Baumit UK Ltd
4200 Waterside Centre
Solihull Parkway
Birmingham Business Park
Birmingham B37 7YN
Tel: 0333-358 3434 Fax: 0843-557 7666
e-mail: info@baumit.co.uk
website: www.baumit.co.uk

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
13/5082
Product Sheet 1

BAUMIT EXTERNAL WALL INSULATION SYSTEMS

BAUMIT EPS/XS022 EXTERNAL WALL INSULATION SYSTEMS

This Agrément Certificate Product Sheet(1) relates to the Baumit EPS/XS022 External Wall Insulation Systems, comprising bonded, and supplementary mechanically-fixed, expanded polystyrene (EPS), Platinum EPS or phenolic (XS022) insulation boards with a reinforced basecoat and render finishes, and suitable for use on new and existing 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 meeting the 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 B-s2, d0 or B-s1, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007, depending on the insulation chosen (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 should 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: 27 January 2014

John Albon — Head of Approvals
Energy and Ventilation

Claire Curtis-Thomas
Chief Executive

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

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

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA
tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk
©2014

Regulations

In the opinion of the BBA, the Baumit EPS/XS022 External Wall Insulation Systems, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



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

Requirement:	A1	Loading
Comment:		The systems can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The systems can satisfy or contribute to satisfying this Requirement. See sections 8.1 to 8.4 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The systems 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 *Installation* part of this Certificate.
Regulation:	26	CO_2 emission rates for new buildings
Comment:		The systems will enable, or contribute to enabling, a wall to satisfy the U value requirement. 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 12.1, 13.1 and the *Installation* 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 section 7.4 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The systems are regarded as 'low risk' and, therefore, 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 the requirements of 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:	3.10	Precipitation
Comment:		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:	3.15	Condensation
Comment:		The systems will satisfy the requirements of this Standard, with reference to clauses 3.15.1(1)(2), 3.15.4(1)(2) and 3.15.5(1)(2). See sections 11.3 and 11.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Buildings insulation envelope
Comment:		The 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:	7.1(a)(b)	Statement of sustainability
Comment:		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 systems can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clause 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 sections 6.2 and 6.3 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for this product 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 systems are acceptable. See section 13.1 and the *Installation* part of this Certificate.

Regulation:	28(b)	Resistance to moisture and weather
Comment:		The systems provide a degree of protection against rain ingress. See sections 4.4 and 10.1 of this Certificate.
Regulation:	29	Condensation
Comment:		The systems can contribute to minimising the risk of interstitial and surface condensation. See sections 11.2 and 11.4 of this Certificate.
Regulation:	30	Stability
Comment:		The systems can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The systems can satisfy or contribute to satisfying this requirement. See sections 8.1 to 8.4 of this Certificate.
Regulation:	39(a)(i)	Conservation measures.
		The systems can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.
Regulation:	40	Target carbon dioxide emission rate
Comment:		The systems 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 Baumit EPS/XS022 External Wall Insulation Systems, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 6 *Superstructure (excluding roofs)*, Chapter 6.9 *Curtain walling and cladding*.

Technical Specification

1 Description

1.1 Baumit EPS/XS022 External Wall Insulation Systems comprise expanded polystyrene (EPS) or phenolic (XS022) insulation boards bonded, and supplementary mechanically-fixed, to the substrate wall, and glassfibre reinforcing mesh with render finishes.

1.2 The systems (see Figure 1) comprise:

Adhesive

- Baumit StarContact, Baumit StarContact Forte and Baumit Open contact — factory prepared dry powder mortars to BS EN 998-1 : 2010, as an adhesive bonding agent and reinforcing basecoat. Baumit Open contact is only used with Baumit EPS 70 and Platinum EPS 70E.

Insulation

- Baumit EPS 70, standard white expanded polystyrene insulation boards — 1200 mm by 600 mm, with a range of thicknesses between 20 mm and 350 mm, with a nominal density of 15 $kg \cdot m^{-3}$, a minimum compressive strength of 70 kPa, and a nominal tensile strength perpendicular to the face of 100 kPa
- Baumit Platinum EPS 70E, grey expanded polystyrene insulation boards — 1200 mm by 600 mm, with a range of thicknesses between 20 mm and 350 mm, with a nominal density of 16 $kg \cdot m^{-3}$ to 18 $kg \cdot m^{-3}$, a minimum compressive strength of 70 kPa, and a nominal tensile strength perpendicular to the face of 100 kPa
- Baumit XS022 phenolic board — 1200 mm by 600 mm, with a range of thicknesses from 30 mm to 200 mm, a nominal density of 40 $kg \cdot m^{-3}$, a minimum compressive strength of 150 kPa, and a nominal tensile strength perpendicular to the face of 80 kPa.

Mechanical fixings (supplementary)

- supplementary mechanical fixings — proprietary external wall insulation fixings of adequate length to suit the substrate and insulation thickness, and supplied by the Certificate holder:
  - — Fischer Termoz 8 U
  - — Fischer Termoz 8 N
  - — Hilti Dämmstoffdübel SD-FV 8
  - — Hilti Dämmstoff-Befestigungselement XI-FV
  - — Hilti SX FV
  - — Ejot Ejotherm STR U
  - — Ejot Ejotherm NT U
  - — Hilti WDVS-Schraudübel D-FV and D-FV T
  - — ETA approved anchors of similar or better characteristics.

Basecoat

- Baumit StarContact Forte — a factory-prepared dry powder mortar to BS EN 998-1 : 2010 as adhesive bonding agent and reinforcing basecoat. For use in all standard applications, using a thickness of between 5 mm and 8 mm with a reinforcement mesh
- Baumit StarContact — a factory-prepared dry powder mortar to BS EN 998-1 : 2010 as adhesive bonding agent and reinforcing basecoat. For use in standard applications with EPS boards, using a thickness of between 3 mm and 4 mm with a reinforcing mesh. For use in high impact areas, in both EPS and phenolic insulation boards, using two coats of thickness between 3 mm and 4 mm, each with a reinforcement mesh
- Baumit Open contact — a factory-prepared dry powder mortar to BS EN 998-1 : 2010 as adhesive bonding agent and reinforcing basecoat. For use in standard applications with EPS boards, using a thickness of between 3 mm and 4 mm with a reinforcing mesh. For use in high impact areas, in EPS insulation boards, using two coats of thickness between 3 mm and 4 mm, each with a reinforcement mesh.

Reinforcement

- standard reinforcement mesh — one-metre wide alkali-resisting glassfibre mesh with a nominal weight of 160 $g \cdot m^{-2}$, and with an aperture size of approximately 4 mm by 4 mm
- Panzer mesh — a heavy-duty alkali and slip-resistant glassfibre mesh, with a mass per unit area of approximately 300 $g \cdot m^{-2}$ and a mesh size of approximately 6 mm by 6 mm.

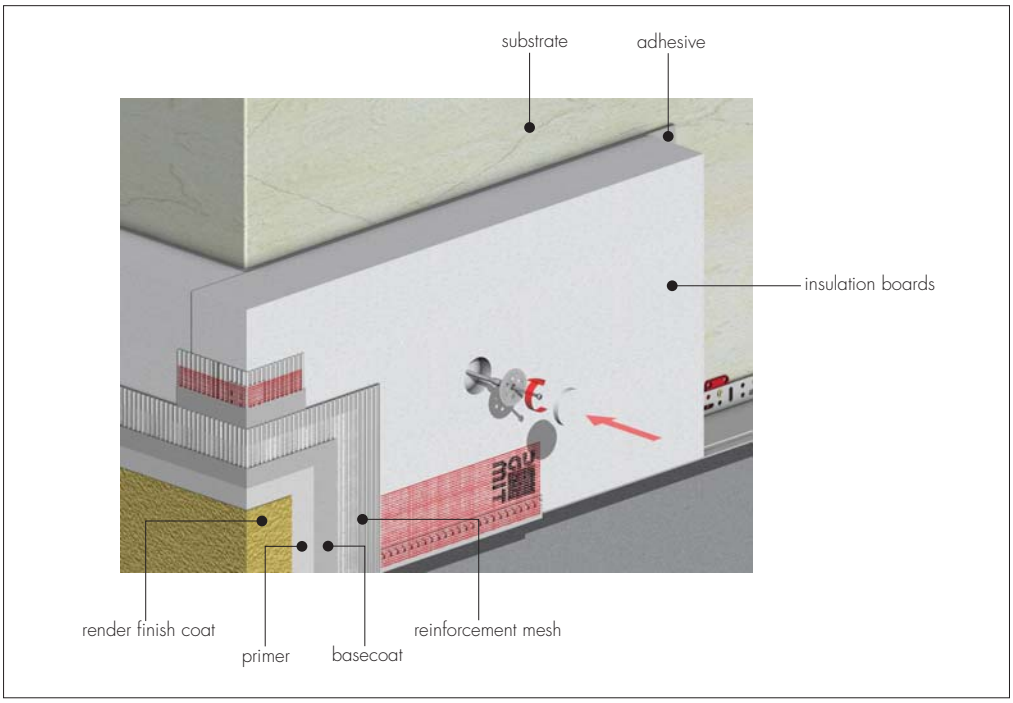
Primer

- Baumit UniPrimer — ready-to-use acrylic-based liquid primer as absorption compensator and bonding agent.

Finishes

- Baumit NanoporTop — a synthetic paste, ready-to-use mineral decorative topcoat render. To be used with phenolic insulation only
- Baumit SilikatTop — a synthetic paste, ready-to-use silicate decorative topcoat render
- Baumit SilikonTop — a synthetic paste, ready-to-use silicone resin decorative topcoat render
- Baumit Edelputz Spezial — a mineral render of factory-prepared dry powder mortar to BS EN 998-1 : 2010 for a topcoat decorative finish as a plain, scratched or freestyle textured finish depending on aggregate size. Maximum grain sizes of 1 mm, 2 mm, 3 mm, 4 mm and 5 mm
- Baumit StyleTop — a synthetic paste ready-to-use organic resin decorative topcoat render. To be used with EPS insulation only
- Baumit GranoporTop — a synthetic paste ready-to-use organic resin decorative topcoat render.

Figure 1 Baumit EPS/XS022 External Wall Insulation System



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

- profiles — a range of standard PVC, aluminium, stainless steel and galvanized steel profiles for use at wall base, stop ends and movement joints
- profile fixings — a range of fixings available to suit insulation thickness and substrate type, including stainless steel screws, polypropylene plug type with steel expansion pins or plastic expansion sleeves, and integral plastic finned nails with disc heads

- joint seal — compressible waterproofing sealing tape
- XPS insulation.

1.4 EPS, Platinum EPS or phenolic insulation boards are primarily bonded to the external surfaces of the walls using 40% adhesive coverage of the insulation board. Supplementary mechanical fixings are added to support the board in place while the adhesive is setting. Basecoat render is trowel-applied to the board face to an approximate thickness of between 2 mm and 3 mm including a layer of embedded mesh reinforcement. For high impact areas a further layer of basecoat render with embedded mesh is applied to a total thickness of approximately from 4 mm to 6 mm. When dry, the primer is applied for the application of the decorative finish coat.

2 Manufacture

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

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

3 Delivery and site handling

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

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

Table 1 Component supply details

Component	Quantity and package
Insulation boards	Polythene shrink-wrapped package
Baumit StarContact, Baumit Open contact, Baumit StarContact Forte — basecoat	25 kg bag
Standard reinforcement mesh Panzer reinforcement mesh	1 m x 50 m roll
Baumit UniPrimer — primer	25 kg bucket
Baumit Edelputz Spezial — mineral render	25 kg bag
Baumit NanoporTop, Baumit SilikatTop, Baumit SilikonTop, Baumit StyleTop, Baumit GranoporTop — synthetic paste renders	25 kg bucket
Mechanical fixings	Boxed by manufacturer

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

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

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

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Baumit EPS/XS022 External Wall Insulation Systems.

Design Considerations

4 General

4.1 Baumit EPS/XS022 External Wall Insulation Systems, when installed in accordance with this Certificate, are effective in reducing the thermal transmittance (U value) of the external masonry walls of new and existing buildings. It

is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from the systems. Only details specified by the Certificate holder should be used.

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

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



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

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

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

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

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

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

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

5 Practicability of installation

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

Note: The BBA operates a UKAS accredited Approved Installer Scheme for external wall insulation; details of approved installer companies approved 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 thermal conductivity (λ_D *value*) of the insulation material given in Table 2.

Table 2 Thermal conductivity values

Insulation	λ_D *value* ($W \cdot m^{-1} \cdot K^{-1}$)
EPS 70	0.038
Platinum EPS 70E	0.030
XS022 (phenolic)	0.020



6.2 The U value of a completed wall will depend on the selected insulation thickness and fixing method, the insulation value of the substrate masonry and its internal finish. Figures for typical design U values, calculated in accordance with section 6.1, are given in Table 3.

Table 3 Insulation thickness required to achieve U value[1][2][3]

U value ($W \cdot m^{-2} \cdot K^{-1}$)	Thickness of insulation[4] (mm)					
	215 mm Brickwork, λ = 0.5 6 $W \cdot m^{-1} \cdot K^{-1}$			200 mm Dense blockwork, λ = 1.75 $W \cdot m^{-1} \cdot K^{-1}$		
	EPS 70	Platinum EPS 70E	XS022	EPS 70	Platinum EPS 70E	XS022
0.19	200	170	110	210	180	110
0.25	140	120	80	150	130	80
0.26	140	120	80	150	120	80
0.28	130	110	70	130	110	70
0.30	120	100	60	120	110	70
0.35	100	80	50	110	90	60

(1) Wall construction inclusive of 13 mm plaster (λ = 0.57 $W \cdot m^{-1} \cdot K^{-1}$), 5 mm render ($\lambda$ = 1.0 $W \cdot m^{-1} \cdot K^{-1}$). Brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar (λ = 0.88 $W \cdot m^{-1} \cdot K^{-1}$). Insulation λ_D (as per Table 2).

(2) Calculation based on a system that included 4 fixings per m^2 for EPS and 5 fixings per m^2 for phenolic with a point thermal transmittance χ_p = 0.004 $W \cdot K^{-1}$. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2007.

(3) Based on calculations in accordance with BS EN ISO 6946 : 2007.

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

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

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

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

7 Strength and stability

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

7.2 Positive wind load (pressure) is transferred to the substrate wall directly by compression of the render and insulation.

7.3 Negative wind pressure (suction) is resisted by the bond between each component. The insulation boards are retained by the adhesive and supplementary fixings.



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

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

- the substrate wall has adequate strength to resist additional loads that may be applied as a result of installing the systems, ignoring any contribution that may occur from the system
- the proposed system layout (with associated supplementary fixing) provides adequate resistance to negative wind loads until the adhesive is set and thereafter associated bond strength between adhesive and substrate provides adequate resistance to negative wind loads
- an appropriate number of site-specific pull-off (bond) 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 lowest of the five results divided by a safety factor of 9 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 : 2000 (amended 2013).

(1) If this value is less than the ultimate wind load, the bonded area should be increased.

7.8 The adhesive between the insulation product and the substrate will have a minimum failure resistance of ≥ 30 $kN \cdot m^{-2}$. For calculating the design resistance, a minimum bonded area should be considered and a safety factor of 9 applied.

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

Impact resistance

7.10 Hard body impact tests were carried out in accordance with ETAG 004 : 2000 (amended 2013). The systems are suitable for use in the categories listed in Table 4 (see section 7.10).

Table 4 Impact resistance

Rendering system: Application description	Finishing coat	Impact resistance Use Category
EPS insulation: Standard application[1]	Baumit Edelputz Spezial, Baumit SilikatTop, Baumit SilikonTop, Baumit StyleTop, Baumit GranoporTop	Category II
EPS insulation: High impact application[2]	Baumit SilikatTop, Baumit SilikonTop, Baumit StyleTop, Baumit GranoporTop	Category I
EPS insulation: High impact application[2]	Baumit Edelputz Spezial	Category II
XS022 (phenolic) insulation: Standard application[1] and High impact application[2]	Baumit Edelputz Spezial, Baumit NanoporTop, Baumit SilikatTop, Baumit SilikonTop, Baumit GranoporTop	Category II

(1) Standard application — construction with single layer of reinforcement mesh.

(2) High impact application — construction with double layer of reinforcement mesh.

7.11 These use categories are defined in ETAG 004 : 2000 (amended 2013) as:

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

8 Behaviour in relation to fire



8.1 The reaction to fire classification for the rendering systems in accordance with BS EN 13501-1 : 2007, is given in Table 5.

Table 5 Reaction to fire classification

Insulation type	Class according to BS EN 13501-1
EPS/Platinum EPS insulation	B-s2, d0
XS022 (phenolic) insulation	B-s1, d0

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

8.3 The systems are restricted for use in buildings up to 18 m in height.

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

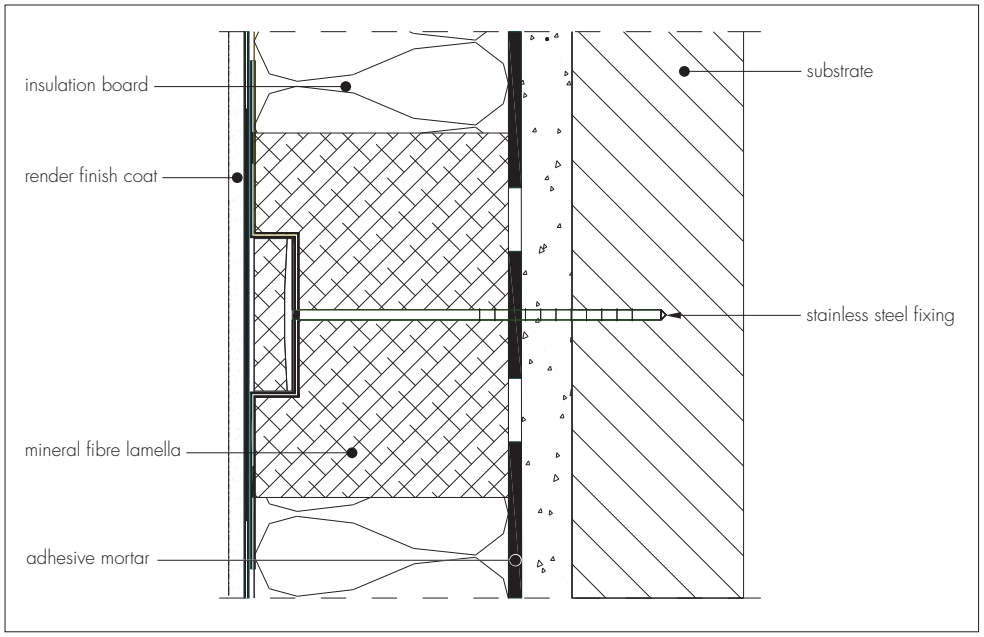


8.5 For flats and maisonettes and non-domestic buildings in Scotland, the system is suitable only for use more than one metre from the boundary.

8.6 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 includes 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).

Figure 2 Fire barrier



9 Proximity of flues

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 rain ingress. However, care should be taken to ensure that walls are adequately weathertight prior to application of the insulation systems. The insulation systems may only be installed where there are no signs of dampness on the inner surface of the substrate other than those caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress. Only details approved by the Certificate holder should be used.

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

10.4 At the tops of walls, the systems should be protected by an adequate overhang or other detail designed for use with these types of systems (see section 16.24).

11 Risk of condensation

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

Surface condensation

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

11.3 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2011 (Section 8, Annex D) and BRE Report BR 262 : 2002.

Interstitial condensation

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

11.5 The renders used with the systems have an equivalent air layer of thickness (S_d) of ≤ 1.0 m. This corresponds to a water vapour resistance factor (μ) which is dependent on the particular basecoat and finish coat configuration.

11.6 The water vapour resistance factors (μ) for EPS/Platinum EPS and phenolic insulation boards are 60 and 50 respectively, as taken from BS EN ISO 10456 : 2007, Table 4.

12 Maintenance and repair



12.1 Regular checks should be made on the installed systems, 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 are effected immediately and the sealant joints at window and door frames are 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 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 Any render containing Portland cement may be subject to lime bloom. The occurrence of this may be reduced by avoiding application in adverse weather conditions. The effect is transient and is less noticeable on lighter colours.

13.3 The finishes may break up the flow of water on the surface and reduce the risk of discoloration by water runs. The finish may become discoloured with time, the rate depending on locality, initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating.

Installation

14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for treatment and the need for any necessary repairs to the building structure before application of the Baumit EPS/XS022 External Wall Insulation 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 beads
- where required, additional corner mesh and reinforcement
- areas where flexible sealants must be used
- any alterations to external plumbing
- where required, the positions of fire barriers.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved applicators (see section 15) to determine the pull-off resistance of the proposed adhesive and pull-out tests for supplementary mechanical fixings for the appropriate substrate. An assessment and recommendation is made on the percentage of the adhesive coverage per board (minimum 40%) required to withstand the building's expected wind loading, based on calculations using the fixing's pull-off resistance test data. In addition, the type and number of supplementary fixings are selected (see section 7). The advice of the Certificate holder should be sought to ensure the proposed bonding pattern is sufficient.

14.3 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge spanning the storey height. Any excessive irregularities, ie greater than 10 mm in 1 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 On existing buildings, purpose-made window sills must be fitted to extend beyond the finished face of the systems (see section 16.10). New buildings should incorporate suitably deep sills.

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

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

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

15 Approved Installers

Application of the systems, within the context of this Certificate, is carried out by approved installers recommended or recognised by the Certificate holder. Such an installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the systems
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirements for each application team to include at least one member operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

16 Procedure

General

16.1 Application of the systems is carried out in accordance with the Certificate holder's current installation instructions.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. The insulation board adhesive, adhesive basecoat and rendering must not be applied when exposure to frost is likely, in damp/wet conditions or at temperatures below 5°C or above 25°C, or where these temperatures are likely to be exceeded during the curing period. The render must be protected from rapid drying and should not be applied on elevations in direct sunlight or where the substrate is hot.

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

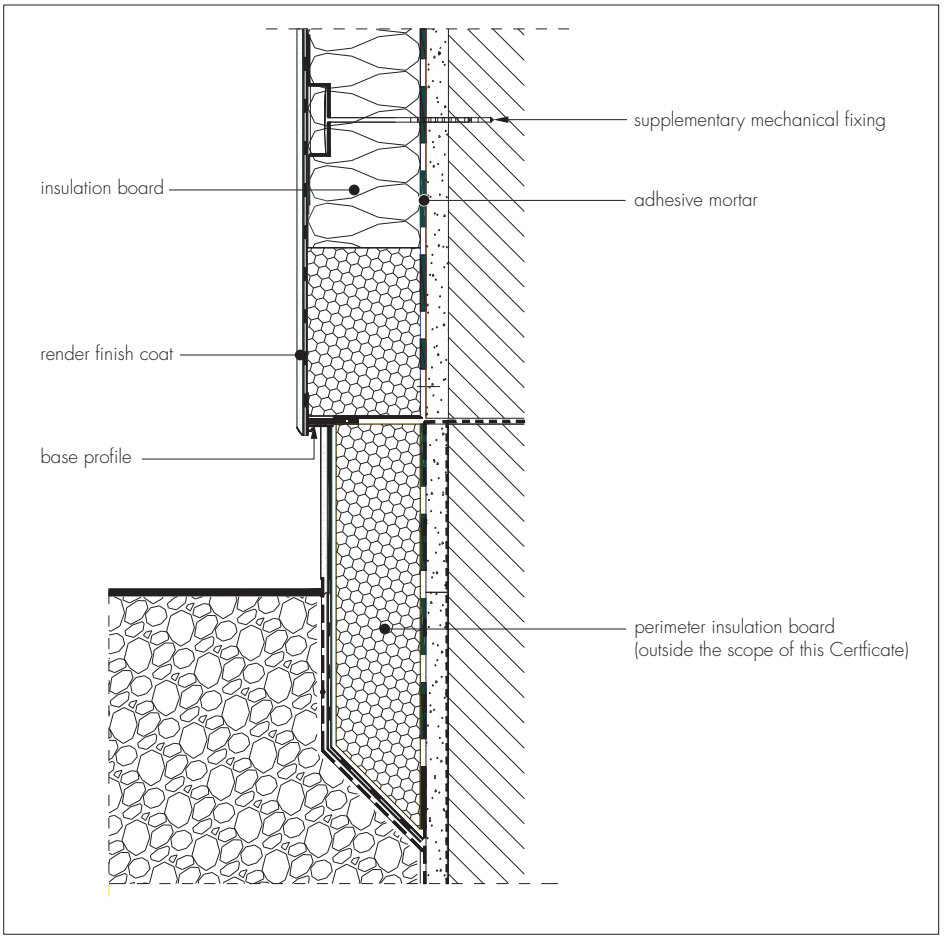
16.4 Baumit bonding mortar — Baumit StarContact, Baumit StarContact Forte or Baumit Open contact — is mixed with an electric hand mixer or horizontal mixer. The material should be allowed to stand for five minutes before remixing for use.

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

Positioning and securing insulation boards

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

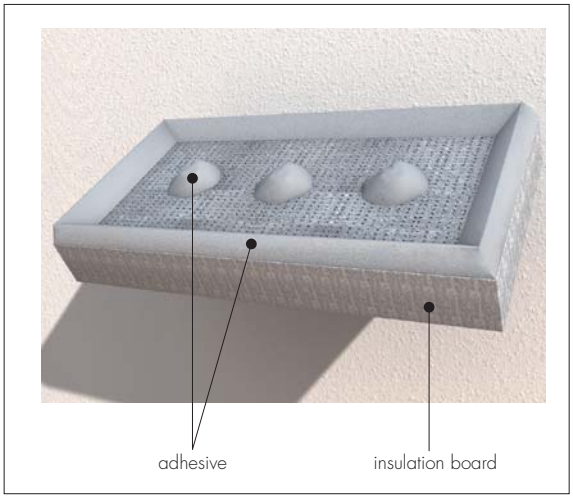
Figure 3 Typical section at base



16.7 Baumit bonding mortar (adhesive) — Baumit StarContact, Baumit StarContact or Baumit Open contact — is prepared by mixing each 25 kg bag with 6.0 litres (StarContact) or 6.8 litres (StarContact Forte) of clean water. The adhesive is applied to the insulation boards using stainless steel tools or a mortar pump.

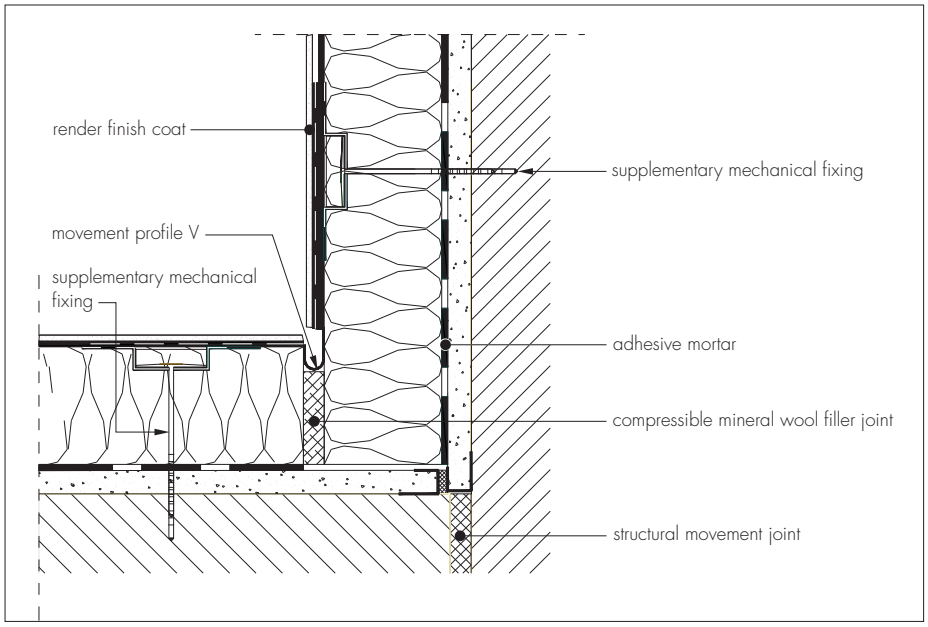
16.8 The insulation boards are bonded to the wall by applying the specified adhesive to the boards using the 'strip-point' method. A circumferential ribbon of adhesive, at least 30 mm wide, is applied to the insulation boards. Six to eight evenly distributed patches of adhesive, 80 mm to 120 mm in diameter, are applied to the boards so that an adhesive surface of at least 40% is achieved (60% after application and pressing) (see Figure 4). Alternatively, for even and smooth substrates, the whole panel can be coated with adhesive using a notched trowel to produce a coat 2 mm to 5 mm in thickness. The insulation panel should be immediately placed on the substrate and pressed into place.

Figure 4 Insulation board adhesive pattern



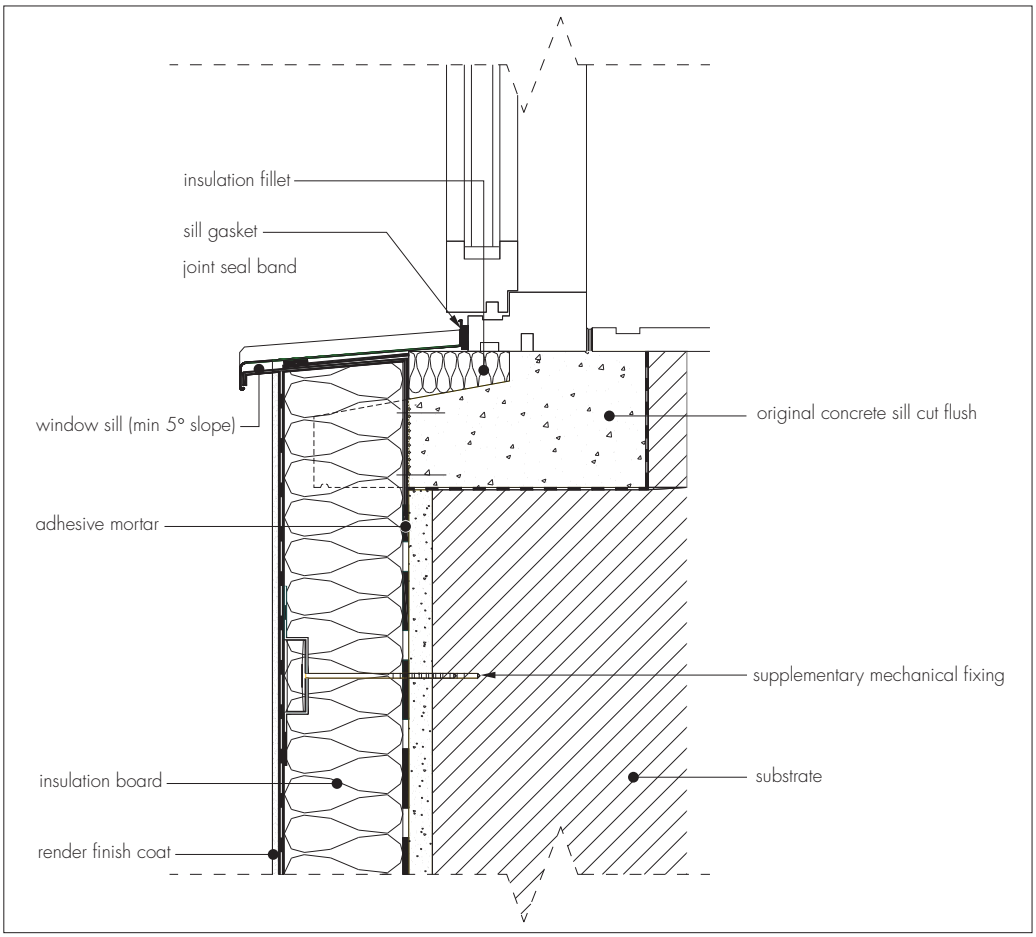
16.9 The insulation boards must be pressed firmly against the wall and butted tightly together with the vertical joints staggered by at least 200 mm. Alignment should be checked as work proceeds.

Figure 5 Typical arrangement at external corner



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

Figure 6 Typical sill detail



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

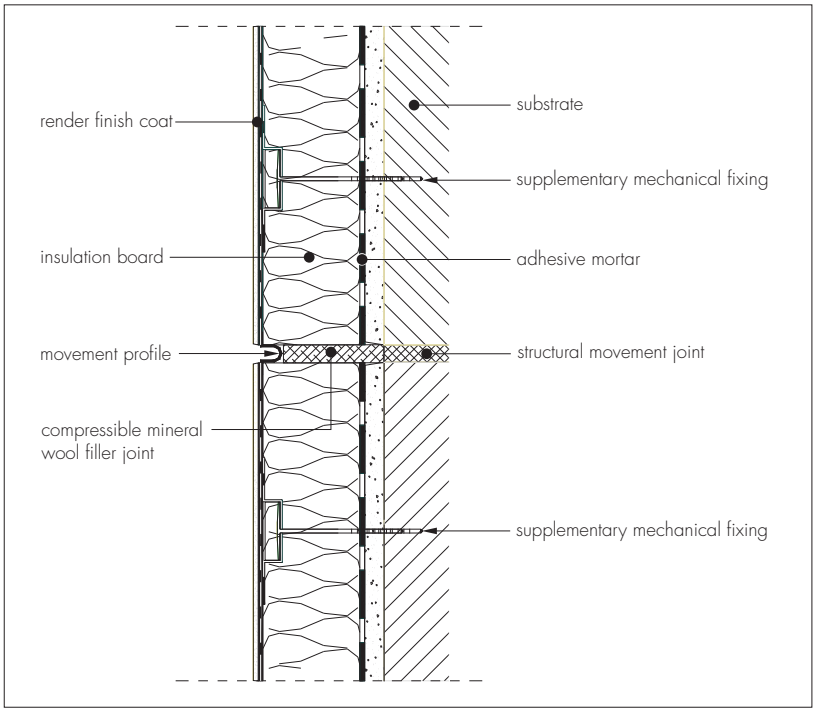
16.12 Prior to the reinforcement coat, expanding foam sealing tape is inserted at window and door frames, overhanging eaves, gas and electric meter boxes, wall vents, or where the render abuts any other building material or surface.

16.13 Corner profiles are fixed to all building corners and to door and window heads and jambs using the basecoat renders.

Movement joints

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

Figure 7 Vertical expansion joint



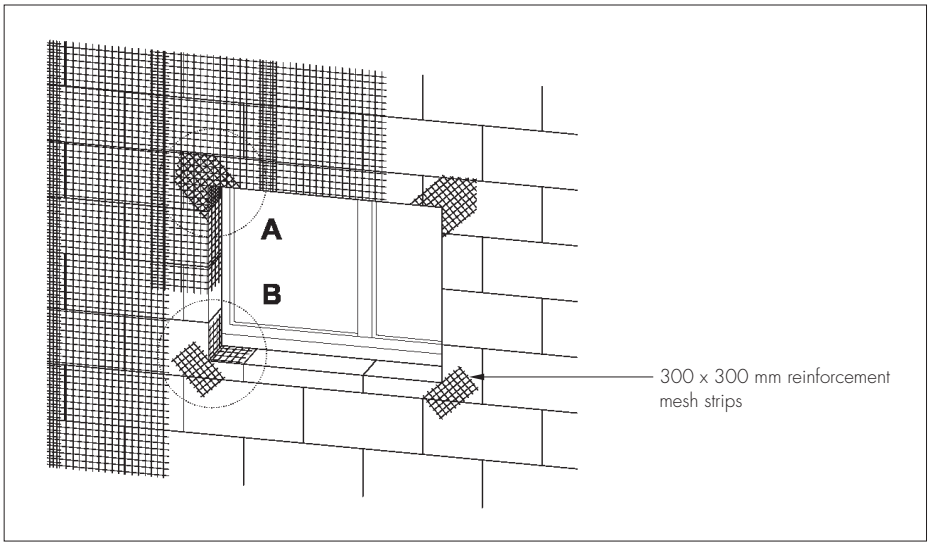
Reinforcement

16.15 Baumit bonding mortar (basecoat render) is applied over the insulation boards, using a stainless steel trowel and floated to an approximate minimum thickness of 3 mm. The reinforcement mesh is immediately embedded and a further minimum thickness of 3 mm of basecoat applied whilst the surface is still wet and smoothed off using a stainless steel float. In high impact areas, a second layer of reinforcement mesh is applied and embedded in the basecoat. After application and smoothing the overall thickness should be minimum of 6 mm.

16.16 Overlaps at all mesh joints should not be less than 100 mm.

16.17 Additional pieces of reinforcement mesh 300 mm by 300 mm are used diagonally at the corners of openings as shown in Figure 8.

Figure 8 Additional reinforcement at openings



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

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

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

Render finish

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

16.22 The finish coats are applied to the thicknesses specified by the Certificate holder and notional thin-coat thicknesses are indicated by the grain size for each specific finish, using a stainless steel trowel and float and finished with a plastic float to create the required finish texture (see Table 6).

Table 6 Thickness of finish coats

Finish coat	Thickness range or minimum thickness (mm)[1]
Baumit Edelputz Spezial finish	1 to 7
Baumit NanoporTop finish	1.5 to 3
Baumit SilikatTop finish	1.5 to 3
Baumit SilikonTop finish	1.5 to 3
Baumit StyleTop finish	1.5 to 3
Baumit GranoporTop	1.5 to 3

(1) Thickness gauged by grain size.

16.23 Continuous surfaces should be completed without a break and care should be taken in the detailing of the systems around and projections to prevent water ingress.

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

Figure 9 Typical detail at window reveal and window head

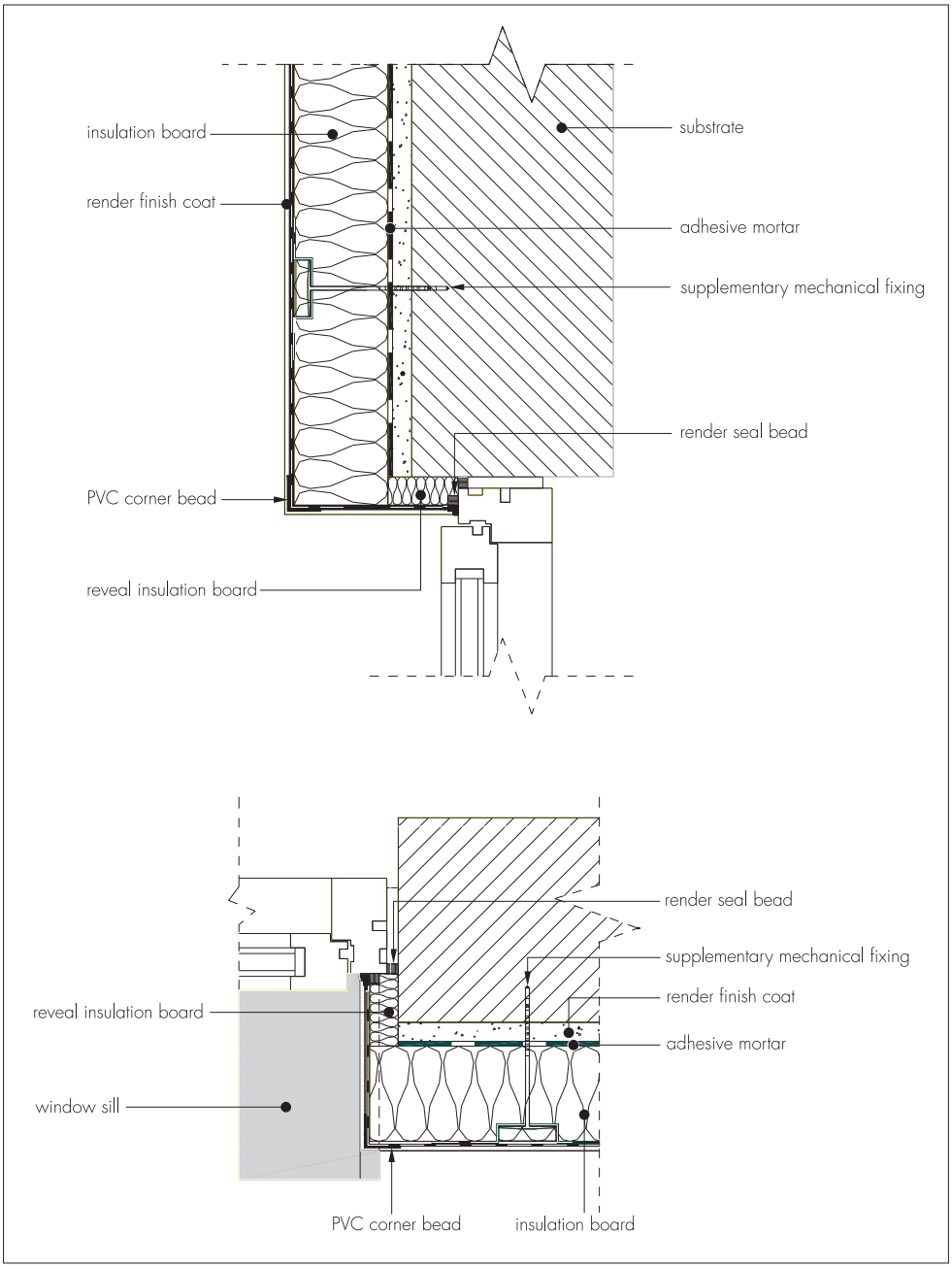
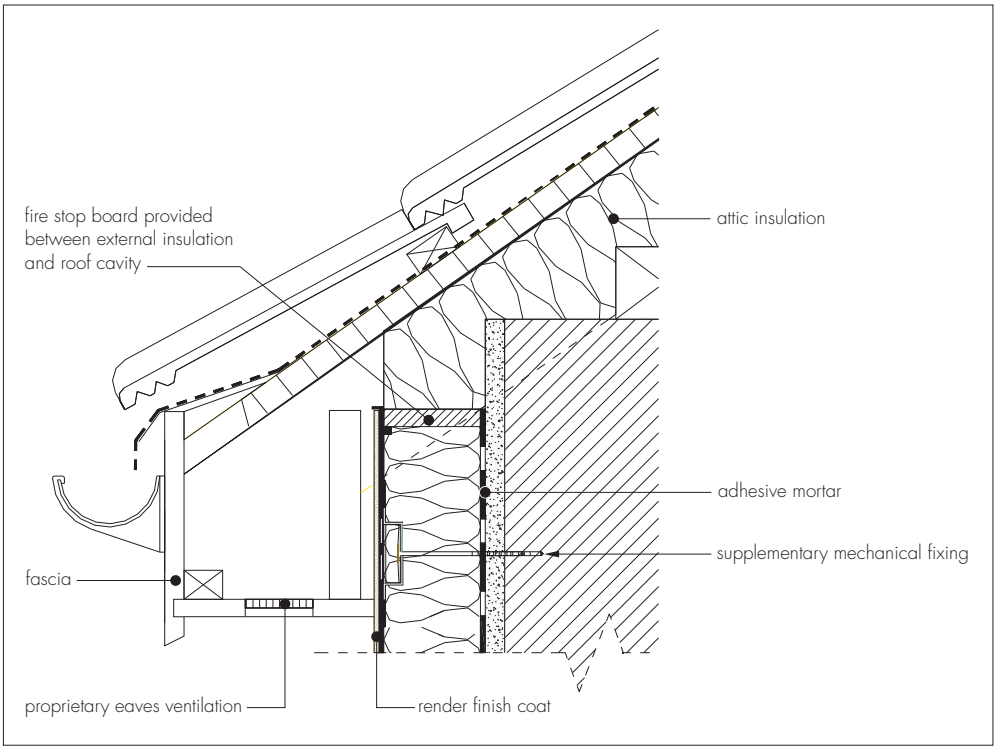


Figure 10 Typical eaves detail



16.25 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 systems during installation.

Technical Investigations

17 Investigations

17.1 The systems were examined and assessed to determine:

- fire performance
- water absorption
- hygrothermal behaviour
- freeze/thaw behaviour
- impact resistance
- water vapour permeability
- bond strength
- wind load resistance.

17.2 An examination was made of data relating to:

- surface spread of flame classification
- thermal conductivity.

17.3 The manufacturing process, the methods adopted for quality control of manufactured and bought-in components, and details of the quality and composition of the materials used, were examined.

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 998-1 : 2010 *Specification for mortar for masonry — Rendering and plastering mortar*

BS EN 1990 : 2002 *Eurocode : Basis of structural design*
NA to BS EN 1990 : 2002 *UK National Annex to 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 *UK National Annex to 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*
NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 : Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using 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 10456 : 2007 *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values*

BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*

BRE Report (BR 135 : 2013) *Fire Performance of External Insulation For Walls of Multistorey Buildings*

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

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

ETAG 004 : 2000 (amended 2013) *Guideline for European Technical Approval of External Thermal Insulation Composite Systems with Rendering*

18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

18.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

18.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA
©2014
tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk