

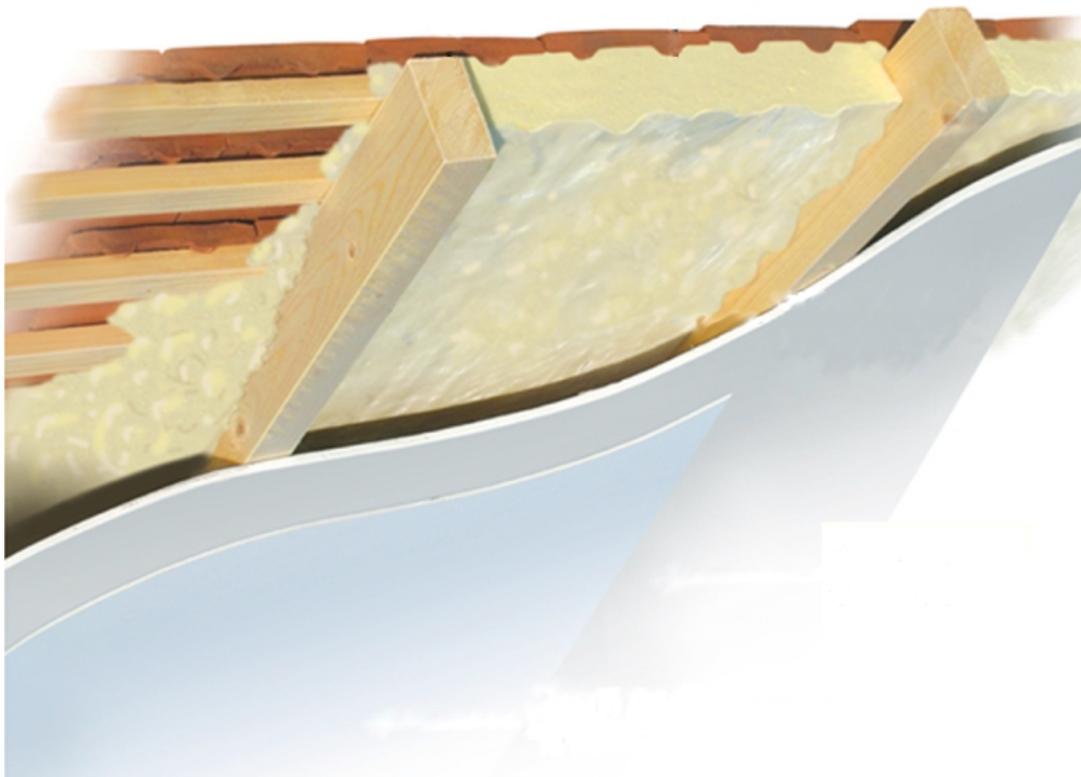
SCOPE

This Agrément relates to Duratherm Spray Foam Stabilisation (hereinafter the "Product"), an in-situ HFO blown, spray-applied stabilisation layer which contributes to the airtightness and watertightness of roofs with a pitch greater than 15°. The Product can be used as a repair medium on tiled or slated cold pitched roofs suffering from slippage or displacement of the roof covering, or nail fatigue. The Product is for internal application to the underside of pitched roofs without a roof tile underlay or sarking boards. The Product is applied directly under the tiles or slates, between the rafters/joists in loft and room in roof spaces of existing domestic buildings in the UK.

DESCRIPTION

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

PRODUCT ILLUSTRATION



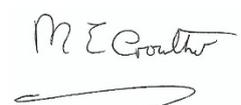
STATEMENT

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.

Paul Oakley, BSc
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 and other regulatory requirements;
- Sources, including codes of practice, test and calculation reports.

MAJOR POINTS OF ASSESSMENT

Strength - the Product has adequate density, adhesive bond strength to substrate surfaces and dimensional stability (see section 2.1.10).

Moisture control - (see section 2.1.11) the Product:

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

Fire performance - the Product is classified as Euroclass E* (combustible) according to BS EN 13501-1 (see section 2.1.12).

Durability - the Product will have a service life equivalent to that of the structure into 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. 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 and Northern Ireland, with due regard to chapter 3 of this Agrément (CDM and national Building Regulations).

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

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

Roofs must be constructed to prevent moisture ingress and air infiltration.

The Product forms a strong bond with clean and dry substrates. This should be taken into account when specifying the Product or anticipating future alterations to a roof, including removal of slates and tiles for re-use.

Care is needed for design at openings, and the correct level of workmanship and design detailing of joints particularly around rooflight and flue pipe openings should be in accordance with BS 6093.

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

Any existing roof tile underlay must be removed before application of the Product.

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.

For internal fire protection, the Product must be covered by a suitable lining board with the joints fully sealed and supported by timber studwork elements except when used in a non-habitable roof space.

Do not apply the Product 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 which incorporate a protective fire hood.

Installation of the Product must not be carried out until the moisture content of any timber is less than 20 %.

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

2.1.4 Project specific design considerations

Prior to the application of the Product, an inspection must be carried out. Typical checks should include:

- the external condition of the roof, valleys, gutters, chimney stacks, flashings etc.;
- there is no existing rain ingress and there are no signs of dampness, staining or condensation on the internal face of the roof;
- the type, suitability and condition of roof timbers;
- roof space ventilation;
- the location of expansion joints;
- areas not to be spayed;
- condition with regard to nail rot or roof tile/slate slippage.

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 installers who have been trained and approved by the Agrément holder under the Quality Installer Scheme™.

2.1.7 Delivery, storage and site handling

The two components of the Product are delivered to site in separate closed 205 litre type 1A1 drums. Both containers are labelled with component name and batch number and marked with the BDA Agrément® logo incorporating the number of this Agrément.

The optimum storage temperature is between 10 °C and 25 °C. The drums should not be exposed to direct sunlight, high temperatures or temperatures below 10 °C for long periods of time. Drums should be stored in a well-ventilated area protected from heat and frost and away from possible ignition sources.

Components A and B are sensitive to humidity, so they should be stored in sealed drums or hermetically sealed tanks and protected from humidity and rain.

The liquid isocyanate component is classified as 'harmful', under The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP 4) and drums bear the appropriate hazard warning signs. When cured, the Product is non-hazardous.

2.1.8 Durability

There is no mould growth risk and the Product does not support vermin or insects.

The Product is durable, rot-proof and considered to be adequately resistant to deterioration and wear by the normal service conditions, provided it is installed in accordance with the requirements of this Agrément.

The reaction to fire does not decrease with time in accordance with BS EN 14315-1.

The adhesion after ageing is considered sufficient to ensure the stability of the Product.

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

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

2.1.9 Maintenance and repair

The Product once installed, does not require regular maintenance provided the weathertightness of the roof is maintained. Damaged or poorly applied Product should be completely removed and re-applied.

Where slates and tiles are damaged after installation, they may be replaced by cutting away the foam from the underside, replacing the slate or tile and re-applying Product to the affected area.

For advice in respect of repair and maintenance concerns, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.1.10 Strength

Density

The Product has adequate apparent density and core density in accordance with BS EN 1602 and can be used to enhance the strength and structural stability of roofs.

Adhesive bond strength

The Product adapts to any profile to form a strong adhesion bond to a broad range of clean and dry substrate materials.

The Product has adequate tensile cohesion and bond strength in accordance with BS EN 14315-1, Annex F.

The Product will significantly increase the attachment of slates and tiles to the roof structure and will contribute to withstanding in-service wind loads, thermal cycling and minor structural movements.

Dimensional stability

The Product has adequate dimensional stability under specified temperature and humidity conditions in accordance with BS EN 1604 and can withstand thermal stresses, differential movement and cracking of the substrate.

2.1.11 Moisture control

Cell structure

The Product has a high volume closed cell percentage (93 %) in accordance with BS EN ISO 4590.

Water vapour transmission resistance

The Product has a low level of water vapour transmission (high water vapour resistance) in accordance with BS EN 12086 Method A but does not favour the accumulation of water vapour between the Product and substrate.

Condensation risk

Roofs incorporating the Product will adequately limit the risk of interstitial and surface condensation when designed in accordance with BS 5250, BRE Report 262 and BRE Digest 369. Roof 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 VCL's (where installed) and linings 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 and BS EN ISO 13788.

Water permeability

The closed cell structure means the Product is water-resistant.

The Product has adequate resistance to water absorption by immersion in accordance with BS EN 1609, Method B.

The Product will contribute towards the roof covering resisting the passage of water, wind-driven rain, wind-blown snow and dust into the interior of the roof space.

2.1.12 Fire performance

The Product has a reaction to fire performance classification of Euroclass 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.

In situations where there is a higher than average risk of fire, the Product must be suitably separated from any potential source of ignition.

The exposed Product could contribute to the development stages of a fire, however this would be to a limited extent in the early stages of a fire.

Once installed, except for a non-habitable roof application, the Product should be contained by a suitable lining board fixed to battens or rafters and with all joints taped, sealed and supported by rafters, noggins or battens. Consequently, in these conditions, the Product will not contribute to the development stages of a fire.

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

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.

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

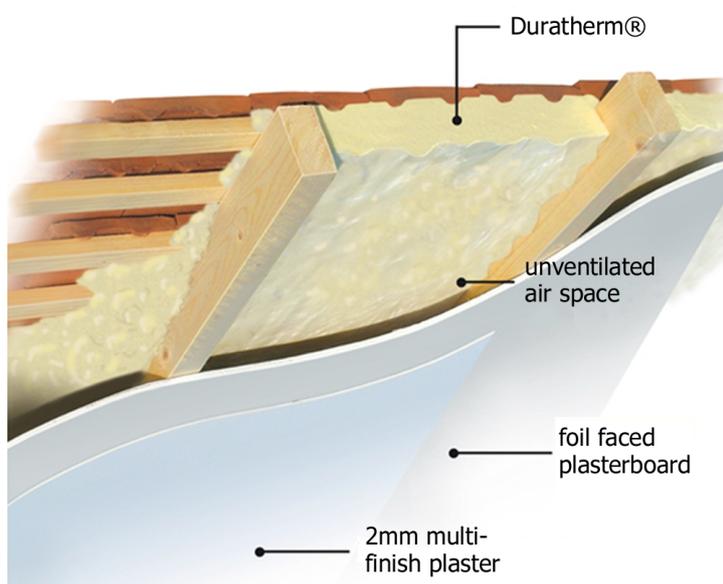
The use of the Product in slated or tiled pitched roofs should not affect the external fire rating when evaluated by assessment or test to BS 476-3.

Proximity of flues and appliances

The Product must be separated from heat-emitting flue pipes, fixed combustion appliances, incinerators, devices, fireplaces and chimneys and any potential source of ignition where the temperature is in excess of 70 °C, by non-combustible material in accordance with the provisions of the national Building Regulations.

2.2 - EXAMPLES OF DETAILS

Figure 1 - Existing cold pitched roof application



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, BS EN 14315-1 and BS EN 14315-2.

During application, prohibit contact with open flames and the presence of ignition sources.

Do not weld or cut metal which is in contact with the Product. If it is necessary to weld metal elements, this must 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. Some vapours given off by component chemicals are heavier than air and will tend to 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.

Protective covers must be placed over water tanks to prevent contamination during application and should not be removed until sufficient time has elapsed for potentially harmful vapours to be ventilated from the roof space.

To prevent the Product from entering an occupied space, the loft hatch/cover must be kept closed during the spraying process.

During spraying, the ambient air temperature and substrate temperature must ideally be between 15 °C and 25 °C and not be lower than 10 °C. An infrared or contact thermometer can be used for checking substrate surface temperature.

On the surfaces of porous materials (concrete), the moisture content of the substrate should not exceed 5 %. Non-porous surfaces must be dry and free from condensation. The presence of surface humidity leads to the formation of a highly porous foam with deficient strength and low adhesion to the substrate.

The moisture content of any timber roof structure to be sprayed must be measured with a substrate hygrometer and be <20 % before application commences.

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.

When spraying, it is important to ensure that the compressed air used is completely dry.

The spraying machine must be specially designed to mix and spray the Product via a spray gun. The Product is applied with volumetric displacement pumps with fixed mixing ratio A/B = 1/1 by volume. The ratio will be controlled prior to each application by measuring the flow rates of the two 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 machine must have a temperature controller in the preheaters and in the hoses. The working temperature must be set between 40 °C and 50 °C depending on the ambient temperature conditions.

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

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 2 m and protected by heat blankets.

A VCL may not always be required such as when the Product is installed between rafters in a non-habitable roof void.

2.3.4 Preparation

- The substrates must be clean, dry and free from dirt, dust, grease, oils and loose particles/torching;
- a small adhesion test to the substrate should be made to guarantee good bonding, especially on metal surfaces. This will determine if a primer is required for maximum adhesion;
- any necessary repairs to roofs, 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;
- remove any existing roof tile underlay or sarking;
- any timber treatment carried out;
- make roofs weathertight before application of the Product;
- dislodged, damaged or missing slates or tiles are re-positioned or replaced;
- cover front faces of surfaces not to be sprayed e.g. exposed joists, purlins and rafters;
- cover services e.g. electrical cables, water tanks and pipes;
- 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 spraying.

2.3.5 Outline procedure

Warm pitched roof - between rafters

1. Set the appropriate temperature and pressure parameters to guarantee the mixing quality of the Product and select a suitable spraying nozzle.
2. Carry out quality control tests to check for round spray pattern, sticky patches, light or dark patches/streaks, no voids, consistent colour, appearance, 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 must be checked on a two-layer spray sample. Density of the Product is checked in accordance with the Agrément holder's recommendations.
4. The Product is sprayed in sections, starting at the eaves and working upwards towards the ridge. Each section is sprayed in a horizontal direction, from right to left and from left to right, continuously.
5. Care should be taken to minimise the degree of overspray generated whilst spraying.
6. The total minimum Product thickness to be applied will depend on the required stabilisation strength. The installer must check the total thickness applied by means of a depth gauge with measuring pin to ensure the required thickness is met. The installer must be aware of the maximum foam layer thickness in ventilated roof designs.
7. The Product is sprayed between rafters directly onto existing exposed tiles/slates and timbers in a flash coat/primer (5 mm layer thickness using a quick pass).
8. Once this layer is cured (dry to the touch), a second layer (20 - 25 mm thick) is applied to give a minimum total thickness of 25 mm.
9. Additional layers should be applied within 10 minutes of the previous layer to achieve the design thickness (not exceeding 400 mm).
10. Once cured and cold the Product can be trimmed flat using a hand-saw if required, being careful not to cut into timbers.

Warm pitched roof - insulation between and under rafters

The Product is applied under roof tiles/slates to the depth of the rafters. Cross-battens are then mechanically fixed to the rafters. The battens must be of sufficient width and spacing (up to 600 mm) to provide adequate support to which the lining board can be mechanically fixed and then filling resumes in 20 - 25 mm layers. A VCL should be on the warm side of the insulation behind the lining board.

2.3.6 Finishing

The Product should be cured and cold prior to undertaking any finishing work.

After installation in roof spaces where the Product is left exposed, fire warning labels must be placed in prominent positions.

Once installed, except when used in a non-habitable pitched roof space, the Product must be covered by a suitable lining board, with all joints taped, sealed, and supported by rafters, noggins or battens.

2.4 - INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.4.1 Strength

Reaction profile to BS EN 14315-1, Annex E and free rise density (core free-rise density method) to BS EN 1602	Mean 32.3 Kg/m ³
Apparent density to BS EN 1602	Mean 32.7 Kg/m ³
Tensile strength (substrate adhesion strength) perpendicular to faces - the adhesion to a fibre cement board substrate to BS EN 14315-1, Annex F and BS EN 1607	>149 KPa, mean 158 KPa
Elasticity module by tensile (cohesion) to BS EN 14315-1, Annex F and BS EN 1607	Cohesive failure occurs in the foam
Tensile strength (substrate adhesion strength) perpendicular to faces to BS EN 1607 bonded to brick	Mean 100 KPa (class A2)
Tensile strength (substrate adhesion strength) perpendicular to faces to BS EN 1607 bonded to plywood	Mean 121 KPa (class A2)

Dimensional stability under specific temperature and humidity conditions to BS EN 14315-1, BS EN 14318-1 and BS EN 1604

Thickness of layer (mm)	Test conditions	Length: mean % change $\Delta\epsilon_l$	Width: mean % change $\Delta\epsilon_b$	Thickness: mean % change $\Delta\epsilon_d$
1 layer of 30 mm	48 h at 70 °C and 90% RH	2.7	3.3	1.5
1 layer of 30 mm	48 h at -20 °C	-0.8	-0.8	-0.1

The Product is classified as Class DS(TH)3 level. The values indicated are valid for the range of layer thicknesses from 10 mm to 30 mm.

2.4.2 Moisture control

Cell structure

Open and closed cell volume % to BS EN 14315-1 and BS EN ISO 4590	Mean 93 % closed cell content, Class CCC4
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Water vapour transmission

Water vapour transmission diffusion resistance factor μ to BS EN 14315-1 and BS EN 12086, Method A	Mean 42 for 60 mm thickness
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Water permeability

Short-term water absorption by 24 hr partial immersion to BS EN 14315-1 and BS EN 1609, Method A, B	Mean 0.09 Kg/m ² * for 60 mm thickness
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2.4.3 Fire performance

Ignitibility to BS EN ISO 11925-2	Surface flame propagation < 80 mm flame height in 30 s, edge flame < 80 mm flame height, turned around at 90 ° with foam edge exposed = 80 mm flame height, no flaming droplets/particles - pass
Flammability - surface spread of flame to BS 476-7	Class 1
Reaction to fire performance classification to BS EN 13501-1	Class E*

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 proportioners (double acting positive displacement piston metering pumps) fitted with spray gun application equipment;
- plastic ventilator spacer used at eaves and/or ridge to create a ventilation gap. It also keeps the eaves clear of the Product (if fitted at eaves);
- vapour control layer (VCL);
- lining boards.

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(b) Resistance to moisture - the Product can contribute to adequately protecting the building from precipitation.
- C2(c) Resistance to moisture - the Product can contribute to adequately protecting the building from condensation.
- J4 Protection of building - the Product can be separated from combustion appliances, flue pipes, fireplaces and chimneys to prevent the building catching fire.
- Regulation 7 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.

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

- C2(b) Resistance to moisture - the Product can contribute to adequately protecting the building from precipitation.
- C2(c) Resistance to moisture - the Product can contribute to adequately protecting the building from condensation.
- J4 Protection of building - the Product can be separated from combustion appliances, flue pipes, fireplaces and chimneys to prevent the building catching fire.
- Regulation 7 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.

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

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

- The Product is manufactured from acceptable materials and is considered to be 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

- 3.10 Precipitation - the Product can contribute to adequately protecting the building from precipitation penetrating to the inner face of the building.
- 3.15 Condensation - the Product can contribute to limiting the risk of surface and interstitial condensation.
- 3.19 Combustion appliances - relationship to combustible materials - the Product can be separated from fixed combustion appliances to prevent damage to the building.
- 7.1(a)(b) Statement of sustainability - the Product can contribute to satisfying the relevant Requirements of Regulation 9 and Standards 1 to 6 in relation to the Technical Handbook (Domestic). The Product will therefore contribute to a construction meeting a bronze level of sustainability as defined in Standard 7.1. In addition, the Product can contribute to a construction meeting a higher level of sustainability.

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)(i)(iii)(b) Fitness of materials and workmanship - the Product is manufactured from materials which are considered to be suitably safe and acceptable for use as described in this Agrément.
- 28 Resistance to moisture and weather - the Product can contribute to protecting the building from the passage of moisture from the weather.
- 29 Condensation - the Product can contribute to limiting the risk of interstitial condensation.
- 73 Protection of people and buildings - the Product can be separated from combustion appliances, flue pipes, fireplaces and chimneys to prevent damage to the building.

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 11925-2:2010 Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test
- 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 1602:2013 Thermal insulating products for building applications. Determination of the apparent density
- 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 1609:2013 Thermal insulating products for building applications. Determination of short term water absorption by partial immersion
- BS EN 12086:2013 Thermal insulating products for building applications. Determination of water vapour transmission properties
- BS EN 13172:2012 Thermal insulation products. Evaluation of conformity
- BS EN 13238:2010 Reaction to fire tests for building products. Conditioning procedures and general rules for selection of substrates
- BS EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests
- BS EN 13823:2010+A1:2014 Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item
- 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
- ISO 8301:1991 Ed 1 Thermal insulation. Determination of steady-state thermal resistance and related properties. Heat flow meter apparatus
- BS 476-7:1997 Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products
- 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
- 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
- PAS 2030:2017 Specification for the installation of energy efficiency measures in existing buildings. Building Fabric Measures (BFM)

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
A	First issue	P Oakley	C Forshaw	March 2019