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BAW-19-111-P-A-UK
BDA Agrément®
Foil-Tec VCL Single and Double
Thermal Insulation Layer
(Wall Applications)

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SCOPE OF AGRÉMENT

This Agrément relates to Foil-Tec VCL Single and Double (hereinafter the 'Product'). The Product is for use as a flexible thermal insulation layer used in conjunction with additional insulation materials or on its own. The Product is intended for installation on timber framed walls with outer brick leaf and masonry cavity walls. When installed with overlaps sealed using YBS Foil Tape, the Product will perform as a vapour control layer (hereinafter 'VCL'). The Product also contributes to airtightness in walls. The Product can be used in new or existing domestic buildings, and non-domestic buildings with similar temperature and humidity conditions.

PRODUCT DESCRIPTION

The Product is a reflective aluminium foil-faced laminate layer with reinforcement coated with nitrocellulose. Foil-Tec Single has aluminium foil on one side and Foil-Tec Double has aluminium foil on both sides. The Product is manufactured in accordance with Draft BS EN 16863. For use with YBS Foil Tape to seal joints and penetrations of the Product.

PRODUCT ILLUSTRATION



THIRD-PARTY ACCEPTANCE

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

STATEMENT

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

Chris Vurley, CEng
 Technical Manager, Building Products

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

SUMMARY OF AGRÉMENT

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

- Conditions of use;
- 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 - the Product can contribute to limiting the risk of interstitial and surface condensation (see section 2.2.9).

Fire Performance - the Product is classified as European Classification E (combustible), in accordance with BS EN 13501-1 (see section 2.2.10).

Thermal Performance - the Product increases the thermal insulation of an external wall structure (see section 2.2.11).

Durability - the Product will have a service life durability equivalent to that of the structure into which it is incorporated (see section 2.2.12).

CE Marking - the Agrément holder has responsibility for CE marking in accordance with all relevant harmonised European Product Standards. An asterisk (*) appearing in this Agrément indicates value included in the Declaration of Performance (DoP) (see section 2.2.13).

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- 2.3 - Examples of details
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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 relevant test reports, technical literature, the Agrément holder's quality plan, DoPs and site visit as appropriate. The NHBC Standards have also been taken into consideration.

1.1.4 Installation supervision

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

The Product must 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 and Northern 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.

1.2 - PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has determined that the Agrément holder fulfils all 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 is in conformity 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.

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

2.1 - PRODUCT COMPONENTS AND ANCILLARY ITEMS

2.1.1 Product components included within the scope of this Agrément

The following components are integral to the use of the Product:

Item	Description	Dimensions
Foil-Tec VCL Single	foil thermal insulation and VCL	1.0 m wide by 50 m long by <1.0 mm (mean) thick providing 50 m ² coverage
		1.5 m wide by 50 m long by <1.0 mm (mean) thick providing 75 m ² coverage
		115 g/m ² (mean) weight
Foil-Tec VCL Double	foil thermal insulation and VCL	1.0 m wide by 50 m long by <1.0 mm (mean) thick providing 50 m ² coverage
		1.5 m wide by 50 m long, mean <1.0 mm (mean) thick providing 75 m ² coverage
		196 g/m ² (mean) weight
YBS Foil Tape	aluminium foil-backed acrylic self-adhesive tape	75 mm wide by 50 m long rolls

2.1.2 Ancillary items falling outside the scope of this Agrément

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

- staples or nails - stainless steel or galvanised steel, minimum 14 mm long;
- breather membrane;
- counter battens - pre-treated timber counter battens;
- additional insulation - including glass mineral wool (GMW); expanded polystyrene (EPS); extruded polystyrene (XPS); polyisocyanurate (PIR); phenolic; sheep's wool; or polyester fibre insulation (YBS Non-Itch);
- wall void vents - plastic vents to provide cavity ventilation.

2.2 - POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design responsibility

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

2.2.2 Applied building physics (heat, air, moisture)

The physical behaviour of the building 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 building design and if necessary, can offer advice in respect of improvements to achieve the final specification. It is recommended that the Specialist co-operates closely with the Agrément holder.

2.2.3 General design considerations

The uncompressed Product is most thermally effective with a minimum 13 mm or 20 mm non-ventilated air cavity (formed using timber battens, structural timbers (studs) or internal metal framing profile) on one side of the Product (Foiltec Single) and both sides of Product (Foiltec Double).

Wall design considerations

Existing external walls shall be structurally sound, be in a good state of repair, and be free from any damp or mould.

New external walls shall be designed and constructed in accordance with the national Building Regulations to resist moisture penetration and air infiltration.

Timber framed walls with outer brick leaf and masonry cavity walls shall incorporate a clear cavity of 50 mm minimum width.

Consideration shall be given to the local wind-driven rain index and the site exposure zone according to BS 8104. In areas of very severe exposure in England and Wales, the NHBC require a residual cavity of minimum 75 mm where the outer leaf of a cavity wall is fair faced masonry.

A breather membrane should be installed on the external cold side of a sheathed timber frame wall with a brick or block outer leaf, cladding, render board/ render or tile/slate hanging.

The surface of masonry cavity walls shall be free from loose material and large projections, with any holes filled and flush with the surface. Packing may be required to ensure a uniform plane for the battens to be fixed.

Insulation batts or boards in an external wall void will be required to meet the U-value requirement of the national Building Regulations.

Battens shall always be positioned at the top and bottom of the wall and around the perimeter of windows and doors.

Timber battens shall either be naturally durable or, where necessary, be treated with preservative to give adequate resistance against decay and insect attack.

The junction between a wall and roof shall be fire stopped. The minimum period of fire resistance of wall/roof junctions shall be maintained in accordance with the provisions of the national Building Regulations.

Account should be taken of:

- Government Accredited Construction Details for Part L - Timber Frame Illustrations, Masonry Cavity Wall insulation details: Illustrations in England and Wales;

- Accredited Construction Details for Scotland;
- PAS 2030; and
- PAS 2035.

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 IP1/06, BRE Report 262 and BRE Report 497.

Thermal transmittance (U-value) calculations of specific external wall constructions incorporating the Product should be carried out in accordance with BS EN ISO 6946, BS EN ISO 10211, and BRE Report 443.

The requirement for limiting heat loss through an external wall, including the effect of thermal bridging, can be satisfied if the U-value of an external wall incorporating the Product does not exceed the target U-value requirement in the national Building Regulations.

The design and construction of junctions with roofs and openings shall minimise air infiltration and thermal bridging. To minimise the effect of thermal bridging cross-battening is advised.

Wall void ventilation shall be in accordance with BS 5250.

Room space ventilation shall be in accordance with BS 5250. Care should be taken to provide adequate trickle ventilation, particularly in rooms expected to experience high humidity.

Any ventilation openings should be sufficiently small or suitably protected by mesh to prevent the ingress of birds and small animals.

Any openings or penetrations in a wall/dry-lining plasterboard and wall-ceiling joints must be well sealed to avoid condensation around the Product.

Product considerations

The Product can be cut using a sharp pair of scissors or craft knife.

The Product shall be cut to fit around openings or connections; gaps shall be minimised and any exposed cut edges shall be sealed using YBS Foil Tape.

Penetration of the Product by services should be kept to a minimum and shall be sealed using YBS Foil Tape.

Where a plasterboard wall lining is installed to encapsulate the Product, it shall be designed and installed in accordance with BS 8212.

The Product shall be:

- suitably separated from any potential source of ignition during installation and once incorporated in an external wall build-up;
- separated from any heat-producing chimney, ductwork or flue pipe penetrations of an external wall, as recommended in the supporting documents to the national Building Regulations, and shall not be in contact heat sources greater than 80 °C.

2.2.4 Project specific design considerations

No pre-installation survey is required for the installation of the Product.

A condensation risk analysis should be carried out at design stage in accordance with BS 5250.

2.2.5 Permitted applications

Only applications designed according to the specifications given in this Agrément are permitted; in each case the Specifier will have to co-operate closely with the Agrément holder.

2.2.6 Installer competence level

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

Installation can be undertaken by competent persons experienced in this sort of work.

2.2.7 Delivery, storage and site handling

The Product is delivered to site in suitable packaging, that bears the Product name, the Agrément holder's name and the BDA Agrément® logo incorporating the number of this Agrément.

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

- avoid exposure to direct sunlight for extended periods of time;
- avoid exposure to high or low temperatures for extended periods of time;
- store in a well-ventilated covered area to protect from rain, frost and humidity;
- store away from possible ignition sources;
- store in clean dry conditions;
- protect from being dropped or crushed;
- store away from flammable material, organic solvents and plasticisers;
- protect from mud and dirt.

For longer term protection on-site, the Product should be stored indoors.

Contaminated or wet Product shall not be used.

2.2.8 Maintenance and repair

Once installed, the Product does not require maintenance. The external wall finish shall be maintained in a weathertight condition.

Holes in the Product shall be repaired using YBS Foil Tape. For advice in respect of repair, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.2.9 Moisture control

Condensation risk

External walls incorporating the Product can adequately limit the risk of interstitial and surface condensation when designed and constructed in accordance with BS 5250 Annex G and BRE Report 262.

2.2.10 Fire performance

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

When the Product is:

- left exposed, it may contribute to an existing fire hazard;
- contained within a wall cavity, it will not contribute to the development stages of a fire or present a smoke or toxic hazard.

The Product does not impair the fire resistance of an external cavity wall.

The Product does not affect the external fire exposure classification obtained by the external wall finish.

2.2.11 Thermal performance

The Product has a low hemispherical emissivity surface, in accordance with BS EN 16012 Annex D.

The Product acts by creating a low emissivity surface in a wall, thus reflecting heat back into a building.

The Product is effective:

- in improving the thermal insulation of external cavity walls and helps to reduce energy transfer by conduction, convection and radiation;
- in winter by reflecting heat back into a building;
- in summer by providing an effective barrier to solar over-heating.

The Product reduces air leakage when joints are sealed using YBS Foil Tape.

2.2.12 Durability

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

The expected lifespan of the building itself should be at least 60 years.

The Product is coated with nitrocellulose to provide a corrosion-resistant surface.

The Product is stable, rot-proof, non-hygroscopic, water-resistant, inert, non-toxic, and does not sustain vermin or insects and will not encourage the growth of fungi or mould.

Once installed, the Product is protected in service from agents liable to cause deterioration.

2.2.13 CE Marking

The harmonised European standard for the Product is Draft BS EN 16863.

2.3 - EXAMPLES OF TYPICAL DETAILS

Diagram 1 - timber-framed wall application with Foil-Tec VCL Single

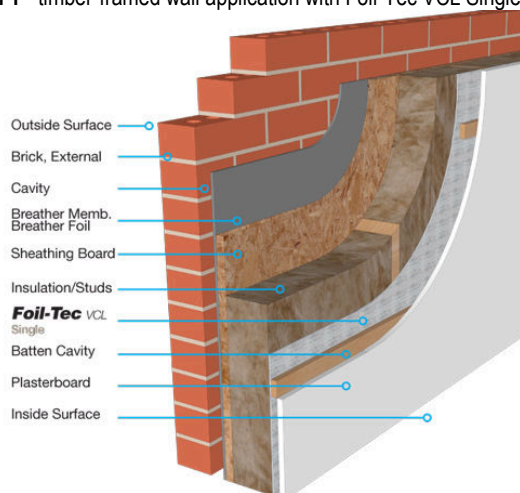


Diagram 2 - timber-framed wall application with Foil-Tec VCL Double

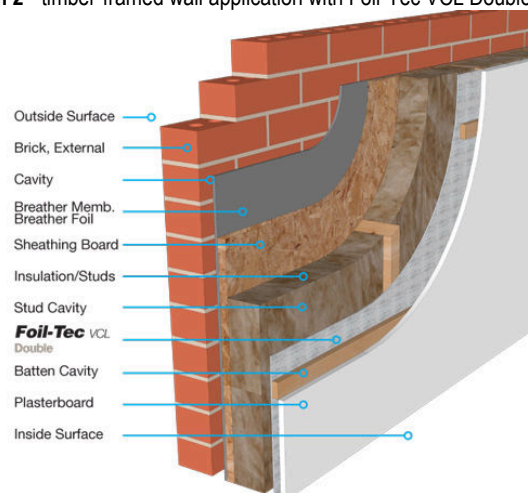


Diagram 3 - cavity wall application (full fill) with Foil-Tec VCL Single

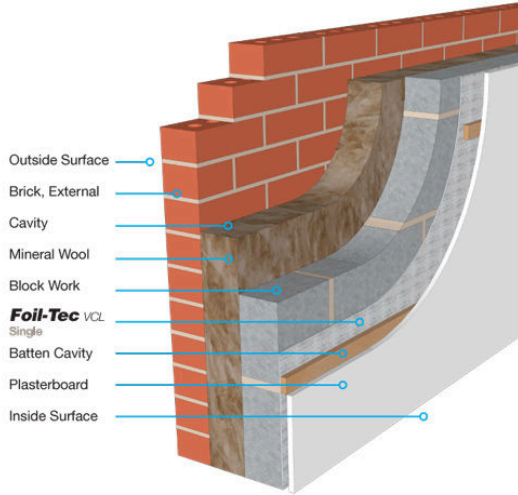
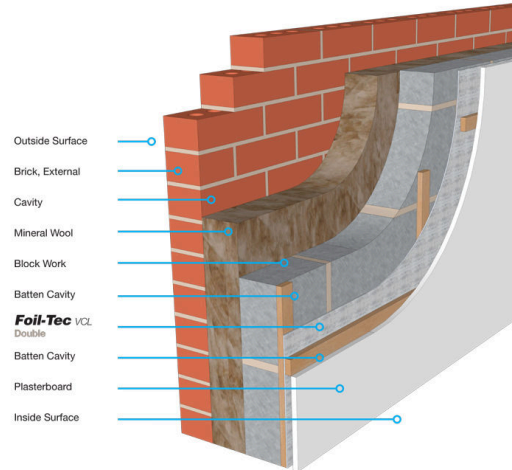


Diagram 4 - cavity wall application (full fill) with Foil-Tec VCL Double



2.4 - INSTALLATION

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

2.4.1 Installer competence level

See section 2.2.6.

2.4.2 Delivery, storage and site handling

See section 2.2.7.

2.4.3 Project specific installation considerations

No pre-installation survey is required for the installation of the Product.

2.4.4 Preparation

The following factors shall be considered prior to the commencement of work:

- ensure that sufficient material is available for the planned work.

2.4.5 Outline installation procedure

The key sequence for installation is:

- fix vertical/horizontal counter battens (with minimum dimensions 25 mm by 38 mm) to a wall at 400 mm centres (shall always be placed at the top and bottom of a wall and around the perimeter of doors and windows);
- install Product directly from the roll either vertical or horizontal depending on wall height, pulled tight and stapled or nailed onto battens at minimum 400 mm centres (making sure the reflective foil side of the Product is facing the cavity formed);
- overlap the Product at each joint by approximately 50 mm and staple onto battens;
- tape and seal all overlaps using YBS Foil Tape.

2.4.6 Finishing

There is no finishing required to the Product upon completion of the installation.

2.5 - INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.5.1 Moisture control

Test	Result
Water vapour transmission resistance	1569 MNs/g*
Water vapour diffusion-equivalent air layer thickness (Sd)	313.8 m
Water vapour diffusion factor (with seam)	1700

2.5.2 Strength

Test	Result	
Tensile strength parallel to faces, in accordance with BS EN 1608	142 kPa*	
Resistance to tearing (nail shank), in accordance with BS EN 12310-1	Length	406 N*
	Width	411 N*
Dimensional stability under specified temperature and humidity, in accordance with BS EN 1604	Length	1.5 %
	Width	2.3 %

2.5.3 Fire performance

Test	Result
Reaction to fire classification, in accordance with BS EN 13501-1	E* (combustible)

2.5.4 Thermal performance

Test		Result
Hemispherical emissivity coefficient of foil face, in accordance with BS EN 16012 Annex D		0.02*
Calculated thermal resistance, in accordance with BS EN ISO 6946	Product with adjacent non-ventilated 13 mm cavity	0.49 m ² K/W*
	Product with adjacent non-ventilated 20 mm cavity	0.74 m ² K/W*
	Product with two adjacent non-ventilated 13 mm cavities	0.98 m ² K/W*
	Product with two adjacent non-ventilated minimum 20 mm cavities	1.48 m ² K/W*

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 - THE 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 THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - the Product can contribute to limiting the risk of surface and interstitial condensation
- J4 Protection of the building - the Product can be separated from heat producing appliances, flue pipes or chimneys to prevent a building from catching fire
- L1(a)(b) Conservation of fuel and power - the Product can contribute to satisfying this Requirement
- Regulation 7 Materials and workmanship - the Product is manufactured from suitably safe and durable materials for its application and can be installed to give satisfactory performance
- Regulation 23 Requirements relating to thermal elements - the use of the Product can contribute to the conservation of fuel and power in buildings by limiting heat gains and losses through external wall
- Regulation 25 Minimum energy performance Requirements for new buildings - the Product can contribute to the target CO₂ emission rates
- Regulation 26 CO₂ emission rates for new buildings - the Product can contribute to satisfying this Regulation
- Regulation 26A Fabric energy efficiency rates for new buildings - the Product can contribute to satisfying this Regulation

3.2.2 - WALES THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - the Product can contribute to limiting the risk of surface and interstitial condensation
- J4 Protection of the building - the Product can be separated from heat producing appliances, flue pipes or chimneys to prevent a building from catching fire
- L1(a)(b) Conservation of fuel and power - the Product can contribute to satisfying this Requirement
- Regulation 7 Materials and workmanship - the Product is manufactured from suitably safe and durable materials for its application and can be installed to give satisfactory performance
- Regulation 23 Requirements relating to thermal elements - the use of the Product can contribute to the conservation of fuel and power in buildings by limiting heat gains and losses through external wall
- Regulation 25 Minimum energy performance Requirements for new buildings - the Product can contribute to the target CO₂ emission rates
- Regulation 26 CO₂ emission rates for new buildings - the Product can contribute to satisfying this Regulation
- Regulation 26A Primary energy consumption rates for new buildings - the Product can contribute to satisfying this Regulation
- Regulation 26B Fabric performance values for new dwellings - the Product can contribute to satisfying this Regulation

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

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

- the Product is manufactured from acceptable materials and is adequately resistant to deterioration and wear under normal service conditions, provided it is installed in accordance with the requirements of this Agrément

3.2.3.2 Regulation 9 Building Standards - Construction

- 2.3 Structural protection - the Product can be separated from heat producing appliances, flue pipes or chimneys to prevent a building from catching fire
- 3.15 Condensation - external walls using the Product in accordance with the Requirements of this Agrément, can be designed and constructed to comply with these Standards
- 3.19 Combustion appliances - relationship to combustible materials - the Product can be separated from heat producing appliances, flue pipes or chimneys to prevent a building from catching fire
- 6.1(b) Carbon dioxide emissions - the Product can contribute to satisfying this Requirement
- 6.2 Building insulation envelope - the Product can contribute to satisfying this Requirement
- 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 can 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 Standards

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(a)(i)(iii)(b) Fitness of materials and workmanship - the Product is manufactured from materials which are considered suitably safe and acceptable for use as thermal insulation
- 29 Condensation - the Product can contribute to limiting the risk of surface and interstitial condensation
- 39(a)(i) Conservation measures - the Product can contribute to limiting heat gains and losses through a wall
- 40(2) Target carbon dioxide emission rates - a wall incorporating the Product must be designed and constructed as not to exceed its target CO₂ emission rate
- 43 Renovation of thermal elements - the renovation work carried out can ensure that external wall complies with Requirement 39(a)(i)
- 73(1) Protection of people and buildings - the Product can be separated from heat producing appliances, flue pipes or chimneys to prevent a building from catching fire

3.3 - THIRD-PARTY ACCEPTANCE

NHBC - In the opinion of Kiwa Ltd., the Product, if installed, used and maintained in accordance with this Agrément, can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standards, Chapters 6.1 External masonry walls and 6.2 External timber framed walls.

CHAPTER 4 - SOURCES

- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods
- BS EN ISO 10211:2017 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations
- BS EN 1604:2013 Thermal insulating products for building applications. Determination of dimensional stability under specified temperature and humidity conditions
- BS EN 1608:2013 Thermal insulating products for building applications. Determination of tensile strength parallel to faces
- BS EN 12310-1:2000 Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank). Bitumen sheets for roof waterproofing
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- BS EN 16012:2012+A1:2015 Thermal insulation for buildings. Reflective insulation products. Determination of the declared thermal performance
- Draft BS EN 16863 Thermal insulation products for buildings. Factory made reflective insulation products (RI). Specification
- BS 5250:2011+A1:2016 Code of practice for control of condensation in buildings
- BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain
- BS 8212:1995 Code of practice for dry lining and partitioning using gypsum plasterboard
- Accredited Construction Details (Scotland) - Part 3 Timber frame construction details: 2015
- BRE Information Paper 1/06:2006 Assessing the effects of thermal bridging at junctions and around openings
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2006 Conventions for U-value calculations
- BRE Report 497:2016 Conventions for Calculating Linear thermal transmittance and Temperature Factors
- Government Accredited Construction Details for Part L:2019
- NHBC Standards: 2020
- PAS 2030:2019 Specification for the installation of energy efficiency measures in existing dwellings and insulation in residential park homes
- PAS 2035:2019 Retrofitting dwellings for improved energy efficiency. Specification and guidance

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

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment Description	Amended By	Approved By	Date
-	First Issue	C Devine	C Vurley	May 2021