

Capital Valley Plastics Ltd

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Agrément Certificate
96/3267
Product Sheet 1

CAPITAL VALLEY PLASTICS MEMBRANES

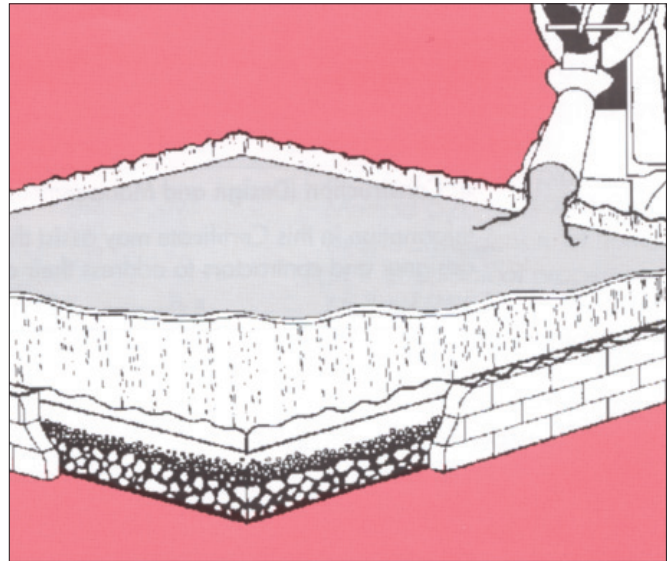
CAPITAL VALLEY PLASTICS DAMP-PROOF MEMBRANES AND RADBAR MEMBRANES

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes, low density polyethylene membranes, for use in solid concrete ground floors not subject to hydrostatic pressure, to protect buildings against moisture from the ground.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Resistance to water and water vapour — the membranes and the methods of jointing provide an effective barrier to the passage of liquid water and water vapour from the ground (see section 5).

Resistance to puncturing — the membranes have a high resistance to puncture. On smooth or blinded surfaces they will not be damaged by foot or site traffic, eg wheelbarrows (see section 6).

Durability — when subject to the normal conditions of use, the membranes will provide an effective barrier to the transmission of liquid water and water vapour for the life of the concrete slab in which they are installed (see section 9).

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément




Date of First issue: 15 October 2009

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

Originally certificated on 25 July 1996

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

| | | |
|--------------|--------------|--|
| Requirement: | C2(a) | Resistance to moisture |
| Comment: | | The product will meet this Requirement. See sections 5.1 and 5.2 of this Certificate. |
| Requirement: | Regulation 7 | Materials and workmanship |
| Comment: | | The product is an acceptable material. See section 9.1 and the <i>Installation</i> part of this Certificate. |



The Building (Scotland) Regulations 2004 (as amended)

| | | |
|-------------|------|--|
| Regulation: | 8(1) | Fitness and durability of materials and workmanship |
| Comment: | | The use of the product satisfies the requirements of this Regulation. See section 9.1 and the <i>Installation</i> part of this Certificate. |
| Regulation: | 9 | Building standards – construction |
| Standard: | 3.4 | Moisture from Ground |
| Comment: | | The product can enable a floor to satisfy the requirements of this Standard, with reference to clauses 3.4.1 ⁽¹⁾⁽²⁾ , 3.4.2 ⁽¹⁾⁽²⁾ , 3.4.4 ⁽¹⁾⁽²⁾ and 3.4.6 ⁽¹⁾⁽²⁾ . See sections 5.1 and 5.2 of this Certificate. |
| Regulation: | 12 | Building standards – conversions |
| Comment: | | All comments given for this product under Regulation 9, 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) 2000 (as amended)

| | | |
|-------------|----|---|
| Regulation: | B2 | Fitness of materials and workmanship |
| Comment: | | The product is acceptable. See section 9.1 and the <i>Installation</i> part of this Certificate. |
| Regulation: | C4 | Resistance to ground moisture and weather |
| Comment: | | The product will contribute to a roof satisfying this Regulation. See sections 5.1 and 5.2 of this Certificate. |

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

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

See section: 1 *Description* (1.1).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.1 *Substructure and ground bearing floors Clause M8 Damp-proof membrane*.

The orange 500 µm Radbar membrane is suitable for NHBC Amber 2 Application.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3 *Substructure*, Sub-section *dpc and dpm*.

Technical Specification

1. Description

1.1 Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes are blown films of extruded low density polyethylene (PE-LD) and have the nominal characteristics given in Table 1. Radbar Membranes are also suitable as a gas barrier (see section 3.3)

Table 1 Nominal characteristics

| Dimensions ⁽¹⁾ | Nominal values | | | | | | Tolerance (%) |
|--------------------------------|----------------|------|------|---|------|------|--------------------|
| | CVP DPM'S | | | Radbar Membranes | | | |
| Thickness (µm) | 250 | 300 | 500 | 300 | 400 | 500 | ±12 ⁽²⁾ |
| Roll width (m) ⁽³⁾ | 4 | 4 | 4 | 4 | 4 | 2 | -0 +2 |
| Roll length (m) ⁽³⁾ | 25 | 25 | 25 | 25 | 20 | 25 | -0 +10 |
| Roll weight (kg) | 23.0 | 27.6 | 23.0 | 23.0 | 29.4 | 23.0 | (min roll weight) |
| Colours | blue, black | | | clear, blue, black, green ⁽⁴⁾ , orange ⁽⁴⁾ , red ⁽⁴⁾ | | | |

(1) See BS EN ISO 9002 : 1994 (Certificate No 6643).

(2) A tolerance of ±12% is allowed in Draft MOAT No 61 with a single value ≥80% of the nominal.

(3) Other length/widths are available on request.

(4) Green, orange and red material signifies the use of virgin material for the production of the 300 µm, 400 µm and 500 µm Radbar Membranes.

1.3 Ancillary materials for use with the products include:

Mastic tape — 50 mm wide tape for jointing

Girth tape — 75 mm wide polyethylene strip backed with adhesive used for sealing joints.

1.4 Quality control checks are carried out on the raw material, during production and on the final product. Checks on the final product include:

- thickness
- weight
- density
- tensile strength/elongation
- dart impact.

2 Delivery and site handling

2.1 Rolls are wound on a paper tube or without paper tube which is packaged in individual polythene sleeves bearing the manufacturer's name, product identification and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls should be stored under cover and on a flat, level surface.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes.

Design Considerations

3 General

3.1 Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes are satisfactory for use in concrete floors not subject to hydrostatic pressure, in accordance with the relevant clauses of CP 102 : 1973.

3.2 The membranes can be installed either as an oversite membrane, between a blinded hardcore bed and the base concrete, or as a sandwich membrane in base concrete or between the base concrete and the screed.

3.3 Radbar Membranes (300 µm, 400 µm and 500 µm thickness), meet the requirements for use as a gas control membrane against radon or on gas-contaminated land in accordance with the recommendations published by the Building Research Establishment (BRE) and the national Building Regulations.

4 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

5 Resistance to water and water vapour



5.1 The membranes and the methods of jointing provide an effective barrier to the passage of liquid water and water vapour from the ground.

5.2 The membranes have minimum nominal sheet thicknesses greater than the requirements of the national Building Regulations. Therefore, the product complies with these requirements, if installed in the manner described in the relevant documents, or in accordance with section 10 of this Certificate (Scotland only):

England and Wales — Approved Document C, Requirement C2(a), Section 4.7

Scotland — Mandatory Standard 3.4, clauses 3.4.1, 3.4.2, 3.4.4 and 3.4.6

Northern Ireland — Regulation C4, Technical Booklet C, Sections 1 and 2.

6 Resistance to puncturing

The membranes have a high resistance to puncture. On smooth or blinded surfaces they will not be damaged by foot or site traffic (eg wheelbarrows). However, care should be taken to avoid damage during installation, particularly when handling building materials and equipment over the surface and when placing concrete or screeds, since the material can be punctured by sharp objects.

7 Underfloor heating

When used in accordance with this Certificate, there will be no adverse effect on the membranes from underfloor heating under normal operating conditions; however, the Certificate holder's advice should also be sought.

8 Maintenance

As the membrane is confined within concrete ground slabs and has suitable durability (see section 9) maintenance is not required.

9 Durability



9.1 When subject to the normal conditions of use, the membranes will provide an effective barrier to the transmission of liquid water and water vapour for the life of the concrete slab in which they are installed.

9.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the membranes. They should be protected from such exposure during storage and when in use.

Installation

10 General

10.1 Installation of Capital Valley Plastics Damp-Proof Membranes and Radbar Membranes must be in accordance with the Certificate holder's instructions and Clause 11 of CP 102 : 1973, the relevant clauses of BS 8000-4 : 1989, or section 13 of this Certificate.

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

10.3 Sheets must be clean and free from dirt and grease.

11 Site conditions

11.1 The membranes may be installed in all conditions normal to ground-floor slab construction. Where there is a risk of ground becoming waterlogged, sub-soil drainage must be provided in accordance with CP 102 : 1973.

11.2 The membranes remain flexible in the extremes of temperature likely to occur in practice.

12 Procedure

12.1 Adjacent sheets should be overlapped by at least 150 mm, bound with mastic strips and sealed with 75 mm wide girth jointing tape (see Figure 1).

12.2 Alternatively, when it is not possible to keep the sheet dry, a double welted fold should be formed using at least 300 mm of the membrane. It is essential that the fold is held in position prior to placing the concrete, eg by weighting with bricks (see Figure 2).

12.3 Perforations or punctures in the sheets should be patched with sheets of identical thickness, lapped at least 150 mm beyond the limits of the puncture and sealed with double-sided pressure sensitive tape.

12.4 The damp-proof membrane must be continuous with the damp-proof course in the surrounding walls. Where necessary the product should be used as a vertical damp-proof course to link the two.

12.5 The membranes must be covered by a screed or other protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not stretched or displaced when placing the concrete or screed over the membrane. Sufficient allowance should be made to avoid bridging (ie creating areas of unsupported membrane) during screeding operations at details such as internal angles.

Figure 1 Mastic tape joint

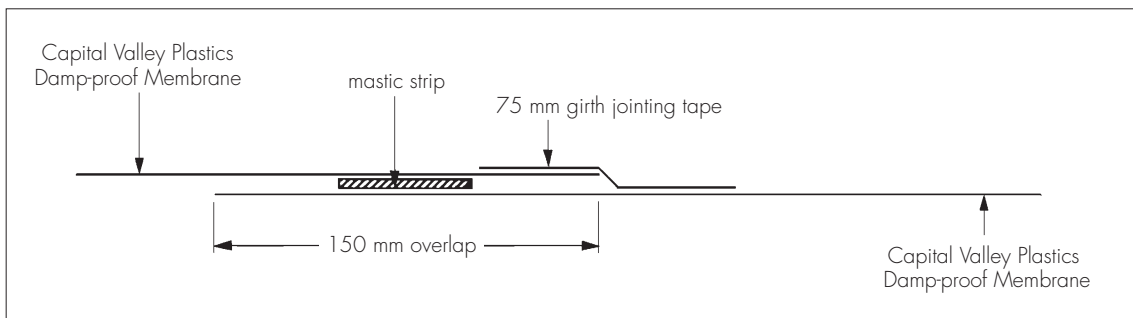
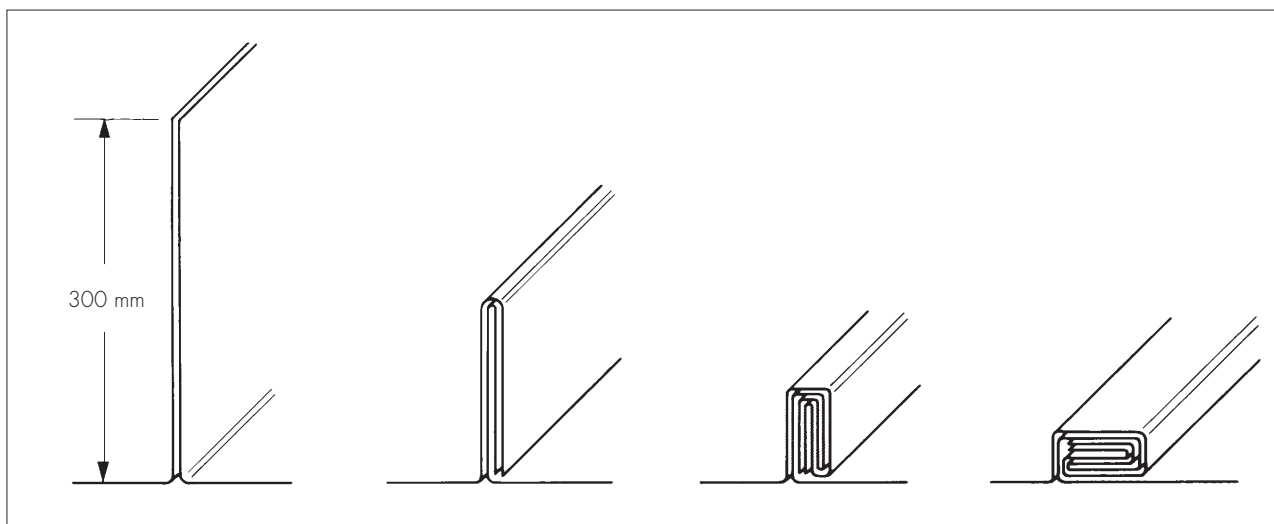


Figure 2 Double welted fold joint



13 Floor finishes

The type of floor finish to be used may limit the suitability of polyethylene damp-proof membranes; the guidance given in CP 102 : 1973 should be followed.

Technical Investigations

14 Tests

Samples of the membrane were obtained from the manufacturer for testing. A summary of tests showing typical values for the material is detailed in Tables 2 to 4.

Table 2 Physical properties — general

| Test (units) | Mean results | | | Method ⁽¹⁾ |
|---|-------------------|-------------------|-------------------|------------------------------|
| | 250 μm | 300 μm | 500 μm | |
| Moisture vapour transmission rate (MVTR) ($\text{g}\cdot\text{m}^{-2}\cdot\text{day}^{-1}$) | 0.68 | 0.29 | 0.15 | BS 3177 (25°C/75% RH) |
| Water vapour resistance ($\text{MN}\cdot\text{s}\cdot\text{g}^{-1}$) | 302 | 708 | 1368 | BS 3177 (25°C/75% RH) |
| Density ($\text{kg}\cdot\text{m}^{-3}$) | 0.93 | — | — | BS 2782-6.620A |
| Impact (dart) (g) | 975 | — | — | BS 2782-3.352D |
| Impact resistance | | | | <i>ad hoc</i> ⁽²⁾ |
| 0°C | satisfactory | — | — | |
| 23°C | satisfactory | — | — | |

(1) Test documents are detailed in the *Bibliography*. Numbers/letters in the tables refer to the sections/parts of the document

(2) After 24 hours conditioning of samples, a 1 kg steel ball was dropped onto an unrestrained sample on a 100 mm thick sand bed, from heights of one and two metres.

— = not tested

Table 3 Physical properties — directional

| Test (units) | Mean results | | | | Method ⁽¹⁾ |
|---------------------------------------|---------------------|----------------------|---------------------|----------------------|--------------------------|
| | 250 µm | | 300 µm | | |
| | Long ⁽²⁾ | Trans ⁽³⁾ | Long ⁽²⁾ | Trans ⁽³⁾ | |
| Tensile strength (Nmm ⁻²) | | | | | BS 2782-3.320A |
| unaged | 21.6 | 23.6 | 20.3 | 24.3 | |
| heat aged ⁽⁴⁾ | 19.5 | 21.4 | — | — | |
| UV aged ⁽⁵⁾ | 17.0 | 16.8 | — | — | |
| Maximum load at break (N per 25 mm) | | | | | BS 2782-3.320A |
| unaged | 145 | 153 | 148 | 178 | |
| heat aged ⁽⁴⁾ | 121 | 135 | — | — | |
| UV aged ⁽⁵⁾ | 112 | 108 | — | — | |
| Elongation at break (%) | | | | | BS 2782-3.320A |
| unaged | 605 | 684 | 590 | 691 | |
| heat aged ⁽⁴⁾ | 557 | 640 | — | — | |
| UV aged ⁽⁵⁾ | 502 | 533 | — | — | |
| Tear strength (nail) (max load N) | 118 | 117 | >118 | >117 | BS 747 (MOAT 27 : 5.4.1) |
| Tear strength (trouser) (max load N) | | | | | BS 2782-3.360B |
| unaged | 28 | 34 | 31 | 40 | |
| heat aged ⁽⁴⁾ | 25 | 30 | — | — | |
| Low temperature flexibility (°C) | -25 | -25 | -25 | -25 | MOAT 27 : 5.4.2 |
| Dimensional stability (free) (%) | -0.60 | +0.41 | -0.45 | +0.35 | MOAT 27 : 5.1.6.1 |

(1) Test documents are detailed in the *Bibliography*. Numbers/letters in the tables refer to sections/parts of the documents.

(2) Longitudinal.

(3) Transverse.

(4) Heat aged 56 days at 60°C.

(5) Specimens were conditioned according to ASTM G53-84, using QUV 313 lamps with a 4 hour UV at 45°C/4 hours condensation at 40°C cycle for a total of 100 light hours.

— = not tested.

Table 4 Performance of joints

| Test (units) | Mean results | Method ⁽¹⁾ |
|---------------------------|--------------|-----------------------|
| Tensile strength (N) | | MOAT 27 : 5.2.2 |
| unaged | 177 | |
| heat aged 28 days at 80°C | 166 | |
| 7 days water soak at 60°C | 168 | |

(1) Test document is detailed in the *Bibliography*. Numbers in the tables refer to the sections/parts of the document.

15 Investigations

The methods of quality control were examined and details were obtained of the quality and composition of the materials used.

Bibliography

- BS 747 : 1977 *Specification for roofing felts*
- BS 2782-3.320A to 320F : 1976 *Methods of testing plastics — Mechanical properties — Tensile strength, elongation and elastic modulus*
- BS 2782-3.352D : 1979 *Methods of testing plastics — Mechanical properties — Determination of falling weight impact resistance of thin flexible sheet (film)*
- BS 2782-3.360B : 1991 *Methods of testing plastics — Mechanical properties — Determination of tear resistance of plastics film and sheeting by the trouser tear method*
- BS 2782-6.620A to 620D : 1991 *Methods of testing plastics — Dimensional properties — Determination of density and relative density of non-cellular plastics*
- BS 2782-6.620B : 1980 *Methods of testing plastics — Dimensional properties — Determination of density of solid plastics excluding cellular plastics (pycnometer method)*
- BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*
- BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*
- BS EN ISO 9002 : 1994 *Quality systems — Model for quality assurance in production, installation and servicing*
- CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*
- MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*
- ASTM G 53-84 *Operating light and water exposure apparatus (fluorescent UV-condensation type) for exposure of non-metallic materials*
- Draft MOAT No 61 : 1998 *Guideline for the assessment of polyethylene damp-proof membranes*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

16.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

16.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.