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-22-262-S-A-UK
BDA Agrément®
Sikatherm® EPS EWI System
External Thermal Insulation Composite System (ETICS)

Sika Ltd.
Watchmead
Welwyn Garden City
Hertfordshire
AL7 1BQ
+44 (0) 1707 394444
enquiries@uk.sika.com
www.sika.co.uk

SCOPE OF AGRÉMENT

This BDA Agrément® (hereinafter 'Agrément') relates to Sikatherm® EPS EWI System (hereinafter the 'System'). The System is a mechanically fixed (and with supplementary adhesive if required), expanded polystyrene (hereinafter 'EPS') insulated, external thermal insulation composite system (ETICS) finished with render systems. The System is for installation above damp-proof course (hereinafter 'DPC') level on masonry (such as clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks) or concrete supporting walls. The System is for existing and new residential and non-residential buildings.

DESCRIPTION

The System consists of EPS insulation boards which are mechanically fixed (and with supplementary adhesive if required) to the supporting wall. A layer of basecoat with reinforcement mesh is applied. Primer is applied before the application of acrylic or silicone finishes; dash receiver is applied before the application of a dash aggregate 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 B-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.

CONTENTS

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
supplementary adhesive	SikaWall - 1015 Adhesive Coat	polymer-modified render basecoat comprising a range of mineral fillers and other additives, applied with thicknesses of 3 mm to 4 mm; when used as a levelling compound up to a maximum thickness of 15 mm	
insulation	EPS insulation	grey EPS 70E HP insulation board, with average density of 12.5 to 20.7 kg/m^3, in accordance with BS EN 13163, λ_D of 0.032 W/mK	1,200 mm by 600 mm, available in thicknesses from 40 to 150 mm
	mechanical fixings for EPS insulation	Rawplug KI10 - hammer-fixed with glass fibre-reinforced polypropylene nail or carbon steel galvanised pin, in accordance with BS EN ISO 4042, with anchor sleeve made of polypropylene with washer	anchor sleeve 70 to 220 mm (plastic pin) or 260 mm (steel pin) long^, 10 mm diameter with 60 mm diameter plate; plastic pin 70 to 220 mm long^, 6.2 mm diameter; steel pin 70 to 260 mm long^, 4.9 mm diameter
		R-TFIX-8M - polypropylene sleeve with electro-galvanized steel pin	135 to 295 mm long by 8 mm diameter with a 60 mm diameter washer
		R-TFIX-8S - polypropylene sleeve with electro-galvanized steel screw	115 to 445 mm long by 8 mm diameter with a 60 mm diameter washer
basecoat	SikaWall - 1015 Adhesive Coat	polymer-modified render basecoat comprising a range of mineral fillers and other additives, applied with thicknesses of 6 to 8 mm	
reinforcement mesh	355 AVU reinforcement mesh	an alkali-resistant, glass fibre mesh with a nominal weight of 160 g/m^2	50 m by 1.1 m, 3.5 mm by 3.8 mm grid size
dash finish	SikaWall - 5400 Exposed Aggregate - dash receiver	polymer-modified, dry mix through, coloured render, used as dry dash receiver or render only, applied with thicknesses of 8 mm to 10 mm	
	Dashing Aggregate	inert aggregate stones used as decorative elements on dash receiver, available in a range of colours	3 to 8 mm diameter
acrylic render finish	Revlane + Regulateur primer	acrylic-based, ready-to-use, white or tinted primer with density of 1.5 ± 0.05 kg/m^3	
	Revlane+ Ignifuge Taloche Fin (TF) and Revlane+ Ignifuge Taloche Gros (TG)	acrylic-based render comprising acrylic binders, minerals, pigments and additives, used as decorative coating, manufactured in accordance with BS EN 15824, available in grain sizes: • 1.0 mm particle size for Revlane+ TF 1.0; • 1.6 mm particle size for Revlane+ TG 1.6.	
silicone render finish	Revlane + Regulateur primer	acrylic-based, ready-to-use, white or tinted primer with density of 1.5 ± 0.05 kg/m^3	
	Revlane+ Siloxane Ignifuge Taloche Fin (TF) and Revlane+ Siloxane Ignifuge Taloche Gros (TG)	silicone-modified render comprising acrylic binders, minerals, pigments and additives, used as decorative coating, manufactured in accordance with BS EN 15824, available in grain sizes: • 1.0 mm particle size for Revlane+ Siloxane TF 1.0; • 1.6 mm particle size for Revlane+ Siloxane TG 1.6.	

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

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 supporting wall - masonry or concrete;
- profiles - a range of standard profiles for end stop, corner reinforcement mesh and expansion joints, starter track, 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;
- silicone sealant;
- hydrophobic sealing tape;
- fire barrier mechanical fixings - stainless steel.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design

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

2.2.1.2 Basis of design
The characteristics detailed in the section titled 'Major Points of Assessment' shall be considered during the use of 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 exposure zones 1, 2 and 3, in accordance with BS 8104 and PD 6697. This Agrément also covers the use of the System onto cavity walls in exposure zone 4; however, for solid walls in exposure zone 4 areas, the Agrément holder shall determine the suitability of the System, taking in consideration the appropriate local wind-driven rain index using BS 8104 and 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.

New masonry supporting walls shall be designed in accordance with:
- BS EN 1992-1-1;
- BS EN 1996-1-1;
- BS EN 1996-2;
- PD 6697.

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.

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 ingress and shall be in accordance with BS 6093.

The System shall be secured to the supporting wall with mechanical fixings passing through the EPS insulation.

Where required, properly constructed structural 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, subject to the project-specific design. Structural expansion joints shall be provided at 7.5 m intervals when the length of a wall exceeds 12 m, in accordance with PD 6697 and BS EN 1996-2 (subject to the project-specific design). Movement joints for the continuous render finish shall be provided at 10 m intervals.

2.2.1.4 Project-specific design considerations
The project-specific design shall:
- be determined by the Agrément holder;
- 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 - see Section 2.4.1.

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;
- pull-out of fixings;
- effect of wind actions on the System;
- accommodation of structural movement.

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

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

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

During the assessment and survey, fixing pull-out strength (kN) tests shall be conducted on the supporting wall surface, in accordance with EOTA TR 051 and EAD 330196-01-0604. The results of the assessment and survey assist the Agrément holder in determining the type, size and minimum number of fixings required for each EPS insulation board. 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 the regular replacement and resealing of joints at window and door frames to prevent failure. Failed elements such as sealants, joint seals and corroded materials shall be replaced to ensure that water ingress does not occur.

Any damage 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.

Performance factors in relation to the Major Points of Assessment

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

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

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

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

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

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

The System has adequate resistance to artificial weathering and resistance to thermal shock, in accordance with 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.

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 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 System has adequate wind-load resistance and suitable mechanical strength, in accordance with EAD 040083-00-0404 and BS EN 16382. For the calculation of the wind-load resistance of the System, the design pull-through values given in Table 2 shall be used.

Table 2 - Design wind load values

Design wind load (kN/m^2)	Number of fixings per m^2	Design fixing pull-through resistance (kN)^
0.65	4	0.17
0.80	5	
0.95	6	
1.30	8	

^ derived from pull-through fixing resistance test on 50 mm thick EPS insulation with Rawplug KI10 screw. Partial factor of 3 has been applied

The qualified structural engineer shall ensure that the maximum design wind load achieved by the System, as per Table 2, shall be equal or less than the design pull-out resistance strength of the mechanical fixings from the supporting wall obtained from site tests.

The contribution of the supplementary adhesive shall not be considered when calculating the wind-load resistance of the System.

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

Impact resistance

When tested for hard-body impact resistance, in accordance with EAD 040083-00-0404, the System is categorised as:

- Use Category I with dash finish;
- Use Category III with acrylic or silicone finish.

The Use Categories in accordance with EAD 040083-00-0404 are as follows:

- I - a zone readily accessible at ground level to the public and vulnerable to hard-body impacts but not subjected to abnormally rough use;
- II - a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the System will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care;
- III - a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects;
- IV - a zone out of reach from ground level.

2.2.9 Fire performance

The System is classified as European Classification B-s1, d0, in accordance with BS EN 13501-1.

For all buildings in Wales and Northern Ireland, and non-residential buildings in England, the System shall not be used on buildings with a storey of 18 m or more above ground level; the System can be used without any boundary restrictions. Refer to the relevant national Building Regulations for types of buildings and any exclusions that may apply.

For residential buildings in England, the System shall not be used on buildings with a storey of 11 m or more above ground level; the System can be used without any boundary restrictions. Refer to the relevant national Building Regulations for types of buildings and any exclusions that may apply.

For all buildings in Scotland, the System is restricted to buildings with no floor more than 11 m above ground level and not less than 1 m from the 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.

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.

The System shall include a minimum of one stainless steel fixing per m^2 of EPS insulation or one stainless steel fixing per insulation board, whichever is lesser, fixed through the reinforcement mesh and the EPS insulation, in addition to the other EPS insulation fasteners normally specified.

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

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.

2.2.10 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 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. The System is designed to minimise moisture penetration to the EPS 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 EPS insulation thickness, fixing method, type of mechanical fixing and insulating value of the supporting wall and its internal finish.

For the purposes of U-value calculations and to determine if the requirements of national Building Regulations are met, the thermal resistance and U-value of the walls incorporating the System shall be calculated according to BS EN ISO 10211 (taking into consideration BS EN ISO 6946, BS EN ISO 10456 and BRE Report 443), using the 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 the Government Accredited Construction Details.

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

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

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 vertical movement joint detail

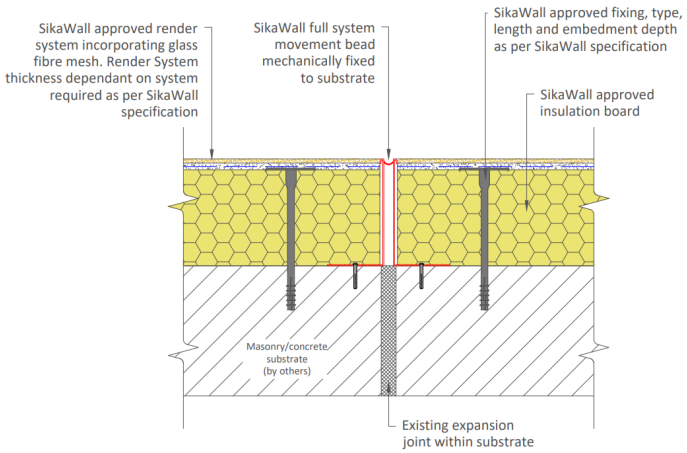


Diagram 2 - Typical horizontal movement joint detail

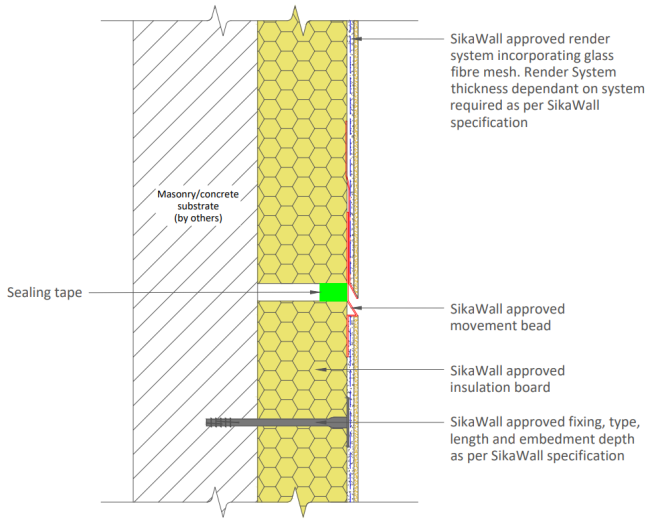


Diagram 3 - Typical standard base detail

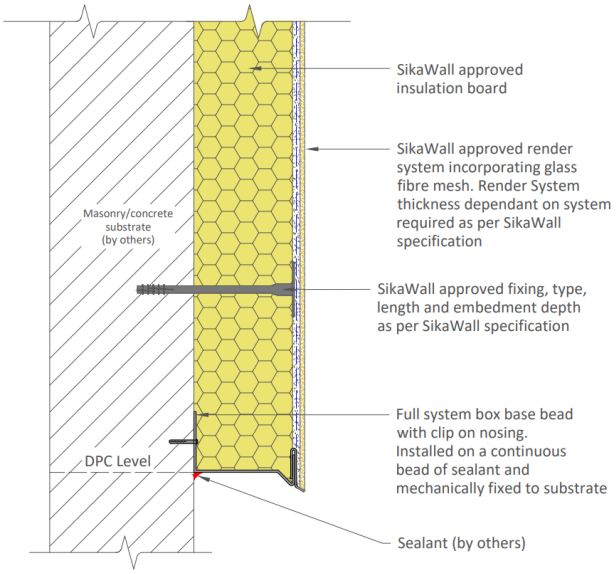


Diagram 4 - Typical window/door reveal detail

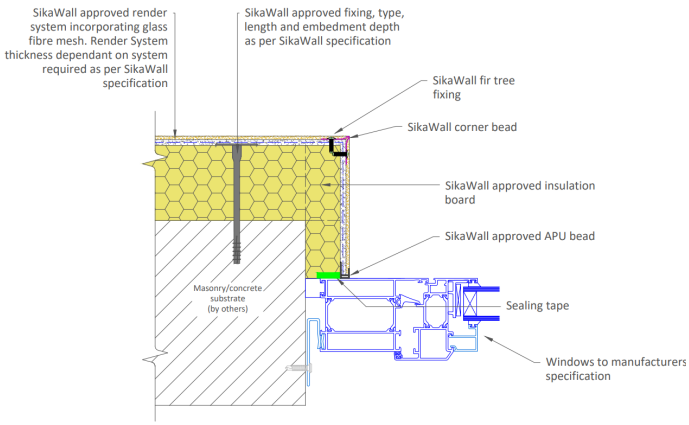


Diagram 5 - Typical external corner detail

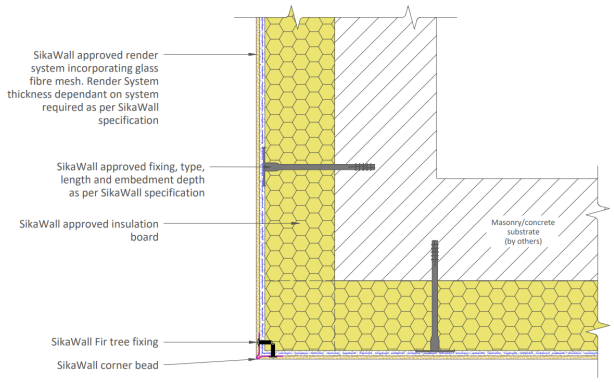


Diagram 6 - Typical window reveal/head detail

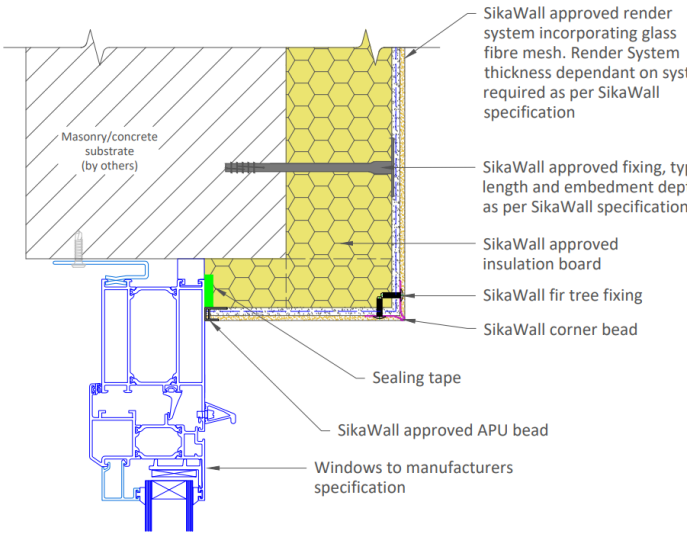


Diagram 7 - Typical over cill detail

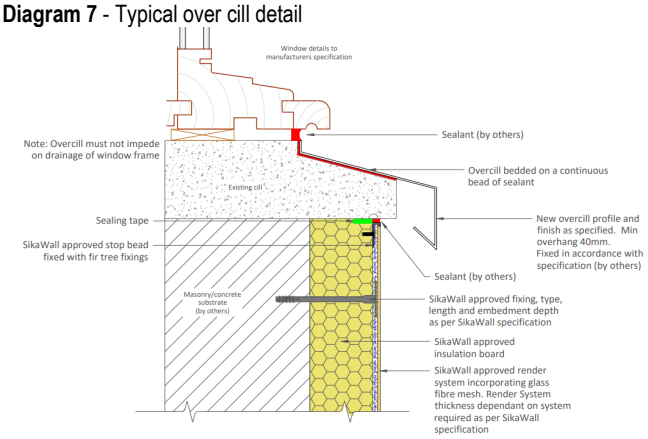


Diagram 8 - Typical opening stress patch detail

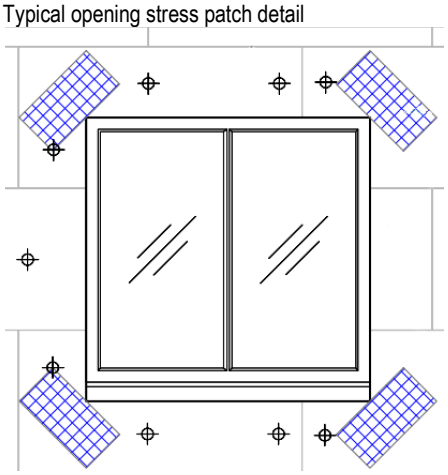


Diagram 9 - Typical fixing pattern

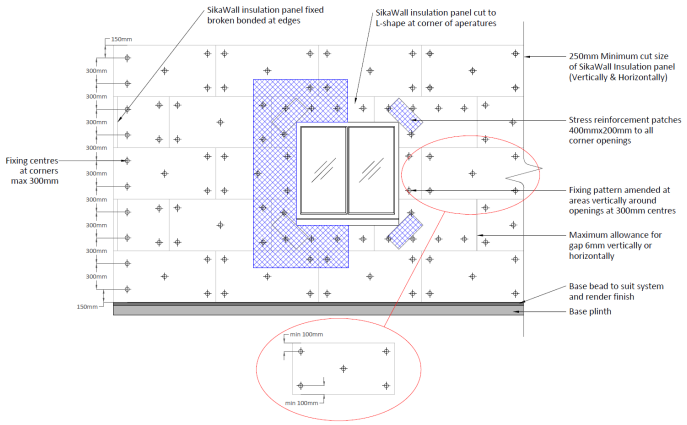
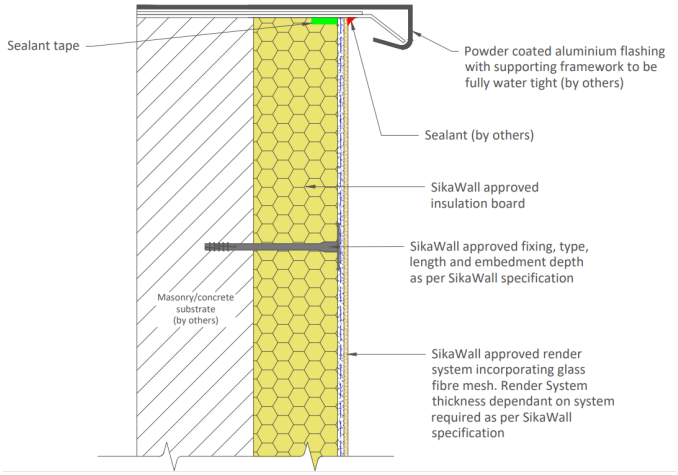


Diagram 10 - Parapet detail



2.4 INSTALLATION

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

2.4.1 Project-specific installation considerations

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

The primary requirement of the pre-installation survey is to determine the following:

- DPC level, the position of starter track, expansion joints and weather seals;
- detailing around windows, doors, etc.;
- location of fire barriers installed in line with compartment walls and floors;
- identification of:
  - services and fittings requiring removal or alteration to facilitate installation of the System;
  - areas where silicone/flexible sealants shall be used.

The installation process includes fixing pull-out tests of the supporting wall according to the Construction Fixings Association Guidance note 'Procedure for site testing construction fixings', to determine pull-out strength values - see Section 2.2.4. Pull-out test loads shall be 2.5 x design load. The pull-out resistance strengths of the supporting wall, spacer support rails and EPS insulation anchor fixings shall be checked by a competent person and shown to be adequate before installation of the System.

Subsequent project-specific design considerations include confirmation that:

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

2.4.2 Preparation

The following works shall be undertaken before 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;
- where necessary, install protection channels to safely sleeve cabling;
- external power cables concealed in trunking shall be well labelled with warning signs;
- where required, extend beyond the surface and securely refix external soil stacks, wastewater pipes, overflows, ducts and vent pipes;
- mix the adhesive (for bonding the EPS insulation to the supporting wall) in accordance with the Agrément holder's recommendations.

2.4.3 Outline installation procedure

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

The outline procedure is as follows:

- fix base track horizontally to the wall above DPC level at base of the wall, or 150 mm above ground level;
- if required, apply adhesive to the EPS insulation using the 'notch trowel' (ensuring 100 % coverage) or 'ribbon and dab' (ensuring minimum 40 % coverage) method;
- fix stop beads vertically, bedded onto sealing tape, and fully seal with silicone;
- fix angle verge trim, bedded onto sealing tape at the top of the System, and seal with silicone at the top of the verge;

- extend cills so that there will be a minimum 40 mm overhang from the drip edge of the cill to the front edge of the System. Similar overhangs shall also be achieved at the soffit; if there is no soffit or it is of insufficient depth, then a verge trim will be required;
- place the EPS insulation boards, ensuring the first row is tightly fitted within the base track and firmly push into position. Continue with additional EPS insulation, ensuring tight butt-joints and adhering to staggered bonding pattern; joints shall not occur within 200 mm of the corners of openings and EPS insulation shall be staggered and overlapped at building corners;
- install initial approved mechanical fixings through EPS insulation into the supporting wall;
- install 'L' shaped EPS insulation around all openings, ensuring that no edge or piece of insulation is smaller than 200 mm;
- fix stop beads vertically onto sealing tape and fully seal with silicone;
- fix movement beads at agreed locations; structural movement joints shall be carried through the System;
- fix angle verge trim using sealing tape at the top of the System and seal with silicone at the top of the verge;
- fix surface mounted beads directly to the EPS insulation at required locations;
- apply mechanical fixings through the EPS insulation to the supporting wall in accordance with project-specific fixing pattern (subject to wind load calculations, with additional fixings at corners and openings);
- apply a 6 to 8 mm thick basecoat to the entire surface of the EPS insulation and bed reinforcement mesh into the top third of the wet adhesive, overlapping joints by minimum 100 mm;
- whilst basecoat is still wet, install additional reinforcement mesh patches (minimum 300 mm by 300 mm) diagonally across corners of all wall openings, and over all penetrations and extend beyond the line of penetration by 150 mm on all sides at 45 ° to the main mesh layer for additional stress reinforcement;
- apply the appropriate System finish.

Dash finish
- apply the dash receiver using a stainless-steel trowel to a thickness of 6 to 8 mm, depending on the aggregate type; ensure a wet edge is always maintained;
- allow dash receiver to float smooth in preparation for receiving the chosen aggregate;
- throw the dash aggregate using a harling trowel in an even manner against the wet dash receiver and ensure a consistent and even spread of the aggregate.

Acrylic and Silicone finishes
- apply the primer using a roller, brush or spraying method and ensure a full coverage;
- apply the desired Revlane finish in an even thickness, using a flexible stainless steel float accordingly. The floating of the finish shall be up to the thickness of the grain size applied;
- always maintain a wet edge and work to corners and joints;
- finish off with a smooth plastic plastering float (a plastic float will roll the large aggregates more than a stainless steel trowel) in a regular motion or in the direction of the required dragged effect.

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;
- apply silicone sealant around windows, door frames, etc., and where the installation abuts any other building or surface, to ensure a weathertight joint.

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

2.5 INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.5.1 Moisture control

Test	Standard	System finish	Result
Water vapour diffusion resistance	BS EN ISO 7783	dash finish	2.34 MNs/g
		acrylic finish	2.55 MNs/g
		silicone finish	2.62 MNs/g
Hygrothermal and freeze-thaw conditioning	EAD 040083-00-0404 and BS EN 16383	dash finish	No defects
		acrylic finish	
		silicone finish	
Test	**Standard**	**System component**	**Result**
Water vapour diffusion resistance factor, μ	BS EN 13163	EPS insulation	20 - 40

2.5.2 Strength

Test	Standard	System finish	Result
Hard-body impact	EAD 040083-00-0404	dash finish	Use Category I
		acrylic finish	Use Category III
		silicone finish	
Test	**Standard**	**System component**	**Result**
Compressive stress at 10 % deformation	BS EN 826	EPS insulation	CS(10)70
Tensile strength	BS EN 1607	EPS insulation	TR100

2.5.3 Fire performance

Test	Standard	System finish	Result
Reaction to fire	BS EN 13501-1	dash finish	B-s1, d0
		acrylic finish	
		silicone finish	
Test	**Standard**	**System component**	**Result**
Reaction to fire	BS EN 13501-1	EPS insulation	E

2.5.4 Thermal performance

Test	Standard	System component	Result
Thermal conductivity (λ_D)	BS EN 12667	EPS insulation	0.032 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)(a)(2) 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, 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 - 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 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(1)(a)(2) 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, 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 - 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 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 9 Building Standards - Construction

- 1.1(a) 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
- 6.1(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(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
- 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) 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 CO_2 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 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 4042:2022 Fasteners. Electroplated coating systems
- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods
- BS EN ISO 7783:2018 Paints and varnishes. Determination of water-vapour transmission properties. Cup method
- BS EN ISO 9001:2015 Quality management systems. Requirements
- BS EN ISO 10211:2017 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations
- BS EN ISO 10456:2007 Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values
- BS EN 826:2013 Thermal insulating products for building applications. Determination of compression behaviour
- 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. Wind actions
- NA to BS EN 1991-1-4:2005+A1:2010 UK National Annex to Eurocode 1. Actions on structures. General actions. Wind actions
- BS EN 1992-1-1:2004+A1:2014 Eurocode 2: Design of concrete structures. General rules and rules for buildings
- NA+A2:2014 TO BS EN 1992-1-1:2004+A1:2014 UK National Annex to Eurocode 2. Design of concrete structures. General rules and rules for buildings
- BS EN 1996-1-1:2005+A1:2012 Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures
- NA to BS EN 1996-1-1:2005+A1:2012 UK National Annex to Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures
- BS EN 1996-2:2006 Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry
- NA to BS EN 1996-2:2006 UK National Annex to Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry
- BS EN 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 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 EN 13914-1:2016 Design, preparation and application of external rendering and internal plastering. External rendering
- BS EN 15824:2017 Specifications for external renders and internal plasters based on organic binders
- BS EN 16382:2016 Thermal insulation products for building applications. Determination of the pull-through resistance of plate anchors through thermal insulation products
- BS EN 16383:2016 Thermal insulation products for building applications. Determination of the hygrothermal behaviour of external thermal insulation composite systems with renders (ETICS)
- BS 5250:2021 Management of moisture in buildings. Code of practice
- BS 6093:2006+A1:2013 Design of joints and jointing in building construction. Guide
- BS 8000-0:2014 Workmanship on construction sites. Introduction and general principles
- BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain
- Accredited Construction Details, Scotland:2019
- BRE Information Paper 1/06:2006 Assessing the effects of thermal bridging at junctions and around openings
- BRE Report 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
- CIGA Technician's guide to best practice: Flues, chimneys and combustion air ventilators:2016
- Construction Fixings Association Guidance Note:2022 Procedure for site testing construction fixings
- EAD 040083-00-0404:2019 External thermal insulation composite systems (ETICS) with renderings
- 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
- Government Accredited Construction Detail for Part L:2019
- PAS 2030:2019+A1:2022 Specification for the installation of energy efficiency measures in existing dwellings
- PAS 2035:2019+A1:2022 Retrofitting dwellings for improved energy efficiency. Specification and guidance
- PD 6697:2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

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	January 2024
A	Additional finish options	A Chapman	C Devine	May 2024

6 CONDITIONS OF USE

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