Radon Detection Remediation and Awareness – Quick Tips

Introduction

According to the Environmental Protection Agency (EPA), radon is the second leading cause of lung cancer in the U.S. causing approximately 21,000 lung cancer related deaths annually. For every 1,000 non-smokers exposed to radon levels at twice the EPA's recommended action level, about 15 will contract lung cancer. For smokers the odds of contracting lung cancer jumps to 120 victims per 1000 exposed.

EPA statistics document the fact that radon is a deadly carcinogen that is easy to ignore and is undetectable by the human senses. Another aspect of radon that makes it particularly dangerous is that it primarily attacks victims at the location where they feel most secure—their home. The EPA estimates that one in every 15 homes in the U.S. has radon levels at or above the action level.

Property owners can resolve radon problems simply and economically. Basic awareness, detection and remediation of radon is key. Taking these three steps will help you protect yourself from Radon exposure.

What Is Radon?

Radon is a radioactive gas that is generated through the breakdown of uranium inside the earth. It's invisible, odorless and tasteless, with no immediate health symptoms.

Radon gas enters buildings primarily through cracks and other holes in the foundation. Once inside a structure, radon is trapped and levels of the gas can become concentrated. The EPA has established a recommended action level for radon at 4 picoCuries per liter (pCi/L). For radon concentrations at or above 4 pCi/L, the EPA recommends that steps be taken to reduce exposure levels to below the action level.

The EPA offers examples of where radon can enter a structure:

- Cracks in solid floors
- Construction joints
- Cracks in walls
- Gaps in suspended floors
- Gaps around service pipes
- Cavities inside walls
- Water supply

While entry through the foundation is the primary concern when it comes to radon gas, it can also enter buildings through the water supply. When present in a facility's

water supply, radon poses both inhalation and ingestion risks. According to a report published by the National Academy of Sciences (NAS), radon in drinking water causes 168 cancer deaths annually. Of these deaths, 89 percent were from lung cancer caused by breathing in radon released from water and 11 percent were from stomach cancer caused by drinking radon-contaminated water.

Radon problems in drinking water are much more common in groundwater supplied systems (private and public wells) rather than surface water supplied systems.

How to Detect Radon

Whether it's entering a structure through the foundation or through the water supply, radon gas can easily be detected and monitored using two different testing methods. The most commonly used method is passive radon monitoring. Passive monitors are placed in an area of a structure for a set period of time and then sealed and sent into a laboratory for analysis after the detection period has expired. Click here for more information on our radon test kit.

There are two types of passive radon tests: short-term and long-term. Because no special training is required to perform these tests, they can easily be conducted by property owners. Radon test kits are available at most local hardware and home improvement stores as well through online retailers. These test kits are generally quite economical to use. For those who would rather not do the testing themselves, the EPA suggests contacting a qualified tester through your state radon office.

Short-term tests are the quickest way to passively monitor for radon in a structure. In a short-term test, the sample media is placed in the test area for anywhere from two to 90 days before being sent into a laboratory for analysis. The laboratory then mails the test results back to the kit owner.

Because radon levels tend to vary from day-to -day and season-to-season, short-term test results may not be indicative of a structure's actual year-round radon level. To obtain a more accurate idea of year-round levels, long-term radon kits are used.

Long-term test kits are placed in a structure for more than 90 days. This duration of exposure compensates for the daily radon fluctuations that can occur, providing a more realistic measurement of year-round radon levels.

To help property owners implement an effective passive radon monitoring program, the EPA has established the following guidelines:

Step 1. Take a short-term test. If your result is 4 pCi/L or higher take a follow-up test (step 2) to be sure.

Step 2. Follow up with either a long-term test or a second short-term test.

- **For a better understanding of your year-round average radon level take a long-term test**
- **If you need quick results, take a second short-term test**

The higher your initial short-term test result, the more certain you can be that you should take a short-term rather than a long-term follow up test. If your first short-term test is more than twice the EPA's 4 pCi/L action level, you should take a second short-term test immediately.

Step 3. If you follow up with a long-term test: Fix your home if your long-term test result is 4 pCi/L or more. If you follow up with a second short-term test: The higher your short term results, the more certain you can be that you should fix your home. Consider fixing your home if the average of your first and second test is 4 pCi/L or higher.

The other method for detecting radon gas uses active monitors to detect the gas.

Active monitors require a power source and provide an instantaneous readout of radon levels at any given time. Some units can calculate short-term and long-term radon levels. Generally, active radon monitors are more costly than passive monitors but the prices on these instruments are coming down.

In most instances, you'll want to perform your radon monitoring in the lowest occupied level of a structure. Instructions regarding detector placement will be included with the radon monitor you purchase.

When it comes to radon concerns in drinking water, the Centers for Disease Control and Prevention (CDC) offers the following advice, "Before you test your water for radon, you should test the air. If the indoor radon level is high and you use groundwater, test your water. If the radon level is low in the air, there is no need to test your water. Test results are expressed in picocuries of radon per liter of water (pCi/L). In general, 10,000 pCi/L of radon in water contributes roughly 1 pCi/L of airborne radon throughout the house. The U.S. Environmental Protection Agency (EPA) currently advises consumers to take action if the total household air level is above 4 pCi/L."

Solving Radon Problems

Although the EPA states that "no level of radon is safe," radon readings of <4 pCi/L are below the EPA's action limit so no remediation measures are necessary at that point. A property owner will want to re-monitor every two years or any time they make structural changes to a property or occupy a previously unused level of a structure.

What happens if monitoring turns up radon levels of 4 pCi/L or higher? The EPA advises that you begin by contacting your state radon office for names of qualified or state certified radon contractors in your area. The EPA recommends the use of radon remediation professionals because, "Lowering high radon levels requires technical knowledge and special skills. You should use a contractor who is trained to fix radon problems. A qualified contractor can study the radon problem in your home and help you pick the right method."

While there are several radon reducing techniques that can be employed, the first step in any remediation plan is to seal all the cracks or gaps in a structures' foundation. Cracks in concrete floors of slabs or basements must be sealed, as well as any cracks in basement walls. A good caulk, appropriate for concrete repairs, is used for this job. If the structure has a sump crock, the crock will need to be sealed and vented to the outside.

In some cases where radon readings are relatively low, simply sealing the foundation and venting the sump crock will lower the radon levels to < 4 pCi/L. While these steps can lower radon concentrations below the action level, the EPA does not recommend the use of sealing alone to fix the problem because, "by itself, sealing has not been shown to lower radon levels significantly or consistently."

There's a variety of techniques that remediation contractors use to solve radon problems. Some techniques prevent radon from entering your home, while others reduce radon levels after it has entered. The EPA recommends using a method that prevents the entry of radon into a home. Soil suction is one example of this technique. It prevents radon from entering a home by drawing radon from below the foundation and venting it through a pipe to the air above the house where it's quickly diluted.

This method, as well as various other methods, of radon remediation is described in detail in the EPA's Consumers Guide to Radon Reduction booklet. This booklet also offers estimates regarding the cost of installing and operating the various radon removal systems.

Waterborne radon problems can be fixed through either point-of entry or point-of-use treatment systems. Of the two, point-of-entry systems are preferred by the CDC. The

CDC states, “it is important to treat the water where it enters your home (point-of-entry device) so that all water will be treated. Point-of-use devices such as those installed on a tap or under a sink will only treat a small portion of your water and are not effective in reducing radon in your water.”

The EPA advises those with questions about radon in their water supply, both testing and treatment, to contact their state radon office or the EPA’s Drinking Water Hotline at (800) 426-4791.

Commonly Asked Questions

Q: Are there requirements for test kits and the laboratories that analyze them?

A: Since you cannot see or smell radon, special equipment is needed to detect it. When you’re ready to test your home, contact your state radon office for information on locating qualified test kits or qualified radon testers as some states have certain requirements to meet for their state programs. You can also order test kits and obtain information from www.sosradon.org.

Q: Who should I call to get my home tested for Radon, can anyone fix the problem?

A: EPA recommends that you use a certified or qualified radon mitigation contractor trained to fix radon problems. You can determine a service provider’s qualifications to perform radon measurements or to mitigate your home in several ways. First, check with your state radon office. Many states require radon professionals to be licensed, certified, or registered, and to install radon mitigation systems that meet state requirements. Most states can provide you with a list of knowledgeable radon service providers doing business in the state. In states that don’t regulate radon services, ask the contractor if they hold a professional proficiency or certification credential, and if they follow industry consensus standards such as the American Society for Testing and Materials, ASTM, Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings, E2121. You can contact private proficiency programs for lists of privately certified professionals in your area. Such programs usually provide members with a photo ID card, which indicates their qualifications and the ID card’s expiration date. For more information on private proficiency programs, visit www.epa.gov/radon/radontest.html, or contact your state radon office.

Sources

For additional information on radon awareness and remediation, visits the EPA’s Radon resource center, or the CDC’s Radon and Drinking Water from Private Wells page.

Source: Grainger Know How – https://www.grainger.com/know-how