



# VISQUEEN ULTIMATE GEOSEAL

A robust gas and chemically resistant pre-applied membrane

- Conforms in full to BS8102:2009, CIRIA C748 and BS8485:2015
- Unique pre-applied and gas resistant membrane
- Excellent VOC, Radon, CO<sub>2</sub> & methane barrier resistance
- Suitable for both Tanking and DPM applications
- Utilises Visqueen's unique technology
- Exceptional puncture resistance - No protection required
- Welding and Visqueen Gas Resistant tape system options

## Description

Visqueen Ultimate GeoSeal is a pre-applied membrane designed to comply with current guidance on waterproofing, 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 barrier membrane suitable in applications that are affected by aggressive chemicals such as Benzene, Toluene, Ethyl Benzene and Xylene (BTEX).

The product is textured on one side to aid adhesion to concrete and available in a large roll format 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 clear outer wrap.

The membrane should be installed grey and textured side up.

## Applications

Visqueen Ultimate GeoSeal is suitable for the following applications:

- Waterproofing applications to BS8102:2009 type A
- Slab edges and permanent shutter work
- Tanking below ground structure e.g. lift pits
- 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

The membrane can withstand normal on-site foot traffic and the activities associated with the laying of a reinforced concrete slab without the need for additional membrane protection. In addition, when applied with welded joints the membrane can provide protection against hydrostatic water pressure.

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

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### 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. 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.

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### Specific Approvals / Standards

■ **BS8102:2009** – Code of practice for protection of below ground structures against water from the ground. Type A membrane

■ **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

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### 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

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### System Components

- Visqueen GX Double Sided Bonding Tape
- Visqueen Ultimate Lap Tape
- Visqueen Retaining Discs and nails
- Visqueen GX Top Hat Units
- Visqueen Detailing strip

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Please note that the membrane can be welded as a preferred alternative to using tapes.

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Visqueen Ultimate GeoSeal and system components should be installed in accordance with the recommendations of the relevant codes of practice and industry guidance, such as CP102:1973, BS8102:2009, BRE414:2001, CIRIA C748, BR211:2007 and BS8485:2015.

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.

When installed horizontally, the membrane should be applied to a smooth concrete blinding or alternatively sand blinding. The surface should be free from loose aggregates or other sharp protrusions. Any standing water should be removed to prevent potential lap joint contamination. The membrane should be laid with the textured surface facing away from the blinding.

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#### **Formwork installation**

When installed vertically, Visqueen Ultimate GeoSeal should be pre applied to temporary formwork or the adjoining structure. Visqueen Retaining Discs are available to provide a means for securing the leading edge of the membrane to the temporary formwork. The membrane should be installed with the smooth surface facing the formwork.

Using oval nails, Visqueen Retaining Discs should be mechanically fixed, at maximum 400mm centre, to the internal face of the shuttering. Using a suitable power tool and 6mm drill bit to create a pilot hole in the membrane, the Visqueen Ultimate GeoSeal should be secured over the protruding section of the retaining disc. The top edge of the membrane should be trimmed to approximately 20mm below the top edge of the slab.

Once the concrete has set, the oval nails should be removed by pulling through from the external face of the shuttering. When the temporary formwork is removed the Visqueen Retaining Discs should be visible on the external (smooth) face of the membrane. Continuity of the membrane system with the damp or gas proof course is maintained using Visqueen GR Self Adhesive Membrane (see Visqueen Typical Details)

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#### **Waterproofing**

When a combined waterproofing system is required Visqueen recommend a suitable drainage system should be designed and incorporated. Visqueen Cavity Drain System provides a type C internal protection and information is available on this link. Please contact Visqueen to ensure correct specification for your project support including design and membrane selection 0333 202 6800.

When using GeoSeal in an external waterproofing application hydrostatic pressure can be relieved by using Visqueen Protect&Drain. The design and installation should be in accordance with BS8102:2009 – please visit [www.visqueenbuilding.co.uk/ products/external-water-management/protect-%26-drain](http://www.visqueenbuilding.co.uk/products/external-water-management/protect-%26-drain)

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#### **Lap joints**

Visqueen Ultimate GeoSeal has been designed to exhibit superior welding properties using hot edge, hot air, or extrusion welding. Therefore onsite welding of membrane lap joints is recommended for all applications and must be employed when hydrostatic water pressure or hydrocarbon/VOC contamination is present.

Where required, Visqueen's network of preferred installers can install the membrane and offer the client a fully warranted system.

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#### **Tape Joints**

Alternatively, when Visqueen Ultimate GeoSeal is used for damp proofing, ground gas protection and sites where hydrostatic water pressure or hydrocarbon contamination is of low risk, lap joints can be bonded with Visqueen GX Double Sided Jointing Tape and then sealed with Visqueen Gas Resistant Lap Tape. When using tapes to secure laps, the overlap should be minimum 150mm and the membrane surfaces to be jointed should be dry and free from contamination

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such as dust or sand. Once the tapes are applied, the lap should be well rolled with firm pressure to ensure complete adhesion and continuity.

**Service penetrations, corners and junctions**

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.

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.

**Precautions**

When the weather is cold, Visqueen jointing tapes and self-adhesive materials should be kept in a warm, dry place until needed. Unless welded, membrane installation is not recommended below 5°C.

To avoid high linear expansion when installed in hot weather, the membrane should be covered immediately after installation with concrete or screed.

**Storage and Handling**

Visqueen Ultimate GeoSeal 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.

A roll weighs 97 kilos and should be handled with care following on site health and safety procedures.

**Product & Performance Data:**

All tests are conducted by a 3rd party approved laboratory

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

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

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	ASTM D4885-01	kN/m	MDV	11.9
Tensiles Yield strength CD	ASTM D4885-01	kN/m	MDV	12.7
Elongation @ break MD	ASTM D4885-01	%	MDV	>500
Elongation @ break CD	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

CE Mark to EN13967	Test Method	Units	Criteria	Result
Tensile Strength - MD	EN 12311	N/mm <sup>2</sup>	>MLV	29



Tensile Strength - CD	EN 12311	N/mm <sup>2</sup>	>MLV	27
Tensile Elongation - MD	EN 12311	%	>MLV	864
Tensile Elongation - CD	EN 12311	%	>MLV	869
Joint Strength	EN 12317-2	N	>MLV	450
Watertightness 60kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	-MLV	900
Low temperature flexibility	EN 1109	°C	-15	Pass
Durability against heat ageing	EN 1296	-	Pass/Fail	Pass
Durability Chemical Resistance	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	445
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	470
Resistance to static loading	EN 12730	Kg	>MLV	Pass at 20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	2385
Water vapour transmission - permeability	EN 1931	g/m <sup>2</sup> /d	MDV	0.05
Puncture	BS EN ISO 12236:2006	N	MLV	>2500

<b>C748 - Permeation vapour tests - 100% concentration</b>	<b>Test Method</b>	<b>Units</b>	<b>Criteria</b>	<b>Result</b>
Benzene	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Toluene	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Ethyl benzene	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
(m,p, and o) xylenes	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Hexane	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Vinyl chloride	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Tetrachloroethene	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Trichloroethene	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1
Naphthalene	ISO 15105-2	ml/m <sup>2</sup> /day	MDV	<1

**About Visqueen**

Visqueen is the market leader in the manufacture and supply of structural waterproofing and gas protection systems. Visqueen offers the complete package – a proven, reliable range backed by a technical support service that goes unmatched in the market - everything you would expect from a reputable and ethical company.

**Complete Range, Complete Solution**

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**Technical support throughout your project**

We are specialists in our field and can help you specify the correct solutions with the necessary performance levels, in accordance with building regulations.

- Nationwide site support team
- Specification advice
- Installation guidance & project sign off
- System design including CAD details

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The specification, technical design, and installation of gas protection systems, enabling the sustainable regeneration of brownfield sites.



**Structural Waterproofing CPD**

The specification, technical design, and installation of structural waterproofing systems for protection against water and damp ingress in both above and below ground projects.



**Visqueen Training Academy**

We are now able to offer exclusive in depth training opportunities on a wide variety of Visqueen products at our Training Academy.



**Visqueen Special Projects**

We provide high-level expertise, comprehensive support and experience in all types of waterproofing and gas protection.



Part of RPC bpi group

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