CI/SfB
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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

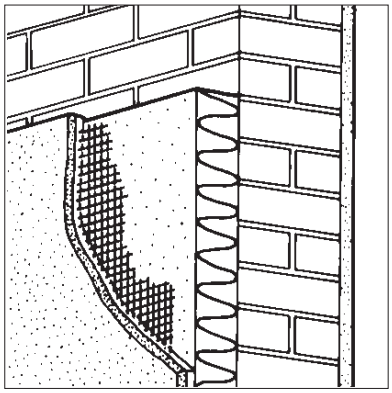
Wetherby Building Systems Limited

THE EPSICON 2
EXTERNAL WALL INSULATION SYSTEM

Certificate No 03/4058

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 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
- 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

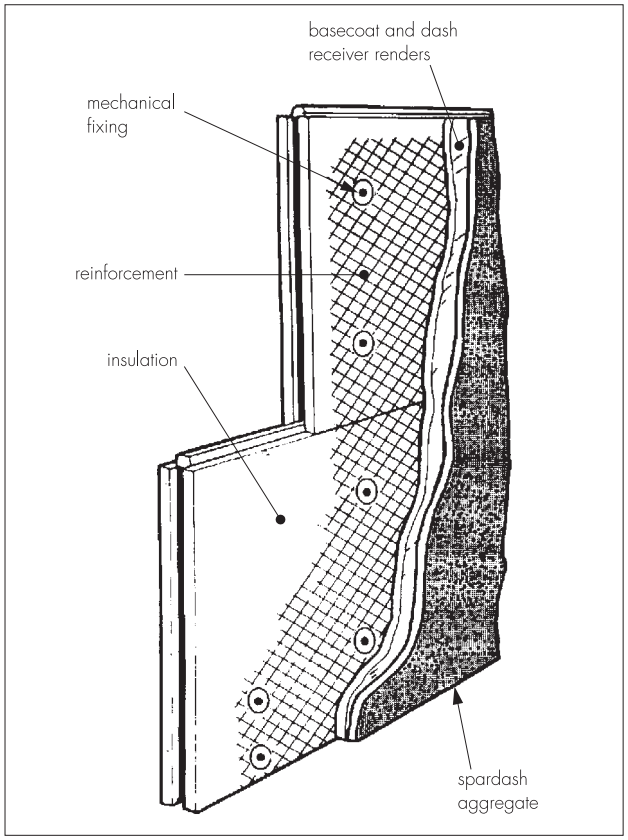
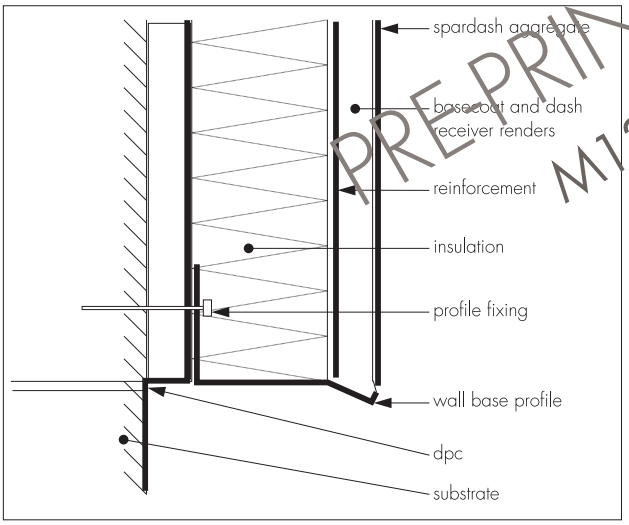


Figure 2 Typical section at base level



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.

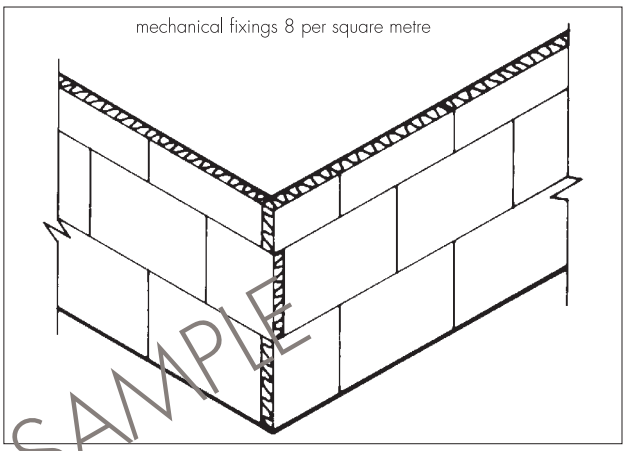
2.3 All rendering should be in accordance with the relevant recommendations of BS 5262 : 1991 and BS 8000-10 : 1995.

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.

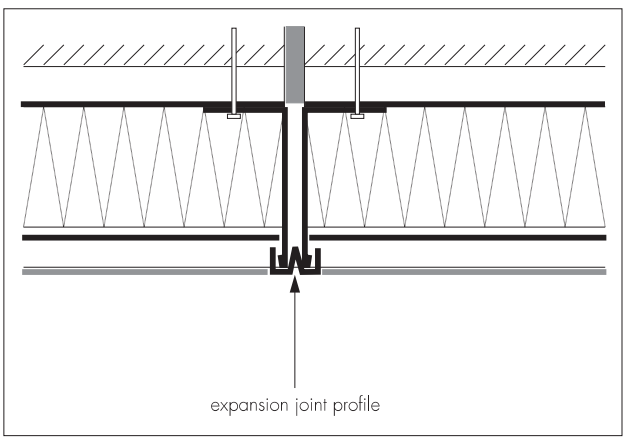
2.7 To fit around details such as doors and windows, insulation boards or slabs may be cut with a sharp knife or a fine-tooth saw. If required, purpose-made window-sills are fitted. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.

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

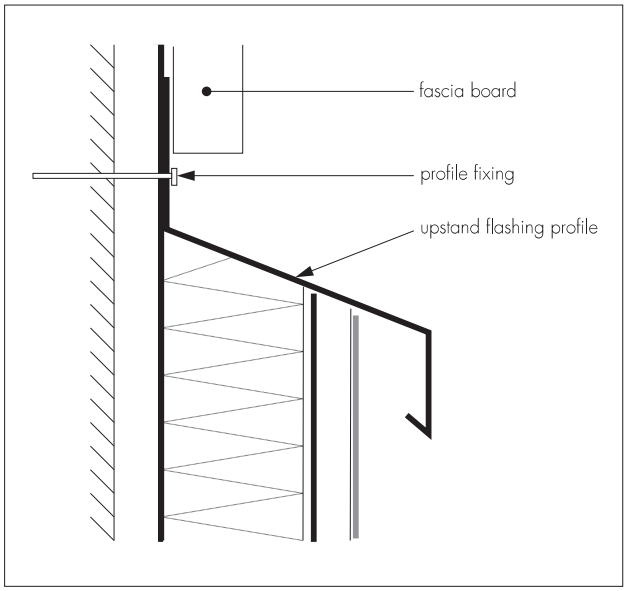


Figure 6 Insulated window detail

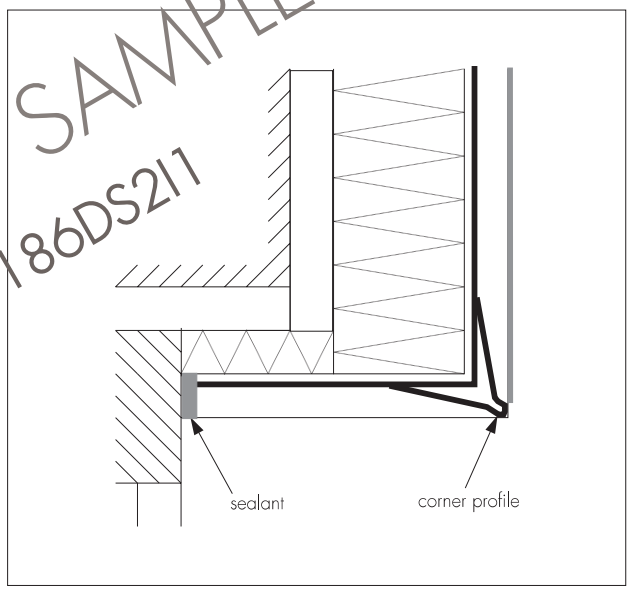


Figure 7 Window head detail

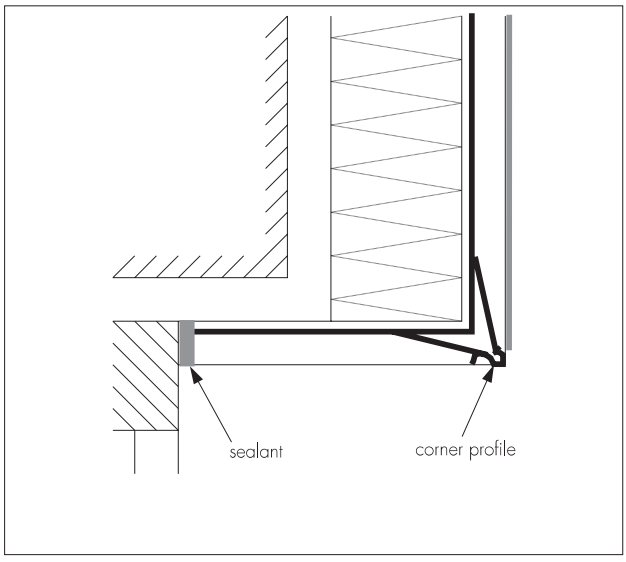
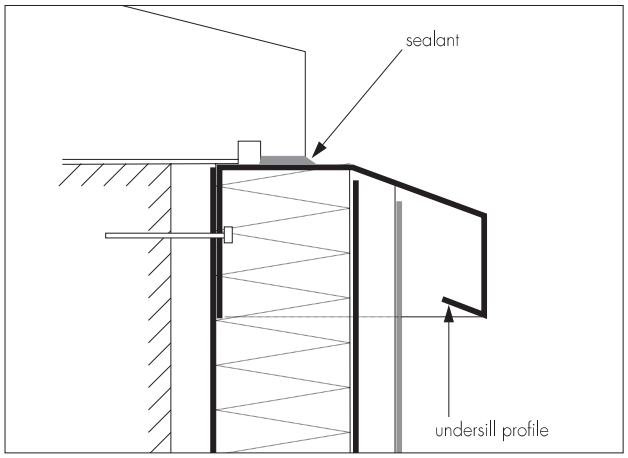


Figure 8 Window-sill detail



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*

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

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

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

On behalf of the British Board of Agrément

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