

SCOPE

This Agrément relates to H₂FoamLite, sold as LD-C-50, (hereinafter the "Product") a spray-applied in-situ thermal insulation for application to the underside of roofs with a pitch more than 15° and a roof tile underlay, the underside of flat roofs and in the lofts of new and existing domestic dwellings or similar buildings.

DESCRIPTION

H₂FoamLite is a spray-applied open cell, water blown, low density polyurethane foam insulation. The Product is prepared from two raw material liquid components, isocyanate (BaseSeal) and resin (H₂FoamLite); and is yellowish in colour. The Product is applied with a fixed ratio (1:1) volumetric placement pump in layers, until the final required design thickness (not exceeding 300 mm) is achieved. Once applied the foam cures almost instantaneously.

PRODUCT ILLUSTRATION



THIRD PARTY ACCEPTANCE

Not required.

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 typical details;
- Installation procedure;
- Independently assessed system characteristics and other system 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 has a declared thermal conductivity (λD) of 0.038 W·m–1·K–1 * (see section 2.1).

Condensation risk — the Product has a water vapour resistance factor (μ) of 3.3 *. The risk of interstitial condensation will depend on the roof construction and should, therefore, be assessed for each project (see section 2.1).

Durability — the Product will have a life equivalent to that of the structure in which it is incorporated (see section 2.1).

CE marking – The Agrément holder has taken responsibility for CE marking the Product. An asterisk (*) appearing in this Agrément indicates that data shown is given in the manufacturer's Declaration of Performance.

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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 Declaration of Performance and factory and site visits. Factory Production Control has been assessed.

1.1.4 Installation

It is recommended that the quality of installation and workmanship is controlled by (a) competent person(s). Such person(s) shall be either a qualified employee of the Consulting Engineer or an employee of the installing contractor. The Product shall be installed strictly in accordance with this Agrément and with 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)

- Technical Assessment Body Kiwa N.V. represented by 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

In order 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 Delivery, storage and site handling

The Product components are delivered to site in drums of up to 250 kg capacity, bearing the Product name, batch number, and marked with the BDA Agrément® logo incorporating the number of this Agrément.

Drums should be stored in a well-ventilated area protected from heat and frost.

The Product components are classified under the Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009, and the Agrément holder has the responsibility for the packaging to show the appropriate hazard warning label(s).

2.1.2 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.

The Product can be installed:

- between, or between and under, timber rafters in a habitable warm pitched roof (room in roof); insulation at rafter level only, with or without counter battens;
- between, or between and under, timber rafters in a non-habitable warm pitched roof (loft space); insulation at rafter level only, with or without counter battens;
- between, or between and over, timber ceiling joists in a ventilated non-habitable cold pitched roof (loft space); insulation at ceiling level only;
- between timber joists to the underside of a roof deck in flat timber roofs;
- between, or between and under, timber rafters, where the purlin and ridge may be steel (including open web steel sections).

2.1.3 Building physics

The physical behaviour of roofs incorporating the Product shall be verified as suitable by a competent specialist, who can be either a qualified employee of the specifier or a qualified consultant. The specialist will check the physical behaviour of the designed roof construction and if need be, advise about improvement to achieve the final specification. It is recommended that the specialist co-operates closely with the Agrément holder.

2.1.4 General Design Considerations

H₂FoamLite is satisfactory for use in reducing the thermal transmittance (U value) of roofs and the lofts of domestic dwellings or buildings or similar buildings.

The Product must be covered by a suitably taped and jointed plasterboard lining supported by rafters, noggins or battens at the plasterboard joints; except when used in a non-habitable loft space. For new build applications, a suitable Vapour Control Layer (VCL) incorporating lapped and sealed joints must be applied behind the plasterboard lining.

A project specific design must give due consideration to:

- BS 5250
- BS 5534
- BS 8103-3
- BS EN 351-1
- BS EN 1995-1-1

Prior to application of the Product, it is essential that construction elements are designed and constructed to incorporate normal precautions against moisture ingress.

Existing constructions must be in a good state of repair with no evidence of rain penetration or damp. Defects must be made good prior to installation.

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

The Product must not come into direct contact with flue pipes, chimneys or other heat-producing appliances.

The Product forms a strong bond with clean, dry substrates. This should be considered when specifying the Product or anticipating future alterations.

The Product must only be applied to a roof construction incorporating a breathable roof tile underlay.

In tiled or slated pitched roofs in accordance with BS 5534 the Product can be spray-applied directly to the underside of reinforced bitumen membranes, breathable roof tile underlays and timber sarking boards between rafters. Due care must be taken to ensure the integrity of the roof tile underlay when spraying the Product.

2.1.5 Electrical wiring

Once applied the Product can restrict the air flow around electrical cables and recessed lighting. Consider re-routing, re-laying in conduit or de-rating electrical cables. Replace existing recessed lighting with ventilated fittings.

2.1.6 Flues and appliances

The Product must not be installed within 50 mm of heat-emitting devices, where the temperature is in excess of 93°C.

2.1.7 Thermal performance

Project specific design calculations of the thermal transmittance (U value) of a roof should be carried out in accordance with BS EN ISO 6946 and BRE Report BR 443, using the declared thermal conductivity (λ D) – see section 2.4.

The U value of a completed roof will depend on the insulation thickness, the roof structure and its' internal finish.

2.1.8 Thermal bridging at junctions and around openings

Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration.

Guidance on linear thermal transmittance, heat flows and surface temperatures can be found in the documents supporting the national Building Regulations and BS EN ISO 10211, BRE Information Paper IP 1/06, BRE Report 262, BRE Report 497 and PAS 2030 - Building Fabric Measures (BFM).

2.1.9 Condensation risk

A condensation risk analysis shall be completed at project specific design stage. Roofs incorporating the Product will adequately limit the risk of interstitial and surface condensation when properly designed in accordance with BS 5250, BRE Report 262 and BRE Digest 369. Make suitable provision for adequate permanent ventilation proportionate to the work being undertaken, with due consideration to the different warm/cold roof conditions.

2.1.10 Behaviour in relation to fire

The Product is classified as Euroclass F * according to BS EN 13501-1. The Product must be protected from naked flames and other ignition sources during and after application.

Once installed, the Product must be contained by a suitably taped and jointed plasterboard lining supported by rafters, noggins or battens at the plasterboard joints. Consequently, the Product will not contribute to the development stages of a fire. Normal fire design precautions shall apply including the incorporation cavity barriers at edges, around openings and at junctions with fire-resisting elements.

2.1.11 Durability

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

2.1.12 Maintenance and repair

The Product, once installed, does not require any regular maintenance and has a suitable durability provided that the waterproof layers of the roof are maintained in a weather-tight condition. For advice in respect of repair and maintenance concerns, consult the Agrément holder.

Figure 1 - the Product installed between rafters prior to the application of the plasterboard lining



Figure 2 - close-up showing the Product detailing around steel RSJ and dwarf partition wall; prior to dressing back flush with the rafters



2.3.1 Installers

The Product shall only be applied by installers who have been trained and approved by the Agrément holder. The Product shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

2.3.2 Delivery and site handling

The Product components are delivered to site in drums of up to 250 kg capacity, bearing the Product name, batch number, and marked with the BDA Agrément® logo incorporating the number of this Agrément.

Drums should be stored in a well-ventilated area protected from heat and frost.

2.3.3 Preparation

To comply with the requirements of the Health and Safety at Work Act 1974, it is essential that there is an exchange of information between the client and the installer before application commences on site. Existing health hazards, and those inherent in the application process, should be discussed and measures agreed to deal with them effectively.

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 a NIOSH-approved full-face fresh air supply respirator, protective clothing (including boots) and chemical-resistant gloves. No unprotected individuals should be in the structure where the application is being conducted. Similarly protected other trades and other personnel must be kept at least 8 m away from the application process whilst spraying is in-process.

Vapours given off by certain Product 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 (for example application in a confined roof space) the use of extractor fans is recommended by the Agrément holder.

Appropriate measurement and monitoring of vapour levels should be undertaken as required.

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

To prevent the Product from entering an occupied or habitable compartment, any loft hatch or other opening must be kept covered during the application process. Protective covers must be placed over water tanks to prevent contamination and blockage during application, and should not be removed until sufficient time has elapsed for potentially harmful vapours to be ventilated from the treated compartment.

2.3.4 General Procedure

Building elements to be insulated must be assessed for suitability and any necessary repairs carried out prior to application. Elements must be weathertight before application of the Product.

The position of and access to services should be taken into consideration. Any necessary access measures and task lighting should be positioned in the compartment to be treated prior to the commencement of work.

The Product should be spray-applied to clean and dry substrates and built up in 50 mm layers, until the final design thickness (not exceeding 300 mm) is achieved.

Once cured, if required the Product is trimmed flat using a hand-saw and covered with a plasterboard lining except when used in a non-habitable loft space.

Where no provision is made for ventilation of the compartment, care should be taken to ensure that ingress of moisture vapour from the rest of the domestic dwelling is restricted.

Pitched roof application - between rafters

The Product is sprayed into the cavity formed by the rafters, or rafters and counter battens. When cured, the excess foam is trimmed flush with the rafters and a plasterboard lining board is installed.

When spraying to breathable or non-breathable roof tile underlays without counter battens the Product must be applied in accordance with the Agrément holder's installation instructions to ensure the integrity of the roof tile underlay.

Loft application

All loose obstructions should first be removed from any loft space and any holes in the ceiling, such as around pipes etc. are to be sealed. Water tanks should be covered and any sources of moisture (for example vent pipes for central heating etc.) should be so arranged as to avoid water vapour entering the loft space.

During installation it is essential that all eaves ventilation, for example eaves gaps and air bricks at gable ends, are kept clear so that the ventilation airflow is maintained.

The Product should be installed from inside the roof space, after tiling or slating is completed.

Flat roof application

The Product is sprayed into the cavity formed by the flat roof joists directly to the underside of the flat roof sarking board to the depth required.

When cured, any excess foam is trimmed flush with the joists, and the plasterboard lining board is installed. In all flat roof constructions, a VCL incorporating lapped and sealed joints is required.

2.4 – INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

Thermal performance — the Product has a declared thermal conductivity (λ D) of 0.038 W·m–1·K–1 *.

Condensation risk — the Product has a water vapour resistance factor (μ) of 3.3 *.

Durability — the Product will have a life equivalent to that of the structure in which it is incorporated.

2.5 – INDEPENDENTLY ASSESSED ANCILLARY ITEMS

Ancillary items used with this Product, but outside the scope of this Agrément, include:

- non-breathable and breathable roof underlays;
- vapour control layer (VCL);
- plaster board for linings;
- timber battens;
- spray application equipment.

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 - REQUIREMENTS: THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - the Product can contribute to satisfying this requirement. See section 2.1 of this Agrément;
- L1(a)(i) Conservation of fuel and power - the Product can contribute to satisfying this requirement. See section 2.1 of this Agrément;
- J4 Protection of the building – the Product can contribute to satisfying this requirement. See section 2.1 of this Agrément;
- Regulation 7 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. See sections 2.1 and 2.3 of this Agrément;
- Regulation 26 - CO₂ emission rates for new buildings - the Product can contribute to satisfying this Requirement. See section 2.1 of this Agrément;
- Regulation 26A - target fabric energy efficiency rate for new dwellings - the Product can contribute to satisfying this Requirement. See section 2.1 of this Agrément.

3.2.2 - REQUIREMENTS: THE BUILDING (AMENDMENT) REGULATIONS 2014 (WALES) AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - the Product can contribute to satisfying this requirement. See section 2.1 of this Agrément;
- L1(a)(i) Conservation of fuel and power - the Product can contribute to satisfying this Requirement. See section 2.1 of this Agrément;
- J4 Protection of the building – the Product can contribute to satisfying this requirement. See section 2.1 of this Agrément;
- Regulation 7 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. See sections 2.1 and 2.3 of this Agrément;
- Regulation 26 - CO₂ emission rates for new buildings - the Product can contribute to satisfying this Requirement. See section 2.1 of this Agrément;
- Regulation 26A - target fabric energy efficiency rate for new dwellings - the Product can contribute to satisfying this Regulation. See section 2.1 of this Agrément;
- Regulation 26B - target fabric performance value for new dwellings - the EPS beads can contribute to satisfying this Requirement. See section 2.1 of this Agrément.

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

3.2.3.1 Regulations 8 (1)(2) Durability of materials and workmanship

- The Product is manufactured from acceptable materials and is adequately resistant to deterioration and wear under normal service conditions, provided they are installed in accordance with the requirements of this Agrément. See sections 2.1 and 2.3 of this Agrément.

3.2.3.2 Regulation 9 Building Standards – Construction

- 3.15 Condensation - the Product will contribute to limiting the risk of surface and interstitial condensation; see section 2.1 of this Agrément;
- 3.19 Combustion appliances – relationship to combustible materials - the Product will contribute to satisfying this Requirement; see section 2.1 of this Agrément;
- 6.1(b) Carbon dioxide emissions - the Product will contribute to satisfying this Requirement; see section 2.1 of this Agrément;
- 6.2 Building insulation envelope - the Product will contribute to satisfying the requirements of this Requirement; see section 2.1 of this Agrément;
- 7.1(a)(b) Statement of sustainability - the Product can contribute to satisfying the relevant Requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard; in addition, the Product can contribute to a construction meeting a higher level of sustainability as defined in this Standard; see section 2.1 of this Agrément.

3.2.3.3 Regulation 12 Building Standards-Conversions

- All comments given for the Product under Regulation 9 also apply to this Regulation, with reference to clause 0.12 and Schedule 6 of this Standard.

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

- 23(a)(1)(iii)(b) Fitness of materials and workmanship - the Product uses materials which are suitably safe and acceptable for use as thermal insulation as described in sections 2.1 and 2.3 of this Agrément;
- 29 Condensation - the Product will contribute to limiting the risk of surface and interstitial condensation; see section 2.1 of this Agrément;
- 39(a)(1) Conservation measures - the Product will contribute to satisfying the requirement of this Standard. See section 2.1 of this Agrément;
- 40(2) Target carbon dioxide emission rate - the Product will contribute to satisfying the requirement of this Standard. See section 2.1 of this Agrément;
- 73 Protection of people and buildings - the Product can contribute to satisfying the requirement of this Standard. See section 2.1 of this Agrément.

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

- B7 internal fire spread linings - the Product, when installed in accordance with this Agrément, can contribute to meeting the relevant requirements of this Regulation; the Product must be protected from naked flames and other ignition sources; see section 2.1 of this Agrément;
- B8 internal fire spread structure - the Product, when installed in accordance with this Agrément, can contribute to meeting the relevant requirements of this Regulation; the Product must be protected from naked flames and other ignition sources; see section 2.1 of this Agrément;
- C4 Resistance to weather and ground moisture - the Product, when installed in accordance with this Agrément, can meet the relevant requirements of this Regulation; see section 2.1 of this Agrément;
- D (D3/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; see sections 2.1 and 2.3 of this Agrément;
- F1 Means of ventilation - the Product, if used in accordance with this Agrément can meet the requirements of this Regulation; see section 2.1 of this Agrément;
- J3 Protection of building - the Product, if used in accordance with this Agrément can meet the requirements of this Regulation; see section 2.1 of this Agrément;
- L1 Conservation of fuel and energy - the insulation of roofs can be designed and constructed to meet current 'U-value' requirements using the Product; see section 2.1 of this Agrément.

3.3 - THIRD PARTY ACCEPTANCE

Not required.

CHAPTER 4 – SOURCES

- BS EN ISO 6946: 2017 Building components and building elements - Thermal resistance and thermal transmittance - Calculation method
- BS EN 351-1: 2007 Durability of wood and wood-based products - Preservative-treated solid wood - Classification of preservative penetration and retention
- 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 UK National Annex to Eurocode 5: Design of timber structures - General - Common rules and rules for buildings
- BS EN 13501-1: 2007 Fire classification of construction products and building elements - Classification using test data from reaction to fire tests
- BS EN 15026: 2007 Hygrothermal performance of building components and building elements - Assessment of moisture transfer by numerical simulation
- BS 5250: 2011 + A1: 2016 Code of practice for control of condensation in buildings
- BS 5534: 2014 + A2: 2018 Slating and tiling for pitched roofs and vertical cladding
- BS 8103-3: 2009 Structural design of low-rise buildings - Code of practice for timber floors and roofs for housing
- BRE Report 262: 2002 Thermal insulation: avoiding risks
- BRE Digest 369: 1992 Interstitial condensation and fabric degradation

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
-	initial draft	E.Tsarouchas	C.Forshaw	March 2018
A	Issued without the requirement for NHBC acceptance	C.Forshaw	C.Forshaw	March 2018