



Environment Matters

Radon

Edition No. 1 January 2000

This estimate doesn't have the same legal force as a written quotation. A quotation commits the builder to do the job at a certain cost or rate. An estimate is an approximate guide that helps you to budget but does not commit the builder; of course you may find his or her costs come in lower than the estimate.

- **Some builders have trained or worked on radon reduction**
The Radon Council list builders who are experienced in radon work.
- **You can get professional advice**
Even if you cannot find a builder experienced in this kind of work, high quality workmanship and good materials are the essential foundations of successful work. An architect or quantity surveyor can advise you on the quality of local builders' work, help you to draw up a contract, assess the quality of work and ensure that the final sum you are charged is right for the work done.

Can I get grant to help pay for the work?

In some cases grants are available, and loans are possible:

- the building societies have agreed in principle to provide loan finance for radon work, subject to the applicant's status;
- if you cannot afford to pay for the work, discretionary 'house renovation' grants are available from the Northern Ireland Housing Executive. The NIHE will assess your eligibility and will determine how much, if any, of the cost you will have to pay.

For information about discretionary grants contact your local NIHE Grants Office.

Do I need permission to carry out the work?

- **If you own your house but have a mortgage**
you may need the lender's permission before carrying out these changes to the house. Your lender will be able to tell you what the mortgage agreement says and you should check this before starting work.
- **If you are a tenant**
you will need to discuss the work with your landlord before you start. You may be able to carry out some of the jobs yourself, but others, especially if they affect the building's structure, might have to be carried out by the landlord.
- **Planning permission or Building Control approval**
are not usually necessary for small radon reduction jobs (unless you are making bigger changes at the same time). Your district council's Building Control Officer can give you the advice you need. However, if your house is a listed building, or in a designated area of outstanding natural beauty, or a conservation area, you may need permission for any work that alters its external appearance. Check with the Planning Service in your local area.
- **What should I do if I am buying or selling a house?**
The Environment and Heritage Service has published a booklet dealing with these issues: Radon – a guide for homebuyers and sellers.
- **Might there be radon in my workplace?**
Radon can affect workplaces and public buildings in the same way as houses. In buildings where radon is above an allowed level, employers have legal responsibility to ensure their workers' safety. If you have concerns, you should take them up

with the employer; you can get more advice from the Health & Safety Inspectorate or the Environmental Health Department of your district council. BRE published a guide to radon in the workplace, Radon in the workplace.

It is always better to know

If anyone is worried about Radon possibly affecting their home it is always better to have the test done on your property. (Approximate cost £36, the relevant testing agency can confirm the exact cost.) Written confirmation will be sent by the testing agency to you the householder of the exact level of Radon in your home. This information is strictly confidential. While EHS receives information on the levels of Radon in households within Northern Ireland this information is not presented in the form of an address or name.

The contact address and telephone number for further information is:-

Industrial Pollution and Radiochemical Inspectorate
Calvert House, 23 Castle Place
Belfast BT1 1FY
Telephone 028 9025 4773 or
028 9025 4706

Where the following publications can be obtained free of charge:-

- Radon:** A householder's guide
- Radon:** A guide to reducing levels in your home
- Radon:** A guide for homebuyers and sellers
- Radon:** You can test for it.

Advice can also be sought from the Local Environmental Health Officers of your local district council and in the case of work premises, schools etc from the:-

Health and Safety Inspectorate
83 Ladas Drive, Belfast
Telephone: 028 9025 1337

What is radon?

Radon is a natural radioactive gas. We have always received doses of radiation from it and always will.

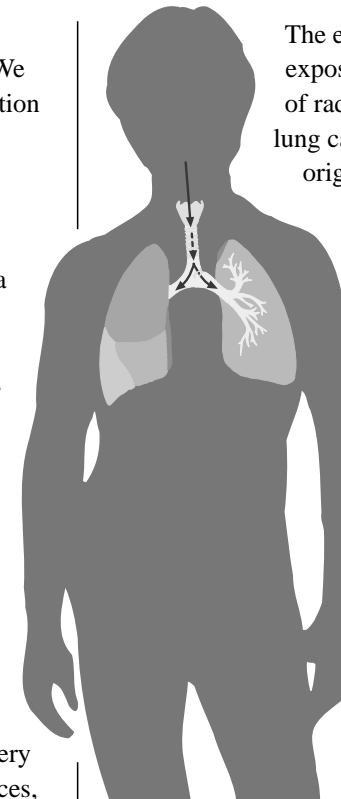
Where does radon come from?

Radon comes from the radioactive decay of uranium. Uranium acts as a permanent source of radon and is found in small quantities in all soils and rocks, although the amount varies from place to place. It is particularly prevalent in granite areas. However, radon levels vary not only between different parts of the country but even between neighbouring buildings.

Radon in the soil and rocks mixes with air and rises to the surface where it is quickly diluted in the atmosphere. Concentrations in the open air are very low. Radon that enters enclosed spaces, such as houses, can reach high concentrations in some circumstances.

How might radon affect me?

Not everyone exposed to high levels of radon will develop lung cancer, and many years may pass before the disease becomes apparent. Lung cancer caused by radon is indistinguishable from that caused by other factors, including cigarette smoking. However, there is evidence to suggest that the risk of developing the disease from radon is greater for smokers than non-smokers.



The evidence linking exposure to high levels of radon and increased lung cancers came originally from studying the health of underground miners and is supported by tests on animals. For most people the risk from radon is insignificant compared to the other risks of everyday life, such as fatal accidents indoors.

However, some houses in some parts of the country have levels of radon comparable to those found in some mines and therefore the risks are greater.

The potential risks of contracting lung cancer from exposure to radon are calculated over a life-time. The increased risk is about ten times greater for smokers than non-smokers. The risk of contracting lung cancer, after a lifetime of exposure to radon at the Action Level, is about 30 in 1,000 for the general population.

The Government's current radon programme was designed to tackle the known health effects of an increased lifetime risk of contracting lung cancer, but any reduction in people's exposure to radon will also reduce the possible risk of contracting other cancers, should that risk exist.

The table below gives some idea of how radon risk compares with other risks when radon is at the average background level found in the UK which is 20 Bq/m³ – that is, 1/10 of the Action Level.

Table
Lifetime risks of death from common causes (UK average for smokers and non-smokers)

	Per 1,000
Fires and flames	1
Pedestrian accidents	3
Background radon level in houses	3
Indoors accidents	8
Lung cancer	60
All cancers	250



Environment and Heritage Service
Directorate and Corporate Affairs
Commonwealth House
35 Castle Street
BELFAST BT1 1GU
Telephone 028 9025 1477
Fax 028 9054 6660

Environment and Heritage Service
Built Heritage
(Including Monuments & Buildings Record)
5-33 Hill Street
BELFAST BT1 2LA
Telephone 028 9023 5000
Fax 028 9054 3111

Environment and Heritage Service
Environmental Protection
Calvert House
23 Castle Place
BELFAST BT1 1FY
Telephone 028 9025 4754
Fax 028 9025 4700

Environment and Heritage Service
Natural Heritage
Commonwealth House
35 Castle Street
BELFAST BT1 1GU
Telephone 028 9025 1477
Fax 028 9054 6660



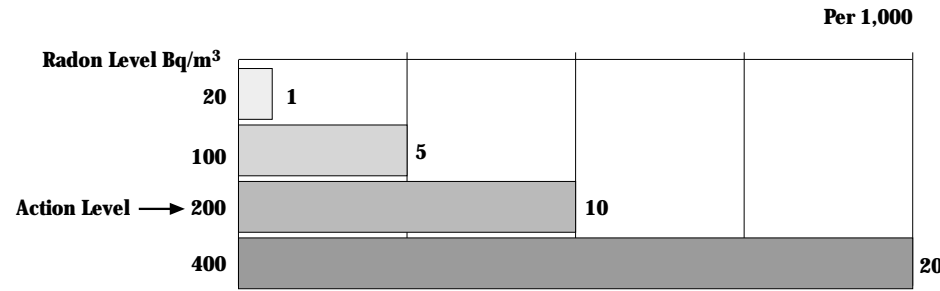


This table shows that, for example, you are more likely to die as a result of an accident indoors, than from lung cancer caused by the background level of radon.

As the radon concentration increases, however, the risk of lung cancer increases.

'Lifetime risk' is of course a long-term hazard. Radon risk is a gradual one, and when taking steps to reduce it, it is far better to plan carefully than take the wrong precautions.

Table 2
Lifetime risk of lung cancer potentially induced by radon (for non-smokers)



Radon affected area

The risk of developing lung cancer increases as the level of radon and the duration of exposure increase. Radon levels indoors vary considerably during the day, from day to day and from season to season.

It is the average level which is important: short exposures to high levels will not be important for health if the average exposure over a long time is low.

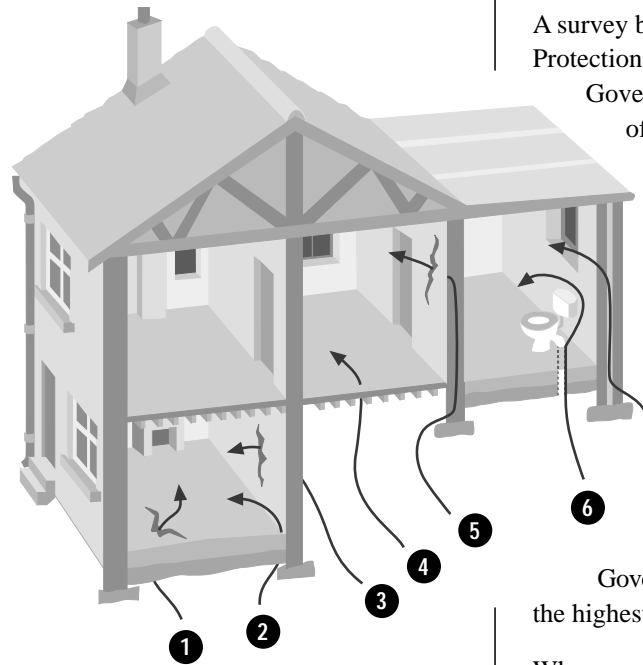
Because of this, you should take no action to reduce radon levels until the average has been measured over a fairly long period normally three months.

There is a recommended Action Level for radon in existing homes, above which you should take action to reduce it. The Action Level is set at an average radon concentration of 200 Bq/m³ over a year.

If the estimated average radon level in your home is above the Action Level you should take action as soon as possible.

How does radon get into my home?

Radon can be drawn in from the soil through cracks in concrete or wooden floors, through gaps around pipes, cables, drains and so on. Some building materials contain small amounts of uranium and can release small amounts of radon.



1. through cracks in solid floors
2. through construction joints
3. through cracks in walls below ground level
4. through gaps in suspended floors
5. through cracks in walls
6. through gaps around service pipes
7. through cavities in walls

BUILDING REGULATIONS

Building regulations and radon

Since 1994, the Building Regulations have required measures to be taken to prevent or limit the ingress of radon into any new dwelling in certain areas. The regulations also apply to any extension to a dwelling where the ground floor area of the extension is greater than 30m².

The Building Regulations for radon do not apply retrospectively to any existing dwellings nor to dwellings which had received approval before 28 November 1994 when the regulations came into effect.

If you want to know whether or not a dwelling incorporates radon protection measures the Building Control Department of your district council will be able to help. They will also be able to show you a map defining the areas where Building Regulations for radon apply.

TESTING

How do I know if my home has a high radon level?

A survey by the National Radiological Protection Board (NRPB), the Government's advisers on matters of radiation protection, has shown that the majority of homes in the UK do not have significant radon levels. In certain areas, however, high levels do occur, and many people in these areas have had their homes monitored; others are currently having radon measurements. These surveys are being carried out for the Government to identify homes with the highest levels.

Wherever you live, if you are worried that your house may have a high radon level, you should arrange for a survey to be carried out.

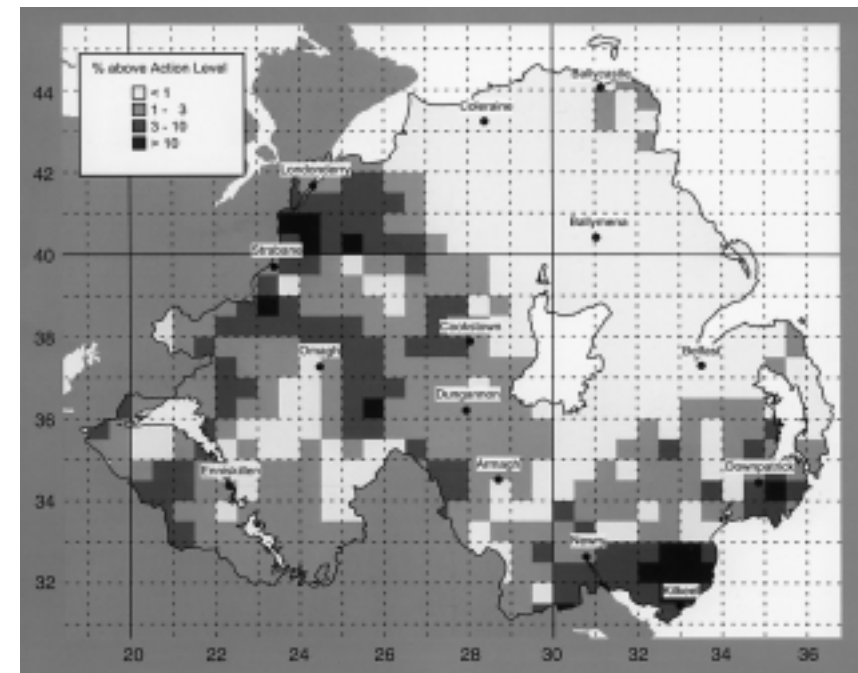
Your chosen testing Agency will send you two small detectors, one for the living room and one for an occupied bedroom. The detectors contain special plastic to measure radon and are harmless. They

are returned after three months for processing.

This may show that there is a high radon level, and action to reduce it will be advised, or it may show that there is a low level and no further action is necessary. In some cases further measurements to make a more accurate estimate of the radon level in your home may be required.

The results of measurements by the NRPB in the course of the Northern Ireland Radon Survey have been given in confidence to the householders concerned. Only the NRPB and the Department of the Environment for Northern Ireland will have access to individual results.

Results to date have identified the following distribution of Radon in Northern Ireland:-

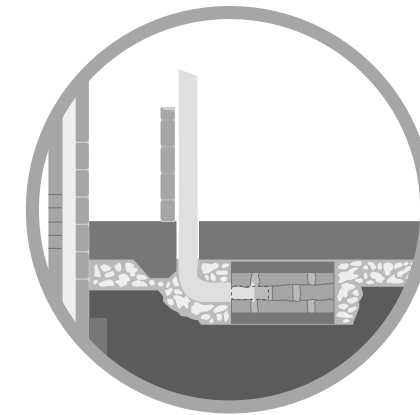


Five ways to reduce radon

It is best to stop radon entering a house or, if that is not practical, to remove it if it gets in. The aim in both cases should be to reduce indoor radon levels to significantly below the Action Level. There are five main ways to achieve this. Depending on the kind of house you live in and the amount of radon reduction you need to achieve, you can discuss the five ways with your builder – then find the one that best suits you, your house and your radon level.

The choices are to:-

- (a) install a radon sump system; or
- (b) improve ventilation under suspended timber floors; or
- (c) use positive ventilation in your house; or
- (d) seal cracks and gaps in solid concrete floors; or
- (e) change the way your house is ventilated.



Finding a builder and drawing up a contract

There is nothing complex about the methods used to bring radon to below the Action Level, and so a local builder that does good quality work should have no problems carrying out the work. But because widespread knowledge of the risks posed by radon is quite new in some parts of the country, builders may not have worked on radon reduction before.

Further expert advice is available to help you and your builder. The National Radiological Protection Board (NRPB) advises on health risks posed by radiation and how to guard against them. The Building Research Establishment (BRE) has developed practical advice about how building work can reduce radon levels to within safe limits. The Radon Council Ltd, an independent trade association, keeps a list of companies experienced in radon reduction work. Addresses and other information available are listed at the end of this booklet.

The following points are useful when you are looking for a builder:

- **You can draw up a lump sum contract**
Many people employ builders to do minor jobs without professional advice and radon work need be no different. The best plan is to write down in advance the work you need doing. Then get at least three written quotations from different builders, asking them to quote on a 'lump sum' basis. This means their price will include everything they think necessary to complete the job as you have described it. It won't include unexpected costs (for things they could not have foreseen, such as discovering dry rot in floor joints), but these aside you will be reasonably sure of the final cost of the work.

- **You can draw up a time-and-materials, or dayworks contract**
If you cannot write down an accurate list of what needs doing, because you don't yet know how much work it will take, a lump sum contract will not be possible. (For example if you need to seal the floor, you may not know how much work needs doing until you take out all the furniture and remove all the carpets and skirting boards.) In this case you could get the builder to quote an hourly rate for labour and a rate for the supply and fixing of materials (for example, so many pounds per metre for sealing edges of floors, so many pounds for sealing around service pipe), and also ask for an estimate of overall cost.