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BAW-21-224-S-A-UK
BDA Agrément®
Direct Fix
External Thermal Insulation
Composite System (ETICS)



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SCOPE OF AGRÉMENT

This BDA Agrément® (hereinafter 'Agrément') relates to Direct Fix (hereinafter the 'System'). The System is a mechanically and adhesively fixed, mineral wool (hereinafter 'MW') insulated, external thermal insulation composite system (ETICS). The System is suitable for use in external walls for installation above damp-proof course (hereinafter 'DPC') level on sheathed light-gauge steel frame (hereinafter 'LGSF'), masonry (where masonry includes clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks) or concrete supporting walls. The System is for existing and new dwellings and buildings other than dwellings.

DESCRIPTION

The System consists of MW insulation which is adhesively and mechanically fixed through the basecoat with reinforcement mesh to a supporting wall. A secondary layer of basecoat with reinforcement mesh is applied, followed by mineral, silicone or Speedyslip finishes. Primer is applied before the application of silicone finishes, and Speedyslip adhesive prior to application of Speedyslips.

ILLUSTRATION



THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

STATEMENT

It is the opinion of Kiwa Ltd. that the System is safe and fit for its intended use, provided it is specified, installed and used in accordance with this Agrément.

Craig Devine
Operations Manager, Building Products

Alpheo Mlotha CEng FIMMM MBA
Technical Manager, Building Products

SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, specialists, engineers, building control personnel, contractors, installers and other construction industry professionals who are considering the safety and fitness for purpose of the System. This Agrément covers the following:

- Conditions of use;
- Production Control, Quality Management System and the Annual Verification Procedure;
- System components and ancillary items, points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed System characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party Acceptance, as appropriate;
- Sources.

MAJOR POINTS OF ASSESSMENT

The System described in this Agrément meets the requirements defined on Kiwa Technical Requirement KTR-23.

Moisture control - see Section 2.2.7 - the System:

- can contribute to limiting the risk of interstitial and surface condensation;
- will provide a degree of protection against rainwater ingress.

Strength - see Section 2.2.8 - the System has adequate strength and is designed to adequately resist impact damage and wind loads normally encountered in the UK.

Fire performance - see Section 2.2.9 - the System is classified as European Classification:

- A1, in accordance with BS EN 13501-1, when incorporating mineral finish;
- A2-s1, d0, in accordance with BS EN 13501-1, when incorporating silicone or Speedyslip finish.

Thermal performance - see Section 2.2.10 - the System improves the thermal performance of external walls and can contribute to satisfying the requirements of the national Building Regulations.

Durability - see Section 2.2.11 - the service life durability of the System will be dependent upon the environment (operating conditions) in which the System will be used.

UKCA and CE marking - see Section 2.2.12 - the manufacturers of the constituent products used within the System have responsibility for conformity marking, in accordance with all relevant British and European Product Standards.

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1 GENERAL CONSIDERATIONS

1.1 CONDITIONS OF USE

1.1.1 Limitations

This Agrément has been prepared in accordance with the mandatory requirements defined in Kiwa Technical Requirement KTR-23. Some information in this Agrément is provided for guidance or reference purposes only; this information falls outside the scope of the Technical Requirement.

1.1.2 Application

The assessment of the System relates to its use in accordance with this Agrément and the Agrément holder's requirements.

1.1.3 Assessment

Kiwa Ltd. has assessed the System in combination with relevant test reports, technical literature, the Agrément holder's quality plan, DoPs and site visit, as appropriate.

1.1.4 Installation supervision

The quality of installation and workmanship shall be controlled by a competent person who shall be an employee of an Approved Installer.

The System shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

1.1.5 Geographical scope

The validity of this document is limited to England, Wales, Scotland and Northern Ireland, with due regard to Section 3 of this Agrément (CDM, national Building Regulations and Third-Party Acceptance).

1.1.6 Validity

The purpose of this Agrément is to provide well-founded confidence to apply the System within the scope described. The validity of this Agrément is as published on www.kiwa.co.uk/bda.

1.2 PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has conducted an audit of the Agrément holder and determined that they fulfil all their obligations in relation to this Agrément in respect of the System.

The initial audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their quality plan. Document control and record-keeping procedures were deemed satisfactory. A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 ANNUAL VERIFICATION PROCEDURE - CONTINUOUS SURVEILLANCE

To demonstrate that the System conforms with the requirements of the technical specification described in this Agrément, an Annual Verification Procedure has been agreed with the Agrément holder in respect of continuous surveillance and assessment, and auditing of the Agrément holder's QMS.

2 TECHNICAL ASSESSMENT

This Agrément does not constitute a design guide for the System. It is intended only as an assessment of safety and fitness for purpose.

2.1 SYSTEM COMPONENTS AND ANCILLARY ITEMS

2.1.1 Components included within the scope of this Agrément

The components listed in Table 1 below are integral to the use of the System.

Table 1 - Integral components

Component		Description	Dimensions
adhesive	Envirobed	a polymer-modified, organically bound, water-based, cement-free adhesive	
MW insulation	Rockwool Frontrock Super	Dual density MW, manufactured in accordance with BS EN 13162, λ_D 0.036 W/mK	80 to 280 mm thick, 1.0 m long, 0.6 m wide
	Rockwool DD insulation		50 to 200 mm thick, 1.2 m long, 0.6 m wide
	Knauf Mono Density insulation	Mono density MW, manufactured in accordance with BS EN 13162, λ_D 0.036 W/mK*	
basecoat	Envirorend	cement-based, polymer-modified basecoat	
reinforcement mesh	Enviromesh	alkali-resistant, multi-stranded, glass-fibre reinforcing mesh with nominal weight 160 g/m ²	50 m by 1 m, 3.5 mm by 3.8 mm grid size
	mechanical fixings ^a	Fischer FABS 31 self-drilling, self-tapping metal screws with Fischer Termofix H washers, for sheathed LGSF supporting walls	85 to 200 mm long by 5.8 mm diameter screws with 60 mm diameter head by 10 to 150 mm deep tube washer
		TFIX 8S, electro-galvanized or stainless steel screws with polypropylene anchor sleeve, for masonry supporting walls	80 to 420 mm long by 8 mm diameter with 60 mm diameter anchor sleeve
		EJOTHERM EJOT STR-H, screw fastener for timber	80 to 260 mm long by 6 mm diameter with 60 mm diameter washer
		EJOTHERM STR U 2G, universal screw-in anchor with anchor sleeve	80 to 260 mm long by 8 mm diameter with 60 mm diameter anchor sleeve
mineral finish	EnviroMin	thin-coat mineral-based textured flexible render finish	
silicone finish	EnviroSil primer option 1	a silicone resin based polymer-modified primer, for masonry supporting walls, for use with EnviroSil silicone finish option 1	
	EnviroSil silicone finish option 1	thin coat render, consisting of silicone resins and grains	
	EnviroSil primer option 2	a silicone resin bonded primer with special adherence additives, for use with EnviroSil silicone finish option 2	
	EnviroSil silicone finish option 2	water-based topcoat render, consisting of silicone resins and calibrated grains	
Speedyslip finish	Speedyslip adhesive	polymer dispersion with liquid pigments containing various fillers of mixed sands	
	Speedyslips	polymer-bound mineral acrylic slips in various colours	215 mm long by 65 mm high, 3 to 5 mm thick ^{AA}

^A length dependent on thickness of MW insulation; alternative fixings may be used provided it can be demonstrated that they have equivalent (or greater) pull-out strength, plate diameter, plate stiffness and load resistance characteristics

^{AA} other sizes are available

2.1.2 Ancillary items falling outside the scope of this Agrément

The following ancillary items detailed in this Section may be used in conjunction with the System, but fall outside the scope of this Agrément:

- supporting wall - masonry, concrete, LGSF;
- sheathing board for LGSF substrate;
- profiles - a range of standard profiles for end stop, corner mesh and expansion joints, available in stainless steel, PVC-U or organic polyester powder-coated galvanized steel, provided to the specifier's requirements;
- under-and-over cills, cill extenders;
- roof verge extenders;
- sealing tape;
- silicone sealant;
- stainless steel mechanical fixings.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design

2.2.1.1 Design responsibility

A Specifier may not undertake a project-specific design; the Specifier shall co-operate closely with the Agrément holder to agree a project-specific design. The Agrément holder retains full design responsibility unless the design is subsequently modified by others.

2.2.1.2 Basis of design

The characteristics detailed in the section titled 'Major Points of Assessment' shall be considered during the use of System.

2.2.1.3 General design considerations

A project-specific design is required. This shall be developed in close co-operation with the Agrément holder.

When the System is specified on:

- masonry supporting walls, it can be installed in exposure zones 1, 2 and 3, in accordance with BS 8104 and PD 6697;
- LGSF supporting walls, the Specifier shall determine the suitability of the System based upon the project-specific exposure zone in accordance with BS 8104.

The System shall be installed above DPC level and a minimum of 150 mm above ground level.

Internal wet work (e.g. screed or plastering) shall be completed and allowed to dry prior to the application of the System.

Assessment of the structural performance of the System shall be carried out by the Agrément holder to confirm that the System can:

- resist the design impact, wind, dead and imposed loads;
- safely transfer loads to the building;
- accommodate all anticipated thermal movements without damage.

Deflection shall be limited to prevent damage to the System.

Sheathing boards shall be:

- weather resistance category A or B and bending strength Class 2 or 3, in accordance with BS EN 12467;
- classified as European Classification A1 or A2-s1, d0, in accordance with BS EN 13501-1.

Supporting walls incorporating the System shall be:

- detailed to reduce the risk of damage due to movement in the supporting wall, taking into consideration differential movement in dissimilar materials;
- designed in accordance with the relevant Standards to limit mid-span deflections - see Section 2.2.8.

New masonry supporting walls shall be designed in accordance with:

- BS EN 1992-1-1;
- BS EN 1996-1-1;
- BS EN 1996-2;
- PD 6697.

LGSF supporting walls shall be designed in accordance with BS EN 1993-1-1 and BS EN 1993-1-3; the steel structure shall be not less than 1.2 mm thick with a minimum of 50 mm flanges.

Buildings incorporating the System shall be designed and constructed to prevent moisture penetration and air infiltration, in accordance with the relevant Codes and Standards.

Care is needed for design detailing of joints around openings, penetrations and movement joints, which shall be in accordance with BS 6093.

The System shall be secured to the supporting wall with mechanical fixings through the reinforcement mesh and MW insulation.

Horizontal and vertical movement joints (designed to cater for the calculated degree of movement to control expansion, contraction and cracking without reducing the stability and weathertightness of the wall) shall be carried through the System using movement beads of PVC, powder-coated galvanised steel or austenitic stainless steel as appropriate, subject to the project-specific design. For systems on masonry substrates, the movement joints within the System shall be provided at 7.5 m intervals when the length of a wall exceeds 12 m in accordance with PD 6697 and BS EN 1996-2.

Examples of relevant detailing for external wall insulation (EWI) systems used with LGSF supporting walls can be found in SCI Publication P343.

2.2.1.4 Project-specific design considerations

The project-specific design shall:

- be determined by the Agrément holder;
- take into account the requirements of the relevant national Building Regulations (see Section 3.2);
- take into account the service life durability required (see Section 2.2.11).

A pre-installation survey is required to allow determination of the project-specific design (see Section 2.4.1).

The Agrément holder shall ensure that the following considerations are included in the development of a project-specific design:

- adequacy of supporting wall;
- thermal transmittance (hereinafter 'U-value') requirements;
- thermal expansion effects of the supporting wall and the System;
- likely local impact resistance;
- pull-through of fixings;
- pull-out of fixings;
- effect of wind actions on the System.

The local spell index method for assessing the exposure zones to wind-driven rain, on Systems installed on LGSF supporting walls, shall be considered at the project-specific design phase, taking in consideration:

- geographical location and orientation of the proposed wall;
- terrain upwind;
- obstructions;
- characteristics of the proposed wall.

Masonry supporting walls shall be vapour permeable to ensure that moisture can escape from inside the building.

Adhesive is not required where the project-specific design incorporates a breather membrane. The use of breather membrane is subject to condensation risk analysis and project-specific design.

The number of fixings required through the reinforcement mesh and MW insulation is a variable design value and shall be equal to or greater than that needed to achieve the required project-specific design wind load - see Section 2.2.8.

Account shall be taken of Government Accredited Construction Details for Part L - Masonry External Wall Insulation Illustrations, Timber Frame Illustrations and Steel Frame Illustrations for England and Wales and Accredited Construction Details for Scotland (hereinafter 'Government Accredited Construction Details').

During the assessment and survey, fixing pull-out strength (kN) tests shall be conducted on the supporting wall surface in accordance with EOTA TR 051 and EAD 330196-01-0604. The results of the assessment and survey shall assist the Agrément holder in determining the type, size and minimum number of fixings required for each MW insulation component. When using pull-out data for fixings, the material safety factor γ_m shall be considered.

2.2.2 Applied building physics (heat, air, moisture)

A Specialist shall check the hygrothermal behaviour of a project-specific design incorporating the System and, if necessary, offer advice on improvements to achieve the final specification. The Specialist can be either a qualified employee of the Agrément holder or a suitably qualified consultant (in which case it is recommended that the Specialist co-operates closely with the Agrément holder).

2.2.3 Permitted applications

Only applications designed according to the specifications given in this Agrément are permitted. In each case, the Specifier and Installer shall co-operate closely with the Agrément holder.

2.2.4 Installer competence level

The System shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

Installation shall be by an Approved Installer, trained and approved by the Agrément holder.

2.2.5 Delivery, storage and site handling

The System components are delivered in suitable packaging bearing relevant identification information (such as the System name, production identification date or batch number, the Agrément holder's name, etc.) and, where applicable, the BDA Agrément® logo incorporating the number of this Agrément.

Prior to installation, the System components shall be stored in accordance with the Agrément holder's requirements. Good housekeeping protocols shall be followed to avoid damage.

Store the System components in accordance with the Agrément holder's requirements. Particular care shall be taken to:

- avoid exposure to direct sunlight for extended periods of time;
- avoid exposure to high or low temperatures for extended periods of time;
- store in a well-ventilated covered area to protect from rain, frost and humidity;
- store away from possible sources of ignition.

For storage of liquid and powder components, minimum and maximum temperatures shall be observed, including limitations of the shelf life, in accordance with the manufacturer's recommendations.

2.2.6 Maintenance and repair

Once installed, the System requires regular maintenance. For 60-year durability, a bespoke extended repair and maintenance protocol will apply. For advice in respect of repair and maintenance, consult the Agrément holder.

The maintenance schedule for the installed System shall include regular visual inspection checks for:

- signs of damaged areas and cracks in the render exceeding 0.2 mm;
- signs of disbandment in Speedyslips; dislodged Speedyslips shall be re-fixed using Speedyslip adhesive;
- signs of damage in Speedyslips; damaged Speedyslips shall be removed and replaced with new ones, re-fixed using Speedyslip adhesive;
- integrity of the sealant around openings and service entry points;
- adequate performance of architectural details designed to shed water away;
- leaks from external plumbing and fittings, guttering and drainpipes.

The System finish may become discoloured by algae and lichens in damp areas. Cleaning with fresh warm water and light brushing or by overcoating will mitigate this. A mild detergent or traffic-film remover can be applied and washed off. Any surface algae can be cleaned off using an algicide.

Any damage shall be repaired immediately, in accordance with BS EN 13914-1 and the Agrément holder's Maintenance and Repair Manual.

Maintenance shall include the regular replacement and resealing of joints at window and door frames to prevent failure. Failed elements such as sealants, joint seals and corroded materials shall be replaced to ensure that water ingress does not occur.

Lime bloom is likely to occur in renders containing Portland cement and this can be avoided by applying the render during weather conditions recommended by the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.2.7 Moisture control

Condensation risk

External walls incorporating the System can adequately limit the risk of surface and interstitial condensation when designed in accordance with BS 5250 and BRE Report 262.

A condensation risk analysis shall be completed at the project-specific design stage for all elements of the construction, including at junctions, openings and penetrations, to minimise the risk of surface and interstitial condensation. When correctly installed on an occupied building, no condensation will form on the internal wall.

Resistance to precipitation including wind-driven rain

The project-specific design shall include detailing around openings, penetrations and movement joints to minimise the risk of wind-driven rainwater ingress, in accordance with BS 6093.

The System will provide a degree of protection against rainwater ingress. However, care shall be taken to ensure that supporting walls are adequately weathertight prior to installation of the System.

The guidance given in BRE Report 262 shall be followed in connection with the weathertightness of wall constructions. The Agrément holder shall select a construction appropriate to the local wind-driven rain index in accordance with BS 8104, paying due regard to the design detailing, workmanship and materials to be used.

At the top of walls, the System shall be protected by an adequate coping, overhang or other project-specific detail.

The System has adequate resistance to artificial weathering and resistance to thermal shock, in accordance with ETAG 004, ETAG 034 and BS EN 16383.

2.2.8 Strength

The supporting wall shall have sufficient strength to withstand all wind, dead and imposed loads applied to and from the System, including racking and any temporary loads that could be applied during installation. The strength of the supporting wall shall be verified by a suitably qualified engineer. The project-specific design shall ensure that the System attachment to the supporting wall has adequate fixing pull-out capacity for the calculated wind loads.

The System shall be designed to withstand wind action loads in accordance with BS EN 1991-1-4. Account shall be taken of the location, shape and size of the building. The average yearly wind load action data for the site location shall be collated and used to calculate the required design wind resistance (positive and negative) of a given support spacing and fixing pattern. Special consideration shall be given to locations with high wind-load pressure coefficients, as extra fixings may be required.

The supporting wall shall be designed in accordance with the relevant Standards to limit mid-span deflections to $L/260$ (mid-span) and $L/150$ (cantilever).

The System has adequate wind-load resistance and suitable mechanical strength, in accordance with ETAG 004. For the calculation of the wind-load resistance of the System, the design pull-through values given in Table 2 shall be used.

Table 2 - Design wind load values

Design wind load (kN/m ²)	Number of fixings per m ²	Design fixing pull-through resistance (kN) ^a
3.30	8	0.39
2.60	7	
1.95	5	

^a derived from static foam block test on MW insulation with Ejotherrm STR U 2G screw and Enviromesh reinforcement mesh. Partial factor of 2.5 has been applied

Where mechanical fixings through the insulation are aided by supplementary adhesive, the contribution of the adhesive shall not be considered when calculating the wind-load resistance of the System.

Positive wind load is transferred to the supporting wall directly via bearing and compression through the MW insulation and the System finish. Negative wind load is resisted by the bond between the System finish and reinforced basecoat. The MW insulation is retained by mechanical anchors through the reinforcement mesh (and adhesive if used), which are fixed to the supporting wall.

Impact resistance

When tested for hard-body impact resistance, in accordance with ETAG 004 and ETAG 034, the System is categorised as:

- Use Category I when incorporating a Speedyslip finish;
- Use Category II when incorporating a mineral or silicone finish.

The Use Categories in accordance with ETAG 004 are as follows:

- I - a zone readily accessible at ground level to the public and vulnerable to hard-body impacts but not subjected to abnormally rough use;
- 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;
- III - a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects;
- IV - a zone out of reach from ground level.

2.2.9 Fire performance

The reaction to fire of the System is classified in accordance with BS EN 13501-1 as follows:

- the System with mineral finish is classified as European Classification A1;
- the System with silicone or Speedyslip finishes is classified as European Classification A2-s1, d0.

The following components are classified as non-combustible in accordance with the relevant national Building Regulations:

- sheathed LGSF and masonry supporting walls;
- MW insulation.

The System can be used on buildings without any restrictions on building height or boundaries, in accordance with the national Building Regulations.

The fire resistance of walls is based on the occupancy, size and use of a building and shall be a minimum of 30 minutes. It is then specified in 60-minute intervals thereafter.

Walls shall be designed and constructed:

- to adequately resist the passage and penetration of fire;
- so that the unseen spread of fire and smoke within concealed spaces in the wall is inhibited.

The System shall include a minimum of one stainless steel fixing per m² of insulation, or per insulation component, whichever is the lesser, fixed through the reinforcing mesh and the MW insulation, in addition to the other MW insulation fasteners normally specified.

For detailed conditions of use regarding requirements for supporting wall fire performance and fire barriers, fire stopping of service penetrations and combustibility limitations for other materials and components used in the overall wall construction, designers shall refer to the relevant national Building Regulations.

2.2.10 Thermal performance

Thermal insulation

The System can assist in reducing the U-value of external walls. It is essential that detailing is carried out to a high standard if the ingress of water into the MW insulation is to be avoided and the full thermal benefit is to be obtained from the installation of the System. Any moisture penetration will affect thermal conductivity; the thermal value will recover when the MW insulation dries out. The System is designed to minimise moisture penetration to the MW insulation.

The requirement for limiting heat loss through the building fabric, including the effect of thermal bridging, can be satisfied if the U-value of a wall incorporating the System does not exceed the maximum U-value requirement given in the national Building Regulations.

The U-value of a completed wall construction will depend on the MW insulation thickness, fixing method, type of mechanical fixing, and insulating value of the supporting wall and its internal finish.

For the purposes of U-value calculations and to determine if the requirements of national Building Regulations are met, the thermal resistance and U-value of the walls incorporating the System shall be calculated according to BS EN ISO 10211 (taking into consideration BS EN ISO 6946, BS EN ISO 10456 and BRE Report 443), using the declared thermal conductivity (λ_D) of the MW insulation (refer to Section 2.5.4).

Thermal bridging at junctions and around openings

Care shall be taken in the overall design and construction of junctions with other elements and openings to minimise cold bridging and air infiltration. Due consideration shall be given to the Government Accredited Construction Details.

Guidance on linear thermal transmittance, heat flows and surface temperatures can be found in the documents supporting the national Building Regulations and in BS EN ISO 10211, BRE Information Paper 1/06, BRE Report 262, BRE Report 497 and PAS 2030.

2.2.11 Durability

The service life durability of the System will be dependent upon the environment (operating conditions) in which the System will be used. The expected service life durability will be in excess of 30 years.

Once installed, the System is not susceptible to damage from environmental conditions normally encountered in the UK. Where relevant, consideration shall be given to the exposure zones where the System is installed.

2.2.12 UKCA and CE marking

There is no relevant Product standard for the System.

Diagram 1 - typical fixing pattern

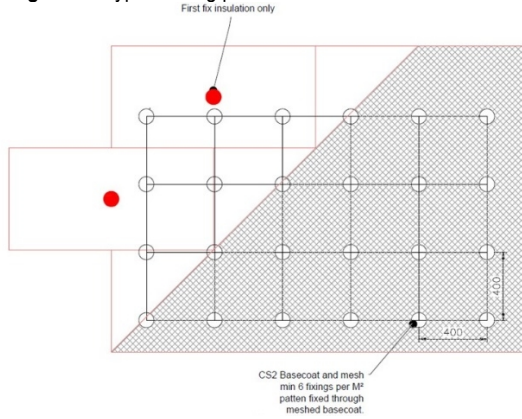


Diagram 2 - typical opening stress patch detail

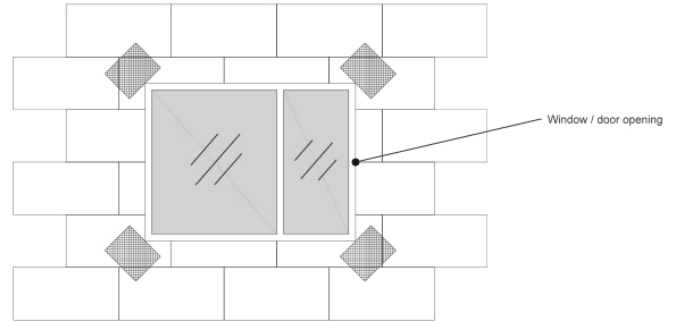


Diagram 3 - typical movement joint detail

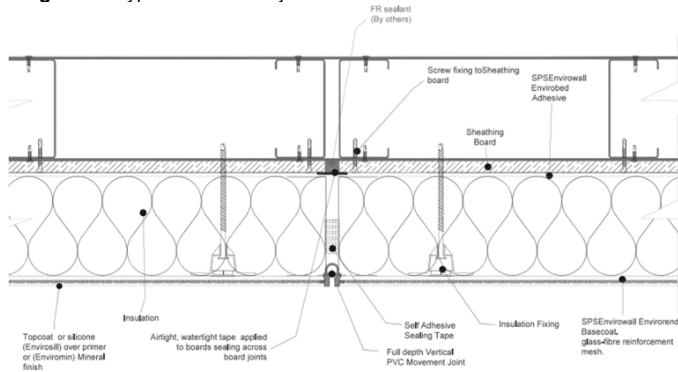


Diagram 4 - typical window cill detail

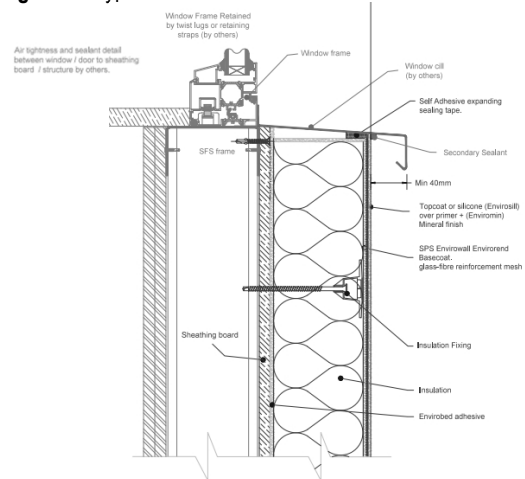


Diagram 5 - typical window reveal detail

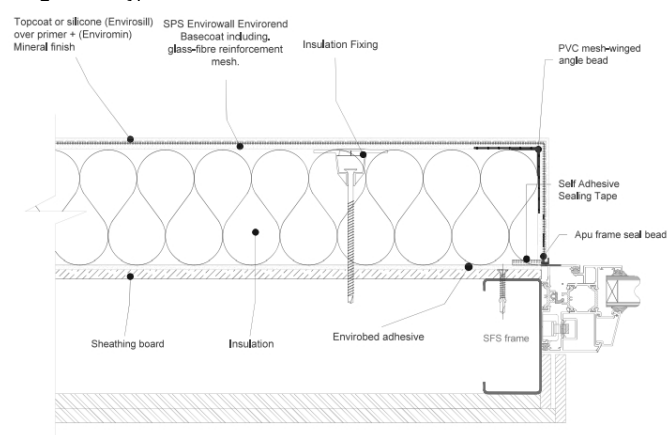


Diagram 6 - typical base detail

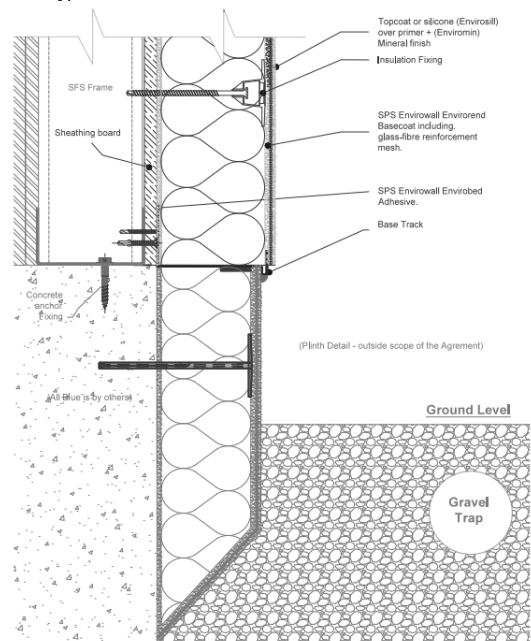
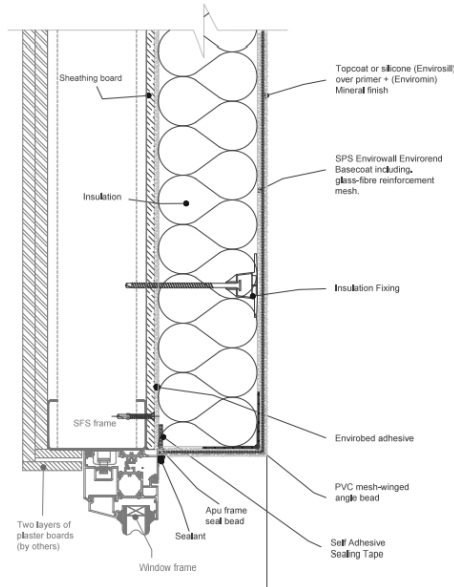


Diagram 7 - typical window head detail



2.4 INSTALLATION

The System shall be installed strictly in accordance with the instructions (hereinafter 'Installation Manual') of the Agrément holder, the requirements of this Agrément and the requirements of BS 8000-0.

2.4.1 Project-specific installation considerations

The project-specific design shall be determined from a pre-installation survey.

A specification shall be prepared for each elevation of the building indicating, where appropriate:

- DPC level, the position of starter track, water deflection beads/channels, expansion joints and weather seals;
- detailing around windows, doors, etc.;
- identification of:
 - services and fittings requiring removal or alteration to facilitate installation of the System;
 - areas where silicone/flexible sealants shall be used.

The installation process includes fixing pull-out tests of the supporting wall according to the Construction Fixings Association Guidance Note 'Procedure for site testing construction fixings', to determine pull-out strength values (see Section 2.2.8). Pull-out test loads shall be 2.5 x design load. The design pull-out resistance strengths of the supporting wall and MW insulation anchor fixings shall be checked by a competent person and shown to be adequate before installation of the System.

Subsequent project-specific design considerations include confirmation that:

- there is no existing rising damp and there are no signs of damp on the inner face of the supporting wall, other than those caused solely by condensation;
- existing walls are:
 - structurally sound, in a good state of repair and show no evidence of rain or frost damage;
 - watertight, clean and meet the requirements of the relevant Standards and national Building Regulations for airtightness.

2.4.2 Preparation

The following works shall be undertaken before the installation of the System:

- the supporting wall shall be finished and free from protrusions and uneven jointing;
- make any necessary repairs or modifications (e.g. removal of fittings which can be relocated after the System is installed);
- if necessary, install protection channel to safely sleeve cabling;
- the roof shall be in place, and window and door openings shall be sealed;
- surfaces shall be clean, dry and free from dirt, grease, oils, solvents and loose particles;
- flues, chimneys and combustion air ventilators shall be continuously sleeved through the wall. Reference shall be made to CIGA's 'Technician's guide to best practice: Flues, chimneys and combustion air ventilators';
- supports for services/fittings (e.g. soil pipes) shall be fixed back to the supporting wall; no load is to be transferred to the System;
- external power cables concealed in trunking shall be well labelled with warning signs;
- extend beyond the surface and securely refix external soil stacks, wastewater pipes, overflows, ducts and vent pipes, where required;
- mix the adhesive (for bonding the MW insulation to the supporting wall) in accordance with the Agrément holder's recommendations.

2.4.3 Outline installation procedure

Detailed installation procedures can be found in the Agrément holder's Installation Manual.

The outline procedure is as follows:

- fix the starter track horizontally to the wall above DPC level at the base of the wall or 150 mm above ground level;
- apply adhesive to the MW insulation, ensuring minimum 70 % coverage using the 'strip and dot' method or full surface application;
- position the MW insulation boards on starter track and firmly push into position;
- temporarily fix the MW insulation to the supporting wall with mechanical fixings;

- continue with additional MW insulation boards, ensuring they are tightly butt-jointed and that a staggered bonding pattern is adhered to;
- install 'L' shaped MW insulation around all openings, ensuring that no edge or piece of insulation is smaller than 200 mm;
- fill any gaps with sections of MW insulation cut to size;
- fix stop beads vertically on sealing tape and fully seal with silicone;
- fix angle verge trim using sealing tape at the top of the System and seal with silicone at the top of the verge;
- fit ancillary materials or accessories as per project design specifications;
- apply reinforcement mesh patches at the corners of wall/door openings and all building openings, such as gas meter boxes, etc.;
- install items such as attachments for fitting gutters, window cills, etc.;
- apply a continuous coating of the basecoat 3-5 mm thick over the entire surface of the MW insulation;
- bed the reinforcement mesh into the basecoat while it is still wet, ensuring joints are overlapped by a minimum 100 mm;
- apply mechanical fixings through the reinforcement mesh and MW insulation to the supporting wall, in accordance with the fixing pattern;
- cover the fixing heads by 100 mm by 100 mm mesh patches;
- apply a slurry coat of 1-2 mm thick over the surface ensuring no mesh is visible and is fully encapsulated;
- apply the appropriate finish as per the project-specific design:
 - apply mineral finish;
 - for silicone finish, apply appropriate primer to the basecoat prior to the application of the finish;
 - for Speedyslip finish, apply Speedyslip adhesive to the basecoat prior to the application of the Speedyslips; apply the Speedyslips ensuring they are firmly pushed into place and leaving consistent joints between each Speedyslip.

2.4.4 Finishing

The following finishing is required on completion of the installation:

- check all trunked air vents and flues (by an appropriate test if necessary) to verify they are clear and unobstructed;
- apply silicone sealant around windows, door frames, etc., and where the installation abuts any other building or surface, to ensure a weathertight joint.

Post-installation inspection checks shall be carried out to ensure that the installation has been successfully completed and that the building has not been damaged. These shall be conducted as soon as possible after completion of the work and before removing scaffolding; any defects shall be reported immediately.

2.5 INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.5.1 Moisture control

Test	Standard	System finish or component	Result
Water vapour diffusion resistance	BS EN ISO 7783	EnviroMin	2.73 MNs/g
		EnviroSil option 1	1.83 MNs/g
		EnviroSil option 2	4.92 MNs/g
		Speedyslip	3.98 MNs/g
Hygrothermal and freeze-thaw conditioning	ETAG 004, BS EN 16383	EnviroMin	No defects
		EnviroSil option 1	
		EnviroSil option 2	
	ETAG 034, BS EN 16383	Speedyslip	

2.5.2 Strength

Test	Standard	System finish or component	Result
Hard-body impact	ETAG 004	EnviroMin	Use Category II
		EnviroSil option 1	
		EnviroSil option 2	
	ETAG 034	Speedyslip	Use Category I

2.5.3 Fire performance

Test	Standard	System finish or component	Result
Reaction to fire	BS EN 13501-1	EnviroMin	A1
		EnviroSil option 1	A2-s1, d0
		EnviroSil option 2	
		Speedyslip	

2.5.4 Thermal performance

Test	Standard	System finish or component	Result
Thermal conductivity (λ_D)	BS EN 13162	MW insulation	0.039 W/mK

3.1 THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015 AND THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS (NORTHERN IRELAND) 2016

Information in this Agrément may assist the client, principal designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

3.2 THE NATIONAL BUILDING REGULATIONS

In the opinion of Kiwa Ltd., the System, if installed and used in accordance with Section 2 of this Agrément, can satisfy or contribute to satisfying the relevant requirements of the following national Building Regulations.

This Agrément shall not be construed to confer the compliance of any project-specific design with the national Building Regulations.

3.2.1 England**The Building Regulations 2010 and subsequent amendments**

- A1 Loading - the System can sustain and transmit combined dead, imposed and wind loads to the ground via the supporting structure
- B4(1) External fire spread - the System can adequately resist the spread of fire over walls and from one building to another
- C2(b) Resistance to moisture - the System can adequately protect the building from precipitation, including wind-driven spray
- C2(c) Resistance to moisture - the System can adequately protect the building from interstitial and surface condensation
- L1(a)(i) Conservation of fuel and power in new dwellings - the System can contribute to limiting heat gains and losses through walls
- L2(a)(i) Conservation of fuel and power in new buildings other than dwellings - the System can contribute to limiting heat gains and losses through walls
- Regulation 7(1) Materials and workmanship - the System is manufactured from suitably safe and durable materials for their application, and can be installed to give a satisfactory performance
- Regulation 7(2) Materials and workmanship - the System can contribute to satisfying this Requirement
- Regulation 23(1) Requirements relating to thermal elements - the System can contribute to walls complying with the requirements of L1(a)(i)
- Regulation 26 CO₂ emission rates for new buildings - the System can contribute to satisfying this Requirement
- Regulation 26A Fabric energy efficiency rates - the System can contribute to satisfying this Requirement

3.2.2 Wales**The Building Regulations 2010 and subsequent amendments**

- A1 Loading - the System can sustain and transmit combined dead, imposed and wind loads to the ground via the supporting structure
- B4(1) External fire spread - the System can adequately resist the spread of fire over walls and from one building to another
- C2(b) Resistance to moisture - the System can adequately protect the building from precipitation, including wind-driven spray
- C2(c) Resistance to moisture - the System can adequately protect the building from interstitial and surface condensation
- L1(a)(i) Conservation of fuel and power in new dwellings - the System can contribute to limiting heat gains and losses through walls
- L2(a)(i) Conservation of fuel and power in new buildings other than dwellings - the System can contribute to limiting heat gains and losses through walls
- Regulation 7(1) Materials and workmanship - the System is manufactured from suitably safe and durable materials for their application, and can be installed to give a satisfactory performance
- Regulation 7(2) Materials and workmanship - the System can contribute to satisfying this Requirement
- Regulation 23(1) Requirements relating to thermal elements - the System can contribute to walls complying with the requirements of L1(a)(i)
- Regulation 26 CO₂ emission rates for new buildings - the System can contribute to satisfying this Requirement
- Regulation 26A Primary energy consumption rates for new buildings - the System can contribute to satisfying this Requirement
- Regulation 26B Fabric performance values for new dwellings - the System can contribute to satisfying this Requirement

3.2.3 Scotland**The Building (Scotland) Regulations 2004 and subsequent amendments****3.2.3.1 Regulation 8 (1)(2) Durability, workmanship and fitness of materials**

- The System is manufactured from acceptable materials and is adequately resistant to deterioration and wear under normal service conditions, provided it is installed in accordance with the requirements of this Agrément

3.2.3.2 Regulation 9 Building standards - construction

- 1.1 Structure - the System can sustain and transmit combined dead, imposed and wind loads to the ground via the supporting structure
- 2.6 Spread to neighbouring buildings - the System can inhibit the spread of fire to neighbouring buildings
- 2.7 Spread on external walls - the System can inhibit the spread of fire on external walls
- 2.8 Spread from neighbouring buildings - the System can inhibit the spread of fire to the building
- 3.10 Precipitation - the System can resist precipitation penetrating to the inner face of the building
- 3.15 Condensation - the System can be designed and constructed to inhibit surface or interstitial condensation
- 6.1(b) Carbon dioxide emissions - the System can contribute to satisfying this Requirement
- 6.2 Buildings insulation envelope - the System can contribute to satisfying this Requirement
- 7.1(a)(b) Statement of sustainability - the System can contribute to meeting the relevant Requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the System can contribute to a construction meeting a higher level of sustainability, as defined in this Standard

3.2.3.3 Regulation 12 Building standards - conversions

- All comments given under Regulation 9 also apply to this Regulation, with reference to Schedule 6 of The Building (Scotland) Regulations 2004 and subsequent amendments, clause 0.12 of the Technical Handbook (Domestic) and clause 0.12 of the Technical Handbook (Non-Domestic)

3.2.4 Northern Ireland

The Building Regulations (Northern Ireland) 2012 and subsequent amendments

- 23 Fitness of materials and workmanship - the System is manufactured from materials which are suitably safe and acceptable as described in this Agrément
- 28(b) Resistance to moisture and weather - the System can be constructed to prevent the passage of moisture
- 29 Condensation - the System can be designed and constructed to prevent interstitial condensation
- 30 Stability - the System can sustain and transmit combined dead, imposed and wind loads to the ground via the supporting structure
- 36(a) External fire spread - the System can adequately resist the spread of fire over walls and from one building to another
- 39(a)(i) Conservation measures - the System can contribute to limiting heat gains and losses through walls
- 40(2) Target CO₂ emission rate - a wall incorporating the System shall be designed and constructed so as not to exceed its target CO₂ emission rate
- 43 Renovation of thermal elements - any renovation work carried out to ensure the wall complies with requirement 39(a)(i)

3.3 THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

- Kiwa Technical Requirement KTR-23
- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods
- BS EN ISO 7783:2018 Paints and varnishes. Determination of water-vapour transmission properties. Cup method
- BS EN ISO 9001:2015 Quality management systems. Requirements
- BS EN ISO 10211:2017 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations
- BS EN ISO 10456:2007 Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values
- BS EN 1991-1-4:2005+A1:2010 Eurocode 1. Actions on structures. General actions. Wind actions
- NA to BS EN 1991-1-4:2005+A1:2010 UK National Annex to Eurocode 1. Actions on structures. General actions. Wind actions
- BS EN 1992-1-1:2004+A1:2014 Eurocode 2. Design of concrete structures. General rules and rules for buildings
- NA+A2:2014 to BS EN 1992-1-1:2004+A1:2014 UK National Annex to Eurocode 2. Design of concrete structures. General rules and rules for buildings
- BS EN 1993-1-1:2005+A1:2014 Eurocode 3. Design of steel structures. General rules and rules for buildings
- NA+A1:2014 to BS EN 1993-1-1:2005+A1:2014 UK National Annex to Eurocode 3. Design of steel structures. General rules and rules for buildings
- BS EN 1993-1-3:2006 Eurocode 3. Design of steel structures. General rules. Supplementary rules for cold-formed members and sheeting
- NA to BS EN 1993-1-3:2006 UK National Annex to Eurocode 3. Design of steel structures. General rules. Supplementary rules for cold-formed members and sheeting
- BS EN 1996-1-1:2005+A1:2012 Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures
- NA to BS EN 1996-1-1:2005+A1:2012 UK National Annex to Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures
- BS EN 1996-2:2006 Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry
- NA to BS EN 1996-2:2006 UK National Annex to Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry
- BS EN 12467:2012+A2:2018 Fibre-cement flat sheets. Product specification and test methods
- BS EN 13162:2012+A1:2015 Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- BS EN 13914-1:2016 Design, preparation and application of external rendering and internal plastering. External rendering
- BS EN 16383:2016 Thermal insulation products for building applications. Determination of the hygrothermal behaviour of external thermal insulation composite systems with renders (ETICS)
- BS 5250:2021 Management of moisture in buildings. Code of practice
- BS 6093:2006+A1:2013 Design of joints and jointing in building construction. Guide
- BS 8000-0:2014 Workmanship on construction sites. Introduction and general principles
- BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain
- Accredited Construction Details, Scotland:2019
- BRE Information Paper 1/06:2006 Assessing the effects of thermal bridging at junctions and around openings
- BRE Report 135:2013 Fire performance of external thermal insulation for walls of multistorey buildings
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2019 Conventions for U-value calculations
- BRE Report 497:2016 Conventions for calculating linear thermal transmittance and temperature factors
- CIGA Technician's guide to best practice: Flues, chimneys and combustion air ventilators:2016
- Construction Fixings Association Guidance Note:2022 Procedure for site testing construction fixings
- EAD 330196-01-0604:2017 Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering
- EOTA TR 051:2018 Recommendations for job site tests of plastic anchors and screws
- ETAG 004:2013 Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with Rendering
- ETAG 034:2012 Guideline for European Technical Approval of Kits For External Wall Claddings (ETICS)
- Government Accredited Construction Detail for Part L:2019
- PAS 2030:2019+A1:2022 Specification for the installation of energy efficiency measures in existing dwellings
- PAS 2035:2019+A1:2022 Retrofitting dwellings for improved energy efficiency - Specification and guidance
- PD 6697:2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2
- SCI Publication P343:2006 Insulated Render Systems Used with Light Steel Framing

Remark - Apart from these sources, technical information and confidential reports have been assessed; any relevant documents are in the possession of Kiwa Ltd. and are kept in the Technical Assessment File of this Agrément. The Installation Manual for the System may be subject to change; contact the Agrément holder for the clarification of revisions.

5 AMENDMENT HISTORY

Revision	Amendment description	Author	Approver	Date
-	First issue	A Chapman	C Devine	June 2022
A	Updated company details	A Chapman	C Devine	July 2022
B	Correction to MW insulation density	A Chapman	C Devine	August 2023
C	Amendment to MW insulation options	A Chapman	C Devine	October 2023

6 CONDITIONS OF USE

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