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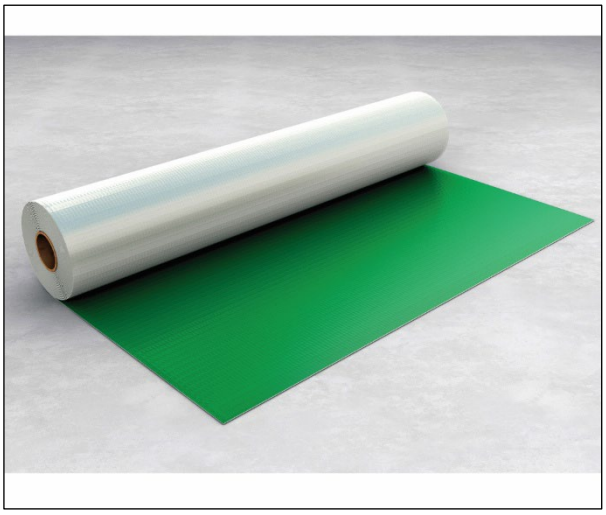
Agrément Certificate
22/5991
Product Sheet 1 Issue 2

CORDEK TEXTILES AND PLASTIC MEMBRANES

TRI-GAS MEMBRANE

This Agrément Certificate Product Sheet(1) relates to Tri-Gas Membrane, a multilayer thermoplastic membrane for use as a gas barrier and damp-proof membrane in concrete ground floors, above and below the slab not subject to hydrostatic pressure, to protect the building against moisture, radon, methane and carbon dioxide 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: 20 June 2025
Originally certified on 20 April 2022

Hardy Giesler
Chief Executive Officer

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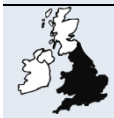
SUMMARY OF ASSESSMENT AND COMPLIANCE

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 Tri-Gas Membrane, 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 enable a structure to satisfy this Requirement. See section 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), 3.1.6(1)(2), 3.1.7(1)(2), 3.1.8(1)(2), 3.2.1(1)(2) and 3.2.2(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(1)(a)(i) (iii)(b)(i)**	**Fitness of materials and workmanship**
Comment:		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 section 3 of this Certificate.

Additional Information

NHBC Standards 2025

In the opinion of the BBA, Tri-Gas Membrane, 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.*

The opinion of the BBA does not amount to any endorsement or approval by NHBC and does not in any way guarantee that NHBC will approve such product / system as compliant with the NHBC Technical Requirements and Standards.

Fulfilment of Requirements

The BBA has judged Tri-Gas Membrane to be satisfactory for use as described in this Certificate. The product has been assessed as a gas barrier and as a damp-proof membrane, for use in concrete ground floors above and below the slab not subject to hydrostatic pressure, to protect the building against moisture, radon, methane and carbon dioxide from the ground.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the product under assessment. Tri-Gas Membrane is a multilayer, 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

Characteristic (unit)	Value
Roll thickness (mm)	0.6 (including reinforcement scrim)
Effective thickness (mm)	0.4 (measured between the reinforcement scrim)
Roll length (m)	50
Roll width (m)	2
Mass per unit area ($g \cdot m^{-2}$)	370
Colour	
upper surface	Green
lower surface	Sliver

Ancillary items

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

- Powerbond Double-sided Jointing Tape — a 30 mm wide butyl tape used to seal overlap joints and penetrations

- Powerbond Foil Tape — a 75 mm wide single-sided tape used in conjunction with Powerbond double-sided jointing tape to secure overlaps
- Powerbond Foil Detailing Tape – a 300 mm wide single-sided foil tape used in conjunction with Powerbond Double-sided Jointing Tape at terminations around penetrations, at corners and other detailing.

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:

- top hats — to seal around penetrations through the membrane
- prefabricated Internal/external corners
- drainage/gas venting membranes
- protection membranes/geotextiles
- gas resistant damp-proof course (dpc).

Definitions for products and applications inspected

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

Product assessment – key factors

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

1 Mechanical resistance and stability

Data were assessed for the following characteristics.

1.1 Structural and mechanical properties

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

Table 2 Mechanical properties

Product assessed	Assessment method	Requirement	Result
Tri-Gas Membrane	Tensile strength to BS EN 12311-1 : 2000 Longitudinal direction	Value achieved	367 N·(50 mm)$^{-1}$
Tri-Gas Membrane	Elongation to BS EN 12311-1 : 2000 Longitudinal direction	Value achieved	> 22 %
Tri-Gas Membrane	Foldability at low temperature to BS EN 495-5 : 2013 Longitudinal direction Transverse direction	Value achieved	 -22.4°C -22.4°C
Tri-Gas Membrane	Resistance to static loading to BS EN 12730 : 2001	Value achieved	20 kg
Tri-Gas Membrane	Resistance to impact to BS EN 12691 : 2006	Value achieved	0.175 m

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.

2 Safety in case of fire

Not applicable.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Weathertightness

3.1.1 Results of weathertightness tests are given in Table 3.

Table 3 Weathertightness

Product assessed	Assessment method	Requirement	Result
Tri-Gas Membrane	Watertightness to BS EN 1928 : 2000	No leakage after 24 hours exposure to 1 m head of water	Pass
Tri-Gas Membrane	Water vapour transmission to BS EN 1931 : 2000	Value achieved	0.031 $g \cdot m^{-2} \cdot day^{-1}$
Tri-Gas Membrane	Shear strength of joints Control (heat welded) to BS EN 12317-2 : 2010	Value achieved	342 $N \cdot (50\ mm)^{-1}$

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

3.1.3 On the basis of data assessed, 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 Results of resistance to hazardous ground gases tests are given in Table 4.

Table 4 Resistance to underground gases tests

Product assessed	Assessment method	Requirement	Result
Tri-Gas Membrane	Methane permeability to BS ISO 15105-1 : 2007 Membrane without joint	As per BS 8485 : 2015 < 40 $ml \cdot m^{-2} \cdot day^{-1} \cdot atm^{-1}$	<0.04 $ml \cdot m^2 day^{-1} \cdot atm^{-1}$
Tri-Gas Membrane	Carbon dioxide permeability to BS ISO 15105-1 : 2007 Membrane without joint	Value achieved	<0.1 $ml \cdot m^{-2} \cdot day^{-1} \cdot atm^{-1}$

3.2.2 On the basis of data assessed, the product will restrict the ingress of radon, methane and carbon dioxide into buildings from landfill and naturally occurring sources, and satisfy the performance criteria for a gas-resistant membrane as defined in BS 8485 : 2015.

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

7.1 Reuse and recyclability

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 the product were assessed.

8.2 Specific test data were assessed as given in Table 5.

Table 5 Durability

Product assessed	Assessment method	Requirement	Result
Tri-Gas Membrane	Tensile strength to BS EN 12311-2 : 2000 Longitudinal direction Heat aged at 70°C for 84 days	No significant loss of properties following ageing	Pass
	UV aged at 50°C for 5 hours, followed by 1 hour water spray for 132 hours		Pass
Tri-Gas Membrane	Elongation to BS EN 12311-1 : 2000 Longitudinal direction Heat aged at 70°C for 84 days	No significant loss of properties following ageing	Pass
	UV aged at 50°C for 5 hours, followed by 1 hour water spray for 132 hours		Pass
Tri-Gas Membrane	Dimensional stability to BS EN 1107-2 : 2001	Value achieved	
	Longitudinal direction		-0.4 %
	Transverse direction		-0.1 %
Tri-Gas Membrane	Watertightness to BS EN 1928 : 2000	No leakage after 24 hours exposure to 1 m head of water	
	Heat aged: Exposed for 84 days in a ventilated oven controlled at 70°C		Pass
	Water soak: Immersed in water at 23°C for 7 days.		Pass

8.3 Service life

8.3.1 Under normal service conditions, the product will have a life of at least as long as the building in which it is installed, provided it is designed, installed, and maintained 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, it must be protected as soon as practicable after installation.

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 gas protection systems must be carried out by suitably experienced and competent individuals 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 damp proof course (DPC) where applicable.

9.1.4 In gas applications, hot air welding specifications must be obtained from the Certificate holder, but such advice is outside the scope of this Certificate.

9.1.5 Where the construction is subject to NHBC requirements, please refer to *NHBC NF94 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 of the product must be carried out in accordance with this Certificate and the Certificate holder's instructions following the relevant guidance given in BRE Report BR 211 : 2023, BS 8485 : 2015 and NHBC NF 94.

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

9.2.4 The membrane can be installed in all normal site conditions, provided that the air temperature is not below 5°C to prevent the risk of surface condensation.

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

9.2 6 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.

9.2.7 The surface of the gas membrane to be lapped must be dry and dust-free.

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

9.2 9 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.

9.2.10 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

9.2.11 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.

9.2.12 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 to 240°C at a rate of 1.5 $m \cdot min^{-1}$. In case of doubt, the Certificate holder must be consulted for advice, but such advice is outside the scope of this Certificate.

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

9.2.14 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.

9.2.15 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

9.2.16 The membranes must be jointed using Powerbond double-sided jointing tape.

9.2.17 All surfaces must be dried thoroughly prior to joining. Roll edges can be welded or taped by applying a strip of the Powerbond Double-sided Jointing Tape over the membrane with its nearest edge 50 mm from the membrane edge.

9.2.18 The protective paper is removed from the tape prior to rolling an adjacent run of the membrane, which must be carefully unrolled over the jointing tape, ensuring a 150 mm overlap. The overlap edge is then secured and protected using Powerbond Foil Tape. Jointed areas must be supported.

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 product 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 Powerbond Double-sided Tape and edges secured with Powerbond Foil 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 label with the product name and the BBA Logo incorporating the number of this Certificate. Rolls are supplied shrink-wrapped on pallets with a maximum of 33 rolls per pallet. Each roll has a nominal weight of 38 kg.

11.2 Delivery and site handing 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.

†ANNEX A – SUPPLEMENTARY INFORMATION

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.

CE marking

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

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 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 : 2013 *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 1931 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties*

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 — Plastic and rubber sheets for roof waterproofing*

BS EN 12691 : 2006 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to impact*

BS EN 12730 : 2001 *Flexible sheets for waterproofing — Bitumen, plastic, and rubber sheets for roof waterproofing — Determination of resistance to static loading*

BS ISO 15105-1 : 2007 *Plastics — Film and sheeting — Determination of gas-transmission rate — Differential-pressure methods*

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

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*

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
- 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
- and any matter arising out of or in connection with it or its subject matter (including non-contractual disputes or claims) is governed by and construed in accordance with the law of England and Wales.
- the courts of England and Wales shall have exclusive jurisdiction to settle any matter arising out of or in connection with this Certificate or its subject matter (including non-contractual disputes or claims).

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.

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