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BAW-19-081-S-A-UK
BDA Agrément®
IcyFoam Fill
Injected Foam Cavity Wall Insulation

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SCOPE OF AGRÉMENT

This Agrément relates to IcyFoam Fill injected cavity wall insulation (CWI) (hereinafter the 'System'), an in-situ full-fill injected thermal insulation which contributes to the airtightness and watertightness of external cavity walls constructed from random stone or masonry (where masonry includes clay and calcium silicate bricks, concrete blocks, natural stone and reconstituted stone blocks). The System is for injection into cavity walls up to and including 12 m in height, in existing or new residential and non-residential buildings in the UK and Ireland. The System may also be used in cavity walls above 12 m in height (up to 18 m) where the building has been assessed as suitable by the Agrément holder.

SYSTEM DESCRIPTION

The System consists of two liquid components that are injected to form a closed cell structure, rigid polyurethane (PUR) seamless foam insulation to BS EN 14318-2 that adheres to the internal faces of a cavity. It is produced by an exothermic reaction between the isocyanate component 'A' and the resin component 'B'. Once applied, the System expands, solidifies and cures. Layers of the System are built up until the whole cavity is fully filled.

SYSTEM ILLUSTRATION

THIRD-PARTY ACCEPTANCE

NHBC/Premier Guarantee - For detailed information see section 3.3 (Third-Party acceptance).

STATEMENT

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

Chris Vurley, CEng
Technical Manager, Building Products

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

SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, building control personnel, contractors, installers and other construction industry professionals considering the fitness for the intended use of the System. This Agrément covers the following:

- Conditions of use;
- Factory Production Control, Quality Management System and the Annual Verification procedure;
- 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, including codes of practice, test and calculation reports.

MAJOR POINTS OF ASSESSMENT

Adequacy of fill - the System can fully fill the cavity (with no voids/gaps and a consistent density) including under cills and at the eaves (see section 2.1.10).

Thermal Performance - the System improves the thermal insulation of the external cavity walls and can enable the walls to meet the design U-value requirements (see section 2.1.11).

Moisture Control - (see section 2.1.12) the System:

- has a high-volume closed cell percentage;
- has adequate water vapour transmission resistance;
- will contribute to minimising the risk of interstitial and surface condensation in or on the wall;
- has adequate resistance to wind-driven rain water penetration across the cavity to the inner leaf;
- does not absorb water by capillary action and will resist the transfer of ground moisture to the inner leaf at damp-proof course (hereinafter 'DPC') level of the inner and outer leaf.

Fire Performance - use of the System will not contribute to the early stages of a fire and does not prejudice the fire resistance properties of the wall (see section 2.1.13).

Durability - the System will have a service life durability equivalent to that of the structure in which it is incorporated (see section 2.1.8).

CE marking - the product manufacturers have taken responsibility for CE marking of the products used in the System in accordance with all relevant harmonised European Product Standards. An asterisk (*) appearing in this Agrément indicates that data shown is included in the relevant product manufacturer's Declaration of Performance (DoP).

CONTENTS

CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations
See section 2.1.

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 its relevant DoPs, test reports, technical literature and factory and site visits. Also, the NHBC Standards and Premier Guarantee Technical Manual have been taken into consideration. Factory Production Control has been assessed.

1.1.4 Installation supervision
The quality of installation and workmanship must be controlled by a competent person who must be an employee of the installation company.

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

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

1.1.6 Validity
The purpose of this BDA Agrément® is to provide for well-founded confidence to apply the System within the Scope described. The validity of this Agrément is three years after the issue date, and as published on www.kiwa.co.uk/bda.

1.2 - FACTORY PRODUCTION CONTROL (FPC) AND QUALITY MANAGEMENT SYSTEM (QMS)

Kiwa Ltd. has determined that the Agrément holder fulfils all obligations in relation to this Agrément, in respect of the System.

The initial FPC audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their FPC operations.

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 FPC is in conformity with the requirements of the technical specification described in this Agrément, the continuous surveillance, assessment and approval of the FPC will be done at a frequency of not less than once per year by Kiwa Ltd.

CHAPTER 2 - TECHNICAL ASSESSMENT

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

2.1 - POINTS OF ATTENTION TO THE SPECIFIER

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

2.1.2 Applied building physics (heat, air, moisture)
The physical behaviour of the building incorporating the System shall be verified as suitable by a competent specialist, who can be either a qualified employee of the Agrément holder or a qualified consultant. The Specialist will check the physical behaviour of the building design and if necessary, can offer advice in respect of improvements to achieve the final specification. It is recommended that the Specialist co-operates closely with the Agrément holder.

2.1.3 General design considerations
For retrofit applications, existing masonry cavity walls must be in a good state of repair with no evidence of rain penetration, damp or frost damage. Any necessary repairs must be carried out prior to installation.

New external masonry cavity walls must be designed and constructed in accordance with the national Building Regulations. Where required, due consideration must be given to the NHBC Standards.

To prevent water ingress, the design of joint detailing at window/door openings, vent and flue pipe penetrations should be in accordance with BS 6093.

For masonry walls, minimum cavity widths to be filled:
- for existing buildings must be no less than 40 mm;
- for new buildings must comply with the relevant national Building Regulations;
- on new buildings where NHBC Technical Standards apply must be no less than 50 mm, as defined in NHBC Standards Chapter 6.1;
- on new buildings where Premier Guarantee Technical Standards apply must be no less than 50 mm, as defined in Premier Guarantee Technical Manual Chapter 7.

On new buildings where Premier Guarantee or NHBC Technical Standards apply, random stone cavity walls must not be filled.

The System may be used in cavity walls above 12 m and up to 18 m in height, where the walls have been assessed as suitable by the Agrément holder.

To comply with the requirements of the NHBC and Premier Guarantee the System may only be used in cavity walls up to 12 m in height.

The System may be considered for use in any exposure zone, in accordance with the technical requirements of the NHBC and Premier Guarantee.

In severe or very severe exposure zones the use of full-fill insulation in rendered masonry cavity walls with an external leaf of clay bricks is not permitted.

The NHBC does not accept:
- the use of full-fill cavity insulation with fair-faced masonry in very severe exposure zones;
- topping-up of residual cavities in existing partial fill installations where insulation, in the form of batts or boards, has previously been built into a wall and there is a residual cavity;
- recessed mortar joints for full-fill applications.

Premier Guarantee does not accept:
- the use of full-fill cavity insulation with fair-faced masonry in very severe exposure zones;
- recessed mortar joints for full-fill applications.

To comply with the requirements of the NHBC:
- in Scotland, it is not permissible to fill the full width of the cavity with any thermal insulation at the time of construction;
- in Northern Ireland it is not permissible to fill the cavity with pumped thermal insulants at the time of construction.

Account should be taken of Government Accredited Construction Details for Part L (England and Wales) masonry cavity wall insulation detail illustrations, Accredited Construction Details (Scotland) and PAS 2030.

Room space ventilation openings should be arranged to prevent the ingress of rain, snow, birds and small animals and the risk of blockage.

Partial fill (omitted areas and residual cavities)
Wherever practicable and possible, all the cavity space from ground level to the roof or gable copings should be filled, except for:
- when a semi-detached or terraced property is to be insulated separately. A cavity barrier installed to create a party wall boundary to prevent overspill into adjacent properties is retained in the cavity;
- insulating a gable apex (i.e. limiting the fill to several brickwork courses above ceiling level) is permitted, provided the top of the wall is protected by the roof, the roof void is not an occupied space, and the loft insulation is at ceiling level;
- when filling up to the underside of a horizontal boundary other than the roof, where the boundary is protected by a cavity tray or similar waterproof barrier;
- where the wall to be insulated is covered by a waterproof cladding, such as hung tiles, and this cladding either extends up to the roof or is protected at the top by other means (such as window cills);
- insulating areas of wall where access for drilling may be limited by features such as carports, conservatories, cladding or tiling.

2.1.4 Project specific design considerations

Pre-installation survey requirements
A pre-installation site survey and assessment is required to allow determination of the project specific design; it is a mandatory requirement to use a tape measure and borescope to assess the width of a cavity and to ensure a clear void exists. The findings of this survey must be recorded on a surveyor's report. Selection of an appropriate drilling pattern must take into consideration the nature of the building and its construction.

A condensation risk analysis shall be carried out at design stage on a project specific basis, in accordance with BS 5250 and BS EN ISO 13788.

2.1.5 Permitted applications
Only applications designed according to the specifications as given in this Agrément are allowed under this Agrément, in each case the Specifier will have to co-operate closely with the Agrément holder.

2.1.6 Installer competence level
Installation shall be by contractors with employees trained and approved by the Agrément holder and subject to 1% inspections by Kiwa Ltd. under a Kiwa Installation Assessment & Surveillance Scheme.
The System must be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

2.1.7 Delivery, storage and site handling
The liquid components are delivered to site in drums that bear the System name, the Agrément holder's name and the BDA Agrément® logo incorporating the number of this Agrément.

Store the System in accordance with the Agrément holder's requirements. Care must be taken to:
- avoid exposure to direct sunlight and high or low temperatures for long periods of time;
- store in a well-ventilated covered area to protect from rain, frost and humidity;
- store away from possible heat/ignition sources.

The optimum storage temperature of sealed drums is between 15 ºC and 30 ºC.

Components A and B are sensitive to humidity. They must be stored in sealed drums or hermetically sealed tanks.

Components A and B are classified as 'irritant' and 'harmful' respectively, under The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP 4) and drums bear the appropriate hazard warning signs. When cured, the System is non-hazardous.

2.1.8 Durability
There is no mould growth risk and the System does not support vermin or insects.

The System is durable, inert, rot-proof, water resistant, stable, does not shrink or crack, and adequately resistant to deterioration.

The System has a small corrosion effect on zinc-plated elements. In this case, cover the zinc plated element with a suitable protective coating. The Certificate holder can advise on an appropriate coating for an application. The System does not react with copper and stainless steel. Due to the good adhesion and permeability of the System, moisture does not build up on metal substrates.

Once installed, the System is protected from agents liable to cause deterioration. The System is unaffected by the normal conditions in a masonry cavity wall.

The reaction to fire does not decrease with time in accordance with BS EN 14318-2.

The System is frost and heat-resistant from -50 °C to +100 °C.

The System will have a service life equivalent to that of the structure into which it is incorporated.

2.1.9 Maintenance and repair
Once installed, the System does not require regular maintenance provided the weather-tightness of the external cavity wall is maintained. For advice in respect of repair, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.1.10 Adequacy of fill
A cavity can be fully filled with the System (with no voids/gaps and a consistent density) including under cills and at eaves.

2.1.11 Thermal Performance
Thermal conductivity
The System expands in volume by up to 100 times after injection. The injected System forms a solid and seamless air tight insulating foam fill to cavities without joints or gaps, reducing thermal bridges.

The System has:
- a high volume % of closed cells in accordance with BS EN ISO 4590;
- adequate apparent density in accordance with BS EN 1602;
- adequate thermal resistance in accordance with BS EN 12667 and SG19;
- a low declared aged thermal conductivity due to its high volume % closed cell structure and maintains its thermal resistance over time.

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 external cavity walls incorporating the System should be calculated in accordance with BS EN ISO 10211 (taking into consideration BS EN ISO 6946, BS EN ISO 10456 and BRE Report 443), using the System's declared aged thermal conductivity (λ_D)*. Design and declared thermal values can be found in BS EN ISO 10456.

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

Thermal bridging at junctions and around openings
Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Guidance on linear thermal transmittance, heat flows and surface temperature factors can be found in the documents supporting the national Building Regulations and BS EN ISO 10211, BRE Information Paper 1/06, BRE Report 262, BRE Report 497 and PAS 2030.

2.1.12 Moisture Control
Cell structure
The System has a high-volume closed cell percentage in accordance with BS EN ISO 4590.

Water vapour transmission resistance
The closed cell structure allows a low level of water vapour to diffuse through the System. The System has an adequate level of water vapour transmission in accordance with BS EN 12086 Method A and does not favour the accumulation of water vapour between the System and cavity substrate faces.

Condensation risk
External cavity walls incorporating the System will adequately limit the risk of interstitial and surface condensation when designed in accordance with BS 5250, BRE Report 262 or BS EN ISO 13788. Room spaces should be ventilated in accordance with BS 5250. Care should be taken to provide adequate ventilation, particularly in rooms expected to experience high humidity, and to ensure the integrity of vapour control layers (VCL) and dry linings, as appropriate, against vapour ingress.

Resistance to precipitation including wind-driven rain penetration
The System will assist in the resistance of any wind-driven rainwater penetration across the cavity to the inner leaf.

Water absorption
The closed cell structure means the System is water-resistant.

The System has low short-term water absorption by partial immersion in accordance with BS EN 1609, Method A. The System has low long-term water absorption by total immersion in accordance with BS EN 12087. The System does not absorb water by capillary action.

The System is not damaged by water and retains its shape, without shrinking or distorting, and regains its performance when dry.

Resistance to ground moisture
When the System is used in situations where it bridges the DPC in cavity walls, it will resist the transfer of ground moisture to the inner leaf at DPC level, provided the wall is detailed in accordance with the requirements and provisions of the national Building Regulations.

2.1.13 Fire Performance
The System must be protected from naked flames and other ignition sources during and after application.

The System will not contribute to the early development stages of a fire.

The use of the System does not prejudice the fire resistance properties of the wall. The System is unlikely to become ignited within the cavity. If fire does penetrate the cavity, the amount of air present will be insufficient to support combustion.

The System is combustible but may be used in a wall on, or less than 1 m from, a relevant boundary provided it is installed in a cavity that is between two leaves of masonry or concrete at least 75 mm thick, and which has a cavity barrier around all openings in the wall and at the top of the wall-head.

The System does not affect the fire resistance of load-bearing masonry cavity walls to BS 476-21.

If residential wiring is encapsulated by the System, the System will not cause the wire temperature to exceed safety limits. However, re-routing, re-laying in conduit or de-rating electrical cables should be considered.

The System must be separated from heat-emitting flue pipes, fixed combustion appliances, incinerators, devices, fireplaces, chimneys, high intensity lamps and any potential source of ignition where the temperature is more than 70 °C, by a minimum gap filled with non-combustible material in accordance with the provisions of the national Building Regulations.

2.2 - EXAMPLES OF DETAILS

Standard drilling patterns for cavity widths from 40 mm to 150 mm wide.

Diagram 1A - Typical standard drilling pattern in brickwork detail

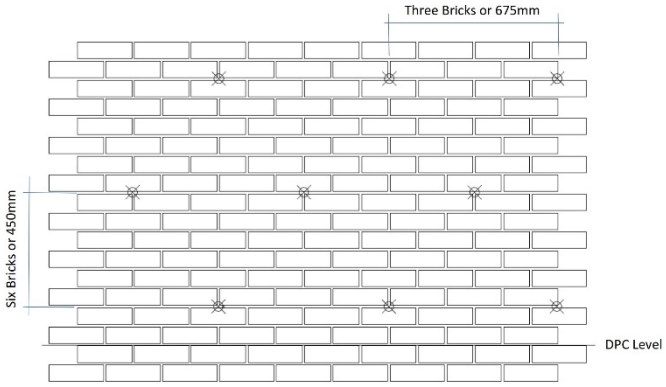


Diagram 1B - Typical drilling around windows and doors detail

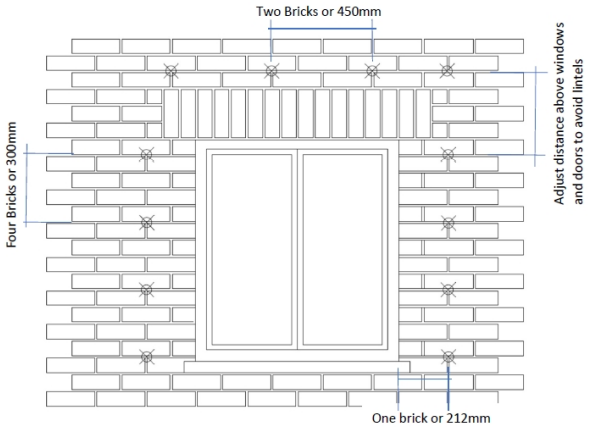


Diagram 1C - Typical drilling at roof or eaves level detail

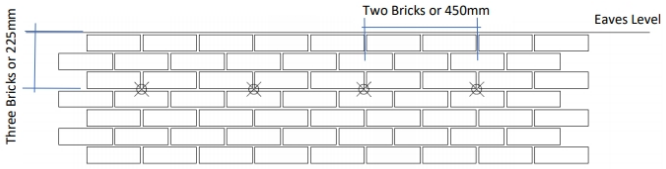


Diagram 1D - Typical drilling at a Party Line detail

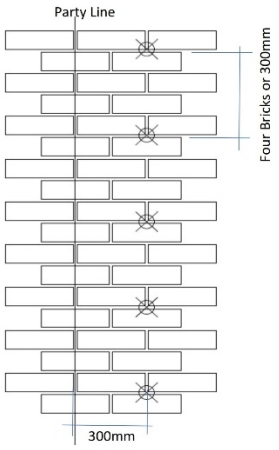


Diagram 2A - Typical standard drilling pattern in blockwork detail

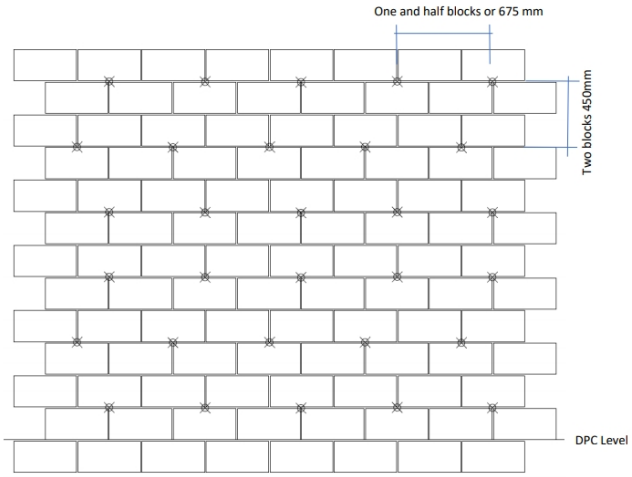


Diagram 2B - Typical drilling around windows and doors detail

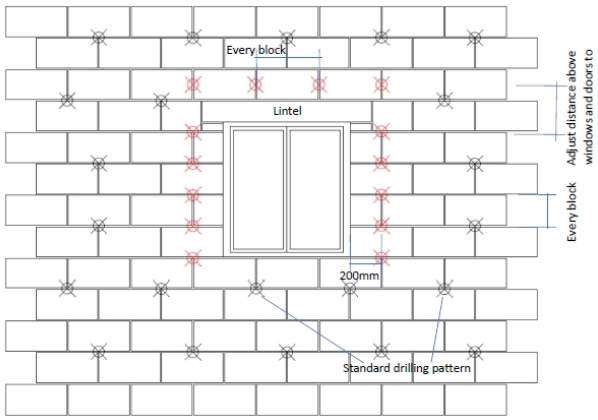
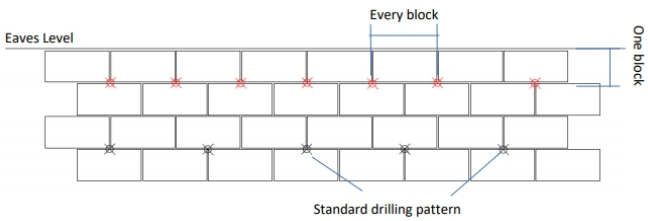


Diagram 2C - Typical drilling at roof or eaves level detail



2.3 - INSTALLATION

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

2.3.1 Installer competence level
See section 2.1.6.

2.3.2 Delivery, storage and site handling
See section 2.1.7.

2.3.3 Project specific installation considerations
Installation of the System shall be in accordance with the Agrément holder's Installation Manual, BS 7456, BS 8000-0, BS 8000-3, BS EN 14318-2, BRE GBG 44-2.

System injection should be delayed until the cavity is sealed from the weather, i.e. the roof is in place and all cavity openings, window/door openings are sealed.

During application the System must be protected from naked flames and other ignition sources.

Do not weld or cut metal which is in contact with the System. If it is necessary to weld elements, this must be done before injecting the System.

Whenever practicable and possible, all the cavity space from ground level to the roof or gable copings should be filled.

The System is usually injected into the cavity externally. Injection can take place internally when the property is undergoing internal refurbishment. On new build installations, the holes should be drilled through the inside wall, prior to internal finishing.

During injection, the ambient air temperature and substrate temperature must ideally be between 15 ºC and 25 °C and not be lower than 10 ºC. Use an infrared or contact thermometer for checking substrate surface temperature.

On the surfaces of masonry, the moisture content of the substrate should not exceed 5 %.

The ratio of the separate components supplied by each volumetric displacement pump must be 1:1 ratio by volume.

The injection machine must be capable of maintaining a temperature of 45 - 65°C for both resin and isocyanate components throughout the installation of the System into the cavity. The working temperature must be set between 40 ºC and 50 ºC depending on the ambient temperature conditions.

The System must be separated from heat-emitting flue pipes, appliances and chimneys etc.

2.3.4 Preparation
The following typical works apply prior to installation of the System:

- make any necessary repairs, such as re-pointing cracks, replacing door/window frames;
- sleeve or otherwise modify essential air vents and air bricks to prevent blockage by the System;
- seal gaps around window/door openings; especially meter boxes using appropriate material;
- remove any debris from the cavity;
- re-route electrical cables or enclose in trunking as necessary;
- insert a continuous cavity brush at the party wall line dividing the semi-detached or terraced property properties to contain the System;
- seal tops of all uncapped cavity walls prior to installation;
- isolate heat-emitting pipes, flues, devices by applying non-combustible material.

2.3.5 Outline installation procedure
The key sequence for installation is:

Drilling
Drill 12 mm diameter holes at intersections of the mortar joints, according to the standard drilling pattern for the main wall area and around doors, windows, cavity closures, chimneys/flues and gables given in the Installation Manual. All drill holes shall be perpendicular to the wall face and breach the cavity.

It is essential that all drilling in each elevation and at least the first metre of adjacent elevations is completed before injection of that elevation is commenced.

Care must be taken during the drilling process to ensure that no damage is done to any DPC.

See Diagrams 1A to 2C and the Installation Manual for further details on this procedure.

Pre-filling checks
Quality control checks are carried out to determine the injection machine settings are optimised in accordance with the Agrément holder's instructions. These include a flow rate check, and System characteristic checks (e.g. density, reaction profile etc.) using test methods in accordance with BS 5617, BS EN 14318-1 and BS EN 14318-2.

Filling procedure
The standard filling and party wall method should be undertaken according to the Installation Manual, using the correct injection gun nozzle for the area of application. To ensure a good result, the following sequence of filling must be followed:
1. set the appropriate temperature and pressure parameters to guarantee the mixing quality of the System and select a suitable spraying nozzle;
2. begin injection at the end of an elevation or adjacent to a sealed stop-end within the cavity (e.g. a door frame etc.), beginning at the lowest row of holes;
3. continue working around the building in horizontal lines;
4. after a minimum of 2 minutes and when the foam is fully cured, the next row of holes can be filled, starting in the hole diagonally above the last one filled;
5. the System should be injected into the cavity and built up in layers of 450 mm maximum thickness, until the whole cavity is filled from ground level to the roof or gable copings.

Sight holes and indicator sticks should be used to check the fill of the System and that the System has reached all areas. A borescope must be used to check filling completeness.

2.3.6 Finishing
The following finishing is required upon completion of the installation:
- fully fill/seal drill holes with mortar of a similar type, colour, texture and weathertightness to that of the existing wall;
- if the cavity is uncapped, trim the System flat around openings or at top of cavity using a handsaw;
- remove any excess System which has spilled over the top of the cavity or into the inside of the property and seal any holes as required;
- isolate the top of the System from the roof structure with plugs of mineral wool;
- replace external vents and seal all cavity vents.

Post-installation external and internal checks are carried out as per the Installation Manual to ensure:
- that the installation has been completed and that no damage has occurred to the building;
- all combustion air ducts, trunked air vents e.g. those providing underfloor ventilation and combustion air for heating appliances, are checked and any obstructions cleared;
- all flues are checked by an appropriate test (e.g. smoke tests for combustion appliances as detailed in BS 7456) to verify that they are clear and not obstructed by the System.

2.4 - INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.4.1 Moisture Control

Test	Thickness	Result (Mean value)
Cell structure volume % to BS EN ISO 4590, Method 2a, 23 °C, 50 % RH	-	93.1 % closed cell content, Class CCC4
Water vapour diffusion resistance factor to BS EN 12086, Method A, test condition A, 23 °C and 50 % RH	45 mm	114
Water vapour transmission rate	45 mm	195 mg/(m²h)
Water vapour permeance	45 mm	0.139 mg/(m²hPa), class MU100*
Water vapour resistance	45 mm	7.20 m²hPa/mg
Water vapour permeability	45 mm	0.00641 mg/(mhPa), class MU100*
Diffusion equivalent air layer thickness	45 mm	5.1 m
Short-term water absorption by 24 hr partial immersion to BS EN 1609, Method B	50 mm	0.15 kg/m²
Long-term water absorption by total immersion to BS EN 12087, Method 2A	-	1.7 volume %, class W0,2*

2.4.2 Fire Performance

Test		Result
Ignitability by direct impingement of single flame to BS EN ISO 11925-2 and BS EN 13238	Ignition of sample	Yes
	Ignition of filter paper	No
Reaction to fire classification to BS EN 13501-1		Euroclass E* (combustible)

2.4.3 Thermal Performance

Test	Result
Apparent density to BS EN 1602, 24 hr at 23 °C	37.2 kg/m³
Declared aged thermal conductivity (λ_D) to BS EN 12667	mean 0.027 W/mK*, 30 - 80 mm thickness, 35 kg/m³ mean 0.028 W/mK*, 85 - 200 mm thickness

2.4.4 Adequacy of fill

Test	Result
Adequacy of fill Site visit to witness injection of the System	the System can be injected to fully fill the wall cavity space

2.4.5 Durability

Test		Result
Corrosion developing capacity on metals in humid 90 - 95 % RH and warm conditions	0.075 mm thick zinc foil	white corrosion and perforations in contact with the System
	0.075 mm thick copper foil	no perforations in contact with the System
Susceptibility to mould growth to CUAP Annex B	with spore addition	Rating 0
	without spore addition	Rating 0 - 1
Reaction to fire against ageing/degradation		reaction to fire does not decrease with time*

Total emission of volatile organic compounds from the System to BS EN ISO 16000-10 into indoor residential rooms of buildings is <0.095 mg/m³ and complies.

The REACH statement for the System in respect of dangerous substances confirms no flame retardants or biocides are present.

2.5 - SYSTEM COMPONENTS AND ANCILLARY ITEMS

2.5.1 System components included within the scope of this Agrément

The following components are integral to the System:

- polyisocyanate (Base Seal®) MDI catalyst - liquid component (A);
- polyol resin (IcyFoam Fill) - liquid component (B);

2.5.2 Ancillary items

Ancillary items detailed in this section may be used in conjunction with the System but fall outside the scope of this Agrément:

- injection machinery including plural component proportioners (double acting positive displacement piston metering pumps) fitted with suitable injection nozzles;
- survey equipment - borescope used to examine the cavity;
- ventilation sleeves/trunking - used to sleeve air vents;
- colour matched mortar - used to fill drill holes;
- mineral wool plugs - used to seal uncapped cavities.

CHAPTER 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 - NATIONAL BUILDING REGULATIONS

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

3.2.1 - ENGLAND
THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- B3(1) Internal fire spread (structure) - in a fire, the System does not prejudice the stability of the building.
- B3(4) Internal fire spread (structure) - a wall incorporating the System can inhibit the unseen spread of fire and smoke within concealed spaces.
- C2(a) Resistance to moisture - the installed walls can adequately protect the building from ground moisture.
- C2(b) Resistance to moisture - the installed walls can adequately protect the building from precipitation including wind-driven spray.
- C2(c) Resistance to moisture - the installed walls can adequately protect the building from interstitial and surface condensation.
- J4 Protection of the building - the System can be separated from hot combustion appliances, flue pipes, fireplaces and chimneys to prevent the building catching fire.
- L1(a)(i) Conservation of fuel and power - the System can limit heat gains and losses through walls and conserve fuel and power.
- Regulation 7(a) - Materials and workmanship - the System is manufactured from suitably safe and durable materials for its application and can be installed to give satisfactory performance.
- Regulation 23(1) - Requirements relating to thermal elements - the System can contribute to a wall complying with the requirements of L1(a)(i).
- Regulation 25 - Minimum energy performance requirements for new buildings - the System can contribute to the target CO_2 emission rates.
- Regulation 26 - CO_2 emission rates for new buildings - the System can contribute to satisfying this Requirement.
- Regulation 26A - Target fabric energy efficiency rate for new buildings - the System can contribute to satisfying this Requirement.

3.2.2 - WALES
THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- B3(1) Internal fire spread (structure) - in a fire, the System does not prejudice the stability of the building.
- B3(4) Internal fire spread (structure) - a wall incorporating the System can inhibit the unseen spread of fire and smoke within concealed spaces.
- C2(a) Resistance to moisture - the installed walls can adequately protect the building from ground moisture.
- C2(b) Resistance to moisture - the installed walls can adequately protect the building from precipitation including wind-driven spray.
- C2(c) Resistance to moisture - the installed walls can adequately protect the building from interstitial and surface condensation.
- J4 Protection of the building - the System can be separated from hot combustion appliances, flue pipes, fireplaces and chimneys to prevent the building catching fire.
- L1(a)(i) Conservation of fuel and power - the System can limit heat gains and losses through walls and conserve fuel and power.
- Regulation 7(a) - Materials and workmanship - the System is manufactured from suitably safe and durable materials for its application and can be installed to give satisfactory performance.
- Regulation 23(1) - Requirements relating to thermal elements - the System can contribute to a wall complying with the requirements of L1(a)(i).
- Regulation 25 - Minimum energy performance requirements for new buildings - the System can contribute to the target CO_2 emission rates.
- Regulation 26 - CO_2 emission rates for new buildings - the System can contribute to satisfying this Requirement.
- Regulation 26A - Target primary energy consumption rate for new buildings - the System can contribute to satisfying this Regulation.
- Regulation 26B - Target fabric performance value for new buildings - the System can contribute to a satisfying this Requirement.

3.2.3 - SCOTLAND
THE BUILDING (SCOTLAND) REGULATIONS 2004 AND SUBSEQUENT AMENDMENTS

3.2.3.1 Regulations 8 (1)(2) Fitness and durability of materials and workmanship

- 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

- 2.1 Compartmentation - a wall incorporating the System can inhibit the spread of fire and smoke.
- 2.4 Cavities - in a fire, the installed cavity wall can inhibit the unseen spread of fire and smoke within concealed spaces in the wall.
- 3.4 Moisture from the ground - the installed cavity wall can prevent moisture penetration from the ground.
- 3.10 Precipitation - the installed cavity wall can adequately protect against precipitation penetrating to the inner face of the building.
- 3.15 Condensation - the System will contribute to limiting the risk of surface and interstitial condensation.
- 3.19 Combustion appliances - relationship to combustible materials - the System can be separated from hot fixed combustion appliances to prevent damage to the building.
- 6.1(b) Carbon dioxide emissions - the System will contribute to energy conservation of the building by reducing carbon dioxide emissions.
- 6.2 Building insulation envelope - the System will contribute to the insulation envelope to resist thermal transfer.

- 7.1(a)(b) Statement of sustainability - the System can contribute to satisfying 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, Standards 1 to 6, 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), Technical Handbook (Non-Domestic).

3.2.4 - NORTHERN IRELAND
THE BUILDING REGULATIONS (NORTHERN IRELAND) 2012 AND SUBSEQUENT AMENDMENTS

- 23(a)(b) Fitness of materials and workmanship - the System is manufactured from materials which are suitably safe and acceptable for use as described in this Agrément.
- 28(a)(b) Resistance to moisture and weather - the installed cavity wall can prevent the passage of moisture from the ground and weather.
- 29 Condensation - the installed cavity wall will contribute to limiting the risk of interstitial condensation.
- 35 Internal fire spread - Structure (1) - in a fire, the System does not prejudice the stability of the building walls.
- 35 Internal fire spread - Structure (4) - a wall incorporating the System can inhibit the unseen spread of fire and smoke within concealed spaces.
- 39(a)(i) Conservation measures - the System can conserve fuel and power by limiting heat gains and losses through thermal elements of the building.
- 40(2) Target carbon dioxide emission rate - the System can contribute to a building to not exceed its calculated target carbon dioxide emission rate.
- 43 Renovation of thermal elements - the cavity wall can be renovated to comply with the requirement of regulation 39(a)(c).
- 73(1)(2) Protection of people and buildings - the System can be separated from hot combustion appliances, flue pipes, chimneys, hearth or fire place to prevent damage to the building by heat or fire.

3.2.5 - IRELAND
REQUIREMENTS: BUILDING REGULATIONS 1997 AND SUBSEQUENT AMENDMENTS

In order to demonstrate compliance with Irish Building Regulations this BDA Agrément® certifies that the System complies with the requirements of a recognised document and indicates it is suitable for its intended purpose and use:

- B3(1) Internal fire spread (structure) - the System does not prejudice the stability of walls.
- B3(3) Internal fire spread (structure) - a wall incorporating the System can inhibit the unseen spread of fire and smoke within concealed spaces.
- B8(1) Internal fire spread (structure) - the System does not prejudice the stability of walls.
- B8(3) Internal fire spread (structure) - a wall incorporating the System can inhibit the unseen spread of fire and smoke within concealed spaces.
- C4 Resistance to weather and ground moisture - the System when installed in accordance with this Agrément, can meet the relevant requirements.
- D1 Materials and workmanship - the System when installed in accordance with this Agrément, can meet the relevant requirements, are manufactured from suitably safe and durable materials for their application and can be installed to give a satisfactory performance.
- J3 Building protection - the System can be suitably separated from heat producing appliances, flue pipes and chimneys to prevent damage to the building by heat or fire.
- L1 Conservation of fuel and energy - the System can be designed and constructed to meet current 'U-value' requirements.

3.3 - THIRD-PARTY ACCEPTANCE

NHBC - In the opinion of Kiwa Ltd., the System in areas other than in very severe exposure zone locations with fair-faced masonry, if installed, used and maintained in accordance with this Agrément, can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standards, Chapter 6.1, External masonry walls.

Premier Guarantee - In the opinion of Kiwa Ltd., the System, if installed, used and maintained in accordance with this Agrément, can satisfy or contribute to satisfying the relevant requirements in relation to the Premier Guarantee Technical Manual, Chapter 7.1 External Masonry Walls.

CHAPTER 4 - SOURCES

- BS EN ISO 10211:2017 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations
- BS EN ISO 13788:2012 Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation. Calculation methods
- BS EN ISO 16000-10:2006 Indoor air. Determination of the emission of volatile organic compounds from building products and furnishing. Emission test cell method
- BS EN 1602:2013 Thermal insulating products for building applications. Determination of the apparent density
- BS EN 12087:2013 Thermal insulating products for building applications. Determination of long term water absorption by immersion
- BS EN 14318-1:2013 Thermal insulating products for buildings. In-situ formed dispensed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products. Specification for the rigid foam dispensed system before installation
- BS EN 14318-2:2013 Thermal insulating products for buildings. In-situ formed dispensed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products. Specification for the installed insulation products
- BS 476-21:1987 Fire tests on building materials and structures. Methods for determination of the fire resistance of loadbearing elements of construction
- BS 5250:2011+A1:2016 Code of practice for control of condensation in buildings
- BS 6093:2006+A1:2013 Design of joints and jointing in building construction. Guide
- BS 7456:1991 Code of practice for stabilization and thermal insulation of cavity walls (with masonry or concrete inner and outer leaves) by filling with polyurethane (PUR) foam systems
- BS 8000-0:2014 Workmanship on construction sites. Introduction and general principles
- BS 8000-3:2001 Workmanship on building sites. Code of practice for masonry
- Accredited Construction Details (Scotland) 2015
- BRE Information Paper 1/06:2006 Assessing the effects of thermal bridging at junctions and around openings

- BRE GBG 44-2:2000 Insulating masonry cavity walls: principal risks and guidance
- 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
- Government Accredited Construction details for Part L, England and Wales - masonry cavity wall insulation detail illustrations
- NHBC Standards 2019
- PAS 2030:2017 Specification for the installation of energy efficiency measures in existing buildings. Building Fabric Measures (BFM)
- Premier Guarantee Technical Manual Version 12:2017

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

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment Description	Amended By	Approved By	Date
-	First Issue	C Vurley	C Forshaw	October 2019