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BDA Agrément®
Fassatherm Mechanical Classic System with Brick Slips External Thermal Insulation Composite System (ETICS)

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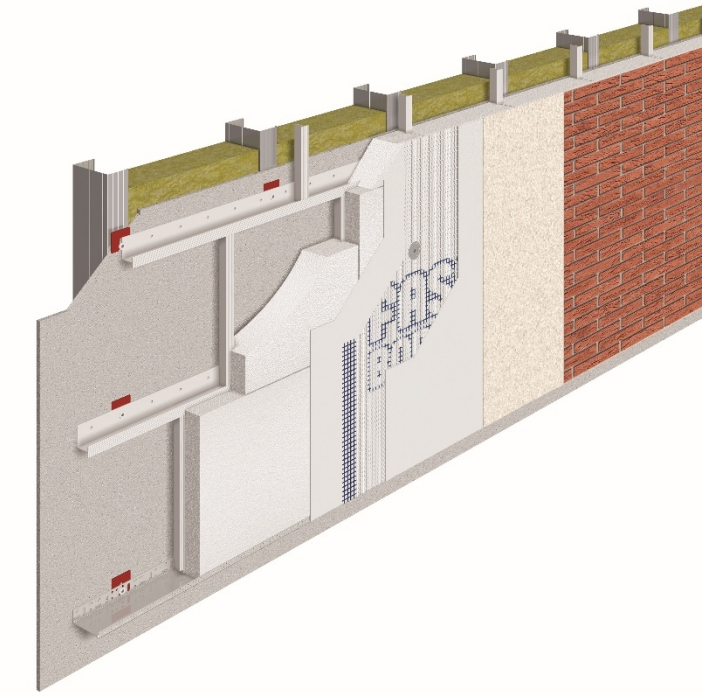
SCOPE OF AGRÉMENT

This Agrément® (hereinafter 'Agrément') relates to Fassatherm Mechanical Classic System with Brick Slips (hereinafter the 'System'). The System is a mechanically fixed, expanded polystyrene (hereinafter 'EPS') insulated, external thermal insulation composite system (ETICS). The System is suitable for use on existing and new dwellings and buildings other than dwellings. It shall be installed above damp-proof course (hereinafter 'DPC') level on supporting walls consisting of external sheathed light-gauge steel frame (hereinafter 'LGSF') with exterior-grade cement-bonded particle board (hereinafter 'CPB'), marine-grade plywood or exterior-grade oriented strand board (hereinafter 'OSB') with suitable strength and stiffness.

DESCRIPTION

The System consists of EPS insulation supported by a horizontal and vertical rail system which is mechanically fixed to a supporting wall. A layer of basecoat incorporating reinforcement mesh is applied to the external face of the EPS insulation before completing the System with adhesively bonded brick slips pointed with mortar.

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.

Chris Vurley, CEng
Operations Manager, Building Products

Mark Crowther, M.A. (Oxon)
Kiwa Ltd. Technical Director

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 - the System (see Section 2.2.9):

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

Strength - the System has adequate strength and is designed to adequately resist impact damage and wind loads normally encountered in the UK (see Section 2.2.10).

Fire performance - the System is classified as European Classification B-s2, d0 in accordance with BS EN 13501-1 (see Section 2.2.11).

Thermal performance - the System improves the thermal performance of external walls and can contribute to satisfying the requirements of the national Building Regulations (see Section 2.2.12).

Durability - the service life durability of the System will be dependent upon the environment (operating conditions) in which the System will be used (see Section 2.2.13).

UKCA and CE marking - the product manufacturers have responsibility for conformity marking, in accordance with all relevant British and European Product Standards (see Section 2.2.14).

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1.1 - Conditions of use
1.2 - Production Control and Quality Management System
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2.4 - Installation
2.5 - Independently assessed System characteristics
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3.1 - The Construction (Design and Management) Regulations 2015 and The Construction (Design and Management) Regulations (Northern Ireland) 2016
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3.3 - Third-Party Acceptance
Section 4 - Sources
Section 5 - Amendment history
Section 6 - Conditions of use

1 GENERAL CONSIDERATIONS

1.1 CONDITIONS OF USE

1.1.1 Design considerations
See Section 2.2.

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 determined that the Agrément holder fulfils all its 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 its 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 following components are integral to the use of the System:

Component		Description	Dimensions
base track	Wemico Protektor 90605 base track	profiled aluminium base track	53 mm wide with 20 mm return, supplied in 2.5 m lengths
	mechanical fixings for base track	EJOT LS 5.5 carbon steel self-drilling screws	32 to 70 mm long by 5.5 mm diameter
EPS insulation	EPS 70 insulation board	white EPS with nominal density of 18 kg/m^3, in accordance with BS EN 13163, λ_D 0.038 W/mK	500 mm by 500 mm, 60 - 250 mm thick
horizontal rails	Wemico Protektor 9116 horizontal rail	aluminium connection and support profile incorporating 8 mm diameter perforation	50 mm by 27.7 mm by 24 mm, supplied in 2 m lengths
	Wemico Protektor 3760 horizontal rail	PVC connection and support profile incorporating 8 mm diameter perforation	50 mm by 27.7 mm by 24 mm, supplied in 2.5 m lengths
	mechanical fixings for horizontal rail	EJOT LS 5.5 carbon steel self-drilling screws	32 to 70 mm long by 5.5 mm diameter
vertical T-connector	Wemico Protektor 9115 vertical spline	mill-finished aluminium connection and support profile incorporating 8 mm diameter perforation	50 mm by 27.7 mm by 24 mm, supplied in 0.470 m lengths
	Wemico Protektor 3761 vertical spline	PVC connection and support profile incorporating 8 mm diameter perforation	50 mm by 27.7 mm by 24 mm, supplied in 0.495 m lengths
basecoat	Fassa Bortolo A96	cement-based basecoat comprising synthetic fibres and limestone with additives, in accordance with BS EN 998-1	
reinforcement mesh	Fassa Bortolo Fassanet 160	alkali-resistant glass fibre mesh with a nominal weight of 160 g/m^2	4.15 mm by 3.8 mm grid size, supplied in 50 m by 1 m rolls
adhesive	Fassa Brickfix	one-component pre-mixed powder adhesive (1,300 kg/m^3) comprising white Portland cement, graded sand, synthetic resins and additives for bonding composite brick slips	
brick slip panels	Monolith BrickPlus Pro	mortar-based lightweight limestone or fibreglass-reinforced concrete (GRC) brick slips in accordance with BS EN 771-1, factory embedded onto fibreglass reinforcement mesh	
pointing mortar	MV40	grey, dry pre-mixed mortar (1,400 kg/m^3) class M10 in accordance with BS EN 998-2, comprising hydrated lime, Portland cement, graded sand, water-repellent material and additives	
	MB60	white, dry pre-mixed mortar (1,400 kg/m^3) class M10 in accordance with BS EN 998-2, comprising natural lime, hydraulic binder, graded sand and water-repellent material	

^ thickness is regulated by the grain size

2.1.2 Ancillary items used with the system

The following ancillary items detailed in this Section are used in conjunction with the System:

Description		Dimensions
shims	EJOT AS30 polypropylene adjustment packer	50 by 50 mm by 30 mm thick
mechanical fixings for EPS insulation	EJOT JT3 ST-2-6.0 grade 304 stainless steel screws	60 to 200 mm long by 6 mm diameter
	EJOT DMT 85/7E grade 304 stainless steel insulation washer	85 mm diameter

2.1.3 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;
- sheathing boards;
- cavity barrier - wool lamella panels;
- DPC;
- profiles - a range of standard profiles for end stop, edge, corner mesh and expansion joints, base profile, provided to the specifier's requirements;
- water deflection beads/battens/channels;
- under-and-over cills, cill extenders;
- roof verge extenders;
- insect mesh;
- self-expanding and sealing tape;
- silicone sealant.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 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.

2.2.2 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 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 any 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, can safely transfer loads to the building and can accommodate all anticipated thermal movements without damage. Deflection shall be limited to prevent damage to the System.

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

Supporting walls shall be designed in accordance with the relevant Standards to limit mid-span deflections - see Section 2.2.10.

Supporting walls incorporating the System shall be detailed to reduce the risk of damage due to movement in the LGSF supporting wall, taking into consideration differential movement in dissimilar materials.

The System can be installed on supporting walls constructed from LGSF where sheathing consists of CPB, marine-grade plywood or OSB:

- CPB shall be manufactured in accordance with BS EN 12467 or BS EN 634-2, with a minimum thickness of 10 mm;
- marine-grade plywood shall be manufactured in accordance with BS EN 313-1, with a minimum thickness of 12 mm;
- OSB shall be manufactured in accordance with BS EN 300, with a minimum thickness of 11 mm.

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 drained and ventilated cavity behind the EPS insulation shall not be allowed to become blocked. Openings shall be kept clean and free of obstructions. Appropriate netting at ventilation openings shall be arranged to prevent the ingress of rain, snow, birds and small animals, and the risk of blockage by other building operations.

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 PVC, powder-coated galvanised steel or stainless steel. Expansion joints shall be provided at 7.5 m intervals when the length of a wall exceeds 12 m.

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

2.2.4 Project-specific design considerations

The project-specific design shall:

- be determined by the Specifier;
- 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 2.2.13).

A pre-installation survey is required to allow determination of the project-specific design (see Section 2.4.3).

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

- structural adequacy of the 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;
- effect of wind actions on the System.

The System incorporates horizontal rails which are mechanically secured to the supporting wall at maximum 300 mm centres. Shims are used at fixing points to create a 15 to 20 mm cavity for drainage.

To meet fire safety requirements, additional stainless steel fixings with washers shall be fixed through the reinforcement mesh, a minimum of one fixing per m^2 or one fixing per EPS insulation component, whichever is the lesser.

Account shall be taken of Government Accredited Construction Details for Part L - 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 assist the Agrément holder in determining the type, size and minimum number of fixings. When using pull-out data for fixings, the material safety factor γ_m of 2.5 shall be considered.

2.2.5 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.

2.2.6 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.

2.2.7 Delivery, storage and site handling

The System components are delivered in suitable packaging bearing the System name, production identification date or batch number, the Agrément holder's name 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 period of time;
- store in a well-ventilated covered area to protect System components from rain, frost and humidity;
- store 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.

2.2.8 Maintenance and repair

Once installed, the System:

- is not susceptible to damage from environmental conditions normally encountered in the UK;
- 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 damage in brick slips; damaged brick slips shall be removed and replaced with new ones;
- 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.

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

Reasonable precautions shall be taken to ensure brick slips are not damaged during or after installation. Damaged brick slips shall be replaced immediately in accordance with Agrément holder's instructions.

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 material shall be replaced to ensure that water ingress does not occur.

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.

Performance factors in relation to the Major Points of Assessment

2.2.9 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 drained and ventilated cavity between the back of the EPS insulation and supporting wall shall be a minimum of 15 mm deep. Any moisture passing through the EPS insulation joints and collecting in the cavity will be removed by drainage and ventilation.

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, 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 to thermal shock, in accordance with EAD 090062-00-0404 and EAD 040914-00-0404.

2.2.10 Strength

Structural loading

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 suitable qualified engineer. The project-specific design shall ensure that:

- the System attachment to the supporting wall has adequate fixing pull-out capacity;
- thermal expansion effects of both metal rails and metal structural frame 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 annual 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 rail support spacing. A partial factor of 1.5 shall be used to determine the design wind load to be resisted by the System.

The supporting wall shall be designed in accordance with the relevant Standards to limit mid-span deflections to L/200 (midspan) and L/150 (cantilever).

The System has adequate dynamic wind uplift load (suction) resistance and suitable mechanical strength in accordance with EAD 090062-00-0404. For the design load value, see Section 2.5.2.

Positive wind load is transferred to the supporting wall directly via bearing and compression of brick slips, EPS insulation to the horizontal and vertical rail system, and through the sheathing boards. Negative wind load is resisted by the brick slips bonded to the EPS insulation which is retained by the horizontal and vertical rail system mechanically fixed to the supporting wall.

Impact resistance

When tested for hard-body impact resistance in accordance with EAD 090062-00-0404, the System is categorised as Use Category I.

The Use Categories in accordance with EAD 090062-00-0404 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 of kicked objects, but in public locations where the height of the System will limit the size if 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.

2.2.11 Fire performance

The System is classified as European Classification B-s2, d0, in accordance with BS EN 13501-1.

LGSF structures are classified as non-combustible, in accordance with the relevant Building Regulations.

The EPS insulation component is not classified as non-combustible or of limited combustibility in accordance with the relevant national Building Regulations.

In England, Wales and Northern Ireland, the System shall not be used on buildings with a storey 18 m or more above ground level and is not subject to any restrictions on proximity to boundaries. Refer to the national Building Regulations for types of buildings and any exclusions that may apply.

In Scotland, the System is not classified as 'non-combustible' and is restricted to buildings with no floor more than 11 m above the ground and not less than 1 m from a boundary. In such cases, the System may be excluded from the unprotected area calculation regardless of openings. Refer to the national Building Regulations for types of buildings and any exclusions that may apply.

To meet fire requirements, additional stainless steel fixings with washers shall be fixed through the reinforcement mesh, a minimum of one fixing per m^2 or one fixing per EPS insulation component, whichever is the lesser.

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

Cavity fire barriers shall be installed in line with compartment walls and floors, as advised in BRE Report 135 and as required under the national Building Regulations. Materials used for cavity barriers and firestops shall be capable of producing adequate resistance to fire and smoke. Intumescent strips shall be applied behind each fire barrier.

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.

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.

Proximity of flues and appliances
The installed System shall be adequately separated from any chimney, heat producing appliance or incinerator flue pipe passing through a wall. Recommended means of separation are detailed in the Approved Documents supporting the national Building Regulations.

2.2.12 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 EPS 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, but the thermal value will recover when the EPS insulation dries out. The System is designed to minimise moisture penetration to the EPS 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 EPS insulation thickness, degree of ventilation to the drainage cavity, fixing method, type of fixing, and insulating value of the supporting wall and its internal finish.

For the purpose 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 EPS 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 flow 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 497 and PAS 2030.

2.2.13 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.

2.2.14 UKCA and CE marking

There is no relevant Product standard for the System.

2.3 EXAMPLES OF TYPICAL DETAILS

Diagram 1 - typical System installation

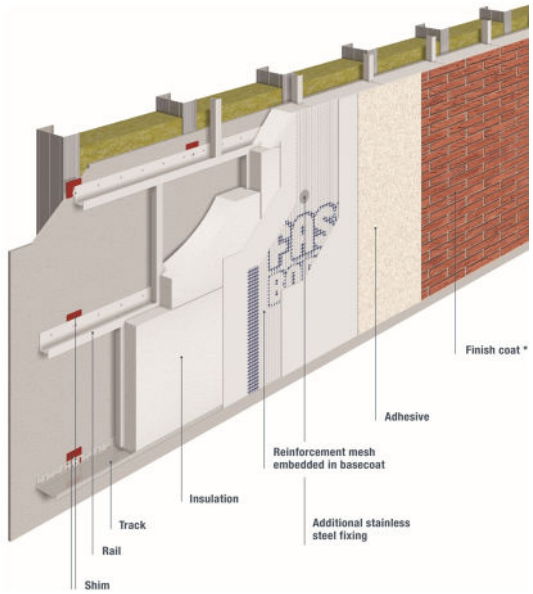
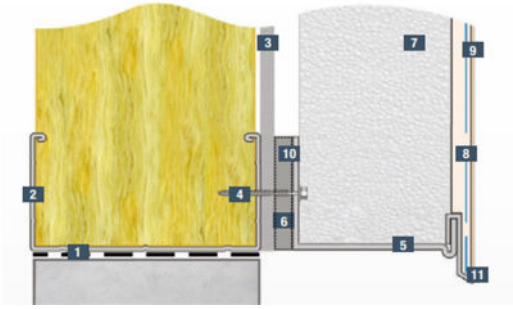
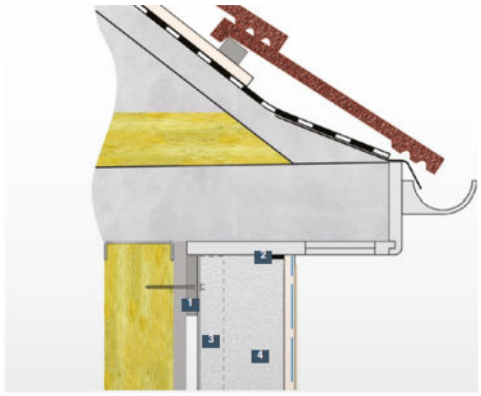


Diagram 2 - typical base track detail



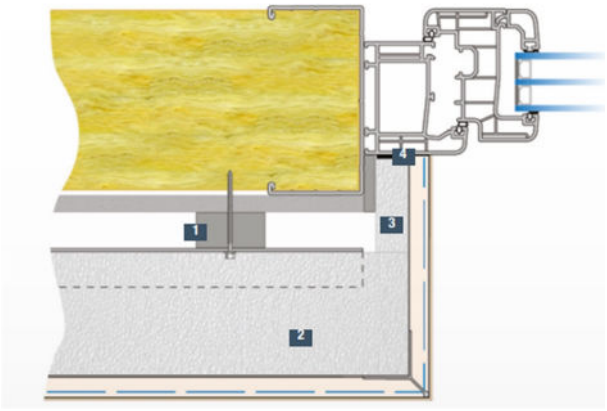
1 - DPC
2 - LGSF
3 - sheathing board
4 - fixing to suit LGSF
5 - aluminium base track
6 - shim
7 - EPS insulation
8 - reinforced base coat
9 - top coat
10 - insect mesh
11 - base track clip

Diagram 3 - typical roof eaves detail



1 - shim
2 - self-expanding sealing tape
3 - head rail
4 - EPS insulation

Diagram 4 - typical window detail



1 - shim
2 - EPS insulation
3 - EPS insulation
4 - self-expanding sealing tape

Diagram 5 - typical window cill detail

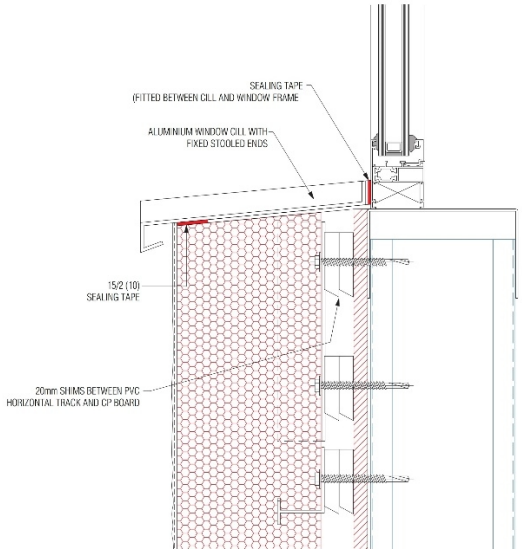
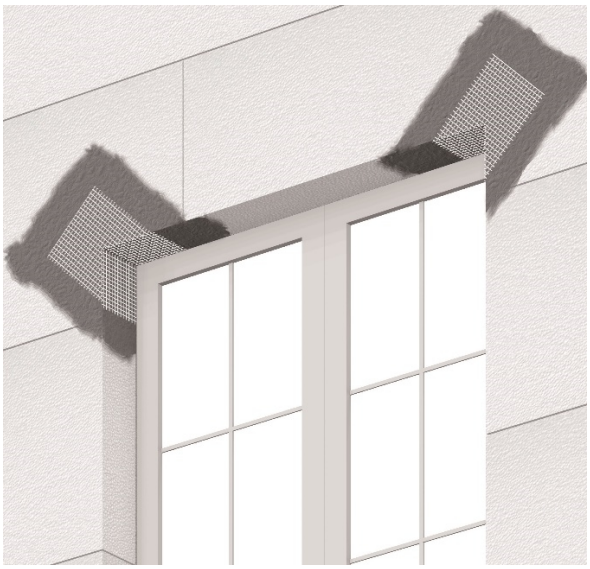


Diagram 6 - typical stress patch detail



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 Installer competence level

See Section 2.2.6.

2.4.2 Delivery, storage and site handling

See Section 2.2.7.

2.4.3 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 base track, horizontal rails, water deflection beads/battens/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.

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'. Pull-out test loads shall be 2.5 x design load. The pull-out resistance strengths of the supporting wall, mechanical fixings, EPS insulation and horizontal and vertical rail system 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.

2.4.4 Preparation

The following considerations apply before starting the work:

- 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, pipes and vents extended beyond the surface, etc.);
- 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;
- the roof shall be in place and window and door openings shall be sealed;
- 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;
- where necessary, protection channel conduits shall be installed so any PVC insulated cables avoid contact with the EPS insulation;
- any cables, ducts, wiring and pipes e.g. electrical installation wiring or air conditioning that are to be hidden behind the insulation, shall be marked on the face of the EPS insulation, to minimise the risk of damage during drilling of mounting holes for mechanical fixings;
- external power cables covered over by cover plates shall be well labelled with warning signs;
- extend beyond the surface and securely re-fix external soil stacks, wastewater pipes, overflows, ducts and vent pipes, where required;
- A 10 mm horizontal and vertical joint between the brick-slips shall be consistently attained. A 10 mm 'T' spacer can be used to help maintain the required joint spacing until the adhesive is set.

2.4.5 Outline installation procedure

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

The outline procedure is as follows:

- secure the base track horizontally to the wall above DPC level or 150 mm above ground level, with mechanical fixings at 300 mm centres horizontally. Use shims at fixing points to create a 15 to 50 mm drainage cavity;
- position the EPS insulation on the base track and place vertical T-connectors between the EPS insulation;
- once the first row of EPS insulation is in place, position horizonal rails into the grooves at the top edge of the EPS insulation and fix to the supporting wall with mechanical fixings at 300 mm centres and shims placed at fixing points;
- continue with additional EPS insulation, ensuring tightly fitting butt-joints and that a staggered bonding pattern is adhered to. The EPS insulation shall overlap at the corners of a building;
- fix fire barriers of 200 mm width (minimum) in the form of a continuous line of wool lamella panels between the floor levels of a building;
- apply a layer of basecoat with fully embedded reinforcement mesh over the external surface of the EPS insulation to the required thickness (approximately 6 mm);
- to meet fire safety requirements, fix additional stainless steel fixings with washers through the reinforcement mesh, a minimum of one fixing per m^2 or one fixing per EPS insulation component, whichever is the lesser;
- once the basecoat has cured (2 - 3 weeks in normal weather conditions), apply a layer of adhesive over the surface of the wall and bed the brick slip panels;
- apply pointing mortar between the brick slip joints.

2.4.6 Finishing

The following finishing is required on completion of the installation:

- all trunked air vents and flues shall be checked (by an appropriate test if necessary) to verify they are clear and unobstructed;
- apply appropriate 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 no damage has occurred to the building. These checks 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 equivalent air thickness, S_d	BS EN ISO 7783	brick slips	0.066 m
Water vapour resistance	BS EN ISO 12572		7.26 MNs/g
Water vapour diffusion resistance factor, μ	BS EN 13163	EPS insulation	20 to 40
Hygrothermal and freeze-thaw conditioning	EAD 090062-00-0404, EAD 040914-00-0404	System	No defects

2.5.2 Strength

Test	Standard	System finish or component	Result
Dynamic wind uplift^	EAD 090062-00-0404	System	2.4 kN/m^2
Hard-body impact			Use Category I
Declared compressive strength at 10 % deformation	BS EN 13163	EPS insulation	CS(10)70
Declared tensile strength	BS EN 1607		TR100

^ design wind load value with a partial factor of 1.5. Specimen consisted of LGSF with studs at 600 mm centres, sheathing board fixed to LGSF studs at 600 mm horizontal centres and 300 mm vertical centres, EPS insulation retained by horizontal rails fixed to the sheathing board at 300 mm centres, basecoat incorporating reinforcement mesh, stainless steel EJOT JT3-ST-2-6.0 screws with EJOT DMT85/7E washers through the mesh and EPS insulation component comprising one fixing per m^2, adhesive and brick slip panels with pointing mortar

2.5.3 Fire performance

Test	Standard	System finish or component	Result
Reaction to fire	BS EN 13501-1	System	B-s2, d0

2.5.4 Thermal performance

Test	Standard	System finish or component	Result
Thermal conductivity (λ_D)	BS EN 13163	EPS insulation	0.038 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(1)(2) 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 23(1) 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 - the System can contribute to satisfying this Requirement

3.2.2 Wales

The Building Regulations 2010 and subsequent amendments

- A1(1)(2) 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 23(1) 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 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 Regulations 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(a)(b) 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 a building
- 3.10 Precipitation - the System can resist precipitation penetrating to the inner face of a 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(a)(i)(iii)(b) 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(a)(b) 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 CO_2 emission rate - a wall incorporating the System shall be designed and constructed as not to exceed its target CO_2 emission rate
- 43 Renovation of thermal elements - the 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.

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 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 ISO 12572:2016 Hygrothermal performance of building materials and products. Determination of water vapour transmission properties. Cup method
- BS EN 300:2006 Oriented strand boards (OSB). Definitions, classification and specifications
- BS EN 313-1:1996 Plywood. Classification and terminology - Plywood. Classification and terminology. Classification
- BS EN 634-2:2007 Cement-bonded particleboards. Specifications - Requirements for OPC bonded particleboards for use in dry, humid and external conditions
- BS EN 771-1:2011+A1:2015 Specification for masonry units - Clay masonry units
- BS EN 998-1:2016 Specification for mortar for masonry - Rendering and plastering mortar
- BS EN 998-2:2016 Specification for mortar for masonry - Masonry mortar
- BS EN 1607:2013 Thermal insulating products for building applications. Determination of tensile strength perpendicular to faces
- BS EN 1991-1-4:2005+A1:2010 Eurocode 1. Actions on structures. General actions
- NA to BS EN 1991-1-4:2005+A1:2010 UK National Annex to Eurocode 1. Actions on structures. General actions
- BS EN 1993-1-1:2005+A1:2014 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 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 12467:2012+A2:2018 Fibre-cement flat sheets. Product specification and test methods
- BS EN 13163:2012+A2:2016 Thermal insulation products for buildings. Factory made expanded polystyrene (EPS) products. Specification
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- 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:2007
- 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 (Third edition)
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2006 Conventions for U-value calculations
- BRE Report 497:2016 Conventions for calculating linear thermal transmittance and temperature factors
- EAD 040914-00-0404:2018 Veture kits - prefabricated units for external wall insulation and their fixing devices
- EAD 090062-00-0404:2018 Kits for external wall cladding mechanically fixed
- EAD 330196-01-0604:2017 Plastic anchors made of virgin or non-virgin material for fixing of ETICS with rendering
- EOTA TR 051:2018 Recommendations for job-site tests of plastic anchors and screws
- 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
- 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	C Devine	C Vurley	May 2022

6 CONDITIONS OF USE

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