



Welcome to the 71st issue of the *Environmental Radon Newsletter*. The newsletter was established in 1994 aiming to inform those working in the radon industry about news, developments and projects within the sector.

We hope you continue to find the newsletter interesting and informative. As always, we are happy to hear any thoughts and views you may have about the newsletter. If you have any comments please contact the editor Daryl Dixon, daryl.dixon@phe.gov.uk.

New Scottish testing begins

Hundreds of households across Scotland's central belt have been offered free radon tests. A testing programme funded by the Scottish Government, across East Lothian, East Renfrewshire, Falkirk, Midlothian, South Lanarkshire, The City of Edinburgh and West Lothian, kicked off in late August.

All these areas were identified as having high radon potential for the first time by new mapping techniques used in the 2011 radon map of Scotland. The Health Protection Agency (whose functions transferred to Public Health England in April) produced the radon map in collaboration with the British Geological Survey.

Updates on the two-year programme will be provided in future issues.

Building regulations – updated guidance on radon

Under part C of the Building Regulations 2010, *Approved Document C* provides guidance on where protective measures should be installed in new buildings and extensions in high radon areas of England. This is based on radon maps produced by the HPA and the British Geological Survey.

The Department for Communities and Local Government issued a circular letter recommending use of the 2007 radon maps as good practice. The guidance in *Approved Document C* has been updated so it now refers

directly to the 2007 maps, which remain current.

Radon potential assessments for large property portfolios

The PHE online postcode search for radon risk has been supplemented by a new service for those who need to check large numbers of addresses. This service is provided directly through the PHE radon office rather than online and is intended for employers and landlords with large or complex property portfolios who wish to be sure they have the best information. Using the postcode in a spreadsheet of addresses supplied by the client, we can search cost effectively through large numbers of properties and identify any that should be tested.

If interested, please contact the radon office on 01235 822622 during office hours.

Website rebuilding in progress

A redesign of our **UKRadon** website is under way. It aims to provide relevant and accessible information on core topics and is being reorganised to focus strongly on the interests of the main user groups – public, employers, councils and professionals. Over the coming months the website will be updated and refreshed to reflect our move into PHE. When complete the new-look site will be easier to use, appear brighter and will also have some increased functionality.

Radon rights

What are the radon action level and target level?

And what is the difference?

These are questions that you may have asked yourself or have been asked.

The action level is 200 Bq m⁻³ and the target level is 100 Bq m⁻³.

If, upon completing a three-month radon measurement, the result is 200 Bq m⁻³ or greater, we would advise action to reduce the level of radon, ideally to below the 100 Bq m⁻³ target level. This applies only if you have previously tested above the action level and so have taken steps to reduce it **OR you fall into a high risk group, for example you are a smoker.**

We would like all remediated properties to be below the 100 Bq m⁻³ target level.

If you have any questions that you are asked frequently, or questions to which you struggle to find an answer, please email me at

nicky.hutt@phe.gov.uk

I will reply with the answer and, to help other readers, the question and answer may feature in a future issue of the newsletter.

Measuring radon in large buildings

The aim of radon measurements in buildings is to assess the exposure of the individuals living or working inside.

In the home, irrespective of size, a test is undertaken by measuring the rooms that are most used by the occupants. The test is carried out using two detectors: one in the living area and one in an occupied bedroom, which is sufficient for comparison with the action level for radon.

In the workplace, the situation is made more complex as these buildings may be large. In addition, workers may occupy rooms on different floors, for different times and for different reasons.

PHE has developed a simple guide for employers who want to undertake testing to comply with health and safety requirements. The guidance is available to download from

www.ukradon.org/article.php?key=radonworkplace

The information on the number of detectors needed is also incorporated into an online tool when detectors are ordered through our dedicated radon website www.ukradon.org. The reference table from the guide is reproduced below.

| Workplace type* | Number of monitors | Examples |
|---|--|--|
| Office, individual or small | 1 per 100 m ² , generally corresponds to between a third and a half of all ground-floor rooms | Banks Shops Professional practice |
| Open plan office, and retail or workshop up to about 1000 m ² , also public access areas | 1 per 250 m ² | Administrative and call centres Light industry Hotels Schools |
| As above, up to 5000 m ² | 1 per 500 m ² | Large retail, etc |
| Very large areas | 1 for each distinct area with obviously different environmental conditions At least 1 per 1000 m ² | Manufacturing or process plant Warehouses |
| Basements | 1 in each separate room, section or area, irrespective of size Even if rarely used, changes in procedures might increase exposure | Retail, bank and professional storage areas |
| Wholly underground | As a guide, at least 1 in each main working area, and other normally occupied areas, but the employer should seek specialist advice | Water industry Mines and caves |

* **Effect of ventilation** – in principle, radon may be prevented from accumulating in premises with a particularly high influx of fresh air, but a measurement is still required unless a risk assessment can show that the radon level at a particular location is necessarily low at all times when it is occupied. Furthermore there will often be adjoining or linked places, such as an office, store or computer area, with quite different conditions where a measurement might be required

Useful points of contact

PHE Radon Group contact details are given on page 4

UKRadon provides general information on radon and details of PHE radon services, including radon risk reports for individual properties in the UK

For a risk report where there is no valid postcode, the building footprint is larger than 25 m in any direction or for plots of land, visit <http://shop.bgs.ac.uk/GeoReports/>

BRE (Building Research Establishment)

E: radon@bre.co.uk
www.bre.co.uk/radon

Health and Safety Executive
www.hse.gov.uk/radiation/ionising/radon.htm

Northern Ireland Environment Agency
E: ipri@doeni.gov.uk
www.doeni.gov.uk/niea/pollution-home/radiation/radon.htm

Welsh Government, Directorate of Sustainable Futures
wales.gov.uk/topics/housingandcommunity/housing/publications/radon

Scottish Government, Health Protection Team
Public Health Division, Area 3EN
St Andrew's House, Regent Road, Edinburgh EH1 3DG
T: 0131 244 2164

The Radon Council Ltd
E: admin@radoncouncil.org
www.radoncouncil.org

A list of laboratories validated by PHE for radon measurements in homes remains available at www.hpa.org.uk

Current radon projects

Readers will be familiar with many of our radon activities, which include the measurement services for homes and workplaces, and producing maps of radon potential (with the British Geological Survey). To underpin our advice, we also have a number of initiatives that investigate both the science and the service we provide to customers. A flavour of some of the current projects is given below.

We are investigating whether householders of new homes that have been built with radon protection are aware of what this means. Ideally, these new homes should also have radon measurements to find out just how effective the 'radon proofing' has been.

Being able to install simple and effective radon remedies is one of our primary objectives. We are working with the Building Research Establishment to see how effective passive (ie no fan) mitigation systems can be in real buildings.

Although most householders are concerned with whether their radon levels are below 200 Bq m⁻³, we have measured more than 10,000 Bq m⁻³ in a few homes. We provide additional support for these people, working with local councils and other public health colleagues, and helping to make sure that appropriate mitigation works are installed.

PHE works across the whole UK on radon and radiation protection. We are working with the Scottish Government and local authorities to offer free radon measurements to householders in recently identified Affected Areas within the central belt of Scotland. In addition, we are preparing the next phase in England, which will again be aimed at collaboration with local authorities in higher radon areas.

Buying and selling houses is one of the most stressful activities people undertake, and having a high radon potential plays its part. We are working with the Law Society to make this part of the process as smooth as possible.

A programme in schools started in 2009 to raise awareness and encourage measurements, in particular for English councils that might not be aware that radon could be a problem in their areas.

We issued advice in 2010 concerning the use of the action level in workplace buildings where members of the public spend more than 2000 hours in a year and in all schools. We have been working to assess what this means in practice for employers and how best practice can be established.

Employers are advised to monitor occupied basements regardless of the radon potential of the buildings above. However, questions have been raised over the threshold for 'occupied'. We have analysed the radon levels according to the mapped potential and will be reviewing our current advice.

Of course, these projects are at different stages. Some are nearing completion and their results will be published soon, while others are very much at the discussion and investigation stage. What is clear, however, is that even after three decades, the radon work is continuing in many areas and there is much more still to do.

What is radon?

You cannot see it, smell it or taste it, but radon is all around us. It is a radioactive gas formed by the decay of uranium in all rocks and soils. Levels of radon in outside air are low as it is able to dilute and disperse; however, when it accumulates within a building, action may be needed, as long-term exposure to raised levels can increase the risk of lung cancer.

We are all exposed to radiation from a range of natural and man-made sources. Just 20 Bq m⁻³ (the average level in UK homes) provides half the annual exposure to radiation from all sources. Higher radon levels give higher exposures: this is why it is important to measure the levels in homes and workplaces.

The amount of uranium in rocks and soils varies; in some parts of the UK the concentration of radon is likely to be small, these are classed as 'Non-Affected Areas' and are the white areas on the radon maps. If a test is carried out in a property in one of these areas, the likelihood of finding high levels is less than 1%. The coloured areas on the maps are radon 'Affected Areas', where homes are much more likely to have high levels. Testing properties in these areas is advisable, as once it is known a property has elevated levels, steps can then be taken to reduce them.

To view the current maps of radon, complete an address search, order a measurement or see remediation advice, please visit www.ukradon.org.



Correct use of radon detectors

The reason for using etched track detectors in a home or workplace is to obtain an accurate assessment of the exposure of people to radon gas. To do this accurately correct placement of the detectors is vital.

The rules for the correct use of the etched track detectors are basically the same for both workplaces and homes. The detectors are recording all the time, so they should be removed from the packaging as soon as they arrive and be placed according to the labels on them. For homes this will be a living area and bedroom that are in regular use; for workplaces this will be according to the agreed scheme.

Measurements normally take three months, so it is best if a diary note is made when they are placed and when they need to be returned. It is very easy to forget that the detectors are

there and need to be returned at the end of the measurement period.

The sensitive material in the detectors can be affected by heat. This will adversely affect the results and the detectors will not give an accurate measurement of the true radon concentration. Heat sources that may have this effect on the detectors include radiators, hot pipes, electrical equipment (eg televisions or VDUs)

and direct sunlight. The detectors should be placed away from these items to prevent this.

The radon concentration in a room is not uniform – it may be lower next to a window, door or ventilation grille where there is a draught bringing in outside air. These spots should be avoided.

means that a repeat measurement will be necessary, introducing extra cost and delay. It is best therefore if the detectors are kept away from inquisitive children or playful pets.

It can be tempting to attach the detectors to surfaces such as walls using materials such as sticky pads or Blu Tack™.

This should be avoided as damage to the labels may be caused, resulting in possible confusion and a delay in processing the results.

If measurements are required in areas of particularly high

humidity, standard detectors should not be used. Moisture can enter these detectors and condense, preventing them from measuring correctly.

Etched track detectors offer a simple and robust method for measuring radon in homes and workplaces. Although they are not infallible, by following some basic rules the measurements can be carried out with minimal processing delays and little or no need for repeat measurements.



Also, because radon normally enters a building through cracks in the floor, it is best to avoid placing the detectors at a very low height, as this may cause them to return an inaccurately high reading, possibly leading to unnecessary remedial work.

The detectors are designed to be tamper proof; if opened a detector is likely to be damaged and it will not be possible to produce a valid result. This

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