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(21.9) Rn7 (M2)

**Agrément
Certificate
No 03/4058**

Designated by Government
to issue
European Technical
Approvals

EPSICON EXTERNAL WALL INSULATION SYSTEMS

Système d'isolation pour murs extérieurs
Wärmedämmung für Außenwand

Product




• THIS CERTIFICATE RELATES TO EPSICON EXTERNAL WALL INSULATION SYSTEMS.

- The systems comprise insulation material with reinforcement and render finishes as described in the accompanying Detail Sheets.
- The systems are applied to the outside of external walls of masonry or dense concrete construction and are suitable for use on new or existing buildings.
- Application and maintenance must be carried out strictly in accordance with the Design Data and Installation parts of this Certificate and the marketing company's instructions by operatives trained and approved by the Certificate holder.

continued

Regulations — Detail Sheet 1

1 The Building Regulations 2000 (as amended) (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of external wall insulation with the Building Regulations. In the opinion of the BBA, Epsicon External Wall Insulation Systems, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: B4(1)	External fire spread
Comment:	The systems are classified Class 0 and therefore can meet this Requirement. See the relevant tinted areas (7.2, 7.4 and 7.5) in the <i>Properties in relation to fire</i> section of these Front Sheets.
Requirement: C4	Resistance to weather and ground moisture
Comment:	Walls insulated with the systems will meet this Requirement. See the relevant tinted areas (6.4) in the <i>General</i> section of these Front Sheets.
Requirement: L1	Dwellings
Requirement: L2	Buildings other than dwellings
Comment:	The systems will enable, or contribute to enabling, a wall to meet the U value requirement. See the tinted area in the <i>Thermal insulation</i> section of these Front Sheets.
Requirement: Regulation 7	Materials and workmanship
Comment:	The systems are acceptable. See the tinted area in the <i>Durability</i> section of these Front Sheets.

continued

- The systems are marketed by the Certificate holder.
- The system components are obtained from manufacturers approved by the Certificate holder and the BBA.

These Front Sheets must be read in conjunction with the relevant accompanying Detail Sheets, which provide information specific to insulation systems.

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2 The Building Standards (Scotland) Regulations 1990 (as amended)



In the opinion of the BBA, Epsicon External Wall Insulation Systems, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation: 10	Fitness of materials and workmanship
Standard: B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:	The product can contribute to a construction meeting this Standard. See the <i>Installation</i> section of these Front Sheets and the accompanying Detail Sheets.
Standard: B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:	The systems are acceptable. See the tinted area in the <i>Durability</i> section of these Front Sheets.
Regulation: 12	Structural fire precautions
Standard: D8.1	Fire spread to adjoining buildings — Principles
Comment:	The systems incorporate insulation which would not be classed as 'non-combustible'. Completed walls would therefore be regarded as unprotected areas as defined in note c to Table D8.1. However in the opinion of the BBA it would not be unreasonable to seek a relaxation of this Standard.
Standard: D8.2	Fire spread to adjoining buildings — Non-combustible materials
Comment:	The systems incorporate insulation which would not be classed as 'non-combustible' and, therefore, should not be used on walls one metre or less from a boundary but see the relevant tinted area (7.6) in the <i>Properties in relation to fire</i> section of these Front Sheets.
Standard: D10.1	Fire spread on an external wall
Comment:	The systems have a 'Low risk' surface classification and are unrestricted by this Standard. See the relevant tinted area (7.2) in the <i>Properties in relation to fire</i> section of these Front Sheets.
Standard: D10.2	Fire spread on an external wall
Comment:	The use of these systems may be restricted by this Standard. See the relevant tinted areas (7.4 and 7.6) in the <i>Properties in relation to fire</i> section of these Front Sheets.
Regulation: 17	Resistance to moisture
Standard: G3.1	Resistance to precipitation — Resistance to precipitation
Comment:	Walls insulated with the systems will satisfy this Standard. See the relevant tinted area (6.4) in the <i>General</i> section of these Front Sheets.
Regulation: 18	Resistance to condensation
Standard: G4.1	Condensation — Interstitial condensation
Comment:	Walls insulated with the systems will satisfy the requirements of this Standard. See the relevant tinted area (6.6) in the <i>General</i> section and the <i>Risk of interstitial condensation</i> section of these Front Sheets.
Regulation: 22	Conservation of fuel and power
Standard: J3.1	Buildings in purpose group 1 — Building fabric
Comment:	The systems will enable, or contribute to enabling, a wall to meet this Standard. See the tinted area in the <i>Thermal Insulation</i> section of these Front Sheets.
Standard: J4.1	Buildings in purpose group 1 — Limiting thermal bridging at junctions and around openings
Comment:	The systems will enable, or contribute to enabling, a wall to meet this Standard. See the tinted area in the <i>Thermal Insulation</i> section of these Front Sheets.
Standard: J8.1	Buildings in purpose groups 2 to 7
Comment:	The systems will enable, or contribute to enabling, a wall to meet this Standard. See the tinted area in the <i>Thermal Insulation</i> section of these Front Sheets.
Standard: J9.1	Buildings in purpose groups 2 to 7 — Limiting thermal bridging at junctions and around openings
Comment:	The systems will enable, or contribute to enabling, a wall to meet this Standard. See the tinted area in the <i>Thermal Insulation</i> section of these Front Sheets.

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3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Epsicon External Wall Insulation Systems, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The systems are acceptable. See the tinted area in the <i>Durability</i> section of these Front Sheets.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		Walls insulated with the systems will satisfy this Regulation. See the relevant tinted area (6.4) in the <i>General</i> section of these Front Sheets.
Regulation:	C5	Condensation
Comment:		Walls insulated with the systems will satisfy the requirements of this Regulation. See the relevant tinted area (6.6) in the <i>General</i> section and the <i>Risk of interstitial condensation</i> section of these Front Sheets.
Regulation:	D1	Stability
Comment:		The systems contribute to enabling a wall to meet this Regulation. See the tinted area in the <i>Strength and stability</i> section of these Front Sheets.
Regulation:	E5	External fire spread
Comment:		The systems have a Class 0 surface and can satisfy this Regulation. See the relevant tinted areas (7.2, 7.4 and 7.5) in the <i>Properties in relation to fire</i> section of these Front Sheets.
Regulation:	F2	Building fabric
Comment:		The systems will enable, or contribute to enabling, a wall to meet this Regulation. See the tinted area in the <i>Thermal Insulation</i> section of these Front Sheets.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: 2 *Delivery and site handling* (2.2 and 2.4) of the accompanying Detail Sheets.

Technical Specification

5 Delivery and site storage

5.1 Components are delivered to site in the packaging and quantities as listed in Table 1. Each basecoat/dash receiver bag carries the product identification and manufacturer's batch number. The BBA identification mark incorporating the number of this Certificate is marked on each shrink-wrapped pallet of render.

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

5.3 The expanded polystyrene and polyisocyanurate insulation must be protected from prolonged exposure to sunlight either by storing opened packs under cover or re-covering with opaque polythene sheeting.

Table 1 Component supply details

Component	Quantity and packaging
Insulation	polythene wrapped
Metal lathing	1.2 metre wide rolls, 5 metre length or 2400 mm by 1200 mm sheets
Reinforcing mesh	1 metre wide rolls, 50 metre length
Basecoats/dash receiver/topcoats	25 kg bag
Mechanical fixings	boxed by manufacturer

5.4 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.


5.5 The basecoat and receiver must be stored in dry conditions, off the ground, and be protected from moisture.

6 General

6.1 Epsicon External Wall Insulation Systems, when installed in accordance with this Certificate, are effective in reducing the thermal transmittance (U value) of the 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 systems.


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

6.3 Existing buildings, subject to national Building Regulations, should have wall surfaces in accordance with the relevant sections of the Detail Sheets.

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


- BS 5628-3 : 2001. In particular Clause 5.5.2 of the Code of Practice *Rain penetration* should be followed in that the designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used
- BS 8000-3 : 2001.

6.5 Other new buildings, not subject to any of the previous requirements, should also be built in accordance with BS 5628-3 : 2001.

 6.6 When using the system, consideration must be given to the overall design to minimise the risk of condensation and the recommendations of BS 5250 : 2002 should be followed.

7 Properties in relation to fire

7.1 In the opinion of the BBA the use of the system will not introduce any additional hazard in respect of behaviour in fire when compared with a system using traditional sand/cement render finishes.

 7.2 The system is classified Class 0 or 'low risk' as defined in the national Building Regulations thus:

England and Wales

Approved Document B, paragraph A12

Scotland

Technical Standard, (D1.3), Table 3

Northern Ireland

Technical Booklet E, Paragraph 2.4.

7.3 Any cavities within the system (such as those formed between the external wall insulation system and the substrate) must have appropriate fire stopping in accordance with:

England and Wales


Approved Document B, Section 10


Scotland


Technical Standards Part D, Sections 6.1 and 6.2

Northern Ireland

Technical Booklet F, Sections 3.27–3.30.

 7.4 The behaviour in fire of external wall insulation systems is the subject of recommendations by BRE in their publication *Fire Performance of External Insulation For Walls of Multi-Storey Buildings* BR 135, Second edition 2003 and this document outlines the design of fire barriers for use in this type of system.

 7.5 Provided fire barriers are installed at every storey from the ground floor, there is no restriction on the height of the building.

 7.6 Fire barriers and cavity barriers must be installed from the ground floor upwards and the height of the building is restricted to 18 m. Also the system may not be on a wall one metre or less from a boundary.

8 Thermal insulation


8.1 For the purpose of U value calculations to determine if the requirements of the Building (or other statutory) Regulations are met, the thermal conductivity (λ value) as stated by the insulation manufacturers may be taken as listed in Table 2.

Table 2 Thermal conductivity values⁽¹⁾

Insulation	λ values (Wm ⁻¹ K ⁻¹)
Expanded polystyrene	0.038 ⁽²⁾
Polyisocyanurate foil faced	0.023 ⁽²⁾
Mineral wool	0.036
Phenolic (40 kgm ⁻³ density board)	0.024 ⁽²⁾ (20 mm–24 mm) 0.023 ⁽²⁾ (25 mm–44 mm) 0.022 ⁽²⁾ (\geq 45 mm)
Phenolic (50 kgm ⁻³ density board)	0.024 ⁽²⁾
PIR-modified urethane	0.027 ⁽²⁾

(1) Not assessed by the BBA.

(2) $\lambda_{90/90}$ value.

 8.2 The requirement for limiting the heat loss through the building fabric will be satisfied if the U values of the building elements, including thermal bridging, do not exceed the maximum values in the relevant Elemental Approach given in:

England and Wales

Approved Document L1 or L2, Table 1

Scotland

Technical Standard J3.2 or J8.3

Northern Ireland

Technical Booklet F, Table 1.2 or 1.4.

8.3 Guidance is also given in these documents on selecting the thickness of insulation required to enable a wall to achieve the desired U value. Alternative approaches are described which allow for some flexibility in design of U values for individual constructional elements.

8.4 Where insulation boards have not been continued into window or door reveals due to a lack of clearance, there will be a risk of cold bridging at these points. Where door and window frames are to be replaced, it is recommended that their size be adjusted to permit the reveals to be insulated.

8.5 Depending on constructional details, cold bridging can also occur at the eaves and at ground-floor level, and care should be taken to minimise this, eg roof or loft insulations should continue over the wall head. Care should be taken to ensure that ventilation openings are not obstructed.

9 Proximity of flues and appliances

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

England and Wales

Approved Document J

Scotland

Technical Standards, Part F

Northern Ireland

Technical Booklet L.

10 Moisture penetration

Tests and site examinations show that the systems will resist the passage of moisture.

11 Risk of interstitial condensation



11.1 The components of the systems have a water vapour resistance such that, under the adverse conditions likely to be found in dwellings in the United Kingdom, interstitial condensation should not occur within the insulation.

11.2 If a system is to be used on the external walls of rooms expected to have continuous high humidities, care must be taken in the design of the rooms to avoid possible problems from the formation of interstitial condensation in the wall.

12 Maintenance

12.1 Regular checks should be made on the installed system, particularly at joints, to ensure

that ingress of water does not occur. Necessary repairs should be effected immediately.

12.2 Damaged areas must be repaired using the appropriate Epsicon components and the procedures detailed in the Epsicon installation instructions.

13 Strength and stability

13.1 The systems have adequate resistance to impact and abrasion where walls are exposed and have some protection, eg walls of private dwellings and walls of communal dwellings above ground-floor level. In other situations, where the system may be exposed to severe impact, eg walls of public buildings, at ground-floor level, precautions, eg supplementary reinforcement; introduction of planting areas to restrict access should be considered to reduce the risk of damage. Further information may be obtained from BRE Current Paper CP 6 : 81 *Assessment of external walls — Hard Body Impact Resistance*.

13.2 The systems as specified in the Detail Sheets can be designed to withstand the thermal stresses and wind pressures (including suction) normally experienced in the United Kingdom. The system can also be designed in accordance with BS 6399-2 : 1997 to withstand the increased wind loads associated with tall buildings (greater than 12 metres) and areas of high exposure. This may require the use of a greater number of fixings per unit area (see section 11.2).

14 Durability



14.1 The results of accelerated ageing tests in accordance with MOAT No 22 : 1988 indicate that the system is durable. The system should remain effective for at least 30 years, provided any damage to the surface finish is repaired immediately, and regular maintenance is undertaken, including checks on joints in the system and external plumbing fittings to identify leakage of rainwater into the system, enabling steps to be taken to correct the defects.

14.2 A spardash finish will 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 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.

14.3 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 less noticeable on lighter colours.

15 Site survey and preliminary work

15.1 Before application of an Epsicon External Wall Insulation System, a pre-installation survey of the property is carried out to determine suitability for treatment and any repairs necessary to the building structure. A specification is prepared for each elevation of the building indicating:

- the position of beads
- additional reinforcement at corners of openings
- detailing around windows, doors and at eaves
- dpc level
- exact position of expansion joints
- areas where flexible sealants must be used
- any alterations to external plumbing
- where required, the position of fire barriers.

15.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved suppliers to determine the pull-out resistance of the proposed mechanical fixings. An assessment and recommendation is made on the type and number of fixings required to withstand the building's expected wind loading based on calculations using the test data, the relevant wind speed data for the site, and in the absence of a formal requirement, a safety factor of 3 should be used.

15.3 All necessary repairs to the building structure are completed before installation of the system is started.

15.4 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 spanning the storey height. Any excessive irregularities, ie greater than 10 mm, must be made good prior to installation to ensure that the insulation boards or slabs are installed with a smooth, in-plane finished surface.

15.5 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.

15.6 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.

15.7 It is recommended that external plumbing be removed and alterations made to underground drainage, where appropriate, to accommodate repositioning on the finished face of the systems.

15.8 New buildings should be of sound masonry or dense concrete construction.

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

16 Approved installers

Application of the systems, within the context of this Certificate, is carried out by approved installers. An approved installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the systems and who have been issued with appropriate training cards by the Certificate holder
- having undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member with a training card, and
- subject to supervision by the Certificate holder, including site inspections.

Bibliography

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5628-3 : 2001 *Code of practice for use of masonry — Materials and components, design and workmanship*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

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

MOAT No 22 : 1988 *Directives for the Assessment of External Insulation Systems for Walls (Expanded Polystyrene Insulation Faced with a Thin Rendering)*

Conditions of Certification

17 Conditions

17.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) is valid only within the UK;
- (d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (e) is copyright of the BBA;
- (f) is subject to English law.

17.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

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

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

17.4 In granting this Certificate, the BBA is not responsible for:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

17.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.



In the opinion of the British Board of Agrément, Epsicon External Wall Insulation Systems are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 03/4058 is accordingly awarded to Wetherby Building Systems Limited.

On behalf of the British Board of Agrément

Date of issue: 30th March 2004

Chief Executive

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British Board of Agrément

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For technical or additional information,
contact the Certificate holder (see
front page).
For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
or check the BBA website.

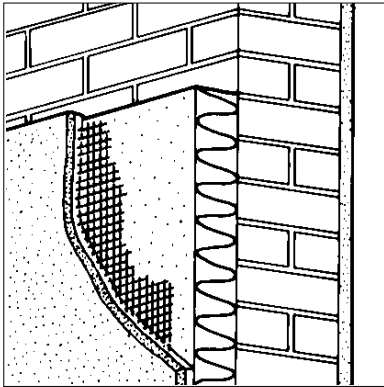


Wetherby Building Systems Limited

Certificate No 03/4058

**THE EPSICON 2
EXTERNAL WALL INSULATION SYSTEM**
DETAIL SHEET 2

Product



• THIS DETAIL SHEET RELATES TO THE EPSICON 2 EXTERNAL WALL INSULATION SYSTEM, A SYSTEM EMPLOYING EXPANDED POLYSTYRENE, POLYISOCYANURATE AND MINERAL WOOL INSULATION, WITH A STAINLESS STEEL REINFORCEMENT AND RENDER FINISHES.

- The system is applied to the outside of external walls of masonry or dense concrete construction and is suitable for new or existing buildings.
- It is essential that the system is installed and maintained in accordance with the conditions set out in the Design Data part of the Front Sheets and Installation parts of this Detail Sheet.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the system's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification.

Technical Specification

1 Description

1.1 The Epsicon 2 External Wall Insulation System (see Figure 1) comprises:

- Insulation in one of the following forms:
 - expanded polystyrene insulation boards — 1200 mm by 600 mm in a range of thicknesses between 40 mm and 80 mm. The boards are manufactured to grade EPS 70 Class E to BS EN 13163 : 2001
 - polyisocyanurate modified polyurethane insulation boards — 1200 mm by 600 mm in a range of thicknesses between 40 mm and 60 mm. The boards are foil faced on both sides, and have a nominal density of 28 kgm⁻³
 - mineral wool insulation slabs — 1200 mm by 600 mm in a range of thicknesses between 30 mm and 100 mm, with a nominal density of 140 kgm⁻³ manufactured to BS EN 3958-5 : 1986
- Mechanical fixings — stainless steel and polypropylene, approved by the BBA and the Certificate holder
- Heavyweight Basecoat Render — a cement-based, ready-mixed render supplied as a powder to which clean water is added. Comprises limestone sand conforming to BS 1199 : 1976 and BS 1200 : 1976, cement to BS EN 197-1 : 2000, and polymers
- Metal lathing — stainless steel grade 304S or grade 430 with a nominal weight 0.7 kgm⁻³. (For areas

≤ three kilometres from the coast, grade 304S should be used to minimise the risk of corrosion)

- Heavyweight Dash Receiver — a cement-based, ready-mixed render supplied as a powder to which clean water is added. Comprises limestone sand conforming to BS 1199 : 1976 and BS 1200 : 1976, cement to BS EN 197-1 : 2000, hydrated lime to BS EN 459-1 : 2001, and polymers
- Ancillary materials:
 - profiles — a range of standard profiles, typically for wall base, end stop, corner mesh and expansion joint. Profiles are available in organic polyester powder coated galvanized steel or stainless steel
 - profile fixings — hammer screws with plastic expansion sleeves as approved by the Certificate holder
 - sealant — silicone mastic as approved by the Certificate holder
 - spardash aggregate as approved by the Certificate holder.

1.2 The insulation boards or slabs are mechanically fastened to the external surfaces of walls, secured initially with one centrally-placed mechanical fixing. The metal lathing is placed against the boards and secured in position with mechanical fixings (see Figures 1 and 2). The Heavyweight Basecoat Render is trowel applied to a thickness of approximately 10 mm, allowing sufficient drying time before the Heavyweight Dash Receiver is trowel applied to a thickness of 8 mm to 10 mm and dry-dashed.

Figure 1 Epsicon 2 External Wall Insulation System

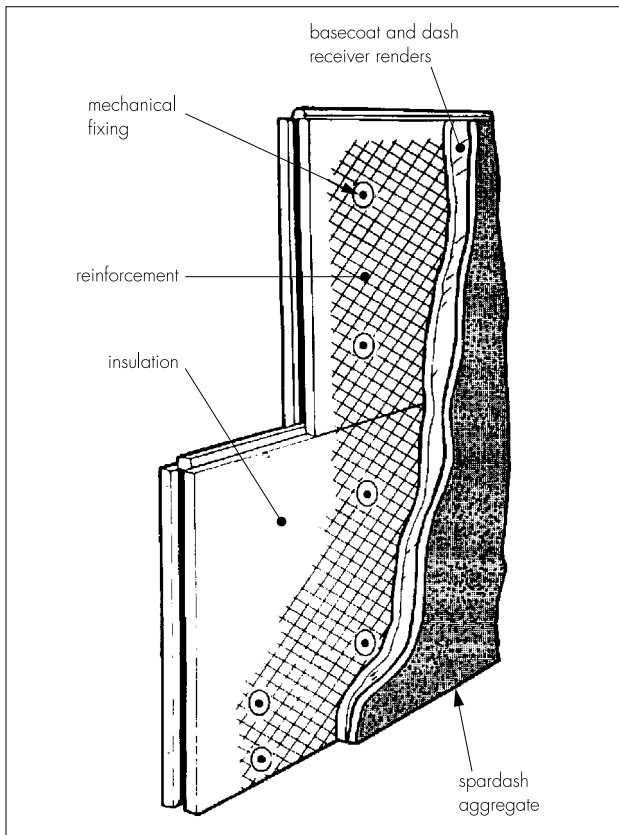
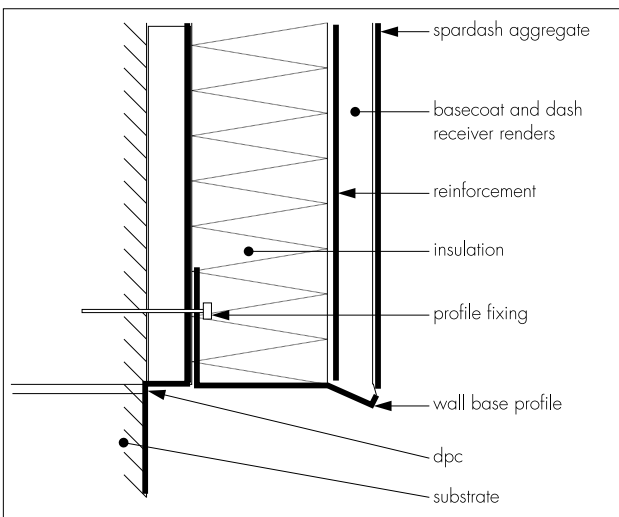


Figure 2 Typical section at base level



Installation

2 Procedure

General

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

2.2 Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, nor if exposure to frost is likely, and the coating must be protected from rapid drying. Weather conditions therefore should be monitored to ensure correct curing conditions.

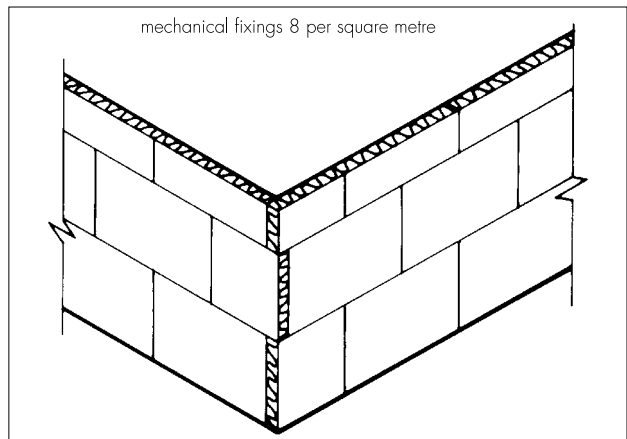
2.3 All rendering should be in accordance with the relevant recommendations of BS 5262 : 1991 and BS 8000-10 : 1995.

Positioning and securing insulation boards or slabs

2.4 The base profile is secured to the external wall above the damp-proof course using the approved profile fixings at approximately 300 mm centres.

2.5 The first run of insulation boards or slabs is positioned on the base profile. Holes are drilled into the substrate to a minimum depth of 50 mm through the centre of each board or slab. The mechanical fixings are inserted and tapped firmly into place, securing the insulation board or slab to the substrate. Subsequent rows of boards or slabs are positioned so that the joints are staggered and overlapped at the building corners (see Figure 3).

Figure 3 Arrangement of insulation boards or slabs



2.6 Care must be taken to ensure that all board or slab edges are butted tightly together, and alignment should be checked as work proceeds. For expanded polystyrene, high spots or irregularities should be removed by lightly planing with a rasp.

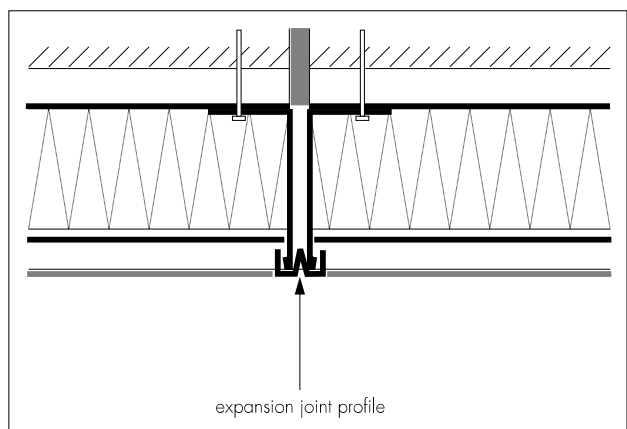
2.7 To fit around details such as doors and windows, insulation boards or slabs may be cut with a sharp knife or a fine-tooth saw. If required, purpose-made window-sills are fitted. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.

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

Movement joints

2.9 Movement joints in the substrate must be continued through the system. The joint detail using purpose-made metal trims is illustrated in Figure 4.

Figure 4 Vertical movement joint



2.10 Expansion beads are fixed vertically in agreed positions. These beads are positioned at approximately seven metre centres along a building, the centres depending on the individual requirements of each job.

Reinforcing

2.11 The metal reinforcing lath is fixed against the insulation using the mechanical fixings typically positioned at 300 mm vertical centres and 400 mm horizontal centres.

2.12 Mechanical fixings are positioned 300 mm apart around door and window details and 300 mm vertical centres at building corners.

2.13 The lath joint should overlap by no less than 100 mm in either a horizontal or vertical direction and should be tied together at 150 mm intervals by wiring together using stainless steel wire or snipping a strand of lath and bending it over the lapping mesh.

2.14 Angle beads are fixed to all building corners and to door and window heads and jambs where required.

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

2.16 Prior to the render coat, a bead of clear silicone rubber mastic 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.

Rendering and finishing

2.17 The basecoat and dash receiver renders are prepared by mixing the contents of each 25 kg bag with the appropriate amount of cold, clean water, using a concrete mixer. Mixing time should be at least five minutes to allow an even dispersion of the resins.

2.18 The basecoat render is trowelled upwards onto the surface of the insulation boards or slabs, so that it is forced behind the lath. It is applied in a minimum thickness of 10 mm, taking care to achieve complete coverage of the lath and to butt the basecoat under details such as window sills. The surface of the basecoat is trowelled smooth and then scored with a toothed trowel or comb to provide a good key for the next coat.

2.19 The drying period of any render will depend on weather conditions; however, the basecoat must be left to harden for at least two days before applying the dash receiver render. The render is trowel applied to a thickness of 8 mm to 10 mm. While the render is still soft, selected clean spar aggregate is thrown or sprayed onto the surface. On completion, the surface must be checked to ensure an even coverage of spardash has been achieved. Where necessary the aggregate should be lightly tamped to ensure that a good bond is achieved.

2.20 At the tops of walls the system should be protected by an adequate overhang or by an adequately sealed, purpose-made flashing (see Figure 5).

2.21 Care should be taken in the detailing of the system around openings and projections (see Figures 6, 7 and 8).

2.22 On completion of the installation, external fittings, eg rainwater goods, are re-fixed through the system into the substrate.

2.23 Continuous surfaces should be completed without a break.

Figure 5 Roof eaves detail

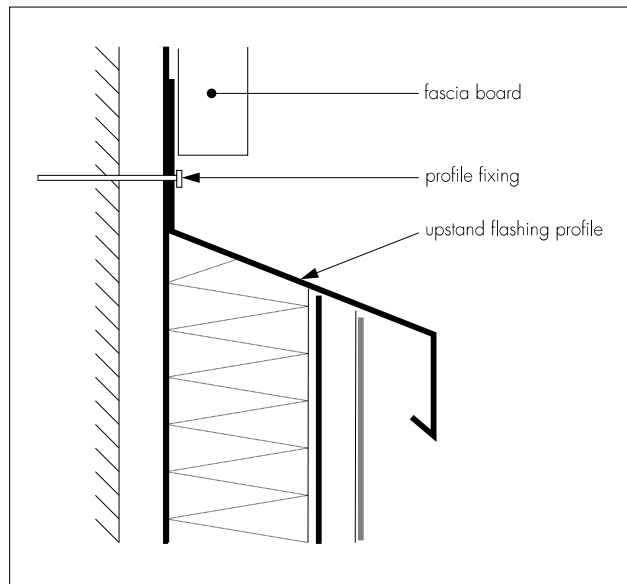


Figure 6 Insulated window detail

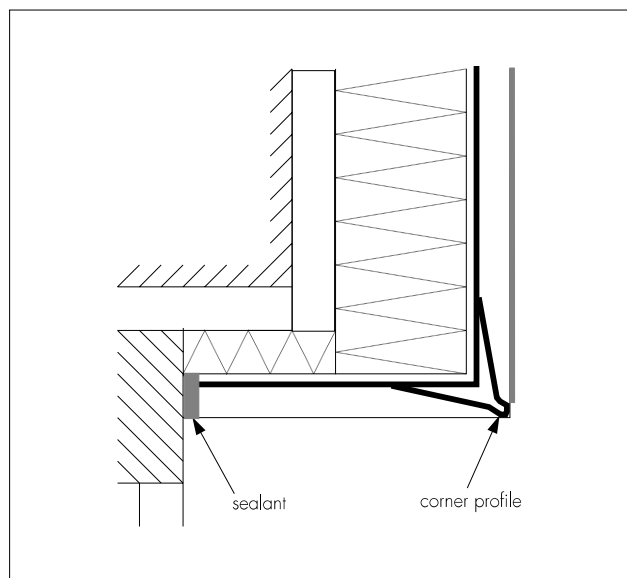


Figure 7 Window head detail

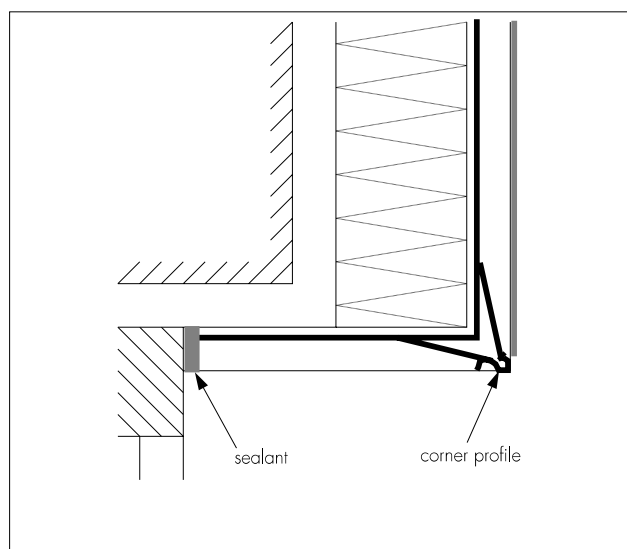
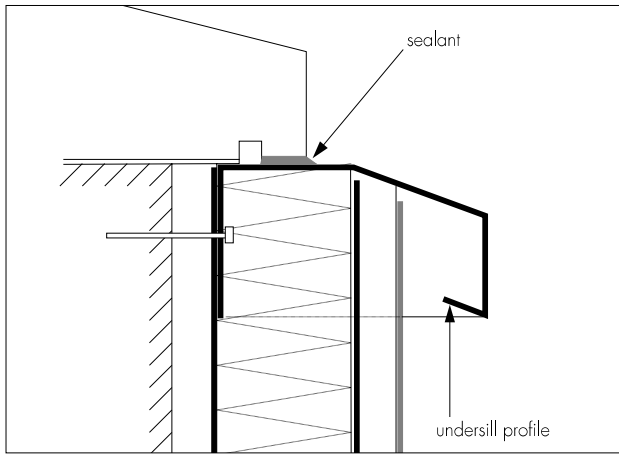


Figure 8 Window-sill detail



Technical Investigations

The following is a summary of the technical investigations carried out on The Epsicon 2 External Wall Insulation System.

3 Tests

3.1 Tests were carried out in accordance with MOAT No 22 : 1988 to determine:

- component characterisation
- heat/spray cycling
- resistance to freeze/thaw
- impact resistance.

3.2 An examination was made of data relating to:

- water vapour permeability
- fire propagation tests to BS 476-6 : 1989
- surface spread of flame tests to BS 476-7 : 1987
- pull-out strength of fixings
- durability of finish.

4 Investigations

4.1 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.

4.2 An assessment of the risk of interstitial condensation was undertaken.

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

Bibliography

- BS 476-6 : 1989 *Fire tests on building materials and structures — Method of test for fire propagation for products*
- BS 476-7 : 1987 *Fire tests on building materials and structures — Method for classification of the surface spread of flame of products*
- BS 1199 : 1976 *Specifications for building sands from natural sources*
- BS 1200 : 1976 *Specifications for building sands from natural sources*
- BS 3958-5 : 1986 *Thermal insulating materials — Specification for bonded man-made mineral fibre slabs*
- BS 5262 : 1991 *Code of practice for external renderings*
- BS 8000-10 : 1995 *Workmanship on building sites — Code of practice for plastering and rendering*
- BS EN 197-1 : 2000 *Cement — Composition, specifications and conformity criteria for common cements*
- BS EN 459-1 : 2001 *Building lime — Definitions, specifications and conformity criteria*
- BS EN 13163 : 2001 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*
- MOAT No 22 : 1988 *Directives for the Assessment of External Insulation Systems for Walls (Expanded Polystyrene Insulation Faced with a Thin Rendering)*



On behalf of the British Board of Agrément

Date of issue: 30th March 2004


Chief Executive



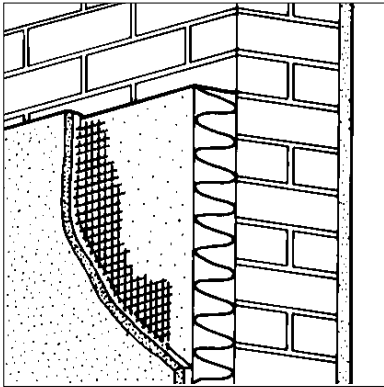
Wetherby Building Systems Limited

Certificate No 03/4058

THE EPSICON 3 EXTERNAL WALL INSULATION SYSTEM

DETAIL SHEET 3

Product



• THIS DETAIL SHEET RELATES TO THE EPSICON 3 EXTERNAL WALL INSULATION SYSTEM, A SYSTEM EMPLOYING EITHER PHENOLIC, PIR-MODIFIED URETHANE, EXPANDED POLYSTYRENE OR MINERAL WOOL INSULATION, WITH A GLASS-FIBRE REINFORCING MESH AND RENDER FINISHES.

- The system is applied to the outside of external walls of masonry or dense concrete construction and is suitable for new or existing buildings.
- It is essential that the system is installed and maintained in accordance with the conditions set out in the Design Data part of the Front Sheets and Installation parts of this Detail Sheet.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the system's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification.

Technical Specification

1 Description

1.1 The Epsicon 3 External Wall Insulation System (see Figures 1 and 2) comprises:

- Insulation in one of the following forms:
 - phenolic insulation boards — 1200 mm by 600 mm in a range of thicknesses between 20 mm and 80 mm. Boards are available with a nominal density of 40 kgm^{-3} or 50 kgm^{-3} and a minimum compressive strength of 150 kNm^{-2} or 120 kNm^{-2} , respectively
 - PIR-modified urethane insulation boards — 1200 mm by 600 mm in a range of thicknesses between 20 mm and 75 mm, with a nominal density of 32 kgm^{-3} and a minimum compressive strength of 150 kNm^{-2} . Boards of 15 mm thickness are also available for use in window reveals
 - PIR-modified urethane insulation boards — 1200 mm by 600 mm in a range of thicknesses between 40 mm and 60 mm. The boards are foil faced on both sides, and have a nominal density of 28 kgm^{-3}
 - expanded polystyrene insulation boards — 1200 mm by 600 mm in a range of thicknesses between 40 mm and 80 mm. The boards are manufactured to comply with the requirements for EPS 70 Class E material to BS EN 13163 : 2001
 - mineral wool insulation slabs — 1200 mm by 600 mm in a range of thicknesses between 30 mm and 100 mm, with a nominal density of 140 kgm^{-3} manufactured to BS EN 3958-5 : 1986
- Mechanical fixings — stainless steel and polypropylene, approved by the BBA and the Certificate holder
- Lightweight Basecoat Render — a cement-based, ready-mixed render supplied as a powder to which clean water is added. Comprises limestone sand conforming to BS 1199 : 1976 and BS 1200 : 1976, cement to BS EN 197-1 : 2000, lightweight aggregates and polypropylene fibres
- Reinforcement mesh — a multi-stranded, alkali-resistant glass fibre, with a polymer coating and a nominal weight of 160 gm^{-2}
- Lightweight Dash Receiver — a cement-based, ready-mixed render supplied as a powder to which clean water is added. Comprises limestone sand conforming to BS 1199 : 1976 and BS 1200 : 1976, cement to BS EN 197-1 : 2000, hydrated lime to BS EN 459-1 : 2001, lightweight aggregates, polypropylene fibres and polymers
- Ancillary materials:
 - profiles — a range of standard profiles, typically for wall base, end stop, corner mesh, and expansion joint. Profiles are available in organic polyester, powder-coated galvanized steel or stainless steel and are provided to the specifier's requirements and approved by the the Certificate holder
 - profile fixings — hammer screws with plastic expansion sleeves as approved by the Certificate holder
 - sealant — silicone mastic as approved by the Certificate holder
 - spardash aggregate as approved by the Certificate holder.

1.2 The insulation boards or slabs are mechanically fastened to the external surfaces of walls, secured initially with one centrally-placed mechanical fixing (see Figures 1 and 2). When all of the boards have been secured to the wall, the basecoat render is trowel applied to the insulation to a minimum thickness of 3 mm, and the reinforcing mesh is embedded. Further mechanical fixings are applied through the mesh into the substrate. Allowing sufficient drying time, the dash receiver is trowel applied to a thickness of 6 mm to 8 mm and dry-dashed.

Figure 1 The Epsicon 3 External Wall Insulation System

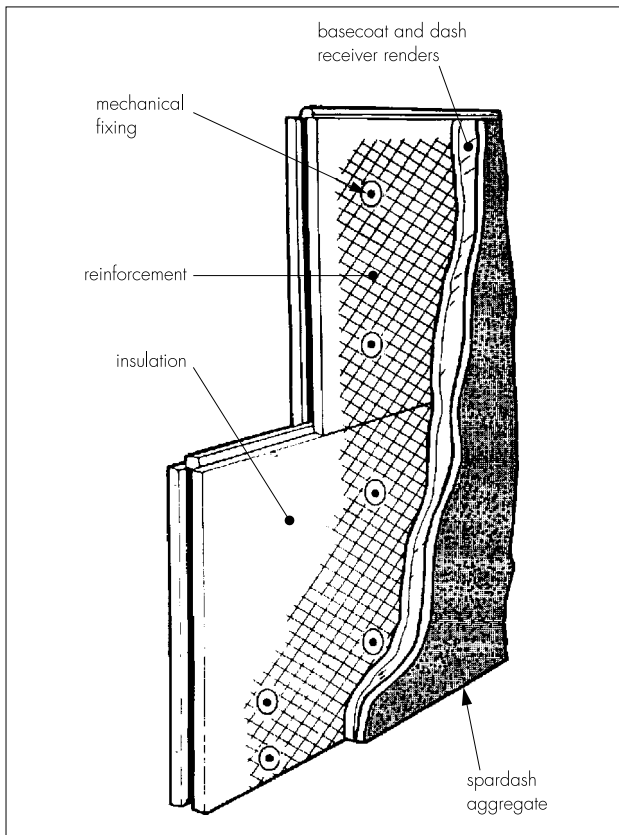
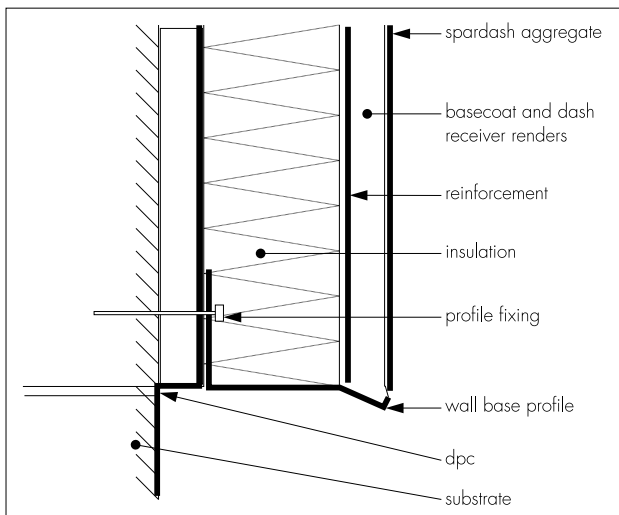


Figure 2 Typical section at base level



Installation

2 Procedure

General

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

2.2 Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, nor if exposure to frost is likely, and the coating must be protected from rapid drying. Weather conditions should therefore be monitored to ensure correct curing conditions.

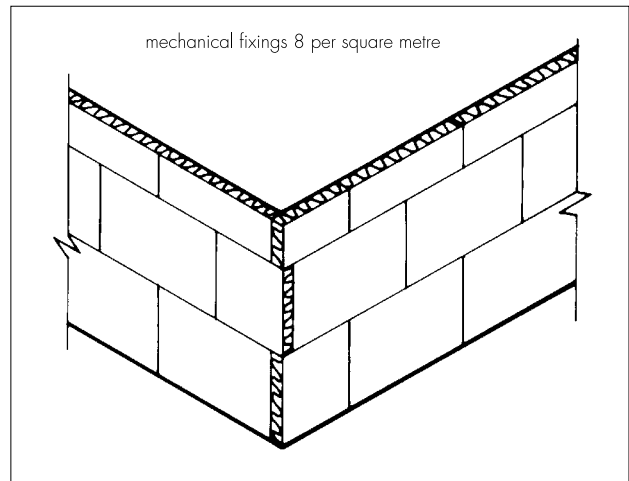
2.3 All rendering should be in accordance with the relevant recommendations of BS 5262 : 1991 and BS 8000-10 : 1995.

Positioning and securing insulation boards

2.4 The base profile is secured to the external wall above the damp-proof course using the approved profile fixings at approximately 300 mm centres.

2.5 The first run of insulation boards is positioned on the base profile. Holes are drilled into the substrate to a minimum depth of 50 mm through the centre of each board. The mechanical fixings are inserted and tapped firmly into place, securing the insulation board to the substrate. Subsequent rows of boards are positioned so that the joints are staggered and overlapped at the building corners (see Figure 3).

Figure 3 Arrangement of insulation boards



2.6 Care must be taken to ensure that all board edges are butted tightly together, and alignment should be checked as work proceeds. For expanded polystyrene, high spots or irregularities should be removed by lightly planing with a rasp.

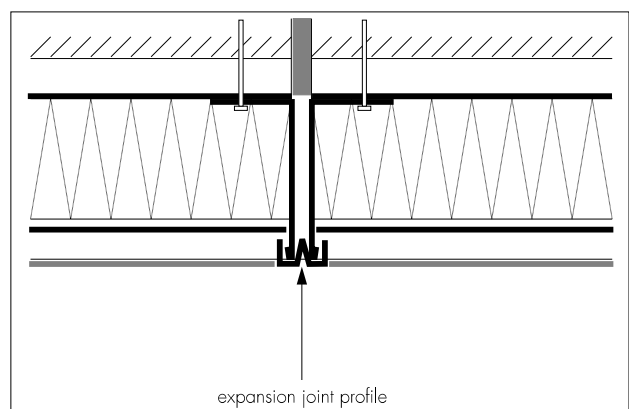
2.7 To fit around details such as doors and windows, insulation boards may be cut with a sharp knife or a fine-tooth saw. If required, purpose-made window-sills are fitted. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.

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

Movement joints

2.9 Movement joints in the substrate must be continued through the system. The joint detail using purpose-made metal trims is illustrated in Figure 4.

Figure 4 Vertical movement joint



2.10 Expansion beads are fixed vertically in agreed positions. These beads are positioned at approximately seven metre centres along a building, the centres depending on the individual requirements of each job.

Reinforcing

2.11 Holes are drilled at 300 mm vertical centres and 400 mm horizontal centres before the basecoat hardens and mechanical fixings are inserted through the mesh and tapped firmly home.

2.12 Angle beads are fixed to all building corners and to door and window heads and jambs where required.

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

2.14 Prior to the render coat, a bead of clear silicone rubber mastic 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.

Rendering and finishing

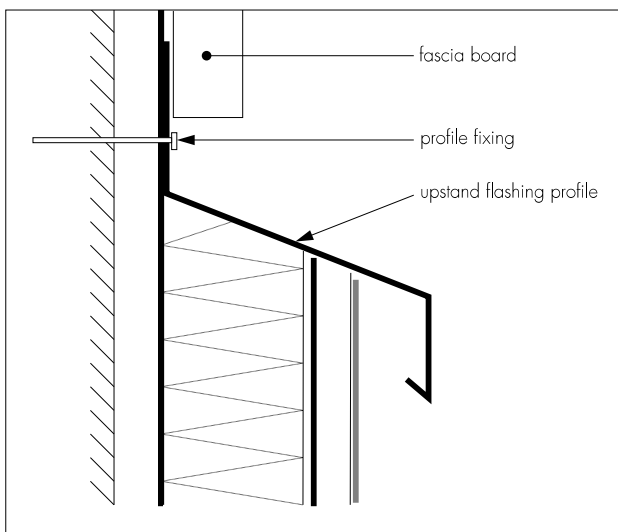
2.15 The basecoat and topcoat renders are prepared by mixing the contents of each 25 kg bag with approximately 7 to 8 litres of cold, clean water, using a concrete mixer. Mixing time should be at least five minutes after the addition of the last bag of render to allow an even dispersion of the resins.

2.16 The basecoat render is trowel applied to the surface of dry insulation boards to a minimum thickness of 3 mm. The mesh is bedded into the adhesive with 100 mm laps at joints.

2.17 The drying period of any render will depend on weather conditions; however, the basecoat must be left to harden for at least one day before application of the topcoat. The topcoat is prepared and trowel applied to a thickness of approximately 6 mm to 8 mm. While the render is still soft, selected clean spar aggregate is thrown or sprayed onto the surface. On completion, the surface must be checked to ensure an even coverage of spardash has been achieved. Where necessary the aggregate should be lightly tamped to ensure that a good bond is achieved.

2.18 At the tops of walls the system should be protected by an adequate overhang or by an adequately sealed, purpose-made flashing (see Figure 5).

Figure 5 Roof eaves detail



2.19 Care should be taken in the detailing of the system around openings and projections (see Figures 6, 7 and 8).

Figure 6 Insulated window detail

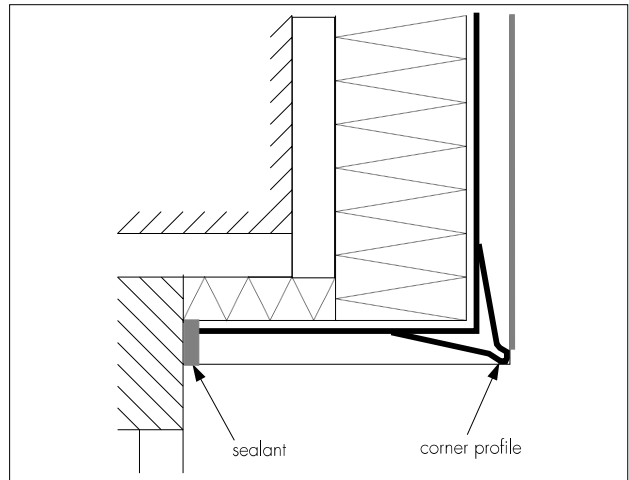


Figure 7 Window head detail

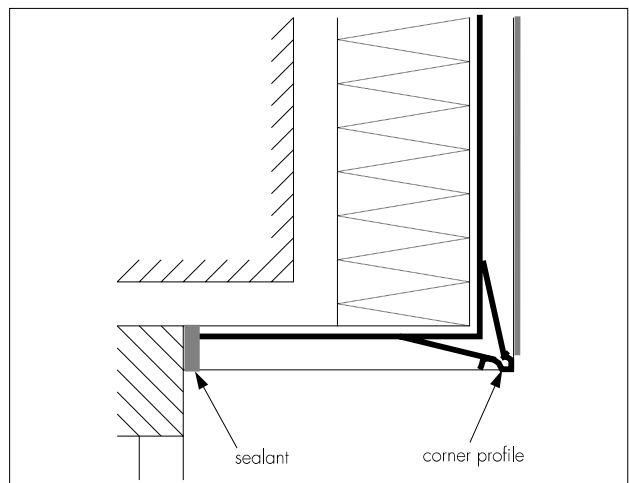
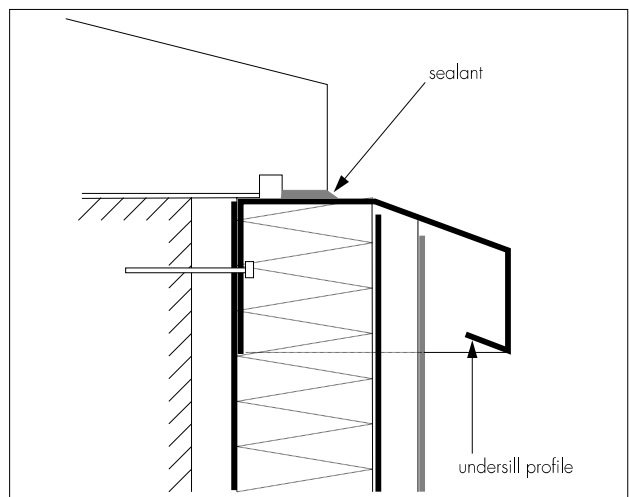


Figure 8 Window-sill detail



2.20 On completion of the installation, external fittings, eg rainwater goods, are re-fixed through the system into the substrate.

2.21 Continuous surfaces should be completed without a break.

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The following is a summary of the technical investigations carried out on The Epsicon 3 External Wall Insulation System.

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3.1 Tests were carried out in accordance with MOAT No 22 : 1988 to determine:

- component characterisation
- heat/spray cycling
- resistance to freeze/thaw
- impact resistance.

3.2 An examination was made of data relating to:

- water vapour permeability
- fire propagation tests to BS 476-6 : 1989
- surface spread of flame tests to BS 476-7 : 1987
- adequacy of fixing system
- durability of finish.

4 Investigations

4.1 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.

4.2 An assessment of the risk of interstitial condensation was undertaken.

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

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