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GROUND GAS PROTECTION

Visqueen's Gas Membranes and Venting Systems allow construction to build on gas contaminated land such as disused petrol stations and post industrial sites. This ensures reclamation of land and eases political pressure of building on green fields.



WHAT GASES AND CONTAMINANTS ARE INVOLVED?

HYDROCARBONS

Hydrocarbons can be highly toxic and are derivative of the petrol chemical industry. Hydrocarbons are prevalent in areas such as disused petrol stations and post industrial sites, most hydrocarbons are carcinogenic.

METHANE

An odourless flammable gas that is explosive when released to the atmosphere at levels as low as 5% and exposed to a source of ignition. Methane is formed wherever there is below-ground degradation of organic substances e.g. landfill sites, sewage treatment areas, mining localities and peat bogs.

CARBON DIOXIDE

Carbon Dioxide is a colourless gas that in high concentrations can result in asphyxiation. The gas is formed by the oxidation of carbon compounds such as in landfill sites. When carbon dioxide levels reach concentrations of 3%, symptoms of headaches and shortness of breath will occur, becoming severe at 5%, with loss of consciousness at 10%. It's fatal at 22%.

RADON

Radon is a naturally occurring radioactive gas that is odourless and colourless. It is formed where uranium and radium are present. It migrates into any building that is built over the source. If it accumulates in a building at unacceptably high concentrations it will increase the risk of lung cancer.

PROTECTION OF BUILDINGS ON GAS CONTAMINATED LAND

IDENTIFYING THE RISK

When identifying risk from contaminated land up-to-date published guidance relating to the risk assessment should be used. Detailed historical mapping is the principal starting point for any site specific environmental assessment. The historical maps provide a powerful insight into past activity and help identify any historically contaminated land and previous uses of the land e.g. disused filling station. The Health Protection Agency (HPA) produce a map which shows the estimated percentage of homes above the radon Action Level, a level set by the Health Protection Agency at 200 becquerels per cubic metre.

The provision of gas protection measures should include measurement of borehole flow rates. This will help identify ground conditions, potential source(s) of gas, migration pathways and general potential. The level of risk may then be assessed and an appropriate gas protection system designed. Account should be taken of the sensitivity of the proposed end use.

REGULATION AND GUIDANCE

The assessment of risk from contaminated ground is a requirement of Planning Policy Statement PPS23 and Building Regulations Approved Document C. The assessment needs to be carried out to support any proposed development whether or not the development is near a recognised gas emission source i.e. landfill. If the development is at risk from contamination then the developer's consultant must submit a risk assessment to the local planning authority. The risk assessment must include information about the source(s) of contamination, the key properties of the contamination and the proposed remediation strategies to deal with any contamination. Where a proposed development is within 250m of a landfill the Environment Agency Policy (2003c) on development within 250m landfill should be used. The policy states the proposals should include detailed risk management actions to deal with any risks. Failing to deal with the risks the LPA will refuse the application.

USEFUL REFERENCES

The Building Regulations Approved Document Part C 2004, CP 102: 1973 Code of practice for the protection of buildings against water from the ground.

BS 8102: 1990 Code of practice for the protection of structures against water from the ground.

BS 8215: 1991 Code of practice for the design and installation of damp proof courses in masonry construction.

BS 8000: Part 4:1989 Workmanship on Building Sites. Code of practice for waterproofing.

Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land".

CIRIA C665 Ground Gas Handbook 2009.

Building Research Establishment BRE 211 "Radon Guidance on Protective Measures".

CIRIA C682 The VOCs Handbook 2009.

THE COMPLETE SOLUTION – VISQUEEN’S GAS PROTECTION SYSTEM

PROTECTION OF BUILDINGS AND OCCUPIERS

The main methods of protecting buildings from gas ingress are the provision of a robust floor slab and gas resistant barrier across the floor slab combined with an underfloor passive venting system.

At Visqueen we offer a comprehensive range of gas barriers (a traditional damp proof membrane is NOT suitable for protection on gas contaminated land) and ventilation systems to protect against all the aforementioned gases and contaminants. When installed in accordance with the relevant codes of practice, Visqueen’s Gas Systems are essential components to provide a protective barrier to gas ingress. Also, all Visqueen gas barrier products act as damp proof membranes.

GAS BARRIERS

The impermeable gas membrane provides a barrier to gas ingress and should be continuous beneath the full ground floor plan of the building. Visqueen offers full protection against the ingress of harmful methane, radon, CO₂ and hydrocarbon gases. Used in conjunction with Visqueen Gas Resistant DPCs, Gas Barrier Jointing Systems and Gas Resistant Self Adhesive Membrane, these systems offer superior protection.

To ease specification issues, Visqueen has produced a product selector that responds to the various and complex design challenges on gas contaminated lands.

GAS PRODUCT SELECTOR

Visqueen Product	Gases involved				Page Ref
	Radon	CO ₂	Methane	Hydrocarbons	
GX Geomembrane	•	•	•	•	36
Gas Barrier	•	•	•		38
Low Permeable Gas Membrane	•	•	•*		42
CO₂	•	•			44
Radon	•				46

*Low Levels



Cancer myths: Only smokers get lung cancer

The radioactive gas radon is a hazard in many homes and workplaces. According to a recent report from the Health and Safety Executive inhaling radon is the second largest cause of lung cancer in

the UK, resulting in up to 2,000 fatal cancers per year. However, radon hazards are simple and inexpensive to measure and relatively easy to address if levels are high.

GAS VENTILATION SYSTEM

Visqueen Gas Ventilation System, when installed with a Visqueen Gas Barrier Membrane, helps dilute and disperse concentrations of gases emitting from the ground to acceptable levels. Visqueen Gas Venting Systems are supplied as fully integrated gas dispersal systems and include all necessary pipework, ducting and a variety of air inlets/outlets to suit individual requirements.

Our CAD department and technical advisors will assist in the full design of a gas ventilation system.



TECHNICAL SUPPORT

Visqueen's nationwide Technical Support Team offer unrivalled technical knowledge, experience and integrity. The Technical Support Managers (TSM) identify appropriate gas protection measures with architects and specifiers and offer advice at every step of the project. Uniquely, Visqueen's TSMs will undertake regular site visits to ensure installation is carried out in accordance with our recommendations concluding with a "Visqueen Gas Installation Checklist", which is signed by our trained technical personnel.



GAS PROTECTION SYSTEMS

VISQUEEN HYDROCARBON PROTECTION SYSTEM



- **LOW PERMEABILITY TO HYDROCARBON SUBSTANCES AND VAPOURS.**
- **HIGH QUALITY SINGLE LAYER HDPE.**
- **EXCELLENT PUNCTURE AND TEAR RESISTANCE.**
- **COMPLIES WITH CURRENT CODES OF PRACTICE.**
- **ALSO ACTS AS A DPM.**

DESCRIPTION

Visqueen GX Geomembrane is a high quality single layer HDPE membrane and is suitable for use as a barrier membrane on brownfield sites that require protection from dangerous contaminants such as hydrocarbons and methane. Due to the membrane's high puncture and impact resistance the Visqueen GX Geomembrane generally requires no protective screed or boarding when laying reinforced concrete above it. The Visqueen GX is also suitable as a high performance damp proof membrane.

APPLICATION

Visqueen GX Geomembrane offers a safe solution for the protection of buildings and occupiers against all levels of hydrocarbons, methane, carbon dioxide and radon ingress. Typically these are sites previously used as petrol stations, coalfields, landfill sites or are contaminated industrial sites.

TECHNICAL SUPPORT

Due to the wide variety of hydrocarbon contaminants found, we strongly recommend the use of the Visqueen Building Products Technical Support Team at an early design stage so that the most appropriate detailing and material specifications are adopted. A full technical datasheet is available online www.visqueenbuilding.co.uk/gas

INSTALLATION GUIDELINES

Visqueen GX and ancillary components must be installed in accordance with the recommendations of Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land" and CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHBC guidelines, Chartered Institute of Environmental Health Ground Gas Handbook and CIRIA C682 the VOC Handbook.

The Visqueen GX system 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 GX Pre Applied Membrane is used. To avoid linear expansion due to temperature change the membrane should NOT be taken through any masonry wall. In order to provide a continuous barrier across the cavity Visqueen GX DPC should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

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.

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

VENTILATION

When medium to high levels of ground gases are present 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 Ventilation System. See page 50 for further details.



REQUIRED COMPONENTS
AVAILABLE AS A DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



VISQUEEN GX JOINTING SYSTEM

P53 VISQUEEN GEOCOMPOSITE VENTING SYSTEM

P20 VISQUEEN GX DPC

SPECIFICATION SUPPORT

THE FOLLOWING ITEMS ARE AVAILABLE
TO VIEW ONLINE OR TO DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



TECHNICAL DATASHEETS



TYPICAL INSTALLATION CAD DETAILS



HEALTH & SAFETY DATA



MANUFACTURED
IN THE UK



DIMENSIONS

GX Geomembrane	1.0mm x 2.95m x 30m (88.50m ²) Standard Roll
GX Geomembrane	1.5mm x 2.95m x 25m (73.75m ²) Standard Roll
GX Jointing System	Two part jointing system
GX Geocomposite Venting System	25mm & 50mm venting mats
Preformed Top Hat Units	For sealing around service pipe penetrations
GX DPC	645mm / 970mm x 30m Roll A flexible reinforced DPC designed to prevent the transmission of hydrocarbon gases through the cavity
Preformed DPC Internal & External Corner Units	To form an effective seal at corners

TECHNICAL DATA

	1mm	1.5mm
Density (ASTM D1505)	941kg/m ³ +/- 1%	941kg/m ³ +/- 1%
Thickness (BS2782-630A)	+/- 5%	+/- 5%
Melt Flow Index (ASTM D1238)	<0.5gm/10 minutes	<0.5gm/ 10 minutes
Unaged Tensile (MPa)	31.2	29.3
Unaged Elongation (%)	860	845
Unaged Instrument Impact(N)	2220.11	3357.5
Tear Strength (N/mm)	156.8/145.6	149.1/156.5
Petrol Permeability (g/m ² /hr)	7.0	3.8
Diesel Permeability (g/m ² /hr)	14.8	1.7
Methane Permeability (cc/m ² /hr)	3.2	1.95



IMPORTANT

For information on Building
Regulations on gas contaminated
land please see P32.

GAS PROTECTION SYSTEMS

VISQUEEN GAS BARRIER



- **LOW PERMEABILITY TO METHANE, RADON AND CARBON DIOXIDE.**
- **HIGH QUALITY MULTI-LAYER REINFORCED LDPE MEMBRANE WITH ALUMINIUM CORE WITH HIGH LEVELS OF TEAR AND IMPACT RESISTANCE.**
- **HIGH RESISTANCE TO PUNCTURE.**
- **COMPLIES WITH RELEVANT CODES OF PRACTICE SUCH AS BRE AND CIRIA.**
- **ALSO ACTS AS A DAMP PROOF MEMBRANE.**



DESCRIPTION

The Building Regulations require that proper precautions be taken to prevent danger to health and safety when building on contaminated land. Visqueen Gas Barrier offers a safe solution for the protection of buildings against methane, radon and carbon dioxide, when installed in accordance with the relevant codes of practice such as BRE, CIRIA and the Chartered Institute of Environmental Health Ground Gas Handbook. Visqueen Gas Barrier is a multi-layer reinforced polyethylene membrane with an integral aluminium foil. 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.

MULTI-LAYER PROTECTION

Visqueen Gas Barrier utilises advanced multi-layer lamination process to create an impenetrable and lasting protection whilst retaining flexibility for easy installation. A 0.4mm membrane comprising of five precision co-extruded film layers, it is made from high quality virgin LDPE laminating films, as thickness tolerance is critical for the heat bonding process. The Visqueen Gas Barrier provides a one piece barrier for safety, security, flexibility and durability.

APPLICATION

Visqueen Gas Barrier offers a safe solution for the protection of buildings and occupiers against methane, carbon dioxide and radon ingress. Typically these are sites previously used as coalfields, landfill or are contaminated industrial sites.

INSTALLATION GUIDELINES

Visqueen Gas Barrier and ancillary components must be installed in accordance with the recommendations of Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land" and CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHBC guidelines, and the Chartered Institute of Environmental Health Ground Gas Handbook. The product is not intended for use where there is a risk of hydrostatic pressure. The membrane should be installed blue side up. The membrane should be installed on a compacted sand blinding layer or smooth concrete float finish. In areas where high levels of unsupported membrane occur it is recommended that Visqueen Pre Applied Membrane is used. To avoid slip or shear planes and high compressive loadings it is not recommended to take the membrane through the wall. In order to provide a continuous barrier across the cavity Visqueen Gas Resistant DPC

should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

Laps can be joined together by either using the Visqueen Gas Barrier jointing system or welded by our specialist on-site contractors.

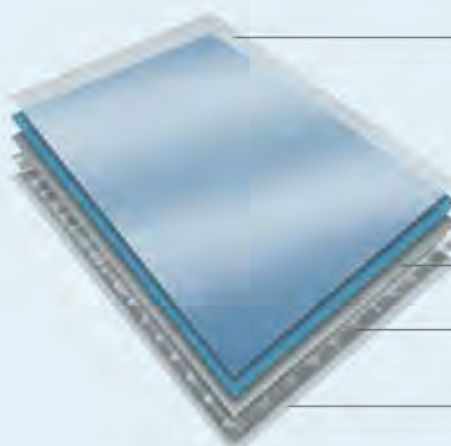
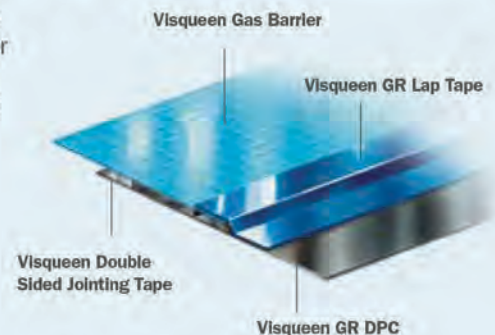
NB. In demanding site conditions use Visqueen GR Lap Tape as a high performance alternative to Visqueen Foil Jointing Tape.

IMPORTANT

For lapping, jointing and puncture repair, please see our Installation section P83

For more information on the Building Regulations on gas contaminated lands see P32

JOINTING DETAIL



LDPE

Tough polyethylene outer layer provides absolute protection against moisture ingress.

Visqueen Blue LDPE

Aluminium Foil

Central shield layer of aluminium provides impenetrable gas-reflecting properties.

Split Yarn HDPE

Adhesive split yarn woven matrix provides 3-D tear resistance.

LDPE

Protective polyethylene outer layer confers additional tensile and tear strength properties.





REQUIRED COMPONENTS
AVAILABLE AS A DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



VISQUEEN TOP HAT UNITS



VISQUEEN DETAILING STRIP



VISQUEEN GAS BARRIER JOINTING SYSTEM

P53 VISQUEEN GEOCOMPOSITE DRAINAGE & VENTING MAT

P88 VISQUEEN HEAVY DUTY PROTECTION BOARD

P21 VISQUEEN GAS RESISTANT (GR) DPC

P60 VISQUEEN GAS RESISTANT SELF ADHESIVE MEMBRANE

SPECIFICATION SUPPORT

THE FOLLOWING ITEMS ARE AVAILABLE
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VISQUEENBUILDING.CO.UK/GAS



TECHNICAL DATASHEETS



TYPICAL INSTALLATION CAD DETAILS



HEALTH & SAFETY DATA



AGRÉMENT CERTIFICATE



VENTILATION

VENTILATION

When medium to high levels of ground gases are present 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 Ventilation System. See page 50 for further details.

COVERING

Visqueen Gas Barrier should be covered by a protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from contacting the barrier. It is recommended that the barrier is covered with Visqueen Protection Boards or screed before positioning the reinforcement. When underfloor heating is being installed, it is recommended that the barrier is positioned between the blinded hardcore and insulation. This will protect the insulation from moisture and avoid any risk of overheating the membrane.



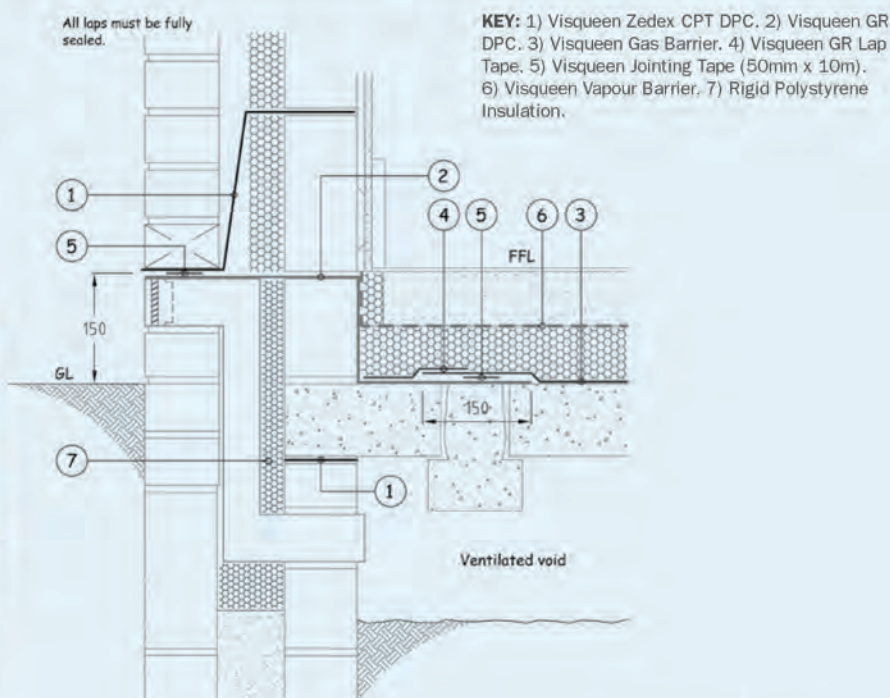
IMPORTANT

Visqueen Gas Barrier must be
installed blue side up.

TECHNICAL INFORMATION

	Width (m)	
	1.6m	2m
Nominal Weight (g/m ²)	350	350
Roll Length (m)	30/60	25/50
Overall Thickness (µm)	400	400
Water Vapour Permeability BS 3177 (g/m ² /day)	0.03	0.03
Methane Permeability (mls/m ² /day)	<0.001	<0.001
Tensile Strength BS 2782:Part 3:320A (N/mm ²)	43.7	43.7
Tear Strength BS 2782: 360B (N/mm)	216	216

Standard Detail: Suspended Slab - Typical Edge Detail (GB-01)



GAS PROTECTION SYSTEMS

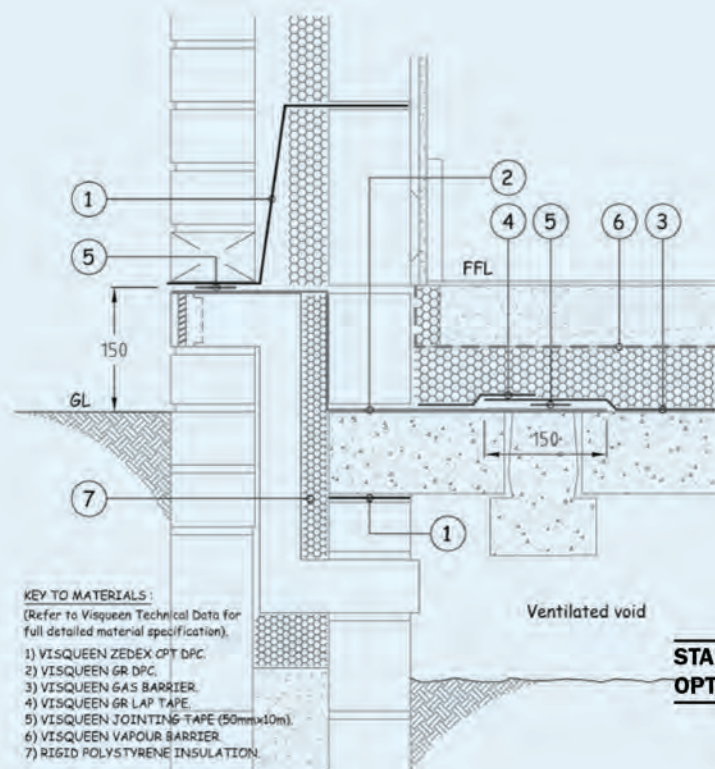
VISQUEEN GAS BARRIER



- LOW PERMEABILITY TO METHANE, RADON AND CARBON DIOXIDE.
- HIGH QUALITY MULTI-LAYER REINFORCED LDPE MEMBRANE WITH ALUMINIUM CORE WITH HIGH LEVELS OF TEAR AND IMPACT RESISTANCE.
- HIGH RESISTANCE TO PUNCTURE.
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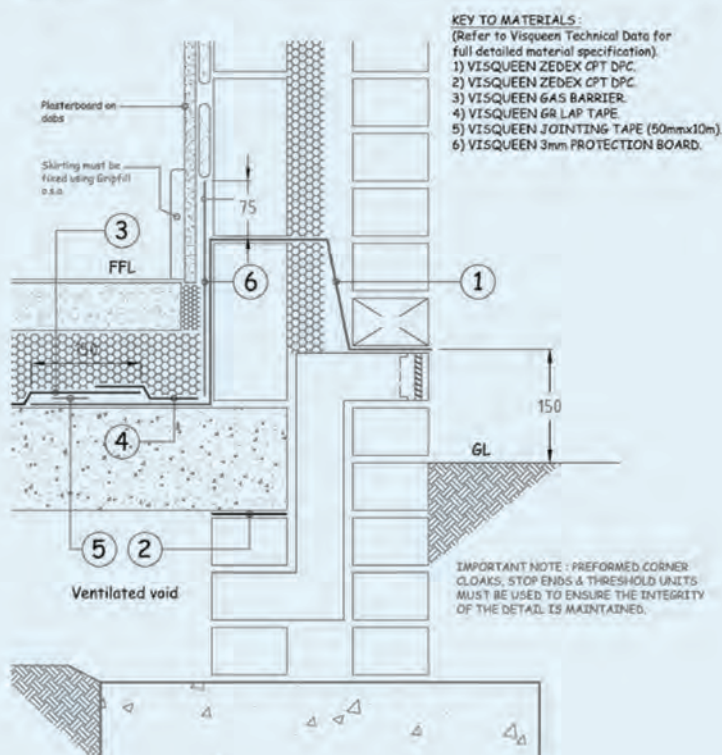


STANDARD DETAIL - SUSPENDED SLAB - TYPICAL EDGE DETAIL OPTION 2 (GB-02)

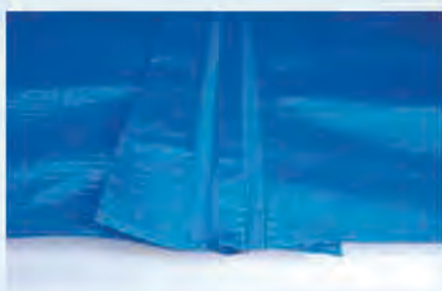


NB: DO NOT SCALE - USE FIGURED DIMENSIONS ONLY.

STANDARD DETAIL - SUSPENDED SLAB - TYPICAL EDGE DETAIL OPTION 3 (GB-02)



- **65% TIME SAVING OVER TRADITIONAL TAPE AND ROLL SEALING METHODS.**
- **FAST TRACK INSTALLATION ON SITE.**
- **REDUCED WASTAGE THROUGH OFF-SITE FABRICATION.**
- **VISQUEEN'S PRE-WELDING TECHNOLOGY ENSURES HIGH INTEGRITY TO GAS MEMBRANE JOINTS.**



Recent building techniques have seen a tendency towards the use of off-site fabrication in many sectors of the building process. It seems logical therefore, that Visqueen Building Products should, in recognising this trend, provide an economical and time saving solution to the needs of the modern developer who requires a proven gas barrier system.

With increasing numbers of housing and industrial developments taking place on gas contaminated sites, developers must ensure that a high integrity gas protection membrane is installed, yet continue to operate under the time related pressures of today's fast track building programmes.

Welding technology for joining membranes is well established but has previously only been available when specialist on-site contractors have been used. It is widely recognised that joining sheets of membranes on site is often the most vulnerable element in the installation of a gas protection system.

By working closely with the designer in early project stages, Visqueen can produce a complete gas protection package that is delivered direct to site when required.

The use of pre-welded sheets means that the designer can now have increased levels of confidence as all joints are constructed in factory conditions and have been rigorously tested for airtightness before reaching site.

Additionally, as there are fewer taped joints to be performed on site, the gas barrier installation is less affected by adverse weather conditions (to be effective, taped joints must be formed in dry conditions).

Visqueen Gas Barrier is pre-welded in the factory to the exact dimensions of the footprint to the building and can be dispatched with the correct quantities of ancillary components as required to form a high integrity gas barrier system.

Factory fabrication helps reduce wastage on site and Visqueen's factory welded joints ensure that a high integrity airtight barrier is always achieved. The reduced time for on-site jointing ensures that for each footprint the installation time is significantly reduced. Each footprint can be identified by a unique reference, thereby, ensuring that on-site ordering is straightforward.

TECHNICAL PROPERTIES - VISQUEEN PRE-WELD GAS BARRIER JOIN

Tensile Strength MOAT 27 1983 5.5.2	35.3 daN/50mm
Resistance to Water Pressure M.O.A.T 27 983 5.1.4	Pass, No leaks
Resistance to 6m head of water pressure	

GAS PROTECTION SYSTEMS

VISQUEEN LOW PERMEABILITY (LP) GAS MEMBRANE



- **LOW PERMEABILITY TO CARBON DIOXIDE RADON AND LOW LEVELS OF METHANE.**
- **HIGH QUALITY ROBUST CO-POLYMER THERMOPLASTIC MEMBRANE.**
- **HIGH RESISTANCE TO PUNCTURE.**
- **COMPLIES WITH RELEVANT CODES OF PRACTICE SUCH AS CURRENT BRE AND CIRIA DOCUMENTATION.**
- **ALSO ACTS AS A DAMP PROOF MEMBRANE.**



DESCRIPTION

The Building Regulations require that proper precautions be taken to prevent danger to health and safety when building on contaminated land. Visqueen Low Permeability Gas Membrane offers a safe solution for the protection of buildings against low levels of methane and carbon dioxide, when installed in accordance with the relevant codes of practice such as BRE, CIRIA and the Chartered Institute of Environmental Health Ground Gas Handbook. For more information on the Building Regulations on gas contaminated lands see P32. Visqueen Low Permeability Gas Membrane is a robust co-polymer thermoplastic membrane; for ease of identification on site the membrane is coloured yellow. The membrane is supplied in 4m x 12.5m roll and has a centre fold. It is flexible and is easy to install, and is also suitable for use as a damp proof membrane.

APPLICATION

Visqueen Low Permeability Gas Membrane offers a safe solution for the protection of buildings and occupiers against low levels of methane, carbon dioxide and radon ingress. Typically these are sites previously used as coalfields, landfill or are contaminated industrial sites.

INSTALLATION

Visqueen Low Permeability Gas Membrane and ancillary components must be installed in accordance with the recommendations of Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land", and CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHBC guidelines and the Chartered Institute of Environmental Health Ground Gas Handbook. The product is not intended for use where there is the risk of hydrostatic pressure.

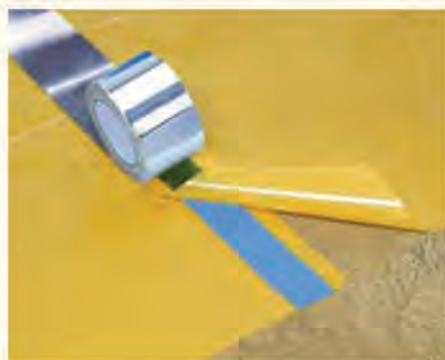
The membrane should be installed on a compacted sand blinding layer or smooth concrete float finish allowing adequate overlap for jointing between the sheets and avoiding bridging (i.e. areas of unsupported membrane). In areas where high levels of unsupported membrane occur it is recommended that Visqueen Pre Applied Membrane is used. To avoid slip or shear planes and high compressive loadings it is not recommended to take the membrane through the wall. In order to provide a continuous barrier across the cavity Visqueen Zedex CPT DPC should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

Laps can be joined together by either using the Visqueen Gas Barrier jointing system or welded by our specialist on-site contractors.

VENTILATION

BS8485 recommends ventilation layers on open voids may be required beneath the floor slab in order to dilute and disperse ground gases to the 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 Ventilation System. See page 50 for further details.

NB. In demanding site conditions use Visqueen GR Lap Tape as a high performance alternative to Visqueen Foil Jointing Tape.



IMPORTANT

For lapping, jointing and puncture repair, please see our Installation section P83.

**A full technical datasheet is available online
www.visqueenbuilding.co.uk/gas**



REQUIRED COMPONENTS
AVAILABLE AS A DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



VISQUEEN GAS BARRIER JOINTING SYSTEM



VISQUEEN DETAILING STRIP



VISQUEEN TOP HAT UNITS

P53 VISQUEEN GEOCOMPOSITE DRAINAGE & VENTING MAT

P88 VISQUEEN HEAVY DUTY PROTECTION BOARD

P8 VISQUEEN ZEDEX CPT DPC

P60 VISQUEEN GAS RESISTANT SELF ADHESIVE MEMBRANE

SPECIFICATION SUPPORT

THE FOLLOWING ITEMS ARE AVAILABLE
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TECHNICAL DATASHEETS



TYPICAL INSTALLATION CAD DETAILS



HEALTH & SAFETY DATA



COVERING

COVERING

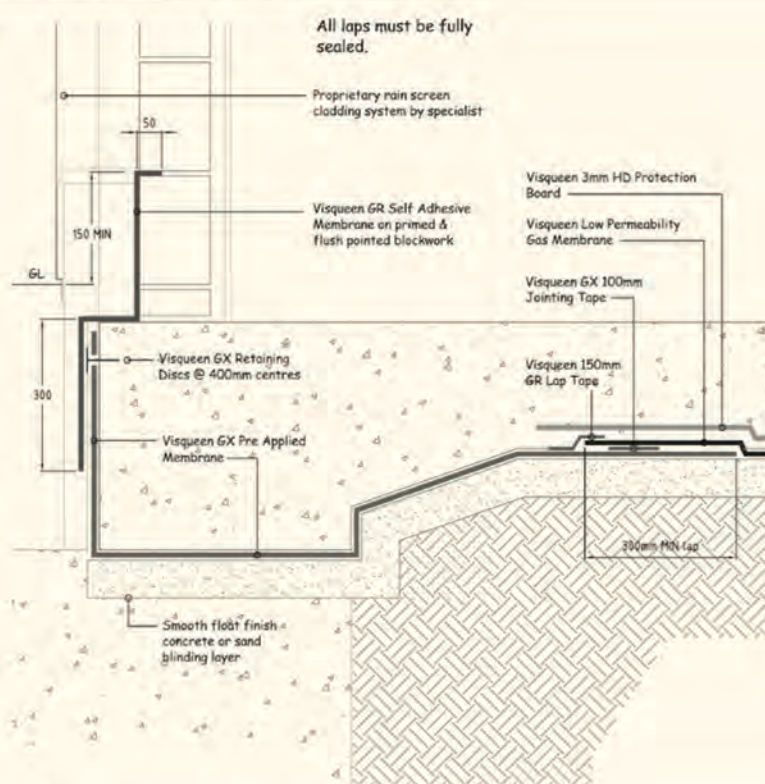
Visqueen Low Permeability Gas Membrane should be covered by a protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended.

When reinforced concrete is to be laid over the membrane, the wire reinforcements and spacers must be prevented from contacting the membrane. It is recommended that the membrane is covered with Visqueen Protection Boards or screed before positioning the reinforcement. When underfloor heating is being installed, it is recommended that the membrane is positioned between the blinded hardcore and insulation. This will protect the insulation from moisture and avoid any risk of overheating the membrane.

STORAGE AND HANDLING

Visqueen Low Permeability Gas Membrane is classified as non-hazardous when used in accordance with the relevant Code of Practice (CP 102:1973). The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The material is not recommended for uses where it will be exposed to long periods of outdoor weathering as exposure to ultraviolet light will embrittle the product. Weathering will not occur when the membrane is installed in accordance with CP 102:1973. Care should be taken to avoid accidental damage when handling the membrane on site. When the weather is cold all jointing tapes should be kept in a warm and dry place until needed. Installation is not recommended below 5°C.

TYPICAL SLAB EDGE HEAVY DUTY COMBI DETAIL / LP GAS MEMBRANE (SW-LPGM-28)



TECHNICAL DATA

Thickness	500 microns (2000 gauge)
Roll Dimensions	4m x 12.5m
Roll Colour	Yellow
Roll Weight	23kg
Angle Tear Strength (BS 2782-3: Method 360C)	MD:112N/mm CD:108N/mm
Tensile Strength (BS EN ISO 572-3)	MD: 26.9N/mm ² CD: 26.8N/mm ²
Elongation (BS EN ISO 572-3)	MD: 780% CD: 825%
Carbon Dioxide Gas Permeability (ISO 2782)	2.80 x 10 ⁻¹⁷ m ² /sec/Pa
Methane Gas Permeability (ISO 2782)	1.13 x 10 ⁻¹⁷ m ² /sec/Pa

GAS PROTECTION SYSTEMS

VISQUEEN CO₂ GAS MEMBRANE



- **LOW PERMEABILITY TO CARBON DIOXIDE AND RADON.**
- **HIGH QUALITY ROBUST CO-POLYMER THERMOPLASTIC MEMBRANE.**
- **HIGH RESISTANCE TO PUNCTURE.**
- **COMPLIES WITH RELEVANT CODES OF PRACTICE SUCH AS BRE AND CIRIA.**
- **ALSO ACTS AS A DAMP PROOF MEMBRANE.**



DESCRIPTION

The Building Regulations require that proper precautions be taken to prevent danger to health and safety when building on contaminated land. Visqueen CO₂ Gas Membrane offers a safe solution for the protection of buildings against carbon dioxide, when installed in accordance with the relevant codes of practice such as BRE, CIRIA and the Chartered Institute of Environmental Health Ground Gas Handbook. Visqueen CO₂ Gas Membrane is a robust co-polymer thermoplastic membrane; for ease of identification on site the membrane is coloured yellow. The barrier is flexible and is easy to install, and is also suitable for use as a damp proof membrane.

APPLICATION

Visqueen CO₂ Gas Membrane offers a safe solution for the protection of buildings and occupiers against carbon dioxide and radon ingress. Typically these are sites previously used as coalfields, landfill or are contaminated industrial sites.

INSTALLATION

Visqueen CO₂ Gas Membrane and ancillary components must be installed in accordance with the recommendations of Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land" and CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHBC guidelines and the Chartered Institute of Environmental Health Ground Gas Handbook. The product is not intended for use where there is the risk of hydrostatic pressure.

The membrane should be installed on a compacted sand blinding layer or smooth concrete float finish 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 Pre Applied Membrane is used. To avoid slip or shear planes and high compressive loadings it is not recommended to take the membrane through the wall. In order to provide a continuous barrier across the cavity Visqueen Zedex CPT DPC should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

If the membrane is punctured or perforated then a patch of material with identical thickness should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Double Sided Jointing Tape and sealed with Visqueen Foil Backed Jointing Tape. Alternatively a patch can be formed using Visqueen Detailing Strip and lapped at least 150mm beyond the limits of the puncture. External and internal corners should be round and reinforced with Visqueen Detailing Strip. Where this is not possible and the three dimensional shapes are complex it is recommended a preformed unit is used.

Laps can be joined together by either using the Visqueen Gas Barrier jointing system or welded by our specialist on-site contractors.

NB. In demanding site conditions use Visqueen GR Lap Tape as a high performance alternative to Visqueen Foil Jointing Tape.

VENTILATION

When medium to high levels of CO₂ gases are present or when the generation of CO₂ 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 Ventilation System. See page 50 for further details.

IMPORTANT

For more information on lapping, jointing and puncture repair, please see our Installation section P83.

**A full technical datasheet is available online
www.visqueenbuilding.co.uk/gas**





REQUIRED COMPONENTS
AVAILABLE AS A DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



VISQUEEN GAS BARRIER JOINTING SYSTEM



VISQUEEN DETAILING STRIP



VISQUEEN TOP HAT UNITS

P53 VISQUEEN GEOCOMPOSITE DRAINAGE & VENTING MAT

P88 VISQUEEN HEAVY DUTY PROTECTION BOARD

P8 VISQUEEN ZEDEX CPT DPC

P60 VISQUEEN GAS RESISTANT SELF ADHESIVE MEMBRANE

SPECIFICATION SUPPORT

THE FOLLOWING ITEMS ARE AVAILABLE
TO VIEW ONLINE OR TO DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



TECHNICAL DATASHEETS



TYPICAL INSTALLATION CAD DETAILS



HEALTH & SAFETY DATA



COVERING

COVERING

Visqueen CO₂ Gas Membrane should be covered by a protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended.

When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from contacting the barrier. It is recommended that the barrier is covered with Visqueen Protection Boards or screed before positioning the reinforcement. When underfloor heating is being installed, it is recommended that the barrier is positioned between the blinded hardcore and insulation. This will protect the insulation from moisture and avoid any risk of overheating the membrane.

STORAGE AND HANDLING

Visqueen CO₂ Gas Barrier is classified as non-hazardous when used in accordance with the relevant Code of Practice (CP 102:1973). The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The material is not recommended for uses where it will be exposed to long periods of outdoor weathering as exposure to ultraviolet light will embrittle the product. Weathering will not occur when the membrane is installed in accordance with CP 102:1973. Care should be taken to avoid accidental damage when handling the membrane on site. When the weather is cold all jointing tapes should be kept in a warm and dry place until needed. Installation is not recommended below 5°C.

TECHNICAL DATA

Nominal Thickness (µm)	500
Nominal Weight (g/m ²)	465
Roll Length (m)	12.5
Roll Width (m)	4
Carbon Dioxide Gas Permeability ISO 2782	2.80 x 10 ⁻¹⁷ m ² /sec/Pa

- **INDEPENDENTLY TESTED FOR RADON RESISTANCE.**
- **BRE CERTIFIED.**
- **HIGH RESISTANCE TO PUNCTURE.**
- **ALSO ACTS AS A DAMP PROOF MEMBRANE.**
- **COMPLIES WITH CIRIA C665.**



Certificate No.083/01



MANUFACTURED
IN THE UK

ASSESSING THE RISK FOR YOUR AREA

Because the level of risk differs across the country according to local geology, the risk depends on where your site is situated.

The main source of guidance on the risks and solutions is BRE Report BR 211.

It includes maps for determining the need for radon protection, as well as detailed information on construction solutions.

The maps are used as the basis for determining in general terms the required degree of radon protection ("basic" or "full") in your area. Essentially, "basic" protection means you need to lay a ground floor radon membrane and "full" protection means that, in addition, you need to make provision for underfloor depressurisation.

Your local authority Building Control Officer or a local Approved Inspector should also be able to help you determine the broad level of risk in your area but, like the maps, they can only give a broad indication. Ultimately, if you are in an area that is potentially at risk, there is no substitute for an assessment close to your actual site – you may be in a pocket where the geology is different from the region as a whole, allowing the required protection to be downgraded from "full" to "basic", or even making radon protection unnecessary.

DETERMINING THE RISK FOR YOUR SITE

If you are in an area where the maps indicate that no protection is required, there is no need to take further action. However, if the maps indicate the need for "full" protection, it is worth confirming this by requesting a detailed assessment from the British Geological Survey (BGS), which focuses more accurately on your location. This may show that only "basic" protection is necessary on your particular site.

CONSTRUCTION SOLUTIONS

Radon Protection

Once you have determined whether you need "basic" or "full" protection, you must check that your preferred ground floor construction gives you the right level of protection. The options are as follows:

Basic Radon Protection

For "basic" protection, you need to provide an airtight barrier covering the entire ground floor of the building, linked to the damp proof course using cavity trays which prevent radon moving through the wall cavity and into the building.

All junctions between the floor membrane and cavity trays should be sealed. You can achieve "basic" protection with both ground supported and suspended (ventilated) concrete ground floors by installing a radon-proof membrane system. With a suspended concrete slab, the space beneath the floor is available to ventilate radon safely away should "full" protection be required.

Full Radon Protection

For "full" protection, you not only need to provide a radon-proof floor membrane, but also an underfloor depressurisation system. Depressurisation can be achieved by natural or mechanical underfloor ventilation through the subfloor space, or from a radon sump if there is no underfloor space. If you prefer to use an in situ slab in contact with the ground, the slab should be supported on the inner leaf. The full system consists of;

- Visqueen Radon Jointing System, prevents radon ingress at joints,
- Visqueen Top Hat Units prevents radon ingress at pipe penetrations,
- Visqueen Radon Sumps, where subfloor depressurisation may be required.

IMPORTANT

For more information on the Building Regulations on gas contaminated lands see P32

A full technical datasheet
is available online
www.visqueenbuilding.co.uk/gas

Below: Visqueen's Radon System Components





REQUIRED COMPONENTS
AVAILABLE AS A DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



VISQUEEN RADON JOINTING SYSTEM



VISQUEEN TOP HAT UNITS

P49 VISQUEEN RADON SUMP

P60 VISQUEEN GAS RESISTANT SELF ADHESIVE DPM

P8 VISQUEEN ZEDEX CPT DPC

P14 VISQUEEN ZEDEX PREFORMED CAVITY TRAY UNITS

SPECIFICATION SUPPORT

THE FOLLOWING ITEMS ARE AVAILABLE
TO VIEW ONLINE OR TO DOWNLOAD FROM
VISQUEENBUILDING.CO.UK/GAS



TECHNICAL DATASHEETS



TYPICAL INSTALLATION CAD DETAILS



HEALTH & SAFETY DATA



BRE CERTIFICATE



DESCRIPTION

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.



Certificate No.083/01

Visqueen Radon Membrane also acts as a damp proof membrane, but is not intended for use where there is the risk of hydrostatic pressure. It is approved for use in Ireland.

Visqueen Radon Membrane must be installed in accordance with BRE Certificate No. 083/01.

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.

Visqueen Radon Membrane can be used in most common floor constructions. 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.

TECHNICAL DATA

DIMENSIONAL DETAILS

Thickness	300µm
Width	4m
Length	25m
Colour	Red
Roll Weight	27.6kg

TECHNICAL PERFORMANCE

Elongation at Break (BS 2782:3 method 320A)	871%
Tear Resistance (MOAT 27: 1983 5.4.1)	118N
Water Vapour Transmission Rate (BS 3177)	0.33 g/m ² /day
Radon Permeability (k)	8 x 10 ⁻¹² m ² /s
Radon Transmittance (P)	26 x 10 ⁻⁹ m/s

VISQUEEN ZEDEX CPT DPC

Radon Permeability (k)	17 x 10 ⁻¹² m ² /s
Radon Transmittance (P)	22 x 10 ⁻⁹ m/s

VISQUEEN DPM DOUBLE SIDED JOINTING TAPE

Roll Length	10m
Roll Width	50mm

VISQUEEN GIRTH JOINTING TAPE

Roll Length	33m
Roll Width	100mm

VISQUEEN HIGH PERFORMANCE RADON MEMBRANE:

Exclusively for use in Ireland Visqueen has developed a High Performance Radon Membrane, which carries Irish Agrément Board Accreditation. For further details visit visqueenbuilding.co.uk/gas



Visqueen Radon Membrane is an un-reinforced polyethylene membrane, suitable for protecting buildings from the entry of radon gas and independently accredited by BRE Certification Ltd (Certificate Number 083/01).

Visqueen Radon Membrane also acts as a damp proof membrane, but is not intended for use where there is the risk of hydrostatic pressure.

Approved for use in Ireland.

INSTALLATION & JOINTING

INSTALLATION

Visqueen Radon Gas Membrane and ancillary components must be installed in accordance with the recommendations of Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land" and CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHBC guidelines and the Chartered Institute of Environmental Health Ground Gas Handbook. The product is not intended for use where there is the risk of hydrostatic pressure.

The membrane should be installed on a compacted sand blinding layer or smooth concrete float finish 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 Pre Applied Membrane is used. To avoid slip or shear planes and high compressive loadings it is not recommended to take the membrane through the wall. In order to provide a continuous barrier across the cavity Visqueen Zedex CPT DPC should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

Laps can be joined together by either using the Visqueen Gas Barrier Jointing System or welded by our specialist on-site contractors.

If the membrane is punctured or perforated then a patch of material with identical thickness should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Double Sided Jointing Tape and sealed with Visqueen Single Sided Girth Tape. Alternatively a patch can be formed using Visqueen Detailing Strip and lapped at least 150mm beyond the limits of the puncture. External and internal corners should be round and reinforced with Visqueen Detailing Strip. Where this is not possible and the three dimensional shapes are complex it is recommended a preformed unit is used.

COVERING

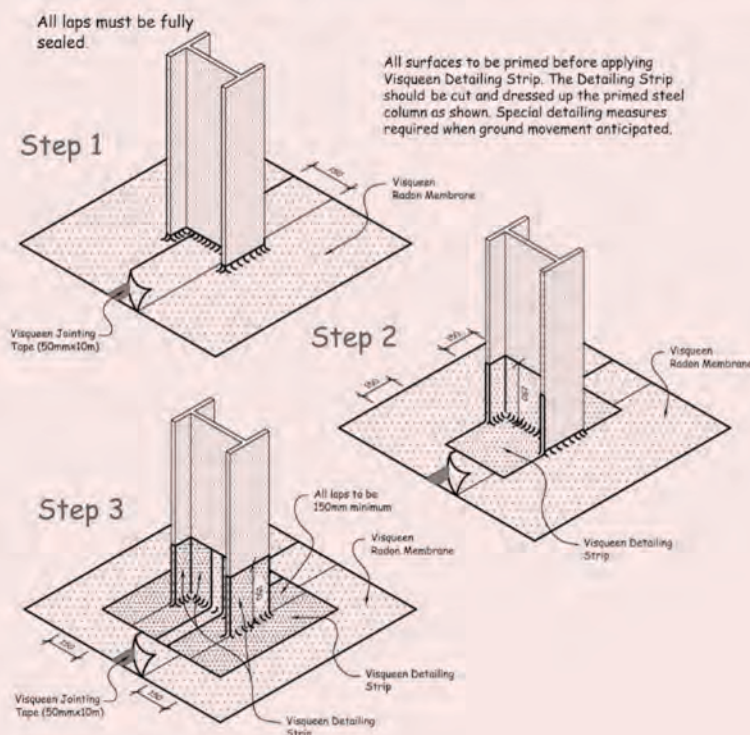
Visqueen Radon Membrane should be covered by a protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from contacting the barrier.

It is recommended that the barrier is covered with Visqueen Protection Boards or screed before positioning the reinforcement. When underfloor heating is being installed, it is recommended that the barrier is positioned between the blinded hardcore and insulation. This will protect the insulation from moisture and avoid any risk of overheating the membrane.

STORAGE AND HANDLING

Visqueen Radon Gas Barrier is classified as non-hazardous when used in accordance with the relevant Code of Practice (CP 102:1973). The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The material is not recommended for uses where it will be exposed to long periods of outdoor weathering as exposure to ultraviolet light will embrittle the product. Weathering will not occur when the membrane is installed in accordance with CP 102:1973. Care should be taken to avoid accidental damage when handling the membrane on site. When the weather is cold all jointing tapes should be kept in a warm and dry place until needed. Installation is not recommended below 5°C.

SEALING METHOD AROUND UNIVERSAL COLUMN PENETRATION (SLAB JUNCTIONS ONLY) (RAD - 19)



IMPORTANT

For lapping, jointing and puncture repair, please see our Installation section P83.

A full technical datasheet is available online
www.visqueenbuilding.co.uk/gas

HOW TO INSTALL A PROPRIETARY RADON SUMP AND EXHAUST PIPE AT THE EXTERNAL WALL



1
Excavate a pit for the sump, ensuring that, for maximum depressurisation, any fill used beneath the slab does not contain excessive fines.



2
Remove the blanking piece from the proprietary sump and connect a 110mm diameter PVC-U pipe to one outlet of the sump.



3
Extend the pipe horizontally so that it passes through the external wall. Ensure that all joints and couplings are airtight.



4
Backfill using a clean permeable material without excessive fines.



5
Terminate the pipe just above ground level, and cap it. It will then be ready for extension to form a vent if necessary.



6
Position the capped section of pipe so that it is about 100mm from the face of the external wall. This will allow space to accommodate a fan if necessary. Provide a plate on the wall to indicate the presence of the radon exhaust pipe.

VISQUEEN RADON SUMP

Colour	Various Colours: White, Black, or Green
Length	430mm
Width	430mm
Height	220mm
Material Composition	Polyethylene

SUMPS FOR USE WITH FULL PROTECTION

Where subfloor depressurisation is required, a Visqueen Radon Sump should be used. This is a prefabricated plastic sump, to which pipework is connected, with the joints fully sealed using the Visqueen Radon Membrane Jointing System.

A venting pipe should be connected to the sump, pass through the external wall and brought out above ground level about 100mm from the face of the external wall. The pipe is then capped until such time as a fan is installed.

IMPORTANT

A sump is only installed as a fallback measure and does not provide any radon removal until a fan is installed or, if the sump is located centrally, the pipe is connected to a passive stack system. Typically sumps are installed at one unit per dwelling or every 15m radius.

VISQUEEN GAS VENTING SYSTEM

BACKGROUND

The hazards of ground gases 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:

- Gaps around service pipes.
- Construction joints.
- Wall cavities.
- Cracks in walls and ground slabs.

Having entered buildings, ground gas may accumulate in confined spaces such as:

- Subfloor voids / voids created by settlement beneath floor slabs.
- Cupboards.
- Drains and soakaways.

METHODS OF PROTECTION

Current UK construction practice adopts the concept of multiple gas protection measures to form a gas control system, typically, protection measures increase in number and robustness as the potential risk increases.

The main methods of protecting buildings from gas ingress are the provision of a robust floor slab and gas resistant barrier across the floor slab which may be combined with an underfloor passive venting system.

In most buildings passive gas protective measures are constructed either at or just below the ground floor level. The protection consists of a number of individual elements, which combine to form an integrated gas protection system.

The most commonly used components in a passive gas protection system are:

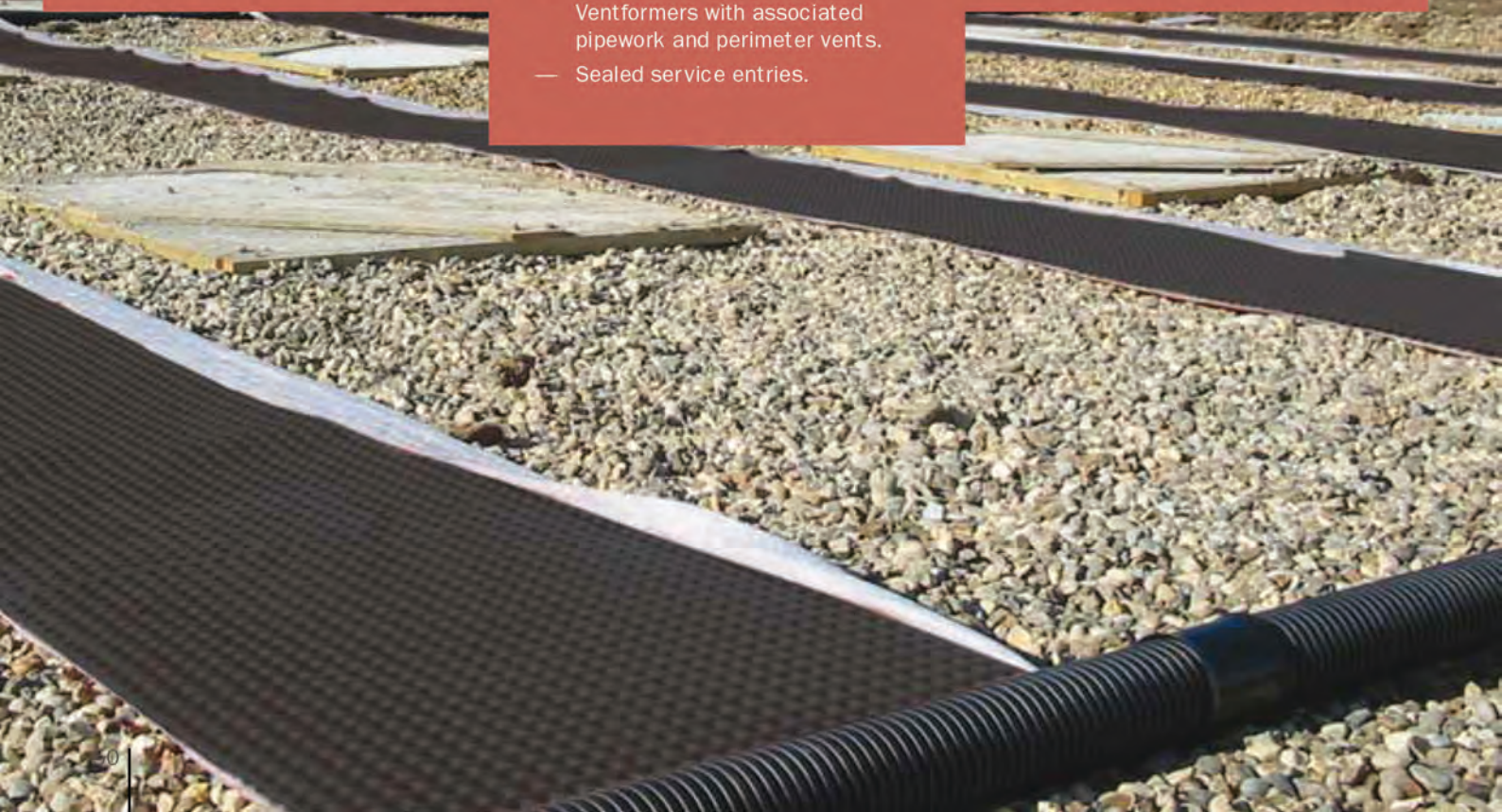
- Ground floor construction.
- Gas resistant membrane/Gas DPC.
- Open void or Geocomposites Ventformers with associated pipework and perimeter vents.
- Sealed service entries.

PASSIVE VENTING

In a passive venting system gas rises to the underside of the building and is diluted to safe concentrations below the slab by the introduction of fresh air through predetermined inlets and outlets which typically provide 2000mm² per metre run of perimeter wall. The vents are placed on opposite sides of the building which allows sufficient air to enter the void below the building and the diluted gas is then released out to atmosphere at safe concentration.

The required air changes per hour to the underside of the building are calculated to ensure that the gas emanating from the ground is safely diluted.

Visqueen Geocomposite Venting Mats are available in both 25mm and 50mm thicknesses and both have been thoroughly tested as per the DETR Partners In Technology Research Report (Passive Venting of Soil Gases Beneath Buildings 1997).



Visqueen Geocomposite Venting Mats can be laid in a blanket under the entire floor area on more heavily gassing sites or alternatively can be laid in strips at predetermined centres to suit the gas regime on site.

It is however important to note that where Visqueen Geocomposite Venting Mat is laid in strips that a gas collection pipe running perpendicular to the vents must be provided. Furthermore it is important to recognise that the strips of venting mat alone will not be adequate in terms of providing the venting capacity required unless they are laid in a 150mm thick layer of coarse granular material e.g 4/20 that must extend under the entire footprint of the building.

Laying strips of geocomposite in MOT type 1 is a common mistake and both DETR Partners In Technology Research Report (Passive Venting of Soil Gases Beneath Buildings 1997) and Chartered Institute of Environmental Health "The local authority guide to ground gas" stipulate that it is not acceptable to lay perforated pipes or geocomposites venting strips in low permeability substrates.

Both documents also state that where venting mat or pipes are laid in strips they must be interleaved to avoid short circuiting.

On more heavily gassing sites it may be necessary to provide a full blanket of either Visqueen 25mm or 50mm Venting Mat in order to facilitate the required air flow under the building.

Table 28 of the DETR Partners In Technology Research Report (Passive Venting of Soil Gases Beneath Buildings 1997) gives performance data on the performance of venting mat on buildings up to 30m widths based on the characteristic situation of the site.

On wider buildings that fall outside of the scope of Table 28 of the DETR report, Visqueen can provide calculations to prove that the gas emanating from the ground will be kept below the required target concentrations for the site.

The introduction of high level vents with rotating cowls can further enhance the performance of the Visqueen Geocomposite Venting Mat which means that it can be used to safely dilute gases on problematic sites without the need for environmentally unfriendly electric fans.

The Chartered Institute of Environmental Health report "The local authority guide to ground gas" recommends that active systems that extract or positively pressurise subfloor voids should only be used when passive measures have been proven to be unsuitable.

At Visqueen Building Products we have a range of gas membranes and venting layers with accessories for selection and specification for different construction types and gas regimes.

The products and systems have been specifically developed to reduce the risk of harm to building occupants. Please contact our technical services department for further information.



GAS PROTECTION SYSTEMS SYSTEM DESIGN



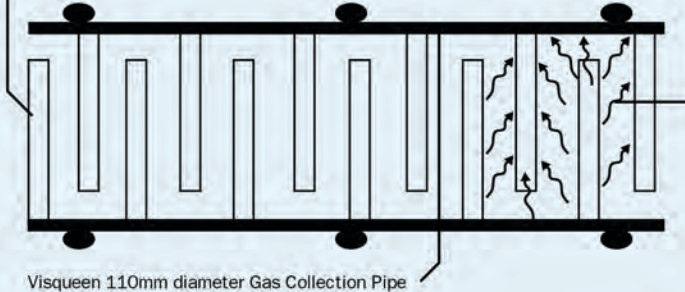
Visqueen Building Products offer an unparalleled nationwide site support service. Our experienced Regional Technical Managers provide design, specification and installation advice at every step of the project.

After receiving the site investigation data which includes bore hole flow rates and gas concentrations, we can make site specific recommendations.

Please see below some examples of our designs which are also available at www.visqueenbuilding.co.uk

Interleaved Strips of Visqueen Gas Venting Mat stop short of the collector pipe on opposite sides of the building.

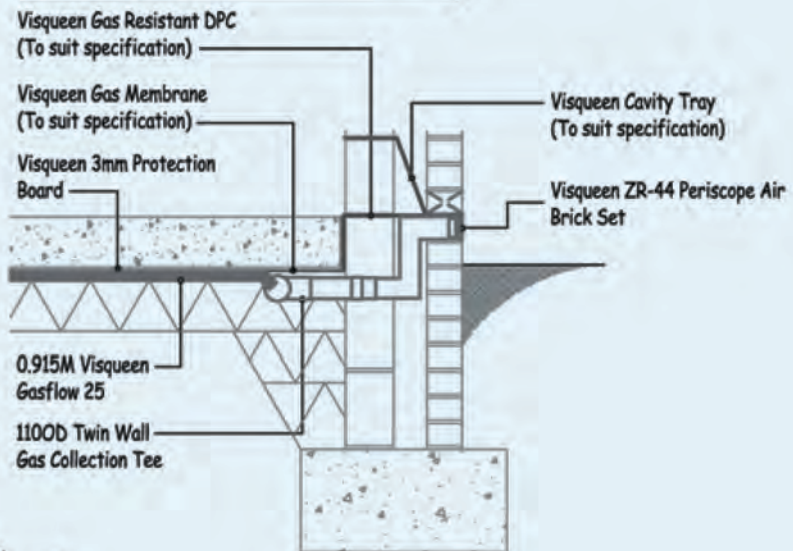
4/20 Gravel Blanket allows air/gas to migrate into Visqueen Venting Mat. Substrates such as Type1 trap gas and stop it reaching the geocomposite strips.



ENGINEERS GROUND FLOOR PLAN



TYPICAL GAS PROTECTION EDGE DETAILS



0.915M VISQUEEN
GASFLOW 25

VISQUEEN ZR-44 PERISCOPE
AIR BRICK SET OR VISQUEEN
GROUND VENT BOX

GAS PROTECTION SYSTEMS

VISQUEEN GEOCOMPOSITE DRAINAGE AND VENTING MAT



- **RAPID INSTALLATION IN BOTH DRAINAGE AND VENTING APPLICATIONS.**
- **HIGH FLOW CAPACITY TO ALLEVIATE HYDROSTATIC PRESSURE ON BELOW GROUND STRUCTURES.**
- **SERVES AS PROTECTION TO EXTERNALLY APPLIED TANKING OR GAS PROTECTION MEMBRANES.**
- **CREATES A DEPRESSURISATION ZONE FOR COLLECTION OF GROUND GASES.**
- **COST EFFECTIVE COMPARED TO TRADITIONAL BELOW SLAB PERFORATED PIPEWORK AND FILL.**



DESCRIPTION

Visqueen Geocomposite Drainage and Venting Mat is a UK manufactured preformed drainage and venting layer supplied in roll form. It comprises a cusped HDPE (High Density Polyethylene) core bonded to a non-woven polypropylene geotextile filter membrane. Visqueen Geocomposite Drainage and Venting Mat is 25mm thick and supplied in rolls 985mm x 50m.

APPLICATION

When laid the product forms a void to collect and transmit water and/or gas into adjacent drainage outlets or collector pipes. Typical applications include drainage for externally applied tanking, drainage behind retaining walls, gas venting below ground bearing slabs, etc. The product can be applied horizontally or vertically.

INSTALLATION

Visqueen Geocomposite Drainage and Venting Mat is designed to be installed with the geotextile filter side of the product facing the direction of the water or gas flow. Rolls can be cut to length with a sharp knife.

In drainage applications, the product is butted together to create a blanket. In venting applications, the product can be laid as single widths beneath a ground bearing slab or raft foundation to create a strip effect, or butted together to create a blanket. When laying in strip format, careful consideration should be given to the slab layout and any available data regarding gas concentration and flow rate. Refer to Visqueen Technical Support for system design advice.

When laid as strips, the ends of the Geocomposite Mat are inserted into Visqueen Tee Manifold Connectors which are commonly joined to Visqueen Periscope Vents via Visqueen Periscope Vent Adapters, thereby allowing the collected gases to exhaust to external air. Other exhaust systems e.g. ground vent boxes, venting bollards, etc are also available.

When installing the product over vertically applied tanking membranes or gas protection membranes, it also serves as protection against backfill. The Geocomposite Mat can be bonded to the membrane with Visqueen Double Sided Jointing Tape.

JOINTING

Where a blanket is required, unroll the mat into position. The next roll should be placed in a similar way to the first so the dimpled cores butt together. The geotextile filter membrane extends beyond the width of the dimpled HDPE core at one side; this creates an overlap flap. Continue laying further rolls in a similar manner to create the blanket.

PRECAUTIONS

Before backfilling or gas membrane application, inspect the installation of the product to ensure that gaps, open ends or sides where soil, aggregate, etc can enter the core are wrapped with geotextile filter membrane and secured with Visqueen DPM Girth Lap Tape.



ALSO CONSIDER...

VISQUEEN HIGH-FLOW GEOCOMPOSITE VENTFORMER 50mm

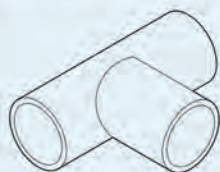
For more information on this product please visit:
www.visqueenbuilding.co.uk/gas

TECHNICAL DATA

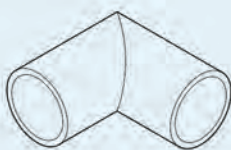
Mat Dimensions	25mm thick, 985mm x 50m
Roll Weight	74kg
Roll Diameter	1.3m
Geotextile Water Flow Rate (BS EN ISO 11058)	120 l/m ² /s
Compressive Strength	180 kN/m ²
Maximum In-Plane Water Flow Capacity (EN ISO 12958)	20 l/s per metre width
Shear Strength (EN ISO 13426-2)	1kN
Chemical Resistance	Highly resistant

GAS PROTECTION SYSTEMS

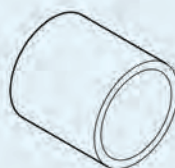
VISQUEEN'S GAS DISPERSAL SYSTEM & GAS FLOW FITTINGS



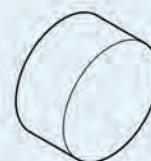
VT001 'T' Fitting ♦ ●
I.D. 100mm, length 87mm,
to fit VT005, VT006 & VT007
(no coupling required).



VT002 90° Bend ♦ ●
I.D. 100mm, length 80mm,
to fit VT005, VT006 & VT007
(no coupling required).



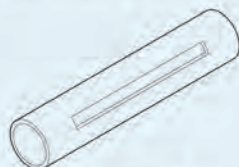
VT003 Coupling ♦
To connect VT005, VT006
or VT007 pipework.



VT004 End Cap ○
To suit VT005, VT006
and VT007.



VT005 Solid Carrier Pipe ●
I.D. 100mm, standard
length 6m.



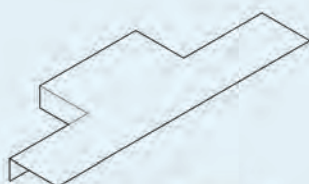
**VT006 Slotted
Carrier Pipe** ●
I.D. 100mm, standard
length 1.5m, standard slot
30mm (50mm slot also
available).



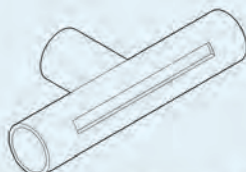
**VT007 Slitted
Carrier Pipe** ●
I.D. 100mm, length 6m,
standard slit 30mm full
length (10, 20 or 50mm
slit also available).



VT008 Gas Vent Pipe ●
53mm I.D pipe, length 6m
(flexible twin wall).



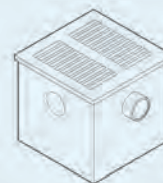
VT010 Gas Vent Outlet ○
VT009/25 (Width 915mm,
connector length 350mm)
to fit Gasflow 25 and VT015
or VT017.



VT011 Gas Vent Outlet ●
Width 990mm, connector
length 150mm to fit VT006
100mm I.D pipe.



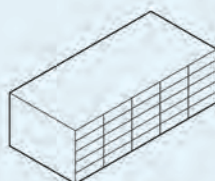
VT012 Gas Vent Outlet ○
VT011/25 (Width 915mm,
connector length 190mm)
to fit Gasflow 25 and VT006
100mm I.D pipe.



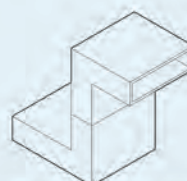
Visqueen Pro Gas Vent Box ○
To suit VT006 (standard
stainless steel slotted
lid, optional plastic lid)
412x412x400mm (open
area 65,000mm²).



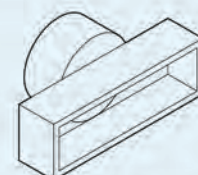
VT023A Gas Vent Bollard - Stainless Steel ○
VT023B Gas Vent Bollard - Powder Coated Steel
VT023c Gas Vent Bollard - Plastic
O/D 110mm (3.5mm wall).Length
800mm, black, open area 25,000mm².



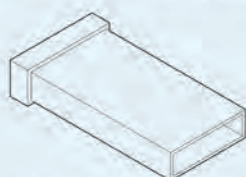
VT024A Air Brick - Black
VT024B Air Brick - Terracotta
VT024C Air Brick - Anthracite
Standard size 70mm x 215mm



**VT014 Adjustable
Periscope Vent** ○
The adjustment ranges
between 3 and 4 brick
courses. May be sealed with
tape. To suit VT011, VT014,
VT016 and VT017.



**VT013 Vent Pipe
Adaptor** ○
Will allow standard I.D.
100mm pipe (VT005)
to be connected to
VT015.



VT015 Extension Sleeve ○
Will increase the adjustment
of VT015 to 6 brick courses.
May be sealed with tape.
Standard length 550mm.
To fit VT015.



**VT009 Flexible
Connector Pipe** ●
I.D. 100mm, standard
length 1.5m to fit VT005.

All buried fittings and pipes HPDE
(High Density Polyethylene)

● Twin wall ○ Smooth ♦ Supplied with seals

