

JUTA GAS-RESISTANT AND DAMP PROOFING MEMBRANES

GP4 GAS BARRIER

This Agrément Certificate Product Sheet⁽¹⁾ relates to the GP4 Gas Barrier, a low-density polyethylene membrane for use as a damp-proof membrane and a gas-resistant membrane in concrete ground floors, above and below slabs not subject to hydrostatic pressure, to protect the building against moisture and radon from the ground.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 16 May 2024
Originally certified on 11 March 2020

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that the GP4 Gas Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C1(2)	Site preparation and resistance to contaminants
Comment:		The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		The product, including joints, can contribute to a construction satisfying this Requirement. See sections 3 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The product is acceptable. See sections 8 and 9 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	9	Building standards – construction
Standard:	3.1	Site preparation – harmful and dangerous substances
Standard:	3.2	Site preparation – protection from radon gas
Comment:		The product can contribute to satisfying the requirements of these Standards, with reference to clauses 3.1.2 ⁽¹⁾⁽²⁾ and 3.1.6 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product will enable a structure to satisfy the requirements of this Standard, with reference to clauses 3.4.1 ⁽¹⁾⁽²⁾ , 3.4.2 ⁽¹⁾⁽²⁾ , 3.4.5 ⁽¹⁾⁽²⁾ and 3.4.7 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		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.
Regulation:	12	Building standards – conversion
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	26(1)(b)(2)	Site preparation and resistance to contaminants
Comment:		The product will contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product will enable a structure to satisfy this Regulation. See sections 3 of this Certificate.

Additional Information

NHBC Standards 2024

In the opinion of the BBA, the GP4 Gas Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standards, Technical Requirement R3 and Chapters 4.1 *Land quality – managing ground conditions*, 5.1 *Substructure and ground bearing floors* and 5.2 *Suspended ground floors*.

Fulfilment of Requirements

The BBA has judged the GP4 Gas Barrier to be satisfactory for use as described in this Certificate. The product has been assessed as a damp proofing membrane and a gas-resistant membrane, for use in concrete floors above and below slabs not subject to hydrostatic pressure, to restrict the ingress of moisture and radon into buildings from the ground.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the product under assessment.

The GP4 Gas Barrier consists of layers of low-density polyethylene (LDPE) membrane, reinforced with a polypropylene reinforcing grid with an integral aluminium foil.

The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics of the GP4 Gas Barrier

Characteristic (unit)	GP4 Gas Barrier
Thickness (mm)	0.6 (including reinforcement scrim)
Thickness (mm)	0.4 (measured between the reinforcement scrim)
Roll length (m)	Various
Roll width (m)	Various
Mass per unit area (g·m ⁻²)	400

Ancillary Items

The following ancillary items are essential to use with the product and have been assessed with the product:

- butyl or bitumen tape — for use at joints and laps
- jointing tape — for securing laps and joints.

The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- GP Top Hats — to seal around entry points to the membrane
- GP Internal Corner Cloaks — prefabricated corner details
- GP External Corner Cloaks — prefabricated corner details
- GP Primer — used to provide adhesion for application of bitumen-enhanced geomembranes
- GP Void Vent 25 — used to provide ventilation
- GP Void Vent 40 — used to provide ventilation
- GP Protection Fleece — to form a protective layer to prevent damage to the membrane
- GP-SAM — a self-adhesive membrane
- GP DPC — a damp-proof course (DPC).

Definitions for products and applications inspected

A gas-resistant membrane is defined for the purpose of this Certificate as a membrane placed above, below or within the floor slab construction to restrict methane and carbon dioxide migration from the ground into a building (as defined in BS 8485 : 2015).

Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

1.1 Structural and mechanical properties

1.1.1 Results of tests for mechanical properties are given in Table 2.

Table 2 Results of mechanical properties tests

Product assessed	Assessment method	Requirement	Result
A representative related product	Nail tear to	Value achieved	
	BS EN 12310-1 : 2000		
	Longitudinal direction		380 N
	Transverse direction		451 N
A representative related product	Tensile strength to	Value achieved	
	BS EN 12311-1 : 2000		
	Control		
	Longitudinal direction		459 N·(50 mm) ⁻¹
	Transverse direction		391 N·(50 mm) ⁻¹
A representative related product	Elongation to	Declared values	
	BS EN 12311-1 : 2000		
	Control		
	Longitudinal direction	15 %	18%
	Transverse direction	20 %	22%
A representative related product	Foldability at low temperature to	Value achieved	-40°C
	BS EN 495-5 : 2001		

1.1.2 On the basis of the data assessed, the product can be punctured by sharp objects and care must be taken when handling building materials over the exposed surface.

1.1.3 Provided there are no sharp objects present on the membrane's surface prior to and during installation of the protective layer, the product will not be damaged by normal foot traffic.

1.1.4 The product will remain flexible at temperatures likely to occur in practice.

2 Safety in case of fire

Not applicable.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Weathertightness and damp-proofing

3.1.1 Results of weathertightness and damp-proofing tests are given in Table 3.

Product assessed	Assessment method	Requirement	Result
A representative related product	Watertightness to BS EN 1928 : 2000	no leakage after 24 hours exposure to 1 m head of water	Pass
A representative related product	Water vapour permeability to BS 3177 : 1959 ⁽¹⁾	Value achieved	0.331 g.m ⁻² .24h ⁻¹
A representative related product	Shear resistance of joints butyl joint welded joint to BS EN 12317-2 : 2010	Value achieved	251 N.(50mm) ⁻¹ 343 N.(50mm) ⁻¹

(1) Testing was carried out before harmonised European Standard EN 1931 : 2000 was published.

3.1.2 On the basis of data assessed, the GP4 Gas Barrier, including joints, provides an effective barrier to the passage of liquid moisture from the ground.

3.1.3 The membrane is impervious to water and provides a waterproofing layer capable of accepting minor structural movements without damage.

3.2 Resistance to underground gases

3.2.1 Measured gas permeability/diffusion values on an unjointed GP4 Gas Barrier are given in Table 4.

Product assessed	Assessment method	Requirement	Result
GP4 Gas Barrier	Radon permeability to ISO/TS 11665-13 : 2017 no joint welded joint	Value achieved	1.6 x 10 ⁻¹¹ 1.7 x 10 ⁻¹¹

3.1.2 On the basis of data assessed, the GP4 Gas Barrier, will restrict the ingress of radon into buildings from naturally occurring sources.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

The product contains polyethylene, which can be recycled.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in this product were assessed.

8.2 Specific test data were assessed for the following.

Table 5 Results of durability tests

Product assessed	Assessment method	Requirement	Result
A representative related product	Tensile strength to BS EN 12311-2 : 2000 Longitudinal direction Heat aged at 70°C for 84 days UV aged 50°C for 100 hours UVB	No significant loss of properties following ageing	Pass Pass
	Tensile strength to BS EN 12311-2 : 2000 Transverse direction Heat aged at 70°C for 84 days UV aged at 50°C for 100 hours UVB	No significant loss of properties following ageing	Pass Pass
A representative related product	Elongation to BS EN 12311-2 : 2000 Longitudinal direction Heat aged at 70°C for 84 days UV aged at 50°C for 100 hours UVB	No significant loss of properties following ageing	Pass Pass
	Elongation to BS EN 12311-2 : 2000 Transverse direction Heat aged at 70°C for 84 days UV aged at 50°C for 100 hours UVB	No significant loss of properties following ageing	Pass Pass
A representative related product	Nail tear to BS EN 12310-1 : 2000 Longitudinal direction Transverse direction Heat aged at 70°C for 84 days	No significant loss of properties following ageing	Pass Pass
A representative related product	Watertightness to BS EN 1928 : 2000 Heat aged at 70°C for 84 days	No leakage after 24 hours	Pass
A representative related product	Shear resistance of joints butyl joint welded joint to BS EN 12317-2 : 2010 Heat aged at 70°C for 84 days	No significant loss of properties following ageing	Pass Pass
A representative related product	Dimensional stability to BS EN 1107-2 : 2001 Longitudinal direction	Value achieved	-1.2%
	Transverse direction		-0.1%

8.3 Service life

8.3.1 Under normal service conditions, the product will have a life at least as long as the building in which it is installed, provided it is designed and installed in accordance with this Certificate and the Certificate holder's instructions.

8.3.2 The product will not be significantly affected by short term exposure to ultraviolet (UV) light. However long periods of exposure may reduce the effectiveness of the membrane and it must be protected from UV light as soon as practicable after it is installed.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed against the requirements of BS 8000-4 : 1989, BS 8485 : 2015, CP 102 : 1973 Section 3, this Certificate and the Certificate holder's instructions, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 The design of a gas protection system must be carried out by a suitably experienced and competent individual with sufficient knowledge of ground gas risk and the construction methods and materials.

9.1.3 The continuity of the gas protection must extend over the footprint of the building, and the product must be sealed to a gas-resistant DPC where applicable.

9.1.4 The membrane contains an aluminium foil interlayer which may be subject to corrosion by alkaline conditions if damage to the membrane and exposure occurs. However, under normal circumstances, the polyethylene faces of the membrane are compatible with other materials and products typically used in the same areas, with the exception of those containing pitch. NHBC NF 94 requires products containing aluminium foil are protected above and below during the installation process.

9.1.5 Where the construction is subject to NHBC requirements, reference must be made to NHBC NF 94 *Hazardous Ground gas – an essential guide for housebuilders*.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions following the relevant guidance in BRE Report BR 211 : 2023, BS 8485 : 2015 and NHBC NF 94.

9.2.3 All gas membrane installations must be subject to third-party independent validation, in accordance with BS 8485 : 2015.

9.2.4 The product can be installed in all normal site conditions, provided that the air temperature is not below 5°C and the membrane is free from condensation.

9.2.5 The surface onto which the product is to be laid must be dry and free from sharp protrusions and debris that could damage the membranes. Surfaces must be free from dust and frost.

9.2.6 The product must normally only be installed over a surface that has a smooth finish, ie it must be free from voids, projections and mortar deposits (see section 9.2.9).

9.2.7 For gas-resistant applications, the membrane must be installed either with hot air welded or taped joints in accordance with the Certificate holder's instructions.

9.2.8 The product must be protected as soon as possible after installation to minimise direct foot trafficking. Direct trafficking by vehicles must be avoided.

9.2.9 Unless the base is smooth, a surface blinding of soft sand (or similar material) must be used to prevent puncturing during installation or when concrete screed is being placed.

9.2.10 If the membrane is installed below a reinforced floor or concrete slab, it must be covered with a screed or protection layer prior to the positioning of the reinforcement.

9.2.11 If the membrane is above the slab, installation must be delayed until just before the laying of the screed or flooring, to avoid damage from site traffic.

Procedure

Hot air welded joints

9.2.12 The membrane is rolled out with the printed side uppermost, ensuring that it is properly aligned. All end and side overlaps must be a minimum of 100 mm and laps must be staggered.

9.2.13 Before welding work is carried out, trials must be completed to determine the 'operating window' for the welding equipment, materials and ambient conditions. Typically, the operating window will be between 180 and 240°C at a rate of 1.5 m·min⁻¹. In case of doubt, the Certificate holder must be consulted for advice, but such advice is outside the scope of this Certificate.

9.2.14 Weld widths must be a minimum of 50 mm and must be checked for integrity after being formed.

9.2.15 All service penetrations and direction changes must be properly detailed in accordance with the Certificate holder's instructions. Service ducts must be vented to prevent the possibility of gas accumulating in confined spaces.

9.2.16 The membrane must be covered by a screed or other protective layer as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction.

Taped joints

9.2.17 For use in damp-proofing applications, the membrane must be jointed using butyl or bitumen tape.

9.2.18 After laying the first sheet, the protective release film on one side of the tape is removed and the tape applied to the clean membrane sheet along a 100 mm guide line from the edge.

9.2.19 The second layer of membrane must be unrolled over the first layer, ensuring an overlap of 150 mm, before rolling with a silicone roller to remove any trapped air.

9.2.20 The joint can then be finished with a suitable sealing tape applied over the joint to provide a smooth finish.

9.3 Workmanship

9.3.1 Practicability of installation was assessed against BS 8485 : 2015, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the GP4 Gas Barrier must be carried out by installers trained by the Certificate holder.

9.3.2 The BBA operates an Approved Installer Scheme for gas membranes; details of approved installer companies are included on the BBA website (www.bbacerts.co.uk).

9.4 Maintenance and repair

9.4.1 As the product is confined within the structure and has suitable durability, maintenance is not required. However, any damage occurring before enclosure must be repaired.

9.4.2 Any damage to the membrane must be repaired using a patch of the membrane, and laps welded or sealed with double-sided tape and secured with the butyl tape. All patched areas must extend a minimum of 100 mm from the damaged area.

9.4.3 If required by the local authority, the adequacy of repair work must be confirmed by an independent validation report.

10 Manufacture

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

†10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

11 Delivery and site handling

11.1 The Certificate holder stated that the product is delivered to site in rolls wrapped in polythene film. Each roll bears a leaflet describing the membrane and installation details. The BBA logo and the number of this Certificate are printed on the leaflet and pallet label.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 Rolls must be stacked on a flat surface, kept under cover and protected from sunlight and mechanical damage.

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the product in accordance with Designated Standard EN 13967 : 2012.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard EN 13967 : 2012.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of ČSN EN ISO 9001 : 2016 and ČSN EN ISO 14001 : 2016 by Bureau Veritas (Certificates CZ006792-1 and CZ002815-1 respectively).

Additional Guidance

A.1 There will be no adverse effect on the membrane from the underfloor heating under normal service conditions. In other circumstances, the Certificate holder's advice should be sought, but such advice is outside the scope of this Certificate.

A.2 Additional guidance on the use of damp-proof material is available in CP 102 : 1973, BS 8000-0 : 2014 and BS 8000-4 : 1989.

Bibliography

BRE Report BR 211 : 2023 *Radon : Guidance on protective measures for new buildings*

BS 3177 : 1959 *Water vapour permeability to water vapour of flexible sheet materials used for packaging*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

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 EN 495-5 : 2001 *Flexible sheets for waterproofing — Determination of foldability at low temperature — Plastic and rubber sheets for roof waterproofing*

BS EN 1107-2 : 2001 *Flexible sheets for waterproofing — Determination of dimensional stability.*

BS EN 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

BS EN 12310-1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank) — Bitumen sheets for roof waterproofing*

BS EN 12311-1 : 2000 *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 Part 2: Plastic and rubber sheets for roof waterproofing*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

ČSN EN ISO 9001 : 2016 *Quality management systems — Requirements*

ČSN EN ISO 14001 : 2016 *Environmental management systems — Requirements with guidance for use*

EN 13967 : 2012 *Flexible sheets for waterproofing — Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet — Definitions and characteristics*

ISO/TS 11665-13 : 2017 *Measurement of radioactivity in the environment — Air : radon 222 — Part 13: Determination of the diffusion coefficient in waterproof materials : membrane two-side activity concentration test method*

NHBC NF 94 *Hazardous ground gas – an essential guide for housebuilders*

Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.