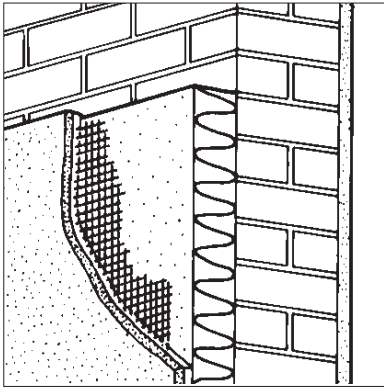


Product



• 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, manufactured to BS EN 13166 : 2001
 - 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 manufactured to BS EN 13165 : 2001. Boards of 15 mm thickness are also available for use in window reveals
 - 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
 - PIR-modified urethane insulation boards — 1200 mm by 600 mm in a range of thicknesses between 40 mm and 60 mm manufactured to BS EN 13165 : 2001. 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
 - 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 dash-dashed.

Figure 1 The Epsicon 3 External Wall Insulation System

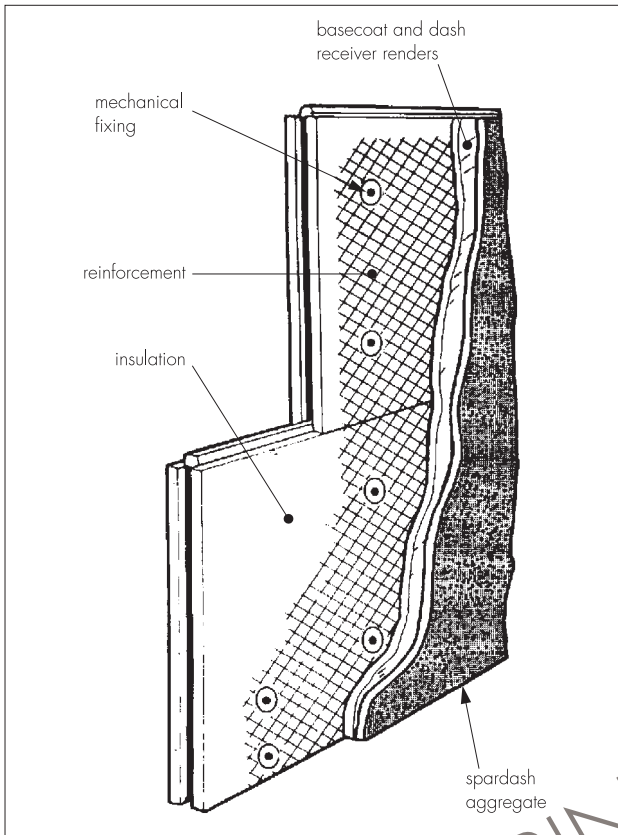
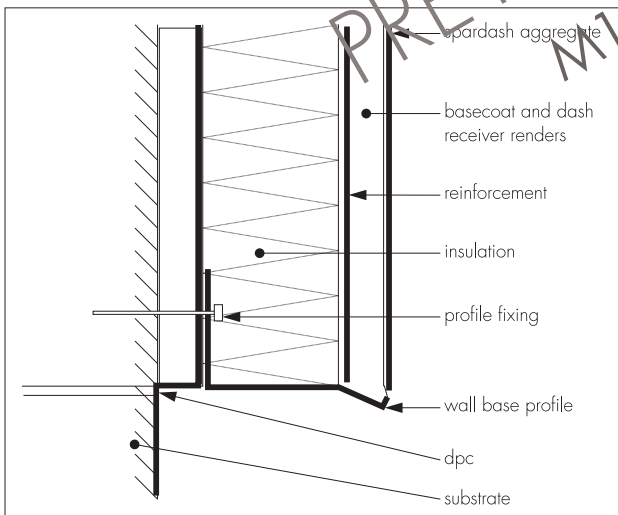


Figure 2 Typical section at base level



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.

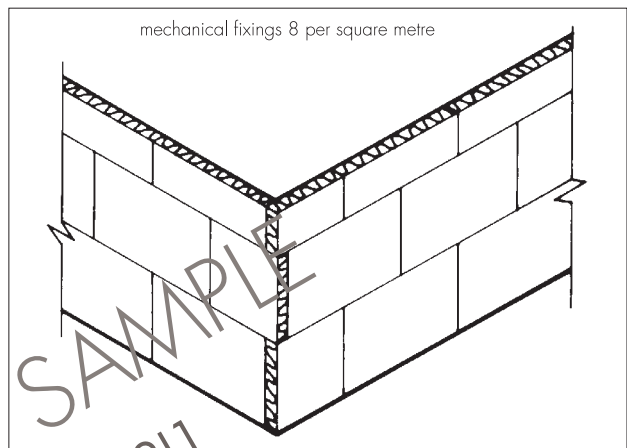
2.3 All rendering should be in accordance with the relevant recommendations of BS 5262 : 1991 and BS 8000-10 : 1995.

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 bolted 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.

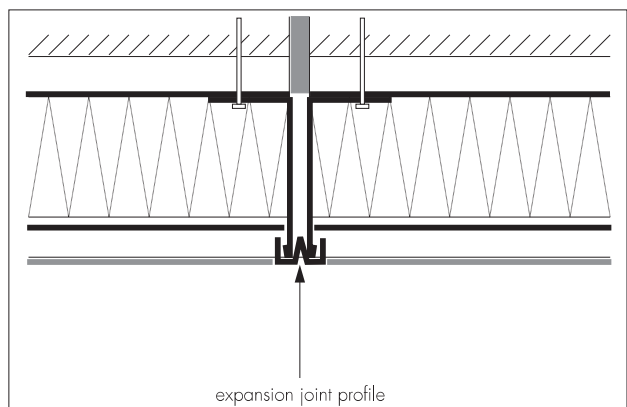
2.7 To fit around details such as doors and windows, insulation boards may be cut with a sharp knife or a fine-tooth saw. If required, purpose-made window-sills are fitted. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.

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

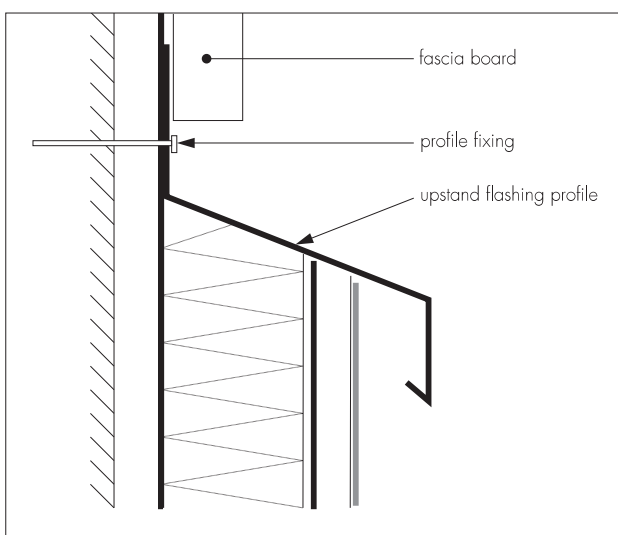
2.15 The basecoat and topcoat renders are prepared by mixing the contents of each 25 kg bag with approximately 7 to 8 litres of cold, clean water, using a concrete mixer. Mixing time should be at least five minutes after the addition of the last bag of render to allow an even dispersion of the resins.

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 clear 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

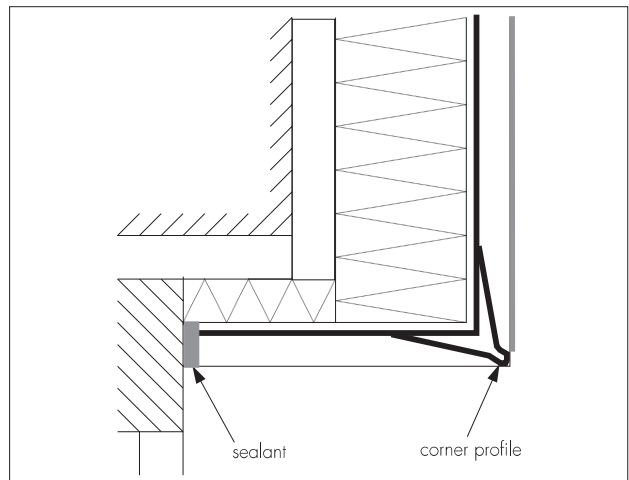


Figure 7 Window head detail

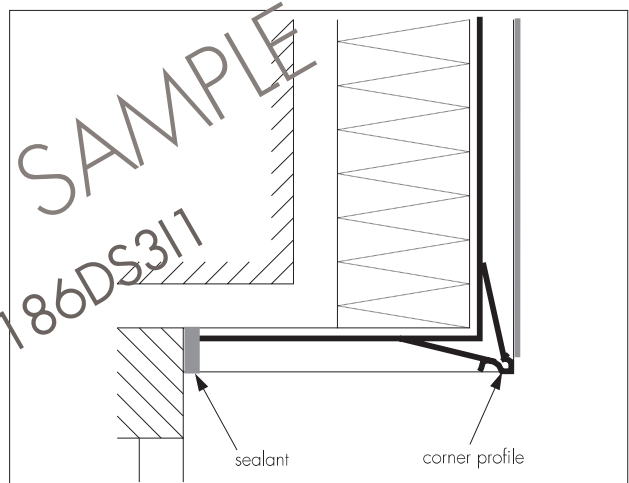
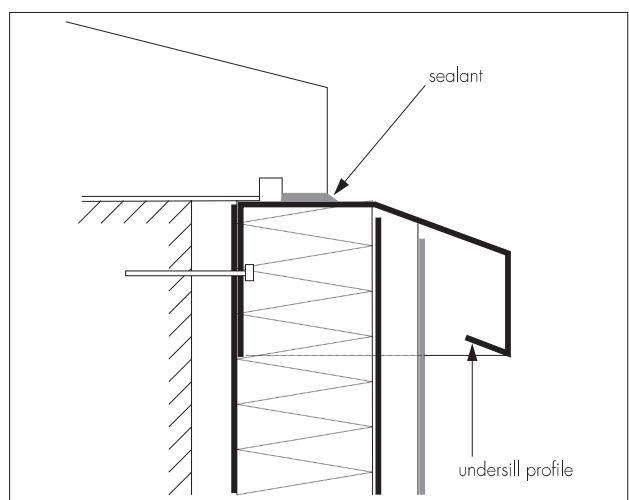


Figure 8 Window-sill detail



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.

Technical Investigations

The following is a summary of the technical investigations carried out on The Epsicon 3 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
- 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.

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*

BS EN 13165 : 2001 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PUR) products — Specification*

BS EN 13166 : 2001 *Thermal insulation products for buildings — Factory made products of phenolic foam (PF) — Specification*

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

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*



On behalf of the British Board of Agrément

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Chief Executive