Kiwa Ltd.
Unit 5 Prime Park Way
Prime Enterprise Park
Derby
DE1 3QB
+44 (0)1332 383333
uk.bpenquiries@kiwa.com
www.kiwa.co.uk/bda

BAW-24-332-S-A-UK
BDA Agrément®
Permarock Mineral Fibre EWI System - Direct Fix on LGSF External Thermal Insulation Composite System (ETICS)

Permarock Products Ltd.
Jubilee Drive
Loughborough
Leicestershire
LE11 5TW
+44 (0)1509 262924
permarock@permarock.com
www.permarock.com

SCOPE OF AGRÉMENT

This BDA Agrément® (hereinafter 'Agrément') relates to Permarock Mineral Fibre EWI System - Direct Fix on LGSF (hereinafter the 'System'). The System is a mechanically and adhesively fixed, mineral wool (hereinafter 'MW') insulated, external thermal insulation composite system (ETICS) with brick-effect render or silicone finishes. The System is for installation above damp-proof course (hereinafter 'DPC') level on external sheathed light gauge steel frame (hereinafter 'LGSF') supporting walls. The System is for existing and new residential and non-residential buildings.

DESCRIPTION

The System consists of MW insulation boards which are mechanically and adhesively fixed to the sheathed LGSF supporting wall and horizontal protected surfaces such as sofits. A layer of basecoat with reinforcement mesh is applied to the MW insulation boards. For multistorey buildings and all buildings with extended 60-year durability, a layer of basecoat and reinforcement mesh is applied to the MW insulation boards which are then mechanically fixed through the mesh to the supporting wall. The System can incorporate either brick-effect render or silicone finishes. Primer is applied before the application of silicone finish.

ILLUSTRATION

THIRD-PARTY ACCEPTANCE

See Section 3.3 (Third-Party Acceptance).

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
Business Unit 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

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 A2-s1, d0, in accordance with BS EN 13501-1.

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, UKNI 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 the relevant Kiwa Technical Requirement. 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	Permarock Adhesive	cement-based, polymer-modified adhesive, conforming to BS EN 998-1	
	Permarock Lamella Adhesive / Permarock HP Adhesive	high polymer content, flexible, cement-based adhesive, conforming to BS EN 998-1	
MW insulation	Permarock Mineral Fibre DD	dual density MW slabs, with a minimum compressive strength of 10 kPa and a tensile strength of 10 kPa, in accordance with BS EN 13162, λ_D 0.036 W/mK	1,200 mm by 600 mm, available in thicknesses from 50 to 250 mm
	Permarock Mineral Fibre HD	high density MW slabs, with a minimum compressive strength of 10 kPa and a tensile strength of 15 kPa, in accordance with BS EN 13162, λ_D 0.039 W/mK	1,200 mm by 600 mm, available in thicknesses from 30 to 160 mm
basecoat	Permarock Bedding Mortar	cement-based, polymer-modified basecoat, conforming to BS EN 998-1	
reinforcement mesh	Permarock Reinforcing Mesh	alkali-resistant coated, glass-fibre reinforcing mesh with a nominal weight of 165 g/m^2	50 m by 1 m, 4 mm by 4 mm grid size
mechanical fixings	fixings	R-WX-58T Self-drilling, zinc-coated carbon steel screws with KCX tubed insulation washers	50 to 300 mm long by 4.8 mm diameter screw with 50 to 90 mm long tube by 60 mm plate diameter washer^
		J-SM70 stainless steel mechanical fixing - high-alloy, fully austenitic, super austenitic, stainless-steel grade 1.4016 BA	160 mm long with 70 mm head diameter^
	washer	R-KWL90-SW Retaining Plate^^	90 mm plate diameter
primer	Permarock K & R Primer	a pigmented synthetic resin dispersion with titanium dioxide, calcium carbonate, silicates, water, film-forming agent and additives, to be used with silicone textured render and flexible brick slip finishes	
silicone textured render	Permarock Silicone^{Ultra} K15 Finish	hybrid binder render comprising silicone emulsion with organically cross-linked quartz silicate particles with 1.5 mm grain size	
brick-effect render	Permarock Brick-Effect Render	polymer-modified, self-coloured, cementitious render system	

^ length is dependent on the thickness of the insulation, alternative fixings may be used for thicker insulations. In all cases, alternative fixings can be used provided they can demonstrate that they have equivalent (or greater) pull-out strength, plate diameter, plate stiffness and load-resistance characteristics

^^ for use with 60 mm plate diameter plastic fixing

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:

- external sheathed supporting walls - LGSF;
- EPDM;
- profiles - a range of standard profiles for end stop, corner reinforcement 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;
- expanding tape;
- sealing tape;
- silicone sealant;
- Class W1 breather membrane;
- roofline closure systems;
- dubbing-out compound;
- moss and mould remover/biocide.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design

2.2.1.1 Design responsibility
A Specifier may undertake a project-specific design, in which case it is recommended that the Specifier co-operates closely with the Agrément holder. The Specifier or Installer is responsible for the final as-built design.

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 the 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.

This Agrément covers the use of the System in sheltered and moderate exposure zones detailed in BRE Report 262, taking into consideration the appropriate local wind-driven rain index in accordance with BS 8104. However, for severe and very severe exposure zone areas, the Specifier, in close co-operation with the Agrément holder, shall determine the suitability of the System, taking into consideration the appropriate local wind-driven rain index using BS 8104 and water permeability of the existing materials.

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.

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.

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.

Sheathing boards shall be 12 mm thick minimum, weather resistance category A and bending strength Class 2 or 3, in accordance with BS EN 12467.

Butt joints, fasteners and penetrations (e.g. flues, ducts) shall be sealed and taped to ensure that water does not penetrate into a wall.

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, to minimise the risk of wind-driven rainwater and, where relevant, shall be in accordance with BS 6093 and Health Building Note 00-10 Part B: Walls and ceilings.

The System shall be secured to the supporting wall with mechanical fixings with or without supplementary adhesive, and where appropriate, through the reinforcement mesh, MW insulation and supplementary adhesive if needed.

Where required, properly constructed 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 galvanised steel, aluminium, PVC, powder-coated galvanised steel or stainless steel. Movement joints within the System shall be installed as follows:
- reflected through sheathing board movement joints;
- to allow for horizontal movement, vertical expansion joints shall be provided at 7.5 m intervals when the length of a wall exceeds 12 m and for existing buildings, shall be provided to align with existing expansion joints within the building structure;
- in accordance with the project-specific design;
- movement and expansion joints of the System when designed in accordance with this Agrément, meet the requirements of Health Building Note 00-10 Part B: Walls and ceilings.

For Systems designed for extended 60-year durability, the following components shall be made from stainless steel grade 1.4301 or similar/equivalent, in line with BS EN 10088-2:
- base profiles and render stop ends, including fixings. Additionally, any other profile component that remains exposed after the finish coat is applied;
- corner profiles (if exposed after application of the System finish);
- pins or screws for mechanical fixings.

To achieve a 60-year service life, plastic anchor sleeve materials such as polyamide (PA6 and PA6.6), polyethylene (PE), or polypropylene (PP) shall be used with stainless steel self-drilling screws of grade 1.4301 or similar/equivalent.

For Systems designed for extended 60-year durability, the sheathing board may be covered with a Class W1 breather membrane, in accordance with BS EN 13859-2. The breather membrane shall have adequate resistance to tearing and be regularly inspected during installation to ensure it is not damaged. If damage occurs to the membrane, it shall be repaired appropriately in accordance with the manufacturer's instructions.

Examples of relevant detailing for EWI systems applied on LGSF can be found in SCI Publication P343.

2.2.1.4 Project-specific design considerations

The project-specific design shall:

- be determined by the Specifier;
- consider the exposure zones where the System is installed;
- 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 for the existing building, and to confirm that the design works can be carried out for new buildings - see Section 2.4.1.

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

- 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;
- accommodation of structural movement.

LGSF supporting walls shall be vapour permeable to ensure that moisture can escape from inside the building. In cases where the external envelopes are not vapour permeable, mechanical moisture management system shall be considered.

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 into consideration:

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

The number of fixings required through the MW insulation, or through 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.

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 per m^2. 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.

Where required, 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 System components in a well-ventilated covered area to protect them from rain, frost and humidity;
- store System components away from 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;
- 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.

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

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

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.

The System shall be cleaned using soft washing techniques instead of high-pressure washing, which can damage the render. This involves applying the cleaning solution at low pressure and letting it sit for a few minutes to break down dirt, algae and graffiti, meeting the requirement of School Output Specification Technical Annex 2C: External Fabric and Health Building Note 00-10 Part B: Walls and ceilings.

Performance factors in relation to the Major Points of Assessment

2.2.7 Moisture control

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.

For Systems with extended 60-year durability, it is recommended to implement vapour barriers to prevent moisture build-up within the wall. Install the vapour barrier on the warm side of the insulation, typically on the interior side of the wall. This placement helps prevent warm, moist air from reaching the cooler exterior wall where condensation can occur.

Ensure adequate ventilation in the building to reduce the risk of interstitial and surface condensation. Mechanical ventilation with heat recovery (MVHR) should be considered.

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 the 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 which is appropriate to the local wind-driven rain index, in accordance with BS 8104, with due consideration to the design detailing, workmanship and materials to be used.

At the tops of walls, the System shall be protected by an adequate coping, overhang or other project-specific detail to shed water away from the walls and, where relevant, the detail shall be in accordance with the requirements of School Output Specification Technical Annex 2C: External Fabric or INCA's 'External wall insulation specification for weathering and thermal bridge control - Guide'.

The System has adequate resistance to artificial weathering and resistance to thermal shock, in accordance with EAD 040083-00-0404.

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;
- thermal expansion effects of the metal structural frames and the System to be supported are taken into consideration in the design and detailing.

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 action load 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 dynamic wind load (suction) resistance and suitable mechanical strength to ETAG 004. For the design load value, see Section 2.5.2.

The System can be designed to adequately resist wind-loads with suitable mechanical strength, in accordance with BS EN 16382. For the calculation of the wind-load resistance of the System, the design pull-through values given in Tables 2, 3 and 4 shall be used.

Table 2 - Design wind load values - R-KI-10 mechanical fixing with 60 mm diameter tubed insulation washers

Design wind load (kN/m²)	No. of fixings per MW board	No. of fixings per m²	Design fixing pull-through resistance (kN)^
3.00	4	6	0.50
3.50	5	7	
4.50	6	9	

^ derived from pull-through test through 110 mm thick MW insulation. A partial factor of 3 has been applied

Table 3 - Design wind load values - R-KI-10 mechanical fixing with 60 mm diameter tubed insulation washers + R-KWL-90 Spreader Washers

Design wind load (kN/m²)	No. of fixings per MW board	No. of fixings per m²	Design fixing pull-through resistance (kN)^
3.30	4	6	0.55
3.85	5	7	
5.00	6	9	

^ derived from pull-through test through 110 mm thick MW insulation. A partial factor of 3 has been applied

Table 4 - Design wind load values - J-SM70 stainless steel mechanical fixing with 70 mm plate head through the MW insulation and reinforcement mesh

Design wind load (kN/m²)	Fixing grid size (mm)^	No. of fixings per m²	Design pull-through resistance (kN)^^
0.54	1000 x 1000	1	0.54
1.51	600 x 600	3	
2.68	450 x 450	5	

^ other grid sizes can be used in order to satisfy the design wind load requirements
^^ derived from static foam block test through reinforcement mesh and 110 mm thick MW insulation. A partial factor of 2.5 has been applied

The number of fixings referenced in Tables 2, 3 and 4 can be reduced when using thicker MW insulation boards. To ensure higher pull-through test values for calculation of the design pull-through resistance, the qualified structural engineer shall insure appropriate factors been applied.

The qualified structural engineer shall ensure that the maximum design wind load achieved by the System, as per Tables 2, 3 and 4, shall be equal or less than the design pull-out resistance strength of the mechanical fixings from the supporting wall obtained from site tests. Contribution of the adhesive is not considered when calculating the wind-load resistance of the System.

For multistorey buildings with excess of 30-year durability and all buildings with extended 60-year durability, the System shall always be fixed through the reinforcement mesh and MW insulation to the supporting wall, due to high wind-load pressure coefficients.

Positive wind load is transferred to the supporting wall directly via bearing and compression of the MW insulation, and System finishes. Negative wind load is resisted by the bond between the MW insulation and the System finish reinforced with reinforcement mesh. The MW insulation is retained by reinforcement mesh and mechanical fixings, which are fixed through reinforcement mesh and insulation or though the insulation only to the supporting wall.

Impact resistance
When tested for hard-body impact resistance, in accordance with EAD 040083-00-0404, all the System finishes are categorised as Use Category I.

The Use Categories in accordance with EAD 040083-00-0404 are as detailed below:
- 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.

The System achieves Use Category I and satisfies the requirement of School Output Specification Technical Annex 2C: External Fabric and Health Building Note 00-10 Part B: Walls and ceilings.

2.2.9 Fire performance
The System is classified as European Classification A2-s1, d0, in accordance with BS EN 13501-1.

The following components are classified as European Classification A1, in accordance with the relevant national Building Regulations, classification without need for further testing (CWFT):
- LGSF supporting frame;
- MW insulation.

Sheathing boards shall be classified as European Classification A1 or A2-s1, d0, in accordance with BS EN 13501-1, when the height of the project-specific design is over:
- 18 m for all buildings in Wales and Northern Ireland, and non-residential buildings in England;
- 11 m for residential buildings in England;
- 11 m for all buildings in Scotland;

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

Construction materials, components and associated attachments used in the overall wall construction shall satisfy the requirements of Regulations 7(2) and 7(3) for England and Wales, Regulations 8(3) and 8(4) for Scotland and Regulations 23(2) and 23(3) for Northern Ireland. Designers shall refer to the national Building Regulations for further details.

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.

In addition to the MW insulation fasteners normally specified, the System shall include a minimum of one stainless steel fixing per m^2 of insulation or one stainless steel fixing per MW insulation board, whichever is lesser, for application to second storey walls and above, fixed through the reinforcement mesh and the MW insulation as per the guidance given in BRE Report 135.

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.

The System as an external envelope meets the requirement of:
- School Output Specification Technical Annex 2C: External Fabric;
- Health Building Note 00-10 Part B: Walls and ceilings;
- Health Technical Memorandum 05-02: Firecode;
- Zurich Municipal's 'School and academy design'.

2.2.10 Thermal performance

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 System is designed to minimise moisture penetration to the insulation layer.

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 further improvement of the thermal performance of the building, the designer should consider additional insulation thickness or service measures.

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 thermal conductivity (λ_D) of the insulation - see 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 INCA's 'External wall insulation specification for weathering and thermal bridge control - Guide'.

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, PAS 2030 and PAS 2035.

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.

The service life durability can be extended to 60 years by fixing the System through the mesh and insulation, using appropriate fixings and following a bespoke extended repair and maintenance protocol as detailed in the inspection, repair and maintenance manual.

Once installed, the System is not susceptible to damage from environmental conditions normally encountered in the UK. The System has a maintenance regime in accordance with Section 2.2.6.

The service life durability of the System is in excess of 30 years and can be extended to 60 years, satisfying the requirement of School Output Specification Technical Annex 2C: External Fabric.

2.2.12 UKCA, UKNI and CE marking

There is no relevant Product standard for the System.

2.3 EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Typical build up fixed through insulation

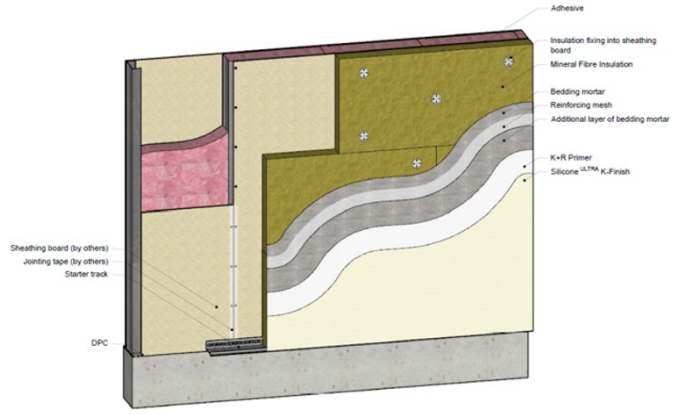


Diagram 2 - Typical build up fixed through mesh and insulation

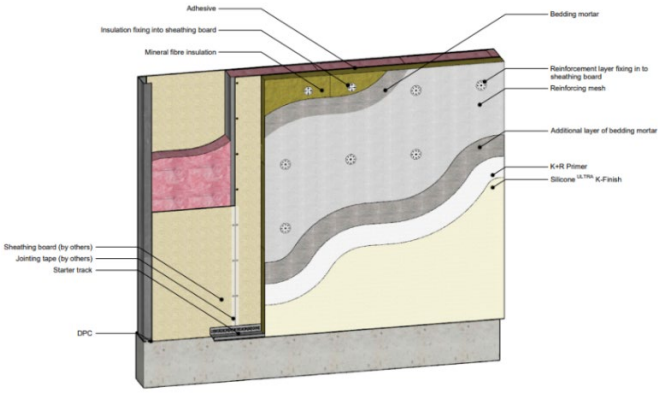
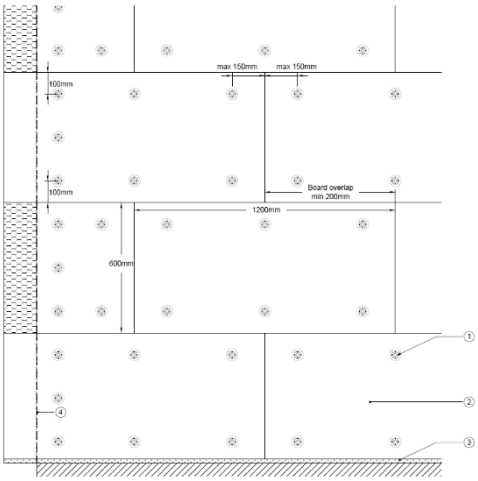


Diagram 3 - Typical fixing pattern



1. mechanical fixings
2. MW insulation with adhesive
3. starter track
4. dashed line represents line of external building corner

Diagram 4 - Typical overhanging eaves detail

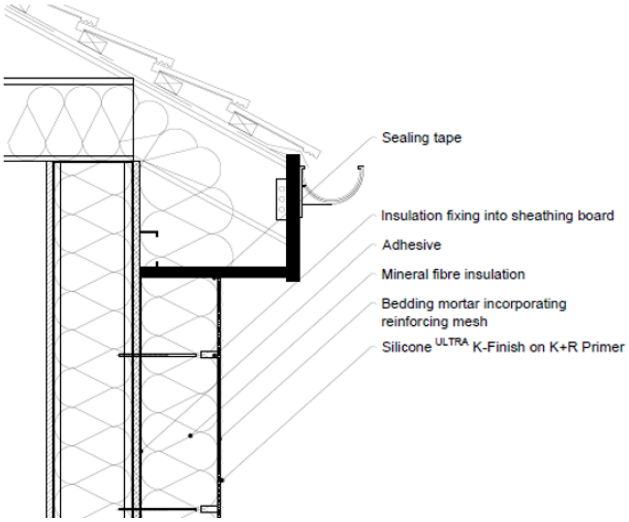
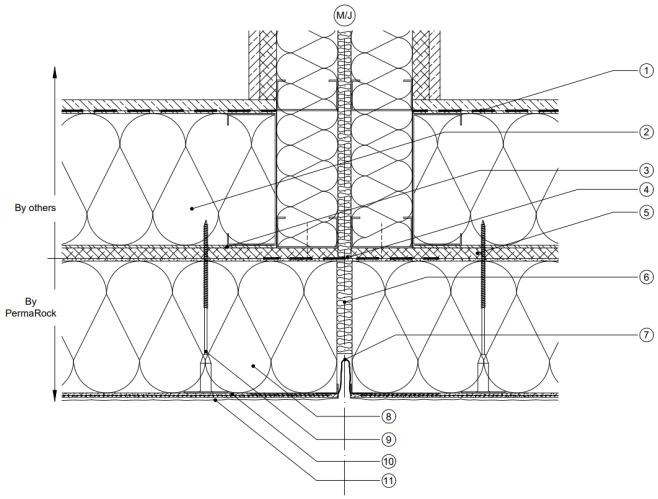


Diagram 5 - Typical vertical movement joint detail



Outside the scope of the Agrément:

1. VCL
2. MW insulation
3. LGSF substrate
4. EPDM
5. sheathing board
6. insulation packer

System components:

7. Permarock Movement Joint Bead white flexible gasket
8. MW insulation on adhesive
9. insulation fixing
10. basecoat incorporating mesh
11. Permarock Decorative Finish

Diagram 6 - Typical standard base detail

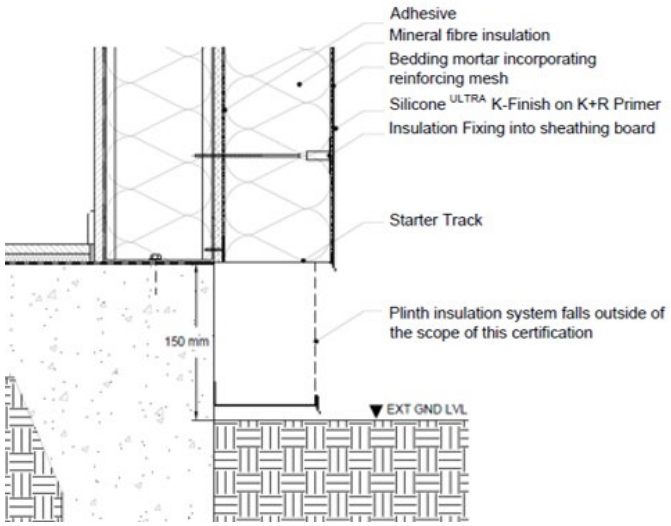


Diagram 7 - Typical window head detail

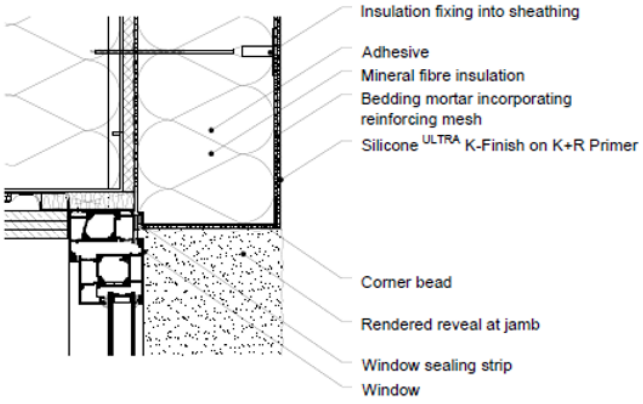


Diagram 8 - Typical cill detail

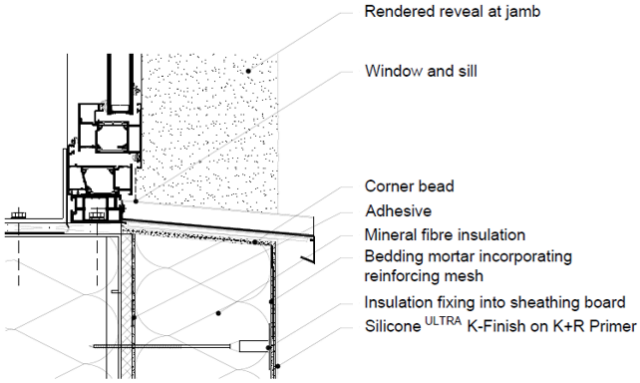


Diagram 9 - Typical window jamb detail

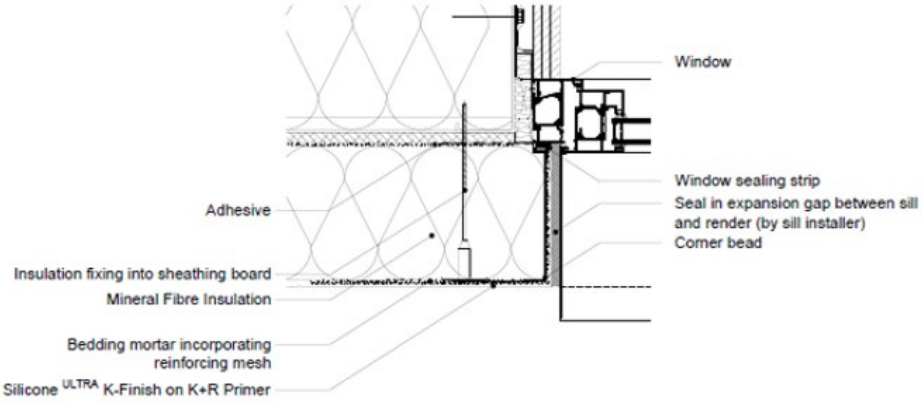
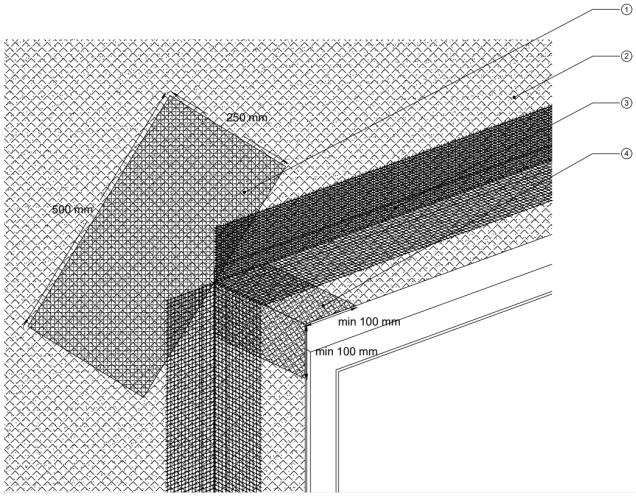
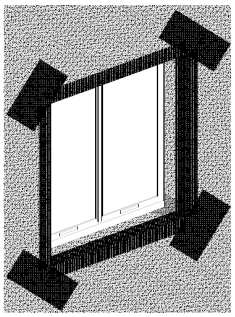


Diagram 10 - Typical opening stress patch detail





1. reinforcement mesh stress patches (500 mm by 250 mm) at all corners of structural openings
2. bedding mortar incorporating reinforcement mesh
3. corner beads with reinforcement mesh
4. reinforcement mesh at internal corner of reveal

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 and BS EN 13914-1.

2.4.1 Project-specific installation considerations

A pre-installation survey is required to allow determination of the project-specific design for the existing building, and to confirm that the design works can be carried out for new buildings.

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 any fittings requiring removal or alteration to facilitate installation of the System;
  - areas where silicone/flexible sealants shall be used.

This 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. The characteristic resistance of fixings shall be subject to the partial factor, as advised by the System designer and the Agrément holder. The design pull-out resistance strengths of the supporting wall and MW insulation anchor fixings shall be checked by a competent person and evidenced 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 installing 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);
- 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. Cables shall be adequately rated in accordance with BS 7671;
- where required, extend beyond the surface and securely refix external soil stacks, wastewater pipes, overflows, ducts and vent pipes;
- roofs/copings shall have sufficient overhang at eaves, verges and parapets.

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 base of the wall, above DPC level, or 150 mm above ground level with fixings at maximum 300 mm centres;
- apply adhesive to the MW insulation boards with a notched trowel;
- position the MW insulation boards onto the starter track and bond to the supporting wall; ensuring it is tightly butt-jointed and that a staggered bonding pattern is adhered to;
- continue with additional MW insulation boards, ensuring no edge or piece of insulation is smaller than 200 mm; L-shaped MW insulation boards shall be placed on corners of windows and doors;
- mechanically fix the MW insulation boards into the supporting wall according to the fixing pattern;

- fit ancillary materials or accessories in accordance with the project-specific design or specifications;
- apply a layer of basecoat to the entire surface of the MW insulation boards and bed reinforcing mesh into the wet basecoat, ensuring joints are overlapped by a minimum of 100 mm;
- apply 250 mm by 500 mm reinforcing mesh patches at the corners of wall/door openings;
- for 60-year durability or multistorey buildings (from the second storey and above), apply stainless steel mechanical fixings through the reinforcement mesh and MW insulation boards to the supporting wall, in accordance with the fixing pattern, and apply 150 mm by 150 mm mesh patches over fixing heads and fully encapsulate the mesh patches into the basecoat;
- for silicone finish, a second layer of basecoat is required prior to application of the finish;
- for silicone finish, primer is applied onto the basecoat prior to application of the finish;
- apply System finishes as follows:
  - for silicone finish, apply silicone finish and rub down the material to the required particle grain size;
  - for brick-effect render, apply a 6 to 8 mm thick Permarock Brick-effect Render Base Layer. Once the base layer has started to stiffen, apply a 3 to 5 mm thick layer of Permarock Brick-effect Render Face Layer onto the base layer; once it has stiffened, create the required Brick-effect pattern accordingly.

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 that they are clear and unobstructed;
- where a proprietary window sealing strip has not been employed, apply mastic 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	Result
Hygrothermal conditioning	EAD 040083-00-0404	silicone finish	No defects
		brick-effect render	
Water vapour diffusion resistance, S_d	BS EN ISO 7783	silicone finish	0.58 m
		brick-effect render	0.37 m

2.5.2 Strength

Test	Standard	System component/ finish	Result
Dynamic wind uplift^	ETAG 004	Permarock bedding mortar	2.31 kN/m^2
Hard-body impact resistance	EAD 040083-00-0404	silicone finish	Use Category I
		brick-effect render	
Test	**Standard**	**Component**	**Result**
Compressive stress at 10 % deformation	BS EN 13162	DD MW insulation	10 kPa
		HD MW insulation	
Tensile strength		DD MW insulation	TR 10
		HD MW insulation	TR 15

^ 5 no. of R-TFIX-8S fixings per 100 mm DD MW insulation board and 1no. of JIF stainless steel fixing (50 mm diameter head) per m^2. Design load with partial factor of 1.5

2.5.3 Fire performance

Test	Standard	System finish	Result
Reaction to fire	BS EN 13501-1	silicone finish	A2-s1, d0
		brick-effect render	

2.5.4 Thermal performance

Test	Standard	Component	Result
Thermal conductivity (λ_D)	BS EN 12667	DD MW insulation	0.036 W/mK
		HD MW insulation	0.039 W/mK

3 CDM, NATIONAL BUILDING REGULATIONS AND THIRD-PARTY ACCEPTANCE

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 and wind loads to the supporting wall
- 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
- 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 - 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 components which are part of the external wall or specified attachment, achieve European classification of A2-s1, d0 or better
- Regulation 23 Requirements relating to thermal elements - the System can contribute to walls complying with the requirements of L1(a)(i)
- Regulation 26 CO_2 emission rates for new buildings - the System can contribute to satisfying this Requirement
- Regulation 26A Fabric energy efficiency rates for new dwellings - the System can contribute to satisfying this Requirement
- Regulation 26C Target primary energy rates for new buildings - 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 and wind loads to the supporting wall
- 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,
- 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 - 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 components which are part of the external wall or specified attachment, achieve European classification of A2-s1, d0 or better
- Regulation 23 Requirements relating to thermal elements - the System can contribute to walls complying with the requirements of L1(a)(i)
- Regulation 26 CO_2 emission rates for new buildings - the System can contribute to satisfying this Requirement
- Regulation 26A Primary energy 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
- Regulation 26C Energy efficiency rating - 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

3.2.3.2 Regulation 8(3) Durability, workmanship and fitness of materials

- The System components which are part of the external wall or specified attachment, achieve European classification of A2-s1, d0 or better

3.2.3.3 Regulation 9 Building standards - Construction

- 1.1 Structure - the System can sustain and transmit combined dead and wind loads to the supporting wall
- 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
- 6.2 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

3.2.3.4 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(1)(a)(i)(ii)(iii)(b) Fitness of materials and workmanship - the System is manufactured from materials which are suitably safe and acceptable as described in this Agrément
- 23(2) Fitness of materials and workmanship - the System components which are part of the external wall or specified attachment, achieve European classification of A2-s1, d0 or better
- 28(b) Resistance to moisture and weather - the System can be constructed to prevent the passage of moisture from the weather
- 29 Condensation - the System can be designed and constructed to prevent interstitial condensation
- 30 Stability - the System can sustain and transmit combined dead and wind loads to the supporting wall
- 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 CO_2 emission rate - a wall incorporating the System shall be designed and constructed as not to exceed its target CO2 emission rate
- 43 Renovation of thermal elements - the renovation work carried out to ensure a wall complies with requirement 39(a)(i)

3.3 THIRD-PARTY ACCEPTANCE

In the opinion of Kiwa Ltd. if installed, used, and maintained in accordance with this Agrément, this System can satisfy the appropriate structural, fire, moisture, thermal, acoustic and durability requirements of a Structural Warranty provider. Please contact the relevant Structural Warranty provider to ascertain their project specific design requirements and to confirm their acceptance on a case-by-case basis.

4 SOURCES

- 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+A1:2024 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 998-1:2016 Specification for mortar for masonry. Rendering and plastering mortar
- 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 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 10088-2:2024 Stainless steels. Technical delivery conditions for sheet/plate and strip of corrosion resistant steels for general purposes
- BS EN 12467:2012+A2:2018 Fibre-cement flat sheets. Product specification and test methods
- BS EN 12667:2001 Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance
- BS EN 13162:2012+A1:2015 Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification
- BS EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests
- BS EN 13859-2:2014 Flexible sheets for waterproofing. Definitions and characteristics of underlays. Underlays for walls
- 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 7671:2018/A3:2024 Requirements for Electrical Installations. IET Wiring Regulations
- BS 8000-0:2014+A1:2024 Workmanship on construction sites. Introduction and general principles
- BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain
- 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:2012 Procedure for site testing construction fixings
- Department of Education:2023 School Output Specification - Technical Annex 2C: External fabric
- Department of Health:2013 Health Building Note 00-10 Part B: Walls and ceilings
- Department of Health:2015 Health Technical Memorandum 05-02: Firecode - Guidance in support of functional provisions (Fire safety in the design of healthcare premises)
- EAD 040083-00-0404:2019 External thermal insulation composite systems (ETICS) with rendering
- 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
- INCA:2019 External wall insulation specification for weathering and thermal bridge control - Guide
- PAS 2030:2023 Installation of energy efficiency measures in existing dwellings. Specification
- PAS 2035:2023 Retrofitting dwellings for improved energy efficiency. Specification and guidance
- SCI Publication P343:2006 Insulated render systems used with light steel framing
- Zurich Municipal:2014 School and academy design. A guide to the design and protection of school and academy buildings

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	February 2025

6 CONDITIONS OF USE

This Agrément may only be reproduced and distributed in its entirety.

Where a National Annex exists in respect of a BS EN (or other) standard, its use is deemed mandatory wherever the original standard is referenced.

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Whilst all due diligence has been used, no liability or warranty is extended by Kiwa Ltd.

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