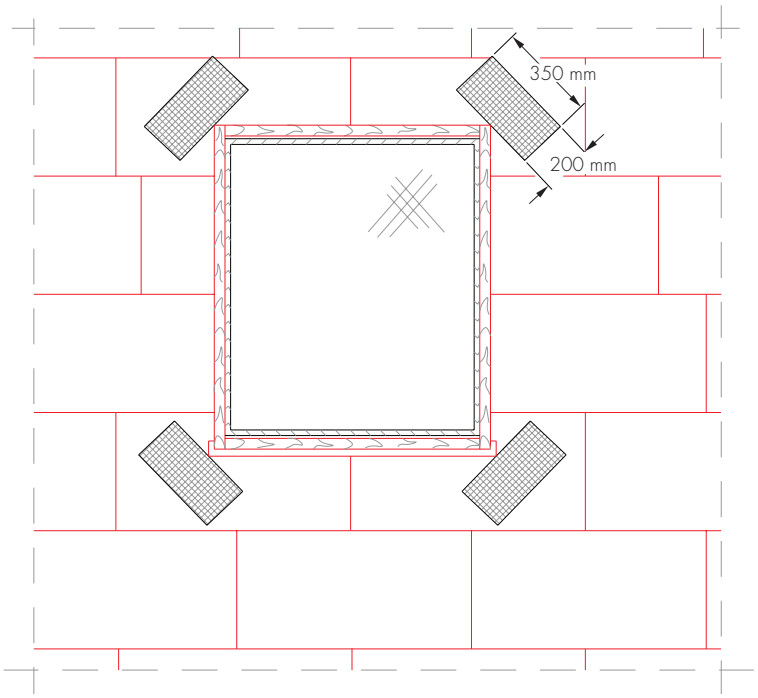
16.17 The basecoat is prepared with the required amount of water (see section 1) then applied over the insulation boards using a stainless steel trowel, and floated with a Darby float to an approximate thickness of 3 mm. The reinforcement mesh (with its concave surface to the wall) is immediately embedded into the basecoat by trowelling from the centre to the edge and an additional light coat of basecoat is applied (whilst the first coat is still wet) to ensure the mesh is free of wrinkles. Further basecoat is then applied as required, to ensure the mesh is completely covered and to ensure a minimum thickness of the basecoat of 4 mm is achieved whilst ensuring that the mesh is placed in the top one third of basecoat.

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

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

16.20 In all cases, additional pieces of reinforcing mesh (approximate size 350 mm by 200 mm) should be used diagonally at the corners of openings, as shown in Figure 7. For areas requiring extra resistance to impact, two mesh layers should be used and applied in two stages.

Figure 7 Additional reinforcement of openings



16.21 Once the whole wall is completed, the basecoat (with mesh embedded) is left to dry for at least 2 days before applying a second coat. The drying time will depend upon the conditions, but an additional 24 hours should elapse before primer and finishing coats are applied. The overall thickness of the reinforced basecoat must be greater than 4 mm.

Primer

16.22 Where required (see section 1.1 *Basecoat*) the primer coat is roller-applied, or applied with long-hair brushes, after the basecoat has dried, first ensuring that it is free from any irregularities (trowel-marks, exposed mesh, etc). It is recommended that the colour of the primer corresponds to the colour of the finish coat.

Finishing

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

16.24 The basecoat and the primer should be thoroughly dry before application of the finish coat. The drying time will depend upon the conditions, but at least 48 hours should elapse before applying the finish coats.

16.25 The render finishes are applied to the required thicknesses (see section 1.1 *Finishing coats*), 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.

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

16.27 At the top of walls, the system should be protected by an adequate overhang (see Figure 8) or by an adequately sealed purpose-made flashing. Care should be taken in the detailing of the system around openings and projections (see Figures 9, 10, 11 and 12).

Figure 8 Roof eaves details

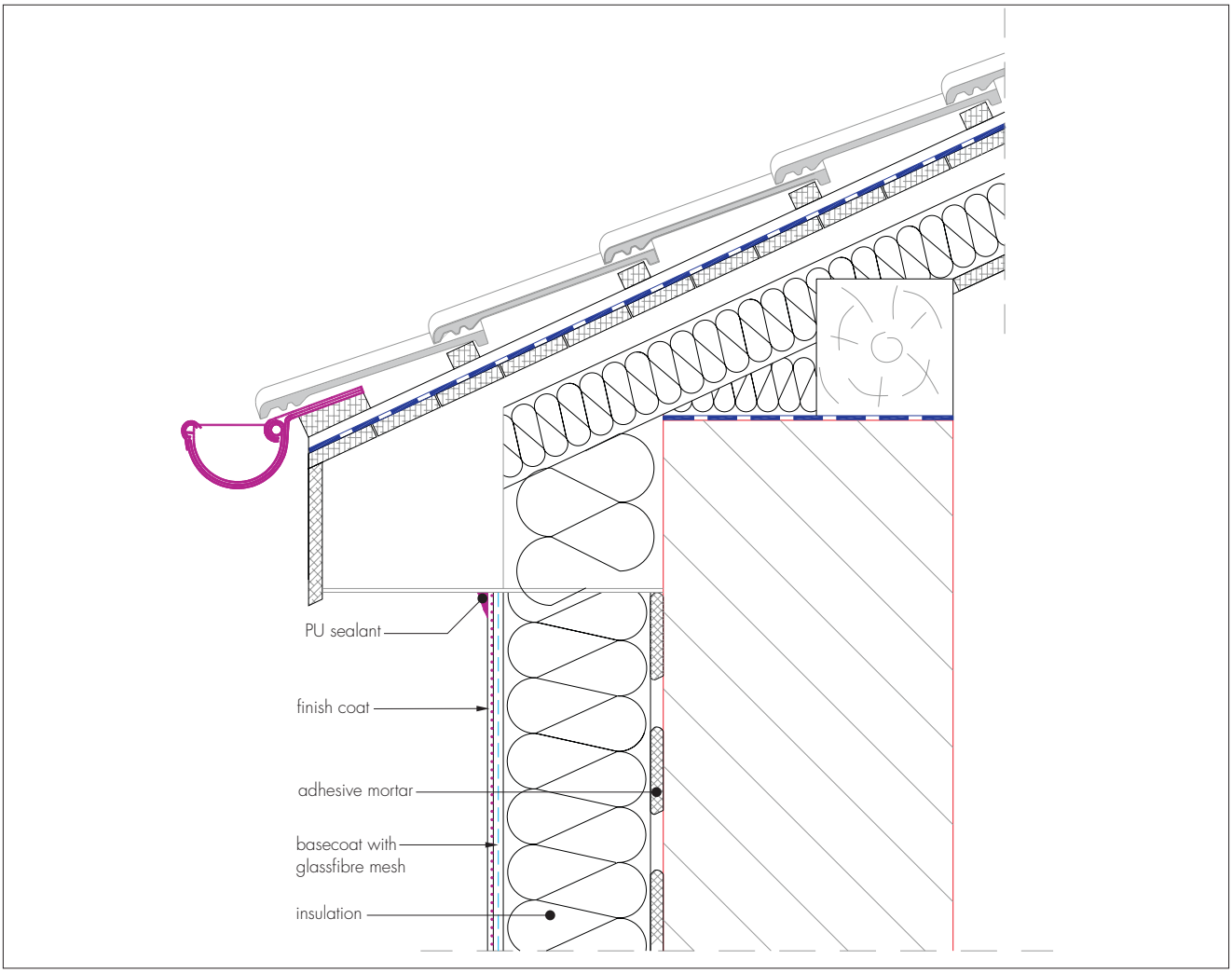


Figure 9 Insulated window reveal details

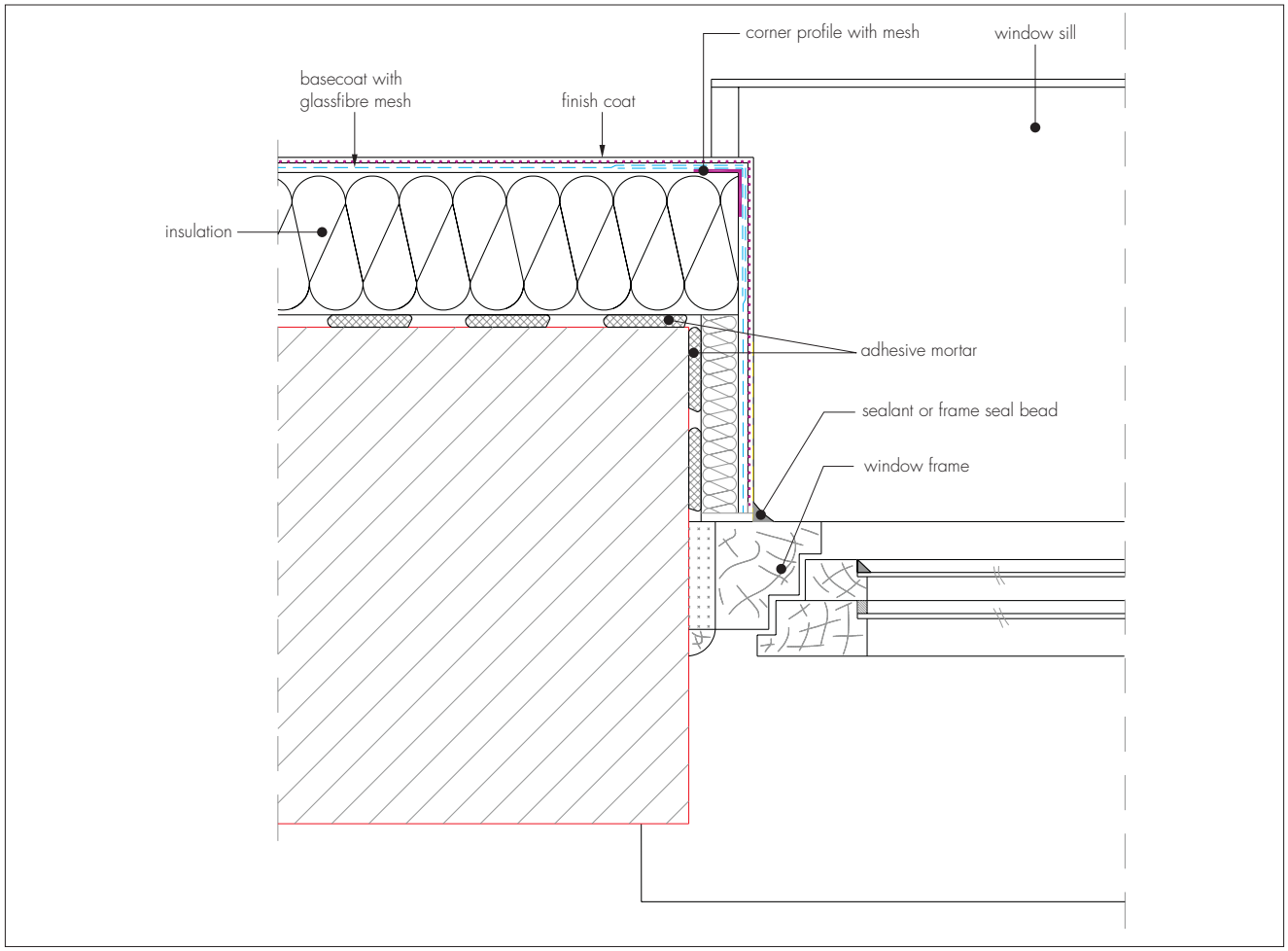


Figure 10 Insulated window head details

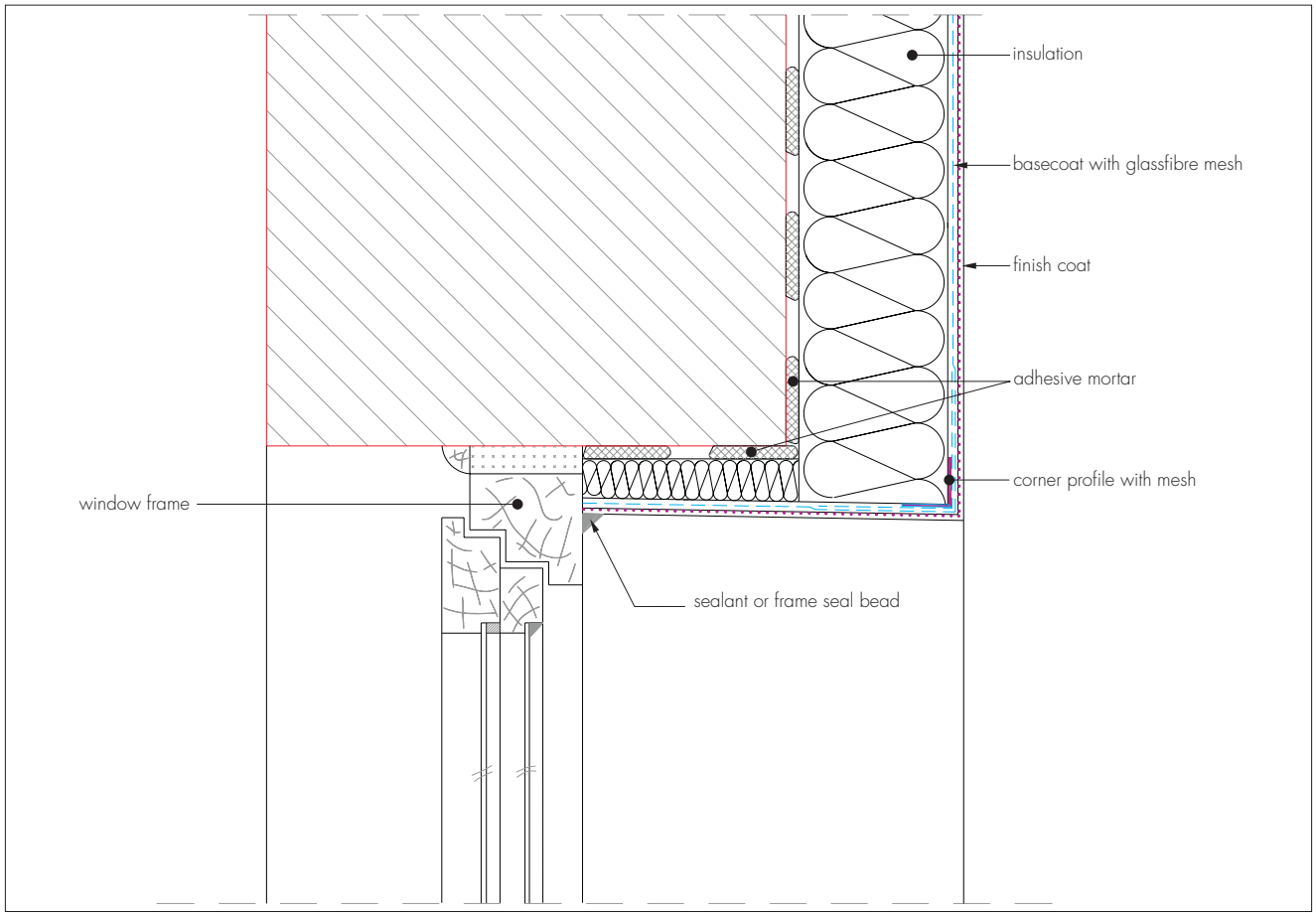


Figure 11 Window sill details

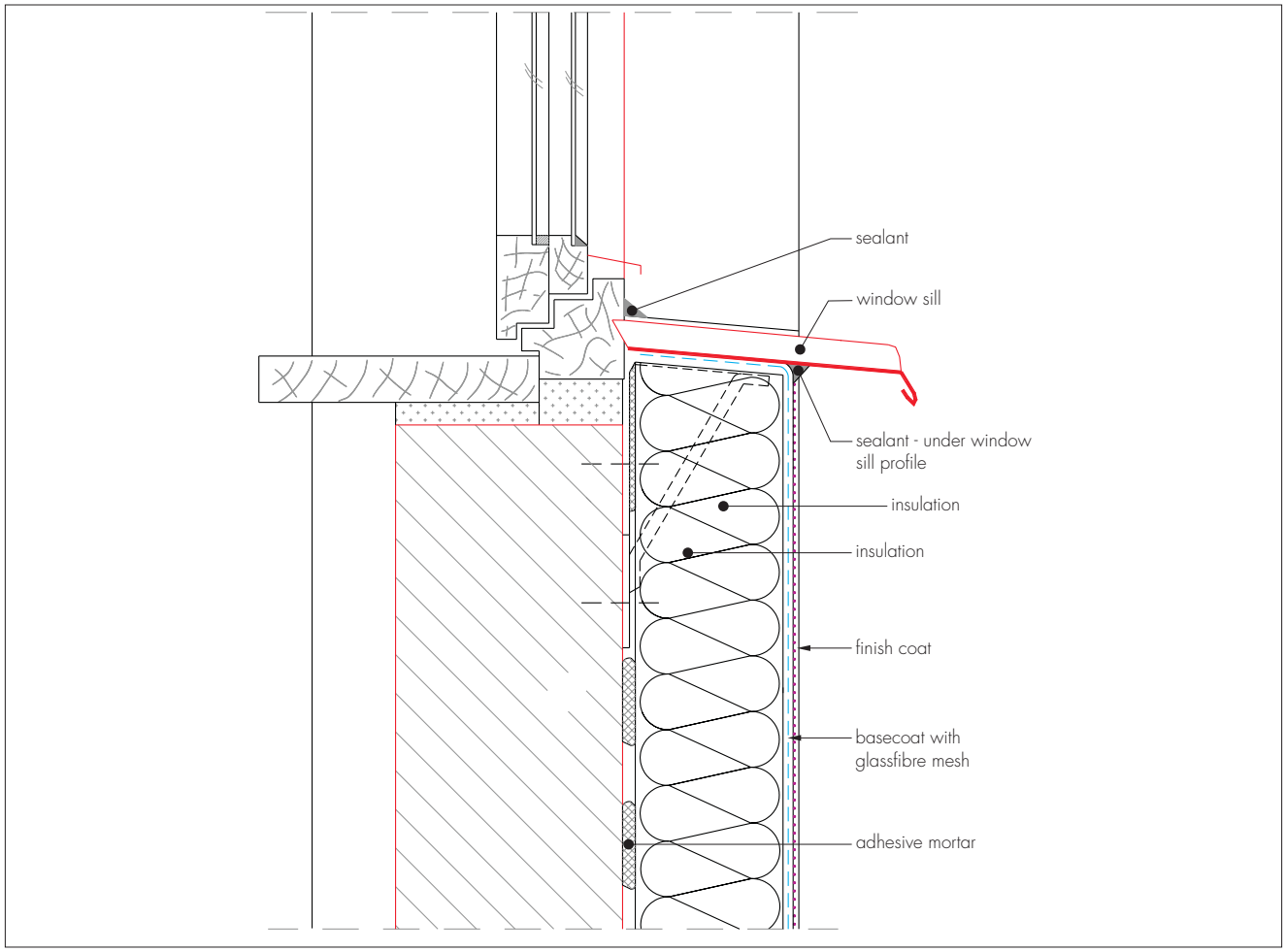
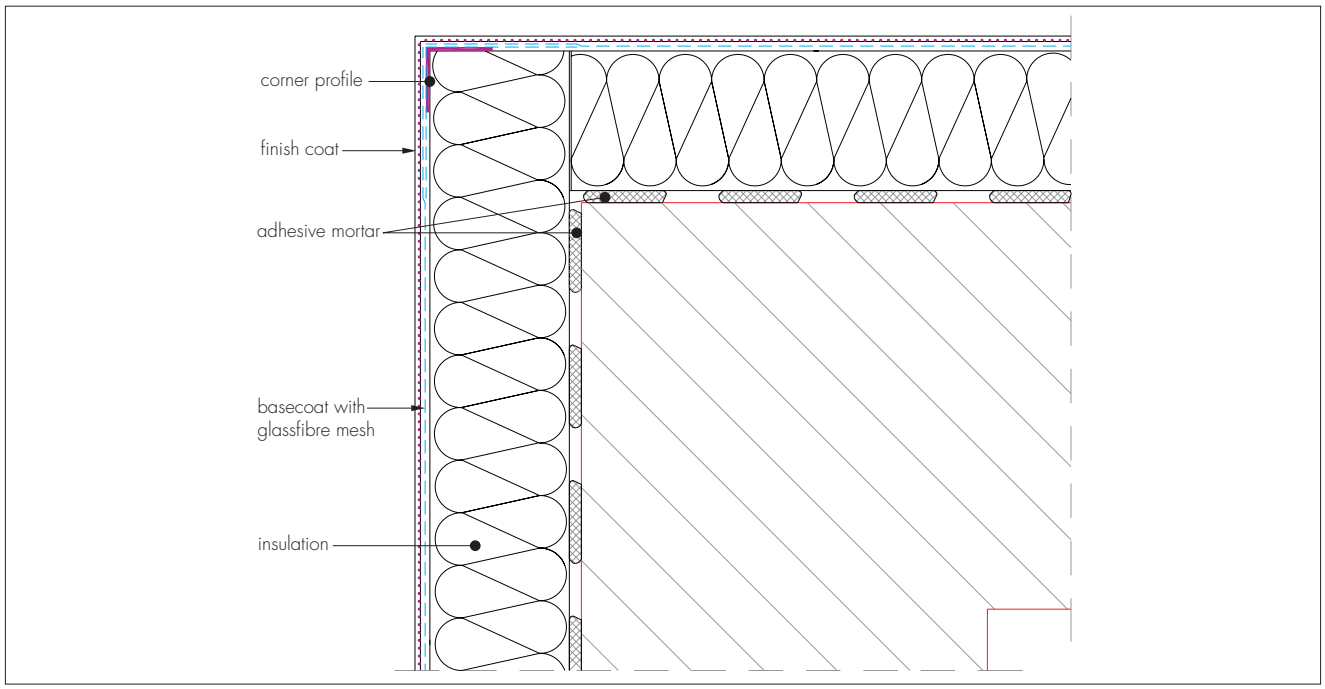


Figure 12 Building corner details



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

17 Investigations

17.1 An examination was made of data relating to:

- fire performance
- bond strength
- hygrothermal performance
- resistance to frost
- resistance to impact
- water vapour permeability.
- reaction to fire
- thermal conductivity
- the risk of interstitial condensation.

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.

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

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

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ETAG 004 : 2013 *Guideline for European Technical Approval of Plastic Anchors for fixing of External ThermalComposite 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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