



# Visqueen Ultimate VOC BLOK

The ultimate membrane protection against VOCs and Methane

- Conforms in full to CIRIA C748 and BS8485:2015
- Excellent VOC & methane barrier resistance
- Utilises Visqueen's unique advanced barrier technology
- Comprehensively tested and validated test results
- Flexible even at low temperatures – limits stress cracking
- Welding and Visqueen Gas Resistant tape system options

## Description

Visqueen Ultimate VOC BLOK is a flexible membrane designed to comply with current guidance on Volatile Organic Compounds (VOCs) and ground gases. Manufactured using Visqueen's advanced barrier technology and drawing on our extensive knowledge and expertise in gas protection, Visqueen has developed a new flexible barrier membrane suitable in brownfield applications that are affected by aggressive chemicals such as Benzene, Toluene, Ethyl Benzene and Xylene (BTEX).

The product is available in large roll formats to minimise jointing and quick installation times. The membrane is grey and black and 2.44m x 41m x 1mm (100m<sup>2</sup>), in single wound roll format and packaged in a blue outer wrap.

The membrane should be installed grey side up.

## Applications

Visqueen Ultimate VOC BLOK is suitable for the following applications:

- VOC/Hydrocarbon contaminated sites in accordance with CIRIA C748
- Carbon dioxide and methane sites in accordance with BS8485:2015
- Radon affected sites in accordance with BRE211:2015
- Damp protection in accordance with Building Regulations part C

Due to a diverse range of applications and variations in attack chemicals we strongly advise contacting Visqueen's technical department for correct specification – 0333 202 6800

## The innovative Visqueen - Advanced Barrier Technology

1. An advanced gas barrier structure
2. Superior physical and chemical resistant barrier properties
3. Easy & rapid welding
4. Flexibility for uneven ground contours

5. Good environmental stress crack resistance

Advanced barrier technology utilises Visqueen’s extensive manufacturing technical expertise and experience to ensure buildings and occupants are safe from hazardous ground gases and VOCs.

**Specific Approvals/Standards**

- **CIRIA C748** – Guidance on the use of plastic membranes as VOC vapour barriers
- **BS8485:2015** - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- **CE Mark EN13967** - Flexible sheets for waterproofing. Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet. Definitions and characteristics

**Validated test data and compliance to the latest standards**

CIRIA C748 and BS8485:2015 are the latest and most relevant standards and codes of practice for protecting buildings on contaminated land. These documents ensure any risks are mitigated by using best practice in design and selection of gas membranes. The documents intend to **harmonise test methods and result units** for the industry and to mirror the application in order that the appropriate membrane can be selected.

Visqueen embarked on an extensive testing regime to ensure its membranes are the best in class and comply with the new standards. Visqueen’s Ultimate range have all passed the stringent **methane 40ml/m<sup>2</sup>/day/atm** (ISO15105-1 to BS8485:2015 requirement) threshold and physical property requirements. CIRIA C748 states a VOC membrane must be tested as a minimum to the below challenge chemicals. Visqueen have conducted VOC vapour and chemical resistance testing (including conducting application cocktail testing) to these challenge chemicals below in accordance C748. The actual test results by a 3rd party approved laboratory are shown in the datasheet.

- Benzene
- Toluene
- ethyl benzene
- (m,p, and o) xylenes
- Hexane
- vinyl chloride
- tetrachloroethene (PCE),
- trichloroethene (TCE),
- Naphthalene

**System Components:**

- Visqueen GX Double Sided Bonding Tape
- Visqueen Gas Resistant Lap Tape
- Visqueen Surface DPC Fixing System
- Visqueen GX DPC
- Visqueen GX Top Hat Units
- Visqueen Detailing strip

Note: the membrane can be welded as a preferred alternative to using tapes.

**Installation**

Visqueen Ultimate VOC BLOK and ancillary components must be installed in accordance with the recommendations of CIRIA C748. The membrane is suitable where hydrostatic pressure is present, however in this application the

joints must be welded and not taped. The membrane should be installed on a blinded or smooth surface allowing adequate overlap for jointing between the sheets and avoiding bridging (i.e. areas of unsupported membrane). In areas where high levels of unsupported membrane occur it is recommended that Visqueen Ultimate GeoSeal is used.

Visqueen Ultimate VOC BLOK is normally installed below the concrete slab (continued) but can be used above the slab. Please contact Visqueen for further information on foundation types and membrane suitability - 0333 202 6800 Technical Department.

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<b>Tape Joints</b>	For taped joints, overlap the membranes by at least 150mm and bond together using Visqueen GX Double Sided Jointing tape. Secure the lap using Visqueen Gas Resistant Lap Tape. Punctures to the membrane can only be repaired by using a patch of the same membrane and lapped at least 150mm beyond the limits of the puncture. Bond and seal the patch using Visqueen GX tape system.
<b>Welding</b>	When a welded joint system is being used, punctures to the membrane can only be repaired by welding a patch of membrane with identical thickness and lapped at least 150mm beyond the limits of the puncture. Where this is not possible and the three dimensional shapes are complex it is recommended a preformed unit is used.
<b>Precaution</b>	<p>The membrane has been designed to perform in circumstances where linear expansion could occur, however in high temperatures the membrane should be covered immediately after installation.</p> <p>The membrane should not be taken through any masonry wall. The relevant Visqueen damp proof or gas proof course should be taken through and extended beyond the wall by a minimum of 250mm where it can be jointed to the membrane.</p>
<b>Service penetrations, corners and junctions</b>	<p>All service pipe penetrations should be fully sealed using welded membrane or Visqueen GX Preformed Top Hat Units. The base and collar of the preformed unit should be bonded using Visqueen GX Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Lap Tape. The collar should be secured with a mechanical fastening.</p> <p>To ensure system integrity, all internal and external corners should be provided with either welded corners or Visqueen Preformed Units bonded to the membrane using Visqueen Double Sided Jointing Tape and sealed with Visqueen GR Single Sided Lap Tape. Complex or awkward junctions should be sealed using either welded membrane or Visqueen Detailing Strip.</p>
<b>Ventilation</b>	When high levels of ground gases are present in accordance with BS8485:2015 or when the generation of gases still occurs, then an open void beneath the ground floor should be constructed as ventilation beneath the ground floor will dilute and disperse the gases to atmosphere. Open voids are normally restricted to beam and block floors or other precast concrete floor systems. An alternative for providing ventilation to in situ concrete floor slabs is to install a Visqueen Gas Venting System
<b>Storage and Handling</b>	<p>Visqueen Ultimate VOC BLOK is classified as non-hazardous when used in accordance with the relevant British Standards. The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The product should be stored in a warm dry environment and not exposed to long periods of sunlight.</p> <p>A roll weighs 97 kilos and should be handled with care following on site health and safety procedures.</p>

**Product & Performance Data:**

Characteristic	Test Method	Units	Criteria	Result
Colour				Black/Grey
Weight		kilos		97
Length	EN 1848-2	m	-0/+10%	41
Width	EN 1848-2	m	-0/+10%	2.44
Thickness	EN 1848-2	mm	+/-10%	1

BS8485 and C748 physical test results	Test Method	Units	Criteria	Result
Puncture	BS EN ISO 12236:2006	N	MDV	2850
Impact resistance Method A hard surface	EN12691	mm	MDV	750
Impact resistance Method B soft surface	EN12691	mm	MDV	>2000
Tensiles Yield strength MD 1	ASTM D4885-01	kN/m	MDV	11.9
Tensiles Yield strength CD 1	ASTM D4885-01	kN/m	MDV	12.7
Elongation @ break MD 1	ASTM D4885-01	%	MDV	>500
Elongation @ break CD 1	ASTM D4885-01	%	MDV	>501
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	79.6
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	75.8
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	128.3
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	126.9

1 - this is at yield and not break as the equipment used was not strong enough to break the membrane

BS8485:2015 - Methane testing	Test Method	Units	Criteria	Result
Methane permeability	ISO 15105-1	ml/m <sup>2</sup> /d/atm	<40	3.2

In order to comply with C748, Visqueen has expressed the test result units by volume (ml) and weight (mg)

C748 - Permeation vapour tests - 100% concentration	Test Method	Criteria	ml/m <sup>2</sup> /d	mg/m <sup>2</sup> /d	mg/m <sup>2</sup> /hr
Benzene	ISO 15105-2	MDV	0.08	67.7	2.82
Toluene	ISO 15105-2	MDV	0.09	75.9	3.16
Ethyl benzene	ISO 15105-2	MDV	0.11	90.7	3.78
(m,p xyxylene	ISO 15105-2	MDV	0.01	6.5	0.27
Hexane	ISO 15105-2	MDV	gas	2.5	0.1
Vinyl chloride	ISO 15105-2	MDV	0	6.2	0.26
Tetrachloroethene (PCE)	ISO 15105-2	MDV	0	3.1	0.13
Trichloroethene (TCE)	ISO 15105-2	MDV	solid	0.3	0.01
Naphthalene	ISO 15105-2	MDV	0.03	19.1	0.8

C748 - Chemical immersion testing	Test Method	Weight %	Thickness %	Tensiles/elongation
Benzene	EN14414	Pass	Pass	Pass
Toluene	EN14414	Pass	Pass	Pass
Ethyl benzene	EN14414	Pass	Pass	Pass
(m,p, and o,) xyxlenes	EN14414	Pass	Pass	Pass
Hexane	EN14414	Pass	Pass	Pass
Vinyl chloride	EN14414	Pass	Pass	Pass
Tetrachloroethene	EN14414	Pass	Pass	Pass
Trichloroethene	EN14414	Pass	Pass	Pass
Naphthalene	EN14414	Pass	Pass	Pass

Pass is achieved if the aged membrane is within 25% of the fresh sample. Visqueen can issue individual test reports on request

CE Mark to EN13967 Type A	Test Method	Units	Criteria	Result
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**ULTIMATE**  
GAS MEMBRANES

**VISQUEEN**

Tensile Strength - MD	EN 12311	N/mm <sup>2</sup>	>MDV	23.6
Tensile Strength - CD	EN 12311	N/mm <sup>2</sup>	>MDV	22.4
Tensile Elongation - MD	EN 12311	%	>MDV	701
Tensile Elongation - CD	EN 12311	%	>MDV	706
Joint Strength	EN 12317-2	N	>MDV	598
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	MDV	750
DDurability watertightness after heat ageing	EN 1296	-	Pass/Fail	Pass
Durability watertightness against chemicals	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	720
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	750
Resistance to static loading	EN 12730	Kg	>MLV	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	2142
Water vapour transmission - permeability	EN 1931	g/m <sup>2</sup> /d	MDV	0.063

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