James Buck

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06/08/2025

Economy and Planning
Wrexham County Borough Council
16 Lambpit Street
Wrexham LL11 1AR

Dear Sir/Madam

In reference to condition 5 of Planning permission, reference P/2024/1686;

"Gas protection measures (Characteristic Situation 2, CIRIA Guidance C659) should be installed in all new buildings (including extensions). A methodology of these works (including specification details, design plans, installation details etc...) should be submitted in writing to the Council for approval prior to any works commencing on site. During the installation work, the membrane should be inspected and validated by an independent and suitably experienced third party.

In order to satisfy this condition and emulate the existing properties gas protection measures, please find below proposed design methodology and specification for your review and approval.

Design of Ground Gas Protection Measures

In accordance with BS8485 (2015) + A1 (2019),

In order to emulate measures with existing property and protect against the **CS2** ground gas risk, **3.5 points** of protection measures must be achieved.

The proposed construction elements to achieve the required points score are given below:

- A beam and block floor construction is to be utilized. This achieves **0 points**.
- A ground gas resistant membrane is to be installed. This achieves **2 points**.
- A clear void passive venting layer with 'very good' performance is recommended.

This achieves **2.5 points**.

Further details on the above measures are included in the below table:

Design Requirements	
A pre-cast suspended segmental subfloor (beam and block) This floor type contains many construction joints and discontinuities and can be affected by cracking. As such, it offers little resistance to the passage of ground gas and has high permeability.	**0 points**
and	
A passive subfloor dispersal layer – clear void connecting to periscopic vents terminating in vents above ground level To comply with BS8485 (2015) + A1 (2019) and to achieve 2.5 points (for 'very good' performance): • the subfloor void must be minimum 150mm thick, and; • the minimum area of side ventilation should be 1 No. standard louvred grille airbrick every 2m of wall, and; • where there are multiple internal obstructions to air flow (caused by beams), there should be four or five times the area of the side vents provided in the internal obstructions (e.g. minimum 1 air brick per 1m of internal obstructions).	**2.5 points**
and	
A ground gas resistant membrane To comply with BS8485 (2015) + A1 (2019) and to achieve the 2 points, the gas resistant membrane must: • be made from virgin polymer and have a methane transmission rate of less than 40.0ml/day/m^2/atm (average); • have lapped and taped joints and 'top hats' around service penetrations (make allowance for jointing) – joint the membrane in accordance with the manufacturer's specification (typically 150mm laps with double sided tape); • be chemically resistant to degradation by other contaminants that may be present; • be sufficiently impervious, both in the sheet material and in the sealing of sheets and sealing around sheet penetrations, to prevent any significant passage of methane and/or carbon dioxide through the membrane; • be sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • be sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); and to withstand in-service stresses (e.g. settlement if placed below a floor slab); • be capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • be verified in accordance with CIRIA C735.	**2 points**
	Total 4.5 points

Cross-Sectional Slab Details

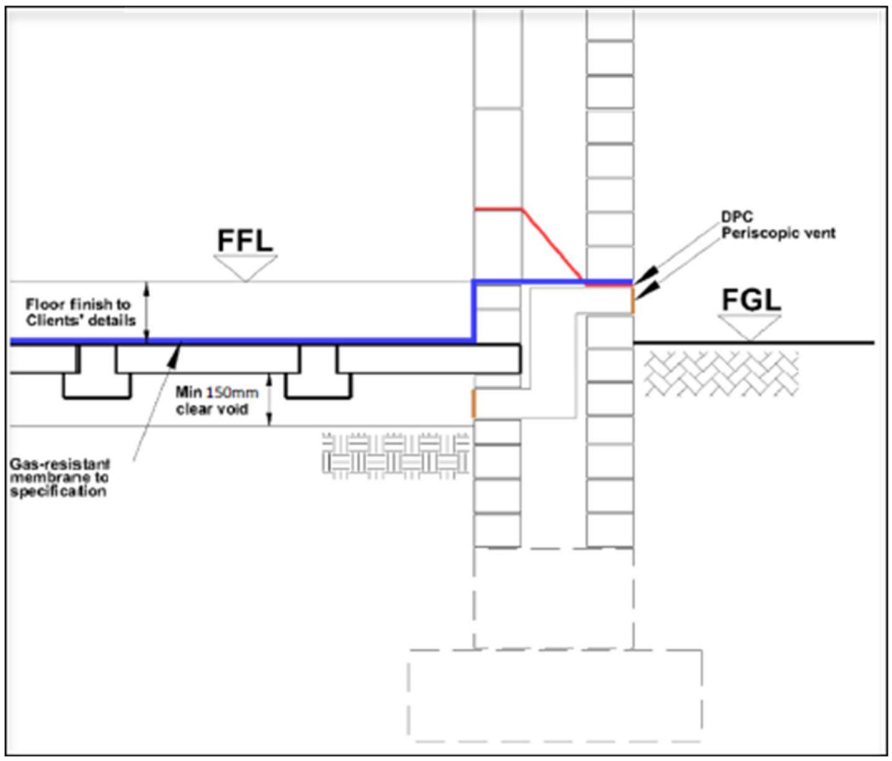


Figure 1 - Edge detail including periscopic vents (brown) and location of ground gas-resistant membrane (blue). This drawing is not to scale.

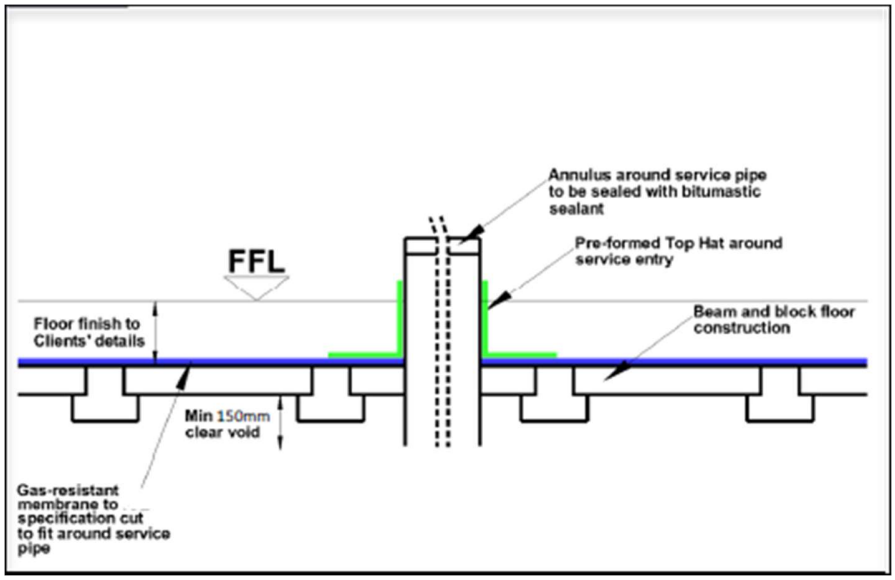


Figure 2 – Service entry detail including pre-formed top hat (green) and location of ground gas-resistant membrane (blue). This drawing is not to scale.

Ground Gas Membrane Installation Guidance

The Main property when under construction specified "Visqueen C02 Gas Membrane" Ref Appendix 4.

This product is now been superseded by; "Visqueen GAS Barrier NF-400" membrane and is the chosen product for this application, this product meets the above-required specification.

The datasheet for membrane is included in Appendix 3.

Installation accessories will also be necessary, including:

- Jointing tape (double sided, gas resistant tape)
- Pre-formed top hats
- Jubilee clips
- NF-Detailing strip (Gas resistant 'detail tape') to install complex joints, party wall sealing, corners and non-standard service entries.

All membrane installation must be undertaken to manufacturer's specification. An example of correct installation is shown in Appendix 1.

All service entry points should be fitted with pre-formed gas resistant 'top hats'. Top hats should be sealed to the pipe and gas membrane utilizing double sided jointing tape and fixed with a jubilee clip.

An example of the method of installation of these top hats is shown above.

Adequate ventilation through internal obstructions is to be installed in line with the above recommendations. Joints between sheets of gas membrane should be lapped (minimum overlap of 100mm) and taped between sheets with appropriate double-sided tape in accordance with the manufacturer's recommendations.

A set of example photographs of good practice installation are contained in Appendix 1.

Gas Protection Validation Plan

The exact construction company appointed to install the gas protection measures is unknown at the time of writing.

In line with CIRIA 735 (2014), a suitably qualified verifier will independently verify the installation of the gas protection measures. A visual inspection method, including pick testing, is recommended to be carried out at the annex. This should be undertaken following the laying of the beam and block pre-cast floor units and laying of the gas membrane on top, but prior to laying insulation and finishes.

The suitably qualified verifier should:

• Identify that the correct membrane has been used, including sealing / jointing tape and preformed components e.g. top hats, corners.

• Inspect the general condition of the membrane for rips, tears and punctures.

• Check that all jointing has been carried out to the manufacturer's specification.

• Check that the membrane has been installed correctly across cavities, including correct jointing in these areas.

• Check that top hats have been correctly installed around service entries, including jubilee clips around the pipe and correct lapping and jointing to the membrane at the base.

• Check that vents have been installed around the perimeter of the building in sufficient number and in the correct locations, including inspecting the condition i.e., not blocked or otherwise restricted.

• Check the presence of a clear >150mm clear void, including measuring that this is of a sufficient depth and the void has not been filled or otherwise compromised.

• Take photographs to provide evidence of the above.

• Make a suitable record of the validation, to be included within a validation report.

The verifier will record the above information utilizing an Inspection record document to produce a report.

A reference example is included in Appendix 2. (Please note this is an example only with the contractors having their own version).

The following information is expected to be included within the Verification Report to demonstrate the successful installation of ground gas protection on the site:

• Objectives of the verification.

• A brief overview of the site conditions and summary of the ground gas regime.

• A description of the installation, including gas-resistant membrane manufacturer and type used

(Including sealing / jointing tape and pre-formed components e.g. top hats, corners). The manufacturer specification / datasheet shall be included.

• Level of competency of installer.

• Detailed description of any deviations from the specification provided in this report, with explanation and justification of such deviations.

• Product specifications of components used.

• A description of the verification approach – in this case visual inspection, including pick testing.

• Verification evidence – in this case photographic evidence.

• Any record of relevant communications with regulatory bodies.

• Verification conclusions.

On acceptance of the design, the working drawings will be updated to reflect same.

If any additional information is needed, do not hesitate to ask.

Kind Regards

James Buck

Enc.

Appendix 1 – Good Practice Installation Guidance and Examples.

Appendix 2 – Example of 'Ground Gas Resistant Membrane Inspection Record' sheet.

Appendix 3 – Visqueen 'Gas Barrier NF-400' Membrane Datasheet.

Appendix 4 – Original existing property specification Datasheet.

APPENDIX 1

How to lap and joint a membrane above a floor slab



Remove loose debris from the surface of the floor slab and unroll the first sheet of membrane. The surface of the slab should be smooth and free from projections or indentations – if very rough, apply a sand blinding.



Remove the protective paper from one side of the appropriate jointing tape and apply it to the first sheet, starting about 50mm from the edge. Ensure that all surfaces are dry for maximum adhesion.



Unroll the second sheet along the joint, overlapping the first by at least 150mm. Press firmly onto the double sided tape, gradually removing the protective paper.



Seal the edge of the overlap with appropriate sealing tape.

Top Hat Installation



Cut a circular hole in the membrane as close as possible to the pipe, or pipe socket. Ensure that pipe penetrations do not occur at joints in the membrane.



With the pipe in position, slide the Visqueen Preformed Top Hat Unit over the pipe (various diameters are available – 110mm being the most common).



Mark the extent of the square horizontal skirt over the membrane and also mark the line of the top of the top hat unit around the pipe.



Raise the top hat unit and cut four lengths of Visqueen Double Sided Jointing Tape, one for each side of the horizontal skirt. Allowing for an overlap at each corner. Cut one length to go round the pipe.



Start to remove the protective paper from the double sided tape around the pipe and raise it up at an angle so that it will project above the top hat unit when it is stuck to the membrane.



Release the protective paper from each of the four lengths of double sided tape. Lower the top hat unit, ensuring that the free end of the protective paper around the pipe is reachable, and seal the horizontal skirt to the membrane.

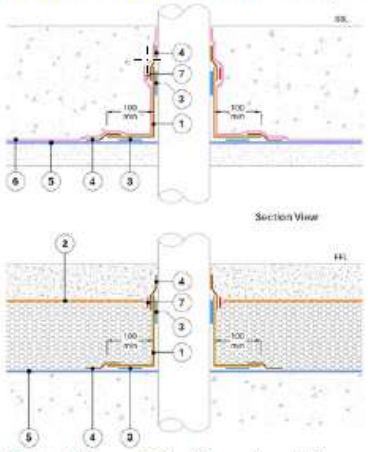


Gradually remove the remainder of the protective paper from the double sided tape around the pipe.



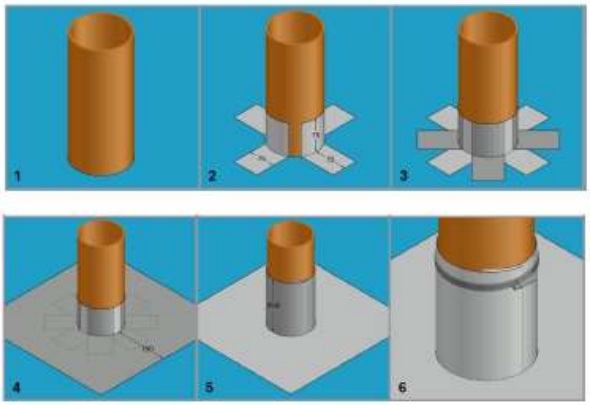
Seal the junction of the horizontal skirt and the membrane with the appropriate sealing tape and secure the top hat unit to the pipe with a jubilee clip.

Diagram 3 - Preformed service pipe sleeve detail with top hat



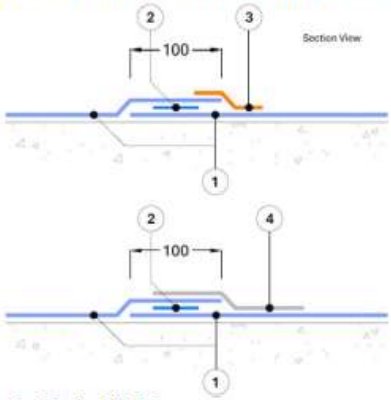
1. Visqueen Ultimate Preformed Pipe Sleeve (top hat)
2. Visqueen Vapour Check or Vapour Barrier
3. VisqueenPro Double-Sided Jointing Tape
4. Visqueen NF-60 Lap Tape
5. Visqueen Gas Barrier NF-400
6. Visqueen TreadGUARD protection
7. Jubilee clip

Diagram 4 - Service pipe detail with Visqueen NF-Detailing Strip



1. ensure surface of pipe is clean and free from any contamination. Cut Visqueen Gas Barrier NF-400 to fit tight around base of pipe
2. bond 150 mm by 75 mm strips of Visqueen NF-Detailing Strip as shown. Strips to be bonded 75 mm onto pipe and 75 mm onto barrier
3. bond additional strips overlapping previous strips by minimum 25 mm
4. cut central hole in a square of detailing strip. Square to extend minimum 150 mm beyond base of pipe. Bond over horizontal strips and barrier
5. bond minimum 150 mm detailing strip upstand collar around vertical strips and pipe
6. secure upstand collar with a mechanical fastening

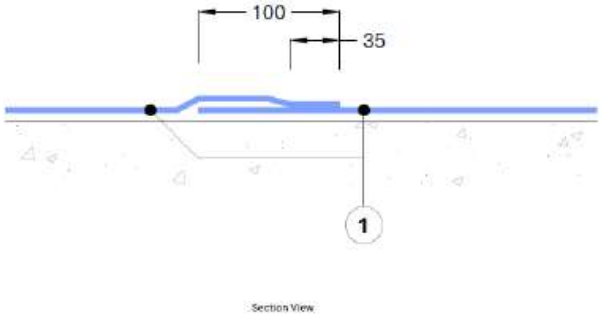
Diagram 5 - Typical taped joint detail (no hydrostatic pressure)



1. Visqueen Gas Barrier NF-400
2. VisqueenPro Double-Sided Jointing Tape
3. Visqueen NF-60 Lap Tape

Dimensions shown in mm

Diagram 6 - Typical welded joint detail (no hydrostatic pressure)



1. Visqueen Gas Barrier NF-400

Dimensions shown in mm

Example Ground Gas Resistant Membrane Installation Photographs



Figure 1 - Air bricks installed at <2m centres.



Figure 2 - General condition. Good installation.

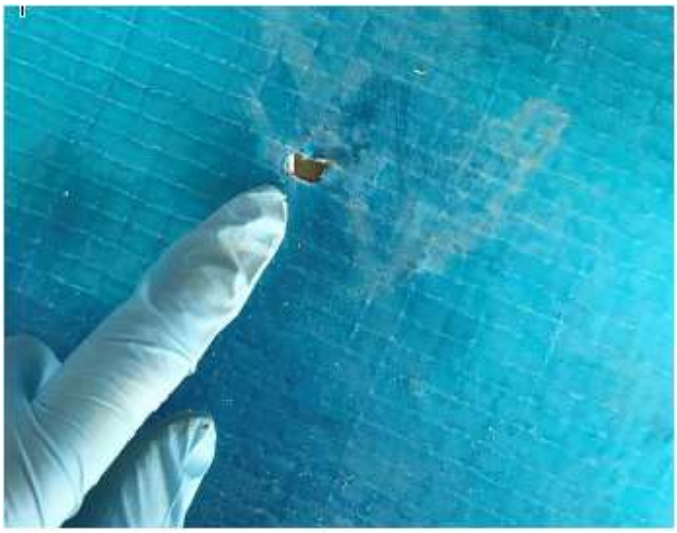


Figure 3 – Common issue – small hole in membrane caused by follow on trades

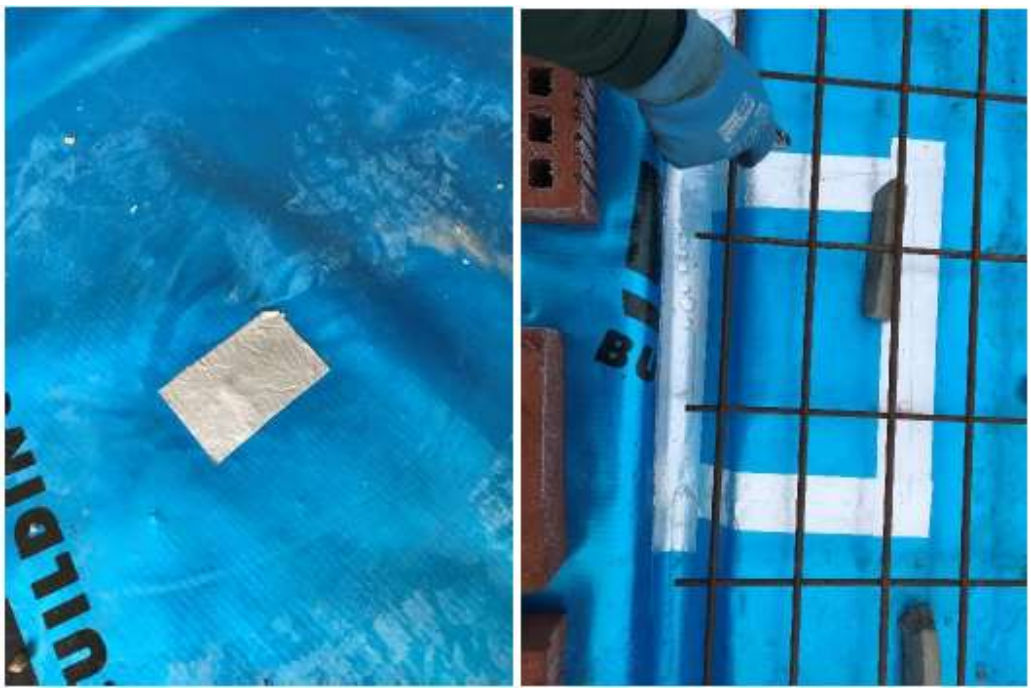


Figure 4 -Options for patching a hole: Left - gas proof detail tape used to cover the hole. Right – a piece of membrane is stuck over the hole using double-sided tape on all sides to manufactures recommendations.

APPENDIX 2

GROUND GAS RESISTANT MEMBRANE INSPECTION RECORD

Project:	
Project No:	
Plot No. Inspected:	
Date of inspection:	
Inspected by:	
Inspection Method:	

INSPECTED ITEM	YES/NO	COMMENTS	PHOTOGRAPHED YES / NO
Identification Identify that the correct membrane has been used, including sealing / jointing tape and pre-formed components e.g. tophats, corners.			
General Condition Inspect the general condition of the membrane for rips, tears and punctures.			
Jointing Check that all jointing has been carried out to the manufacturer's specification.			
Installation Check that the membrane has been installed correctly across cavities, including correct jointing in these areas.			
Top Hat Installation Check that top hats have been correctly installed around service entries, including jubilee clip around pipe and correct lapping and jointing to membrane at base.			
Vent Installation Check that vents have been installed around the perimeter of the building in sufficient number and in the correct locations, including inspecting the condition i.e. not blocked or otherwise restricted.			
Pressure Relief / Passive Venting Check the presence of a vented void / pressure relief pathway, including measuring that this is of a sufficient depth and not been filled or otherwise compromised. Check that internal sleeper walls are also vented to provide adequate flow-through within the void so that none of the walls are blocking off unvented sections within the void.			

This plot has PASSED / FAILED inspection.

Additional inspection visit IS / IS NOT required for this plot.

Engineer: ..... Signed: .....

PHOTOGRAPHS	
Figure 1 –	Figure 2 –
Figure 3 –	Figure 4 –
Figure 5 –	Figure 6 –

APPENDIX 3

Technical Datasheet

Visqueen Gas Barrier NF-400

Features & benefits

- BDA Agrement Certification - third party accreditation
- Complies with NHBC Foundation NF94 guidance for use in Type A membrane locations - non foil system
- Complies with the methane gas transmission rate, mass per unit area and thickness requirements of BS 8485:2015 + A1:2019 - industry standard for methane and carbon dioxide protection
- Transparent - allows a clear view of the substrate during and post installation
- Multi functional - also acts as a radon and damp proof membrane
- Dual jointing methods - depending upon specification, lap joints can be heat welded or taped

Product description

Visqueen Gas Barrier NF-400 is a co-extruded, multi-layer thermoplastic gas membrane, 0.4mm thick (400 micron). The membrane is transparent with a blue tint and supplied 2.4m x 43.5m in a single wound roll.

Approvals and standards

- Third party accreditation (BDA Agrement Certificate BAB-24-339-P-A-UK)
- Complies with the methane gas transmission rate, mass per unit area and thickness requirements of BS 8485:2015 + A1:2019
- Suitable for all Characteristic Gas Situation (CS) ground gas regimes
- Complies with NHBC Foundation NF94 guidance for use in Type A membrane locations (non foil system)
- Conforms to the specification requirements of NHBC Amber 1 and Amber 2 applications
- Conforms to the specification requirements of BR 211:2023
- UKCA UKNI CE to EN 13967:2012
- Visqueen certified with Quality Management System ISO 9001:2015
- Visqueen certified with Occupational Health and Safety System ISO 45001:2018
- Visqueen certified with Environmental Management System ISO 14001:2015

Usage

Visqueen Gas Barrier NF-400 is suitable for use in all types of buildings to prevent the ingress of harmful levels of methane, carbon dioxide and radon.
The barrier can be positioned above or below reinforced cast in situ concrete floor slabs e.g. ground bearing, suspended or raft, or above precast suspended segmental subfloors, e.g. beam and block floor.
The barrier can also be used as a high performance radon membrane and/or damp proof membrane.

Radon, carbon dioxide, and methane protection - NHBC NF94 guidance:
Visqueen Gas Barrier NF-400 when installed with either welded or taped joints complies with NHBC Foundation NF94 publication, Hazardous ground gas - an essential guide for housebuilders, in Type A membrane locations in precast suspended segmental subfloors and reinforced cast in situ concrete floor slabs (ground bearing, suspended or raft).

For site or zone characteristic gas situations of CS4 and above, contact Visqueen Technical Services.

The barrier is not intended for use where there is a risk of hydrostatic pressure.

System components

- VisqueenPro Double Sided Jointing Tape, 50mm x 10m
- Visqueen TreadGUARD 300, 2m x 75m
- Visqueen NF-Detailing Strip, 300mm x 10, 500mm x 10m
- Visqueen NF-60 Lap Tape, 60mm x 45m
- Visqueen NF-150 Lap Tape, 150mm x 10m

Storage and handling

When storing Visqueen Gas Barrier NF-400 care should be taken to:
- store in its original packaging;
- avoid exposure to direct sunlight and high or low temperatures for prolonged periods of time;
- store in a well-ventilated covered area to protect from rain, frost, humidity and mechanical damage;
- store away from possible ignition sources;
- store rolls of the barrier horizontally on a flat surface and not stacked.

Care should be taken to avoid accidental damage to the product when handling on site.

Care should be taken when handling the product in line with current manual handling regulations.

Preparation

Visqueen Gas Barrier NF-400 should be installed on a smooth continuous surface e.g. grouted beam and block floor, a compacted blinding layer e.g. 50mm thick sand blinding, or smooth concrete blinding. The substrate should be free from irregularities such as loose aggregates or other sharp protrusions, voids, projections or mortar deposits.

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Visqueen Gas Barrier NF-400

The barrier can be cut with a sharp retractable safety knife or robust scissors.

Hand rollers are required during lap joint formation and sealing membrane detailing. Typical hand rollers include 40mm silicone pressure roller and 6mm brass penny pressure roller.

Consult the project specification to ensure the correct method of lap joint formation for the project is followed (welded or taped).

Rolls of tape should be kept in a warm, dry location prior to use to ensure the tape is workable and can be more easily applied.

Installation

Installation of Visqueen Gas Barrier NF-400 should be carried out by a competent contractor experienced with this type of product e.g. hold an NVQ Level 2 Diploma in substructure work occupations (Installation of Gas Membranes - Construction).

The installation should be subjected to third-party validation in accordance with BS 8485:2015 +A1:2019 and CIRIA C735.

Visqueen Gas Barrier NF-400 should be loose laid on the substrate ensuring that the barrier sheet edges are aligned allowing adequate overlap for jointing between the sheets. The barrier can be laid either side facing upwards.

The barrier lap area should be clean and dry at the time of jointing. The barrier has been designed to exhibit superior welding properties using hot wedge and hot air welding, therefore onsite welding of all lap joints is recommended. When hot air hand welding the lap joints, the joint should be overlapped by approximately 100mm and an approximate 35mm weld is normally
achieved. During hand welding, the lap joints should be firmly compressed using a hand roller to ensure an adequate bond is achieved.

When taping the lap joints, the joint should be overlapped by approximately 100mm and bonded with VisqueenPro Double Sided Jointing Tape (positioned approximately 25mm from the edge of the sheet) and sealed with Visqueen NF-60 Lap Tape or Visqueen NF-150 Lap Tape depending upon the project specification. The lap joints should be firmly compressed using a hand roller during taping to ensure an adequate bond is achieved.

Gas protection should be continuous at all detailing including internal and external walls, internal and external corners, doorway thresholds, service pipes, party walls and structural columns. Visqueen NF-Detailing Strip should be used to seal these junctions. The detailing strip lap joints should be firmly compressed using a hand roller to ensure an adequate bond is achieved. Visqueen Ultimate Preformed Units are also available.

If the barrier is punctured or perforated a patch of the same material should be lapped at least 100mm beyond the limits of the puncture and either welded in position, or bonded with VisqueenPro Double Sided Jointing Tape (positioned approximately 25mm from the edge of the sheet) and sealed with Visqueen NF-60 Lap Tape or Visqueen NF-150 Lap Tape depending upon the project specification. Alternatively a patch can be formed using Visqueen NF-Detailing Strip lapped at least 150mm beyond the extents of the puncture.

Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane. The membrane should be covered by a protective layer immediately after installation to prevent damage from following trades, ultraviolet light, etc. 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 reinforcement and spacers must be prevented from puncturing the barrier. Where there is a risk of potential damage, the barrier should be covered with Visqueen TreadGuard protection, screed or other approved protection material before positioning the reinforcement.

Usable temperature range

When Visqueen Gas Barrier NF-400 is installed with taped lap joints, the air temperature should not be below 5°C or falling to prevent the risk of surface condensation affecting the tape adhesion.

When ambient temperatures are above 25°C or rising, the barrier should be covered immediately after installation.

Additional information

When used in accordance BS8485:2015 + A1:2019 a subfloor ventilation system or pressure relief may also be required.

To assist build sequencing, Visqueen Ultimate Gas DPC is available for gas protection through the wall construction.

For further information contact Visqueen Technical Office +44 (0) 333 202 6800.

The information in this datasheet was correct at the time of publication. It is the user's responsibility to obtain the latest version of the datasheet as it is updated on a regular basis. The information contained in the latest datasheet supersedes all previously published editions.

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Technical Datasheet

Visqueen Gas Barrier NF-400

Property	Test method	Units	Compliance criteria	Result
Dimensions	BS EN 1848-2	m	-	2.4 x 43.5
Nominal thickness	BS EN 1849-2	mm	+/-10%	0.4
Mass	BS EN 1849-2	g/m²	>370	>370
Tensile strength - machine direction	BS EN 12311-2 method B	N/mm²	MDV	26.3
Tensile strength - cross direction	BS EN 12311-2 method B	N/mm²	MDV	29.4
Elongation at break - machine direction	BS EN 12311-2 method B	%	MDV	607
Elongation at break - cross direction	BS EN 12311-2 method B	%	MDV	921
Joint strength - taped joint	BS EN 12317-2	N/50mm	MDV	217
Joint strength - welded joint	BS EN 12317-2	N/50mm	MDV	405
Watertightness at 2kPa for 24 hours	BS EN 1928 method A	-	Pass/Fail	Pass
Watertightness at 2kPa for 24 hours after ageing	BS EN 1296 (12 weeks) + BS EN 1928 method A	-	Pass/Fail	Pass
Watertightness at 2kPa for 24 hours after alkali environment	BS EN 1847 (28 days) + BS EN 1928 method A	-	Pass/Fail	Pass
Resistance to impact	BS EN 12691 method A	mm	MLV	200
Low temperature flexibility	BS EN 495-5	°C	MDV	-20
Resistance to tearing (nail shank) - machine direction	BS EN 12310-1	N	MDV	265
Resistance to tearing (nail shank) - cross direction	BS EN 12310-1	N	MDV	240
Water vapour resistance	BS EN 1931 method B	MNs/g	MDV	2,296
Water vapour permeability	BS EN 1931 method B	g/m²/d	MDV	0.08
Water vapour resistance factor	BS EN 1931 method B	µ	MDV	1,140,000
Water vapour diffusion equivalent air layer thickness	BS EN 1931 method B	SD in m	MDV	459
Methane gas transmission rate - membrane	BS ISO 15105-1	ml/m²/day/atm	MDV	13.2
Methane gas transmission rate - welded membrane joint	BS ISO 15105-1	ml/m²/day/atm	MDV	15
Carbon dioxide gas transmission rate	BS ISO 15105-1	ml/m²/day/atm	MDV	22
Radon gas transmission rate - membrane	SP method	m/s	MDV	<3.0 x 10-9
Puncture CBR	BS EN 12236	N	MDV	1620
Tensile yield strength - machine direction	ASTM D4885-01	kN/m	MDV	8
Tensile yield strength - cross direction	ASTM D4885-02	kN/m	MDV	7.3
Resistance to static loading	BS EN 12730 method C	kg	MDV	15
Elongation yield - machine direction	ASTM D4885-01	%	MDV	405.3

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Technical support: +44 (0) 333 202 6800

Date Published: 20-Nov-2024

Visqueen Gas Barrier NF-400

Elongation yield - cross direction	ASTM D4885-01	%	MDV	400.2
Tear resistance - trouser method A - machine direction	BS ISO 34-1	kN/m	MDV	128
Tear resistance - trouser method A - cross direction	BS ISO 34-1	kN/m	MDV	109.7
Tear resistance - angle method B - machine direction	BS ISO 34-1	N	MDV	137
Tear resistance - angle method B - cross direction	BS ISO 34-1	N	MDV	139.6

Health and safety information

Refer to the Visqueen Gas Barrier NF-400 safety datasheet (SDS).

About Visqueen

Visqueen is a leading provider of construction membrane technologies and design-based solutions for ground gas, structural waterproofing, damp proofing and fire protection.

We offer complete support at every stage of the specification, including the supply chain process. As the UK's principal technical authority, we are best placed to ensure that the principal designer and contractor specify the most technically suited, durable, and competitive solution to guarantee their project is protected for the lifetime of the building.

Visqueen is at the forefront of advanced membrane technology and innovation in the construction industry, earning the trust and loyalty of specifiers throughout the UK and Europe.

For more information, visit visqueen.com or contact our sales office at +44 (0) 333 202 6800 or enquiries@visqueen.com

Complete Range, Complete Solution



Passive Fire Protection | Gas Protection | Damp Proof Membrane | Air and Vapor Control | Stormwater | Damp Proof Course | Temporary Protection

Visqueen Technical Support

Visqueen offer a comprehensive full nationwide technical support. Our team of CSSW qualified technical support managers provide on site design-based solutions for specifiers, contractors and builders merchants, and will ensure that from design stage to installation the project is fully risk assessed and the specification is approved by all stakeholders.

Our Technical Office, can design, prepare and manage CAD detailing, together with assisting in quantity take offs, while offering advice on technical installations and product selection.

Competency & Design

Visqueen promotes competency in building design by ensuring that its technical team possesses the necessary skills, knowledge, experience, and ethical practices. The company adopts the "golden thread of information," ensuring all project data is digitally secure and accessible throughout a building's lifecycle. This approach aligns with the Building Safety Act and aims to foster accountability and compliance with evolving regulations, providing clients with confidence in the safety and reliability of their projects.

Visqueen CPD Seminars

Visqueen's CPD Seminars offer insights into Building Regulations, Standards, and industry guidance related to damp proofing, hazardous ground gas protection, and structural waterproofing. These one-hour seminars are tailored for construction design professionals and delivered by our Technical Support Managers. Visit our website to book a free CPD.

Visqueen Contract Design Services

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APPENDIX 4

DATASHEET

Technical Support: 0845 302 4758
LAST UPDATED: 20.9.2016

VISQUEEN CO_2 GAS MEMBRANE

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 CO_2 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 CO_2 Gas Membrane is a robust copolymer 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 CO_2 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.

VISQUEEN BUILDING PRODUCTS

STRUCTURAL WATERPROOFING AND GAS PROTECTION SYSTEMS

DATASHEET

Technical Support: 0845 302 4758

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Installation

Visqueen CO_2 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 C IRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHB C 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 onsite contractors.

Jointing and Sealing

Visqueen CO_2 Gas Membrane should be overlapped by at least 150mm and bonded with Visqueen Double Sided Tape. The joint is secured with Visqueen Foil Backed Girth Jointing Tape. Ensure that the membrane is clean and dry at the time of jointing. Airtight seals should be formed around all service entry points. Visqueen Pre-formed Top Hat Units must be used for sealing service entry pipes. The base of the top hat should be sealed using Visqueen Double Sided Tape and Visqueen Foil Backed Girth Jointing Tape is used to secure the joint.

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 CO_2 gases are present or when the generation of CO_2 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.

Covering

Visqueen CO_2 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

SPECIFICATION SUPPORT

The following items are available to view online or to download from www.visqueenbuilding.co.uk

- Technical Datasheets
- Typical Installation CAD details
- Health and Safety data

Register online for access to NBS Clauses and for information about our CPD Seminars

TECHNICAL SUPPORT

For advice on detailing or installation call Visqueen Building Products Technical Help Line 0845 302 4758. Pricing & Availability may be obtained from our UK Network of merchant stockists. For details of these call our Sales Office on 0845 302 4758.

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moisture and avoid any risk of overheating the membrane.

Storage and Handling

Visqueen CO_2 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 subsoils. 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 PROPERTIES	
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 m³sec/Pa

The information given in this datasheet is based on data and knowledge we have at the time of printing. Statements made are of a general nature and are not intended to apply to any one use or application unless we have told you in the datasheet. As we cannot control the conditions under which you use our products, we do not warrant that the information is complete or that our products are suitable for your purposes. Please contact us if you are in any doubt as to the suitability of our products.

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