

## What Is Radon?

**Radon is a tasteless, odorless, invisible gas that occurs naturally throughout the earth's crust.** It is a by-product of the breakdown of uranium in the soil, rock, and water. Over time, uranium will decay into lead. This process has fourteen steps, and radon is formed at the sixth step. This is especially unique, in that it is the first of the decay products which is a gas, not a solid.

**Radon is found in every state in America.** Radon gas typically moves up through the ground to the air above, and can enter your home through cracks or other openings in your foundation. Radon which escapes into the air is not a problem, since it is quickly diluted. However, radon gas that enters your house can remain trapped there, especially during the winter months when windows and doors are kept closed.

## How Does Radon Enter Your House?

**As radon gas moves up through the soil, it can be drawn into your home through air pressure differences.** The air pressure inside your home is usually lower than the pressure in the soil around the foundations and basement floor slab. Any home can have a radon problem - new or old, well sealed or drafty, with or without basements.

Because of this difference in air pressure, your house acts like a giant vacuum, drawing radon gas in through any opening in the foundation or basement floor.

**Radon may also be present in well water,** and can be released into the air in your home when water is used for showering and other household uses.

In most cases however, radon entering the home through water is a small risk compared to radon entering your home through the soil.

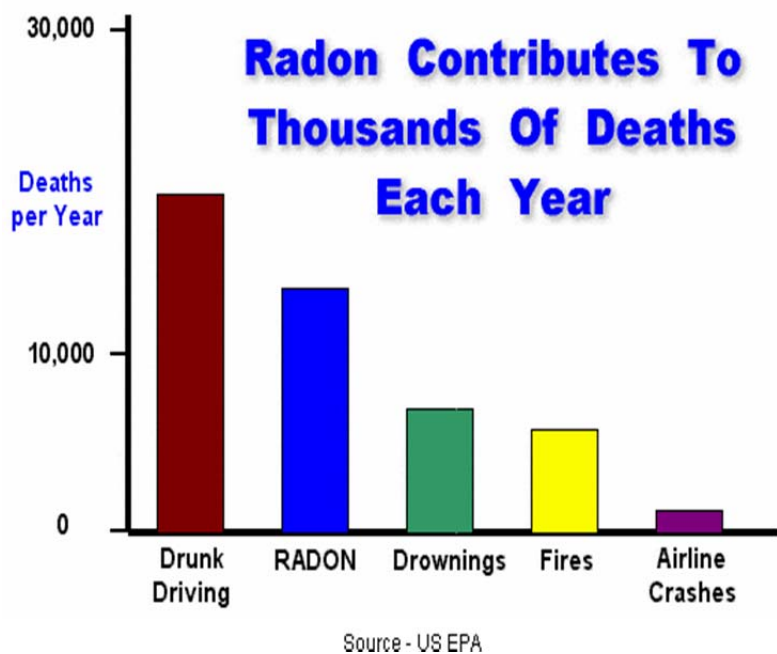
## What are The Health Risks?

**Radon is a cancer-causing, radioactive gas.** It is classified as a class-one carcinogen, which is a proven cancer-causing agent. The radioactive decay products of radon gas, can attach themselves to lung tissue when radon gas is inhaled. Since radon has a 3.8 day half-life, it is likely that when a radon atom is inhaled it will be exhaled again before it decays. However, as the radon concentrations increase, the quantity of radon gas that has the potential to decay while still inside your lungs also increases, thereby resulting in a greater health risk.

**Alpha radiation emitted during the decay process presents the most significant risk to humans.** The energy released by alpha particles can cause permanent damage to DNA tissue in the lungs. Most of this damage can prevent further cell division, and eventually the cell will die. Small children are especially at risk.

The level at which action should be taken to reduce radon levels in your home is in dispute, in some circles. In the United States, Congress has set a long-term goal that indoor radon levels be no more than outdoor levels - or about 0.4 pCi/l (picocuries of radon per liter of air). The average indoor radon level in the United States is estimated to be about 1.3 pCi/l. While the EPA advises that no levels are safe, it recommends fixing your home if the radon levels are found to be 4.0 pCi/l or higher. This is often called the "action level". Some other developed countries have action levels of 6.0 -10.0 pCi/l, or greater.

Whichever side of the debate you find to be more credible, **there can be no argument that high radon levels pose a significant health risk.** When life safety issues are at stake, often times the **safest course** is the **best course.**



The Surgeon General has warned that radon is the second leading cause of lung cancer in the United States - only cigarette smoking causes more lung cancer deaths. If you smoke and your home has high radon levels, your risk of lung cancer is especially high.

Your family's risk of developing lung cancer from radon depends on the average annual level of radon in your home, and the amount of time you spend there. The longer your exposure to radon, the greater the risk (especially for young children and smokers).

## Radon And Home Sales

### If You Are Buying An Existing Home

The EPA recommends that you obtain the indoor radon level of a home you are considering buying. Ask the seller for radon test results. If the seller has a radon reduction system installed, ask him for information about the system (i.e. Who installed it? , What were the before and after radon levels? , etc.).

If the home has already been tested for radon, you can decide to either accept the test or have a new one performed. If you decide to accept the seller's test, be sure that the test was performed by an individual who is qualified to do so (successfully completed the EPA Radon Measurement Proficiency (RMP) Program, and/or certified by the National Radon Safety Board). This will help to assure you of the accuracy of the test results. You should ask the seller for the following:

- **The results of the previous test.**
- **Who conducted the test.**
- **Where, specifically, in the house was the test taken.**
- **Have any structural changes been made to the house since the test was taken.**

If the home has not yet been tested for radon, make sure that a radon test is done as soon as possible. You should make this a part of the "full inspection contingency", in your contract with the seller. You should consider including provisions in the contract specifying:

- **Who should conduct the test.**
- **What type of test to do.**
- **When to do the test, and for what duration.**
- **How the seller and buyer will share the test results, and if necessary the costs of radon reduction.**

**For accuracy**, always try to utilize the services of a trained, qualified, professional to take the radon measurements.

## If You Are Buying A Newly-built Home

**New homes can be built with radon resistant features** that minimize radon entry and allow for easier radon reduction, if high levels should be determined to exist. These features cost much less to install during the construction process, than if added to an existing home later. As a matter of fact, some municipalities and states are considering adopting radon resistant construction features as a part of their building codes.

**Contact your builder** and ask him to incorporate radon resistant technology into your new home, as it is being built. Information about this type of construction is readily available from most State Health Departments, Local Health Departments, and the US EPA.

## If You Are Selling Your Home

**If your home has already been tested for radon**, provide your test results to the buyer. Remember, a potential buyer may ask for a new test if the one you took was not performed properly, or if it was not performed by an qualified individual.

**If your home has not yet been tested for radon**, make sure that a radon test is done as soon as possible. If you can, **test your home before you put it on the market**. This may save you valuable time during a real estate transaction. The test should always be taken in the lowest level of the home which is finished and suitable for occupancy. This means, test your home in the lowest level that you currently live in, or a lower level not currently used, but which a buyer could use for living space without making renovations. The result of the radon test is important information about your home's radon level that potential buyers may want to know.

## There Are Two General Ways To Test For Radon

**Short-Term Testing** - The quickest way to test. Short-term tests remain in you home for two days to 90 days, depending upon the device used. Because radon levels tend to vary from day-to-day and season-to-season, a short-term test is less likely than a long term test, to tell you your year-round average radon level. However, if the test is being done as a part of a real estate transaction, you need results quickly. In this case, a short-term test may be your only realistic option.

**Long-Term Testing** - Will give you a reading that is more likely to reflect your home's year-round average radon level than a short-term test. Long-term tests will remain in your home for more than 90 days.

## RADON RISK IF YOU SMOKE. . .

Radon Level	If 1,000 people who smoked were exposed to this radon level over a lifetime. . .	The risk of cancer from radon exposure compares to. . .
20 pCi/l	About 135 people could get lung cancer	100 X the risk of drowning
10 pCi/l	About 71 people could get lung cancer	100 X the risk of dying in a house fire
8 pCi/l	About 57 people could get lung cancer	- -
4 pCi/l	About 29 people could get lung cancer	100 X the risk of dying in a plane crash
2 pCi/l	About 15 people could get lung cancer	2 X the risk of dying in a car crash
1.3 pCi/l	About 9 people could get lung cancer	(Average indoor radon level in the U.S.)
0.4 pCi/l	About 3 people could get lung cancer	(Average outdoor radon level in the U.S.)

Source - US EPA

## RADON RISK IF YOU HAVE NEVER SMOKED...

Radon Level	If 1,000 people who never smoked were exposed to this radon level over a lifetime. . .	The risk of cancer from radon exposure compares to. . .
20 pCi/l	About 8 people could get lung cancer	The risk of being killed in a violent crime
10 pCi/l	About 4 people could get lung cancer	- -
8 pCi/l	About 3 people could get lung cancer	10 X the risk of dying in a plane crash
4 pCi/l	About 2 people could get lung cancer	The risk of drowning
2 pCi/l	About 1 person could get lung cancer	The risk of dying in a house fire
1.3 pCi/l	Less than 1 person could get lung cancer	(Average indoor radon level in the U.S.)
0.4 pCi/l	Less than 1 person could get lung cancer	(Average outdoor radon level in the U.S.)

### Test Your Home NOW!

More and more, home buyers and renters are asking about radon levels **before** they buy or rent a home. Because real estate sales happen quickly, there is often little time to deal with radon and other issues, to both the buyer's and seller's full satisfaction. The best thing to do is to test for radon **NOW** and save the results in case the buyer is interested in them. Fix a problem if it exists so it won't complicate your home sale later on! Remember, during home sales:

- Buyers more and more often are asking if a home has been tested, and if elevated levels were found have they been reduced?
- Buyers frequently want tests to be made by an impartial third party (not you!), who has no financial interest in the outcome of the test. Contact a qualified professional to take the radon measurement.

Many large corporate relocation companies require a radon test as part of their acceptance of a property

### Can My Home Be Fixed If High Radon Levels Are Found?

**Yes!** Radon is one of the easiest of all environmental concerns to repair. Sometimes, all it takes is sealing up cracks and openings in basement floors, foundation walls, openings around pipes, etc. If a crawl space is present, often times placing a vapor barrier (plastic sheeting) over the bare soil will cure the problem.

In other cases, it may be necessary to install a special suction system that draws air from under the basement floor and exhausts it to the outside. This is called a sub-floor de-pressurization system. Whatever the methods used, a high radon level can almost always be reduced easily!

***How radon enters a house***

