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BAR-19-084-P-A-UK
BDA Agrément®
Elastospray LWP 1672/1/I
Spray Foam Insulation
for Pitched Roofs

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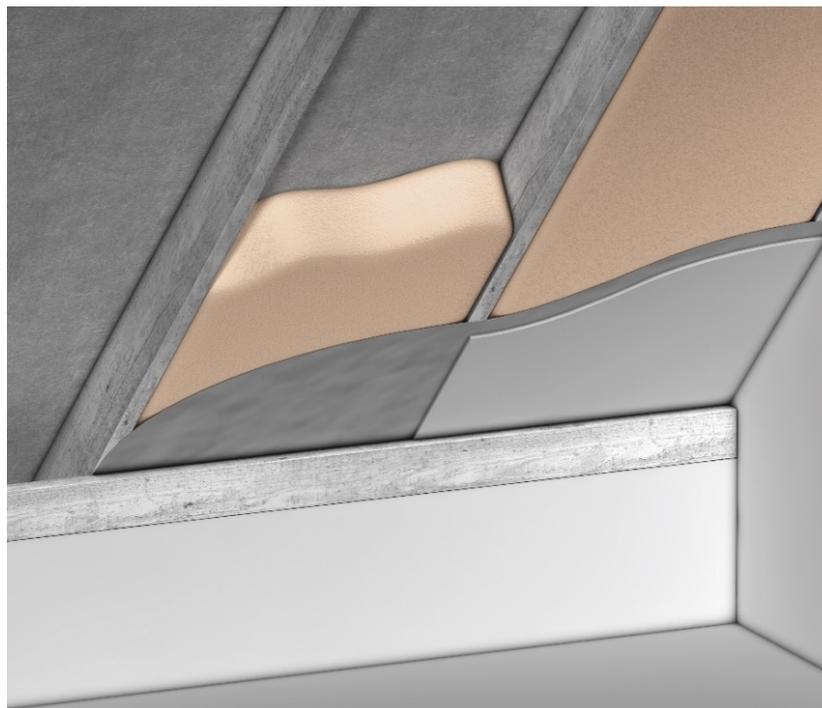
SCOPE

This Agrément relates to Elastospray LWP 1672/1/I (hereinafter the 'Product'), an in-situ formed, HFO blown, spray-applied (hereinafter 'applied') thermal insulation layer which contributes to the thermal performance, airtightness and watertightness of roofs with a pitch greater than 15 ° (hereinafter 'pitched roofs'). The Product is for internal application to the underside of pitched roofs with Type LR breather membrane (new build or retrofit), Type HR non-breathable membrane (retrofit) or sarking boards in loft and room in roof spaces of existing or new domestic buildings in the UK and Ireland.

DESCRIPTION

The Product consists of two liquid chemical components (hereinafter 'Product components') that are applied to form a closed cell structure, rigid polyurethane (PUR) seamless foam insulation layer, in accordance with BS EN 14315-2, that adheres to the treated surface. It is produced by an exothermic reaction between the isocyanate component and the resin component. Once applied, the Product expands, solidifies and cures. The Product is applied in layers until the final required design thickness (not exceeding 400 mm) is achieved.

PRODUCT ILLUSTRATION



THIRD-PARTY ACCEPTANCE

NHBC - For detailed information see section 3.3 (Third-Party Acceptance).

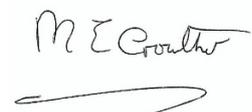
STATEMENT

It is the opinion of Kiwa Ltd. that the Product 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 Product. This Agrément covers the following:

- Conditions of use;
- Initial Factory Production Control, Quality Management System and the Annual Verification procedure;
- Points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed Product characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party Acceptance;
- Sources, including codes of practice, test and calculation reports.

MAJOR POINTS OF ASSESSMENT

Thermal performance - the Product improves the thermal performance of pitched roofs and has a declared aged thermal conductivity of 0.025 - 0.027 W/mK* depending on application thickness (see section 2.1.10).

Moisture control - the Product (see section 2.1.11):

- has a high-volume closed cell percentage;
- has adequate water vapour transmission resistance;
- can contribute to limiting the risk of interstitial and surface condensation;
- has adequate resistance to water penetration.

Fire performance - the Product is classified as European Classification E* (combustible), in accordance with BS EN 13501-1 (see section 2.1.12).

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

CE marking - the Agrément holder has taken responsibility for CE marking the Product in accordance with all relevant harmonised European Product Standards. An asterisk (*) appearing in this Agrément indicates that data shown is given in the Product manufacturer's Declaration of Performance (DoP).

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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 Product relates to its use in accordance with this Agrément and the Agrément holder's requirements.

1.1.3 Assessment

Kiwa Ltd. has assessed the Product in combination with its relevant DoPs, test reports, technical literature and factory and site visits. Also, the NHBC Standards 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 shall be an employee of the installation company.

The Product shall be installed strictly in accordance with this Agrément and the Agrément holder's requirements.

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 Product 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. After this, the validity of the Agrément can be extended every three years after a positive review.

1.2 - INITIAL FACTORY PRODUCTION CONTROL (FPC)

- Kiwa Ltd. has determined that the Agrément holder has fulfilled all provisions of the specifications described in this Agrément in respect of the Product.
- 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.
- A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 - QUALITY MANAGEMENT SYSTEM (QMS)

- The Agrément holder:
 - has an effective and well maintained QMS in operation which covers the necessary clauses required for BDA Agrément®.
 - is committed to continually improving their FPC, QMS and associated procedures.
- Document control and production line procedures were deemed satisfactory, with sufficient evidence provided in support of BDA Agrément® requirements.

1.4 - 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.

2.1.1 Design responsibility

The Agrément holder reviews all designs submitted and offers design advice and guidance to ensure a compliant final project specific design.

2.1.2 Applied building physics (heat, air, moisture)

The physical behaviour of the pitched roofs incorporating the Product 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 pitched roof 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

The Product can be applied directly to a pitched roof construction incorporating:

- Type LR breather membrane;
- Type HR non-breathable membrane;
- sarking boards.

Pitched roofs incorporating the Product can adequately limit the risk of interstitial and surface condensation when designed in accordance with BS 5250 Annex H and BRE Report 262. Room spaces should be ventilated in accordance with BS 5250 Annex K. Care should be taken to provide adequate trickle ventilation, particularly in rooms expected to experience high humidity, and to ensure the integrity of any vapour control layer (hereinafter 'VCL') (where installed) and plasterboard lining against vapour ingress.

Cavity barriers should be provided at the edges of cavities, including around rooflights and service penetrations, with fire-resisting elements, in accordance with the relevant provisions of the national Building Regulations.

Ventilation openings should be arranged to prevent the ingress of rain, snow, birds and small animals, and the risk of blockage by other building operations.

Care is needed for design detailing of joints at rooflight and flue pipe openings and should be in accordance with BS 6093.

The Product shall not be applied over junctions between roofs and compartment walls or external walls required to provide a minimum period of fire resistance. Care shall be taken to ensure continuity of fire resistance at junctions with fire-resisting elements, in accordance with the national Building Regulations.

In habitable roof space, the Product shall be covered by a plasterboard lining fixed to rafters and with all joints taped, sealed and supported by timber studwork elements to give a minimum 30-minute fire rating.

The Product shall be separated by 200 mm from any heat-emitting devices and any potential source of ignition, where the temperature is in excess of 70 °C.

Do not apply the Product over electrical cables, recessed lighting, existing vents or ventilation gaps. Consider rerouting, re-laying in conduit or trunking, or de-rating electrical cables. Replace existing recessed lighting with ventilated fittings which incorporate a protective fire hood (see section 2.3.4).

The Product is a closed cell foam which is inert once cured and is therefore chemically inactive. The Product will not react with metals typically used in construction elements.

The Product must not be applied to a VCL.

Retrofit design considerations

Existing pitched roofs shall be in a good state of repair with no evidence of rain penetration or damp. Any necessary repairs shall be carried out prior to installation.

New build design considerations

New pitched roofs should be designed and constructed in accordance with the national Building Regulations, for the site exposure and wind-driven rain index in accordance with BS 8104, to prevent moisture ingress and air infiltration.

2.1.4 Project specific design considerations

Prior to the application of the Product, an inspection must be carried out. The primary requirement of the pre-installation survey is to determine the following:

- the external condition of the pitched roof, valleys, gutters, chimney stacks, flashings etc;
- that there is no existing rain ingress and there are no signs of damp, staining or condensation on the internal face of the pitched roof;
- the type, suitability and condition of timbers;
- the type and condition of any sarking boards or breather membrane present;
- pitched roof space ventilation requirements;
- the location of expansion joints;
- areas not to be treated.

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

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

Installation shall be by employees trained and approved by the Agrément holder under the BASF Foam Masters Scheme.

2.1.7 Delivery, storage and site handling

The Product components are delivered to site in suitable containers, that bear the Product component name, the Agrément holder's name and the BDA Agrément® logo incorporating the number of this Agrément.

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

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

The Product components:

- are sensitive to humidity and shall be stored in sealed drums or hermetically sealed tanks to protect from moisture;
- shall be stored between 10 °C and 25 °C.

The isocyanate component is classified as 'harmful' under The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP 4); drums containing the isocyanate component bear the appropriate hazard warning signs. Ventilate and vacate the installed space for 24 hours subsequent to installation to prevent the inhalation of isocyanate vapour. When cured, the Product is non-hazardous.

2.1.8 Durability

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

The Product is inert once cured and is therefore chemically inactive. The Product does not encourage corrosion on metals. No corrosive substances are released from the cured Product.

2.1.9 Maintenance and repair

Once installed, the Product does not require regular maintenance provided the weathertightness of the pitched roof is maintained. Damaged or poorly applied Product shall be removed from the affected area using a handsaw. New Product should then be applied. For advice in respect of repair, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.1.10 Thermal performance

Thermal conductivity

The Product offers high thermal resistance relative to its installed thickness, in accordance with BS EN 12667.

For the purpose of thermal transmittance (hereinafter 'U-value') calculations and to determine if the requirements of the national Building Regulations are met, the thermal resistance and U-value of pitched roofs incorporating the Product should 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 Product's declared thermal conductivity (λ_D). Design and declared thermal values can be found in BS EN ISO 10456.

The Product can be used to upgrade a pitched roof that already has insulation between the rafters, to meet current U-value requirements.

The maximum thickness of the Product should not exceed 400 mm. For improved thermal/carbon emissions performance, increased insulation thickness may be required.

Account should be taken of standardised junction details in the Government Accredited Construction Details for Part L, England and Wales, Accredited Construction Details for Scotland, and energy efficiency measures in PAS 2030 and PAS 2035.

The requirement for limiting heat loss through a pitched roof, including the effect of thermal bridging, can be satisfied if the U-value of a pitched roof incorporating an appropriate thickness of the Product does not exceed the maximum U-value requirement in the national Building Regulations.

Thermal bridging at junctions and around openings

Care shall be taken in the overall design and construction at junctions with external walls and openings to minimise air infiltration and thermal bridging.

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.

The applied Product forms a solid, seamless, airtight insulating foam layer without joints or gaps, reducing thermal bridges.

2.1.11 Moisture control

Cell structure

The Product has a high-volume closed cell percentage (90 %), in accordance with BS EN ISO 4590.

Water vapour transmission resistance

The Product has a low level of water vapour permeability (high water vapour resistance), in accordance with BS EN 12086 Method A.

Condensation risk

Pitched roofs incorporating the Product can adequately limit the risk of interstitial and surface condensation when designed in accordance with BS 5250 Annex H and BRE Report 262. Room spaces should be ventilated in accordance with BS 5250 Annex K. Care should be taken to provide adequate trickle ventilation, particularly in rooms expected to experience high humidity, and to ensure the integrity of any VCL (where installed) and plasterboard lining against vapour ingress.

A Condensation Risk Analysis can be carried out by the Agrément holder on a project-specific basis, in accordance with BS 5250 Annex D, BS EN ISO 13788 and BS EN 13370.

Water permeability

The closed cell structure means the Product is water-resistant and has adequate watertightness, in accordance with BS EN 1928 and EOTA TR 003, to prevent water infiltration into a building.

2.1.12 Fire performance

The Product is classified as European Classification E* (combustible), in accordance with BS EN 13501-1.

The Product must be:

- protected from naked flames and other ignition sources during and after application;
- suitably separated from any potential source of ignition.

The exposed Product has the potential to contribute to the development stages of a fire.

Pitched roofs must incorporate cavity barriers at edges, around openings, at junctions and in extensive cavities with fire-resisting elements, in accordance with the relevant provisions of the national Building Regulations.

The Product shall be separated by 200 mm from any heat-emitting devices and any potential source of ignition, where the temperature is in excess of 70 °C.

In habitable roof spaces, the Product shall be covered by a plasterboard lining fixed to rafters or battens and with all joints taped, sealed and supported by battens to give a minimum 30-minute fire rating.

Replace existing recessed lighting with ventilated fittings which incorporate a protective fire hood.

Proximity of flues and appliances

The installed Product shall be separated or shielded from any heat-emitting devices, recessed lighting, flue pipes or chimneys passing through a pitched roof and any potential source of ignition where the temperature is in excess of 70 °C, by non-combustible insulation, in accordance with the provisions of the national Building Regulations.

2.2 - EXAMPLES OF DETAILS

Diagram 1 - Existing pitched roof with Type HR non-breathable membrane

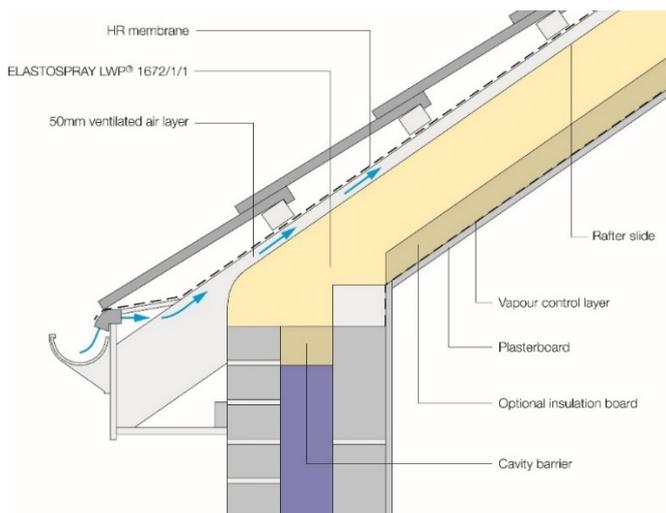
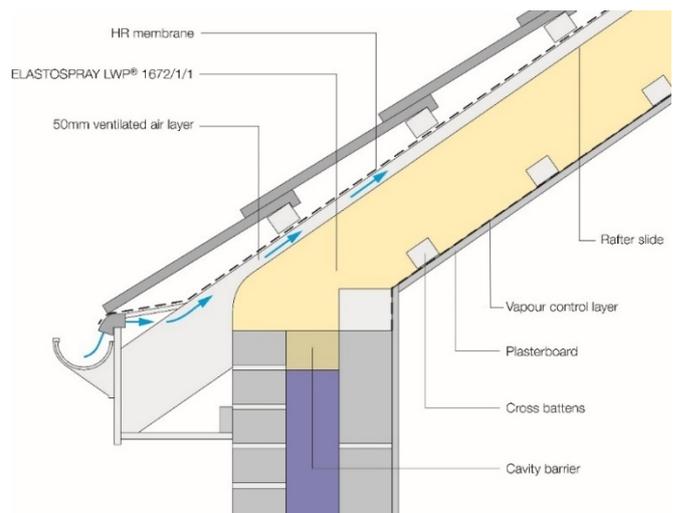


Diagram 2 - Existing warm pitched roof with cross battens



2.3 - INSTALLATION

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 General

Installation of the Product shall be carried out in accordance with BS 8000-0 and BS EN 14315-2.

During application, prohibit contact with naked flames and sources of ignition.

Do not weld or cut metal which is in contact with the Product. If it is necessary to weld metal elements, this shall be done before applying the Product.

Application of the Product may produce a build-up of harmful vapours. Installers must wear personal protection equipment (PPE) when working with the Product including nitrile gloves, disposable overalls and full-face mask (with A2P3 filters) air-fed from NIOSH-approved pumping equipment.

Some vapours given off by Product components are heavier than air and will naturally move to lower parts of the building compartment. These areas should be suitably ventilated. In certain conditions (e.g. application in a confined space) the use of extractor fans is recommended. Ensure proper ventilation in the work area.

To prevent the Product from entering an occupied space, the loft hatch/cover shall be kept closed during application.

The moisture content of the surfaces of porous materials should not exceed 20 % before application commences. Non-porous surfaces must be dry and free from condensation.

The ambient air/substrate temperature shall be between 5 °C and 30 °C. An infrared or contact thermometer can be used for checking surface temperature.

The relative humidity of the air in the workplace must be less than 85 % to minimise the risk of surface condensation. Care should be taken to ensure that ingress of moisture vapour from the rest of the dwelling space is restricted.

The spraying machine must be specially designed to mix and apply the Product via a spray gun. The Product is applied with volumetric displacement pumps with fixed mixing ratio 100:100 by volume. The ratio will be controlled prior to each application by measuring the flow rates of the two Product components before they pass through the mixer in the spraying machine. The value must not differ from 5 % by mass to the indicated value.

The Product components must not be used when their temperature is below 10 °C. Optimum temperatures for processing the Product components shall be between 18 °C and 22 °C.

The spraying machine shall have a temperature controller in the pre-heaters and in the hoses. The working temperature shall be set between 40 °C and 55 °C depending on the ambient temperature conditions.

Due to the short reaction time, application can be performed without resulting in sagging. The Product hardens quickly, although it will not be completely cured until approximately 24 hours have passed.

Care should be taken to minimise the degree of overspray generated whilst applying.

The total applied Product thickness will depend on the required U-value.

The Product must not make contact with heat-emitting flue pipes, appliances and chimneys etc. If hot work is to take place near the Product, it must be cut back by 1 m and protected by heat blankets.

Use wind screens if applying from outside when the wind speed is over 17 miles per hour.

Self-verification quality control checks provided for in BS EN 14315-2 shall be carried out by the installer in respect of core density, appearance and thickness.

2.3.4 Preparation

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

- the substrates must be clean, dry and free from dirt, dust, grease, oils and loose particles/torching;
- a small adhesion test should be made to the substrate to guarantee good bonding, especially on metal surfaces. This will determine if a primer is required for maximum adhesion;
- any necessary repairs such as replacing damp or broken/rotten timbers must be made prior to application;
- repair any damaged or dislodged valleys, gutters, flashings, slates or tiles;
- any timber treatment carried out;
- ensure the pitched roof is weathertight before application of the Product;
- cover front faces of surfaces not to be treated, e.g. exposed joists, purlins and rafters;
- cover services, e.g. electrical cables, and pipes;
- isolate heat-emitting pipes, flues, etc. by applying non-combustible thermal insulation around them;
- access to services, task lighting, safety and breathing equipment and ventilation facility (if required) should be positioned in the compartment to be treated prior to application.

2.3.5 Outline procedure

Initial set-up

1. set the appropriate temperature and pressure parameters to guarantee the mixing quality of the Product and select a suitable application nozzle;
2. carry out quality control tests to check for a round application pattern, sticky patches, light or dark patches/streaks, no voids, consistent colour, appearance and reaction profile - cream time, gel time, tack-free time and free rise density, using test methods in accordance with BS EN 14315-1 Annex E;
3. interlaminar adhesion shall be checked on a two-layer application sample;
4. check density of the Product is in accordance with Agrément holder's recommendations.

The key sequence for installation is:

1. apply the Product in sections, starting at the eaves and working across towards the ridge, in a horizontal direction from right to left and from left to right, continuously onto a surface in a flash coat/primer using a quick pass;
2. once this layer is cured (dry to the touch), a second layer (20-25 mm thick) is applied to give a maximum total thickness of 25 mm;
3. when the previous layer has cured (dry to the touch), apply additional layers of maximum thickness of 40 mm;
4. additional layers should be applied within 10 minutes of the previous layer to achieve the design thickness (not exceeding 400 mm);
5. once cured and cold, the Product can be trimmed flat using a handsaw if required.

Warm pitched roof - insulation between rafters

The Product shall be applied between rafters directly to the underside of existing Type LR breather membrane. Care must be taken to ensure the integrity of the Type LR breather membrane when applying the Product where rafter slides have not been used.

Warm pitched roof - insulation between and under rafters

The Product shall be applied under a Type LR breather membrane to the depth of the rafters. Cross-battens shall then be mechanically fixed to the rafters. The battens shall be of sufficient width and spacing (up to 600 mm) to provide adequate support to which the plasterboard lining can be mechanically fixed. Application of the Product shall then resume in 20 - 25 mm layers. A VCL shall be on the warm side of the insulation behind the plasterboard lining.

Other warm pitched roofs

The Product shall be applied directly to the underside of:

- timber sarking boards;
- polyisocyanurate (PIR) or expanded polystyrene (EPS) insulation boards;

Rafter slides

Rafter slides are used with Type HR non-breathable membrane. Once stapled to the rafters, the Product shall be applied over the rafter slides in layers as described above.

2.3.6 Finishing

The following finishing is required on completion of the installation:

- the Product shall be cured and cold prior to undertaking any finishing work;
- in habitable rooms, the Product shall be covered by plasterboard lining, with all joints taped, sealed and supported by studs, noggins or battens;
- in applications where the Product is left exposed, prominent 'fire warning' labels shall be placed in treated areas.

2.4 - INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.4.1 Thermal performance

Test	Result
Declared aged thermal conductivity (λ_D), in accordance with BS EN 14315-1 Annex C and BS EN 12667	0.027 W/mK for < 80 mm thickness
	0.026 W/mK for 80 < 120 mm thickness
	0.025 W/mK for > 120 mm thickness ^a

^a the maximum thickness of the Product must not exceed 400 mm

2.4.2 Moisture control

Test	Result	
Cell structure	Open and closed cell volume %, in accordance with BS EN 14315-1 and BS EN ISO 4590	mean 90 % closed cell content, Class CCC4
Water vapour transmission	Water vapour transmission diffusion resistance factor μ , in accordance with BS EN 14315-1 and BS EN 12086 Method A	mean 74 for 50 mm thickness
	Water vapour resistivity, in accordance with BS EN 12086	mean 325 MNs/gm
	Water vapour permeability, in accordance with BS EN 12086	mean 0.7519 mg/(mhPa)
Water permeability	Long-term water absorption by total immersion test, in accordance with BS EN 12087 Method 2B	< 2 %
	Long-term water absorption by partial immersion, in accordance with BS EN 12087 Method 1B	< 0.20 kg/m ²
	Short-term water absorption by 24 hour partial immersion, in accordance with BS EN 14315-1 and BS EN 1609 Method B	< 0.10 kg/m ² (mean 0.07 kg/m ² for 50 mm thickness)
	Partial immersion of the foam core	mean 0.15 kg/m ²
	Partial immersion of the outer skin	mean 0.08 kg/m ²
	Permeability to water (at 60 kPa (6 m column of water) or 0.6 bar), in accordance with BS EN 1928 Methods A and B	watertight
	Watertightness (water pressure at 60 kPa (6 m column of water) or 0.6 bar for 24 hours), in accordance with EOTA TR 003	watertight

2.4.3 Fire performance

Test	Result
Ignitibility, in accordance with BS EN 13238 and BS EN ISO 11925-2	flame propagation < 15 cm flame propagation height in 20 s, no paper inflammation - pass
Continuous glowing combustion (smouldering), in accordance with BS EN 13238 and BS EN 16733	the Product does not show propensity for continuous smouldering combustion - pass
Reaction to fire performance classification, in accordance with BS EN 13501-1	E* (combustible)
Durability of reaction to fire against ageing/degradation, in accordance with BS EN 14315-1	reaction to fire does not decrease with time

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

2.5 - ANCILLARY ITEMS

Note:

Ancillary items detailed in this section may be used in conjunction with the Product but fall outside the scope the Agrément, include:

- spray machinery including plural component proportioner (double-acting positive displacement piston metering pumps), transfer pumps, primary heaters and heated hose fitted with spray gun application equipment;
- Type HR non-breathable membrane and Type LR breather membrane;
- corrugated cardboard rafter slide (water vapour permeable) fitted between rafters to create a 50 mm ventilation gap between the Type HR non-breathable membrane/sarking board and the Product;
- plastic ventilator spacer used at eaves and/or ridge to create a 50 mm ventilation gap between the Type HR non-breathable membrane/sarking board and the Product. It also keeps the eaves clear of the Product (fitted at eaves);
- VCL;
- plasterboard lining.

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 Product, 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 REQUIREMENTS: THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - a pitched roof incorporating the Product can adequately protect a building from interstitial and surface condensation
- J4 Protection of building - the Product can be separated from hot appliances and surfaces to prevent a building catching fire
- L1(a)(i) Conservation of fuel and power - the Product can limit heat gains and losses through a pitched roof
- Regulation 7(1) Materials and workmanship - the Product is manufactured from suitably safe and durable materials for its application and can be installed to give a satisfactory performance
- Regulation 23(1) Requirements relating to thermal elements - the Product can contribute to a pitched roof complying with the requirements of L1(a)(i)
- Regulation 26 CO₂ emission rates for new buildings - the Product can contribute to a building to not exceed its CO₂ emission rate
- Regulation 26A Fabric energy efficiency rates (new buildings) - the Product can contribute to satisfying this Requirement

3.2.2 - WALES REQUIREMENTS: THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - a pitched roof incorporating the Product can adequately protect a building from interstitial and surface condensation
- J4 Protection of building - the Product can be separated from hot appliances and surfaces to prevent a building catching fire
- L1(a)(i) Conservation of fuel and power - the Product can limit heat gains and losses through a pitched roof
- Regulation 7(1) Materials and workmanship - the Product is manufactured from suitably safe and durable materials for its application and can be installed to give a satisfactory performance
- Regulation 23(1) Requirements relating to thermal elements - the Product can contribute to a pitched roof complying with the requirements of L1(a)(i)
- Regulation 26 CO₂ emission rates for new buildings - the Product can contribute to a building to not exceed its CO₂ emission rate
- Regulation 26A Primary energy consumption rates for new buildings - the Product can contribute to satisfying this Regulation
- Regulation 26B Fabric performance values for new dwellings - the Product can contribute to satisfying this Requirement

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

3.2.3.1 Regulation 8(1)(2) Durability, workmanship and fitness of materials

- The Product 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

- 3.15 Condensation - a pitched roof incorporating the Product can protect a building from moisture caused by surface or interstitial condensation
- 3.19 Combustion appliances - relationship to combustible materials - the Product can be separated from fixed combustion appliances to prevent damage to a building
- 6.1(b) Carbon dioxide emissions - the Product will contribute to energy conservation of a building
- 6.2 Building insulation envelope - the Product will contribute to the insulation envelope to resist thermal transfer
- 7.1(a)(b) Statement of sustainability - the Product can contribute to satisfying the relevant Requirements of Regulation 9, Sections 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard; in addition, the Product 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)

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

- 23(a)(b) Fitness of materials and workmanship - the Product is suitable and can be adequately mixed, prepared and applied
- 29 Condensation - pitched roofs incorporating the Product can adequately protect a building from moisture in the form of interstitial condensation
- 39(a)(i) Conservation measures - the Product will limit heat gains and losses through a pitched roof
- 40(2) Target carbon dioxide emission rate - the Product will contribute to a building to not exceed its target CO₂ emission rate
- 73(1)(b) Protection of people and buildings - the Product can be separated from combustion appliances, flue-pipes, flues or chimneys to prevent damage to a 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 Product complies with the requirements of a recognised document and indicates it is suitable for its intended purpose and use.

- D1 Materials and workmanship - the Product is manufactured from suitably safe and durable materials for the application and can be installed to give a satisfactory performance
- J3 Protection of building - the Product can be separated from heat producing appliances, flue pipes or chimneys to prevent a building catching fire
- L1 Conservation of Fuel and Energy - the Product can enable a building to conserve energy and limit CO₂ emissions

3.3 - THIRD-PARTY ACCEPTANCE

NHBC - In the opinion of Kiwa Ltd., the Product, 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 7.2 Pitched roofs.

CHAPTER 4 - SOURCES

- BS EN ISO 4590:2016 Rigid cellular plastics. Determination of the volume percentage of open cells and of closed cells
- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods
- 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 ISO 11925-2:2010 Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test
- BS EN ISO 13370:2017 Thermal performance of buildings. Heat transfer via the ground. Calculation methods
- 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 1609:2013 Thermal insulating products for building applications. Determination of short term water absorption by partial immersion
- BS EN 1928:2000 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of watertightness
- BS EN 12086:2013 Thermal insulating products for building applications. Determination of water vapour transmission properties
- BS EN 12087:2013 Thermal insulating products for building applications. Determination of long term water absorption by immersion
- 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 13238:2010 Reaction to fire tests for building products. Conditioning procedures and general rules for selection of substrates
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests
- BS EN 14315-1:2013 Thermal insulating products for buildings. In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products. Specification for the rigid foam spray system before installation
- BS EN 14315-2:2013 Thermal insulating products for buildings. In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products. Specification for the installed insulation products
- BS EN 16733:2016 Reaction to fire tests for building products. Determination of a building product's propensity to undergo continuous smouldering
- BS 476-3:2004 Fire tests on building materials and structures. Classification and method of test for external fire exposure to roofs
- 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 8000-0:2014 Workmanship on construction sites. Introduction and general principles
- 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
- EOTA TR 003:1999 Determination of the watertightness
- Government Accredited Construction Detail for Part L:2019
- NHBC Standards 2020
- PAS 2030:2019 Specification for the installation of energy efficiency measures in existing buildings
- PAS 2035:2019 Retrofitting dwellings for improved energy efficiency - Specification and guidance

Remark: apart from these sources confidential reports may also have been assessed; any relevant reports are in the possession of Kiwa Ltd. and kept in the Technical Assessment File of this Agrément; the Installation Guides are current at the time of publication and 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 Devine	C Vurley	February 2021