

SempreTherm EWIS

External Thermal Insulation Composite Systems

Système d'isolation pour murs extérieurs
 Wärmedämmung für Außenwand

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 2010**.



PRODUCT DESCRIPTION:

The SempreTherm External Thermal Insulation Composite Systems (ETICS) comprise insulation board (bonded and mechanically fixed) with reinforced undercoat, and decorative finishes as described in Section 3, Table 1 of this certificate.

This external thermal insulation composite system (ETICS) comprises of:

- Surface preparation of masonry or concrete substrate.
- Base profile (Starter track).
- Corner profile
- Adhesive.
- Insulation board: Expanded Polystyrene (EPS)
- Standard white and Grey Enhanced (Platinum).
- Mechanical fixings.
- Base coat with reinforcement.
- Glass fibre mesh reinforcement.
- Primer coat.
- Finishing coat.
- Weather-tight joints.

- Movement joints.
- Provision for limiting cold bridging at external wall/floor junctions in compliance with Acceptable Construction Details published by the DoEHLG (Department of the Environment, Heritage and Local Government).
- Provision for fire stopping at external compartment walls and floors.

SempreTherm is responsible for the design manufacture and supply of all components to approved specifications, in accordance with the SempreTherm approved supplier system.

The installation of the system is carried out by installers who have been trained by SempreTherm EWIS and are approved by SempreTherm EWIS and NSAI Agrément to install the system.

USE:

The systems are for use as an external insulation for refurbishment/retrofit of existing masonry or concrete dwellings up to a maximum of six

storeys (18m) in height in purpose groups 1(a), 1(b), 1(c), 2(a), 2(b), 3, 4(a) and 4(b) as defined in Part B of the Building Regulations 1997 to 2010.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2010. Reference should be made to table 4 and clause 4.2 of this certificate for fire classification of this ETICS system.

For all systems, reference should also be made to Table 3 of this Certificate for the Impact Classifications that apply and any resulting restrictions imposed.

The systems have not been assessed for use with timber frame or steel frame construction.

In an Irish context, Category I 'Impact Resistance' (see Table 3 and Section 4.1.2) 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 AND MARKETING:

The system is designed and manufactured by:

SEMPRE FARBY Sp. z o.o.
ul. Gen. J. Kuźnia 60
43-301 Bielsko-Biala
Poland

Installation:

SempreTherm EWIS Licensed Applicators.

SempreTherm EWIS is responsible for the design and supply of all components to approved specifications, in accordance with the SempreTherm EWIS approved supplier system.

1.1 ASSESSMENT

In the opinion of NSAI Agrément, the SempreTherm External Thermal Insulation Composite Systems if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 to 2010, as indicated in Section 1.2 of this Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2010**REQUIREMENTS:*****Part D – Materials and Workmanship*****D3 – Proper Materials**

The SempreTherm External Thermal Insulation Composite 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

The SempreTherm External Thermal Insulation Composite Systems, as certified in this Certificate, meet the requirements for workmanship.

Part A - Structure**A1 – Loading**

The SempreTherm External Thermal Insulation Composite Systems once appropriately detailed, designed and installed have adequate strength and stability to meet the requirements of this Regulation (see Part 3 of this Certificate).

A2 – Ground Movement

The SempreTherm External Thermal Insulation Composite 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**

The SempreTherm External Thermal Insulation Composite 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 Part 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 the SempreTherm External Thermal Insulation Composite 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 the SempreTherm External Thermal Insulation Composite 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 TGD to Part L of the Building Regulations 1997 to 2010 (see Table 2 Part 4 of this Certificate).

2.1 PRODUCT DESCRIPTION

The SempreTherm Systems consist of fixing thermal insulation made of EPS (expanded polystyrene) boards (See Table 1) to the substrate. The EPS boards are adhesively fixed to the substrate with supplementary mechanical fixings as required. A layer of reinforced is embedded in the base coat layer. The base coat is cementitious and the decorative finishes are available in a range of colours and textures and are based on either silicate/silicone or acrylic materials.

The system can be applied on a variety of existing external surfaces such as brick or rendered masonry walls. The EPS system is suitable for both dry and wet dashed external walls however loose dry dashing or predominant sections of dashing should be removed. Loose dashing would reduce the effective adhesion of the boards and peaks of dry dashing may serve to locally reduce the thermal effective of the insulation layer. Over rendering of an existing dashed finishes would serve to level the substrate.

The EPS system is suitable for soffits of overhangs or the underside of building projections, provided the installation in no way impinges on the fire certification of the existing dwelling. It can also be fixed on inclined or sloped surfaces provided that they are not directly exposed to precipitation. The system is not suitable for horizontal surfaces exposed to precipitation.

The substrate on which the SempreTherm EPS system will be used should have reaction to fire class: A1 or A2-s1 d0 according to EN 13501-1.

See Table 1 for the full list of components of the SempreTherm EPS Systems.

2.2 MANUFACTURE, SUPPLY AND INSTALLATION

SempreTherm EWIS is responsible for the design manufacture and supply of all components to approved specifications, in accordance with the SempreTherm EWIS approved supplier system. SempreTherm EWIS and their approved Irish Agents/Distributors are responsible for:

- Project specific design in accordance with approved design process;
- Training, monitoring and review of licensed applicators in accordance with approved training and assessment procedures;
- Product supply;
- Technical support;
- Sales and marketing.

The installation of each system is carried out by the Certificate Holder's trained and approved installers in accordance with the Certificate Holder's project specific specifications and method statements.

Installers must also be approved and registered by NSAI Agrément as part under the NSAI Agrément Approval Scheme for installers of External Thermal Insulating Composite Systems (ETICS). See Cl. 2.4.1

2.2.1 Quality Control

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

2.3 DELIVERY, STORAGE AND MARKING

The insulation is delivered to site in packs. Each pack is marked with the manufacturer's details, product identification marks and batch numbers.

See Table 1 of this certificate for the designation code that must be included on the on the insulation identification label.

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 should 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.

Each container for other components, e.g. mesh cloth, primers, renders etc., bears the manufacturer's and product's identification marks, batch number and the NSAI Agrément logo incorporating the Certificate number. These components must be stored in accordance with the manufacturer's instructions, in dry conditions, and at the required storage temperatures. Products must be used within the stated shelf life, where applicable.

	Table 1 – SempreTherm EPS Systems Components	Thickness (mm)	Coverage (kg/m²) or (W/(m.K))
Adhesives	SEMPRE START TS-100 ADHESIVE MORTAR – dry mix cement based adhesive requiring addition of water from 0.2 L/kg to 0.22 L/kg	-	4.0
Insulation EPS EN 13163	T2-L2-W2-S1-P3-BS115-DS(N)2-DS(70,-)1-TR100-WP0,5-F(tk)70-G(m)1-MU30 T2-L2-W2-S1-P3-BS115-DS(N)2-DS(70,-)1-TR100-WP0,5-F(tk)70-G(m)1-MU30 T2-L1-W2-S2-P4-BS300-CS(10)200-DS(N)2-DS(70,90)1-DLT(2)5-WL(T)1 T2-L2-W2-S2-P3-BS115-DS(N)2-DS(70,-)2-TR100 T2-L2-W2-S2-P4-BS115-DS(N)2-DS(70,-)2-TR100 T1-L1-W1-S1-P3-BS250-CS(10)200-DS(N)2-DS(70,-)2-DLT(1)5-WL(T)3 T1-L1-W1-S1-P3-BS150-CS(10)100-DS(N)2-DS(70,-)2-DLT(1)5-WL(T)3 T2-L2-W2-S2-P4-BS115-CS(10)70-DS(N)2-DS(70,-)1-TR150 T2-L2-W2-S2-P4-BS115-CS(10)70-DS(N)2-DS(70,-)1-TR150 T2-L2-W2-S2-P4-BS170-DS(N)2-DS(70,-)1-TR150 T2-L2-W2-S2-P4-BS150-DS(N)2-DS(70,-)1-TR130 T2-L1-W2-S2-P4-BS350-CS(10)200-DS(N)2-DS(70,90)1-DLT(2)5-WL(T)1-WD(V)3 T2-L1-W2-S2-P4-BS250-CS(10)150-DS(N)2-DS(70,90)1-DLT(2)5-WL(T)1-WD(V)3 T2-L2-W2-S2-P4-BS100-CS(10)70-DS(N)2-TR150 T2-L2-W2-S2-P4-BS115-CS(10)70-DS(N)2-DS(70,-)1-TR150 T2-L2-W2-S2-P4-BS100-CS(10)70-DS(N)2-TR150 T2-L2-W2-S2-P4-BS150-CS(10)100-DS(N)2-TR150	50 to 150	0.038 0.038 0.034 0.031 0.038 0.036 0.038 0.031 0.038 0.030 0.031 0.034 0.034 0.037 0.030 0.030 0.028
Anchors	EJOT Ejothrm NT-U or other anchors covered by ETA's issued against the requirements of ETAG 004	-	-
Base coats	SEMPRE UNIVERSAL TU-200 BASECOAT – dry mix cement based adhesive & basecoat requiring addition of water from 0.22 L/kg to 0.24 L/kg. Consists of main components: portland cement, powder synthetic binding agents, sand, specific additives.	Minimal (dry) 5.0	5.4
Glass fibre meshes	SEMPRE TG 22 145 gr/m² (mesh size 5 x 5 mm) SEMPRE TG 15 165 gr/m² (mesh size 4 x 4 mm) SEMPRE TG 16 230 gr/m² (mesh size 7 x 7 mm)	-	-
Primers	SEMPRE W DEEP-ACTING PRIMER - ready to use, designed for priming highly absorbent substrates (e.g. concrete, old sand & cement renders) prior to installing External Wall Insulation Systems. SEMPRE TESORO GRUNT : ready to use pigmented liquid intended as a primer for Tesoro Acrylic Render. SEMPRE MARESIL GRUNT : ready to use pigmented liquid intended as a primer for Maresil Polysilicate Render. SEMPRE MARMARE GRUNT : ready to use pigmented liquid intended as a primer for Marmare Mosaic Render.	-	0.2 L/m ²
Finishing coats (renders)	SEMPRE TESORO TYNK ; ready to use pastes - acrylate binder (floated or sprayed). Water-based acrylic binder, aggregates and additives. SEMPRE MARESIL TYNK : ready to use pastes - silicate/silicone binder (floated or sprayed). Based on potassium silica glass poliacrive technology modified render. SEMPRE MARMARE TYNK : ready to use pastes - acrylate binder (towedled). Based on transparent resins and coloured quartz sand and marble aggregates fillers.	1.5, 2.0, 2.5, 3.0. 1.0, 1.5.	2.3 to 4.5 2.5 to 4.0
Ancillary materials	Ancillary materials (mastics, corner strips) must be approved by the Certificate holder.	-	-
Reference should be make to Table 3 & 4 of this certificate for minimum thickness for Impact and Fire Classification			

2.4 INSTALLATION

2.4.1 Approved installers

Installation shall be carried out by the Certificate Holder's 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 the Certificate Holder and NSAI Agrément to install the product.
- 3) Have undertaken to comply with the Certificate Holders installation Procedure.
- 4) Are employing Supervisors and Operatives who have been issued with appropriate identity cards by the Certificate Holder. Each team must consist of at least one ETICS Operative and ETICS Supervisor (can be the same person).

- 5) Are subject to supervision by the Certificate Holder including unannounced site inspections (and office records) by both the Certificate Holder/Distributor and NSAI Agrément, in accordance with the NSAI Agrément ETICS Approval Scheme.

2.4.2 General

The Certificate Holder prepares a bespoke site package for each project, including 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 technical representative of the Certificate Holder.

The Certificate Holders technical representatives will visit the 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.

For fire barriers, lamella should 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.

2.4.3 Site Survey and Preliminary Work

A pre-installation survey of the property shall be carried out and recorded to confirm suitability of substrate for application of the ETICS System including, modifications/repairs necessary, pullout resistance of proposed mechanical fixings etc. 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. Loose or flaking elements should be removed. Internal wet work e.g. screeding or plastering, should be completed and allowed to dry, prior to system application.

Where discrepancies preventing installation of the SempreTherm External Thermal Insulation Composite Systems in accordance with this Certificate and the Certificate holder's instructions exist, these discrepancies should be discussed with the Certificate holder and a

solution implemented with the approval of the Certificate holder.

2.4.4 Application Procedure

- 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.
- Weather conditions must be monitored to ensure correct application and curing conditions. Application of coating materials should not be carried out below 5°C or above 25°C, nor if exposure to frost is likely. In addition, cementitious-based renders must not be applied if the temperature will be below 0°C at any time during 72 hours after application; cement-free, synthetic-resin and silicone-resin plasters must not be applied if the temperature will be below 5°C at any time during 72 hours after application; silicate plasters must not be applied if the temperature will be below 8°C at any time during 72 hours after application. SempreTherm ETICS adhesives can be applied in temperature between 0°C and 5°C on a rising scale only. 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 can not be re-located 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.
- See Table 1 for approved range of Adhesive/Base Coats
- Base profile and corner profiles are fixed as specified in the site package. Existing structural expansion joints shall be extended through to the surface of the ETICS system with full system expansion beads.
- A plinth strip/starter track is mechanically fixed to the substrate level with DPC level. This provides a horizontal line for the installation of insulation panels as well as providing reinforcement to the lower edge of the system. The starter track has a secondary function as an anti-vermin control.
- XPS or EPS 150/200 skirting boards are then fixed to the wall below DPC to provide the necessary impact and capillary action resistance. To minimise the effects of cold bridging the XPS/ EPS150/200 should extend below ground level where possible. Where this is not possible the first run of XPS/ EPS150/200 insulation boards is positioned at ground level.
- The insulation boards are bonded to the wall by applying the specified adhesive (see Table

- 1) to the boards using the "strip-point" method. A circumferential ribbon of adhesive at least 3cm wide is applied to the insulation boards. 6 - 8 evenly distributed patches of adhesive 8 - 12 cm in diameter are then applied to the boards so that an adhesive surface of at least 40% is achieved (60% after application and pressing). Alternatively, for even and smooth substrates, the whole panel can be coated with adhesive using a notched trowel to produce a coat 2-5 mm in thickness. The insulation panel should be immediately placed on the substrate and pressed into place.
- Subsequent rows of insulation boards are installed above DPC, 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. A foam filler approved by the Certificate Holder may be used for filling gaps up to 5mm. Larger gaps shall be filled with strips of the ETICS insulation material.
 - 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 EPS boards should be levelled out using a rubbing board with local trimming as required.
 - Window and door reveals should be insulated to minimise the affects of a cold bridging in accordance with the recommendations of the Acceptable Construction Details Document (published by the DoEHLG), Section 2 – External Wall Insulation, Detail 2.21. to achieve an R-value of $0.6\text{m}^2\text{K/W}$ as shown in Figure 3. The R-value of $0.6\text{m}^2\text{K/W}$ at reveals relates to a wall U-value of $0.27\text{ W/m}^2\text{K}$. For improved U-values higher R-values are required in order to achieve the target liner thermal transmittance for all junctions. Where clearance is limited, strips of approved insulation should be installed to suit available margins and details recorded as outlined in Cl. 4.5 of this Certificate.
 - To minimise the affects of cold bridging in all other junctions over and above window and doors, designers should consider the recommendations of the Acceptable Construction Details Document (published by the DoEHLG), 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 Cl. 4.5 of this Certificate.
 - Details of mechanical fixings (including their arrangement in the insulation boards) are specified in the project specific design requirements based on pullout test results,

- substrate type and wind loading data. Installation of mechanical fasteners shall commence no earlier than 24 hours after the insulation panels have been adhesively fixed. A minimum of 2 mechanical per EPS board (maximum size of EPS board $1.2\text{m} \times 0.6\text{m}$) or 2.8 fixings per m^2 for EPS shall be installed unless otherwise specified in the project specific design. Above two stories an additional fire fixing is provided at a rate of 1 per m^2 . See Table 1 for the list of approved fasteners that can be used. Holes are drilled into the substrate through the insulation, and the fixings are installed, fixed tightly to the insulation board, using the dedicated driving system, to ensure there is no risk of pull off.
- Purpose-made powder coated hot dip galvanized mild steel window sills (complete with PVC stop ends and rear upstands), are installed in accordance with the Certificate holders instructions. They are designed to prevent water ingress and incorporate drips to shed water clear of the system. See Figure 2.
 - Lamella (Rockwool) fire stops are installed in accordance with the certificate holders instructions as defined in Cl. 4.2 of this Certificate, at locations defined in the project specific site package. See Figure 6.
 - For EPS, any high spots or irregularities should be removed by lightly planning with a rasp to ensure the application of an even thickness of Base Coat. After sufficient stabilisation of the installed 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 or eaves, the system must be protected e.g. by an adequate overhang or by purpose made sub-cills, seals or flashing.
 - Building corners, door and window heads and jambs are formed using angle beads bonded to the insulation in accordance with the manufacturer's instructions.
 - To minimise the thermal bridge affect during the installation of railings, exterior lighting, shutter guide rails, canopies, aerials /dishes etc., the certificate holder offers a range of anchoring options. These 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. For retro fit installation reference should be made to the Certificate Holder project specific site package.

- Prior to application of base coat and finish coat all necessary protective measures, such as taping off of existing timber window and covering of glass, should be in place.
- The Base Coat is prepared as described in Table 1 and is trowel applied to the surface of dry insulation boards to approximately 2/3 of the final base coat thickness. Base coats requiring the addition of water should be mixed mechanically using a drill and mixer. A 10mm toothed trowel (held at 45° to the insulation board) is used to leave castellations in the basecoat. A layer of alkali-resisting glass-fibre mesh is then applied (see Table 1 for approved meshes) either vertically or horizontally ensuring the mesh is overlapped at joint by a minimum coverage of 100mm (overlaps in quoins should be min. 150mm). The mesh shall be pressed into the base coat using a notched float so that it is not visible, yet it should not make direct contact with the Insulation.
- The remaining 1/3 thickness of base coat is then applied as required to ensure the mesh is completely covered and the required minimum thickness of base coat is achieved.
- Additional pieces of reinforcing mesh are applied diagonally at the corners of openings to provide the necessary reinforcement prior to the application of the final layer of basecoat. Additional mesh patches 200 x 300mm are installed at a 45° angle in accordance with the Certificate holder's instructions. These patches provide additional reinforcement at locations of potentially high stress due to shrinkage /curing of the external renders.
- Refer to the certificate holder's instructions and the project specific site package regarding the installation method and location of the stainless steel (S.S.) fixings (normally at 0.4m centres) 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 the rate of one per square metre above two stories. The fixing design should take account of the extra duty required under fire conditions.
- The base coat must be allowed to dry/cure (3 days approx.) prior to the application of the primer/finish coat. Prior to the application of the finishing coat, sealant should be applied as required as defined in the project specific site package in accordance with the certificate holders instructions.
- Primers shall be applied in accordance with the Certificate instructions and allowed to dry for approximately 12 hours 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.
- Finishing Coats (See Table 1 for approved list of Finishing coats and their compatibility with the primer coats) shall be applied in accordance with the Certificate instructions.
- It is imperative that weather conditions are suitable for the application and curing of the SempreTherm finishing coats. Finishing coats should not be applied when the air or wall temperature is below +5° C or above 25° C for the duration of the curing time. In wet weather the finished walls should be protected to prevent wash-off. It is also advisable that protective covers remain in place as required to maximise the drying process.
- 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.
- To minimise colour shade variations and to avoid dry line jointing, continuous surfaces should be completed without a break. If breaks cannot be avoided they should be made where services or architectural features, such as reveals or lines of doors and windows, help mask cold joints. Where long uninterrupted runs are planned, containers of the Finishing Coat should be checked for batch numbers. Bags with different batch numbers should be checked for colour consistency.
- All rendering should follow best practice guidelines e.g. BS 8000-10:1995 *Workmanship on building sites – Code of practice for plastering and rendering* and IS EN 13914-1:2005 *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.
- Proprietary thermally broken grounds should be included through the external wall insulation system at installation stage to provide suitable fixing for heavy, externally mounted, installations such as gates, cantilevered light stands, anchor points for electrical cables and telecommunication cables, large hanging baskets etc. When installing any of the above post installation of EWIS system advice should be sought from the certificate holder on best practice.

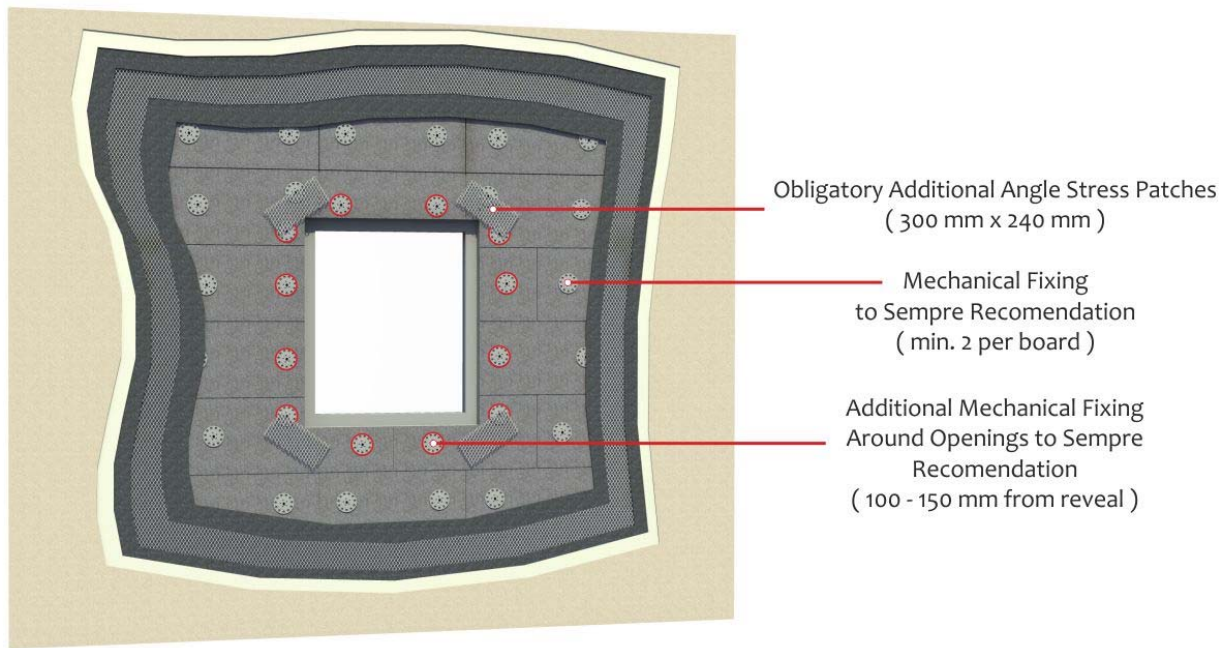


Figure 1: Reinforcement Detail at Opes

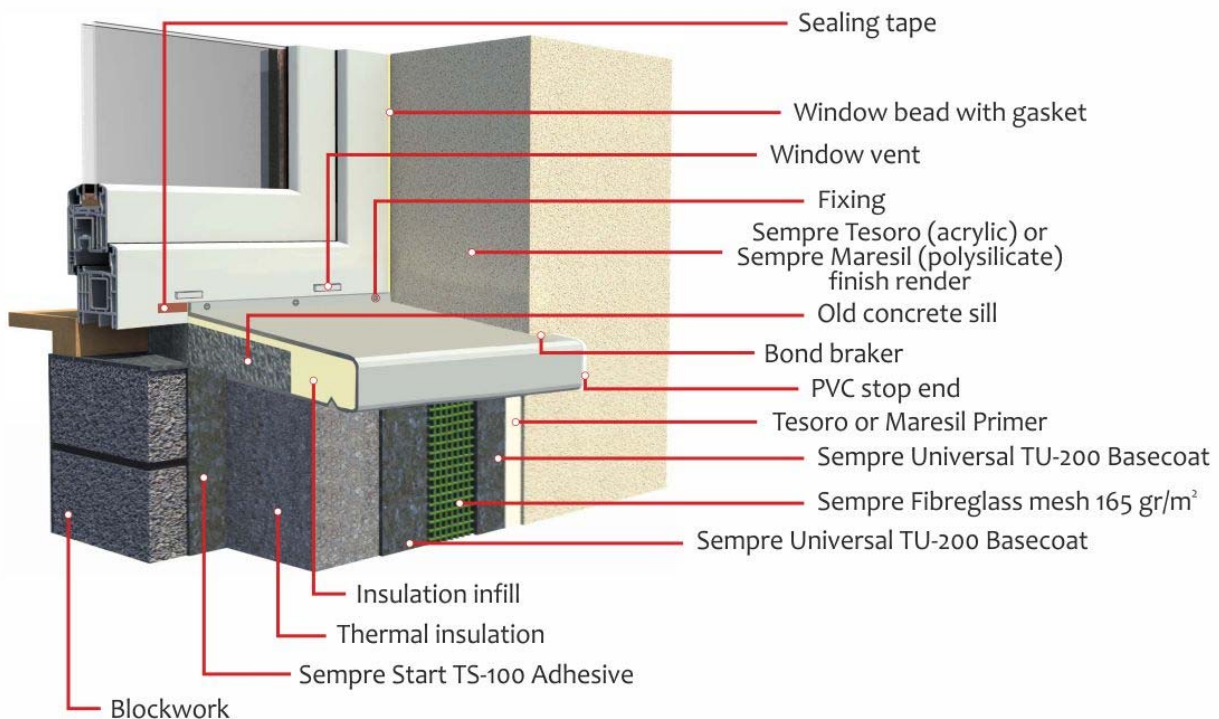


Figure 2: Window Cill Detail

- When obstructions abut external wall such as boundary wall best practice would be to cut back the boundary wall to allow for continuation of the EWIS system or in the case of unheated lean-to buildings, the EWIS system should continue around the lean-to.
- If it is not possible to install the EWIS system to all external walls, alternate forms of thermal upgrades, such as cavity bead or internal dry lining, must be provided. There should be an adequate over lap at the junction between an EWIS system and the alternative insulation

method selected to limit thermal bridging at this interface.

- All necessary post-application inspections should be performed and the SempreTherm

documentation (check/sign-off sheets and provision of the Maintenance/Homeowners manual and project specific documentation to the client) completed accordingly.

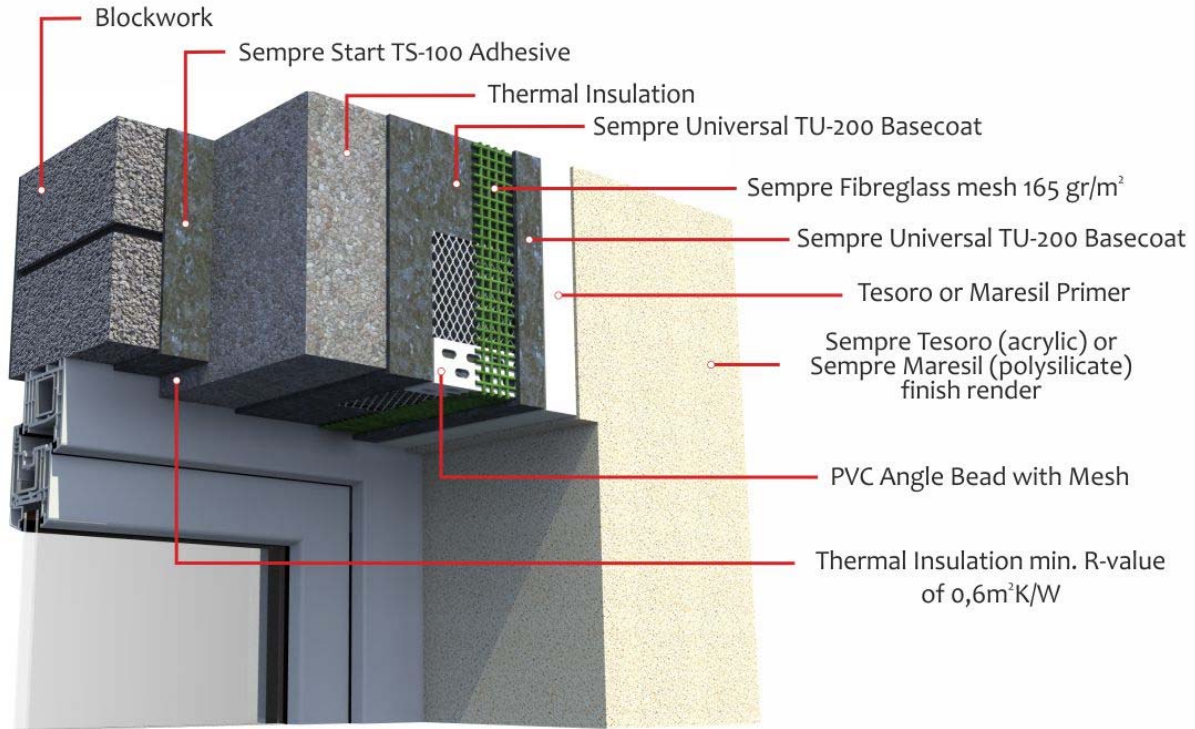


Figure 3: Ope Head Detail

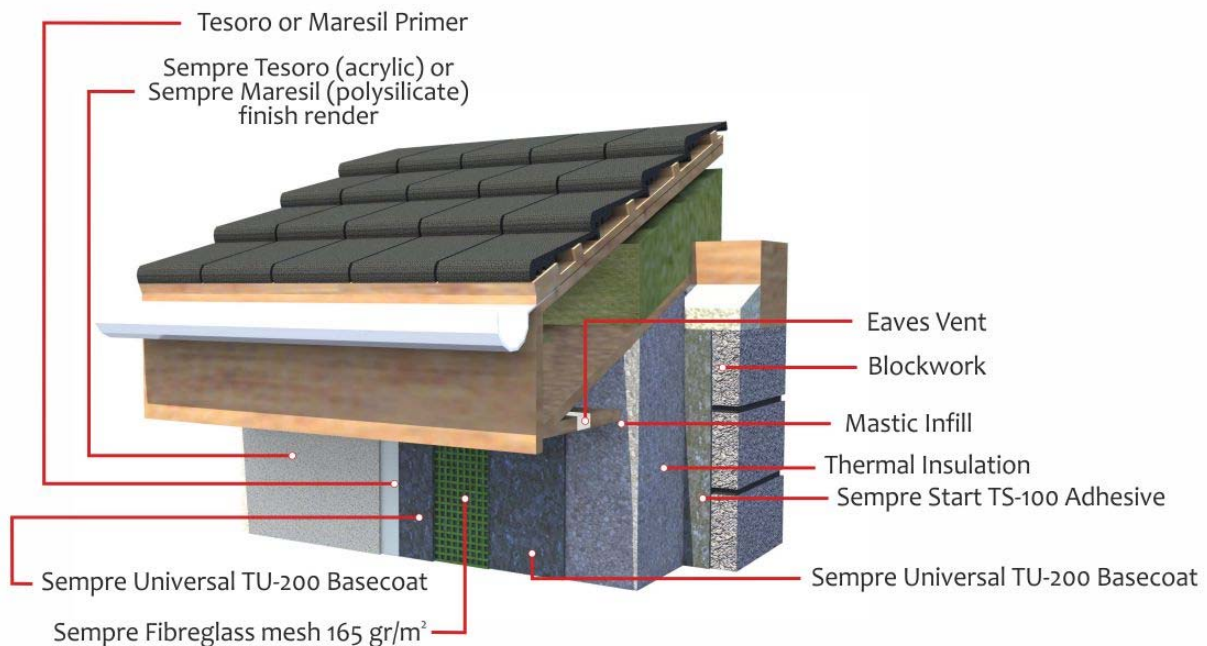


Figure 4: Eves Detail (ETICS connects with roof insulation).

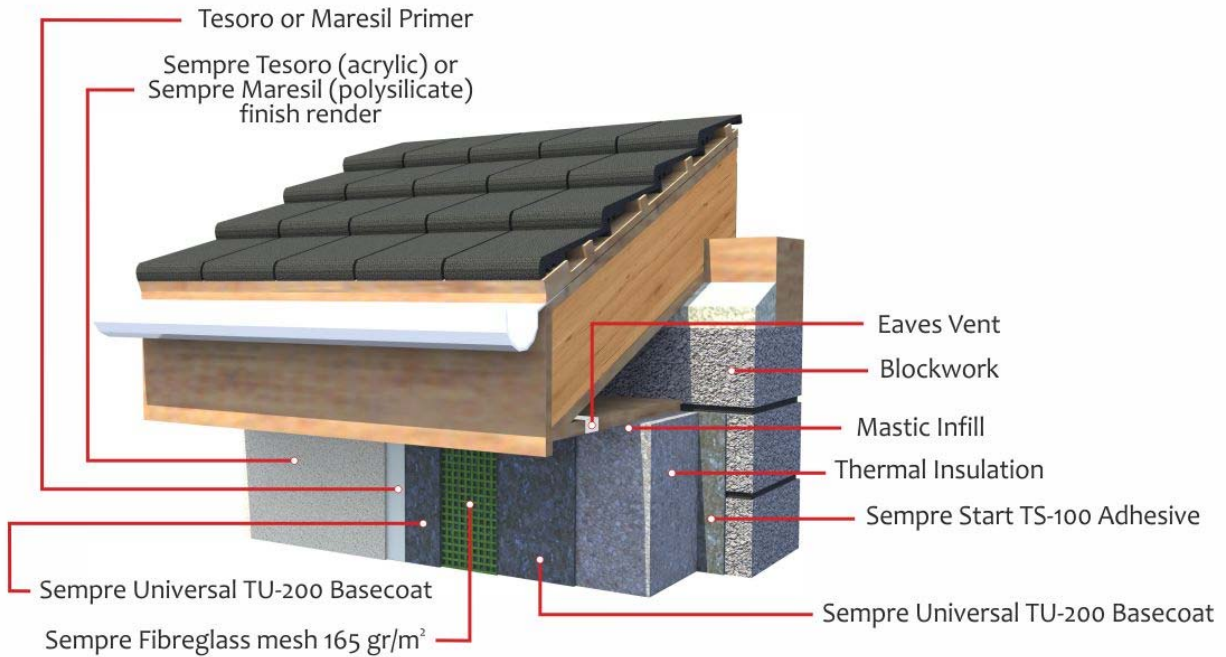


Figure 5: Eaves Detail (ETICS stops at soffit board).

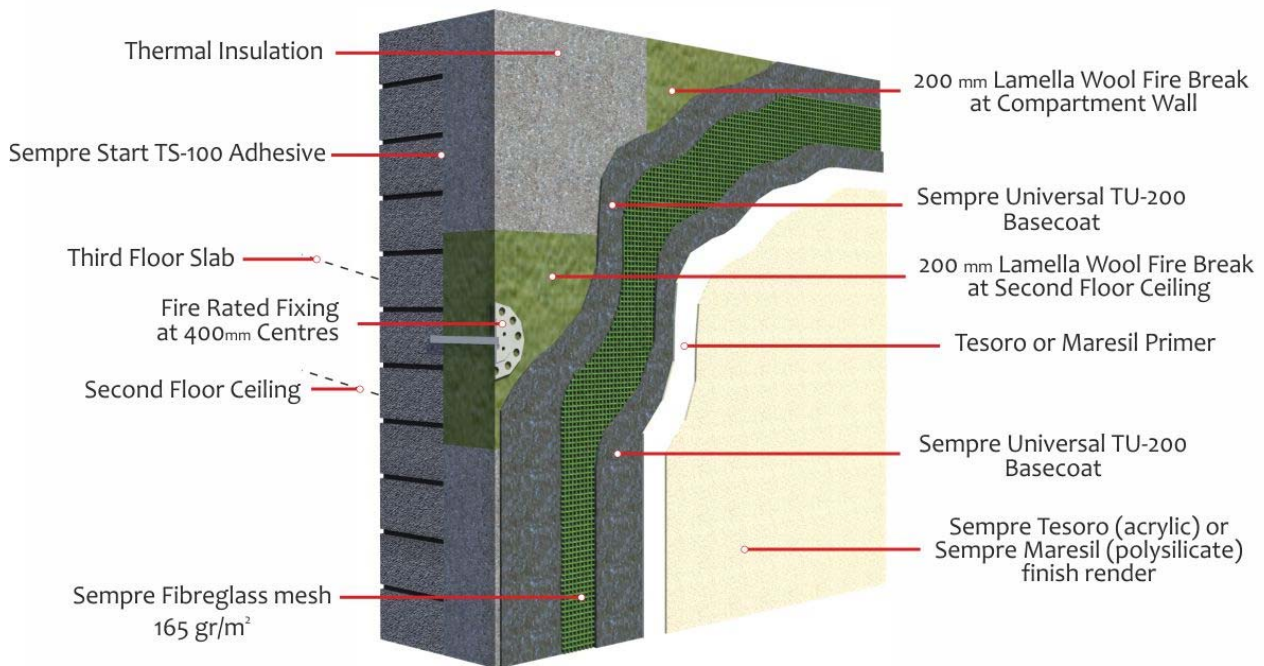


Figure 6: Horizontal & Vertical Fire Barrier

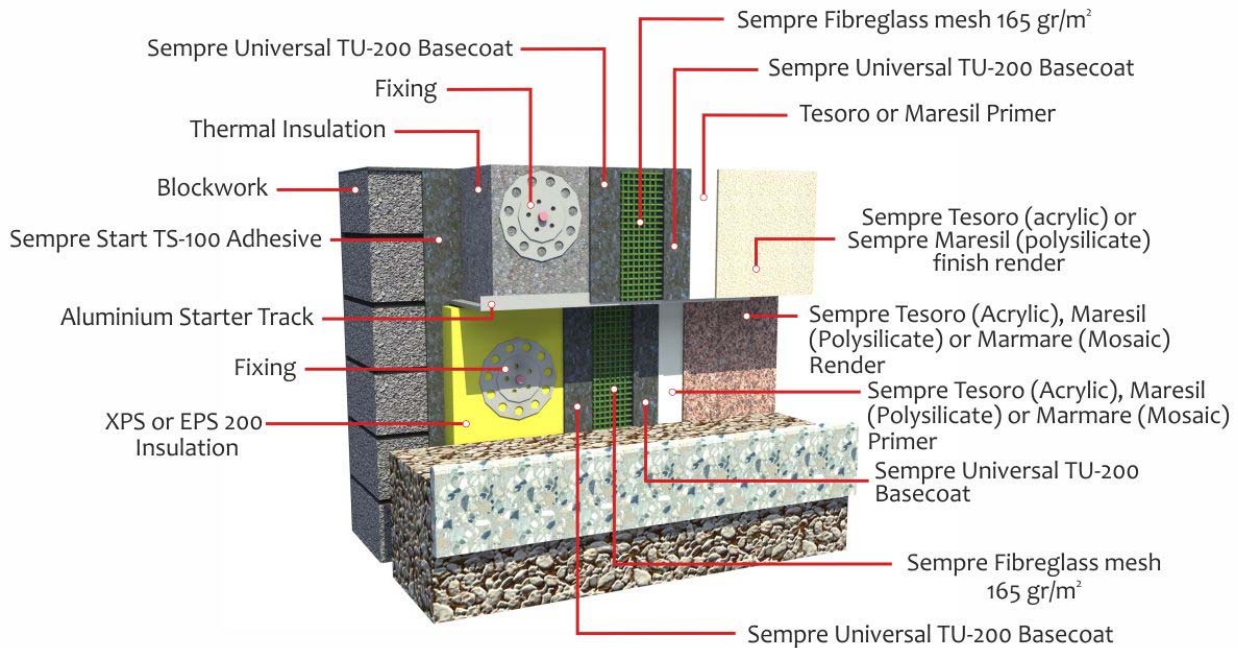
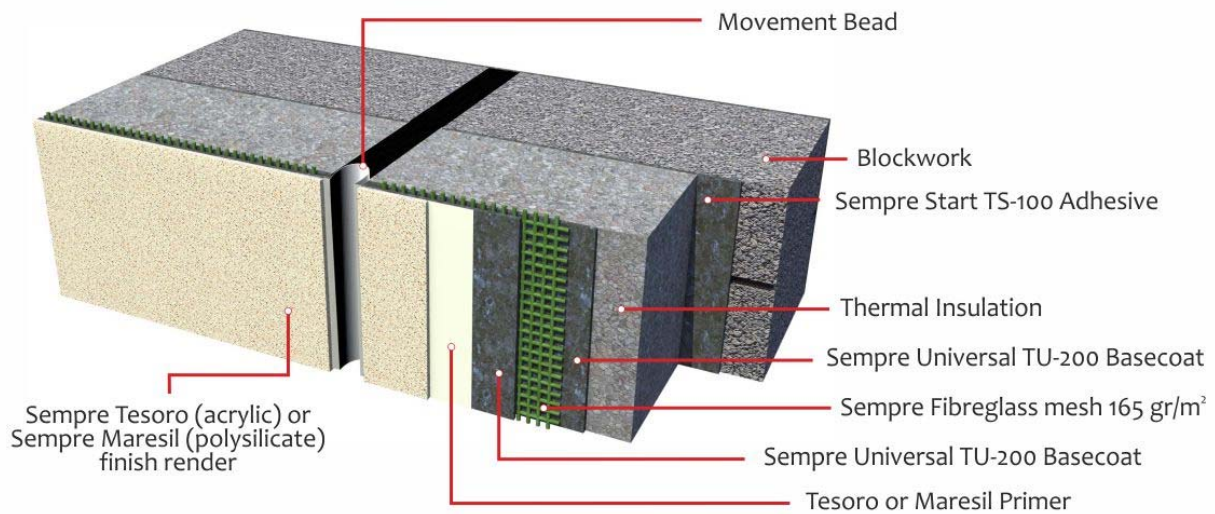


Figure 7: Plinth Detail



NOTE: Standard V and E Movement Joint Profiles Are Also Available

Figure 8: Movement Joint Detail

3 GENERAL

The system is designed by the Certificate Holder on a standard or project specific basis. The design will include for:

- a) The completion and recording of a site survey.
- b) Evaluation and preparation of substrate.
- c) Minimising risk of condensation in accordance with recommendations of BS 5250:2002 *Code of practice for control of condensation in buildings*. This includes the use of approved SempreTherm detailing as shown in Figures 1 – 8 incorporating the requirements of the Acceptable Construction Details published by the DoEHLG.
- d) Thermal insulation provision to TGD to Part L of the Building Regulations 1997 to 2009.
- 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 400mm 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 building greater than two stories should be checked by a chartered engineer in accordance with Eurocode 1: I.S EN 1991-1-4:2005 *General actions- Wind actions*. A general factor of safety of 1.5 is applied to design wind loads.
- j) Design for fire resistance, fire spread and fire stopping. As defined in Cl. 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 cill design are coordinated to achieve a fully integrated design as per the certificate holders technical details.
- l) Movement joints.
- n) A site specific maintenance programme for inclusion in the home owner's documentation.
- o) 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.

When designed and installed in accordance with this Certificate, the systems will satisfy the requirements of TGD to Part L of the Building Regulations. 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 DoEHLG.

Seals to windows and doors shall be provided in accordance with the project specific site plan. When new powder coated galvanized mild steel window cills are face fixed to window frame, a compressible gasket must be used to create a weather tight seal between frame and cill.

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 expanded polystyrene, in accordance with good construction practice, all PVC sheathed cables should be run through ducting or be re-routed.

The durability of the render systems is influenced by the colour of the render used. The Certificate Holder recommend that where renders are used in thermal insulation systems, dark colors with a reflection coefficient of scattered light below 20% should be avoided. The use of dark color renders for such applications should not exceed 10% of facade surface. This should be considered when choosing the finishing coat to be used. Exceptions include north facing or shaded walls. In case of the doubt, the advice of the Certificate holder should be sought.

4.1 STRENGTH AND STABILITY

4.1.1 Wind Loading.

The SempreTherm External Thermal Insulation Composite Systems can be designed to withstand the wind pressures (including suction) and thermal stresses in accordance with the Building Regulations 1997 to 2009. The design for wind loading on building greater than two stories should be checked by a chartered engineer in accordance with Eurocode 1 *Actions on Structures*: I.S EN 1991-1-4:2005. *General Actions- Wind Actions*. A general factor of safety of 1.5 is applied to design wind loads.

4.1.2 Impact Resistance

a) The systems described in Table 1 of each of the Detail Sheets have been classified as defined in Table 3 to be suitable for use as defined in 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. There are no restrictions on the use of Category I Systems.

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. Class II excludes use on wall at ground level adjacent to a public footpath, but includes use on properties with their own private, walled in garden.

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.

b) The design should include for preventing damage from impact by motor vehicles or other machinery. Preventative measures such as a provision of protective barriers, or kerbs, should be considered.

4.2 BEHAVIOUR IN RELATION TO FIRE

See Table 4 for details of the fire classifications achieved.

- Systems that achieved a Class B (or better i.e. Class A) 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) as defined in Technical Guidance Document (TGD) to Part B of the Building Regulations 1997 to 2009.

- The Polysilicate rendered system achieves a Class B – s1, d0 Reaction to Fire Classification (see Table 4).

- Systems that achieved a Class C Reaction to Fire Classification (see Table 4) are suitable for use on Residential Dwellings (Purpose Groups 1(a) and 1(b), not more than 10m high and for Flats and Maisonettes (Purpose Group 1(c)) not more than 10m high as defined in TGD to Part B of the Building Regulations 1997 to 2009. These systems may not be used on a wall which is less than 1m away for a boundary. Reference should be made to Section 4.1 and 4.2 of TGD to Part B of the Building Regulations 1997 to 2009.

- The Acrylic rendered system achieves a Class B – s1, d0 Reaction to Fire Classification (see Table 4).

- Systems for which no Reaction to Fire performance has been determined are suitable for use on Residential Dwellings (Purpose Groups 1(a) and 1(b), not more than 4.5m high). These systems may not be used on a wall which is less than 1m away for a boundary. Reference should be made to Section 4.1 and 4.2 of TGD to Part B of the Building Regulations 1997 to 2009.

With regard to fire stopping of cavities and limitations on use of combustible materials, walls must comply with Sections B3.2, B3.3, B3.4 and B4 of TGD to Part B of the Building Regulations 1997 to 2009.

Stainless steel fire fixings to be provided at the rate of one per square metre above two stories. 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, including the second floor level of a three-storey single occupancy house. Firebreaks should be completely 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 firestop should 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, see

Figure 13. Glass wool is not suitable for use as a firestop.

4.3 PROXIMITY OF HEAT PRODUCING APPLIANCES

Combustible material must be separated from a brick or block work chimney by at least 200mm from a flue, or 40mm from the outer surface of the brick or block work chimney, in accordance with Clause 2.15 of TGD to Part J of the Building Regulations 1997 to 2009. 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 2009 can be achieved using the SempreTherm External Thermal Insulation Composite Systems.

The manufacturer's declared thermal conductivity value ($\lambda_{90/90}$) is 0.038 W/mK for the standard white EPS70 board; 0.031 – 0.028 W/mK for the graphite enhanced EPS70 (Grey) board. These have not been assessed by NSAI Agrément.

Table 2 shows typical insulation thickness to achieve the required 0.27 W/m²K U-Value, in addition to thickness of insulation to achieve the improved U-value of 0.21 W/m²K.

Calculation of U-Values will be required on individual projects to confirm a U-Value of 0.27 W/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 declared $\lambda_{90/90}$ value.

When the ETICS system is applied to a masonry cavity wall construction, consideration should be given to the treatment of the ventilated cavity. In order to maximise the impact of the ETICS system on the U-Value of the wall, filling of the cavity, or sealing to ensure no airflow occurs should be considered.

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 the SempreTherm External Thermal Insulation Composite Systems have been assessed and when detailed in accordance with this certificate, can meet the requirements of Table D1 of Appendix D of TGD to Part L of the Building Regulations 1997 to 2009. When **all** bridged junctions within a building comply with the requirements of Table D1 of appendix D of TGD to Part L, the improved 'y' factor of 0.08 can be entered into the Dwelling Energy Assessment Procedure (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 DoEHLG then the improved 'y' factor of 0.08 can be used i.e. $R \text{ value} = 0.6 \text{ m}^2 \text{ K/W}$ for window/door reveals.

Where either of the above options are shown to be valid, or when the required values can not be achieved, all relevant details must be recorded on the 'Certificate of Compliance' for that project for use in future BER calculations.

' Ψ ' values for other junction outside the scope of this certificate should be assessed in accordance with the BRE IP1/06 "Assessing the effects of thermal bridging at junctions and around openings" and BRE Report 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 2009.

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, thought 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 section of the envelope such as window jambs, cills and eaves will experience a lower level of improved 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 TGD L appendix D table D1, 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 been 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 level of insulation at bridged junctions, guidance should be sought from the certificate holder as to acceptable minimum requirements.

4.6.2 Interstitial Condensation

An interstitial condensation risk analysis will be carried out by the Certificate Holder in accordance with BS 5250:2002, and the design modified as appropriate to reduce the risk of interstitial condensation to acceptable levels.

Table 2 – Typical U-Values ³			
ETICS Insulation	² Declared Thermal Conductivity ($\lambda_{90/90}$) of insulation (W/mK)	Thickness of insulation (mm)	U-Value (W/m ² K)
No ETICS system	-	-	2.17
EPS 70 White ¹	0.038	120	0.27
		160	0.21
EPS 70 Graphite enhanced ¹ (Platinum)	0.031	100	0.26
		130	0.21
EPS 70 Graphite enhanced ¹ (Platinum)	0.030	100	0.26
		130	0.20
EPS 70 Graphite enhanced ¹ (HD Platinum)	0.028	90	0.26
		120	0.21

¹ Designation Code of approved Insulation defined in Table 1

² The thermal conductivity (λ) value of the insulation in all U-value calculations must be the $\lambda_{90/90}$ value

³ These values are based on the a typical house of 215 mm hollow block construction (Building Regulations 2009 Part L) with the following construction build-up (internal to external):

- Internal Gypsum (BS5250) - 22 mm
- Hollow block - 215 mm (10 mm Mortar joint)
- External Render - 20mm ($\lambda = 0.57$)
- SempreTherm Adhesive Mortar - 5 mm
- ETICS Insulation board as specified above
- Render finish with basecoat with mesh (where applicable) as defined in Table 1

Note: Calculation of U-Values will be required on individual projects to confirm a U-Value of 0.27 W/m²K, 0.21 W/m²K (or better) has been achieved, based on the wall construction and the lambda (λ) value of the insulation.

Table 3 – SempreTherm EPS Systems Impact resistance Category Matrix		
Base Coat	Finishing coat (thickness 1.5, 2.0, 2.5, 3.0 mm)	Impact Resistance Single Mesh (TG 15 165 gr/m ²)
Sempre Universal TU-200 (thickness min. 5 mm)	Sempre Tesoro Acrylic Render	Category I
	Sempre Maresil Polysilicate Render	Category II

Note :- further explanation of Impact resistance Category I, II and III under Clause 4.1.2

Table 4 – SempreTherm EPS Systems Reaction to Fire				
Configuration	Maximum declared organic content of the finishing coat	Declared flame retardant content of the rendering system	Thickness (mm)	Reaction to fire class according to I.S. EN 13501-1
SempreTherm EWIS EPS - in combination with: 1. TS-100 Start 2. EPS 70 3. Sempre TU-200 Basecoat 4. Sempre Tesoro Acrylic Primer 5. Sempre Tesoro Acrylic Render	max. 7.1 %	0 %	50 to 150	B – s1, d0
SempreTherm EWIS EPS - in combination with: 1. TS-100 Start 2. EPS 70 3. Sempre TU-200 Basecoat 4. Sempre Maresil Polysilicate Primer 5. Sempre Maresil Polysilicate Render	max. 5.6 %	0 %	50 to 150	B – s1, d0
All other configurations (with decorative finishes)	-	-	-	No performance determined

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. When these existing ventilation provisions do not meet the requirements of Part F of the Building Regulations, 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 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 their Repair and Maintenance Method Statement, which is incorporated into the Home Owner's Manual.

Necessary repairs should be affected immediately and should be carried out 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.

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. See Figure 2 & 3.

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 fixings specifications;
- Joint design;
- Construction details;
- Maintenance requirements.

The assessment indicates that the system should remain effective for at least 30 years, providing that it is designed, installed and maintained in accordance with this Certificate. Any damage to the surface finish shall be repaired immediately and regular maintenance shall be undertaken as outlined in Section 4.7 of this Certificate.

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 dependent 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.

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 relation to 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 for 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 conjunction with this Certificate.

(iv) Site visits were conducted to assess the practicability of installation the history of performance in use of the product.

Part Five / Conditions of Certification

5

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 2009 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 NSAI Agrément 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.

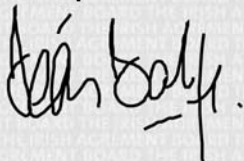
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is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

NSAI Agrément

This Certificate No. **11/0358** is accordingly granted by the NSAI to SempreTherm on behalf of NSAI Agrément.

Date of Issue: **April 2011**

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.nsai.ie

Revisions:

September 2011 To add Graphite enhanced EPS