Kiwa Ltd.
Unit 5 Prime Park Way
Prime Enterprise Park
Derby
DE1 3QB
+44 (0)1332 383333
uk.bpenquiries@kiwa.com
www.kiwa.co.uk/bda

BAB-23-293-P-A-UK
BDA Agrément®
Combi-Seal HD
Ground VOC Barrier, Ground Gas Barrier and Waterproof Membrane

Premcrete Ltd.
44 Macadam Way
West Portway Industrial Estate
Andover, Hampshire
SP10 3XW
+44 (0)2380 276166
sales@premcrete.com
www.premcrete.com

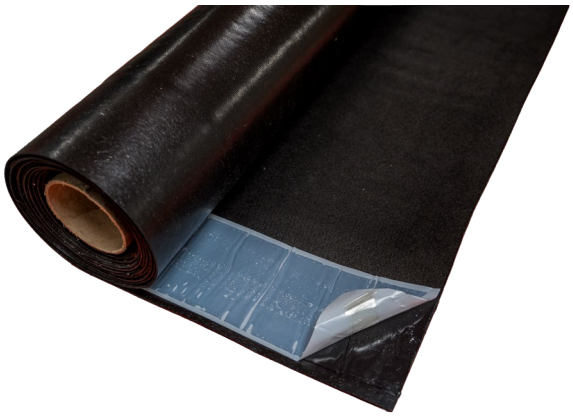
SCOPE OF AGRÉMENT

This BDA Agrément® (hereinafter 'Agrément') relates to Combi-Seal HD (hereinafter the 'Product'). The Product is a flexible, high-density composite ground volatile organic compound (hereinafter 'VOC') barrier, ground gas barrier and waterproof membrane. The Product provides protection to the building against moisture and water, methane and carbon dioxide gases and VOC vapours from the ground. The Product is for use on the underside of ground floor slabs and basement construction, lift pits, concrete retaining walls and other structures which extend below ground. The Product is for new dwellings, and buildings other than dwellings.

DESCRIPTION

The Product is a two-layer, flexible waterproofing membrane, consisting of a high-density polyethylene membrane (hereinafter 'HDPE'), cross-laminated with a non-woven geotextile and thermally bonded using a factory-applied adhesive. The upper surface of the Product is a black textured non-woven geotextile and the underside is black with a smooth finish. The Product is manufactured in accordance with BS EN 13967.

ILLUSTRATION



THIRD-PARTY ACCEPTANCE

See Section 3.3 (Third-Party Acceptance).

STATEMENT

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

Craig Devine
Operations Manager, Building Products

Alpheo Mlotha CEng FIMMM MBA
Business Unit Manager, Building Products

SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, specialists, engineers, building control personnel, contractors, installers and other construction industry professionals who are considering the safety and fitness for purpose of the Product. This Agrément covers the following:

- Conditions of use;
- Production Control, Quality Management System and the Annual Verification Procedure;
- Product components and ancillary items, points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed Product characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party Acceptance, as appropriate;
- Sources.

MAJOR POINTS OF ASSESSMENT

Moisture control - see Section 2.2.7 - the Product, including taped lap joints, provides an effective barrier to:

- the passage of liquid groundwater when subject to hydrostatic pressure up to and including 60 kPa;
- water vapour transmission from the ground.

Strength - see Section 2.2.8 - the Product has adequate performance in respect of:

- damage resistance to puncture, impact and static loading;
- tensile strength;
- tensile strength of lap joints;
- resistance to tearing.

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

Resistance to chemicals and ground gases - see Section 2.2.10 - the Product can provide resistance to:

- nine challenge VOC chemical vapours;
- methane and carbon dioxide ground gas.

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

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

CONTENTS

1 GENERAL CONSIDERATIONS

1.1 CONDITIONS OF USE

1.1.1 Limitations

This Agrément has been prepared in accordance with the mandatory requirements defined in the relevant Kiwa Technical Requirement. Some information in this Agrément is provided for guidance or reference purposes only; this information falls outside the scope of the Technical Requirement.

1.1.2 Application

The assessment of the Product relates to its use in accordance with this Agrément and the Agrément holder's requirements.

1.1.3 Assessment

Kiwa Ltd. has assessed the Product in combination with relevant test reports, technical literature, the Agrément holder's quality plan, DoPs and site visit, as appropriate.

1.1.4 Installation supervision

The quality of installation and workmanship shall be controlled by a competent person who shall be an employee of the installation company (hereinafter 'Installer').

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

1.1.5 Geographical scope

The validity of this document is limited to England, Wales, Scotland and Northern Ireland, with due regard to Section 3 of this Agrément (CDM, national Building Regulations and Third-Party Acceptance).

1.1.6 Validity

The purpose of this Agrément is to provide well-founded confidence to apply the Product within the scope described. The validity of this Agrément is as published on www.kiwa.co.uk/bda.

1.2 PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has conducted an audit of the Agrément holder and determined that they fulfil all their obligations in relation to this Agrément in respect of the Product.

The initial audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their quality plan. Document control and record-keeping procedures were deemed satisfactory. A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 ANNUAL VERIFICATION PROCEDURE - CONTINUOUS SURVEILLANCE

To demonstrate that the Product conforms with the requirements of the technical specification described in this Agrément, an Annual Verification Procedure has been agreed with the Agrément holder in respect of continuous surveillance and assessment, and auditing of the Agrément holder's QMS.

2 TECHNICAL ASSESSMENT

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

2.1 PRODUCT COMPONENTS AND ANCILLARY ITEMS

2.1.1 Components included within the scope of this Agrément

The components listed in Table 1 below are integral to the use of the Product.

Table 1 - Integral components

Component	Description	Dimensions
Combi-Seal HD	two-layer membrane, consisting of top black non-woven geotextile layer, thermally bonded to the HDPE layer. A selvedge strip (100 mm wide by 1 mm thick double-sided butyl tape) is pre-applied along the membrane's long edge to bond adjacent membrane sheets at their joints; consisting of polyethylene carrier film coated with a solvent acrylic adhesive and a release film	2.0 m wide by 10 m long roll, 3 mm thick

2.1.2 Ancillary items falling outside the scope of this Agrément

The following ancillary items detailed in this Section may be used in conjunction with the Product, but fall outside the scope of this Agrément:

- Combi-Seal Tape - single-sided, reflective foil tape, 150 mm wide;
- Selvedge Tape - double-sided butyl tape, 100 mm wide;
- Hydroprufe LG;
- Twinseal Compound GR;
- metal washer fixings;
- Hydroprufe Detail Strip;
- Premcrete Protection Board 600;
- Hydroprufe 8000;
- Hydroprufe Top Hats;
- termination bar;
- Hydrocrete;
- Hydrostop BR;
- Cemflex VB;
- Teknocem HBR;
- Epodure EP 600;
- Hydroprufe DPC;
- pre-formed units.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design

2.2.1.1 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 Installer is responsible for the final as-built design.

2.2.1.2 Basis of design

The characteristics detailed in the section titled 'Major Points of Assessment' shall be considered during the use of the Product.

2.2.1.3 General design considerations

The Product provides protection to the structure against water and moisture, subject to hydrostatic pressure of up to and including 60 kPa. The Product restricts the transmission of methane and carbon dioxide gases and VOC vapours into buildings from contaminated landfill and naturally occurring sources.

The Product can act as a fully bonded Type A membrane, in accordance with BS 8102, providing waterproofing protection Grades 1a, 1b and 2, and Grade 3 when part of a combined waterproofing solution.

The project-specific design shall achieve complete integrity across the entire building footprint.

The application of the Product shall take account of possible differential movement in the floor due to ground settlement.

The Product shall be designed and installed in accordance with the following minimum recommendations:

- BS 8000-0;
- BS 8000-4;
- BS 8485;
- BRE Report 414;
- Chartered Institute of Environmental Health publication 'The Local Authority Guide to Ground Gas';
- CIRIA R149;
- CIRIA R152;
- CIRIA C665;
- CIRIA C716;
- CIRIA C735;

- CIRIA C748;
- CP 102.

The Specifier shall consider the site-specific ground gas regime and purpose criteria in BS 8485 (the complexity of the design and the experience of the workforce).

When medium-to-high levels of ground gases are present, or when the production of gases still occurs, a suspended concrete ground floor should be considered. A ventilation void beneath the ground floor will dilute and disperse ground gases to the atmosphere. For further details, the Agrément holder shall be consulted.

The Product shall be protected using Premcrete Protection Board 600 prior to backfill, to avoid damage during construction.

Reinforcement spacer blocks shall be placed along the length of the lap joint to ensure that the Product is effectively loaded to prevent displacement during placement of the concrete.

The Product laps shall:
- be jointed and sealed with tape and a minimum overlap of 150 mm;
- form a continuous barrier with a gas-resistant damp proof course (hereinafter 'GRDPC') in a wall.

The textured face of the Product aids adhesion to wet concrete.

2.2.1.4 Project-specific design considerations
The project-specific design shall:
- be determined by the Specifier;
- take into account the requirements of the relevant national Building Regulations - see Section 3.2;
- take into account the service life durability required - see Section 2.2.11.

A pre-installation survey is required to allow determination of the project-specific design - see Section 2.4.1.

2.2.2 Applied building physics (heat, air, moisture)
A Specialist shall check the hygrothermal behaviour of a project-specific design incorporating the Product and, if necessary, offer advice on improvements to achieve the final specification. The Specialist can be either a qualified employee of the Agrément holder or a suitably qualified consultant (in which case it is recommended that the Specialist co-operates closely with the Agrément holder).

2.2.3 Permitted applications
Only applications designed according to the specifications given in this Agrément are permitted. In each case, the Specifier and Installer shall co-operate closely with the Agrément holder.

2.2.4 Installer competence level
The Product shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

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

2.2.5 Delivery, storage and site handling
The Product is delivered in suitable packaging bearing relevant identification information (such as the Product name, production identification date or batch number, the Agrément holder's name, etc.) and, where applicable, the BDA Agrément® logo incorporating the number of this Agrément.

Prior to installation, the Product shall be stored in accordance with the Agrément holder's requirements. Good housekeeping protocols shall be followed to avoid damage. In particular, care shall be taken to:
- avoid exposure to direct sunlight for long periods of time;
- avoid exposure to high or low temperatures 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 rolls of the Product horizontally on a flat surface.

Care shall be taken to avoid accidental damage to the Product when handling on-site.

2.2.6 Maintenance and repair
Once installed, the Product does not require regular maintenance. For advice in respect of repair, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.2.7 Moisture control
When under hydrostatic pressure, the Product, including taped lap joints, has adequate watertightness to provide a barrier to the passage of water from the ground into the internal environment, in accordance with BS EN 1928 - as detailed in Section 2.5.1.

The Product provides water vapour resistance and can prevent water vapour transmission from the ground into a building, in accordance with BS EN 1931.

2.2.8 Strength
Once installed on a compacted or blinded surface, the Product will not be damaged by normal on-site foot traffic. However, the Product can be punctured by sharp objects during installation, therefore care shall be taken when handling building equipment and materials.

As detailed in Section 2.5.2, the Product has been tested to determine its:

- static puncture resistance, in accordance with BS EN ISO 12236;
- tensile strength and elongation properties, in accordance with BS EN 12311-2;
- shear resistance of taped or welded lap joints, in accordance with BS EN 12317-2;
- resistance to tearing (nail shank), in accordance with BS EN 12310-1;
- resistance to impact, in accordance with BS EN 12691;
- resistance to static loading, in accordance with BS EN 12730.

2.2.9 Fire performance

The Product is classified as European Classification E, in accordance with BS EN 13501-1. Once incorporated into a concrete ground floor, the Product is fully protected.

2.2.10 Resistance to chemicals and ground gases

The Product will:

- restrict methane and carbon dioxide ground gas ingress and VOC vapour transmission into buildings;
- meet the performance criteria for a ground gas resistant membrane as defined in Table 7 of BS 8485.

2.2.11 Durability

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

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

2.2.12 UKCA, UKNI and CE marking

The British and European standard for the Product is BS EN 13967.

2.3 EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Typical cross section through basement piled wall detail

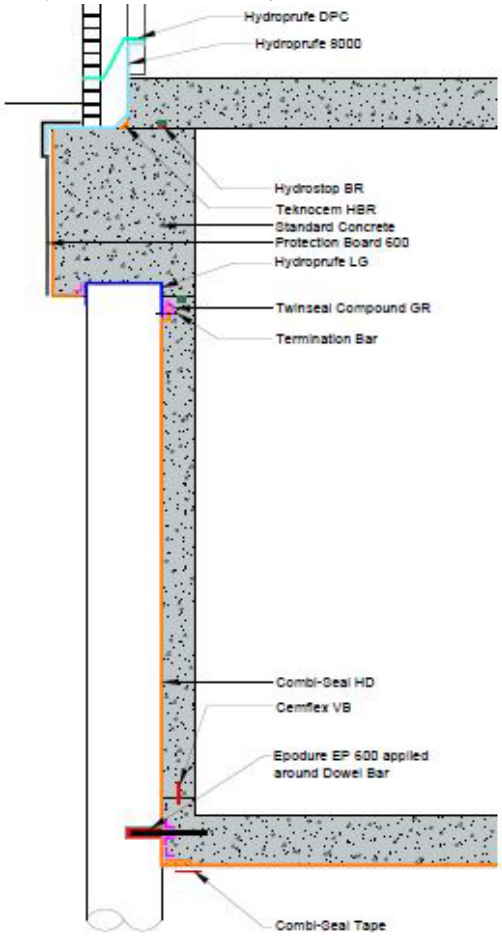


Diagram 2 - Typical cross section through basement retaining wall detail

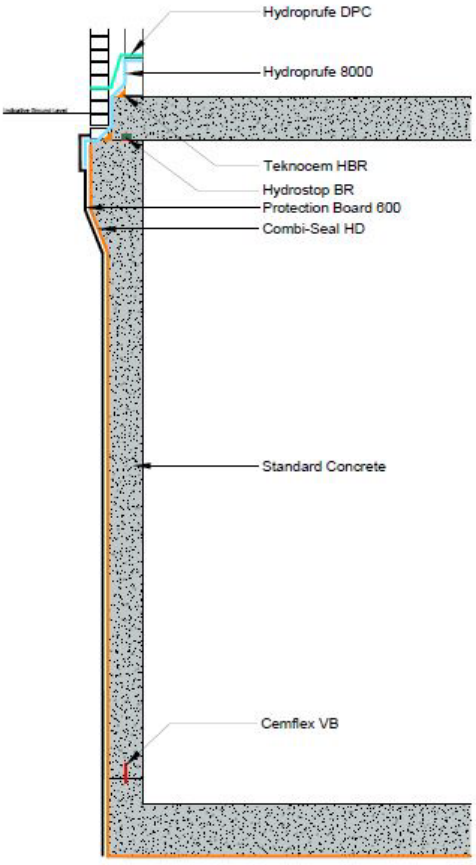


Diagram 3 - Typical cross section through slab edge detail

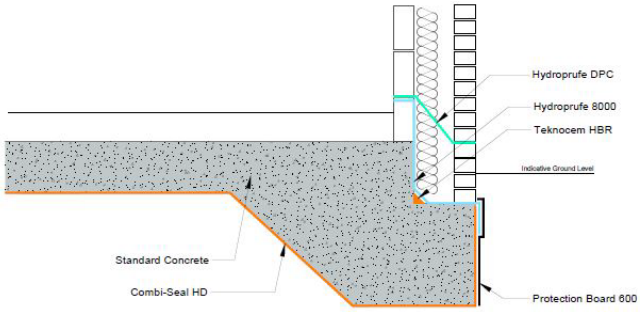
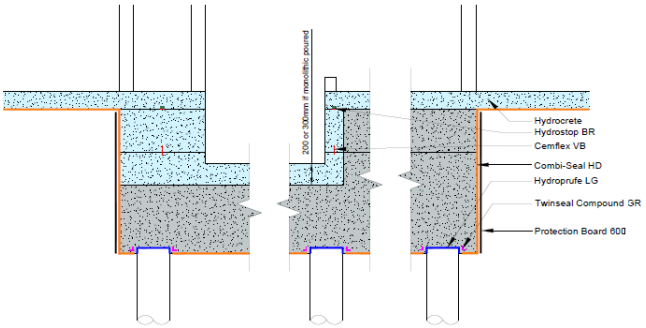


Diagram 4 - Typical cross section through core - Liftpit



2.4 INSTALLATION

The Product shall be installed strictly in accordance with the instructions (hereinafter 'Installation Manual') of the Agrément holder, the requirements of this Agrément and the requirements of BS 8000-0, BS 8000-4 and BS 8485.

2.4.1 Project-specific installation considerations

The project-specific design shall be determined from a pre-installation survey.

For ground VOC barrier and ground gas barrier applications, a pre-installation walkover site survey is required to allow determination of the project-specific design. This shall include:

- an assessment of the ground conditions;
- a site investigation to determine the nature and extent of the conditions, including invasive geotechnical and contamination investigations, in accordance with BS EN 1997-2, BS EN ISO 14688-1 and BS EN ISO 22476-1; this on-site testing shall be supplemented by subsequent laboratory testing where necessary;
- investigating, assessing and managing risks from the inhalation of ground VOCs and ground gases in land affected by contamination (in accordance with CIRIA C665 and CIRIA C682);
- investigation for ground VOC and ground gas contamination, in accordance with BS 8576 and BS 10175.

A desktop study of the site shall be undertaken for all applications. This shall include:

- a review of the results of the pre-installation walkover site survey (if required for the application);
- assessment of the soils, geology, surface water, groundwater, and current and historical land uses;
- a ground gas risk assessment and site characterisation, in accordance with CL:AIRE RB 17 and CIRIA R152;
- an assessment of ground conditions and the groundwater table, in accordance with BS 8102.

All service penetrations and changes in direction shall be properly detailed in accordance with the Agrément holder's instructions.

The Product shall form a continuous barrier over the footprint of the building using a suitable gas-resistant damp-proof course (GRDPC), overlapping with the Product by a minimum of 150 mm.

2.4.2 Preparation

The following considerations apply before starting the work:

- the Product shall only be applied:
  - below ground floor surfaces with a smooth and clean finish, i.e. free from loose aggregates or other sharp protrusions, voids, projections and mortar deposits, which can cause damage and affect adhesion;
  - when the air temperature is above 5 °C, to prevent the risk of surface condensation;
- ensure rolls of tape are kept in a warm, dry place, to ensure the tapes are workable and can be more easily applied.

The following works shall be undertaken before installing the Product:

- concrete ground floor surfaces shall be dry and free from protrusions, dust, dirt, moisture and frost to prevent potential joint contamination;
- blind the surface over which the Product is to be applied with compacted soft sand (or similar material) to fill voids in the concrete ground floor, or apply a smooth concrete float finish;
- in waterproofing applications, any cracks and joints in concrete substrates shall be repaired, and an appropriate drainage system shall be installed prior to application of the Product;
- irregularities in concrete substrates shall be repaired with a suitable Premcrete repair mortar;
- if the Product is to be installed to concrete foundation piles, prepare the piles properly by removing all loose soil and ensure the concrete is relatively flat;
- ensure any surface over which the Product is to be applied is prepared so that there are no voids over which the Product would have to span.

2.4.3 Outline installation procedure

Detailed installation procedures can be found in the Agrément holder's Installation Manual.

The outline procedure is as follows:

- the Product shall be rolled out with the textured facing the concrete placement, ensuring that the sheet edges are aligned allowing a minimum overlap of 150 mm;
- use the Selvedge Tape or Combi-Seal Tape for bonding the lapped joints, ensuring a minimum tape width of 100 mm;
- compress the joints firmly using a hand roller and check that complete adhesion is achieved;
- seal the joints with Combi-Seal Tape to provide smooth finish;

- seal around service penetrations using Hydroprufe Detail Strip or Hydroprufe Top Hats as appropriate;
- reinforce complicated junctions, e.g. external and internal corners, with Hydroprufe Detail Strip and bond using Combi-Seal Tape. Where this is not possible, reinforce the junctions with pre-formed units and bond to the Product using the Selvedge Tape or seal using Combi-Seal Tape;
- ensure that lap joints are staggered by a minimum of 300 mm to avoid four sheets of the Product intersecting at one junction.

In pre-applied applications, a suitable drainage system may be incorporated, in accordance with the requirements of BS 8102.

Vertical permanent shuttering and temporary formwork surfaces:
- attach the Product to the inside face of the permanent shuttering, temporary formwork, or the adjoining structure using metal washer fixings to secure the leading edge of the Product;
- install the Product with the smooth surface facing the shuttering/formwork and align vertically, ensuring that all lap joints face down away from the concrete pour;
- ensure the lap joints are sealed using the Selvedge Tape or Combi-Seal Tape and with a minimum of 150 mm overlap width;
- compress the joints firmly using a hand roller and check that complete adhesion is achieved;
- secure the membrane in place prior to pouring concrete with mechanical fixings; fix with metal washer fixings through the membrane selvedge prior to placing the adjacent sheet;
- once the concrete has set, remove temporary formwork, and the Product will remain adhered to the concrete;
- protect the Product using Premcrete Protection Board 600 prior to backfilling, to ensure it remains un-punctured;
- ensure the Product is not installed above the final ground level;
- ensure continuity of the Product with a GRDPC is maintained where appropriate.

Horizontal application to surfaces below or above a concrete ground floor:
- if fixing is required, fix the Product mechanically through the selvedge using metal washer fixings;
- place reinforcement spacer blocks along the length of lap joints to ensure that the Product is effectively loaded and to prevent displacement;
- seal penetrations using Hydroprufe Top Hats, which shall be taped to the underside of the Product using Combi-Seal Tape;
- apply a fillet of Twinseal Compound GR around the penetration to ensure the integrity of the joint.

When underfloor heating is being installed, it is recommended that the Product is positioned between the concrete ground floor and insulation layer.

2.4.4 Finishing

The following finishing is required on completion of the installation:
- the Product shall be covered immediately after installation by applying the suitable finishing as per the project-specific design;
- care shall be taken to ensure that the Product is not punctured, stretched or displaced during finishing.

In vertical shuttering/formwork applications, the Product shall be protected using Premcrete Protection Board 600 prior to backfilling of the installation is carried out.

2.5 INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.5.1 Moisture control

Test			Standard	Result
Watertightness at 60 kPa	Control	Plain membrane	BS EN 1928 Method B	Pass, dry
		Jointed membrane^		
	After heat ageing (BS EN 1296) at 70° C for 24 weeks	Plain membrane		
		Jointed membrane^		
	After chemical ageing (BS EN 1847) in various solutions* for 28 days	Plain membrane		
		Jointed membrane^		
Water vapour transmission properties	Water flow rate density, g	Plain membrane	BS EN 1931 Method B	1.92×10^{-8} kg/m²s
	Water vapour diffusion-equivalent air layer thickness, S_d			15 m
	Water vapour resistance factor, μ			4,802

^ jointed membrane incorporating taped lap joints (Selvedge Strip), tested in accordance with the general principles of BS EN 1928

* various solutions including lime water solution, NaCl solution and sulphurous acid solution

2.5.2 Strength

Test			Standard	Result
Tensile strength of plain membrane (HDPE layer only)	Control	Machine direction	BS EN 12311-2	Mean 17.8 N/mm²
		Cross direction		Mean 33.0 N/mm²
	After heat ageing at 70 ± 2 °C for 56 days	Machine direction		Mean 5.8 N/mm²
		Cross direction		Mean 6.5 N/mm²
Elongation at break of plain membrane (HDPE layer only)	Control	Machine direction		Mean 667 %
		Cross direction		Mean 394 %
	After heat ageing at 70 ± 2 °C for 56 days	Machine direction		Mean 783 %
		Cross direction		Mean 701 %
Shear resistance of tape bonded and sealed lap joints			BS EN 12317-2	Mean 174 N/50 mm
Resistance to tearing (nail shank)			BS EN 12310-1	Mean 1,230 N
Impact resistance on hard concrete support			BS EN 12691 Method A	No leakage at 2,000 mm drop height
Resistance to static loading			BS EN 12730 Method A	No leakage at 20 kg, pass

2.5.3 Fire performance

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

2.5.4 Resistance to chemicals and ground gases

Test		Standard	Result	
Methane permeability by differential-pressure method	Plain membrane (HDPE layer only)	BS ISO 15105-1	≤ 4.8 ml/m²/day/atm	
Carbon dioxide permeability by differential-pressure method	Plain membrane (HDPE layer only)	BS ISO 15105-1	≤ 19.2 ml/m²/day/atm	
Organic vapour transmission rate by equal pressure method	Plain membrane (HDPE layer only)	BS ISO 15105-2	Hexane	0.50 mg/m²/day
			Benzene	2.05 mg/m²/day
			Toluene	0.56 mg/m²/day
			Ethyl benzene	2.20 mg/m²/day
			Xylene	1.73 mg/m²/day
			Vinyl chloride	0.07mg/m²/day
			Tetrachlorethene	0.02 mg/m²/day
			Trichloroethylene	1.48 mg/m²/day
			Naphthalene	0.10 mg/m²/day

2.5.5 Other characteristics

Test		Standard	Result
Additional product characteristics	Mass per unit area	BS EN 1849-2	Mean 1.47 kg/m²
	Straightness	BS EN 1848-2	≤10 mm deviation over a 10 m span
Visible defects		BS EN 1850-2	No visible defects

3 CDM, NATIONAL BUILDING REGULATIONS AND THIRD-PARTY ACCEPTANCE

3.1 THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015 AND THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS (NORTHERN IRELAND) 2016

Information in this Agrément may assist the client, principal designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

3.2 THE NATIONAL BUILDING REGULATIONS

In the opinion of Kiwa Ltd., the Product, if installed and used in accordance with Section 2 of this Agrément, can satisfy or contribute to satisfying the relevant requirements of the following national Building Regulations.

This Agrément shall not be construed to confer the compliance of any project-specific design with the national Building Regulations.

3.2.1 England

The Building Regulations 2010 and subsequent amendments

- C1(2) Preparation of site and resistance to contaminants - the Product can contribute to separating the occupants from contaminants in the ground
- C2(a) Resistance to moisture - floors/basements incorporating the Product can contribute to adequately protecting a building from ground moisture
- Regulation 7(1) 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

3.2.2 Wales

The Building Regulations 2010 and subsequent amendments

- C1(2) Preparation of site and resistance to contaminants - the Product can contribute to separating the occupants from contaminants in the ground
- C2(a) Resistance to moisture - floors/basements incorporating the Product can contribute to adequately protecting a building from ground moisture
- Regulation 7(1) 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

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

- 3.1 Site preparation - harmful and dangerous substances - the Product can contribute to separating a building and occupants from harmful or dangerous substances
- 3.4 Moisture from the ground - floors/basements incorporating the Product can contribute to adequately protecting a building from moisture penetration from the ground
- 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

3.2.3.3 Regulation 12 Building standards - Conversions

- All comments given under Regulation 9 also apply to this regulation, with reference to Schedule 6 of The Building (Scotland) Regulations 2004 and subsequent amendments, clause 0.12 of the Technical Handbook (Domestic) and clause 0.12 of the Technical Handbook (Non-Domestic)

3.2.4 Northern Ireland

The Building Regulations (Northern Ireland) 2012 and subsequent amendments

- 23(1)(a)(b) Fitness of materials and workmanship - floors/basements incorporating the Product are suitable and can be adequately prepared and applied
- Regulation 26(1)(b) Site preparation and resistance to contaminants - the Product can contribute to separating a building and occupants from harmful contaminants
- Regulation 28(a)(b) Resistance to moisture and weather - floors/basements incorporating the Product can contribute to adequately protecting a building from the passage of moisture from the ground and the weather

3.3 THIRD-PARTY ACCEPTANCE

In the opinion of Kiwa Ltd. if installed, used, and maintained in accordance with this Agrément, this Product can satisfy the appropriate structural, fire, moisture, thermal, acoustic and durability requirements of a Structural Warranty provider. Please contact the relevant Structural Warranty provider to ascertain their project specific design requirements and to confirm their acceptance on a case-by-case basis.

4 SOURCES

- BS EN ISO 9001:2015+A1:2024 Quality management systems. Requirements
- BS EN ISO 12236:2006 Geosynthetics. Static puncture test (CBR test)
- BS EN ISO 14688-1:2018 Geotechnical investigation and testing. Identification and classification of soil. Identification and description
- BS EN ISO 22476-1:2023 Geotechnical investigation and testing. Field testing. Electrical cone and piezocone penetration test
- BS EN 1296:2001 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roofing. Method of artificial ageing by long term exposure to elevated temperature
- BS EN 1847:2009 Flexible sheets for waterproofing. Plastics and rubber sheets for roof waterproofing. Methods for exposure to liquid
- BS EN 1848-2:2001 Flexible sheets for waterproofing. Determination of length, width and straightness - Plastic and rubber sheets for roof waterproofing
- BS EN 1849-2:2019 Flexible sheets for waterproofing. Determination of thickness and mass per unit area - Plastics and rubber sheets for roof waterproofing
- BS EN 1850-2:2001 Flexible sheets for waterproofing. Determination of visible defects. Plastic and rubber sheets for roof waterproofing
- BS EN 1928:2000 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of watertightness
- BS EN 1931:2000 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of water
- BS EN 1997-2:2007 Eurocode 7. Geotechnical design. Ground investigation and testing
- NA to BS EN 1997-2:2007 UK National Annex to Eurocode 7. Geotechnical design - Ground investigation and testing
- BS EN 12310-1:2000 Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank). Bitumen sheets for roof waterproofing
- BS EN 12311-2:2013 Flexible sheets for waterproofing. Determination of tensile properties. Plastic and rubber sheets for roof waterproofing
- BS EN 12317-2:2010 Flexible sheets for waterproofing. Determination of shear resistance of joints. Plastic and rubber sheets for roof waterproofing
- BS EN 12691:2018 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of resistance to impact
- BS EN 12730:2015 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of resistance to static loading
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- BS EN 13967:2012+A1:2017 Flexible sheets for waterproofing. Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet. Definitions and characteristics
- BS 8000-0:2014+A1:2024 Workmanship on construction sites. Introduction and general principles
- BS 8000-4:1989 Workmanship on building sites. Code of practice for waterproofing
- BS 8102:2022 Protection of below ground structures against water ingress. Code of practice
- BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)
- BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice. Code of practice
- BRE Report 414:2001 Protective measures for housing on gas-contaminated land
- BS ISO 15105-1:2007 Plastics. Film and sheeting. Determination of gas-transmission rate. Differential-pressure methods
- BS ISO 15105-2:2003 Plastics. Film and sheeting. Determination of gas-transmission rate. Equal-pressure method
- Chartered Institute of Environmental Health:2008 The Local Authority Guide to Ground Gas
- CIRIA C665:2007 Assessing risks posed by hazardous ground gases to buildings
- CIRIA C682:2009 VOCs handbook: investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination
- CIRIA C716:2012 Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination
- CIRIA C735:2014 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases
- CIRIA C748:2014 Guidance on the use of plastic membranes as VOC vapour barriers
- CIRIA R149:1996 Protecting development from methane: methane and associated hazards to construction
- CIRIA R152:1995 Risk assessment for methane and other gases from the ground
- CL:AIRE RB 17:2012 A Pragmatic Approach to Ground Gas Risk Assessment
- CP 102:1973 Code of practice for protection of buildings against water from the ground

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

5 AMENDMENT HISTORY

Revision	Amendment description	Author	Approver	Date
-	First Issue	A Tsourlini	C Devine	November 2025

6 CONDITIONS OF USE

This Agrément may only be reproduced and distributed in its entirety.

Where a National Annex exists in respect of a BS EN (or other) standard, its use is deemed mandatory wherever the original standard is referenced.

Kiwa Ltd. has used due skill, care and attention in the preparation of this BDA Agrément®.

Whilst all due diligence has been used, no liability or warranty is extended by Kiwa Ltd.

The Agrément holder is responsible for advising Kiwa Ltd. immediately if there is a variation to the Product specification or constituent elements/components after initial publication of this BDA Agrément®.

For full terms and conditions, refer to Kiwa Ltd.