



Radon Mitigation Systems

REDUCING RADON IN THE HOME

This flyer is for people who tested their home indoor air for radon and have elevated radon levels of 4 picocuries per liter (pCi/L) or higher.

Buying or selling a home?

If you are buying or selling a home and need to make decisions about radon, consult the North Carolina Radon Program website at radon.ncdhhs.gov.

If you are selling a home that has a radon reduction system, inform potential buyers and supply them with information about your system's operation and maintenance.

The North Carolina Real Estate Commission regards a level of 4 pCi/L or more to be a "material fact" and has stated that "if a licensee [licensed real estate broker] knows that dangerous levels of radon are present in any structure which will be occupied regularly by people, then the licensee must disclose that to all prospective buyers or tenants."

What do your radon test results mean?

Any radon exposure has some risk of causing lung cancer. The lower the radon level in your home, the lower your family's risk of lung cancer. The Environmental Protection Agency (EPA) recommends fixing your home if the results of one long-term test or the average of two short-term tests show radon levels of 4 pCi/L or higher.

You can determine your radon levels by using a short-term test usually lasting from two to seven days or up to 90 days, or a long-term test from 90 days to one year. Radon tests should be conducted for a minimum of 48 hours, but longer tests provide a better estimate of exposure.

How to select a certified mitigator

Visit the NC Radon Program website at radon.ncdhhs.gov for details about radon and your home. The web page includes links to help you identify a certified radon professional near you.

Choose a certified radon mitigator to fix a radon problem just as you would choose any other professional to do other home repairs. It is recommended that you seek more than one estimate. Ask for their warranty and guarantee that they will reduce the radon to an acceptable level. Request references. Contact some of those references and ask if they are satisfied with the mitigator's work.

Compare the mitigator's proposed costs and consider what you get for your money. Consider the following:

- A less expensive system may cost more to operate and maintain;
- A less expensive system may have less aesthetic appeal;
- A more expensive system may be best for your home; and
- The quality of the building materials will affect how long the system lasts.



The contract

Ask the mitigator to prepare a contract before any work starts. Read the contract before you sign it. Make sure everything in the contract matches the original proposal. The contract should describe exactly what work will be done prior to and during the installation of the system, what the system consists of, and how the system will operate.

What to look for in a radon reduction system

In selecting a radon reduction method for your home, you and your mitigator should consider: how high your initial radon level is, the costs of installation and system operation, your home size, and your foundation type. The system must be labeled and have a visual or audible alarm to let you know it is working. Exhaust fans must never be in or below the living space or vent into the living space or attic.



Radon reduction techniques

Some radon reduction techniques prevent radon from entering your home while others reduce radon levels after it has entered. The EPA generally recommends methods that prevent the entry of radon. However, each home requires a unique mitigation system specifically designed for that building.

HOME FOUNDATION TYPES

Homes have different types of foundation. Some have a combination of foundation types. Foundation type will determine the type of mitigation system installed. Foundation types include: basement, slab-on-grade, and crawlspace.

Basement & Slab-on-Grade Homes

Active sub-slab suction, also called sub-slab depressurization, is the most common and usually most reliable radon reduction method.

Passive sub-slab depressurization is the same as active sub-slab suction except it relies on natural pressure differentials and air currents and is usually associated with radon resistant features installed using radon resistant new construction techniques.

Drain tiles or perforated pipes are used to direct water away from the foundation of the home and suction on these tiles or pipes is often effective in reducing radon levels.

Block-wall suction can be used in homes with hollow block foundation walls. This method removes radon and depressurizes the block wall.





Crawlspace Homes

Submembrane suction, when properly applied, is the most effective way to reduce radon levels in homes with crawlspaces.

Mechanical ventilation uses a fan to blow air into the living area from outdoors, which dilutes the concentration of radon in the home and pressurizes the building.

A heat recovery ventilator (HRV), also called an air-to-heat exchanger, can be installed to increase ventilation.

Some natural ventilation occurs in all homes. By opening windows, doors and vents, you can increase the ventilation in your home.

Checking your mitigator's work



- The exhaust pipes of soil suction systems must vent no less than 12 inches above the surface of the roof, 10 feet or more above the ground, and at least 10 feet away from windows, doors or other openings that could allow radon to reenter the home.
- The exhaust fan must not be in or below a livable area because a puncture or leak in the pipe above the fan will cause high amounts of radon to be blown into the house.
- If installing an exhaust fan outside, the contractor must install a fan that meets local building codes for exterior use.
- Electrical connections of all active radon reduction systems must be installed according to local electrical codes.
- A warning device must be installed to alert you if an active system stops working properly. The system must be labeled as a radon mitigation system with information on the certified radon business that installed the system.
- Note the warning device will not tell you if the radon levels increase, just if the mechanical parts of the mitigation system fail.
- A post-mitigation radon test should be conducted within 30 days of system installation but not sooner than 24 hours after your system is in operation with the fan on, if the system includes a fan.
- Make sure your contractor explains your radon reduction system in detail, demonstrates how it operates, explains how to determine if it is not working, and describes how to maintain it.

Living in a home with a radon reduction system

MAINTAINING YOUR RADON REDUCTION SYSTEM

It is recommended that homes with radon reduction systems be tested for radon at least every two years as changes to the building or the ground beneath it may cause significant changes in the radon concentration.

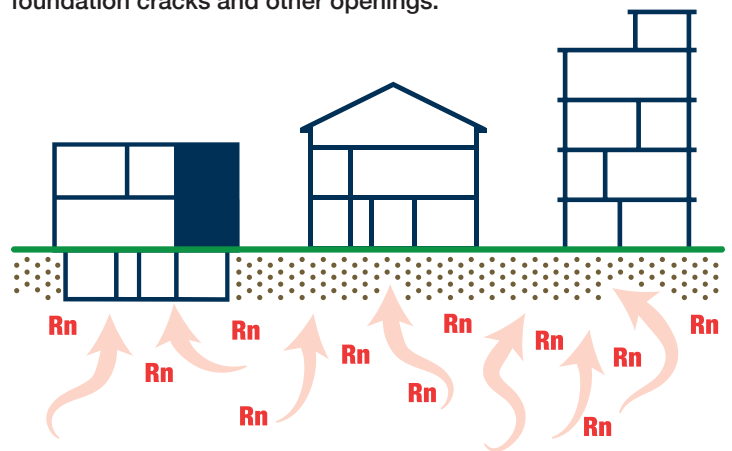
Similar to a furnace or chimney, radon reduction systems need occasional maintenance.

Radon is a cancer-causing, radioactive gas

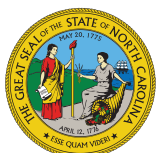
Radon is colorless, odorless and tasteless. Radon is estimated to cause 21,000 lung cancer deaths each year in the United States. In fact, the US Surgeon General has warned that radon is the second leading cause of lung cancer and the leading cause of lung cancer among non-smokers. Only smoking causes more lung cancer deaths. If you smoke and your home has high radon levels, your risk of lung cancer is especially high.

How radon enters your home

Radon is a naturally occurring radioactive gas produced by the breakdown of uranium in soil, rock, and water. Air pressure inside your home is usually lower than pressure in the soil under your home's foundation. Because of this pressure differential, your home acts like a vacuum, drawing radon in through foundation cracks and other openings.



Learn more at radon.ncdhhs.gov



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