VISQUEEN GAS PROTECTION

VISQUEEN'S GAS PROTECTION SYSTEM – THE COMPLETE SOLUTION

CI/SfB | | (21.9) | | (L34) | Jan 2019 | v. 4

Contents

Think Visqueen

Gas Protection Systems

Visqueen is one of the largest European producers of high performance construction materials used in gas protection, structural waterproofing, damp proofing, stormwater and floor protection systems.

Welcome to Visqueen

Visqueen is the market leader in the manufacture and supply of structural waterproofing and gas protection systems.

Visqueen offers complete support at every stage in the specification and supply chain process. We offer a comprehensive range of advanced products, a dedicated technical support team of specialists - offering specification and design advice and a best in class level of customer service.

With a team of highly trained and experienced technical experts offering the highest level of support to our customers, including architects and specifiers, contractors and merchants – all of our technical team have been awarded the CSSW award (certificated surveyor of structural waterproofing), a nationally recognised professional qualification – we aim to promote excellence within the industry, improving consumer confidence and encouraging professional development.

Our market leading expert team are equipped to offer the best specification and design solution for gas and waterproofing using Visqueen's extensive product range.

Working to only the highest standards and through innovation and excellence as key values, Visqueen remains the industry leader and is trusted as the technical authority for product standards.

2007

CIRIA C665 - Assessing risks posed by hazardous ground gases to buildings.
BS8485 - Code of practice for the characterization and remediation from ground gas in affected developments.
NHBC - Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present.

Visqueen introduces :

VISQUEEN GAS BARRIER

VISQUEEN LOW PERMEABILITY GAS MEMBRANE

2009

CIRIA C682 - The VOCs Handbook. Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination.

Visqueen introduces:

VISQUEEN GX GEOMEMBRANE SYSTEM

2012

CIRIA C716 - Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination.

Visqueen introduces:

VISQUEEN PRE APPLIED MEMBRANE

2014

CIRIA C748 - Guidance on the use of plastic membranes as VOC vapour barriers.

Visqueen introduces:

VISQUEEN LIQUID GAS MEMBRANE

Evolving Guidance and Codes of Practice Timeline

Building on Contaminated Land

Brownfield Land

Background – the dangers

The most widely known UK tragedies where ground gas produced explosive or asphyxiating conditions occurred at Loscoe in Derbyshire (1986)[1], Abbeystead in Lancashire (1984)[2] and most recently in Gorebridge near Edinburgh (2012)[3]. The £8m Gorebridge housing site was mothballed after occupants complained of dizziness and sickness which was directly attributed to ground gases not being effectively managed. Publicity surrounding these incidents heightened regulatory and public expectations for managing ground gas.

What is brownfield land?

Britain's great industrial past has left its mark with many land areas having been contaminated with hazardous waste or pollution. From coal fields, abandoned industrial factories to closed
petrol stations; they leave historic contaminants such as hydrocarbon spillages, solvents and ground gases (methane and carbon dioxide).

Brownfield is a term used for building on contaminated land previously used for industrial uses.

Government brownfield policies

For the past 20 years governments have repeatedly committed developing land affected by contamination (for both housing and other developments). This commitment continues today as the current government encourage redevelopment on brownfield sites[4] to manage population growth and a housing shortage. This strategy also decreases the pressure to build on Britain's precious green open spaces. Building on brownfield land is a fundamental element in the delivery of sustainable development.

Building on contaminated land – A guidance history

Prior to 2007 most guidance for building on contaminated land took little account of risk and what was the best way to prevent/manage risks. There was much disagreement between consultants, regulators and construction industry as to the "best way" to assess risks from ground gases. Since 2007 the industry has come together and published guidance, codes of practices and regulations surrounding the design, build and protective measures on contaminated land. These guidelines have evolved to cover a complex area of design and prevention against various chemicals and gases emanating from the ground.

2015

BS8485 - Code of practice for the characterization and remediation from ground gas in affected developments.

Visqueen introduce:

VISQUEEN GAS BARRIER ADVANCED

2016

NHBC Technical extra issue 20.

Visqueen introduces:

VISQUEEN ULTIMATE GAS MEMBRANES

2018

BR 211 - Radon: Guidance on protective measures for new buildings.

Visqueen introduces:

VISQUEEN ULTIMATE RADONBLOK 600

2019

BS8485:2015+A1:2019 code of practice is updated. Visqueen achieves 3rd party certification for the Ultimate and Gas Barrier membranes

BDA Agrément

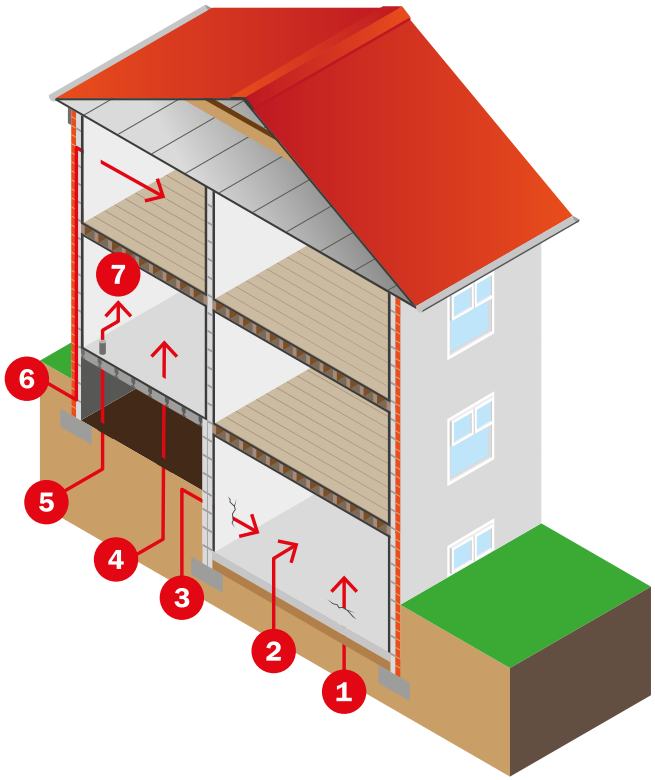
For more details, please see Appendix A on page 24

Background

The hazards of ground gases and volatile organic compounds (VOCs) must be taken into account when designing and constructing new developments. Ground gas can be drawn into a building by the pressure difference that exists between the inside and outside of the building (warm indoor air is less dense than cold outdoor air). Ground gases can enter buildings through:

Potential ground gas entry points

1. Cracks in solid floors
2. Construction joints
3. Cracks in walls below ground
4. Gaps in suspended concrete or timber floor
5. Gaps around service pipes
6. Cavities in walls
7. Soil and vent pipes



Gas Membrane Compliance Criteria

Building on contaminated land

Visqueen has created a test check list for each application to ensure compliance to the latest regulations. The tests are a minimum requirement and allow the designer and user peace of mind that the membrane will perform in these critical applications.

How to use the table below

■ **Table 1 - Site Conditions**
Check your site contaminants (methane, VOC etc.) and identify what system test requirements are needed. Now refer to the relevant part of table 2.

■ **Table 2 - Test Criteria**
Ensure all the test regime is fulfilled using the specific individual testing methods to meet the requirement of table 1. For example, from table 1 a site with VOC vapours and methane requires table 2's test criteria of: methane permeability, membrane physicals and VOC vapour testing.

Acronym key
CO_2 - Carbon dioxide
CH_4 - Methane
VOC - Volatile organic compounds

Table 1

	SITE CONDITIONS		
System Test Requirements	**CO_2 & CH_4 (BS8485:2015+A1:2019 CS2-4)***	**VOC Vapours (C748)**	**VOC Immersions (C748)**
Methane permeability	✔		
Membrane Physicals	✔	✔	✔
VOC Vapours		✔	
VOC Immersions			✔

* CS refers to Characteristic Situation as described in BS8485:2015+A1:2019
Site conditions may have combinations of methane, VOC vapours and/or immersions therefore each category above must be fulfilled

Table 2

TEST CRITERIA

Methane Permeability			
Description	**Test Method**	**Units**	**Criteria**
Methane Permeability	ISO 15105-1	ml/m²/atm	<40

Membrane Physicals			
Description	**Test Method**	**Units**	**Criteria**
Mass	EN 1849-2	g/m²	>370
Thickness between scrim	BS EN ISO9863-2016	mm	>0.4
Puncture CBR	BS EN ISO 12236:2006	N	>824 example
Impact resistance Method A hard surface	EN12691	mm	>750 example
Impact resistance Method B hard surface	EN12691	mm	>750 example
Tensile	ASTM D4885-01	kN/m	MDV*
Elongation	ASTM D4885-01	%	MDV*
Tear resistance - trouser method A	BS ISO 34-1	kN/m	MDV*
Tear resistance - angle method B	BS ISO 34-1	N	MDV*

VOC Vapours			
Description	**Test Method**	**Units**	**Criteria**
9 Challenge chemicals	ISO 15105-2	ml/m²/d	MDV*

MDV* Manufacturer's Declared Value. The result to be assessed for suitability

VOC Immersion			
Description	**Test Method**	**Units**	**Criteria***
9 Challenge chemicals	EN14414	Pass/Fail	<25% of fresh result

*Mass,Tensiles and elongation <25% fresh tested sample

CIRIA C748 give us the 9 Challenge Chemicals

CIRIA C748 and BS8485:2015+A1:2019 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. CIRIA C748 states a VOC membrane must be tested as a minimum to the 9 challenge chemicals. 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/m²/day/atm** (ISO15105-1 to BS8485:2015+A1:2019) requirement threshold and physical property requirements.

Visqueen has conducted VOC vapour and chemical resistance testing (including conducting application cocktail testing) to these challenge chemicals below in accordance C748.

- benzene
- toluene
- ethyl benzene
- m,p xylene
- hexane
- vinyl chloride
- tetrachloroethene (PCE)
- trichloroethene (TCE)
- naphthalene

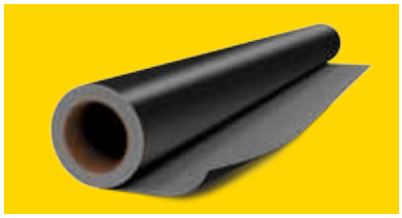
A manufacturer must be able to produce the test data and NOT offer modelled data which could compromise the building and its occupants.

NEW Advanced Barrier Technology

Introducing a new superior gas barrier

- An advanced gas barrier structure
- Superior physical and chemical resistant properties
- Easy and rapid welding
- Flexibility for uneven ground contours
- 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.



Visqueen Ultimate GeoSeal is a high performance pre-applied 1mm thick coextruded membrane designed to comply with current guidance on waterproofing, volatile organic compounds (VOCs) and ground gases. An all in one solution for waterproofing and gas/VOC applications.

Visqueen Ultimate VOC BLOK is an exceptional puncture resistant and flexible 1mm thick coextruded membrane designed to comply with current guidance on volatile organic compounds (VOCs in liquid and vapour form) and ground gases.

Visqueen Ultimate HC BLOK is a highly flexible 0.5mm thick coextruded membrane designed to comply with current guidance on volatile organic compounds (VOCs) vapours and ground gases.

Visqueen Ultimate RADONBLOK 600 is a unique high performance co-polymer thermoplastic radon barrier which exhibits excellent welding characteristics.

VISQUEEN
ADVANCED BARRIER TECHNOLOGY

Visqueen Gas Product Selector

Ensure you are working with the correct product for the application

Visqueen's NEW Ultimate range offers an unrivalled choice for protection against dangerous gases and chemicals in compliance with the latest regulations and standards.

The NEW range utilises Visqueen's advanced barrier technology and to aid specification we have a created a product selector below.

Also available on the website

- Datasheets
- Standard details
- BIM and NBS
- Our new standard details pack includes 3D designs

	COMPLIANCE DOCUMENT					
	BRE211	**NHBC Amber 1**	**BS8485:2015+A1:2019/ Amber 2**	**C748**	**C748**	**BS8102**
	Radon	**CO_2/CH_4**	**CO_2/CH_4**	**VOC Vapours**	**VOC Immersions**	**Waterproof**
Ultimate GeoSeal	✔	✔	✔	✔	✔	✔
Ultimate VOC BLOK	✔	✔	✔	✔	✔	
Ultimate HC BLOK	✔	✔	✔	✔		
Gas Barrier	✔	✔	✔			
LPGM500	✔	✔				
Radon Barrier	✔					
Ultimate RadonBlok 600	✔					

The highlights of the NEW Ultimate Gas Membrane range are:

- Comprehensively tested and validated test results
- Conforms in full to CIRIA C748 and BS8485:2015+A1:2019
- Utilises Visqueen's advanced barrier technology
- VOC Blok does not require protection
- Comprehensive range for all vapour and VOC immersion applications
- Exceptional puncture resistance and flexible even at low temperatures
- Outstanding welding characteristics

PLEASE NOTE

Visqueen's New Ultimate range does not use modelled data or use aluminium (thin foils are susceptible to holing)

A New Generation of Gas Membranes Performance

A comparison guide to performance

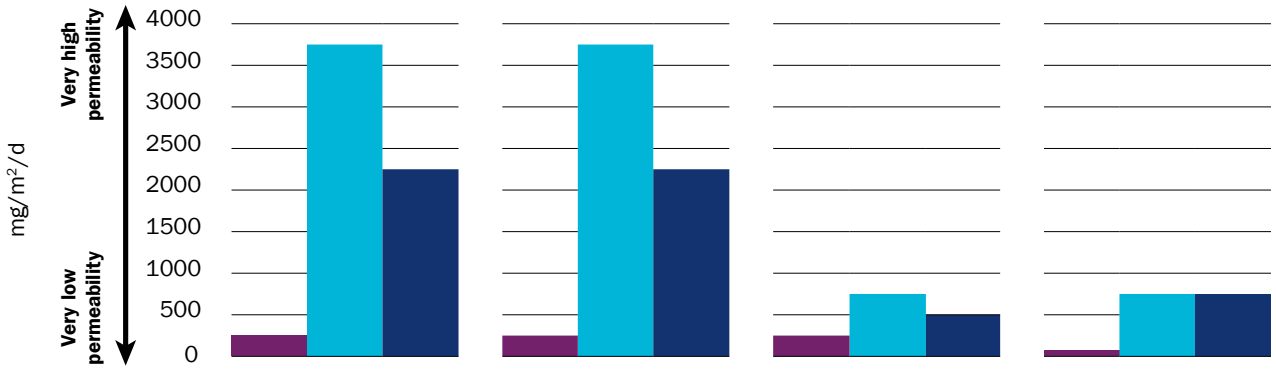
To prove Visqueen's new Ultimate range is the 'best in class', we have compared published test data for key performance characteristics. Physical testing such as puncture, impact and tear resistance indicate whether a membrane is suitable for demanding site conditions. If a membrane is not robust enough it could easily tear or puncture during installation which could allow dangerous gases to flow into the building.

Permeability test results was also compared against the most common VOCs in contaminated land. Visqueen's New Ultimate range was proven to have the highest physical performance and gas barrier attributes as shown on the tables below.

	Impact resistance method A (mm)	Puncture (N)	Tear resistance – trouser method A (kN/m)	Tear resistance – angle method B (kN/m)	Elongation (%)
	EN12691	**BS EN ISO 12236:2006**	**BS ISO 34-1**	**BS ISO 34-1**	**EN 12311-1**
Product A Typical Reinforced Aluminium	200	1114	48.2	53.5	350
Product B Co-extruded VOC Barrier	200*	1470	60	48*	500*
Product C Polyethylene Gas/VOC Barrier	200*	1400*	55*	48*	400
Ultimate HC BLOK Visqueen Barrier Technology	250	1640	60.2	48.7	723
Ultimate VOC BLOK Visqueen Barrier Technology	750	2850	79.6	128.3	701
Best Performance	Ultimate VOC BLOK	Ultimate VOC BLOK	Ultimate VOC BLOK	Ultimate VOC BLOK	Ultimate HC BLOK

*Manufacturer has not conducted required tests. This result is assumed on material composition and thickness, the products do not conform to the criteria of BS8485:2015+A1:2019 & CIRIA C748

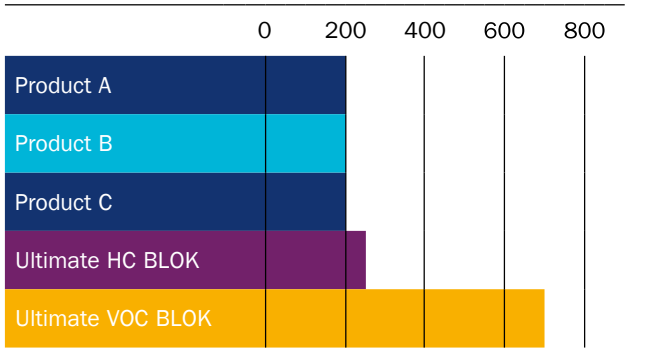
Comparative permeability testing to ISO15105-2



	Benzene	Toluene	Ethyl Benzene	Xylene
Ultimate HC BLOK	70	78.5	93.8	6.7
Product B	3846	3763	464	767
Product C	2250	2370	400	690
Best Performance	Ultimate HC Blok	Ultimate HC Blok	Ultimate HC Blok	Ultimate HC Blok

Tested and Compared

Impact resistance method A (mm)



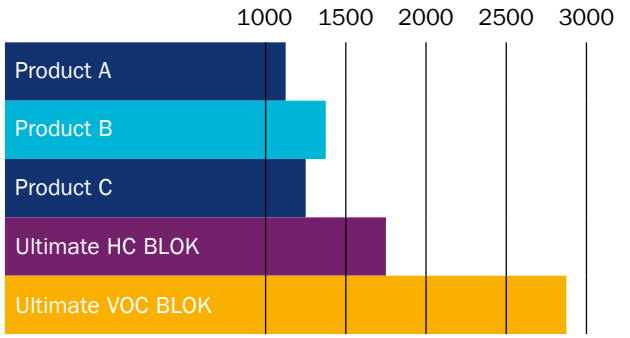
Ultimate VOC BLOK is the only gas membrane that does NOT require protection after installation i.e. concrete can be poured straight onto it or place steel reinforcements (rebars).

Important information on impact test methods

Method A represents the membrane being placed on a hard surface such as concrete.

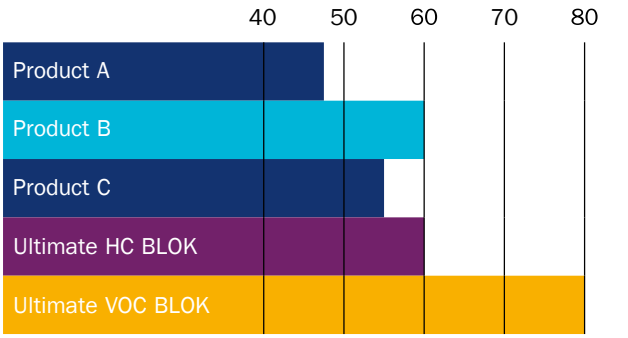
Method B represents the membrane being placed on a soft surface such as insulation.

Puncture (N)



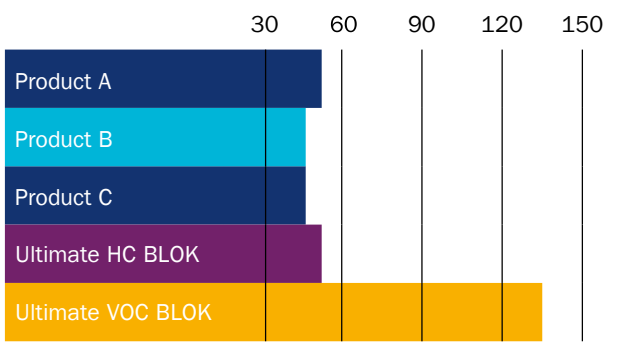
The highest performance attributes ensures the membrane is not damaged on-site.

Tear resistance – trouser method A (kN/m)



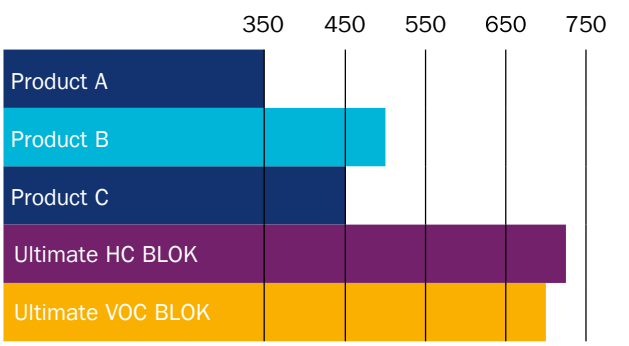
Visqueen Ultimate VOC BLOK has the 'best in class' tear and abrasion resistance which is essential during the rigours of installation.

Tear resistance – angle method B (kN/m)



Visqueen Ultimate VOC BLOK is class leading with exceptional test results for tear resistance.

Elongation (%)



Over twice the elongation of standard aluminium gas barriers ensure the membrane does not break under tensile forces underneath a floor slab and settlement.

Best Performance	Ultimate VOC BLOK	Ultimate VOC BLOK	Ultimate VOC BLOK	Ultimate VOC BLOK	Ultimate HC BLOK
	Impact resistance	Puncture	Tear resistance – A	Tear resistance – B	Elongation

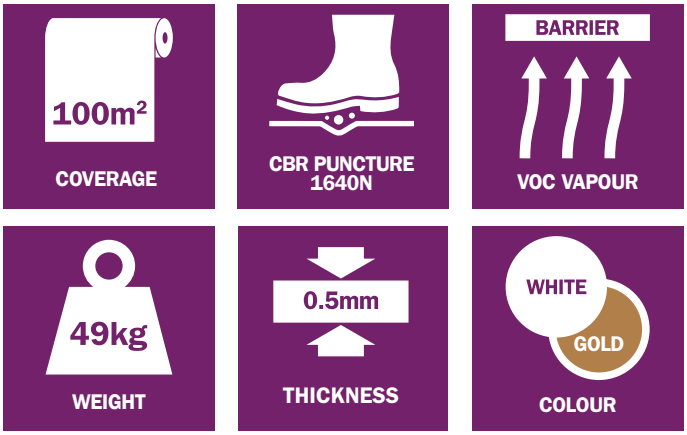
Ultimate HC BLOK

VISQUEEN
ADVANCED BARRIER TECHNOLOGY

The ultimate methane and VOCs' vapour barrier

- **Conforms to CIRIA C748 and BS8485:2015+A1:2019**
- **Excellent VOC (vapour) and methane barrier resistance**
- **Exceptional flexibility and puncture resistance**
- **Outstanding welding characteristics, saving time and costs**

Visqueen Ultimate HC BLOK is a highly flexible 0.5mm thick coextruded membrane designed to comply with current guidance on volatile organic compounds (VOCs) vapours and ground gases.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs

APPLICATION

- For use on beam and block/vented void floor constructions
- VOC/Hydrocarbon (gaseous phase) contaminated sites in accordance with CIRIA C748
- Carbon dioxide and methane sites in accordance with BS8485:2015+A1:2019
- Radon affected sites in accordance with BRE211:2015

USE WITH:

- Visqueen Ultimate Double Sided Tape 100mm x 15m
- Visqueen Ultimate Lap Tape 150mm x 10m

BS8485:2015+A1:2019

TECHNICAL DETAILS

Colour	Weight	Dimension	Code
Gold/White	49kg	2.44m x 41m x 0.5m	RS058032

Characteristic	Test method	Unit	Criteria	Result
BS8485:2015+A1:2019 – Methane testing				
Methane permeability	ISO 15105-1	ml/m2/d/ atm	<40	Pass
C748 - Permeation vapour tests - 100% concentration				
9 challenge chemicals as listed on page 7	ISO 15105-2	ml/m2/d	MDV	<1

To view all our comprehensive test data please visit our website **www.visqueen.com**

PLEASE NOTE
Visqueen's New Ultimate range does not use modelled data or use aluminium (thin foils are susceptible to holing)

Ultimate GeoSeal

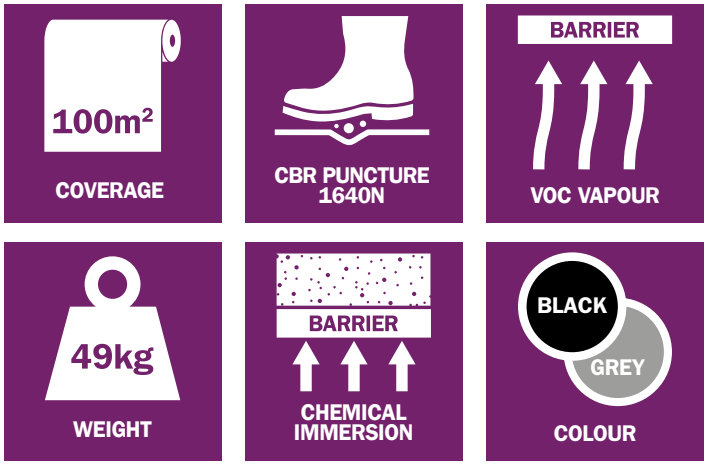
VISQUEEN
ADVANCED BARRIER TECHNOLOGY

The all in one solution for any site requirements

- **Conforms in full to BS8102:2009, CIRIA C748 and BS8485:2015+A1:2019**
- **Unique pre-applied and gas resistant membrane**
- **Excellent VOC and methane barrier resistance**
- **Outstanding welding characteristics, saving time and costs**
- **Exceptional puncture resistance - No protection required**

Visqueen Ultimate GeoSeal is a pre-applied membrane designed to comply with current guidance on waterproofing, Volatile organic compounds (VOCs) and ground gases.

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.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs

APPLICATION

- 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+A1:2019
- Radon affected sites in accordance with BRE211:2015

USE WITH:

- Visqueen Ultimate Double Sided Tape 100mm x 15m
- Visqueen Ultimate Lap Tape 150mm x 10m
- Visqueen Retaining discs

TECHNICAL DETAILS

Colour	Weight	Dimension	Code
Black/Grey	97kg	2.44m x 41m x 1m	RSO58034

Characteristic	Test method	Unit	Criteria	Result
BS8485:2015+A1:2019 – Methane testing				
Methane permeability	ISO 15105-1	ml/m²/d/ atm	<40	Pass
C748 - Permeation vapour tests - 100% concentration				
9 challenge chemicals as listed on page 7	ISO 15105-2 EN14414:C	ml/m²/d Physical	MDV	Pass

To view all our comprehensive test data please visit our website **www.visqueen.com**

PLEASE NOTE
Visqueen's New Ultimate range does not use modelled data or use aluminium (thin foils are susceptible to holing)

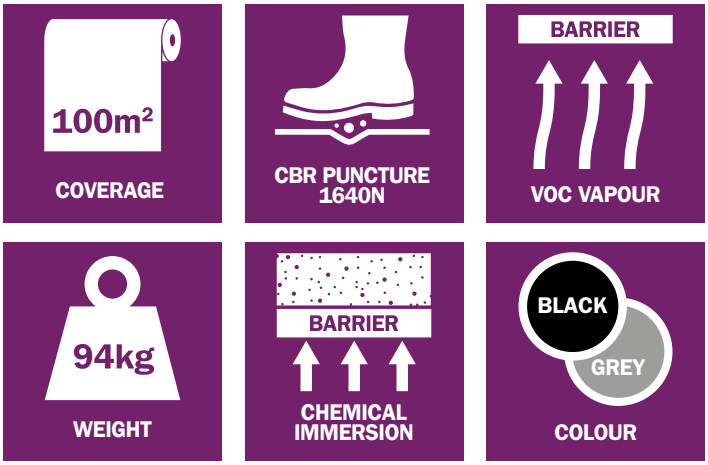
Ultimate VOC Blok

VISQUEEN
ADVANCED BARRIER TECHNOLOGY

The ultimate membrane protection against VOCs and methane

- **Conforms in full to CIRIA C748 and BS8485:2015+A1:2019**
- **Excellent VOC and methane barrier resistance**
- **NO protection required**
- **Outstanding welding characteristics, saving time and costs**
- **Comprehensively tested and validated test results**

Visqueen Ultimate VOC BLOK is a flexible membrane designed to comply with current guidance on volatile organic compounds (VOCs) and ground gases. The membrane should be installed grey side up.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs

PLEASE NOTE
Visqueen's New Ultimate range does not use modelled data or use aluminium (thin foils are susceptible to holing)

APPLICATION

- For below ground bearing slab
- VOC/Hydrocarbon contaminated sites in accordance with CIRIA C748
- Carbon dioxide and methane sites in accordance with BS8485:2015+A1:2019
- Radon affected sites in accordance with BRE211:2015

USE WITH:

- Visqueen Ultimate Double Sided Tape 100mm x 15m
- Visqueen Ultimate Lap Tape 150mm x 10m
- Visqueen Retaining discs

TECHNICAL DETAILS

Colour	Weight	Dimension	Code
Black/Grey	49kg	2.44m x 41m x 0.4m	RS060461

Characteristic	Test method	Unit	Criteria	Result
BS8485:2015+A1:2019 – Methane testing				
Methane permeability	ISO 15105-1	ml/m2/d/ atm	<40	Pass
C748 - Permeation vapour tests - 100% concentration				
9 challenge chemicals as listed on page 7	ISO 15105-2	ml/m2/d	MDV	<1

To view all our comprehensive test data please visit our website **www.visqueen.com**

Ultimate RadonBlok 600

NSAI Agrément

Visqueen Ultimate RadonBlok Radon Air & Damp Protection System

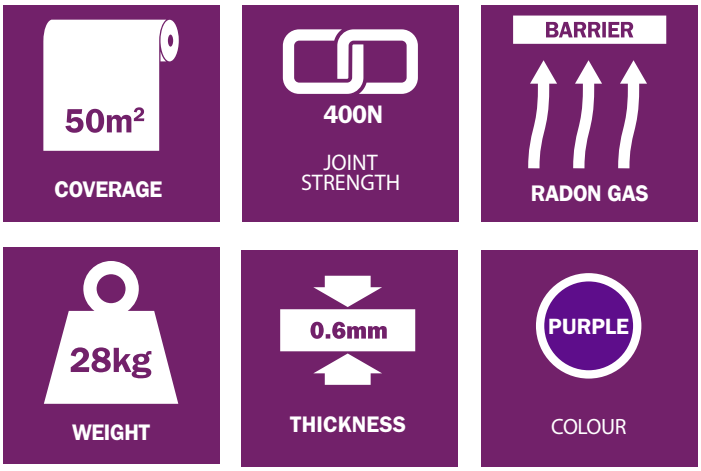
CERT No. 05/0214

The complete high performance welded radon barrier system.

- **Specially formulated for easy and rapid welding**
- **Exceptional flexibility and puncture resistance**
- **NSAI certified radon barrier system**
- **Excellent cold weather properties**
- **More than 2 X greater impact strength (*as compared to traditional reinforced radon membranes)**

Visqueen Ultimate RadonBlok is a unique high performance co-polymer thermoplastic radon barrier which exhibits excellent welding characteristics. Manufactured using Visqueen's advanced membrane technology and drawing on our extensive knowledge and expertise in gas protection, Visqueen has developed a new flexible barrier membrane that works in extreme conditions. The system provides complete protection from sealing floors to walls, and complex detailing such as service pipe penetrations and corners.

The product is available in large roll formats to minimise jointing and quick installation times. The membrane is purple, 2m x 25m x 0.6mm (50m^2), in single wound roll.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs
- NSAI Certification

APPLICATION

- Radon contaminated areas in accordance with NSAI certificate no. 05/0214
- Resistance to moisture in accordance with Technical Guidance Document C
- Above or below concrete floors in accordance with Visqueen design specification

Due to a diverse range of applications, site conditions and variations in attack chemicals we strongly advise contacting Visqueen's technical department for correct specification.

USE WITH:

- Visqueen Radon Blok Double Sided Tape 30mm x 30m
- Visqueen Radon Blok Single Sided Cross Weave 75mm x 33m

TECHNICAL DETAILS

Colour	Weight	Dimension	Code
Purple	28kg	25m x 2m x 0.6mm	RS058893

Characteristic	Test method	Unit	Criteria	Result
Radon Permeability	SP Test Method		MDV	5.6 x 10-12
Radon Permeability <12E -12	SP Test Method		Pass/ Fail	Pass

To view all our comprehensive test data please visit our website **www.visqueen.com**

**Visqueen RadonBlok 400 - taped system available on request

PLEASE NOTE

Visqueen's New Ultimate range does not use modelled data or use aluminium (thin foils are susceptible to holing)

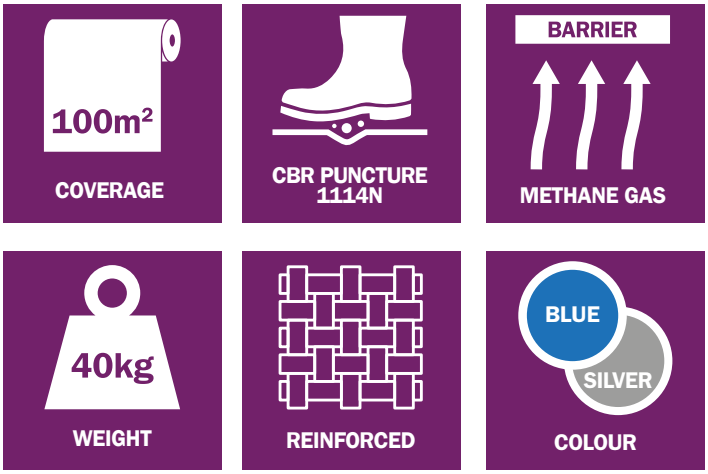
Gas Barrier

Compliant to BS8485:2015+A1:2019

A multi-layer reinforced polyethylene membrane with an integral aluminium foil

- **BBA approved, fully complies with BS8485:2015+A1:2019**
- **Low permeability to methane, radon and carbon dioxide**
- **Approved for use in NHBC Amber 2 applications**
- **Five layer film with thick aluminum core**

Visqueen Gas Barrier is a 400 gsm multi-layer reinforced polyethylene membrane with an integral 20 micron aluminium foil that is approved for use in BS8485:2015+A1:2019 and NHBC Amber 2 applications. For ease of identification on site Visqueen Gas Barrier is coloured blue on one side and silver on the reverse. The barrier combines strength and performance with flexibility and easy installation. Visqueen Gas Barrier also acts as a damp proof membrane.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs

APPLICATION

- Carbon dioxide and methane sites in accordance with BS8485:2015+A1:2019
- Radon affected sites in accordance with BRE211:2015
- Damp protection in accordance with Building Regulations part C
- The membrane should be installed blue side up

USE WITH:

- Visqueen Double Sided Tape 50mm x 10m
- Visqueen Gas Resistant Foil Tape 75mm x 50m

TECHNICAL DETAILS

Colour	Roll weight	Roll dimension	Code
Blue/Silver	40kg	50m x 2m x 400gsm	RS056551
Blue/Silver	40kg	25mx 2m x 400gsm	RS056695

Product	Weight	Thickness between scrim	Foil thickness
Visqueen Gas Barrier	400gsm	400mu	20mu

Characteristic	Test method	Unit	Criteria	Result
BS8485:2015+A1:2019 – Methane testing				
Methane permeability	ISO 15105-1	ml/m²/d/atm	<40	Pass
Puncture CBR	BS EN ISO 12236	N	1000	1114
Impact resistance	EN12691	mm	MDV	1000

To view all our comprehensive test data please visit our website **www.visqueen.com**

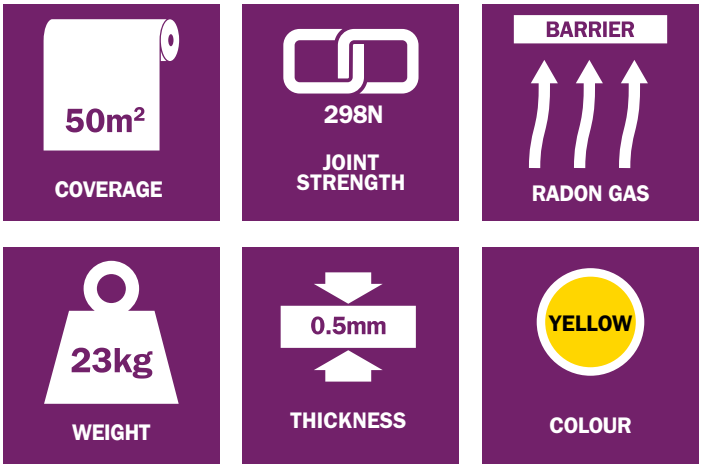
LPGM500

High quality co-polymer thermoplastic membrane

- **Low permeability to carbon dioxide, radon and low levels of methane**
- **Approved for use in NHBC Amber 1 application**
- **BBA Certificate 13/5069 and CE Mark 13967**

Visqueen Low Permeability Gas Membrane (LPGM) offers a safe solution for the protection of buildings against radon, carbon dioxide and low levels of methane gas when installed in accordance with the relevant codes of practice and is approved for use in NHBC Amber 1 application.

The membrane is manufactured as a centre folded product to limit creases which aids jointing and welding applications on site. Centre folded films can also help to reduce cracks found in structural concrete screeds where traditional multi-folded DPMs are used.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs

APPLICATION

Visqueen Low Permeability Gas Membrane offers a safe solution for the protection of buildings and occupiers against radon, carbon dioxide and low levels of methane gas in NHBC Amber 1.

- Radon affected sites in accordance with BRE211:2015
- Damp protection in accordance with Building Regulations part C

USE WITH:

- Visqueen Double Sided Tape 50mm x 10m
- Visqueen Gas Resistant Foil Tape 75mm x 50m

TECHNICAL DETAILS

Colour	Weight	Dimension	Code
Yellow	23kg	12.5m x 4m x 0.5m	RS058893

Characteristic	Test method	Unit	Criteria	Result
Radon Permeability	SP Test Method		MDV	5.477 x 10-12
Radon Transmittance	SP Test Method	m/s	MDV	1.095 x 10-8
Carbon Dioxide Permeability	IS0 2782	m/s/Pa	MDV	2.8 x 10-17
Methane Permeability	IS0 2782	m/s/Pa	MDV	1.13 x 10-17

To view all our comprehensive test data please visit our website **www.visqueen.com**

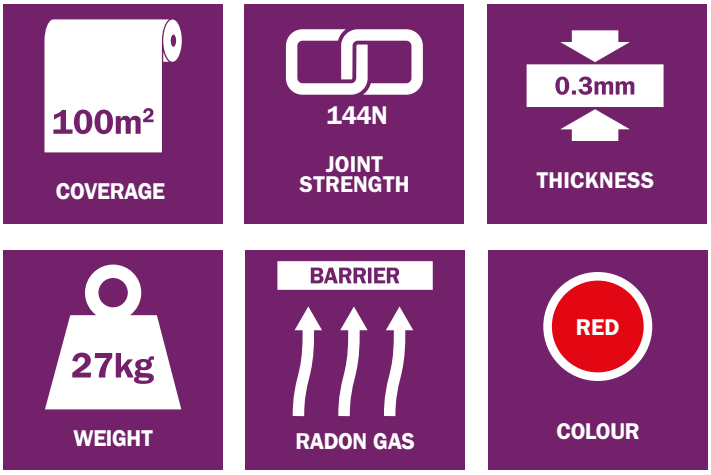
Radon Membrane

An un-reinforced polythene membrane

- **Independently tested for radon resistance**
- **BBA Certified**
- **High resistance to puncture**
- **Also acts as a damp proof membrane**
- **Complies with BR 211: 2015**

Visqueen Radon Membrane is manufactured from an enhanced blend of polymer films that is suitable for use in the protection of buildings from the ingress of radon gas. It also acts as a damp proof membrane, but is not intended for use where there is the risk of hydrostatic pressure.

Visqueen Radon Membrane and ancillary components must be used in accordance with the recommendations in the most recent edition of Building Research Establishment Report BR 211. It is installed in a similar way to a damp proof membrane, but with much greater attention paid to workmanship and detailing in order to achieve effective sealing at all locations.



AVAILABLE ON THE WEBSITE

- Comprehensive datasheets including performance data
- Storage and handling
- MSDS
- Standard details
- NBS and BIM specs

APPLICATION

Visqueen Radon Barrier offers a safe solution for the protection of buildings and occupiers against radon, carbon dioxide and low levels of methane gas in NHBC Amber 1.

- Radon affected sites in accordance with BRE211:2015
- Damp protection in accordance with Building Regulations part C

USE WITH:

- Visqueen Double Sided Tape 50mm x 10m
- Visqueen Gas Resistant Foil Tape 75mm x 50m

TECHNICAL DETAILS

Colour	Weight	Dimension	Code
Red	27.6kg	25m x 4m x 0.3mm	RS058896

Characteristic	Test method	Unit	Criteria	Result
Radon Permeability	SP Test Method		MDV	5.477 x 10-12
Radon Transmittance	SP Test Method	m/s	MDV	1.922 x 10-8

To view all our comprehensive test data please visit our website **www.visqueen.com**

Visqueen's Comprehensive System Components Range

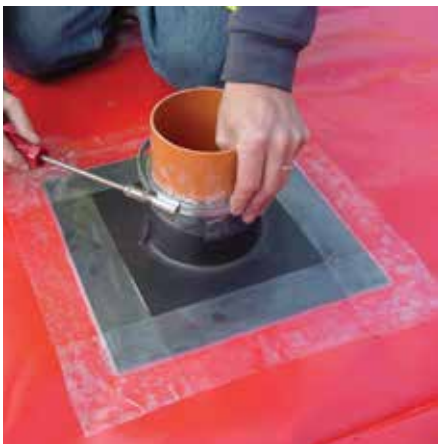
To provide continuity of protection in gas applications, Visqueen's comprehensive range of ancillaries will ensure a gas-tight seal even in the most difficult places

Gas Membrane jointing System -
The gas resistant system consists of Visqueen D/sided tape for bonding the membranes and Visqueen Gas Lap tape to seal the overlap.

Welding and Pre-welding
Visqueen's membranes exhibit outstanding welding (using hot air or extrusion type) characteristics, saving labour time and costs. When projects demand a higher degree of integrity, Visqueen can prepare pre-welded panels according to customer's specification or

Visqueen Ultimate Damp Proof Course (DPC) and cavity trays
Gas membranes should NOT be taken through any wall or point load as they could cause a slip plane. Visqueen Ultimate DPC has been tested for mortar bond and shear strength under various loading classes as well as not complying with BS8485:2015+A1:2019 methane threshold.

Visqueen Ultimate Preformed Units (PFUs)
In accordance with BS5628 part 3 code of practice for the use of masonry, Visqueen's PFUs and cavity tray units simplify detailing at columns, corners, windposts, change of levels etc. The PFUs saves labour time and money when dealing at these complex areas.



Visqueen Ultimate Top Hats
Gas-tight seals should be formed around all service entry points. Visqueen Ultimate Top Hat Units are available for sealing around pipe units. The full system is illustrated below using the Ultimate Top Hat and Ultimate jointing system

Complete Nationwide Support Service

We combine our extensive product portfolio with industry leading levels of service and support which includes bespoke CAD drawings to help with complex detailing, CPD seminars, electronic NBS specifications and access to a dedicated team of highly knowledgeable, field based technical support managers.

Plus, as installation requirements, site conditions and legislation all evolve so too does our ability to meet your needs thanks to an unrelenting focus on new innovation and continuing product development.

Continued product innovation programmes working with leading technical authorities ensures Visqueen's products and services meet the demands of the ever changing construction regulations and compliance. These products offer product durability unrivalled in the market place.

Appendix A – Evolving guidance codes of practice timeline

2007

NHBC – Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present

The National House Building Council (NHBC) guidance document included a simple multi stage classification method for low-rise housing, commonly referred to as the "Traffic Light system". This guidance document follows similar lines to BS8485 but adopting a traffic light system (green, amber 1 and 2, red) for gas characteristic situations.

CIRIA C665 – Assessing risks posed by hazardous ground gases to buildings

This was the first guidance document that took a pragmatic approach from start to finish. The guidance it contains consolidates good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to gas contaminated land. It was the first document to introduce a source-pathway-receptor model. To date all good Site Investigation (SI) reports follow the methods stated in this document.

BS8485 - Code of practice for the characterization and remediation from ground gas in affected developments

Until its revision in 2015 this was the principal guidance used when assessing risks posed by methane and carbon dioxide and summarises the suitable measures for dealing with them. The standard is broken down into the following key elements:

- Site categorisation and investigation
- Risk assessment objective – determining gas flow rate and characteristic gas situation hazard potential from very low (1) to very high (7)
- Point scoring mechanism – used to match the building type with the gas protection system solution having ascertained the characteristic gas situation.
- Protection element/system rating – each protection element is allocated an appropriate point system such as a validated gas membrane scores 2 points.

2009

CIRIA C682 – The VOCs Handbook. Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination

The first in depth guide when building on land affected by Volatile Organic Compounds (VOCs). The handbook intended to compliment the guidance released by CIRIA C665 in 2007 with a focus on VOCs.

2012

CIRIA C716 – Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination

This document provides clear and flexible guidance specific to management of VOC vapours, primarily relating to inhalation by people.

2014

CIRIA C748 – Guidance on the use of plastic membranes as VOC vapour barriers

The new document is the most up to date and commonly used guidance when specifying VOC barrier membranes. The document states various membrane requirements from physical performance – in order to withstand the installation process and durability – to listing 9 challenge chemicals for vapour and chemical resistance testing. Testing and result units are also harmonised to give clarity to the industry when using VOC barrier membranes.

2015

BS8485 Code of practice for the characterization and remediation from ground gas in affected developments

The updated version from 2007 (see above) is the most recognised guidance document when protecting new buildings from carbon dioxide and methane. The main updates are:

- Clearer guidance on the interpretation of gas monitoring data and assignment of gas screening values
- Defined gas membrane performance requirements as per table 7
- A methane permeability of less than 40 ml/m2/d/atm for a gas membrane to ISO 15105-1
- Harmonised physical performance standards and declared test units for gas membranes
- Review and expanded guidance on protection measures scoring (old Table 3)

2016

NHBC Technical extra issue 20

The addendum to the 2007 NHBC guideline (see above) brought it up to date with the latest guidelines and regulations especially BS8485:2015. The traffic light system can still be used based on a typical house as defined "a house (up to three storeys) with <100m2 footprint and minimum 150mm depth clear ventilated void achieving sub-slab ventilation of one complete air exchange per day. If falling outside these parameters you are to default to BS8485:2015 and its requirements.

2018

BR 211 - Radon: Guidance on protective measures for new buildings

This document provides guidance for reducing the concentration of radon in a variety of developments ranging from new buildings, extensions, conversions, and refurbishment projects, to reduce the risk of exposure to radon by the occupants.

2019

BS8485 Updated

BS8485:2015+A1:2019 code of practice is updated. Visqueen achieves 3rd party certification for the Ultimate and Gas Barrier membranes

References
1. landfill-gas.com/1980s-landfill-gas-explosions.html
2. www.hse.gov.uk/comah/sragtech/caseabbeystead84.htm
3. www.bbc.co.uk/news/uk-scotland-edinburgh-east-fife-27905611
4. www.gov.uk/government/uploads/system/uploads/attachment_data/file/398745/Brownfield_Consultation_Paper.pdf

GAS PROTECTION AND VENTING SYSTEMS

VISQUEEN ULTIMATE GEOSEAL
Unique pre-applied membrane with excellent VOC & methane resistance suitable for both Tanking and DPM.

VISQUEEN ULTIMATE VOC BLOK
Excellent VOC & methane barrier resistance and flexible even at low temperatures.

VISQUEEN ULTIMATE HC BLOK
Excellent VOC (vapour) & methane barrier with exceptional flexibility with outstanding welding characteristic.

VISQUEEN LIQUID GAS MEMBRANE
A liquid gas membrane that dries to form a black rubber flexible membrane.

VISQUEEN GAS BARRIER
A BBA certified 5 layer reinforced gas membrane with aluminium foil, providing low permeability to methane.

VISQUEEN LOW PERMEABLITY GAS MEMBRANE
Carbon dioxide, radon and low levels of methane approved for use in NHBC Amber 1 application.

VISQUEEN RADON MEMBRANE
Unreinforced LDPE membrane with higher radon resistance accredited by BRE.

VISQUEEN GAS VENTING SYSTEM
Visqueen gas venting and draining systems.

DAMP PROOF COURSES

VISQUEEN ZEDEX CPT DAMP PROOF COURSE
BBA accredited; made from CPT and outperforms all other flexible DPCs.

VISQUEEN ZEDEX HIGH BOND
BBA accredited; superior performance in low loading applications; low permeability to methane, radon and carbon dioxide gases; can be torch bonded.

VISQUEEN ZEDEX HOUSING GRADE DPC
High performance DPC for domestic applications; contains no pitch or bitumen.

VISQUEEN POLYETHYLENE DPC
Economical polyethylene DPC; conforms to BS6515.

VISQUEEN GX DPC
A high performance DPC suitable for use on hydrocarbon contaminated sites.

VISQUEEN GR DPC
Integral aluminium foil provides resistance against gas ingress in the cavity.

STRUCTURAL WATERPROOFING

VISQUEEN SELF ADHESIVE DAMP PROOF MEMBRANE
BBA accredited cold applied modified bitumen tanking membrane.

VISQUEEN GR SAM
A tough HDPE polyethylene and bitumen self adhesive membrane designed to prevent the transmission of gas in tanking applications.

VISQUEEN TORCHON TANKING MEMBRANE
Robust waterproofing membrane for heavy duty tanking applications.

VISQUEEN PRE APPLIED MEMBRANE
A robust high performance HDPE geomembrane with textured surface to aid adhesion to cast concrete.

VISQUEEN PROTECT & DRAIN
Acts as a heavy duty draining membrane for damp proofing, gas proofing and tanking membranes.

VISQUEEN CAVITY DRAIN MEMBRANE SYSTEM
Effective mechanical drainage solutions for all below ground structures.

VISQUEEN ULTIMATE GEOSEAL
Unique pre-applied membrane with excellent VOC & methane resistance suitable for both Tanking and DPM.

VISQUEEN AXIOM SHIELD LAC
Easy to apply, high performance liquid damp proof membrane which dries to form a flexible membrane.

VISQUEEN AXIOM GUARD
A unique single component polyurethane liquid membrane giving a continuous full bond.

VISQUEEN AXIOM UNISEAL
Two part system specially formulated for waterproofing below ground structures both internally and externally.

VISQUEEN AXIOM GUARD PRIMER
Solvent free, one component, polyurethane based primer suitable for all substrates.

VISQUEEN AXIOM CRETESEAL
Low modulus structural concrete expansion joint sealant.

CPD Seminars and Training Academy

Visqueen's Continuing Professional Development (CPD) seminars are designed to provide current information on the latest building regulations and guidance affecting those within the construction sector. We understand the importance of adhering to all the latest regulations and that is why we continually review and update our CPD presentations to ensure that they comply with industry standards. With recent changes to BS8485:2015+A1:2019 in gas protection and BS8102 in waterproofing, to name but two, our new CPDs will cover everything you and your employees need to know to stay ahead of the game.

Presented by our highly qualified and experienced technical consultants, Visqueen's one hour interactive seminars provide key advice and support for architects, specifiers and anyone involved in new-build construction or refurbishment.

To arrange your free CPD seminar please complete our online form or call us on **0333 202 6800**

- Current regulations & guidance
- Specification advice
- Protective measures
- Installation techniques
- On site technical support services

CPD CERTIFIED Construction CPD Certification Service

Gas Protection CPD

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

CPD CERTIFIED Construction CPD Certification Service

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

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.

VAPOUR CONTROL LAYERS

VISQUEEN VAPOUR CHECK

A loose laid vapour control layer suitable for humidity levels less than 50% at 15°C: BS5250 Class 1 condition.

VISQUEEN VAPOUR BARRIER

A loose laid membrane suitable for humidity levels less than 60% at 20°C: BS5250 Classes 2 and 3 conditions.

VISQUEEN HP VAPOUR BARRIER

A loose laid membrane suitable for humidity greater than 60% at 20°C: BS5250 Classes 4 and 5 conditions.

VISQUEEN FB VAPOUR BARRIER

A self adhesive membrane suitable for humidity levels greater than 60% at 20°C: BS5250 Classes 4 and 5 conditions, requiring a fully bonded vapour control layer.

DAMP PROOF MEMBRANES

VISQUEEN ECOMEMBRANE 100% RECYCLED

A 100% UK recycled LDPE membrane suitable for use as a Type 'A' damp proof membrane.

VISQUEEN DPM TO PIFA STANDARD

The UK's leading DPM, produced in blue and black to PIFA standard 6/83A:1995.

VISQUEEN HIGH PERFORMACE DPM

Premium grade Damp Proof Membrane suitable for use on commercial and domestic applications.

STORMWATER PROTECTION

VISQUEEN URBAN DRAINAGE GEOMEMBRANE

A comprehensive system for use with stormwater management attenuation systems.

VISQUEEN HIGH PERFORMANCE UDG

A comprehensive system for use with stormwater management attenuation systems in high water table sites.

VISQUEEN ULTIMATE UDG

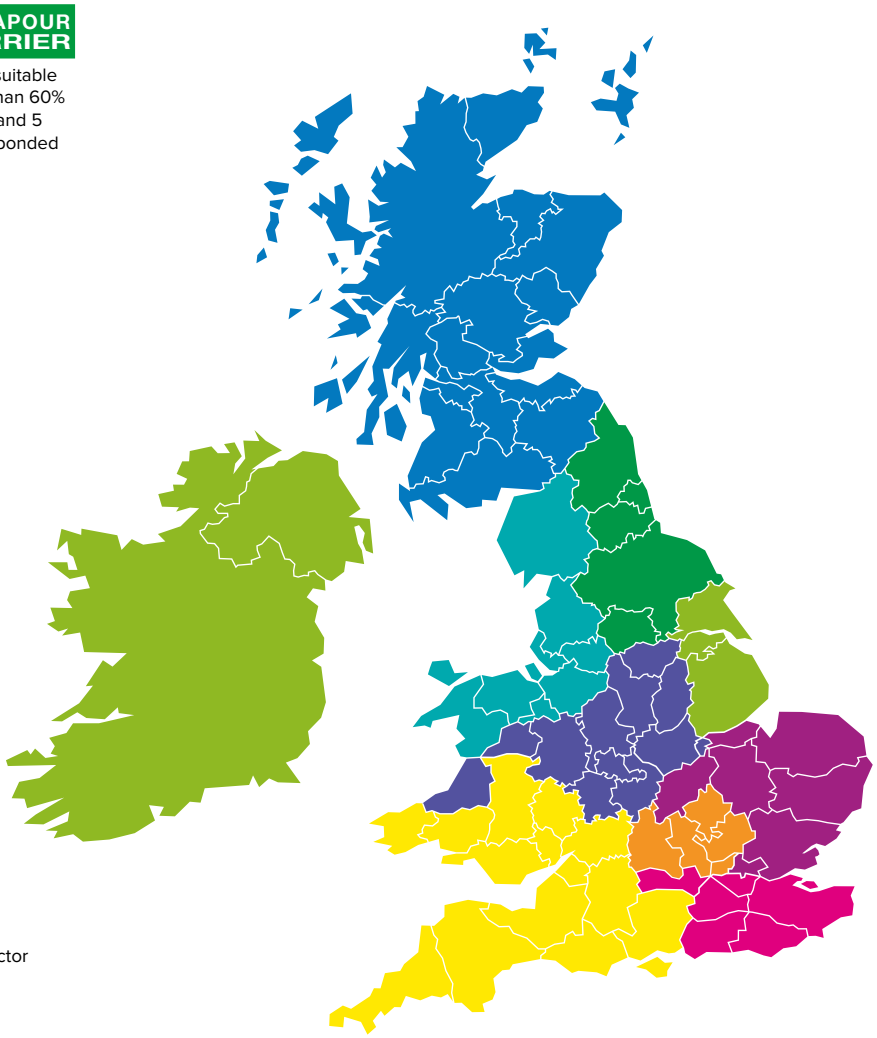
A comprehensive system for use with stormwater management attenuation systems on contaminated land.

SPECIAL PROJECTS

VISQUEEN SPECIAL PROJECTS

VISQUEEN SPECIAL PROJECTS WATERPROOF DESIGN SERVICES

VISQUEEN SPECIAL PROJECTS GAS DESIGN SERVICES



Technical Sales

James Walsh
E jameswalsh@visqueen.com

Cameron Vauvelle-Don
E cameron@visqueen.com

Steve D'Arcy
E steved'arcy@visqueen.com

Gerry McGhee
E tsmgerry@visqueen.com

Toni Record
E tonirecord@visqueen.com

Paul Vincent
E paulvincent@visqueen.com

David Higgs
E davidhiggs@visqueen.com

Carl Orr
E carlorr@visqueen.com

Ian Thick
E ian.thick@visqueen.com

General Manager & Sales Director
Phil Bull
PhilBull@visqueen.com

National Sales Manager
Laura Guy
LauraGuy@visqueen.com

National Contractor Manager
Laura Beveridge
L.Beveridge@visqueen.com

National Specification Manager
Tony Goode
AnthonyGoode@visqueen.com

National Account Manager
Jen Stainton
jenstainton@visqueen.com

Business Development Manager – South
Tia Rehman
Tia@visqueen.com

Technical Product Manager
Cameron Yates
CameronYates@visqueen.com

National Technical & Development Manager
Nik Ullfors
NiklasUllfors@visqueen.com

VISQUEEN

Part of RPC bpi group

Heanor Gate, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800
enquiries@visqueen.com
www.visqueen.com
Visqueen Construction
@visqueenbp
Visqueen Construction