



Exposure to radon gas claims thousands of lives each year, yet many employers aren't doing enough to assess this invisible hazard that could be accumulating in their workplace

## A killer in your midst

**A naturally** occurring radioactive gas, radon is a primary concern for those involved in property management. The gas is formed during the decay of uranium in the ground, and when it permeates into open air it is quickly diluted to harmless concentrations. If, however, it rises into a building high concentrations can accumulate, posing a serious threat to the occupants.

When concentration of the gas is high, the radioactive decay products quickly attach themselves to particles in the air, which are then inhaled by the building's occupants. The particles can then be deposited in the lungs, where they continue to emit radiation. Each year in the UK approximately 2,500 people die from lung cancer, developed as a direct result of exposure to radon. The gas accounts for the second greatest number of lung cancer cases in the UK, second only to smoking.

### Assessment

Given the serious consequences that could result should an individual be exposed to high levels of radon, legislation is in place to help eliminate such exposure.

Under the *Management of health and safety at work regulations 1999*, employers must assess all risks posed to their staff. If a workplace is either in a government designated "radon affected area", or has a basement or other area beneath ground level where employees spend a significant amount of time, an assessment of radon exposure must be made.

The only way to assess the presence and level of radon in a building is to test. A specialist detector should ideally be left in place for a three-month period, before being sent to a laboratory for analysis. Radon levels fluctuate according to seasonal and occupational variation (eg, amount of ventilation

through opening windows) therefore a three-month period is the length of time recommended to take such variations into account.

The HSE, which is responsible for enforcement of legislation requiring radon testing, make unannounced visits to workplaces in a bid to crack down on employers who have failed to properly assess this risk. Similar requirements are placed upon landlords, who hold a duty of care towards their tenants, whether domestic or commercial.

### Testing

These regulations are only enforceable for workplaces situated in a designated affected area or with below-ground workspaces. However, as testing is an inexpensive and unobtrusive procedure that has the potential to prevent future cases of a life threatening disease, all employers are encouraged to take a proactive approach and test for the gas. Affected area status is only based upon estimates, and does not provide a definitive answer as to whether any individual property will contain high levels of radon or not.

Radon concentration is measured in becquerels per cubic metre of air (Bq/m<sup>3</sup>), and an "action level" of 400 Bq/m<sup>3</sup> has been set by the government as the point at which remedial action should be taken in workplaces. In the home, the action level is 200 Bq/m<sup>3</sup> as most individuals are likely to spend more time in the home than anywhere else.

It is important to note that the action level does not represent a boundary between safety and danger, but simply a guideline as to the level at which the government believes the hazard posed has become unacceptable and measures should be taken to reduce it. An individual who spends eight hours per day in a building with radon levels of 400 Bq/m<sup>3</sup> will receive an annual radiation dose equivalent to that of more

than 200 chest x-rays. Many believe the action level should be lowered.

If high levels of radon (above 400 Bq/m<sup>3</sup>) are found in a workplace or rented building the employer or landlord is required under the *Ionising Radiation Regulations 1999* (IRR99) to either reduce the hazard or treat the building as a radioactive space, which in practical terms means taking it out of use. In the vast majority of cases, the only realistic choice is to reduce radon levels, which can be done at a relatively low cost and with minimum disruption.

### Expertise

In the absence of a proper understanding of the science of radon, well intentioned but uninformed measures can make the problem worse, rather than better.

Radon is drawn into buildings through a process called advection; the pressure inside a building is normally lower than outside, so gases from the soil are literally sucked in. Increasing ventilation, particularly through the use of extraction fans, can lower the pressure inside the building further, thus escalating the rate at which radon is drawn in and increasing its concentration.

This highlights not only the need to use a specialist contractor, but also the essential requirement for radon testing after measures have been taken, as without this, it will be impossible to know if the actions have been effective or indeed detrimental. Radon mitigation is a specialist and potentially life-saving area of building management, where training and sophisticated accuracy are imperative to its success. It would be unwise to place this responsibility in the hands of a general contractor. **FM**

**Martin Freeman is managing director of specialist contractor ProTen Services**

### FM QUICK FACTS

- Employers and landlords must test for radon if their property is in a designated affected area or contains below-ground work or living spaces



- If the workplace action level of 400 Bq/m<sup>3</sup> is exceeded, IRR99 is applicable

- Reducing radon concentration is a specialist activity, and should never be undertaken by an untrained general contractor