



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.

