

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.

