



# ***Maintaining the Home***

## ***Radon***

# ***Maintaining the Home:***

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Every home should be tested for radon, an invisible, odorless, radioactive gas that occurs naturally. Radon is estimated to be the second leading cause of lung cancer in the United States. However, with proper equipment, radon is easy to detect, and even dangerously high levels can be removed from homes.

Radon is produced when uranium breaks down naturally in soil, rock and water. It typically moves up through the ground and mixes in the air we breathe. Radon enters a home through cracks and other holes in the foundation as well as through well water. Once inside, radon can become trapped in a home.

Every home is susceptible to a radon gas problem. Dangerously high levels of radon have been found in homes in every state in the U.S.

### **Health/Cancer Risks**

Radon produces no immediate physical symptoms. Typically, people must be exposed to it for years before problems surface.

The primary hazard from radon is caused when you breathe in the gas and the highly radioactive, heavy metallic particles that are produced when it decays. These particles collect on dust in the air. After you inhale radon, the dust and smoke particles become deeply lodged or trapped in your lungs where they penetrate the cells of the mucous membranes and other tissues.

Lung cancer from inhaling radon decay products is the only known health problem associated with radon. Scientists estimate that in the U.S., 5,000 to 20,000 people die of lung cancer every year because of radon. The Environmental Protection Agency calculates that radon causes about 14,000 deaths each year.

Tobacco users are more likely than nonusers to develop lung cancer when exposed to radon, according to a study by researchers from the National Institute for Occupational Safety and Health, the Centers for Disease Control and the Harvard School of Public Health.

### **Testing for Radon**

The amount of radon that accumulates inside a home is caused by factors relating to the homes structure and geographic location. Because the radon concentration varies greatly even among homes in the same neighborhood, each home must be tested to determine its radon level. Such testing is highly recommended by the Environmental Protection Agency, the U.S. Surgeon General, the American Lung Association, the American Medical Association and the National Safety Council. The EPA recommends that people check their homes for radon if the home has a basement or if they live on the first or second floor.

### **Radon Testing Methods**

With proper equipment, radon is relatively easy

to detect. The quickest way to test for radon is with a short-term, do-it-yourself radon test kit, available by mail order or from a grocery store. Common short-term devices used for testing are charcoal canisters, alpha track detectors, liquid scintillation detectors and continuous monitors.

For a short-term test, all doors and windows must be closed 12 hours before the test and throughout the testing period. The test kit is placed in the lowest lived-in level of the home. When the test is completed, the kit is mailed to a laboratory for analysis. The lab will mail back the results within a few weeks.

Long-term tests give a better measure of a home's average radon concentration year-round. These tests require more than 90 days. Common long-term testing devices are the alpha track and electret detectors.

Once high levels of radon are detected, they must be reduced and further infiltration prevented. Even extremely high levels of radon can be reduced to acceptable levels. To lower the risk of developing lung cancer, it is recommended modifications be made to any house with a radon level of 4 picocuries (a measure of radioactivity) per liter of air or higher.

### **Mitigation Methods**

The cost to lower the radon level in the average home ranges from about \$500 to \$2,500. There are two ways to reduce radon levels in homes:

- Prevent the radon gas from entering the home.
- Ventilate from the home the air containing radon and its decay products.

### **Radon Reduction Techniques**

Most methods to reduce radon levels in houses either prevent radon from entering the house

or reduce the levels after it enters. Prevention is generally the preferred approach. This is typically done by venting air below the foundation to the outdoors. Air can be vented with fans and ducts or, in some cases, with natural ventilation. The type of foundation dictates the most appropriate technique.

Other reduction methods include sealing cracks in the foundation, house pressurization and increased air exchange with a heat recovery system.

The National Environmental Health Association maintains a list of certified radon professionals. This list is available from the Web at <http://www.radongas.org/>.

### **Summary**

- Radon is a naturally occurring gas that results from the breakdown of uranium commonly found in soil.
- Surveys show that one out of five homes in the U.S. have elevated radon levels.
- Radon is the second-leading cause of lung cancer.
- Radon testing kits can be purchased through the mail or from your local grocery store. Look for a test certified by the state or listed by the EPA.

This material was adapted from publications produced by Texas A&M University Cooperative Extension.

*This resource is one in a series on **Maintaining the Home** which include:*

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