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BDA Agrément®
Insulthane 50
Spray Foam Insulation for Pitched Roofs

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SCOPE OF AGRÉMENT

This BDA Agrément® (hereinafter 'Agrément') relates to Insulthane 50 (hereinafter the 'Product'). The Product is an in-situ formed, water-blown, spray-applied (hereinafter 'applied') thermal insulation layer which contributes to the thermal performance of timber-framed pitched roofs. The Product is for internal application between timber rafters in pitched roofs with a high resistance (hereinafter 'HR') roof underlay (for retrofit applications only), a low resistance (hereinafter 'LR') roof underlay, or sarking boards in new and existing residential and non-residential buildings. Alternatively, the Product is applied at ceiling level where the attic space is non-habitable.

DESCRIPTION

The Product consists of two liquid-based components (hereinafter 'Product components') that are mixed under pressure and applied in-situ to form an open cell structure, semi-rigid polyurethane (hereinafter 'PUR') seamless foam insulation layer, in accordance with BS EN 14315-2, that adheres to the treated surface. The Product is applied in layers until the final required design thickness (not exceeding 400 mm) is achieved. Once applied, the Product expands, solidifies and cures.

ILLUSTRATION



THIRD-PARTY ACCEPTANCE

See Section 3.3 (Third-Party Acceptance).

STATEMENT

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

- Conditions of use;
- Production Control, Quality Management System and the Annual Verification Procedure;
- Product components and ancillary items, 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, as appropriate;
- Sources.

MAJOR POINTS OF ASSESSMENT

Moisture control - see Section 2.2.7 - the Product:

- has a low-volume closed cell percentage
- can contribute to limiting the risk of interstitial and surface condensation;
- is not resistant to water penetration;
- has low water vapour transmission resistance.

Strength - see Section 2.2.8 - the Product has adequate adhesion strength on substrates it is intended to be applied to.

Fire performance - see Section 2.2.9 - the Product is classified as European Classification F, in accordance with BS EN 13501-1.

Thermal performance - see Section 2.2.10 - the Product improves the thermal insulation of pitched roofs and can contribute to satisfying the requirements of the national Building Regulations.

Durability - see Section 2.2.11 - the Product shall have a service life durability equivalent to that of the building into which it is incorporated.

UKCA, UKNI and CE marking - see Section 2.2.12 - the Agrément holder has responsibility for conformity marking, in accordance with all relevant British and European Product Standards.

CONTENTS

Section 1 - General considerations
1.1 - Conditions of use
1.2 - Production Control and Quality Management System
1.3 - Annual Verification Procedure - continuous surveillance
Section 2 - Technical assessment
2.1 - Product components and ancillary items
2.2 - Points of attention to the Specifier
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2.4 - Installation
2.5 - Independently assessed Product characteristics
Section 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
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Section 4 - Sources
Section 5 - Amendment history
Section 6 - Conditions of use

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 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 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 Product 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, Northern Ireland and 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 Product 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 Product.

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 Product 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 Product. It is intended only as an assessment of safety and fitness for purpose.

2.1 PRODUCT 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 Product.

Table 1 - Integral components

Product	Description
Insulthane 50	an in-situ formed, semi-rigid PUR, open cell foam insulation complying with BS EN 14315-1. It is produced by an exothermic reaction between an isocyanate component and a resin (polyol blend) component. Once sprayed and cured, it has a density ranging from 7 to 12 kg/m^3

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 Product, but fall outside the scope of this Agrément:

- spray machinery;
- roof covering;
- timber rafters;
- ceiling joists;
- timber battens;
- LR and HR roof underlay;
- vapour control layer (hereinafter 'VCL');
- plasterboard lining.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design

2.2.1.1 Design responsibility

Project-specific design is the responsibility of an Approved Installer, trained and approved by the Agrément holder. The Specifier may be an Approved Installer.

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 Product.

2.2.1.3 General design considerations

The Product is satisfactory for use in reducing the thermal transmittance (hereinafter 'U-value') of the pitched roof of new and existing residential and non-residential buildings.

A project-specific design is required. This shall be developed in close co-operation with the Agrément holder. It shall give due consideration to:

- BS EN 300;
- BS EN 351-1;
- BS EN 1995-1-1 / I.S. EN 1995-1-1;
- BS EN 14081-1;
- BS 5250;
- BS 5534;
- BS 8000-0;
- BS 8000-6;
- BS 8103-3;
- BS 8104;
- BS 9250;
- PD 6693-1;
- PD 6697.

Buildings incorporating the Product shall be designed and constructed to prevent moisture penetration and air infiltration, in accordance with the relevant Codes and Standards.

Installation of the Product shall not be undertaken until the roof is weathertight, i.e. the roof is in place and the window and door openings, and all joints are sealed, and the moisture content of any timber is less than 19 %.

In new buildings, ventilation openings shall be:

- provided in two opposite sides of the pitched roof to promote cross ventilation, with a 5 mm opening at ridge level and a 25 mm at eaves;
- arranged with due consideration to potential ingress of rain, snow, birds and small animals, whilst also reducing the risk of blockage by other building operations.

The Product shall not be applied over electrical cables, recessed lighting, existing vents or ventilation gaps. Consider re-routing, re-laying in conduit or trunking, or de-rating electrical cables. Replace existing recessed lighting with ventilated fittings that incorporate a protective fire hood.

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

To prevent water ingress, due consideration shall be given to the design of joint detailing of rooflights and flue pipes and services penetrations in accordance with BS 6093.

Where applicable (i.e. new building), the guidance given in BRE Report 262 shall be followed in connection with the weathertightness of roof constructions. The Specifier shall select a construction appropriate to the intended exposure zone category in accordance with BS 5534 and BS 8104, paying due regard to the design detailing, workmanship and materials to be used.

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

A suitable VCL incorporating lapped and sealed joints shall be applied behind the lining board in pitched roofs, unless an assessment to BS 5250 indicates that it is not necessary.

2.2.1.4 Project-specific design considerations
The project-specific design shall:
- be determined by the Agrément holder;
- 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 project-specific designer shall ensure that the following considerations are included in the development of a project-specific design:
- structural adequacy of supporting roof;
- adequacy of roof underlay;
- U-value requirements;
- condensation risk analysis and ventilation requirements;
- choice of a suitable VCL;
- choice of a suitable plasterboard appropriate to the fire rating of the roof;
- thermal expansion effects of the supporting roof and the Product;
- resistance to the ingress of precipitation and moisture.

Account shall be taken of Government Accredited Construction Details for Part L, England and Wales and Accredited Construction Details for Scotland (hereinafter 'Government Accredited Construction Details'), and energy efficiency measures in PAS 2030 and PAS 2035.

2.2.2 Applied building physics (heat, air, moisture)
A Specialist shall check the hygrothermal behaviour of a project-specific design incorporating the Product 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 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 and subject to inspections by Kiwa Ltd. under a Kiwa Installation Assessment & Surveillance Scheme.

2.2.5 Delivery, storage and site handling
The Product components are delivered in suitable packaging bearing relevant identification information (such as the Product 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 Product components shall be stored in accordance with the Agrément holder's requirements. Good housekeeping protocols shall be followed to avoid damage.

Prior to installation, store the Product components in accordance with the Agrément holder's requirements. When 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 Product components in sealed drums or hermetically sealed tanks indoors at temperatures between 15 °C and 24 °C;
- store in a well-ventilated covered area to protect Product components from rain, frost and humidity;
- store away from possible ignition sources.

The isocyanate component is classified as 'harmful' under The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP 4); drums containing Product components bear the appropriate hazard warning signs. The treated area shall be adequately ventilated after application to prevent the inhalation of isocyanate vapour. When cured, the Product is non-hazardous.

The Agrément holder has the responsibility of classifying and labelling the product under Regulation (EC) No 1272/2008 (CLP) on the Classification, packaging and labelling of chemical substances and mixtures. Installation and handling of the Product shall follow the precautions given in the relevant Safety Data Sheets.

2.2.6 Maintenance and repair

Once installed, the Product does not require regular maintenance, provided the weathertightness of the pitched roofs is maintained. Damaged or poorly applied Product shall be completely removed and re-applied. For advice in respect of repair and maintenance concerns, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.2.7 Moisture control

Cell structure

The Product has a very low-volume closed cell percentage (2.63 %), in accordance with BS EN ISO 4590 and is detailed in Section 2.5.1.

Condensation risk

The Product has low water vapour transmission resistance in accordance with BS EN 12086 and is detailed in Section 2.5.1.

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

The Specifier shall carry out a condensation risk analysis (CRA) at design stage on a project-specific basis, in accordance with BS 5250 and BRE Report 262, including an assessment of junctions, openings and penetrations.

Water absorption

The open cell structure means the Product has low resistance to water absorption by immersion, in accordance with BS EN ISO 29767, and is detailed in Section 2.5.1.

2.2.8 Strength

The substrate adhesion of the Product in accordance with BS EN 1607 is detailed in Section 2.5.2.

The Specifier shall ensure that the adhesion of the Product to the substrate is sufficient. To guarantee good bonding, the substrate may be prepared prior to application in accordance with the Agrément holder's requirements.

The Product shall be protected to ensure no damage occurs when handling building materials and tools during installation or where there is risk of damage after the Product is fully cured but not yet covered.

2.2.9 Fire performance

The Product is classified as European Classification F, in accordance with BS EN 13501-1.

The fire classification of any pitched roof containing the Product will depend upon the roof finish and its components. This will also determine the boundary limitations in accordance with the national Building Regulations.

The Product shall be:

- protected from naked flames and other ignition sources at all times;
- applied away from recessed lighting, and shall not be applied inside electric outlets or junction boxes.

The Product shall not be applied over junctions between roofs and compartment walls or external walls that are required to provide a minimum period of fire resistance.

Pitched roofs shall incorporate cavity barriers at edges, junctions, around openings, rooflights and service penetrations with fire-resisting elements, ensuring continuity of fire resistance, in accordance with the national Building Regulations.

For habitable room spaces, the roof structure shall achieve a minimum 30-minute fire rating.

Proximity of flues and appliances

The installed Product shall be adequately separated from any heat-producing appliance, fixed combustion appliance, chimney or incinerator flue pipes passing through a pitched roof. Recommended means of separation are detailed in the Approved Documents supporting the national Building Regulations.

2.2.10 Thermal performance

Thermal conductivity

The U-value of a completed pitched roof will depend on the insulation thickness, the roof structure and its coverings.

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

For the purpose of 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 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 Product's declared 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 U-value of a pitched roof incorporating an appropriate thickness of the Product does not exceed the maximum U-values given in the national Building Regulations.

The maximum thickness of the Product shall not exceed 400 mm.

Thermal bridging at junctions and around openings

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

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

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, PAS 2030 and PAS 2035.

2.2.11 Durability

The Product shall have a service life durability equivalent to that of the building into which it is incorporated. The expected lifespan of the building itself shall be at least 60 years.

Once installed, the Product is not susceptible to damage from environmental conditions normally encountered in the UK and Ireland.

2.2.12 UKCA, UKNI and CE marking

The European standard for the Product is BS EN 14315-1.

2.3 EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Details of typical pitched slate roof with sarking boards

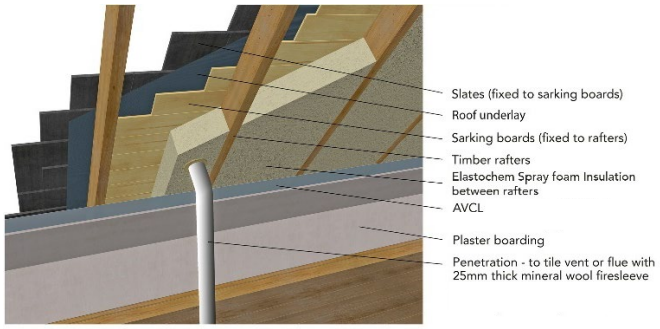


Diagram 2 - Details of typical pitched tiled roof with underlay

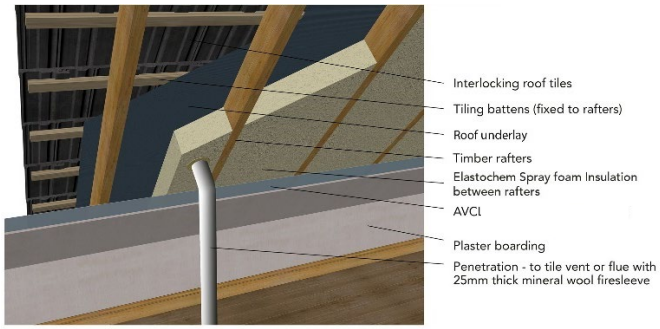
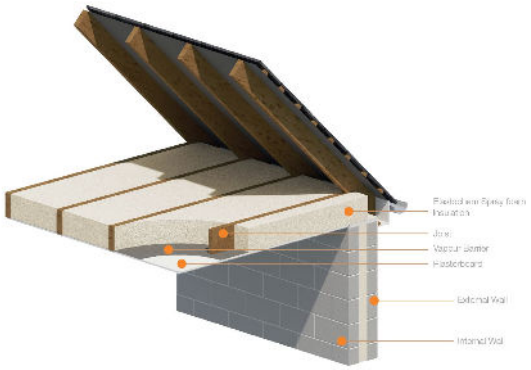


Diagram 3 - Details of typical ceiling level (attic application)



2.4 INSTALLATION

The Product 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:

- the type, suitability and condition of all roof layers and components;
- the existing roof is structurally sound, in a good state of repair with no evidence of underlying defects, rain penetration, dampness, staining or condensation;
- the location of any services, electrical devices, penetrations, and expansion joints;
- all roof elements are weathertight before the application of the Product;
- any ventilation requirements;
- the moisture content of porous surfaces shall not be greater than 19 %; non-porous substrates shall be checked to ensure that there is no condensation present on the surface;
- the substrate temperature is between 5 °C and 35 °C. An infrared or contact thermometer can be used for checking the substrate surface temperature;
- areas not to be treated.

2.4.2 Preparation

The following considerations apply before starting the work:

- application of the Product shall be carried out in accordance with BS 8000-0, BS EN 14315-1 and BS EN 14315-2;
- application of the Product may produce a build-up of harmful vapours. Installers shall wear personal protective equipment (PPE) when working with the Product, including nitrile gloves, disposable overalls and a full-face supplied-air respirator (SAR);

- sufficient natural or mechanical ventilation shall be put in place to prevent gasses entering other potentially habited areas of the building. It is advisable that other trades and personnel avoid entering the work area during and immediately after application;
- the relative humidity of the environment shall be considered before application. Care shall be taken to ensure that moisture vapour ingress from other areas of the building is restricted;
- the ambient temperature during the spraying shall be between 5 to 35 ºC;
- safety equipment, services, task lighting and ventilation facilities shall be easily accessible;
- building access and safe re-entry times shall be in accordance with Agrément holder's guidelines;
- during application, prohibit contact with open flames and other sources of ignition;
- the maximum thickness of the Product shall not exceed 400 mm.

The following works shall be undertaken before installing the Product:
- substrate preparation and application parameters shall be in accordance with Product Installation Manual;
- any timber elements shall be treated and repaired if required;
- all permanent elements (i.e. windows, doors, walls and surfaces), air vents, pipes and other service penetrations shall be protected to prevent blockage and splashing of the Product;
- services, e.g. electrical cables, may need re-routing or trunking;
- flues shall be isolated by applying non-combustible thermal insulation material around them;
- ensure that the component's mixing ratio is correct (1:1 by volume), by separately measuring the flow rates of the two components before they pass through the spraying machine;
- ensure that all parameters (i.e. pressures and temperatures) of the components and spray machinery are in line with the Agrément holder's Installation guidelines;
- carry out the following quality control tests, using test methods in accordance with BS EN 14315-1 and BS EN 14315-2 to check:
  - the appearance of the Product, ensuring a round spray pattern, no sticky patches, no light or dark patches, no voids and a consistent colour;
  - the reaction profile of the Product by spraying a small section of material onto the floor and measuring the cream time, gel time, tack-free time and free-rise density, while ensuring the Product is free of moisture content and lumps or bubbles in the texture;
  - the adhesion strength to the substrate by conducting an on-site pull-out test;
- if the material shows any issue during quality control tests, adjust the parameters of the spray machinery and repeat the process until the required result is achieved.

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:

General:
- set the appropriate temperature and pressure parameters on the spray machinery and select a suitable spraying nozzle;
- prepare and mix the Product components with an electric or pneumatic mixer to the required mixing ratio;
- apply the Product with the spray gun perpendicular to the substrate;
- ensure any subsequent layer is sprayed immediately after the previous one has fully risen.

Spraying on sarking boards:
- spray the Product directly onto the sarking board between the rafters, ensuring no gaps;
- spray the Product in layers to the required total thickness (50 mm to 150 mm thick per layer), with a gradual build-up following the same process.

Spraying on roof underlay:
- spray the Product directly onto the underside of the roof underlay between the rafters in three initial flash coats (leaving each flash coat to cure/set for at least one minute, before the application of the next coat), following the below procedure:
  - spray the first coat of 1 mm thick;
  - spray the second coat of 2 mm thick;
  - spray the third coat of 5 mm thick, achieving an approximate combined thickness of 8 mm;
- continue spraying the Product in layers to the required total thickness (50 mm to 150 mm thick per layer), ensuring no gaps.

Spraying at ceiling level (attic application):
- spray the Product directly onto the VCL between the ceiling joists, ensuring appropriate ventilation is maintained at the eaves;
- spray the Product in layers to the required total thickness (50 mm to 150 mm thick per layer), with a gradual build-up following the same process**.**

2.4.4 Finishing

The following finishing is required on completion of the installation:
- the Product shall be cured and cold prior to undertaking any finishing work;
- any excess Product can be trimmed flat to the inside edge of the rafters using a handsaw;
- if required, install a suitable VCL and plasterboard lining on the inside of the roof or a suitable floorboard for attic application;
- follow the post-application best practices according to 'Guidance on best practices for installation of spray polyurethane foam';
- a survey shall be performed to check that electrical cables and flues are not obstructed. Corrective measures shall be taken to clear any such obstruction.

2.5 INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.5.1 Moisture control

Test	Standard	Result
Closed cell volume	BS EN ISO 4590 Method 2b	CCC1 (2.63 % closed cells)
Water vapour diffusion factor (μ)	BS EN 12086 Method A	3.68
Water vapour diffusion equivalent air layer thickness (S_d)		0.18 m
Short-term water absorption	BS EN ISO 29767 Method B	0.54 kg/m^2

2.5.2 Strength

Test		Standard	Result
Adhesion strength perpendicular to faces	on concrete	BS EN 1607	36 kPa
	on oriented strand board		33 kPa
	on natural stone		24 kPa
	on steel		31 kPa

2.5.3 Fire performance

Test	Standard	Result
Reaction to fire	BS EN 13501-1	F

2.5.4 Thermal performance

Test		Standard	Result
Declared aged thermal conductivity (λ_D)	50 to 400 mm thick	BS EN 12667	0.038 W/mK

2.5.5 Other properties

Test		Standard	Result
Dimensional stability under specified conditions	70 °C and 90 % RH	BS EN 1604	DS(TH)4
	-20 °C		
Airflow resistance		BS EN ISO 9053-1	78.9 x 10^3 Pa.s.m^{-1}

REACH Statement for the Product in respect of emission of dangerous substances in accordance with Regulation (EC) No 1907/2006 confirms that no hazardous materials are present.

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 Product, 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

- B3(4) Internal fire spread (Structure) - the Product can inhibit the unseen spread of fire and smoke within concealed spaces
- C2(c) Resistance to moisture - a pitched roof incorporating the Product can adequately protect a building from interstitial and surface condensation
- 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 Requirements relating to thermal elements - the Product can contribute to a pitched roof complying with the requirements of L1(a)(i)
- Regulation 26 CO_2 emission rates for new buildings - the Product can contribute to a building not exceeding its target CO_2 emission rate
- Regulation 26A Fabric energy rates for new buildings - the Product can contribute to satisfying this Regulation
- Regulation 26C Target primary energy rates for new buildings - the Product can contribute to satisfying this Regulation

3.2.2 Wales

The Building Regulations 2010 and subsequent amendments

- B3(4) Internal fire spread (Structure) - the Product can inhibit the unseen spread of fire and smoke within concealed spaces
- C2(c) Resistance to moisture - a pitched roof incorporating the Product can adequately protect a building from interstitial and surface condensation
- 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 Requirements relating to thermal elements - the Product can contribute to a pitched roof complying with the requirements of L1(a)(i)
- Regulation 26 CO_2 emission rates for new buildings - the Product can contribute to a building not exceeding its target CO_2 emission rate
- Regulation 26A Primary energy efficiency 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 Regulation

3.2.3 Scotland

The Building (Scotland) Regulations 2004 and subsequent amendments

3.2.3.1 Regulation 8(1) 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

- 2.4 Cavities - the Product can inhibit the unseen spread of fire and smoke within concealed spaces
- 3.15 Condensation - a pitched roof incorporating the Product can protect a building from moisture caused by surface or interstitial condensation
- 6.2 Building insulation envelope - the Product will contribute to the insulation envelope resisting 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) 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) 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
- 35(4) Internal fire spread (Structure) - the Product can inhibit the unseen spread of fire and smoke within concealed space
- 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 not exceeding its target CO_2 emission rate
- 43 Renovation of thermal elements - the Product can contribute to a wall complying with the requirements of 39(a)(i)

3.2.5 Ireland

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.

- B3(3) Internal fire spread (structure, for buildings other than dwellings) - the Product can inhibit the unseen spread of fire and smoke within concealed spaces
- B8(3) Internal fire spread (structure, for dwellings) - the Product can inhibit the unseen spread of fire and smoke within concealed spaces
- C4 Resistance to weather and ground moisture - a pitched roof incorporating the Product can contribute to adequately protecting a building from the passage of moisture from precipitation and condensation
- 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
- F2 Condensation in roofs - pitched roofs incorporating the Product can adequately protect a building from moisture in the form of interstitial condensation
- L1 Conservation of fuel and energy - the Product can enable a building to conserve energy and limit CO_2 emissions
- L2(a) Conservation of fuel and energy (in existing dwellings) - the Product will limit heat gains and losses through a pitched roof
- L4(a) Conservation of fuel and energy (in existing buildings other than dwellings) - the Product will limit heat gains and losses through a pitched roof
- L5(c) Conservation of fuel and energy (in new buildings other than dwellings) - the Product will limit heat gains and losses through a pitched roof
- Regulation 8(c) Conservation of fuel and energy in new dwellings - the Product can contribute to satisfying this Requirement

3.3 THIRD-PARTY ACCEPTANCE

In the opinion of Kiwa Ltd. if installed, used, and maintained in accordance with this Agrément, this Product can satisfy the appropriate structural, fire, moisture, thermal 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 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 9053-1:2018 Acoustics. Determination of airflow resistance. Static airflow method
- BS EN ISO 10211:2017 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations
- BS EN ISO 10456:2007 Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values
- BS EN ISO 29767:2019 Thermal insulating products for building applications. Determination of short-term water absorption by partial immersion
- BS EN 300:2006 Oriented strand boards (OSB). Definitions, classification and specifications
- BS EN 351-1:2023 Durability of wood and wood-based products. Preservative-treated solid wood. Classification of preservative penetration and retention
- BS EN 1604:2013 Thermal insulating products for building applications. Determination of dimensional stability under specified temperature and humidity conditions
- BS EN 1607:2013 Thermal insulating products for building applications. Determination of tensile strength perpendicular to faces
- BS EN 1995-1-1:2004+A2:2014 Eurocode 5: Design of timber structures. General. Common rules and rules for buildings
- NA to BS EN 1995-1-1:2004+A2:2014 UK National Annex to Eurocode 5: Design of timber structures. General. Common rules and rules for buildings
- BS EN 12086:2013 Thermal insulating products for building applications. Determination of water vapour transmission properties
- 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 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- BS EN 14081-1:2016+A1:2019 Timber structures. Strength graded structural timber with rectangular cross section - General requirements
- 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 5250:2021 Management of moisture in buildings. Code of practice
- BS 5534:2014+A2:2018 Slating and tiling for pitched roofs and vertical cladding. Code of practice
- BS 6093:2006+A1:2013 Design of joints and jointing in building construction. Guide
- BS 8000-0:2014+A1:2024 Workmanship on construction sites. Introduction and general principles
- BS 8000-6:2023 Workmanship on construction sites - Slating and tiling of roofs and walls. Code of practice
- BS 8103-3:2009 Structural design of low-rise buildings. Code of practice for timber floors and roofs for housing
- BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain
- BS 9250:2007 Code of practice for design of the airtightness of ceilings in pitched roofs
- American Chemistry Council Spray Foam Coalition:2012 Guidance on best practices for the installation of spray polyurethane foam
- 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 443:2019 Conventions for U-value calculations
- BRE Report 497:2016 Conventions for calculating linear thermal transmittance and temperature factors
- I.S. EN 1995-1-1:2005 Eurocode 5: Design of timber structures. Part 1-1: General. Common rules and rules for buildings
- I.S. EN 1995-1-1/NA:2005+A1:2013 Irish National Annex to Eurocode 5: Design of timber structures. Part 1-1: General. Common rules and rules for buildings
- PAS 2030:2023 Installation of energy efficiency measures in existing dwellings. Specification
- PAS 2035:2023 Retrofitting dwellings for improved energy efficiency. Specification and guidance
- PD 6693-1:2019 Recommendations for the design of timber structures to Eurocode 5: Design of timber structures - General. Common rules and rules for building
- PD 6697:2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2
- Regulation (EC) No 1272/2008: Classification, labelling and packaging of substances and mixtures
- Regulation (EC) No 1907/2006: Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- UK Statutory Instruments 2009 No. 716 The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009

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 Product 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 2025

6 CONDITIONS OF USE

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