

# Radon Facts



## Radon Defined

Radon is a radioactive gas. You can't see, smell, or taste radon. It comes from the decay of radium and exists in varying amounts in most soils. High radon concentrations can be found in soils and rocks containing uranium, granite, shale, phosphate, and pitchblende.

Because radon is a gas, it can move through soil and into the atmosphere or a home. In outdoor air, radon is diluted to relatively harmless low concentrations. However, once trapped inside an enclosed space, radon can accumulate. Indoor radon levels depend upon the concentration of radon in the soil, the number of available paths into the building, and the strength of forces drawing radon into the building. Levels can vary greatly in the same town, on the same street, and from house to house.

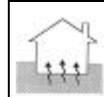


## Health Concern

Radon is one part in a long chain of radioactive decays. Radon gas decays into solid decay products that are also radioactive. These decay products can attach to other particles in air and be inhaled, remaining in the lungs to release tissue-damaging radiation.

Unlike some indoor air pollutants, radon does not cause headaches, nausea, sneezing, or other similar symptoms. Prolonged exposure to high levels of radon can lead to lung cancer – radon's only known health effect. Radon is considered to be the leading cause of lung cancer among nonsmokers. The U.S. Environmental Protection Agency (EPA) estimates that radon causes about 14,000 deaths per year in the United States.

Certain groups of people are at higher risk from long-term exposure to elevated radon levels. Children may be at higher risk because their lungs are still developing and the sensitive tissues are more easily damaged. If you smoke and your home has high radon levels, you may face a lung cancer risk about 15 times greater than a nonsmoker. That is in addition to your risk of developing lung cancer from just smoking.



## Radon in Homes

Although radon's existence in air has been known for a long time, its natural presence in homes was not discovered until about 1984. Since then, high indoor radon levels have been found in almost every county in the United States.

In Nebraska, over 50% of homes test above the EPA "action level." Although many Nebraska homes are "slightly high," very few Nebraska readings have been in the "very high" category.

Radon can enter a house in several ways. It moves from soils into basements or lowest levels of homes through openings such as cracks, loose fitting pipes, sump pits, dirt floors, slab joints, or block walls. Although much less important in Nebraska, water supplies and building materials are two other possible entry points.



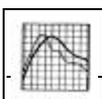
## Testing for Radon

All Nebraska homes should be tested for radon. Only individual testing can determine which houses may have a radon problem. You cannot base your radon level on a neighbor's test result. Every house is different!

Measuring radon levels in your home is simple, inexpensive, and only takes a few minutes. Test kits can be purchased which include complete instructions and return postage for mailing back to the analysis lab.

Short-term detectors (such as charcoal canisters) are used for two to seven days. They provide quick screening measurements indicating potential radon problems. Short-term detectors should be placed in the lowest livable level of the house, preferably during the winter.

Long-term detectors (such as alpha track detectors) are left in place for three months to one year. They provide the advantage of averaging seasonal variations associated with radon levels. Long-term detectors are generally placed in main living areas.



## Interpreting Results

Radon measurements show how much radon was present in the home during the test period. This level can vary depending on detector location and the time of year it was used. Radon levels are generally highest when the house is closed and in the basement or near possible radon entry routes. Readings averaging over an entire year are usually lower than those taken in a basement during the winter months.

Radon gas is measured in units of picocuries per liter (pCi/L), a standard measure of radioactivity. The EPA has set 4 pCi/L as a "recommended action level." If a short-term measurement is over 4 pCi/L, the recommended action is to perform a follow-up test to better characterize the radon levels. If a long-term test is over 4 pCi/L, action should be taken to reduce radon exposures.

The following actions are recommended for the respective test results:

**Less than 4 pCi/L.** It is not necessary to take further action unless you desire.

**4 to 10 pCi/L.** Short-term results should be followed up with long-term measurements lasting approximately twelve months. Homes with long-term results in this range should take action to reduce exposures within the next few years.

**10 to 100 pCi/L.** Follow-up testing with another short-term test (no longer than three months) is recommended. Homes with results in this range should take action to reduce exposures within the next few months.

**Over 100 pCi/L.** Immediately notify the Department of Health and Human Services. Confirmatory short-term follow-up measurements should be performed as soon as possible.

## Reducing High Levels

Several methods have successfully reduced high levels in Nebraska homes and in other areas of the country. Even though homeowners can perform some reduction methods, determining which method will work in your home can best be done by a trained professional.

Sealing cracks and penetrations in the basement may reduce radon entry, but sealing every entry route may be very difficult and new cracks will continually develop. In most cases, sealing by itself is not a successful, permanent solution to radon problems.

Better ventilation of the home or continuous ventilation of the basement can reduce levels, especially in warmer months when windows can be left open. However, ventilation does not prevent radon entry and, if done incorrectly, can increase radon entry or cause damage to the home. Natural ventilation is not a permanent solution and may increase utility costs.

Providing exhaust appliances (such as furnaces, water heaters, and clothes dryers) with their own source of intake air can reduce the amount of radon drawn into the house.

The most effective method of reducing radon levels, and the method most often used in Nebraska homes, is changing the ventilation underneath the house by installing a fan driven system. These systems remove radon from below the foundation or crawlspace before it enters the home. The radon is drawn into pipes and exhausted into the atmosphere where it is diluted to safe levels.



### For More Information

The Nebraska Department of HHS Regulation and Licensure Radon Program can provide you with a list of companies offering radon measurement or mitigation services in Nebraska. Pamphlets, brochures and other materials on radon are also available.

Questions or requests for information about radon can be directed to:

Nebraska Department of Health and Human Services  
Regulation and Licensure  
Radon Program  
301 Centennial Mall South  
Lincoln NE 68509-5007

Phone: (402) 471-0594 or (800) 334-9491 Fax: (402) 471-6436