



## **FREQUENTLY ASKED QUESTIONS ABOUT RADON GAS**

### **WHAT IS RADON? WHERE DOES IT COME FROM?**

Radon is a gas that is inert (meaning it cannot react with anything), odorless and colorless and also radioactive. Radon is a relatively small gas as it is a just single atom. It is a byproduct of the natural decay of uranium, which is naturally present in granite and shale located under our soils. As it is a gas, radon will tend to want to percolate up through the soil to the atmosphere. If your home is above a deposit of uranium, you will most likely have a higher chance of elevated radon gas in your home.

All radioactive elements will eventually decay to a stable form over time. Some of this decay process can take many years. Others can happen in days, hours minutes or seconds. In the case of uranium, the decay process to radioactive radium can take million of years. But once it makes it to radon, the decay process is measured in days.

### **WHAT HAPPENS WHEN RADON DECAYS? WHY IS RADON A HEALTH PROBLEM?**

Like all radioactive elements, when they decay, they give off a particle or ray that can have quite a bit of energy. For radon the primary decay product is an alpha particle, which is made up of two protons and two neutrons. When an alpha particle hits something like paper, the particle is stopped.

As radon is a gas, it can be easily inhaled. If radon decays while it is in your lungs, the energy given off can be very damaging as the cell membrane of lung tissue is very thin. When the decay happens in the lung, it can easily pierce a cell and cause permanent damage to its DNA, increasing the chances of cancer. Prolonged exposure to radon gas is the 2nd leading cause of lung cancer (behind smoking) and according to the US EPA an estimated 21,000 people die as a result of exposure to radon gas each year. Of this, an estimated 2,900 never smoked.

But as radon is an inert gas, it is easily inhaled and then exhaled with each breath. For the radon to cause damage, it has to be in the lungs when it decays. But once radon gives off its alpha particle, it decays to a variety of different single atom solids. But these are still very radioactive and also very reactive elements. These byproducts will want to "stick" to something in the room.

If these stick to say something like a wall or something else that is stationary, it is relatively safe. But if it sticks to something like a dust particle, it is relatively easily inhaled into the lungs. Normally the lungs are very good at expelling items like dust. But this process can take quite a while. But now the elements that radon has changed into decay themselves relatively quickly, on the order of 30 minutes or less, a much



Louie  
Delaware

The Home  
Safety Guru

shorter a period of time than the lungs can expel a piece of dust. So radon is not really the major risk factor in causing cancer, but its so-called “offspring” more of a concern.

## **WHAT IS THE ROUTE THAT RADON CAN GET INTO MY HOME?**

If your home is over a uranium deposit, you are at risk of radon flowing up into your home. As your home usually will be warmer than the soil below it, the air pressure will usually be less and actually draw the radon up into your home.

The most common routes for radon to get into your home are:

- ◆ Spaces between basement foundations and the slab
- ◆ Cracks in the concrete slab or at expansion (also known as contraction) joints
- ◆ Openings around anything that protrudes through the slab, including drains, pipes, sump pumps and the like
- ◆ Exposed dirt areas like sump pits
- ◆ Cracks in foundations and/or walls
- ◆ From well water that has high concentrations of radon gas

## **IS RADON A PROBLEM HERE IN COLORADO?**

Excessive radon levels have been found in all of the 50 states. The US EPA has deemed 52 out of 64 counties to be a concern here in Colorado when building new home. But there have been high levels of radon found in every county here in Colorado. It is estimated that between 1/3 and 1/2 of all home in Colorado have levels of radon in excess of 4 picoCuries per liter (pC/L). Anything above this level is where the EPA recommends mitigation to reduce the radon to a safer level.

## **HOW DO I KNOW IF I HAVE A HIGH LEVEL OF RADON GAS IN MY HOME?**

The only way to find out if your home has higher levels of radon is to do testing. There are two ways to do this:

- ◆ You can test your home yourself. There are many manufacturers who sell a do-it-yourself test kit that can be purchased at a variety of different home improvement centers and hardware stores. You can also purchase many of these through internet mail order sites. You can also get a discounted coupon for getting short- or long-term test packs at [http://www.Radon-Pros.com/Radon\\_Discount\\_Coupons.pdf](http://www.Radon-Pros.com/Radon_Discount_Coupons.pdf). But be sure that the test kit packaging states that it “Meets EPA Requirements”, or
- ◆ Hire a certified radon tester. You can locate a certified radon measurement professional at <http://www.cdphe.state.co.us/hm/rad/radon/measurementproviders.pdf>.



Louie  
Delaware

The Home  
Safety Guru

## SHORT TERM VS. LONG TERM TESTING

- ◆ Short-term tests take at least 48 hours to complete. The house is closed for 12 hours. Then the test pack or sensor is opened to the atmosphere and left that way anywhere from 48 to 96 hours. The windows or your home need to be kept shut during this test, as well as keeping doors shut as much as possible. These are best used if you need to get a quick measurement of the radon levels in your home, like for when you are selling or buying a home. They can also be used during cooler months when radon will be more prone to coming up into your home from the soil underneath it.
- ◆ Long-term tests are placed anywhere from 14 to 365 days. Closed house conditions do not have to be maintained during the testing. As such, long-term tests give a better and more representative of the actual levels of radon in your home as radon levels are affected by temperature, barometric pressure and wind conditions.

## HOW DO I DO THE TESTING?

For more information as to how and where to place the short- or long-term test kits, go to [www.Radon-Pros.com/Radon\\_Test\\_Protocol.com](http://www.Radon-Pros.com/Radon_Test_Protocol.com).

## I HAVE A HIGH RADON READING IN MY HOME. HOW DO I GET IT FIXED?

The best way to take care of reducing the levels of radon in your home is to use a Certified Radon Mitigator. They have been trained on the best way to deal with designing a system that would be required for your home. To find one, go to <http://www.carma.us> or at <http://www.cdphe.state.co.us/hm/rad/radon/radonlists.htm>.

## WHAT IS THE AVERAGE COST OF MITIGATING A HOME?

The cost of a sub-slab system in Colorado is generally less than \$1,200 unless aggregate or difficult foundation design problems are encountered.

## WHAT SHOULD I LOOK OUT FOR IN SELECTING A RADON MITIGATOR?

There are standards that have been established by the US EPA as to the design and the appropriate materials that should be used for installing a radon mitigation system. Further, there are Colorado State Regulations as to what a mitigator can and cannot do, especially as it relates to connecting the fan to electricity. For more information on what to look out for in a radon mitigator, go to [www.Radon-Pros.com/Radon\\_Questions.pdf](http://www.Radon-Pros.com/Radon_Questions.pdf).

## I HAVE WELL WATER AT MY HOME. SHOULD I HAVE IT TESTED FOR RADON?

If you have tested the air in your home and found a radon problem and your water comes from a private well, you should also test the water. This testing is a bit more



Louie  
Delaware

The Home  
Safety Guru

involved and is best left for a certified radon tester to do this for you.

### **IS RADON A PROBLEM IN PUBLIC DRINKING WATER?**

Generally, radon is not a problem with public drinking water systems because during the treatment process, the aeration of water easily releases radon that is absorbed by the water to the atmosphere.

### **CAN I BRING THE RADON LEVEL IN MY HOME DOWN TO ZERO?**

The average level of radon present in our atmosphere here in Colorado is between 0.4 and 0.8 picoCuries/liter. As the air in our homes is constantly being mixed with exterior air, it is virtually impossible to bring it below this level, although there are other mitigation means besides just pulling the radon gas from below your home to bring the levels as low as possible. Contact a certified radon mitigator if you want to bring it down as low as possible.

### **QUESTION: IS RADON A PROBLEM AT SCHOOLS & BUSINESSES?**

Schools and businesses are at just as much risk from radon just as homes are.

For schools, Colorado statute requires that they be tested for radon, and to maintain records of the test results for disclosure on request. The regulation does not require schools that find a problem to have to mitigate according to a mandated schedule. It is up to the District and its constituents to address mitigation issues. About fifty percent of the schools that were found to have a problem have mitigated. This means that quite a number of schools may have higher (and possibly unsafe) levels of radon present. Further information on radon in schools can be found in the EPA Radon Publication [Radon in Schools](#).

There are no similar requirements for businesses. As such, you may want to ask your company if they had tested the facility and what they did if the levels came in above 4 picoCuries per liter, especially if you work on the lowest level of the building.

© 2008 The Home Safety Guru®. All Rights Reserved

For more information about Radon-Pros, LLC, go to [www.Radon-Pros.com](http://www.Radon-Pros.com), or call (303) 726-6828.