

Key Points about Radon

Radon is an odorless and colorless gas that emanates naturally from the earth and rock beneath building structures and typically enters the structure from cracks in the foundation. Other sources of radon include building materials manufactured from earth and rock (that contain radon) and from well water. Radon is a gaseous radioactive element having the symbol Rn, the atomic number 86, an atomic weight of 222, a melting point of -71°C , and a boiling point of -62°C . It is an extremely toxic, colorless gas; it can be condensed to a transparent liquid and to an opaque, glowing solid; it is derived from the radioactive decay of radium and is used in cancer treatment and in radiography.

Radon cannot be seen, smelled or tasted, but it could be a problem in a building. The EPA has developed Radon Zone Maps for each state. These maps were developed using five factors to determine radon potential: indoor radon measurements; geology; aerial radioactivity; soil permeability; and foundation type. These maps can be accessed at the EPA website (<http://www.epa.gov/radon/zonemap.html>).

Radon is estimated to cause many thousands of deaths each year since air containing radon may cause lung cancer. **In fact, the Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today.**

A variety of methods can be used to reduce radon in a structure. In some cases, sealing cracks in floors and walls may help to reduce radon. In other cases, simple systems using pipes and fans may be used to reduce radon. Such systems are called "sub-slab depressurization", which do not require major changes to the structure. These systems remove radon gas from below the concrete floor and the foundation before it can enter the building. Similar systems can also be installed in buildings with crawl spaces. Increased use of outside ventilation air will also reduce radon levels inside the structure, and, in many cases, may be the least expensive method and one which also solves various other IAQ problems.

Exposure to radon gas in buildings is considered a long-term health risk and is not considered a short-term hazard. Radon gas decays into radioactive particles that may become trapped in the lungs as a person breathes. As they break down further, these particles release small bursts of energy. This could damage lung tissue and lead to lung cancer over the course of one's lifetime. Not everyone exposed to elevated levels of radon will develop lung cancer, and the amount of time between exposure and the onset of the disease may be many years.

Like other environmental pollutants, there is some uncertainty about the magnitude of radon health risks. However, we know more about radon risks than risks from most other cancer-causing substances. This is because estimates of radon risks are based on studies of cancer in humans (underground miners, for example). Additional studies on more typical populations are under way. **Smoking combined with radon is an especially serious health risk.** Children are reportedly at greater risk than adults of certain types of cancer from radiation, but there is currently no conclusive data on whether children are at greater risk than adults from radon.

An individual's chances of getting lung cancer from radon depend mostly on:

- The level of radon in a person's building
- The amount of time spent in a person's building
- Whether a person is a smoker or has ever smoked

EPA does not recommend using air cleaners to reduce levels of radon and its decay products. The effectiveness of these devices is uncertain because they only partially remove the radon decay products and do not diminish the amount of radon entering the building. The EPA plans additional research on whether air cleaners are, or could become, a reliable means of reducing the health risk from radon.

The federal government recommends measuring the level of radon in structures. Without measurements, there is no way to tell whether radon is present because it is a colorless, odorless, radioactive gas. Inexpensive devices are available for measuring radon. EPA provides guidance as to risks associated with different levels of exposure and when the public should consider corrective action. There are specific mitigation techniques that have proven effective in reducing levels of radon in the building. For additional information consult your state or local health department or your medical professional.