



NSAI

Agrément

IRISH AGRÉMENT BOARD CERTIFICATE NO. 12/0371

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Soltherm External Thermal Insulation Composite Systems

NSAI Agrément (Irish Agrément Board) is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2017**.



PRODUCT DESCRIPTION:

This Certificate relates to the Soltherm P and MW Systems. The systems comprise of:

- Surface preparation of masonry or concrete substrate;
- Full system beads and render only beads;
- Insulation boards
 - **P System:** Expanded Polystyrene and Graphite Enhanced Polystyrene
 - **MW System:** Mineral Wool
- Cementitious base coat with reinforcement;
- Decorative finish (acrylic, mineral, silicone, silicone/acrylic, or silicate)
- Mechanical fixings;
- Adhesive fixings;
- Weather tight joints;
- Movement joints;
- Provision for limiting cold bridging at external wall/floor junctions in compliance with Acceptable Construction Details published by the DECLG.
- Provision for fire stopping at external compartment walls and floors.

Soltherm External Insulations Ltd is responsible for the design, manufacture and supply of all components to approved specifications.

The list of Soltherm Agents/Distributors in Ireland is available at www.e-soltherm.com/en/Official%20distributors.

The ETICS system is designed on a project specific basis by trained Soltherm External Insulations Ltd or their approved Agents/Distributors in accordance with an approved design process.

The installation of the system is carried out by installers who have been trained by Soltherm Agents/Distributors and are approved by Soltherm External Insulations Ltd and NSAI Agrément to install the system. Applicators must adhere to strict installation guidelines as specified by Soltherm External Insulations Ltd.

Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting NSAI Agrément, NSAI, Santry, Dublin 9 or online at <http://www.nsai.ie>

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2017.

USE

The Soltherm P and MW systems are for the external insulation of:

- (a) Existing concrete or masonry dwellings;
- (b) New concrete or masonry commercial or industrial buildings, which are designed in accordance with the Building Regulations 1997 to 2011.

The Soltherm P system is suitable for use up to a maximum of six storeys (18m) in height in purpose groups 1(a), 1(c), 1(d), 2(a), 2(b), 3, 4(a) and 4(b), and for use up to a maximum of five storeys (15 metres) in height in purpose group 1(b), as defined in TGD to Part B of the Building Regulations 1997 to 2017. The Soltherm MW system is non-combustible with a fire classification of A1 or A2-s1, d0 to IS EN 13501-1 and may be used on heights in excess of this – the Certificate holder must be contacted for the specific build-up, fixing details etc.

The system has not been assessed for use with timber frame or steel frame construction, or for new dwellings.

In an Irish context, Category I 'Impact Resistance' (see Table 2) includes a wall at ground level readily accessible to the public and vulnerable to hard body impacts but not subjected to abnormally rough use. Category II excludes any wall at ground level adjacent to a public footpath, but includes one with its own private, walled-in garden. Category III does not include any wall at ground level.

MANUFACTURE, DESIGN & MARKETING:

The system is designed and manufactured by:

Soltherm External Insulations Ltd,
Challenge House,
Sherwood Drive,
Bletchley,
MK3 6DP.

T: +44 1908 533444

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1.1 ASSESSMENT

In the opinion of NSAI Agrément, the Soltherm P and MW Systems, when installed by recommended contractors, in accordance with this Certificate and site specific design, can meet the requirements of the Building Regulations 1997 to 2017, as indicated in Section 1.2 of this Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2017

REQUIREMENTS:

Part D – Materials and Workmanship

D3 – Proper Materials

Soltherm P and MW Systems, as certified in this Certificate, are comprised of 'proper materials' fit for their intended use (see Part 3 and 4 of this Certificate).

D1 – Materials & Workmanship

Soltherm P and MW Systems, as certified in this Certificate, meet the requirements for workmanship.

Part A - Structure

A1 – Loading

Soltherm P and MW Systems, once appropriately designed and installed in accordance with this Certificate, have adequate strength and stability to meet the requirements of this Regulation (see Part 3 of this Certificate).

A2 – Ground Movement

Soltherm P and MW Systems can be incorporated into structures that will meet this requirement (see Parts 3 and 4 of this Certificate).

Part B – Fire Safety

B4 – External Fire Spread

Part B Vol 2 – Fire Safety

B9 – External Fire Spread

Soltherm P and MW Systems can be incorporated into structures that will meet this requirement (see Part 4 of this Certificate).

Part C – Site Preparation and Resistance to Moisture

C4 – Resistance to Weather and Ground Moisture

External walls have adequate weather resistance in all exposures to prevent the passage of moisture from the external atmosphere into the building as specified in Parts 3 and 4 of this Certificate.

Part F – Ventilation

F2 – Condensation in Roofs

The system as certified can be incorporated into structures that will meet the requirements of this Regulation (see Parts 3 and 4 of this Certificate).

Part J – Heat Producing Appliances

J3 – Protection of Building

When Soltherm P and MW Systems are used in accordance with this Certificate, wall lining, insulation and separation distances meet this requirement (see Part 4 of this Certificate).

Part L – Conservation of Fuel and Energy

L1 – Conservation of Fuel and Energy

The walls of Soltherm P and MW Systems can be readily designed to incorporate the required thickness of insulation to meet the Elemental Heat Loss method calculations for walls as recommended in Part L of the Building Regulations 1997 to 2017 (see Part 4 of this Certificate).

L2 – Conservation of Fuel and Energy

At interface junctions at windows and at junctions between elements, the Soltherm External Wall Insulation System installation details have been assessed, and when installed in accordance with this Certificate and the Certificate holder's approved installation details, excessive heat losses and local condensation problems associated with thermal bridging will be avoided.

2.1 PRODUCT DESCRIPTION

The Soltherm P and MW Systems consist of fixing thermal insulation boards, either factory-prefabricated standard or graphite enhanced expanded polystyrene (EPS), or mineral wool, with a base coat layer incorporating reinforcement mesh and a decorative finish.

See Tables 1 and 2 for the full list of components of the Soltherm P and W Systems.

The system can be applied on a variety of existing external surfaces such as concrete, brick or rendered masonry walls. It can also be fixed on surfaces of horizontal or tilted structural elements provided that they are not directly exposed to precipitation. These may include ceilings over passageways, internal walls and roofs (on the ceiling side) of garages or cellars adjacent to heated rooms.

The substrate on which the Soltherm P and MW Systems will be used should have a reaction to fire class A1 or A2-s1 d0 in accordance with I.S. EN 13501-1.

2.2 MANUFACTURE, SUPPLY AND INSTALLATION

Soltherm External Insulations Ltd is responsible for the design and manufacture of all components to approved specifications. Soltherm External Insulations Ltd and their approved Irish Agents/Distributors are responsible for:

- Project specific design in accordance with approved design process;
- Preliminary project assessment incorporating wind load calculations, U-value calculations, condensation risk analysis, impact resistance, substrate suitability and pull-out testing of fixings;
- Training, monitoring and review of licensed applicators in accordance with approved training and assessment procedures;
- Product supply and documentation control;
- Technical support and installation supervision;
- Sales and marketing.

The installation of Soltherm P and MW Systems is carried out by the Certificate holder's trained and approved installers in accordance with project specific specifications and method statements. Installers must also be approved and registered by NSAI Agrément under the NSAI Agrément External Thermal Insulating Composite Systems (ETICS) Approval Scheme (See Section 2.4.1 of this Certificate).

2.2.1 Quality Control

The Certificate holder, and the manufacturer, operate a quality management system, and a quality plan is in place for system manufacture, system design and system installation.

2.3 DELIVERY, STORAGE AND HANDLING

The materials of the Soltherm P and MW Systems are delivered to site in packs. Each pack is marked with the manufacturer's details, product identification marks and batch numbers. See Tables 1 and 1 for the designation code that must be included on the insulation identification label.

Each container for other components, e.g. mesh, renders, adhesives etc., bears the manufacturer's and the product's identification marks and batch number, and the NSAI Agrément logo incorporating the Certificate number.

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

Care must be taken when handling the insulation boards, to avoid damage and contact with solvents or bitumen products. The boards must not be exposed to ignition sources.

Mesh-cloth, primers, renders, paints, texture synthetic finish coatings and sealants should be stored in accordance with the manufacturer's instructions, in dry conditions, at the required storage temperatures. They should be used within the stated shelf life.

2.4 INSTALLATION

2.4.1 Approved Installers

Installation shall be carried out by Soltherm External Insulations Ltd External Insulation trained applicators who:

- 1) Are required to meet the requirements of an initial site installation check by NSAI Agrément prior to approval and are subject to the NSAI Agrément ETICS Approval Scheme.
- 2) Are approved by Soltherm External Insulations Ltd and NSAI Agrément to install the product.
- 3) Have undertaken to comply with the Soltherm External Insulations Ltd installation procedure, requirements of this Certificate, and the NSAI scheme document for approved contractors.
- 4) Are employing Supervisors and Operatives who have been issued with appropriate identity cards by Soltherm External Insulations Ltd Each team must consist of at

least one ETICS Operative and ETICS Supervisor (can be the same person).

- 5) Are subject to supervision by Soltherm External Insulations Ltd, including unannounced site inspections by both the Certificate holder and NSAI Agrément, in accordance with the NSAI Agrément ETICS Approval Scheme.
- 6) Are subject to periodic surveillance by the system manufacturer Soltherm External Insulations Ltd and/or their Irish Agents/Distributors – site visits and office records.

2.4.2 General

Soltherm External Insulations Ltd or their Irish Agents/Distributors prepare a site package for each project, including wind loading and U-value calculations, requirements for materials handling and storage, method statements for installation, building details, fixing requirements, provision for impact resistance, maintenance requirements etc. This document forms part of the contract documentation for circulation to the home owner and the installer. Installers will be expected to adhere to the specification. Deviations must be approved by a Soltherm External Insulations Ltd technical representative. Soltherm External Insulations Ltd or their Irish Agents/Distributors technical representatives will visit each site on a regular basis to ensure that work is carried out in accordance with the project specific site package, including the Certificate holder's installation manual. Certificates of Compliance, guarantees and home owner's manual will be issued on successful completion of completed projects.

Mineral fibre board and lamella must be protected from moisture prior to and during installation. It may be necessary to remove and replace any unsuitable/wet material.

External works that leave the external appearance of the building inconsistent with neighbouring buildings may require planning permission. The status of this requirement should be checked with the local planning authority as required.

Details shown in this Certificate were developed to strike a balance between thermal efficiency and economic viability. To maximise thermal performance, reference should be made to the requirements of Section 2 of the Acceptable Construction Details document (ACDs).

2.4.3 Site Survey and Preliminary Work

A comprehensive pre-installation site survey of the property shall be carried out by a suitably qualified technical representative of the NSAI Agrément approved contractor and all key information is recorded on the site survey form. The pre-installation survey is also used to price the project and identify all the relevant factors/technical information which needs to be

considered in the design of the external cladding system and important information to be included in the site specific pack. This pack would typically include wind load calculations and a fixing specification summary sheet, thermal bridging evaluation, surface condensation risk analysis, elemental wall U-value calculation, and a full set of project specific building details. The survey will also establish the suitability of the substrate, and the technical representative will determine if pullout resistance testing is required and what substrate preparation is required.

The substrate must be free of water repellents, dust, dirt, efflorescence and other harmful contaminants or materials that may interfere with the adhesive bond. Remove projecting mortar or concrete parts mechanically as required. Where the substrate contains dash, it must be levelled as much as possible with a layer of adhesive base coat prior to the application of the insulation boards/batts.

Where discrepancies exist which prevent installation of the system in accordance with this Certificate and the Certificate holder's instructions, these discrepancies must be discussed with the Certificate holder and a solution implemented with the approval of the Certificate holder.

2.4.4 Procedure

- Following award of contract, the site specific pack is prepared by Soltherm External Insulations Ltd or their Irish Agents/Distributors based on the information recorded in the site survey form.
- Prepare substrate in accordance with the project specific site package. This will include brushing down of walls, washing with clean water and treatment with a fungicidal wash as required.
- The integrity of the existing substrate is assessed by checking the surface for loose render by tapping with a hammer and listening for a hollow sound. If render is loose it must be removed and replaced.
- At external window and door frame reveals, the existing plaster reveals should only be removed if a minimum clearance of 30mm cannot be achieved between the reveal and the window/door frame. This clearance must allow for opening sections of window and door frames. This is to allow the application of insulation around the reveals and heads of the doors and windows to significantly reduce cold bridging.
- Weather conditions must be monitored to ensure correct application and curing conditions. Renders (adhesives, base coats, primers, finish coats) must not be applied if the temperature is below 5°C or above 25°C at the time of applications. In addition, cementitious-based renders must not be

applied if the temperature will be below 5°C at any time during 48 hours after application; cement-free, synthetic-resin and silicone-resin plasters must not be applied if the temperature will be below 5°C; silicate plasters must not be applied if the temperature will be below 10°C.

- Until fully cured, the coatings must be protected from rapid drying, precipitation, direct sunlight and strong wind.
- Refer to the site package for guidance on modifications of down pipes, soil and vent pipes, pipe extensions etc.
- Where possible all pipe work should be relocated as required to accommodate the insulation. Where pipe work cannot be relocated and is to be housed in the depth of the system, access for maintenance must be maintained through the use of removable covers or alternative design to be approved by the Certificate holder.
- Base beads and all full system beads are fixed as specified. Insulation and render only beads are fixed as specified in the site package.
- The starter track or PVC drip bead is mechanically fixed to the substrate level with the DPC line. This provides a horizontal line for the installation of insulation panels as well as providing reinforcement to the lower edge of the system. In addition, the starter track serves as a bottom end closer to impede vermin and burrowing insects.
- At plinth level, XPS boards are then fixed to the wall below the starter track to provide the necessary resistance to impact and capillary action. To minimise the effects of cold bridging, the XPS boards should extend below ground level where possible. Where this is not possible, the first run of XPS boards should be positioned at ground level as detailed in Figure 1.
- The EPS or XPS insulation boards are bonded to the wall by applying the specified adhesive (see Tables 1) to the boards using the "ribbon and dab" method. A circumferential ribbon of adhesive at least 30mm wide in diameter is applied to the insulation boards. 6 – 8 evenly distributed patches of adhesive 80 – 120mm in diameter are then applied to the boards so that an adhesive surface of at least 40% is achieved. Alternatively, for even and smooth substrates, the whole EPS or XPS panel can be fully coated with adhesive using a notched trowel to produce a coat 2 – 10mm in thickness (see Tables 1 and 2). The insulation board should be immediately placed on the substrate and pressed into place. In all cases, mineral wool is fully bonded.
- If using the notched trowel method, first apply the adhesive to the back-facing side of the insulation board so that when it is applied to the substrate, the notched trowel pattern runs in a consistent vertical pattern. The notched pattern should cover the board face all the way to the board edges. To ensure sufficient bonding and coverage of the adhesive, the insulation board should be visible in between the notches / grooves of adhesive. Adhesive should only be applied to the back-facing side of the insulation board. Remove any adhesive from insulation board edges.
- Before applying adhesive to mineral wool, the boards must be cleared of dust and loose particles. The boards should be initially covered with adhesive by applying a thin layer using a smooth edge trowel in order to increase adhesion. On the surface of the mineral wool prepared as described above the actual adhesion layer can be applied as a thin layer using a notched trowel or using the "ribbon and dab" method as described previously for the EPS boards.
- Subsequent rows of insulation boards are installed on top of the starter track and positioned so that the vertical board joints are staggered and overlapped at the building corners.
- To avoid thermal bridging, ensure a tight adhesive free joint connection between adjacent insulation boards. Foam filler approved by the Certificate holder may be used for filling gaps up to 5mm. When used, the expanding foam should have a fire-rating of B3 or better and a maximum lambda value of 0.038 W/mK.
- At façade openings, e.g. windows and doors, insulation boards must be continued around the corner. Insulation boards must overlap at these locations and can be cut to size to facilitate this. Any projecting insulation boards should be levelled out using a rasp, with local trimming as required on mineral wool boards.
- Window and door reveals should, where practicable, be insulated to minimise the effects of cold bridging in accordance with the recommendations of the Acceptable Construction Details Document published by the DECLG, Detail 2.21, to achieve an R-value of 0.6m²K/W. Where clearance is limited, strips of approved insulation should be installed to suit available margins and details recorded as detailed in Section 4.5 of this Certificate.
- To minimise the effects of cold bridging in all other junctions over and above windows and doors, designers should consider the recommendations of the Acceptable Construction Details Document (published by the DECLG), Section 2 – External Wall Insulation. Where clearance is limited, strips of approved insulation (with better thermal resistance values) should be installed to suit available margins and details recorded as outlined in Section 4.5 of this Certificate.
- Details of mechanical fixings (including their arrangement in the insulation boards) are specified in the project specific design based on pullout test results, substrate type and

wind loading data. A minimum number of 4 mechanical fixings per square meter for EPS and XPS. A minimum of 6 mechanical fixings per square meter for mineral wool shall be installed unless otherwise specified in the project specific design. Above two stories an additional stainless steel fire fixing is provided at a rate of 1 per m².

- The heads of mechanical fixings cannot protrude beyond the plane of the boards, i.e. they should be exactly flush. Excessively deep insertion of fixing heads in the insulation material can cause cracking of the boards which in turn weakens the insulation. Filling indentations in these areas can cause thermal bridges and consequently may lead to plaster loosening in such areas.
- Refer to the Certificate holder's instructions and the project specific site package regarding the installation method and location of the SS fixings through the reinforcing mesh where fire stops have been installed. Additional layers of mesh are also applied at these locations.
- Stainless steel fire fixings to be provided at a rate of one per square metre above two stories. The fixing design should take account of the extra duty required under fire conditions.
- Purpose-made powder coated aluminium window sills with PVC stop-ends are installed in accordance with the Certificate holder's instructions. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.
- Lamella fire stops are installed in accordance with the Certificate holder's instructions as defined in Section 4.2 of this Certificate, at locations defined in the project specific site package.
- For EPS insulation, any high spots or irregularities should be removed by lightly planeing with a rasp to ensure the application of an even thickness of base coat. After sufficient stabilisation of the insulation (normally 2 days, during which time the insulation should be protected from exposure to extreme weather conditions to prevent degradation), the insulated wall is ready for the application of the base and finish coats.
- EPS boards exposed to UV light for extended periods prior to the application of the render coatings are subject to breakdown and should be rasped down as required in preparation for rendering.
- Movement joints shall be provided in accordance with the project specific site package.
- At all locations where there is a risk of insulant exposure, e.g. window reveals, eaves or stepped gables, the system must be protected, e.g. by an adequate overhang or by purpose-made sub-sills, seals or flashings.
- Building corners, door and window heads and jambs are formed using angle beads bonded to the insulation in accordance with the Certificate holder's instructions.
- To minimise the thermal bridge effect during the installation of railings, exterior lighting, shutter guide rails, canopies, aerials, satellite dishes etc, the Certificate holder offers a range of anchoring options. These fixings /anchors must be installed in accordance with the Certificate holder's instruction, as defined in the project specific site package, during the installation of the insulation boards.
- Where the external insulation meets intersecting walls etc and the abutting structure cannot be cut back, the edge of the insulation where it meets the wall should be protected using PVC universal stop-trim, followed by the application of a low modular silicone sealant between the top coat and the abutting structure.
- Prior to application of base coat and finish coat, all necessary protective measures such as taping off of existing window frames and covering of glass should be in place.
- If it is not possible to install the ETICS to all external walls, alternative forms of thermal upgrades, such as full fill cavity wall insulation or dry lining, should be provided where physically and economically feasible. There should be an adequate overlap at the junction between the ETICS and the alternative insulation method selected to limit thermal bridging at this interface.
- In sunny weather, work should commence on the shady side of the building and be continued following the sun to prevent the rendering drying out too rapidly.
- An additional diagonal reinforcement must be applied at all corners of the façade openings. This involves embedding diagonal strips of mesh in the reinforcing mortar ensuring a double layer of mesh in these areas.
- Base coat should be mixed using a low-speed drill until homogeneous consistency is achieved. After 5 minutes and another stirring, the mixture is ready to use. Mix only enough material for immediate use.
- For system based on MW boards, immediately prior to the basecoat application a thin coat of basecoat must be spread over the surface of the MW board to increase the adhesion strength to the MW board. Use a trowel or 8mm notched trowel to apply "wet on wet" a continuous layer of the basecoat adhesive to a uniform thickness.
- The base coat should be applied (by trowel or 8mm notched-trowel) over the surface of the dry EPS insulation.
- The Soltherm system reinforcing mesh must be immediately embedded into the fresh base coat, trowelling from the centre and outward to the edges, with a 100mm overlap maintained at all ends and edges. The mesh

should always be embedded in such a way that in the case of thin-layered reinforcement the mesh is in the middle of the base coat layer, and in the case of thick-layered reinforcement it is in the upper third of the base coat layer. The mesh can be laid either vertically or horizontally.

- Allow to set and apply a second coat of basecoat to ensure an overall thickness of 3-5mm.
- For double mesh build-ups, the first layer is applied as described above. Once the base coat is touch dry, an additional layer of base coat is applied and the second layer of mesh is embedded. The second mesh layer should be placed in opposite direction towards the first mesh layer. Mesh strips should be placed in horizontal or vertical in such way that mesh strips do not cover with mesh overlap in the first layer of mesh.
- Where required, in the case of fire fixings, fixings can be installed through the reinforcing mesh. This should be done before the basecoat hardens. Mechanical fixings placed through the reinforcement should be smoothed over with basecoat as soon as they have been installed.
- The primer and/or finish coat must not be applied until after the base coat has dried out fully (3 days approximately).
- Primers (see Tables 1 and 2 for approved list of primers and their compatibility with finishing coats) shall be applied in accordance with the Certificate holder's instructions and allowed to dry fully prior to the application of the finishing coat. Render primers prevent penetration of impurities from the adhesive into the render, protects and reinforces the substrate, and increases the bond strength between the render and the substrate.
- A number of finishing coat options are available for both the Soltherm P and MW Systems. Consult Tables 1 and 2 for suitable finishing coats. Finishing coats must be applied in accordance with the Certificate holder's instructions.
- All rendering should follow best practice guidelines, e.g. BS 8000-10:2014 *Workmanship on building sites – Code of practice for plastering and rendering* and IS EN 13914-1:2016 *Design, preparation and application of external rendering and internal plastering – External rendering*.
- On completion of the installation, external fittings, rainwater goods etc. are fixed through the system into the substrate in accordance with the Certificate holder's instructions.
- When obstructions abut external walls such as a boundary wall, best practice would be to cut back the boundary wall to allow for the continuation of the external insulation system, or in the case of unheated lean-to buildings

the external insulation system should continue around the lean-to.

- All necessary post-application inspections should be performed and the homeowner's manual completed and handed over to the homeowner accordingly.

	Table 1 – Soltherm P EPS-Based External Insulation Systems	Thickness (mm)	Coverage (kg/m²)
Adhesives	Soltherm SA - adhesive for EPS Soltherm UB - universal adhesive/base coat Soltherm WB - winter universal adhesive/base coat Soltherm BC-P - premium microfibre reinforced adhesive/base coat		4.0 4.0 4.0 4.0
Insulation	EPS -EN 13163-T1-L2-W2-S5-P5-DS(N)2-DS(70,-)1-DS(70,-)2-TR100-TR150	20-250	
Anchors	EJOT STR U 2G or other anchors covered by ETA's issued according of ETAG 014.		
Base coats	Soltherm UB - universal adhesive/base coat Soltherm WB - winter universal adhesive/base coat Soltherm BC-P - premium microfibre reinforced adhesive/base coat	S [†] D [‡] 3-5 6.5 Min.	~4.0 – 6.5 ~4.0 – 6.5 ~4.0 – 6.5
Glass fibre meshes	Soltherm HD 145/S Soltherm HD 158/S Soltherm HD 160/S Soltherm HD 174/S Soltherm HD 335/P		145 g/m ² 158 g/m ² 160 g/m ² 174 g/m ² 335 g/m ²
Primers	Soltherm AP colour – mineral and acrylic renders primer Soltherm STP – silicate renders and paints primer Soltherm STP colour - coloured primer for silicate renders Soltherm SNP – silicone renders and paints primer Soltherm SNP colour - coloured primer for silicone renders Soltherm SP - paint primer		0.25-0.40 0.10-0.20 0.25-0.40 0.10-0.20 0.25-0.40 0.10-0.20
Finishing coats (renders)	<u>Acrylic plasters:</u> Soltherm AFC 20 – sprayed or floated acrylic finish, granulation 2mm (regular texture) Soltherm AFC 15 - sprayed or floated acrylic finish, granulation 1.5mm (regular texture) Soltherm AFC 10 - sprayed or floated acrylic finish, granulation 1mm (regular texture) Soltherm AFC 25wt – floated acrylic finish, granulation 2.5mm (woodworm texture) Soltherm AFC 15wt – floated acrylic finish, granulation 1.5mm (woodworm texture) Soltherm AFC i – floated acrylic finish, granulation 2.5mm (irregular texture) Soltherm AMC – floated acrylic mosaic plaster, granulation 0.5-2.0mm (regular texture) Soltherm AFC s – sprayed acrylic finish, granulation 1.0mm (regular finish) <u>Acrylic plasters with anti-microbiological protection:</u> Soltherm AFC 20 eco-shield – sprayed or floated biocide acrylic finish, granulation 2mm (regular texture) Soltherm AFC 15 eco-shield – sprayed or floated biocide acrylic finish, granulation 1.5mm (regular texture) Soltherm AFC 10 eco-shield – sprayed or floated biocide acrylic finish, granulation 1mm (regular texture) Soltherm AFC 25wt eco-shield – floated biocide acrylic finish, granulation 2.5mm (woodworm texture) Soltherm AFC 15wt eco-shield – floated biocide acrylic finish, granulation 1.5mm (woodworm texture) Soltherm AFC i eco-shield – floated biocide acrylic finish, granulation 2.5mm (irregular texture) Soltherm AFC s eco-shield – sprayed biocide acrylic finish, granulation 1.0mm (regular finish) <u>Mineral plasters:</u> Soltherm MTC 10 – floated mineral finish coat, granulation 1.0mm (regular texture) Soltherm MTC 15 – floated mineral finish coat, granulation 1.5mm (regular texture) Soltherm MTC 15g – floated mineral finish coat, granulation 1.5mm (regular texture) Soltherm MTC 20 - floated mineral finish coat, granulation 2.0mm (regular texture)	Regulated by particle size.	2.8-3.4 2.2-2.8 1.7-2.2 3.0-3.5 2.0-2.5 3.0-3.5 2.0-4.0 3.0-3.5 2.8-3.4 2.2-2.8 1.7-2.2 3.0-3.5 2.0-2.5 3.0-3.5 3.0-3.5 1.4-1.8 2.0-2.7 2.0-2.7 2.5-3.2

	<p>Soltherm MTC 30 - floated mineral finish coat, granulation 3.0mm (regular texture)</p> <p>Soltherm MTC 25wt - floated mineral finish coat, granulation 2.5mm (woodworm texture)</p> <p>Soltherm MTC 25wt g - floated mineral finish coat, granulation 2.5mm (woodworm texture)</p> <p>Silicone plasters:</p> <p>Soltherm SFC-P 10 - floated silicone finish, granulation 1.0mm (regular texture)</p> <p>Soltherm SFC-P 15 - floated silicone finish, granulation 1.5mm (regular texture)</p> <p>Soltherm SFC-P 20 - floated silicone finish, granulation 2.0mm (regular texture)</p> <p>Soltherm SFC-P 25wt - floated silicone finish, granulation 2.5mm (woodworm texture)</p> <p>Soltherm SFC-P+15 - floated silicone finish HD, granulation 1.5mm (regular texture)</p> <p>Silicate plasters:</p> <p>Soltherm STF 10 - floated silicate finish, granulation 1.0mm (regular texture)</p> <p>Soltherm STF 15 - floated silicate finish, granulation 1.5mm (regular texture)</p> <p>Soltherm STF 20 - floated silicate finish, granulation 2.0mm (regular texture)</p> <p>Soltherm STF 25wt - floated silicate finish, granulation 2.5mm (woodworm texture)</p> <p>Silicate-silicone plasters:</p> <p>Soltherm AF-P + 15 - floated or sprayed silicate-silicone finish, granulation 1.5mm (regular texture)</p> <p>Soltherm AF-P + 20 - floated or sprayed silicate-silicone finish, granulation 2.0mm (regular texture)</p> <p>Soltherm AF-P + 25wt - floated silicate-silicone finish, granulation 2.5mm (woodworm texture)</p> <p>Soltherm AF-P + 30 - floated or sprayed silicate-silicone finish, granulation 3.0mm (regular texture)</p>	Regulated by particle size	<p>3.2-4.0</p> <p>3.0-3.5</p> <p>3.0-3.5</p> <p>1.7-2.2</p> <p>2.2-2.8</p> <p>2.8-3.4</p> <p>3.0-3.5</p> <p>2.2-2.8</p> <p>2.0-2.5</p> <p>2.5-3.0</p> <p>3.0-3.5</p> <p>3.0-3.5</p> <p>2.2-2.8</p> <p>2.8-3.4</p> <p>3.0-3.5</p> <p>4.0-4.8</p>
Top coats* (optional)	<p>Acrylic top coats:</p> <p>Soltherm ACP - acrylic top coat</p> <p>Soltherm ACP eco-shield - acrylic top coat with antimicrobial protection</p> <p>Silicate top coats:</p> <p>Soltherm STPT -vapour permeable silicate top coat</p> <p>Silicone top coats:</p> <p>Soltherm STC-P - vapour permeable silicone top coat</p> <p>Soltherm STC-P eco-shield - vapour permeable silicone top coat with antimicrobial protection</p> <p>Soltherm STC-P+ -HD silicone top coat with droplet effect</p>		<p>s.s: 0.12-0.28 l/m² r.s: 0.18-0.40 l/m²</p> <p>s.s: 0.12-0.18 l/m² r.s: 0.18-0.40 l/m²</p> <p>s.s: 0.12-0.18 l/m² r.s: 0.18-0.40 l/m²</p> <p>s.s: 0.18-0.28 l/m² r.s: 0.18-0.40 l/m²</p> <p>s.s: 0.18-0.28 l/m² r.s: 0.18-0.40 l/m²</p> <p>s.s: 0.12-0.18 l/m² r.s: 0.18-0.40 l/m²</p>
Accessories	<p>Beads:</p> <p>Window reveal bead with sealing tape 2.6m</p> <p>Drip edge profile with mesh 2.5m</p> <p>PVC corner bead with mesh 100x100 2.5m</p> <p>PVC corner bead with mesh 100x150 2.5m</p> <p>PVC corner bead with mesh 80x120 2.5m</p> <p>Corner bead with nose 2.5m</p> <p>Movement joint bead for flat surfaces</p> <p>Movement joint bead for inner corners</p> <p>Clip on drip bead with mesh</p> <p>Trimming window profile with removable leg 2.4m</p> <p>3mm stop bead 2m</p> <p>3mm stop bead 2.5m</p> <p>6mm stop bead 2m</p> <p>6mm stop bead 2.5m</p>		

	<p>10mm stop bead 2m 10mm stop bead 2.5m 15mm stop bead 2m 15mm stop bead 2.5m Archway corner bead 2.5m Sill and reveal connection profile 2m Under window sill profile 2m Movement bead 2.5m PVC groove bead with mesh 10mm x 10mm 3m PVC groove bead with mesh 20mm x 20mm 3m PVC groove bead with mesh 30mm x 20mm 3m PVC groove bead with mesh 50mm x 20mm 3m Groove bead connector 10mm Groove bead connector 20mm Groove bead connector 30mm Groove bead connector 50mm or any other ancillary item that are approved by the ETICS system manufacture.</p>		
<p>* smooth surface – s.s, rough surface – r.s † S – Single mesh layer ‡ D – Double mesh layer</p>			

Table 1: Soltherm P Component Specification

	Table 2 – Soltherm MW – Mineral Wool Based External Insulation System	Thickness (mm)	Coverage (kg/m²)
Adhesives	Soltherm MB – mineral wool adhesive/base coat Soltherm MA – mineral wool adhesive Soltherm UB special – mineral wool adhesive/base coat		
Insulation	MW-EN13162-T5-DS(70,-)-DS(70,90)-WS-WL(P)-TR10 & TR80 (Lamella, shear strength 0.02MPa, shear modulus 1MPa) Euroclass A1, max density 130 kg/m ³	50-300	
Anchors	Covered by ETA issued according to ETAG 014 can be used.		
Base coats	Soltherm MB – mineral wool adhesive/base coat Soltherm UB special – mineral wool adhesive/base coat	3.0-5.0	4.0 (powder)
Glass fibre meshes	Soltherm HD 145/S Soltherm HD 158/S Soltherm HD 160/S Soltherm HD 174/S		145 g/m ² 158 g/m ² 160 g/m ² 174 g/m ²
Primers	Soltherm AP – paint primer Soltherm AP colour – mineral and acrylic renders primer Soltherm STP – silicate renders and paints primer Soltherm STP colour – coloured primer for silicate renders Soltherm SNP – silicone renders and paints primer Soltherm SNP colour – coloured primer for silicone renders		0.10-0.20 0.25-0.40 0.10-0.20 0.25-0.40 0.10-0.20 0.25-0.40
Finishing coats (renders)	Mineral plasters: Soltherm MTC 10 – floated mineral finish coat, granulation 1.0mm (regular texture) Soltherm MTC 15 – floated mineral finish coat, granulation 1.5mm (regular texture) Soltherm MTC 20 – floated mineral finish coat, granulation 2.0mm (regular texture) Soltherm MTC 30 – floated mineral finish coat, granulation 3.0mm (regular texture) Soltherm MTC 25 wt – floated mineral finish coat, granulation 2.5mm (woodworm texture) Silicone plasters: Soltherm SFC-P 10 – floated silicone finish, granulation 1.0mm (regular texture) Soltherm SFC-P 15 – floated silicone finish, granulation 1.5mm (regular texture) Soltherm SFC-P 20 – floated silicone finish, granulation 2.0mm (regular texture) Soltherm SFC-P 25wt – floated silicone finish, granulation 2.5mm (woodworm texture) Soltherm SFC-P+ 15 – floated silicone finish HD, granulation 1.5mm (regular texture) Soltherm SFC-P+ 20 – floated silicone finish HD, granulation 2.0mm (regular texture) Silicate plasters: Soltherm STF 10 – floated silicate finish, granulation 1.0mm (regular texture), Soltherm STF 15 – floated silicate finish, granulation 1.5mm (regular texture), Soltherm STF 20 – floated silicate finish, granulation 2.0mm (regular texture), Soltherm STF 25wt – floated silicate finish, granulation 2.5mm (woodworm texture) Silicate-silicone plasters: Soltherm AF-P+ 15 – floated silicate silicone acrylic finish, granulation 1.5mm (regular texture) Soltherm AF-P+ 20 – floated silicate silicone acrylic finish, granulation 2.0mm (regular texture) Soltherm AF-P+ 30 – floated silicate silicone acrylic finish, granulation 3.0mm (regular texture)		1.4-4.0 (powder) 1.4-4.0 (powder) 1.4-4.0 (powder) 1.4-4.0 (powder) 1.4-4.0 (powder) 1.7-3.5 1.7-3.5 1.7-3.5 1.7-3.5 2.2-3.4 2.2-3.4 2.0-3.5 2.0-3.5 2.0-3.5 2.0-3.5 2.2-3.4 2.2-3.4 2.2-3.4

Top coats* (optional)	<u>Silicate top coats:</u> Soltherm STPT – , vapour permeable silicate top coat,	s.s: 0.12-0.18 l/m ² r.s: 0.18-0.40 l/m ²
	<u>Silicone top coats:</u> Soltherm STC-P , vapour permeable silicone top coat, Soltherm STC-P+ - HD silicone top coat with droplet effect.	s.s: 0.12-0.18 l/m ² r.s: 0.18-0.40 l/m ² s.s: 0.12-0.18 l/m ² r.s: 0.18-0.40 l/m ²
Accessories	<u>Beads:</u> Window reveal bead with sealing tape 2.6m Drip edge profile with mesh 2.5m PVC corner bead with mesh 100x100 2.5m PVC corner bead with mesh 100x150 2.5m PVC corner bead with mesh 80x120 2.5m Corner bead with nose 2.5m Movement joint bead for flat surfaces Movement joint bead for inner corners Clip on drip bead with mesh Trimming window profile with removable leg 2.4m 3mm stop bead 2m 3mm stop bead 2.5m 6mm stop bead 2m 6mm stop bead 2.5m 10mm stop bead 2m 10mm stop bead 2.5m 15mm stop bead 2m 15mm stop bead 2.5m Archway corner bead 2.5m Sill and reveal connection profile 2m Under window sill profile 2m Movement bead 2.5m PVC groove bead with mesh 10mm x 10mm 3m PVC groove bead with mesh 20mm x 20mm 3m PVC groove bead with mesh 30mm x 20mm 3m PVC groove bead with mesh 50mm x 20mm 3m Groove bead connector 10mm Groove bead connector 20mm Groove bead connector 30mm Groove bead connector 50mm or any other ancillary item that are approved by the ETICS system manufacture.	
* smooth surface – s.s, rough surface – r.s		

Table 2: Soltherm MW Component Specification

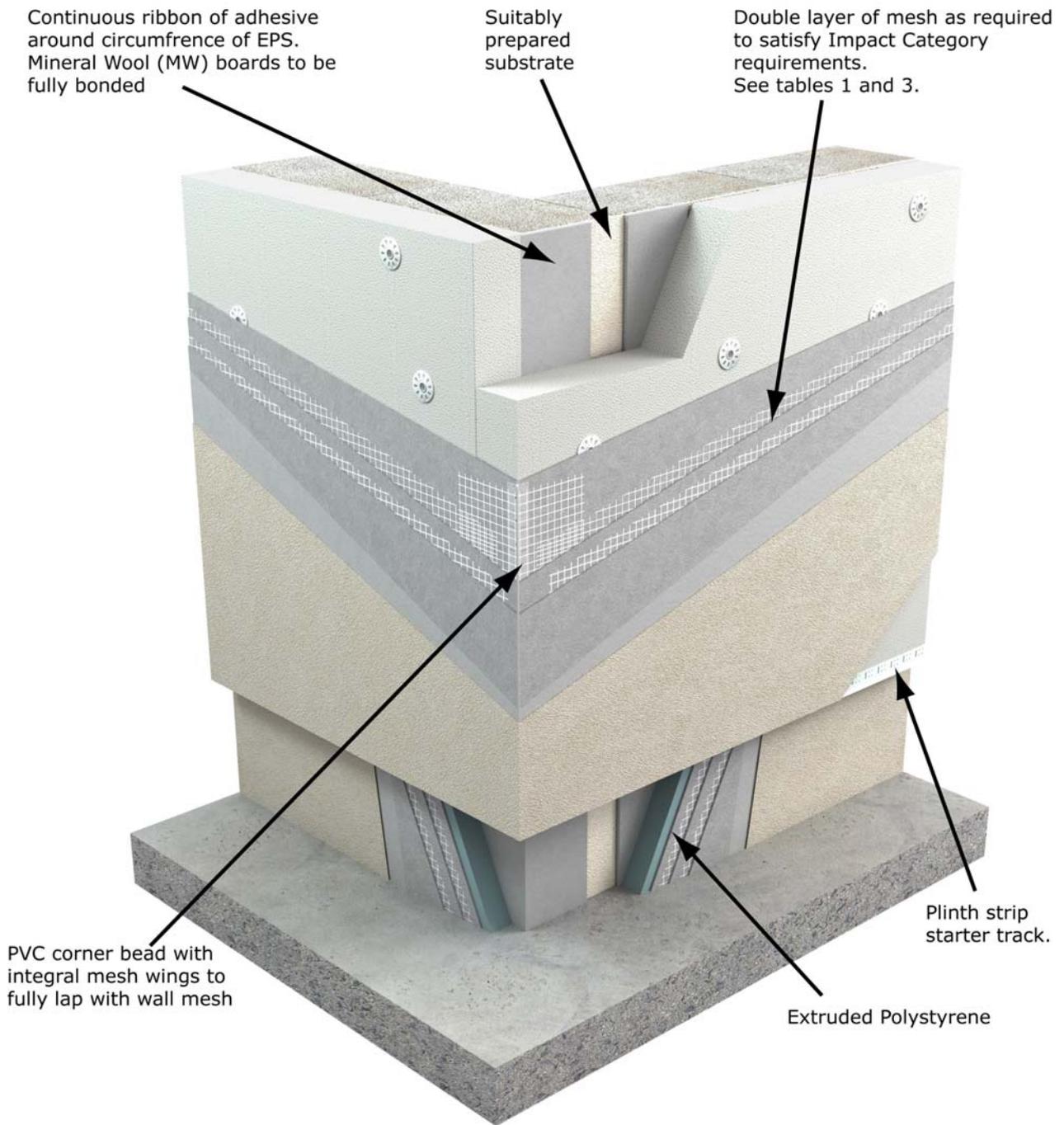


Figure 1: Corner/Plinth/Wall Details

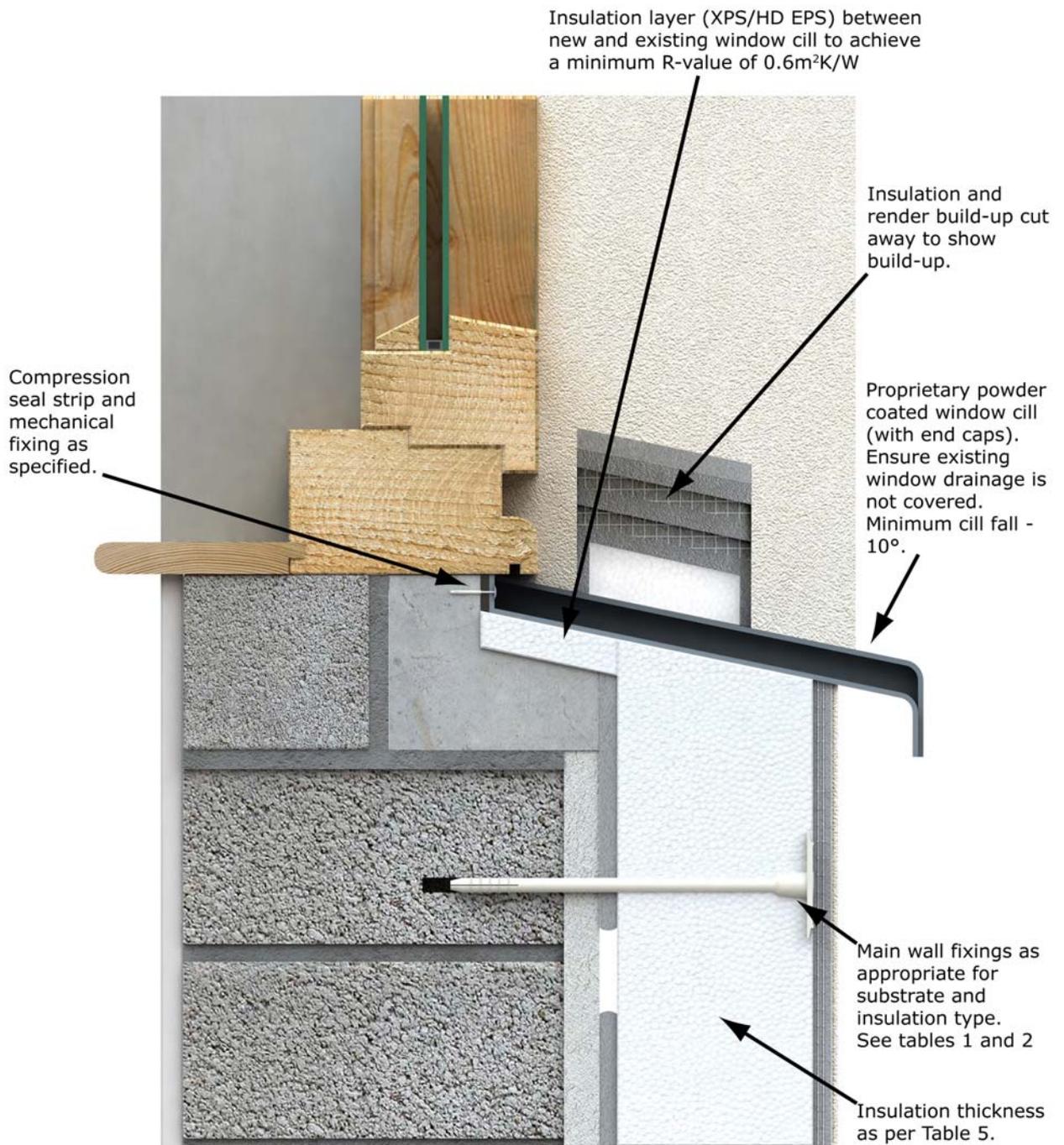


Figure 2: Window Sill Detail

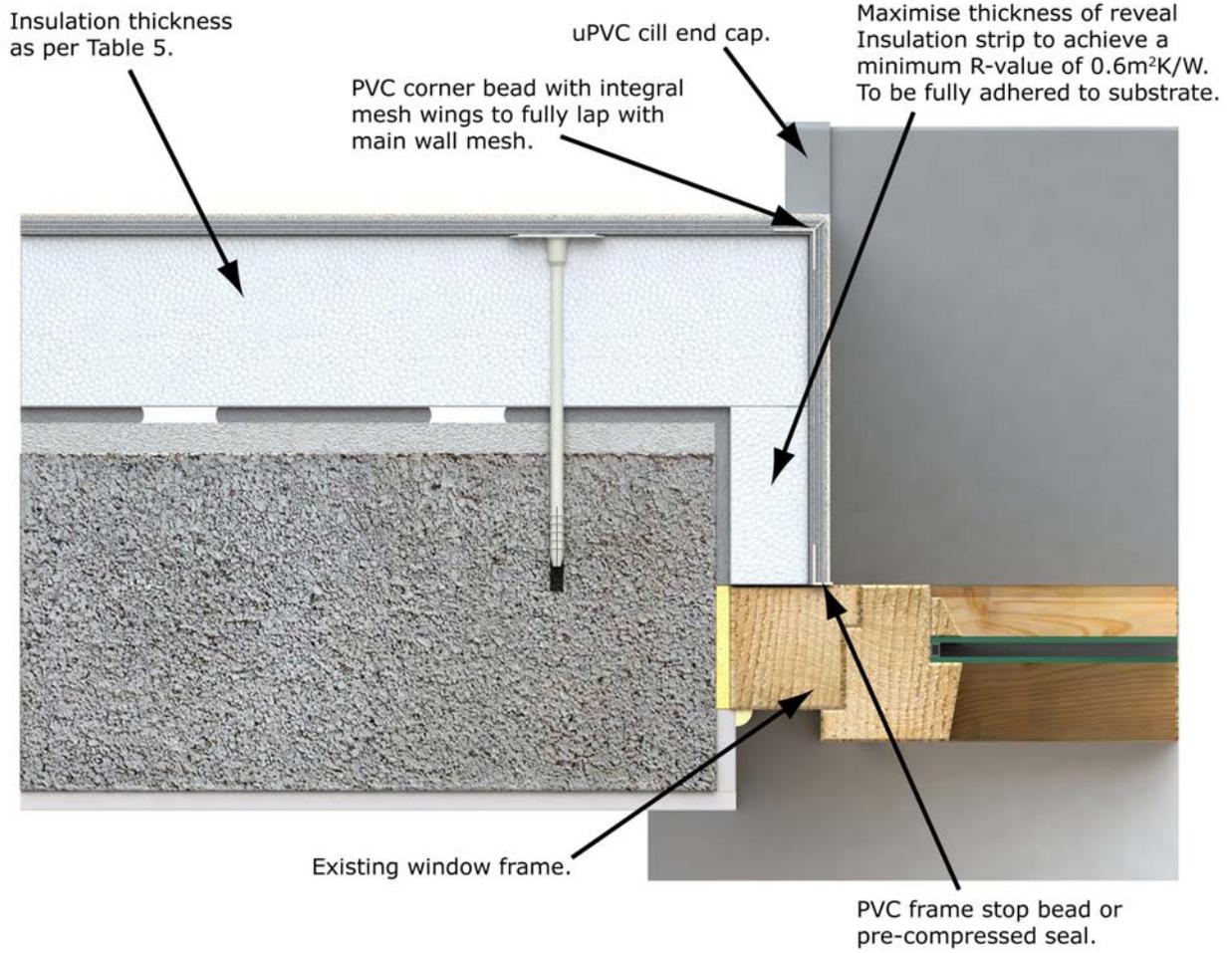


Figure 3: Cill and Reveal Detail

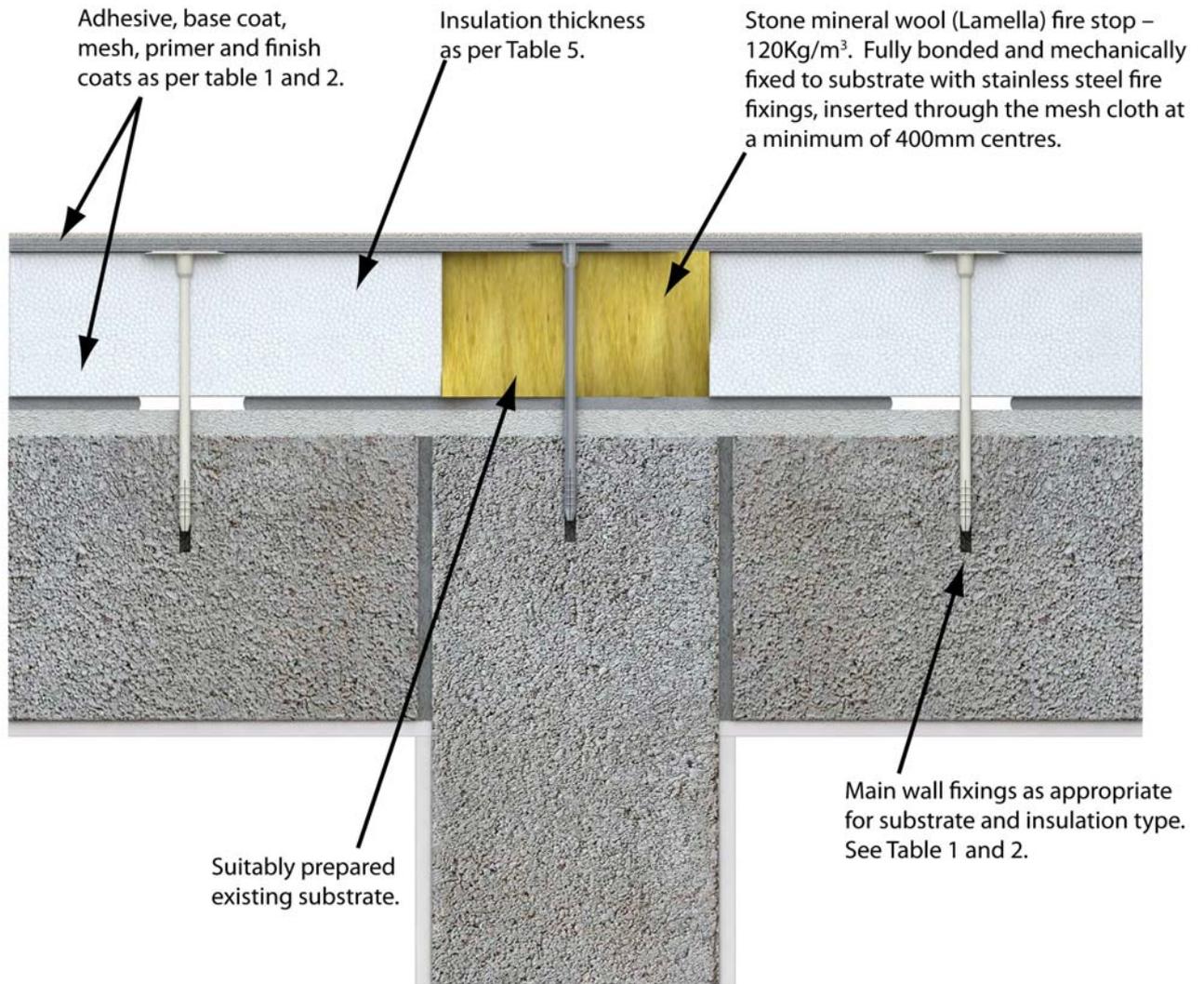


Figure 4: Vertical Fire-Stop Detail

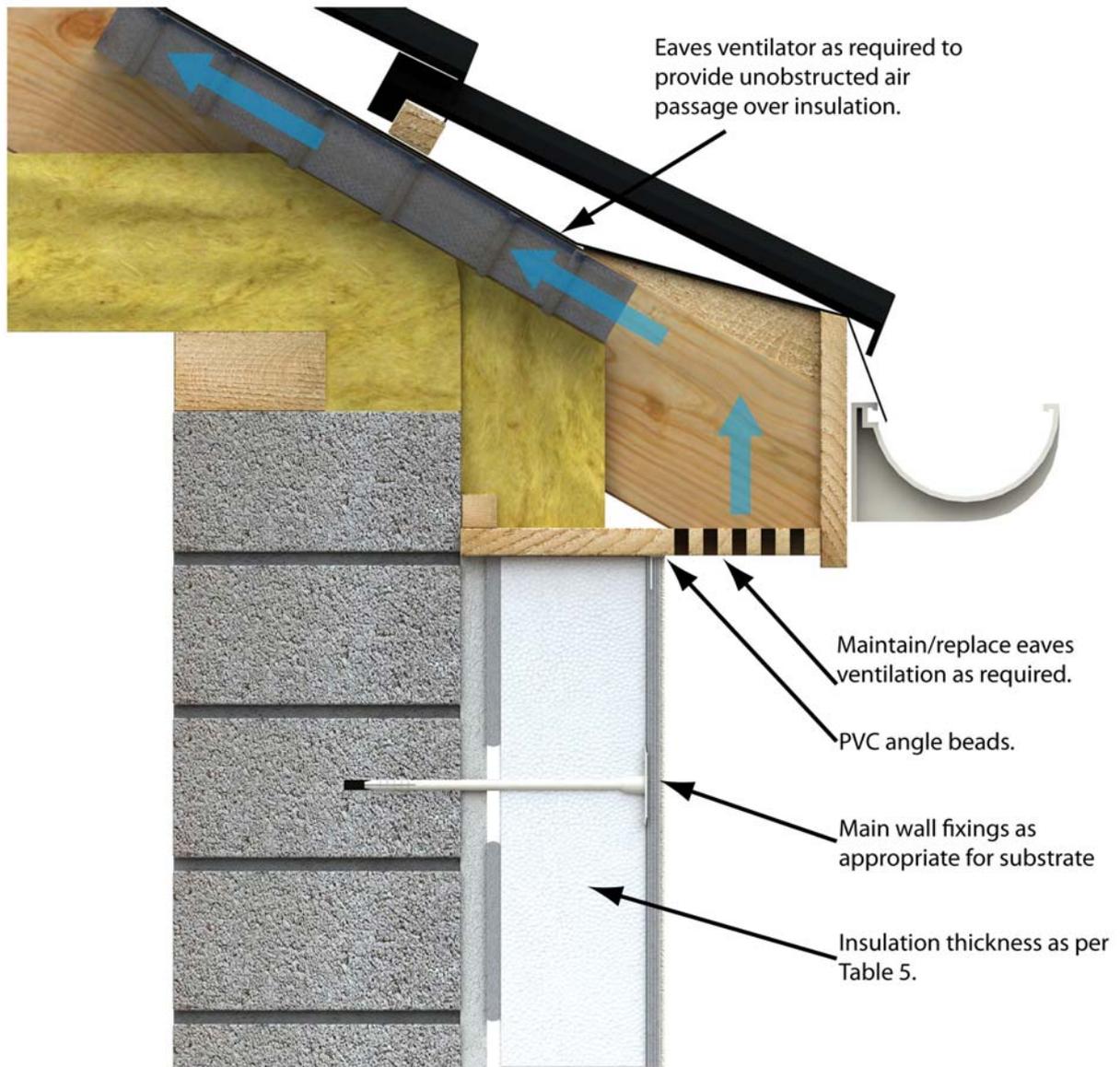


Figure 5: Eaves Detail

3. GENERAL

The system is designed by Soltherm External Insulations Ltd or their Irish Agent/Distributor on a project specific basis. Where the external insulation system is being applied to improve the thermal performance of an existing building, Soltherm approved installer will assess the building and advise on how to maximise the benefits of the external insulation system for that building. The design will include for:

- a) The completion and recording of a site survey. For existing buildings, U-value calculations, condensation risk analysis, pull-out resistance etc. should be based on the existing structure.
- b) Evaluation and preparation of substrate.
- c) Minimising risk of condensation in accordance with the recommendations of BS 5250:2011+A1:2016 *Code of practice for control of condensation in buildings*. This includes the use of approved detailing as shown in Figures 1 to 8 incorporating the requirements of SR 54:2014 *Code of practice for the energy efficient retrofit of dwellings* and, where possible, the Acceptable Construction Details published by the DHPLG.
- d) Thermal insulation provision to Part L of the Building Regulations 1997 to 2017.
- e) Resistance to impact and abrasion.
- f) Resistance to thermal stresses.
- g) Resistance to wind loading.
- h) Design of fixings to withstand design wind loadings, using a safety factor of 3 (three) for mechanical fixings and a safety factor of 9 (nine) for adhesive. In addition, fixings around window and door openings shall be at a maximum of 300mm centres in each board or section of board so as to provide positive and robust restraint over the life of the system.
- i) The design for wind loading on buildings greater than 2 stories should be checked by a chartered engineer in accordance with Eurocode 1 I.S. EN 1991-1-4:2005 *Actions on structures – General actions – Wind actions*.
- j) Design for fire resistance, fire spread and fire stopping, as defined in Section 4.2 and 4.3 of this Certificate.
- k) Design of a water management system to prevent ingress of water at movement joints, windows, doors, openings for services etc. Particular attention is required to ensure that window and sill design are coordinated to achieve a fully integrated design.
- l) Movement joints.

- m) A site specific maintenance programme for inclusion in the home owner's documentation.
- n) Durability requirements.

Detailing and construction must be to a high standard to prevent the ingress of water and to achieve the design thermal performance. Window details should be designed such that, where possible, they can be removed and replaced from within the building. Consideration should be given to maximising improvement of thermal insulation at window reveals, door openings etc. Adequate provision should be made at design and installation stage for the release of trapped moisture e.g. above window heads.

When designed and installed in accordance with this Certificate, the system will satisfy the requirements of Part L of the Building Regulations 1997 to 2017. The design shall include for the elimination/minimising of cold bridging at window and door reveals, eaves and at ground floor level in compliance with Acceptable Construction Details published by the DHPLG.

The system is intended to improve the weather resistance of the external walls. Seals to windows and doors shall be provided in accordance with the project specific site plan. Care should be taken to ensure that any ventilation or drainage openings are not obstructed.

In areas where electric cables can come into contact with EPS, in accordance with good practice all PVC sheathed cables should be run through ducting or be re-routed. Domestic gas installations must not be adversely affected by the fitting of external insulation. If the external insulation has an impact on the gas service line/meter location, then Bord Gáis Networks must be contacted so that a suitable solution can be achieved. If altering a gas installation, a Registered Gas Installer (RGI) must be employed.

The durability of the render systems is influenced by the colour of the render used. Further information is available by contacting the Certificate holder.

In locations where frost heave is likely to occur, plinth XPS must be kept 10mm above ground level.

4.1 STRENGTH AND STABILITY

4.1.1 Wind Loading

The Soltherm P and MW Systems can be designed to withstand wind pressures (including suction) and thermal stresses in accordance with the Building Regulations 1997 to 2017. The design for wind loading on buildings greater than two stories should be checked by a chartered engineer in accordance with Eurocode 1 I.S. EN 1991-1-4:2005. A general factor of safety of 1.5 is applied to design wind loads.

4.1.2 Impact Resistance

a) The Soltherm P and MW Systems have been classified as defined in Tables 3 and 4 to be suitable for use as defined in European Technical Assessment Guideline ETAG 004 Cl. 6.1.3.3 Table 8 as follows:

Category I: A zone readily accessible at ground level to the public and vulnerable to hard impacts but not subject to abnormally rough 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.

Category III: A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects. Class III is taken to exclude the use on any wall at ground level.

Note: The above classifications do not include acts of vandalism.

In an Irish context, Category II excludes any wall at ground level adjacent to a public footpath but includes one with its own private, walled-in garden. Category III excludes all walls at ground level.

- b) The design should include for preventing damage from impact by motor vehicles or other machinery. Preventive measures such as provision of protective barriers or kerbs should be considered.
- c) To achieve category I impact resistance, renders must demonstrate no visible signs of damage when subjected to an impact of 10 Joules (J). Table 3 lists a range of Soltherm P and MW build-ups for a range of impact categories. In addition table 3 lists the Soltherm premium range, with double mesh layers, which while achieving category I, can also sustain impacts in excess of 40J.

4.2 BEHAVIOUR IN RELATION TO FIRE

The reaction to fire classification according to IS EN 13501-1:2007 *Fire classification of construction products and building elements – Classification using data from reaction to fire tests* for Soltherm P and MW systems for the full systems including insulation board, adhesive, base coat, finishing coats and decorative coats are defined in Table 6 and 7 and are summarized as follows:

P System:	B-s1, d0
MW System:	A1 or A2-s1,d0

Systems that achieve a Class B Reaction to Fire Classification are suitable for use up to a maximum of six storeys (18 metres) in height on purpose groups 1(a), 1(b), 1(c), 2(a), 2(b), 3, 4(a) and 4(b), and for use up to a maximum of five storeys (15 metres) in height on purpose group 1(b), as defined in TGD to Part B of the Building Regulations 1997 to 2017.

The mineral wool board is classified as non-combustible as per Table A8(d) of TGD to Part B of the Building Regulations 1997 to 2017.

With regard to fire stopping and limitations on use of combustible materials, walls must comply with Sections 3.2, 3.3, 3.4 and 4 of TGD to Part B of the Building Regulations 1997 to 2017, and Sections 3.5, 3.6, 3.7 and 4 of TGD to Part B Volume 2 of the Building Regulations 1997 to 2017. Stainless steel fire fixings are to be provided at the rate of one per square metre when specified. The fixing design should take account of the extra duty required under fire conditions.

Vertical and horizontal lamella fire barriers shall be provided at each compartment floor and wall, with fixings provided at 400mm vertical centres and 400mm horizontal centres respectively, including the second floor level of a three-storey single occupancy house (see Diagram 12 of TGD to Part B Volume 2 of the Building Regulations 1997 to 2017). Firebreaks should be fully adhesively bonded to the substrate (i.e. ribbons or dabs of adhesive is not acceptable) and mechanically fixed with stainless steel fire fixings at 400mm centres. The fire barrier shall be of non-combustible material (i.e. Rockwool, slab of minimum density 120kg/m³), be at least 200mm high, continuous and unbroken for the full perimeter of the building and for the full thickness of the insulation. Glass wool is not suitable for use as a firestop (see Clause 3.6.3 of TGD to Part B Volume 2 of the Building

Regulations 1997 to 2017 for types of suitable firestop).

4.3 PROXIMITY OF HEAT PRODUCING APPLIANCES

Combustible material must be separated from a brick or blockwork chimney by at least 200mm from a flue and 40mm from the outer surface of the brick or blockwork chimney, in accordance with Clause 2.5.6 of TGD to Part J of the Building Regulations 1997 to 2017. Metal fixings in contact with combustible materials should be at least 50mm from a flue.

4.4 THERMAL INSULATION

Assessments were carried out to verify that the requirements of Part L of the Building Regulations 1997 to 2017 can be achieved using Soltherm P and MW Systems. The manufacturer's declared thermal conductivity values ($\lambda_{90/90}$) taken from their CE Marking Declarations of Performance are 0.038W/mK for the standard white EPS board, 0.032W/mK and 0.031W/mK for the graphite enhanced EPS board, and 0.036W/mK for the mineral wool board (density 150kg/m³). These have not been assessed by NSAI Agrément. Table 5 shows typical insulation thicknesses to achieve the required 0.27W/m²K U-value.

Calculation of U-values will be required on individual projects to confirm a U-value of 0.27W/m²K has been achieved, based on the wall construction and the insulation used. The thermal conductivity (λ) value of the insulation to be used in all U-value calculations must be the $\lambda_{90/90}$ value.

When the system is to be applied to a masonry cavity wall construction, consideration should be given to the treatment of the ventilated cavity. In order to maximise the thermal effectiveness of the improved U-value created by the external insulation system in a cavity wall/block of an external wall of a building, it is critical to significantly reduce or eliminate airflow within the cavity void. It is essential to seal the cavity to achieve an unventilated air layer. This eliminates heat losses due to airflow within the cavity circumventing the ETIC system. Best practice is to fill the cavity void with an NSAI Agrément approved Cavity Wall Insulation (CWI) system. Ventilation to the building must be maintained in accordance with the requirements of TGD to Part F of the Building Regulations 1997 to 2017.

4.5 LIMITING THERMAL BRIDGING

The linear thermal transmittance ' Ψ ' (Psi) describes the heat loss associated with junctions and around openings. Window and door reveal design used on Soltherm P and MW Systems have been assessed and when detailed in accordance with this Certificate can meet the requirements of Table D2 of TGD to Part L of the Building Regulations 1997 to 2017. When **all**

bridged junctions within a building comply with the requirements of Table D1 of TGD to Part L, the improved ' γ ' factor of 0.08 can be entered into the DEAP building energy rating (BER) calculation.

Alternatively if **all** junctions can be shown to be equivalent or better than the Acceptable Construction Details published by the DECLG, then the improved ' γ ' factor of 0.08 can be used, i.e. R value = 0.6m²K/W for window/door reveals. Where either of the above options are shown to be valid, or when the required values cannot be achieved, all relevant details should be recorded on the 'Certificate of Compliance' for that project for use in future BER calculations.

' Ψ ' values for other junctions outside the scope of this Certificate should be assessed in accordance with BRE IP1/06 *Assessing the effects of thermal bridging at junctions and around openings* and BRE BR 497 *Conventions for calculating linear thermal transmittance and temperature factors* in accordance with Appendix D of TGD to Part L of the Building Regulations 1997 to 2017.

As per Acceptable Construction Details, a minimum thermal resistance of 0.6m²K/W should be provided at window reveals, heads and sills.

4.6 CONDENSATION RISK

Areas where there is a significant risk of condensation due to high levels of humidity should be identified during the initial site survey.

4.6.1 Internal Surface Condensation

When improving the thermal performance of the external envelope of a building through external wall insulation, designers need to consider the impact of these improvements on other untouched elements of the building. As discussed in Section 4.5 of this Certificate, thermally bridged sections of the envelope such as window jambs, sills and eaves will experience a lower level of increased thermal performance. The degree of improvement to these junctions can be limited due to physical restrictions on site i.e. footpaths, soffit boards or hinges for windows.

When bridged junctions meet the requirements of Appendix D Table D2 of TGD to Part L of the Building Regulations 1997 to 2017, the coldest internal surface temperature will satisfy the requirements of Section D2, namely that the temperature factor shall be equal to or greater than 0.75. As a result, best practice will have to be adopted in order to limit the risk of internal surface condensation which can result in dampness and mould growth.

When site limiting factors give rise to substandard levels of insulation at bridged junctions, guidance should be sought from the

Certificate holder as to acceptable minimum requirements.

4.6.2 Interstitial Condensation

Where a interstitial condensation risk is identified, an interstitial condensation risk analysis will be carried out by the certificate holder in accordance with BS 5250:2011+A1:2016 and the design modified as appropriate to reduce the risk of interstitial condensation to acceptable levels.

4.6.3 Ventilation

When installing the external insulation system, the works to be undertaken must not compromise the existing ventilation provisions in the home, including the ventilation of suspended timber floors, where existing vents must be sleeved across the rising wall and sealed.

When these existing ventilation provisions do not meet the requirements of Part F of the Building Regulations 1997 to 2017, the homeowner should be informed and remedial action should be taken before the external insulation system is installed.

4.7 MAINTENANCE

Adequate provision should be made in the initial design phase for access and maintenance over the life of the system.

The system shall be inspected and maintained in accordance with the Certificate holder's instructions, as detailed in the Repair and Maintenance Method Statement, which is incorporated into the Building Owner's Manual.

Necessary repairs should be carried out immediately and must be in accordance with the Certificate holder's instructions. Repairs to plumbing etc. should also be carried out as required to prevent deterioration or damage, and to protect the integrity of the system.

Synthetic finishes may be subject to aesthetic deterioration due to exposure to UV light. They should be re-painted every 18 to 20 years to maintain appearance. Care should be taken to ensure that the synthetic finish used is compatible with the original system and that the water vapour transmission or fire characteristics are not adversely affected.

Sealants shall be subject to regular inspection (at least annually). They should be replaced as required and fully replaced every 18 to 20 years to maintain performance according to the manufacturer's instructions.

4.8 WEATHERTIGHTNESS

When designed and detailed in accordance with this Certificate, the system will prevent moisture from the ground coming in contact with the

insulation. The external render has adequate resistance to water penetration when applied in accordance with the Certificate holder's instructions.

Joint designs, sealant specifications and recommendations for detailing at windows and doors were assessed and are considered adequate to ensure that water penetration will not occur, assuming that regular maintenance is carried out in accordance with the Certificate holder's instructions.

Recommendations for detailing at windows and doors have been assessed and are considered adequate to ensure that water penetration will not occur, assuming that regular maintenance is carried out in accordance with the Certificate holder's instruction.

4.9 DURABILITY

4.9.1 Design Life

An assessment of the life of the system was carried out. This included an assessment of:

- Design and installation controls;
- Proposed building heights;
- Render thickness and specification;
- Material specifications, including insulant, mesh, beading and fixing specifications;
- Joint design;
- Construction details;
- Maintenance requirements.

External render systems can last in excess of 40 years in accordance with BS 7543:2015 *Guide to durability of buildings and building elements, products and components* subject to normal use, regular inspection and maintenance. It is important to note that the durability of the render system is entirely dependent on the correct installation of the product in accordance with this Certificate, the manufacturer's instructions, IS EN 13914-1:2016 and ongoing care and maintenance as described in Section 4.7 of this Certificate. Critical details include rendering at window sills, raised features, junctions with eaves and verges, and the use of suitably designed overhangs and flashings. Reference should be made to IS EN 13914-1:2016 for general advice on design, in particular on the use of angle, stop and movement beads.

4.9.2 Aesthetic Performance

As with traditional renders, the aesthetic performance of the systems, e.g. due to discolouration, soiling, staining, algal growth or lime bloom, is depended on a range of factors such as:

- Type, colour and texture of surface finish;
- Water retaining properties of the finish;
- Architectural form and detailing;
- Building orientation/elevation;
- Local climate/atmospheric pollution.
- Proximity to vegetation.

Where cleaning of walls is required, for example in the case of algal growth, the procedure in the Soltherm maintenance document must be followed which contains detailed information on the removal of algae. It is the homeowner's responsibility to inspect the walls every year and clean when required; however the homeowner may contract the approved installer to provide this service.

Adequate consideration should be given at the design stage to all of the above to ensure that the level of maintenance necessary to preserve the aesthetics of the building is acceptable.

4.10 PRACTICABILITY

The practicability of construction and the adequacy of site supervision arrangements were assessed and considered adequate. The project specific designs and method statements for application, inspection and repair were reviewed and found to be satisfactory.

4.11 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING

- Structural strength and stability
- Behaviour in fire
- Impact resistance
- Pull-out resistance of fixings
- Thermal resistance
- Hygrothermal behaviour
- Condensation risk
- Site erection controls
- Durability of components
- Dimensional stability of insulants

4.12 OTHER INVESTIGATIONS

- (i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.
- (ii) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- (iii) Special building details (e.g. ground level, window and door openings, window sill and movement joints) were assessed and approved for use in conjunctions with this Certificate.
- (iv) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

SOLTHERM P					
Base Coat	Finishing Coat	Reinforcement	Single Mesh		Double Mesh
			Render Thickness < 6mm	Render Thickness ≥ 6mm	Render Thickness ≥8mm
Soltherm UB	Acrylic Plaster (Soltherm AFC)	Soltherm 145/S, Soltherm 158/S, Soltherm 160/S or Soltherm 174/S	III		
Soltherm WB			III		
Soltherm BC-P			III	I*	
Soltherm BC-P					I*
Soltherm UB	Silicone Plaster (Soltherm SFC-P)		II		
Soltherm WB			III		
Soltherm WB			III	I*	
Soltherm BC-P					I*
Soltherm UB	Silicate Plaster (Soltherm STF)		II		
Soltherm WB			II		
Soltherm BC-P			II		
Soltherm UB	Mineral Plaster (Soltherm MTC)		III		
Soltherm WB			III		
Soltherm BC-P			III		
Soltherm UB	Silicate-Silicone Plaster (Soltherm AF-P+)		II		
Soltherm WB			III		
Soltherm BC-P		III	I*		
Soltherm UB	Mineral Plaster (Soltherm MTC)	II			
	Silicate Plaster (Soltherm STF)	I			
	Silicone Plaster (Soltherm SFC-P)	I			
	Acrylic Plaster (Soltherm AFC)	I			
	Silicate-Silicone Plaster (Soltherm AF-P+)	I			

* The required base coat thickness for Category I is 5mm

Table 3: Impact Resistance - Soltherm P System

SOLTHERM MW					
Base Coat	Finishing Coat	Reinforcement	Impact Category ETAG 004 Table 8		
MW panels + Soltherm MB	Soltherm MTC	Mesh other than Soltherm HD 174/S (Single or double mesh)	III		
	Soltherm STF		II		
	Soltherm SFC-P /Soltherm SFC-P eco-shield		II		
	Soltherm SFC-P+		I		
	Soltherm AF-P+		I		
MW lamella + Soltherm MB	Soltherm MTC		Soltherm HD 174/S (Single or double mesh)	III	
	Soltherm STF			II	
	Soltherm SFC-P /Soltherm SFC-P eco-shield			II	
	Soltherm SFC-P+			I	
	Soltherm AF-P+			I	
MW panels + Soltherm MB	Soltherm MTC	Soltherm HD 174/S (Single or double mesh)		III	
	Soltherm STF			I	
	Soltherm SFC-P /Soltherm SFC-P eco-shield			II	
MW lamella + Soltherm MB	Soltherm MTC			Soltherm HD 174/S (Single or double mesh)	III
	Soltherm STF				II
	Soltherm SFC-P /Soltherm SFC-P eco-shield		II		

Table 4: Impact Resistance - Soltherm MW System

Existing Wall Structure	Insulation Material	Thermal Conductivity ($\lambda_{90/90}$) of Insulation (W/mK)	U-Value (thickness of insulation) W/m ² K					
			0.27	0.25	0.21	0.17	0.15	0.11
215mm Block on Flat (No insulation)	EPS 70 White	0.038	130mm	140mm	170mm	210mm	240mm	330mm
	EPS 70 SILVER	0.031	110mm	120mm	140mm	170mm	200mm	270mm
	Mineral Wool	0.036	120mm	130mm	160mm	200mm	230mm	320mm
215mm Hollow Block (No insulation)	EPS 70 White	0.038	130mm	140mm	170mm	210mm	240mm	330mm
	EPS 70 SILVER	0.031	100mm	110mm	140mm	170mm	200mm	270mm
	Mineral Wool	0.036	120mm	130mm	160mm	200mm	230mm	310mm
Concrete Block Cavity Wall (No insulation)	EPS 70 White	0.038	120mm	130mm	160mm	210mm	240mm	330mm
	EPS 70 SILVER	0.031	100mm	110mm	130mm	170mm	190mm	270mm
	Mineral Wool	0.036	120mm	130mm	160mm	200mm	220mm	320mm
Concrete Block Cavity Wall 100/100/100 (50mm Cavity insulation $\lambda = 0.039$ W/mK)	EPS 70 White	0.038	70mm	90mm	110mm	160mm	190mm	280mm
	EPS 70 SILVER	0.031	60mm	70mm	90mm	130mm	150mm	230mm
	Mineral Wool	0.036	70mm	80mm	110mm	150mm	180mm	260mm
Concrete Block Cavity Wall 100/100/100 (50mm Cavity insulation $\lambda = 0.033$ W/mK)	EPS 70 White	0.038	70mm	80mm	110mm	150mm	180mm	270mm
	EPS 70 SILVER	0.031	50mm	60mm	90mm	120mm	150mm	220mm
	Mineral Wool	0.036	60mm	70mm	100mm	140mm	170mm	260mm
Concrete Block Cavity Wall 100/100/100 (100mm Cavity insulation $\lambda = 0.039$ W/mK)	EPS 70 White	0.038	30mm	40mm	70mm	120mm	150mm	240mm
	EPS 70 SILVER	0.031	30mm	40mm	60mm	90mm	120mm	190mm
	Mineral Wool	0.036	30mm	40mm	70mm	110mm	140mm	230mm
Concrete Block Cavity Wall 100/100/100 (100mm Cavity insulation $\lambda = 0.035$ W/mK)	EPS 70 White	0.038	20mm	30mm	60mm	100mm	130mm	230mm
	EPS 70 SILVER	0.031	20mm	30mm	50mm	90mm	110mm	190mm
	Mineral Wool	0.036	20mm	30mm	60mm	100mm	130mm	210mm

All calculation assume horizontal heat flow, unventilated cavities <25mm with a thermal resistance of 0.18m²K/W, 18mm of existing external render $\lambda = 1.0$ W/mK, Concrete blocks (thickness as specified) $\lambda = 1.35$ W/mK, 16mm internal plaster $\lambda = 0.3$ W/mK or 12.5mm plaster board $\lambda = 0.25$ W/mK

Table 5: Soltherm P and MW Systems Typical U-values (W/m²K)

SOLTHERM P – Reaction to Fire			
ETICS system description	Maximum declared organic content	Thickness	Class according to EN 13501-1
ETICS Soltherm P with rendering system: <ul style="list-style-type: none"> • Adhesives: SOLTHERM UB, SOLTHERM SA, SOLTHERM WB/ SOLTHERM BC-P • EPS of thickness up to and including 250 mm • Glass fibre meshes according to table 1 • Base coats: SOLTHERM UB, BOLIX WB/ BOLIX BC-P • Finishing coats SOLTHERM (with relevant key coats according to table 1): AFC 20, AFC 10, AFC 15, AFC i, AFC 25wt, AFC 15wt, RMG, AMG, AFC 20 eco-shield, AFC 15 eco-shield, AFC 10 eco-shield, AFC 25wt eco-shield, AFC 15wt eco-shield, AFC i eco-shield, AFC s eco-shield. • Decorative finishes Soltherm (with relevant primers according to table 1): ACP, STC-P, STPT. 	base coats $\leq 4.3\%$ finishing coats $\leq 11.7\%$ decorative finishes $\leq 17.0\%$	50 - 250	B-s1, d0
ETICS Soltherm P with rendering system: <ul style="list-style-type: none"> • EPS of thickness up to and including 250 mm • Adhesives: Soltherm UB, Soltherm SA, Soltherm WB / Soltherm BC-P • Glass fibre meshes according to table 1 • Base coats: Soltherm UB, Soltherm WB / Soltherm BC-P • Finishing coats Soltherm (with relevant key coats according to table 1): MCT 15, MCT 20, MCT 30, MCT 25wt, MCT 15g, MCT 15wtg, SFC 10, SFC 15, SFC 20, SFC 25wt • Decorative finishes Soltherm (with relevant primers according to table 1): ACP, STC-P, STPT 	base coats $\leq 4.3\%$ finishing coats $\leq 3.5\%$ decorative finishes $\leq 17,0\%$	50 - 250	B-s1, d0

Table 6: Soltherm P System – Reaction to Fire

SOLTHERM MW – Reaction to Fire			
Configuration	Max heat of combustion (MJ/kg)	Flame retardant content	Euroclass according to EN 13501-1
Adhesive	0.34	No flame retardant	A1
MW boards (organic content in quantity ensuring Euroclass A1 according to EN 13501-1), density $\leq 130\text{kg/m}^3$	-		
Base coat	0.34		
Glass fibre mesh	8.61		
Key coat: Soltherm AP Colour Soltherm AP	6.65		
Finishing coat: Soltherm MTC	0.0		
Key coat: Soltherm SNP	3.98		
Decorative coat: Soltherm STC-P / Soltherm STC-P eco-shield	1.99		
Adhesive	0.34		
MW boards (organic content in quantity ensuring Euroclass A1 according to EN 13501-1), density $\leq 130\text{kg/m}^3$	-		
Base coat	0.34		
Glass fibre mesh	8.61		
Key coat	5.68		
Finishing coat	2.65		
Key coat	7.33		
Decorative coat	4.60		
* For configurations of Soltherm MW not covered by Euroclass A1			

Table 7: Soltherm MW System – Reaction to Fire

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2017 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to IAB are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.3 In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
- (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **12/0371** is accordingly granted by the NSAI to **Soltherm External Insulations Ltd** on behalf of NSAI Agrément.

Date of Issue: **June 2012**

Signed



Seán Balfe
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.n sai.ie

Revision:

- **November 2015:** System name change and system component names amended to new marketing names.
- **September 2018:** References to Building Regulations and standards updated.