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Radon in the Workplace

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What is radon?



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What is radon?

- It is actually a naturally occurring radioactive gas
- Discovered in the 20th Century when chemist and physicist Ernest Rutherford verified radium emitted a gas – ‘radon’ which qualified as a new element



Where does it come from?

- Originates from uranium that occurs naturally in many rocks, soils, bricks and concrete



Uranium Ore

Where can it be found?

- The highest radon concentrations can be found in spaces that are either wholly or partially below ground, eg:
 - Basements and cellars
 - Caves and mines
 - Buildings built into an embankment



Where can it be found?

- In addition, ground floors of buildings with poor ventilation or high temperatures may also be a problem



Legal requirements

Employers have general duties to manage radon:

- Health and Safety at Work etc. Act
- The Management of Health and Safety at Work Regulations

In addition, specific duties apply:

- Ionising Radiation Regulations

Why is radon a problem?

Radon is a problem because:

- It can't be seen – it is colourless and odourless
- It can seep out of the ground and build up in houses and workplaces
- Levels can vary daily / seasonally:
 - Temperature differences
 - Reduced ventilation
 - Central heating

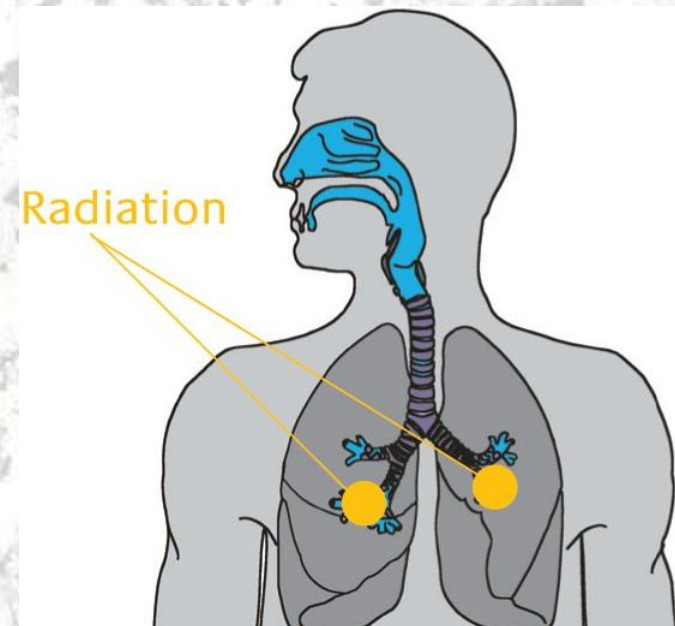


Effects of radon

As a general rule radon gas breathed in is immediately exhaled and presents little hazard

However:

- Some radon decay products may become lodged in the lungs and airways
- Long term exposure to high radon concentrations increases the risk of lung cancer
- Health studies show radon is responsible for 3-5% of all lung cancers



Putting it into context

People may panic when they hear the word 'radioactive'

However, to put it into context:

- Radon levels are lower in the UK than many European countries
- Some workplaces have levels of 17,000 Bq m⁻³
- Half of the radon associated deaths occur among the quarter of the population who are current smokers
- It is mainly lungs that are exposed to and damaged by radon. There is no consistent evidence that radon causes cancers elsewhere, or other harm

What do I need to do?

Managing radon

To comply with legislation you must:

- Identify radon affected areas
- Assess the risk of exposure to radon
- Put in place controls to manage any risk
- Inform anyone who may be affected

Assessing radon risks...

- You could pay a consultant to identify radon affected areas



Alternatively!

IDENTIFY POTENTIAL RADON AREAS

- Search **Radon UK** (from the Health Protection Agency (HPA)) to identify radon areas by postcode
- Utilise local knowledge to identify areas wholly or partially below ground

UKradon - *The UK reference site on radon, from the Health Protection Agency*

Alternatively!

ASSESS THE RISK

Once potential radon areas have been identified, assess the risk by taking into account:

- The extent the area is below ground
- The room use
- How long the room is used for
- Room temperature ie is it very hot
- Ventilation sources



Alternatively!

MEASURING RADON

- Once you have identified 'at risk' areas you must take radon measurements
- Purchase radon monitors from the HPA, which are hollow plastic shells containing clear plastic that records the damage caused by radon



A monitor, which is completely inert and harmless

Alternatively!

MEASURING RADON

- On receipt of the monitors, place them immediately following the instructions provided in the radon identified areas
- After 3 months, collect the monitors and return to the HPA
- Wait for the results



Alternatively!

ANALYSE THE RESULTS

- The HPA results are very easy to follow
- Cross reference them against the Ionising Radiation Regulations action level for workplaces of:

400 Bq m⁻³

Alternatively!

IF A RESULT EXCEEDS THE ACTION LEVEL

- Contact the Health Protection Agency and they will advise you on what action you should take



Alternatively!

SIMPLE SOLUTIONS

- Appoint a single point of contact for radon
- Change the room use eg storage room
- Restrict access so only authorised persons can enter the area
- Set up logging systems so you know who is going into the room and for how long
- Improve ventilation eg Vent-Axia fans, make sure windows can be opened
- Control temperature eg put in place thermostats so rooms don't get too hot, maintain equipment so it doesn't overheat
- Ensure change of room use / modification are reported to the Appointed Person

Monitor

As with all risk assessments, they should be kept under review. The HSE recommend the following monitoring periods:

- Where significant changes are made to the fabric of a building or the work carried out in it
- Once every 10 years where radon levels were found to be significantly less than 400 Bq/m³
- Less than 10 years where radon levels were just below 400 Bq/m³
- Significantly more frequently where radon levels above 400 Bq/m³ were found and where measures were taken to reduce exposure eg engineered systems or occupancy restrictions

Still worried?

If you are still worried about radon contact:

- The Health Protection Agency
- HSE Specialist Inspector who deals with radiation issues which includes radon