

Testing Your Home for Radon

Radon is an odorless, colorless, naturally-occurring radioactive gas associated with lung cancer.

Radon and Health

The health risk associated with exposure to radon is lung cancer. In fact the U.S. Environmental Protection Agency (EPA) ranks radon a more serious threat than lead paint, PCBs, dioxins and asbestos combined. The risk of someone getting lung cancer from radon depends on the level of radon and how long a person is exposed.

Lung cancer takes many years to develop. Even if you have radon levels that are higher than normal, you will have enough time for follow-up tests and time to decide what corrective measures are needed.

Radon is measured in units called picocuries per liter of air (abbreviated pCi/L). The EPA has set an “action level” of 4 pCi/L. This means that the EPA recommends action lowering indoor radon levels higher than 4 pCi/L. A level of 20 pCi/L has about the same risk as smoking one pack of cigarettes a day. The average radon level in U.S. homes is about 1.3 pCi/L.

In addition to the health risk, radon may cost you money. In some cases, real estate companies or buyers will not consider a house unless a radon test has been completed. If you plan to sell your home, test for radon first.

What is radon?

Radon is a naturally-occurring radioactive gas. It is produced by the normal breakdown of uranium in rocks, building materials, and soil. As radon breaks down it produces radioactive particles. If you breathe in these small particles and they lodge in your lungs. While all are at risk of lung cancer due to radon exposure, smokers are at even greater risk.

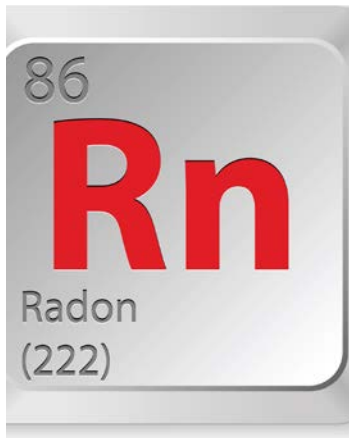
Radon can be present in masonry building products or in well water, but the radon in the soil as a soil gas is by far the most common source of indoor radon problems. Radon is also present in outside air, but at very low levels.

How does radon get into your house? It enters through tiny cracks in building materials like concrete blocks and through larger cracks and holes like floor drains. The forces that draw radon into a house are caused by household appliances like exhaust fans, gas heaters, and wood stoves.

Whether you live in the coastal plains, the mountains, or the piedmont area, your home has the potential for high levels of radon gas. High levels of radon have been found across the state. Homes include single family homes, apartments, mobile homes, and homes with and without basements. Radon levels are known to vary from place to place, *even in the same neighborhood*. Two similar houses side by side could have very different radon levels. This is why testing is extremely important. Testing is also the only way to know the radon level in your home.

How is radon measured?

Fortunately, testing for radon is relatively easy, and you can do it yourself. There are several ways that you can test for radon in your house. The most common way is a short-term measurement. A short-term test gives you a “snapshot” of the radon levels in your house during the time the test was made. Short-term tests are also called screening tests. Screening tests give a quick and inexpensive indication of whether a house has high levels of radon. Charcoal canisters, the most common devices used for screening tests, are usually left in place for 2 to 7 days. At the end of the test period, the canister is sent to a lab which analyzes the canister for radon and sends a report back to you with the results.



Charcoal canisters are low in cost (about \$10 - \$20) and are easy to use. The self-mailer and lab analysis are generally included in the price. Keep in mind that the results are a “one-time” measurement and may be affected by extremes of temperature and humidity, or blowing air from vents or fans.

Screening tests should be done using “closed house” conditions. This means that windows and doors should remain closed except when entering or leaving. Attic or window fans should not be used. Cooling and heating systems can be used during the test period because they do not mix outside and inside air. The house should be under these “closed house” conditions for 12 hours before the test is started and throughout the testing period.

Long-term testing is usually done with an alpha track detector. The results give a more average assessment of radon levels in your house. Alpha track detectors consist of a plastic film inside a small container. A lab analyzes the film and sends you a report indicating the radon level. Long-term testing with an alpha track detector is done over a period of several months to a year. It isn’t necessary to use closed house conditions so you can open windows and use fans as you would normally. Alpha track detectors are easy to use and cost between \$15 and \$40.

Radon professionals may use other radon detectors. These detectors cost much more than either charcoal canisters and alpha track detectors and require specialized training. They can read radon levels without being sent to a lab.

Whether you choose a charcoal canister or an alpha track detector, carefully follow the instructions that come with the test device. In most cases, instructions will tell you how long it should be left in place, what data you need to record before and after the test, what house conditions are needed, and where to place the device. One of the questions most asked is “Where should I place the detector?” You need to place it where your family spends time. Don’t put one in the crawl space or a basement with a dirt floor. Detectors for short-term (screening) tests should be placed on the lowest lived-in level of a home. For long-term tests, a detector should be placed on the lowest-lived in level of the home. Detectors should be placed at least 20 inches above the floor, out of the sunlight or drafts from fans or vents.

Whichever method you select, buy a detector that meets EPA standards. Look for the EPA statement on the detector package. For more information about radon and radon testing, visit the U.S. Environmental Protection Agency’s radon site at: www.epa.gov/radon

What do my results mean?

The lab analyzing your device will report what the radon levels were during your test. Keep in mind that the EPA “action level” is 4 pCi/L. If your level was less than 4 pCi/L, your test result is considered low and more testing is optional. If your test indicated a level more than 4 pCi/L, EPA recommends follow-up testing on all levels of your house. For results over 20 pCi/L you should complete short-term testing on all levels of your house and consider actions to lower radon levels. Test results over 200 pCi/L demand immediate attention to lower radon levels.

How are radon levels lowered?

Radon mitigation is not a do-it-yourself project. Instead, it is important to hire a qualified radon mitigation contractor. Methods used may include sealing radon entry routes, ventilation, or removing radon in the soil underneath the home. Before taking action to lower levels, you should complete an initial test and a follow-up test to confirm the initial test results.

Where can I get more information?

You can contact the North Carolina Radon Program for more information. The program’s website, www.ncradon.org/ includes valuable information for homeowners and builders. It also has links to publications, maps, testing, and mitigation information related to radon.

Reviewed by Phillip Ray Gibson, NC Department of Health and Human Services, Radiation Protection Section, 2/5/2014