The Visqueen VAPOur Control Layer system consists of:

- Developed to reduce the risk of interstitial condensation and improve energy efficiency.

Background

Today there is greater emphasis on the environment and the need to significantly reduce CO₂ emissions. It has been an accepted fact that buildings in the United Kingdom account for 46% of CO₂ emissions. The Government is committed to reducing greenhouse gases that contribute towards global warming for the benefit of future generations. This is reflected in the revision of Building Regulations Approved Document Part L and the ongoing increased energy efficiency and air tightness requirements. The improvement in energy efficiency dramatically increases the risk of interstitial condensation and decisions should be taken to avoid this at the design stage. The designer should take into account water incorporated during the building process and water vapour arising from the occupants and their ongoing activities.

A good design and appropriate specification of materials are necessary to comply with building regulation requirements to ensure condensation is kept to a minimum and to achieve effective air tightness in new buildings and dwellings. Visqueen Building Products supply a range of Vapour Control Layers which can help achieve this.

The consequences of increased levels of condensation will result in damage to the building structure and failure to reduce air leakage will result in increased heat loss and poorer performing buildings.

Regulations

The Building Regulations Approved Document C for England & Wales states that the floors, walls and roof of a building should adequately protect the building and its users from the harmful effects caused by interstitial and surface condensation. In Scotland, Technical Standard 3.15 states that every building must be designed and constructed in such a way that there will not be a threat to the building or the health of the occupants as a result of moisture caused by surface or interstitial condensation.

The British Standard BS5250 is the 'Code of practice for the control of condensation in buildings and dwellings'. The risk of interstitial condensation for a floor, wall or roof should be assessed or constructed in accordance with Section 8 and Annex D of BS5250 2002. The analysis uses the calculation method contained in BS EN ISO 1378. The risk of condensation in a building depends on a number of factors which should be taken into consideration at the design stage.

Description

Visqueen Vapour Control Layers are a range of loose laid and self adhesive elastomer membranes. They are designed to prevent the occurrence of interstitial condensation in the fabric of a building by protecting the thermal insulation incorporated in the building structure.

Visqueen High Performance Fully Bonded Vapour Barrier should be used in any situation where a fully bonded Vapour Control Layer is required.
## Product Selection

The following is a guide to product suitability depending on building type.

<table>
<thead>
<tr>
<th>Building Type</th>
<th>Condensation Risk</th>
<th>Visqueen Vapour Check</th>
<th>Visqueen Vapour Barrier</th>
<th>Visqueen HP Vapour Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factories</td>
<td>Low</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouses</td>
<td>Low</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Industrial Units</td>
<td>Low</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Areas</td>
<td>Low</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Domestic Dwellings</td>
<td>Medium</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Apartment Blocks</td>
<td>Medium</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offices</td>
<td>Medium</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td>Medium</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textile Factories</td>
<td>High</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Paper Mills</td>
<td>High</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Swimming Pools</td>
<td>High</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Laundries</td>
<td>High</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Communal Shower Blocks</td>
<td>High</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Canteens</td>
<td>High</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sports Halls</td>
<td>High</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Industrial Processes</td>
<td>High</td>
<td>✓</td>
<td></td>
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</tr>
</tbody>
</table>

## Application

The control of condensation to within safe limits is an important consideration in the design and construction of buildings.

The occupants of a building and their associated activities produce water vapour which, if unmanaged, can condense within or between building elements; a process referred to as interstitial condensation. This condensation can have serious detrimental effects upon the fabric of the building such as causing the decay of timber elements and corrosion of metal components, and reducing the thermal effectiveness of insulating materials.

With the progressive increases in thermal efficiencies of buildings in order to reduce energy usage, any reduction in the effectiveness of the installed insulation can have long term financial implications. The negative effect upon the fabric of the building increases the incidence of moulds and mildews, which in turn can have a harmful effect upon the health of the building’s occupants.

Visqueen Vapour Control Layers provide a means of protecting the warm side of the thermal insulation incorporated in a building by creating a barrier to the movement of warm, moist air. The Vapour Control range, which provides suitability for all internal building conditions, consists of the following systems:

- Visqueen Vapour Check
- Visqueen Vapour Barrier
- Visqueen High Performance Vapour Barrier
- Visqueen High Performance Fully Bonded Vapour Barrier
**VAPOUR CONTROL LAYERS**

**VISQUEEN VAPOUR BARRIERS**

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**RANGE SUITABLE FOR ALL INTERNAL BUILDING CONDITIONS.**

**USED WITHIN ROOF, WALL AND FLOOR CONSTRUCTIONS.**

**REDUCES THE LIKELIHOOD OF INTERSTITIAL CONDENSATION.**

**LOOSE LAID OR SELF ADHESIVE OPTIONS.**

**ALSO USED AS SEPARATION LAYERS ABOVE RIGID URETHANE FOAM INSULATIONS.**

**PROVIDES PROTECTION AGAINST AIR LEAKAGE.**

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**DESIGN**

To avoid harmful condensation, careful consideration should be given to the design of the thermal insulating elements and particular attention given to ventilation and the appropriate level of vapour control required.

It is recommended that the risk of interstitial condensation be assessed by calculation method (undertaken by the insulation manufacturer) in order to determine where it is likely to take place, whether it will be harmful and the optimum level of vapour control for that part of the structure.

Penetrations of the vapour control layer will downgrade performance and as such should be avoided wherever possible. Where penetrations occur, vapour tight seals should be formed.

Selection of the appropriate vapour control layer is by reference to the building’s internal humidity conditions, as follows:

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**Visqueen Vapour Check** is a loose laid membrane designed for use in roofs, walls and floors subject to humidity levels less than 50% at 15°C or less than 35% at 20°C (BS5250: 2002 class 1 condition) e.g. warehouses, industrial units and storage areas.

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**Visqueen Vapour Barrier** is a loose laid membrane designed for use in roofs, walls and floors subject to humidity levels less than 60% at 20°C (BS5250: 2002 class 2 and 3 conditions) e.g. offices and domestic dwellings with low occupancy.

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**Visqueen High Performance Vapour Barrier** is a loose laid membrane designed for use in roofs, walls and floors subject to humidity levels greater than 60% at 20°C or greater than 45% at 25°C (BS5250: 2002 class 4 and 5 conditions) e.g. domestic dwellings with high occupancy, sports halls, swimming pools, communal shower areas, laundries, canteens and buildings with wet industrial processes.

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**Visqueen High Performance Fully Bonded Vapour Barrier** is a self adhesive membrane designed for use in roofs, walls and floors subject to humidity levels greater than 60% at 20°C or greater than 45% at 25°C (BS5250: 2002 class 4 and 5 conditions) where a fully bonded vapour control layer is required.

When designing buildings used as service and retail outlets where specific use, and hence humidity levels, may be unknown at design stage, the likelihood is that there will be a high degree of variability in the vapour protection requirements. In these instances, the choice of vapour control layer should err on the side of caution and include for an adequate margin of safety.

When designing the system in which the vapour control layer is to be incorporated, careful consideration should be given to compatibility with the other components or their method of application e.g. thermoplastic membranes are suitable for use with mechanically fixed polymeric single ply flat roofing systems, and unsuitable for use with bitumen bonded flat roofing systems due to the high temperatures involved during application.

For cold storage areas, contact Visqueen Technical Support for specific design advice.

The following design considerations are not exhaustive but are offered to provide general guidance for typical applications.
Design consideration – roofs
Incorporated between the insulation and internal lining in pitched roofs with inclined insulation and ceilings, the vapour control layer should be sealed at all roof details e.g. hips, valleys, ridges, abutments and fire walls.

With cold deck flat roof constructions, the vapour control layer is included between the insulation and ceiling. Perimeter detailing should be effectively sealed.

When incorporated in warm deck flat roof constructions, the vapour control layer should be secured in position between the structural deck and insulation ensuring that it envelopes the insulation at upstands, abutments and penetrations.

Design consideration – walls
Commonly incorporated in masonry cavity walls and solid walls with internal insulation, timber framed walls, metal framed walls where the frame is within the main insulation layer and site assembled twin skin wall systems, the vapour control layer should be secured in position between the insulation and the internal lining. All fixings penetrating the layer should be sealed with Visqueen Double Sided Jointing Tape and detailing around window and door openings should be sealed with Visqueen Vapour Tape.

Design consideration – floors
With precast concrete floors or ground bearing floors, a vapour control layer should be provided on the warm side of the insulation when insulation is positioned above the structural floor. Perimeter detailing should be effectively sealed. Vapour control layers also function as separating layers in solid floor construction. Commonly incorporated between rigid urethane foam insulations and the floor screed, they prevent contamination of the insulation by the screed and minimise cracking should movement occur below the screed.

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**VISQUEEN VAPOUR CONTROL LAYERS**

<table>
<thead>
<tr>
<th>BS5250 Conditions</th>
<th>Vapour Check</th>
<th>Vapour Barrier</th>
<th>HP Vapour Barrier</th>
<th>HP FB Vapour Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Method</td>
<td>Loose laid</td>
<td>Loose laid</td>
<td>Loose laid</td>
<td>Self Adhesive</td>
</tr>
<tr>
<td>Roll Dimensions (m)</td>
<td>2.45 or 4x50</td>
<td>2x50</td>
<td>1.6x30 or 60</td>
<td>1x20</td>
</tr>
<tr>
<td>Water Vapour Min. Resistance (MN/g)</td>
<td>260</td>
<td>530</td>
<td>1100</td>
<td>2000</td>
</tr>
</tbody>
</table>
— RANGE SUITABLE FOR ALL INTERNAL BUILDING CONDITIONS.
— USED WITHIN ROOF, WALL AND FLOOR CONSTRUCTIONS.
— REDUCES THE LIKELIHOOD OF INTERSTITIAL CONDENSATION.
— LOOSE LAID OR SELF ADHESIVE OPTIONS.
— ALSO USED AS SEPARATION LAYERS ABOVE RIGID URETHANE FOAM INSULATIONS.
— PROVIDES PROTECTION AGAINST AIR LEAKAGE.

VISQUEEN VAPOUR BARRIERS

MANUFACTURED IN THE UK
REQUIRED COMPONENTS
AVAILABLE AS A DOWNLOAD FROM VISQUEENBUILDING.CO.UK/VCL

- VISQUEEN VAPOUR TAPE
- VISQUEEN VAPOUR EDGE TAPE
- VISQUEEN PREFORMED TOP HAT UNIT
- VISQUEEN HP TANKING PRIMER (SL TIN)
- VISQUEEN DOUBLE SIDED JOINTING TAPE

INSTALLATION

Visqueen Vapour Control Layers should be installed in accordance with the recommendations of BS5250: 2002 ‘Code of practice for control of condensation in buildings’.

The vapour control layer should be of the appropriate vapour resistance and should be situated on the warm side of the insulation.

The laps of the vapour control layer and junctions with metal, timber, glass, cementitious boarding and plastic building elements should be sealed with Visqueen Vapour Tape. Abutments to masonry units or junctions where structural movement is anticipated should be sealed with Visqueen Vapour Edge Tape. Failure to suitably connect the vapour control layer to other building elements will seriously reduce performance.

Where fixings penetrate through the vapour control layer e.g. application of mechanically fixed plaster board, a vapour seal should be formed using a Visqueen Double Sided Jointing Tape applied to the surface of the vapour control layer along the line of the substrate for the fixings.

Loose Laid Vapour Control Layers

All joints in the vapour control layer should be lapped by minimum 75mm, and sealed with Visqueen Vapour Tape applied equidistant over the lap. To aid formation, laps should be made over a solid substrate. Where possible, reduce the number of laps to a minimum by using full rolls of membrane. The heads of any mechanical fixings penetrating through the membrane should be sealed with Visqueen Vapour Tape.

Tears, cuts or holes should be repaired with Visqueen Vapour Edge Tape extending minimum 75mm beyond the damaged area. Vapour tight seals should be formed around all service entry points. Visqueen Preformed Top Hat Units are available for sealing around pipe penetrations. The base and collar of the preformed unit should be sealed using Visqueen Vapour Tape and the collar secured with a mechanical fastening.

Other penetrations through the membrane such as electrical cabling should be kept to a minimum and sealed during construction with Visqueen Vapour Tape.

The perimeter of the installation should be sealed to ensure full vapour protection. Where perimeter detailing involves sealing to masonry units such as brickwork, blockwork, etc ensure vapour proof continuity by sealing with Visqueen Vapour Edge Tape applied equidistant over the junction.

Ensure all surfaces are clean, smooth and dry prior to the application of Visqueen Vapour Tape or Visqueen Vapour Edge Tape. Surfaces do not require priming prior to tape application.

Self Adhesive Vapour Control Layer

All surfaces to which the membrane is to be bonded should have a smooth finish, be dry and free from dust and loose particles.

When bonding to porous surfaces, adhesion can be improved by priming the substrate with Visqueen HP Tanking Primer which should be allowed to dry. However, compatibility should be ensured between primer and substrate before application. If in doubt, contact Visqueen Technical Support before application.

Visqueen High Performance Fully Bonded Vapour Barrier should be laid by peeling back the protective release paper and applying the adhesive face onto the prepared surface.

All lap joints should be a minimum of 75mm and well rolled with firm pressure, using a lap roller to ensure complete adhesion and continuity.

Damaged areas should be repaired by patching with an oversize piece of the same material. Ensure the surface is clean and dry prior to application of the patch. Extend minimum 75mm beyond the damaged area and roll firmly with a lap roller to ensure complete adhesion and continuity.

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PRECAUTIONS

Visqueen Vapour Control Layers are classified as non-hazardous when used in accordance with BS5250: 2002.

Care should be taken to avoid accidental damage when handling the membranes on site. Membrane installation is not recommended below 5°C.

Visqueen Vapour Control Layers are not intended for use where they will be exposed for long periods of outdoor weathering.