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BAE-19-124-P-A-UK
BDA Agrément®
Kevothermal
Vacuum Insulation Panel (VIP)

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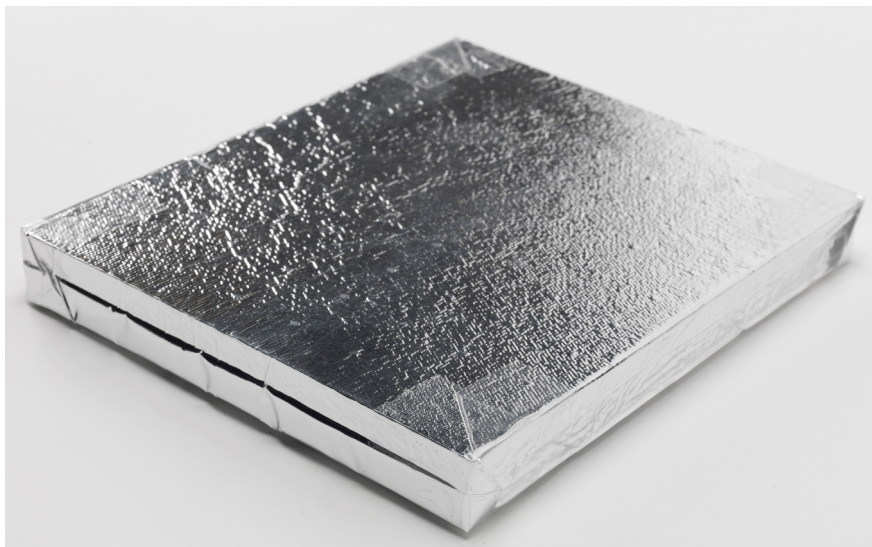
SCOPE OF AGRÉMENT

This Agrément relates to Kevothermal (hereinafter 'the Product'), a vacuum insulation panel (hereinafter 'VIP') for use as thermal insulation in walls, roofs and floors of dwellings and buildings with similar temperature and humidity conditions.

PRODUCT DESCRIPTION

The Product consists of a micro-porous fumed silica core material (silicon carbide, hydrophilic pyrogenic silica and polyester fibres), contained within a vacuum sealed envelope (multi-layer aluminium foil wrapper), manufactured in accordance with prEN 17140. Available in a maximum size of 1000 by 1500 mm and a range of thicknesses from 6 to 50 mm.

PRODUCT ILLUSTRATION



THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

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 AGREEMENT

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 Agreement 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).

Strength - the performance of the Product with regard to compressive stress, tensile strength and soft-body impact has been considered (see section 2.2.10).

Fire performance - the Product is classified as European Classification F (combustible) in accordance with BS EN 13501-1 (see section 2.2.11).

Thermal performance - the Product has a declared thermal conductivity (λ_D) of 0.0045 W/mK (see section 2.2.12).

Durability - the Product will have a service life durability equivalent to that of the structure into which it is incorporated (see section 2.2.13).

CE marking - the Agreement holder has responsibility for CE marking in accordance with all relevant harmonised European Product Standards (see section 2.2.14).

CONTENTS

Chapter 1 - General considerations

- 1.1 - Conditions of use
- 1.2 - Production Control and Quality Management System
- 1.3 - Annual verification procedure - continuous surveillance

Chapter 2 - Technical assessment

- 2.1 - Product components and ancillary items
- 2.2 - Points of attention to the Specifier
- 2.3 - Examples of details
- 2.4 - Installation
- 2.5 - Independently assessed Product characteristics

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
- 3.2 - The national Building Regulations
- 3.3 - Third-Party acceptance

Chapter 4 - Sources

Chapter 5 - Amendment history

Chapter 6 - Conditions of use

CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations

See section 2.2.

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 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

2.1.1 Components included within the scope of this Agrément

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

Product	Description	Density	Dimensions
Kevothermal	Rectangular VIP, consisting of a microporous fumed silica core material (silicon carbide, hydrophilic pyrogenic silica and polyester fibres) within a vacuum sealed envelope (multi-layer aluminium foil wrapper), manufactured in accordance with prEN 17140	180 kg/m ³	length 100 to 1500 mm; width 100 to 1000 mm; thickness 6 to 50 mm

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)

A competent Specialist shall check the physical behaviour of a project specific design incorporating the Product and if necessary can offer advice in respect of 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 consultant Specialist co-operates closely with the Agrément holder).

2.2.3 General design considerations

The Product can be used as insulation in the following applications:

- floors;
- internal and external walls;
- roofs.

For retrofit applications, existing constructions must have flat, levelled surfaces. Any necessary repairs must be carried out prior to installation.

The Product must not be used in applications with heat sources greater than 60 °C. For applications above 80 °C please consult the Agrément holder.

To reduce the risk of puncture, the Product must not be left exposed after installation.

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

To reduce linear thermal bridging, the Product shall be closely butted at all joints, in accordance with the Agrément holder's instructions.

When used in flooring applications, the Product is not recommended for use in direct contact with the subsoil and must be positioned above the damp-proof membrane (DPM).

The Product can be used beneath a floating floor system with suitably protected substrate.

When used in roofing and flooring applications, ensure any pre-installed Product is protected prior to the installation of additional layers.

The Product is susceptible to punctures, therefore do not:

- use mechanical fixings for installation;
- cut or saw;
- drill or screw into panels;
- walk directly on panels.

2.2.4 Project specific design considerations

A pre-installation survey is required, to allow determination of the project specific design - see section 2.4.3.

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 bearing 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.

2.2.8 Maintenance and repair

Once installed, the Product does not require maintenance.

Performance factors in relation to the Major Points of Assessment

2.2.9 Moisture control

External walls, flat roofs and ground floors incorporating the Product will adequately limit the risk of interstitial and surface condensation when designed in accordance with BS 5250. Care should be taken to provide adequate ventilation and to ensure the integrity of linings and vapour control layers (VCLs) (where installed), against vapour ingress.

A condensation risk analysis shall be completed at the design stage on a project-specific basis, in accordance with BS 5250.

When designed and installed in accordance with this Agrément, the Product will provide for a convection-free envelope of high vapour resistance.

2.2.10 Strength

The Product has adequate:

- compressive strength, in accordance with prEN 17140;
- tensile strength, in accordance with BS EN 1607;
- resistance to soft-body impact, in accordance with BS EN 1195

2.2.11 Fire performance

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

When used in walling applications, the national Building Regulations place specific regional restrictions on the use of the Product regarding:

- maximum building height;
- building function;
- proximity to boundaries;
- relevant boundaries.

Refer to the national Building Regulations for full details of the restrictions that apply.

Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity closers and barriers, fire stopping of service penetrations, and combustibility limitations for other materials and components used in the overall construction of walls.

The installed Product shall be separated or shielded from any heat-emitting devices, recessed lighting, flue pipes or chimneys passing through a suspended floor, and any potential source of ignition where the temperature is in excess of 60 °C, by non-combustible insulation in accordance with the provisions of the national Building Regulations.

2.2.12 Thermal performance

The Product can meet or contribute to meeting all required levels and provisions regarding thermal transmittance (U-values) or thermal resistance.

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 building elements incorporating the Product should be calculated according to BS EN ISO 10211 (taking into consideration BS EN 6946, BS EN ISO 13370 and BRE Report 443), using the Product's declared thermal conductivity (λ_D).

The U-value of the building elements incorporating the Product is dependent upon on the Product thickness, type of substrate and internal finish, and is to be determined for the completed installation as a whole.

Account should be taken of the applicable Government Accredited Construction details for Part L, England and Wales, and Accredited Construction details, Scotland.

The requirement for limiting heat loss through the building fabric, including the effect of thermal bridging, can be satisfied if the U-value of the building elements incorporating the Product does not exceed the maximum and target U-value given in the national Building Regulations.

2.2.13 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 30 to 60 years.

2.2.14 CE Marking

The harmonised European standard for the Product is prEN 17140.

2.3 - EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Typical internally insulated external wall detail

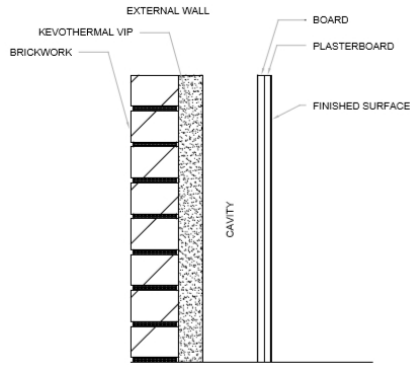


Diagram 2 - Typical externally insulated external wall detail

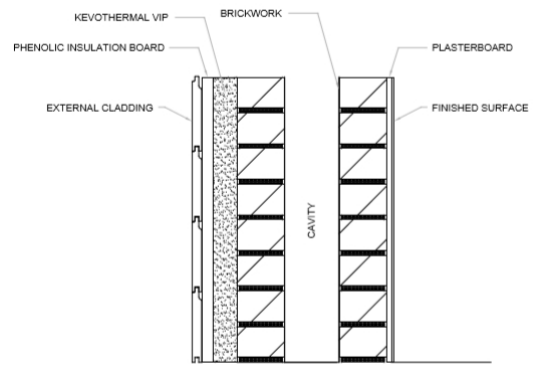


Diagram 3 - Typical ballasted flat or tapered roof system detail

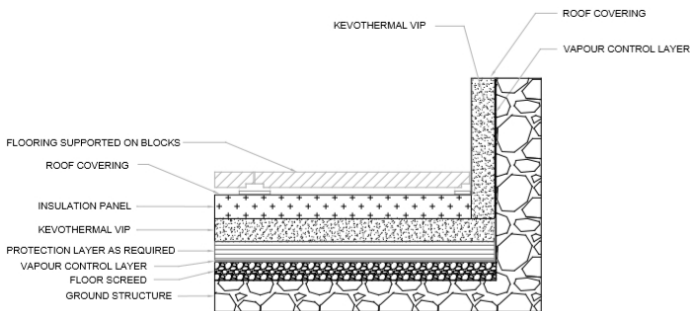
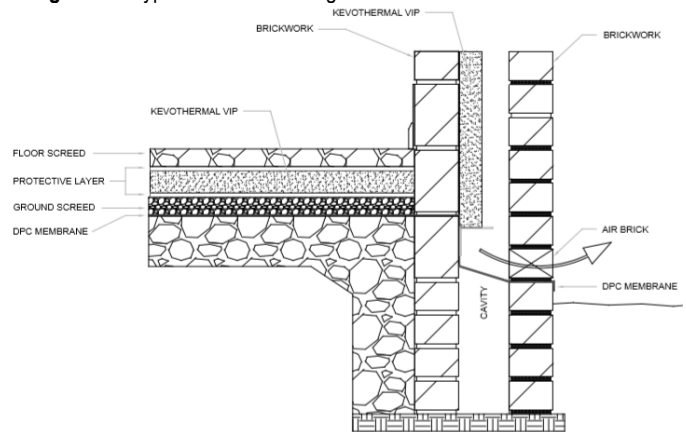


Diagram 4 - Typical solid concrete ground-based floor detail



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

The project-specific design has been determined from a pre-installation survey.

The primary requirement of the pre-installation survey is to determine the following:

- existing constructions must have flat, levelled surfaces;
- any necessary repairs have been carried out prior to installation.

2.4.4 Preparation

The following considerations apply prior to starting the work:

- read the installation instructions carefully prior to installing the Product;
- consult the System Designer for details of Product installation;
- during installation, extreme care must be taken to avoid damaging the Product. Should damage occur, the damaged Product shall be replaced by a new panel;
- the substrate must be clean, dry, level and free of sharp objects or edges.
- the Product should not be:
 - used in association with solvent-based adhesive systems;
 - exposed to naked flames or excessive heat ($> 60\text{ }^{\circ}\text{C}$);
 - cut or penetrated.

2.4.5 Outline installation procedure

The detailed installation sequence can be found in full in the System Designer's Installation Manual.

Installation of the Product shall be done in accordance with the System Designer's installation instructions. The structure into which the Product is installed shall be constructed and waterproofed in accordance with:

- PD 6697 (walls);
- BS 6229 and BS 8217 (flat roofs);
- BS 8102 and BS 8215 (walls and floors).

2.4.6 Finishing

The following finishing is required upon completion of the installation:

- no finishing is required upon completion of the installation.

2.5 - INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.5.1 Strength

Test	Standard	Result	Comment
Minimum compressive stress @ 10 % compression	prEN 17140	223 kPa	Level CS(10\Y)200
Tensile strength perpendicular to faces	BS EN 1607	93.6 kN/m ²	Level TR90
Soft-body impact	BS EN 1195	No defect	No loss of vacuum
Deformation under specified compressive load and temperature conditions	BS EN 1605	0.29 %	Pressure of 20 kPa and 23 °C/80 °C (48 hours + 48 hours). Within the acceptable limit of 3 %
		0.68 %	Pressure of 40 kPa and 23 °C/70 °C (48 hours + 168 hours). Within the acceptable limit of 3 %

2.5.2 Fire performance

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

2.5.3 Thermal performance

Test	Standard	Result	Comment
Declared thermal conductivity (λ_d)	BS EN 17140	0.0045 W/mK	-

2.5.4 Other product characteristics

Test	Standard	Result	Comment
Dimensional stability under specified temperature and conditions (70 °C/90 % RH)	BS EN 1604	-0.30 %	$\Delta\epsilon_l$ (mean length), acceptable
		0.10 %	$\Delta\epsilon_b$ (mean breadth), acceptable
		3.09 %	$\Delta\epsilon_d$ (mean depth), acceptable

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 - roofs, walls and floors 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 roof, wall or floor
- Regulation 7(1) Materials and workmanship - the Product is manufactured from suitably safe and durable materials for the application
- Regulation 23(1) Requirements relating to thermal elements - the Product can contribute to a roof, wall or floor complying with the Requirements of L1(a)(i)
- Regulation 26 CO₂ emission rates for new buildings - the Product can contribute to a building to not exceed its CO₂ emission rate
- Regulation 26A Fabric energy efficiency rates (new buildings) - the Product can contribute to satisfying this Requirement

3.2.2 - WALES THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - roofs, walls or floors 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 roof, wall or floor
- Regulation 7(1) Materials and workmanship - the Product is manufactured from suitably safe and durable materials for the application
- Regulation 23(1) Requirements relating to thermal elements - the Product can contribute to a roof, wall or floor complying with the Requirements of L1(a)(i)
- Regulation 26 CO₂ emission rates for new buildings - the Product can contribute to a building to not exceed its CO₂ emission rate
- Regulation 26A Primary energy consumption rates for new buildings - the Product can contribute to satisfying this Requirement
- Regulation 26B Fabric performance values for new dwellings - the Product can contribute to satisfying this Requirement

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 durable and fit for its intended purpose

3.2.3.2 Regulation 9 Building standards - construction

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

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

- 23(a)(b) Fitness of materials and workmanship - roofs, walls and floors incorporating the Product are suitable and can be adequately mixed, prepared and applied
- 29 Condensation - roofs, walls and floors incorporating the Product can adequately protect a building from moisture in the form of interstitial condensation
- 39(a)(i) Conservation measures - the Product will limit heat gains and losses through a roof, wall or floor
- 40(2) Target carbon dioxide emission rate - the Product will contribute to a building to not exceed its target CO₂ emission rate
- 73(1)(b) Protection of people and buildings - the Product can be separated from combustion appliances, flue-pipes, flues or chimneys to prevent damage to a building by heat or fire

3.3 - THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

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 ISO 13370:2017 Thermal performance of buildings. Heat transfer via the ground. Calculation methods
- BS EN 1195:1998 Timber structures. Test methods. Performance of structural floor decking
- BS EN 1604:2013 Thermal insulating products for building applications. Determination of dimensional stability under specified temperature and humidity conditions
- BS EN 1605:2013 Thermal insulating products for building applications. Determination of deformation under specified compressive load and temperature conditions
- BS EN 1607:2013 Thermal insulating products for building applications. Determination of tensile strength perpendicular to faces
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- prEN 17140 Thermal insulation products for buildings. Factory made Vacuum Insulation Panels (VIP). Specification
- BS 5250:2011+A1:2016 Code of practice for control of condensation in buildings
- BS 6229:2018 Flat roofs with continuously supported flexible waterproof coverings. Code of practice
- BS 8102:2009 Code of practice for protection of below ground structures against water from the ground
- BS 8217:2005 Reinforced bitumen membranes for roofing. Code of practice
- BS 8215:1991 Code of practice for design and installation of damp-proof courses in masonry construction
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2006 Conventions for U-value calculations
- PD 6697:2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

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	June 2020

CHAPTER 6 - CONDITIONS OF USE

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