



Visqueen Ultimate HC BLOK

The ultimate Methane & VOCs' vapour barrier

- Conforms to CIRIA C748 and BS8485:2015
- Excellent VOC (vapour) & methane barrier resistance
- Utilises Visqueen's Advanced Barrier Technology
- Exceptional flexibility and puncture resistance
- Comprehensively tested and validated test results
- Outstanding welding characteristics, saving time and costs

Description

Visqueen Ultimate HC BLOK is a highly flexible 0.5mm thick coextruded membrane designed to comply with current guidance on Volatile Organic Compounds (VOCs) vapours and ground gases. Manufactured using Visqueen's advanced membrane technology and drawing on our extensive knowledge and expertise in gas protection, Visqueen has developed a new flexible barrier membrane suitable in brownfield applications that are affected by aggressive chemicals (vapour phase) such as such as Naphthalene, Benzene, Toluene, Ethyl Benzene and Xylene (BTEX).

The product is available in large roll formats to minimise jointing and quick installation times. The membrane is gold and white, 2.44m x 41m x 0.5mm (100m²), in single wound roll format and packaged in a white outer wrap. The membrane should be installed gold side up.

Applications

Visqueen Ultimate HC BLOK is suitable for the following applications

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

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

The innovative Visqueen's Advanced Barrier Technology

1. An advanced gas barrier structure
2. Superior physical and chemical resistant properties
3. Easy & rapid welding

4. Flexibility for uneven ground contours
5. Good environmental stress crack resistance

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

Specific Approvals/Standards

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

Validated test data and compliance to the latest standards

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

Visqueen embarked on an extensive testing regime to ensure its membranes are the best in class and comply with the new standards. Visqueen's Ultimate range have all passed the stringent **methane 40ml/m²/day/atm** (ISO15105-1 to BS8485:2015 requirement) threshold and physical property requirements. CIRIA C748 states a VOC membrane must be tested as a minimum to the below challenge chemicals. Visqueen have conducted VOC vapour testing to these challenge chemicals below in accordance with C748. The actual test results by a 3rd party approved laboratory are shown in the performance table on page 4.

- benzene
- toluene
- ethyl benzene
- (m,p, and o) xylenes
- Hexane
- vinyl chloride
- tetrachloroethene
- trichloroethylene
- naphthalene

System Components

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

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

Installation

Visqueen Ultimate HC BLOK and ancillary components must be installed in accordance with the recommendations of CIRIA C748 and BS8485:2015. 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 such as settlement applications occur it is recommended that Visqueen Ultimate GeoSeal is used.

Visqueen Ultimate HC BLOK is normally installed above the concrete slab (vented void) but can be used below the slab in certain conditions. Please contact Visqueen for further information on foundation types and membrane suitability – 0333 202 6800 Technical Department.

For taped joints, overlap the membranes by at least 150mm and bond together using Visqueen Double Sided Jointing tape. Secure the lap using Visqueen GR Foil Tape. Punctures to the membrane can only be repaired by using a patch of the same membrane and lapped at least 150mm beyond the limits of the puncture. Bond and seal the patch using Visqueen jointing tape system

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. The membrane has been designed to perform in circumstances where linear expansion could occur, however in high temperatures the membrane should be covered immediately after installation.

The membrane should not be taken through any masonry wall. The relevant Visqueen damp proof or gas proof course should be taken through and extended beyond the wall by a minimum of 250mm where it can be jointed to the membrane.

Service penetrations, corners and junctions

All service pipe penetrations should be fully sealed using welded membrane or Visqueen GX Preformed Top Hat Units. The base and collar of the preformed unit should be bonded using Visqueen GX Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Lap Tape.

The collar should be secured with a mechanical fastening. To ensure system integrity, all internal and external corners should be provided with either welded corners or Visqueen Preformed Units bonded to the membrane using Visqueen Double Sided Jointing Tape and sealed with Visqueen GR Single Sided Lap Tape. Complex or awkward junctions should be sealed using either welded membrane or Visqueen Detailing Strip.

Ventilation

When high levels of ground gases and VOCs are present in accordance with BS8485:2015 and CIRIA C716 or when the generation of gases still occurs, then an open void beneath the ground floor should be constructed as ventilation beneath the ground floor will dilute and disperse the gases to atmosphere. Open voids are normally restricted to beam and block floors or other precast concrete floor systems. An alternative for providing ventilation to in situ concrete floor slabs is to install a Visqueen Gas Venting System. Please visit Visqueen Gas Venting System

Storage and Handling

Visqueen Ultimate HC BLOK is classified as non-hazardous when used in accordance with the relevant British Standards. The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The product should be stored in a warm dry environment and not exposed to long periods of sunlight.

A roll weighs 50 kilos and should be handled with care following on-site health and safety procedures.

| Characteristic | Test Method | Units | Criteria | Result |
|--|-------------|---------------------|-----------|--------|
| Tensile Strength - MD | EN 12311 | N/mm ² | >MDV | 32.8 |
| Tensile Strength - CD | EN 12311 | N/mm ² | >MDV | 33.1 |
| Tensile Elongation - MD | EN 12311 | % | >MDV | 699 |
| Tensile Elongation - CD | EN 12311 | % | >MDV | 723 |
| Joint Strength | EN 12317-2 | N | >MDV | 265 |
| Watertightness 2kPa | EN 1928 | - | Pass/Fail | Pass |
| Resistance to impact | EN 12691 | mm | MDV | 200 |
| DDurability watertightness after heat ageing | EN 1296 | - | Pass/Fail | Pass |
| Durability watertightness against chemicals | EN 1847 | - | Pass/Fail | Pass |
| Resistance to tearing (nail shank) CD | EN 12310-1 | N | MDV | 245 |
| Resistance to tearing (nail shank) MD | EN 12310-1 | N | MDV | 270 |
| Resistance to static loading | EN 12730 | Kg | >MLV | 20 |
| Water vapour transmission - resistance | EN 1931 | MNs/g | MDV | 1034 |
| Water vapour transmission - permeability | EN 1931 | g/m ² /d | MDV | 0.13 |

Visqueen can issue individual test reports on request

Product & Performance Data:

| Characteristic | Test method | Units | Criteria | Result | |
|--|----------------------|--------------------------|-------------|----------------------|----------------------|
| Colour | | | | Gold/White | |
| Weight | | kilos | | 49 | |
| Length | EN 1848-2 | m | - 0/+10% | 41 | |
| Width | EN 1848-2 | m | - 0/+10% | 2.44 | |
| Thickness | EN 1849-2 | mm | +/-10% | 0.5 | |
| BS8485:2015 and C748 physical test results | | Units | Criteria | Result | |
| Puncture | BS EN ISO 12236:2006 | N | MDV | 1640 | |
| Impact resistance Method A hard surface | EN12691 | mm | MDV | 200 | |
| Impact resistance Method B soft surface | EN12691 | mm | MDV | 1250 | |
| Tensiles Yield strength MD 1 | ASTM D4885-01 | kN/m | MDV | 5.1 | |
| Tensiles Yield strength CD 1 | ASTM D4885-01 | kN/m | MDV | 4.91 | |
| Yield elongation MD 1 | ASTM D4885-01 | % | MDV | 76 | |
| Yield elongation CD 1 | ASTM D4885-01 | % | MDV | 62 | |
| Tear resistance - trouser method A - MD | BS ISO 34-1 | kN/m | MDV | 60.2 | |
| Tear resistance - trouser method A - CD | BS ISO 34-1 | kN/m | MDV | 66.1 | |
| Tear resistance - angle method B - MD | BS ISO 34-1 | N | MDV | 48.7 | |
| Tear resistance - angle method B - CD | BS ISO 34-1 | N | MDV | 49.6 | |
| 1 - this is at yield and not break as the equipment used was not strong enough to break the membrane | | | | | |
| BS8485:2015 - Methane testing | | Test method | Units | Criteria | Result |
| Methane permeability | ISO 15105-1 | ml/m ² /d/atm | <40 | 1.3 | |
| C748 - Permeation vapour tests - 100% concentration | | | Criteria | ml/m ² /d | mg/m ² /d |
| benzene | ISO 15105-2 | MDV | 0.08 | 70 | 2.92 |
| toluene | ISO 15105-2 | MDV | 0.09 | 78.5 | 3.27 |
| ethyl benzene | ISO 15105-2 | MDV | 0.11 | 93.8 | 3.91 |
| m,p xylene | ISO 15105-2 | MDV | 0.01 | 6.7 | 0.28 |
| hexane | ISO 15105-2 | MDV | gas | 2.6 | 0.11 |
| vinyl chloride | ISO 15105-2 | MDV | 0 | 6.4 | 0.27 |
| tetrachloroethene (PCE) | ISO 15105-2 | MDV | 0 | 3.2 | 0.13 |

ULTIMATE
GAS MEMBRANES

VISQUEEN

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|---|-------------|-------------|---------------------|------|------|
| trichloroethene (TCE) | ISO 15105-2 | MDV | solid | 0.3 | 0.01 |
| naphthalene | ISO 15105-2 | MDV | 0.03 | 19.7 | 0.82 |
| Visqueen can issue individual test reports on request | | | | | |
| | | | | | |
| C748 - Chemical immersion testing | weight % | Thickness % | Tensiles/elongation | | |
| Pass is achieved if the aged membrane is within 25% of the fresh sample | | | | | |
| Benzene | EN14414 | Pass | Pass | Pass | |
| Toluene | EN14414 | Pass | Pass | Pass | |
| Ethyl benzene | EN14414 | Pass | Pass | Pass | |
| (m,p, and o) xylenes | EN14414 | Pass | Pass | Pass | |
| Hexane | EN14414 | Pass | Pass | Pass | |
| Vinyl chloride | EN14414 | Pass | Pass | Pass | |
| Tetrachloroethene | EN14414 | Pass | Pass | Pass | |
| Trichloroethene | EN14414 | Pass | Pass | Pass | |
| Naphthalene | EN14414 | Pass | Pass | Pass | |
| Visqueen can issue individual test reports on request | | | | | |

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