

**Technical Specification**

1 Description

1.1 The weber.therm XM (MFS) External Wall Insulation System (see Figure 1) comprises:

- weber.therm MFS insulation slab — 1000 mm by 500 mm\(^{(1)}\) in a range of thicknesses between 30 mm and 140 mm in 10 mm increments, with a nominal density of 115 kgm\(^{-3}\) and a minimum compressive strength of 25 kNm\(^{-2}\), incorporating a phenolic resin binder and a mineral oil water repellent

\(\text{(1)}\) Special sizes of board can be supplied to meet the requirements of individual sites.

- weber.rend LAC — a factory batched, polymer-modified, basecoat mortar, supplied as a powder, to which only water is added

- weber Fibreglass Meshcloth — a one-metre wide, woven glass-fibre reinforcing mesh with a polymer coating and a nominal weight of 160 gm\(^{-2}\)

- weber.rend PTC — a factory batched, pre-mixed, polymer-modified mortar of limestone sand, Portland cement, fibres and polymers. It is supplied as a powder to which only water is added

- weber Dry-Dash aggregate — natural coloured, sized up to 6 mm and available in a range of colours

This Detail Sheet must be read in conjunction with the Front Sheets, which give general information relating to the product, the system’s position regarding the Building Regulations and Conditions of Certification, respectively.
1.2 Where the substrate has an uneven surface not exceeding 20 mm in one metre, an adhesive coat is applied to the insulation slabs, which are then positioned on the wall. Structural fixings are inserted through the insulation boards to give a rate of five fixings per slab (see section 3.6).

1.3 The undercoat is applied in two layers with the mesh in between, to give a finished undercoat thickness of approximately 6 mm. The undercoat is allowed to cure (ie dry and shrink) before applying one of the finishes (see Figure 2).

Figure 2 Typical section at base level

1.4 Where a dashed finish is required, weber.rend PTC is applied to a thickness of approximately 6 mm, and dry-dashed immediately. Where a textured acrylic or silicone finish is required, the primer is applied by spray, brush or roller to the undercoat. After a sufficient drying period the weber.plast TF and weber.plast DF, or weber.sil TF is trowel applied (see Figure 2).

Design Data

2 Thermal insulation

2.1 For the purpose of U value calculations to determine if the requirements of the Building (or other statutory) Regulations are met, the thermal conductivity$^1$ of the insulation slab ($\lambda_{90/90}$ value) as stated by the insulation manufacturers may be taken as 0.036 Wm$^{-1}$K$^{-1}$.

$^1$ Not assessed by the BBA.

2.2 The requirement for limiting heat loss through the building fabric, including thermal bridging, will be satisfied if the U values of the building elements do not exceed the maximum values in the relevant Elemental Approach given in the national Building Regulations:
2.3 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 also described which allow for some flexibility in design of U values for individual constructional elements.

2.4 Where the insulation has 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.

2.5 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, e.g. roof or loft insulation should continue over the wall head. Care should be taken to ensure that ventilation openings are not obstructed.

Installation

3 Procedure

General

3.1 Application is carried out in accordance with the current installation instructions of the Certificate holder.

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

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

Positioning and securing insulation boards

3.4 The base profile is secured to the external wall above the damp-proof course using approved profile fixings at 700 mm maximum centres (see Figure 2).

3.5 Where the substrate surface is uneven, but less than 20 mm in one metre, the adhesive coat is applied to the back of the insulation slab, but if greater, then the substrate must be made good.

The first run of insulation slabs is positioned on the base profile.

3.6 Holes are drilled into the substrate through the insulation slab (see Figure 3) and mechanical fixings are inserted and tapped firmly home to secure the slabs at the specified minimum rate of four fixings per slab or eight fixings per m² (see the Strength and stability section of the Front Sheets).

3.7 Subsequent rows of boards are positioned so that the vertical slab joints are staggered and overlapped at the building corners (see Figure 4).

3.8 Care must be taken to ensure that all slab edges are butted tightly together, and surface alignment should be checked as work proceeds.

3.9 To fit around details such as doors and windows, insulation slabs may be cut with a sharp knife or a fine-toothed saw. If required, purpose-made window-sills are fitted at this stage. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.
3.10 Installation continues until the whole wall is completely covered including, where appropriate, the building soffits.

Movement joints

3.11 Movement joints in the substrate must be continued through the system by cutting through the insulation slabs to coincide with the building’s movement joint. The weber expansion joint metal profile is fixed to the insulation slab surface with adhesive mortar, prior to application of the reinforced undercoat (see Figure 5).

3.12 The extent of a rendered area should take account of the shape of the work. Where necessary, render movement joints are formed as above.

Reinforcing

3.13 The undercoat is prepared and trowel applied to the surface of the dry insulation initially to an approximate thickness of 2 mm to 3 mm. The mesh is bedded into the undercoat with 100 mm laps at joints and a further coat is applied. The overall coat thickness is approximately 6 mm. Additional pieces of reinforcing mesh are used diagonally at the corners of openings, as shown in Figure 6.

3.14 Care is taken to butt the undercoat under details such as window-sills. The surface of the undercoat is trowelled smooth and depending on the finish, lightly sponged, or scored, combed to provide a good even surface for the finish.

Beads

3.15 Expansion beads are fixed vertically as day joints, ideally over existing joints.

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

3.17 Where required, angle beads are fixed to all building corners and to door and window heads and jambs.

Render finishing

3.18 The base undercoat must be left to cure for at least two to three days depending on weather conditions, before application of the finish.

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

3.20 The finish coat can be either a polymer-modified cementitious topcoat with a dry-dash finish or synthetic coat, or a cement-free synthetic coat applied direct to the primed undercoat.

3.21 Where a dry-dash finish is required, the weber.rend PTC is mixed to a smooth, workable consistency.

3.22 One coat is trowel applied onto the undercoat to a thickness of approximately 6 mm. While the render is still soft the dry-dash is applied with a dashing trowel. Narrow widths of weber.rend PTC around window and door openings, and in reveals, may be smooth float finished and painted with weber masonry paint. On completion the surface should be checked to ensure an even coverage has been achieved. Where necessary, the aggregate should be lightly tamped down to ensure that a good bond is achieved.

3.23 Where a weber.plast TF and weber.plast DF or weber.sil TF finish is required, the primer is brush applied and allowed to dry. The finished should be mixed thoroughly before application over the undercoat. The chosen finish is applied with a steel trowel to a uniform thickness, depending on grain size and immediately worked with a thin, plastic or wooden float to produce the desired texture (see section 1).

3.24 To prevent the finish from drying too rapidly it should not be applied in direct sunlight. The finished render surface should be protected from rain and frost until the material is dry and hard,
approximately 24 hours under favourable conditions; in winter, drying may take at least 48 hours. Continuous surfaces must be completed without a break.

3.25 At the tops of walls the system must be protected by an adequate overhang or by an adequately sealed, purpose-made flashing (see Figure 7).

3.26 Care must be taken in the detailing of the system around openings and projections (see Figure 8).

3.27 On completion of the installation, external fittings, eg rainwater goods, are re-fixed through the system into the substrate.
The following is a summary of the technical investigations carried out on the weber.therm XM (MFS) External Wall Insulation System.

4 Tests
4.1 Tests were carried out in accordance with MOAT No 22 : 1988 to determine:
- component characterisation
- flexural and compressive strength of renders
- resistance to freeze/thaw
- heat/spray cycling
- impact resistance
- water absorption of render
- water permeability
- water vapour permeability.

4.2 An examination was made of data relating to:
- fire propagation tests to BS 476-6 : 1989
- surface spread of flame tests to BS 476-7 : 1997
- pull-out strength of fixings
- durability of finish coatings.

5 Investigations
5.1 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.

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

5.3 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 : 1997 Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products
BS 5262 : 1991 Code of practice for external renderings
BS 6497 : 1984 Specification for powder organic coatings for application and stoving to hot-dip galvanized hot-rolled steel sections and preformed steel sheet for windows and associated external architectural purposes, and for the finish on galvanized steel sections and preformed sheet coated with powder organic coatings
BS 8000-10 : 1995 Workmanship on building sites — Code of practice for plastering and rendering
BS EN 10088-1 : 1995 Stainless steels — List of stainless steels
BS EN 10327 : 2004 Continuously hot-dip coated strip and sheet of low carbon steels for cold forming — Technical delivery conditions
MOAT No 22 : 1988 UEAtc 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

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*Original Detail Sheet issued on 2nd February 1993. This amended version includes a change of Certificate holder’s name, and new component names.