

# Indoor airPLUS Technical Bulletin



## Activating a Passive Radon System



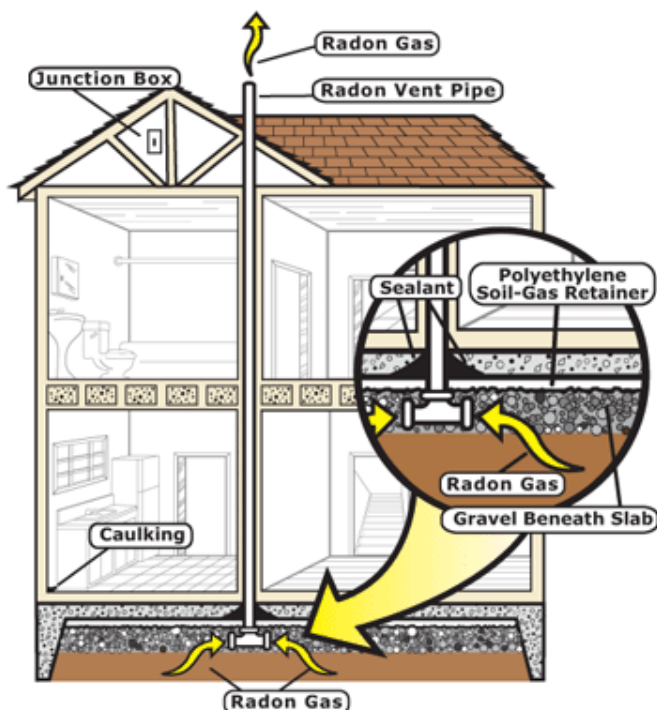
Radon is a naturally occurring radioactive gas that can cause cancer. By building [radon-resistant new homes](#), builders and contractors provide a public health service — helping to reduce buyers' risk of lung cancer from exposure to radon in indoor air. Using common materials and straightforward techniques, builders can construct new homes that are resistant to radon entry.

To comply with the Indoor airPLUS and Zero Energy Ready Home programs, approved radon-resistant features must be installed in [EPA Radon Zone 1 homes](#). This includes the installation of a “passive” radon system with an electrical outlet for future fan installation if an “active” system is necessary.

### Passive Radon Mitigation System Vs. Active Radon Mitigation System

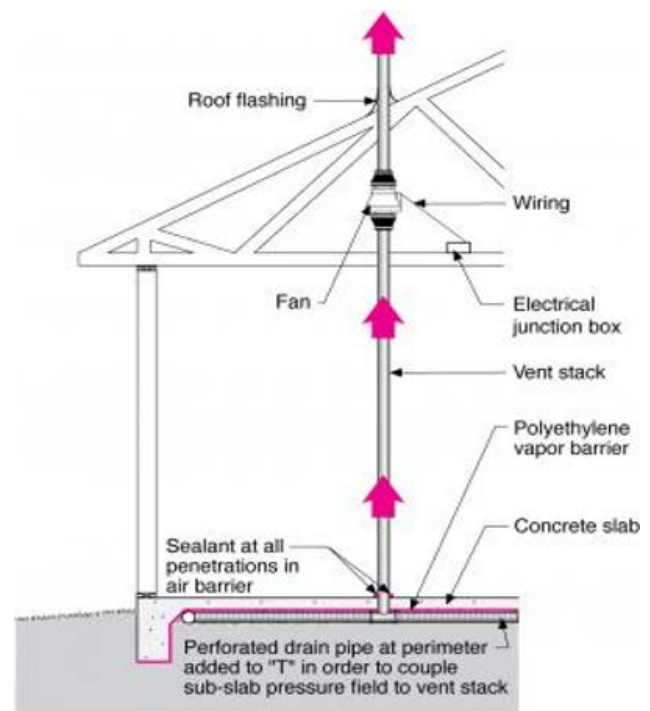
#### Passive Radon System

A passive radon ventilation system consists of a [vertical vent pipe](#) extending up from a sub-slab collection pipe or mat, through the conditioned space of the home, and through the roof. The natural stack effect pulls soil gases up and out of the house.



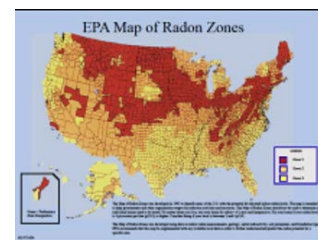
#### Active Radon System

An active radon ventilation system includes an [in-line fan](#) installed in the [vertical vent pipe](#). The fan pulls soil gases up and out of the house.



## Building a Radon Resistant Home

Radon resistant construction techniques are [required](#) for homes in Radon Zone 1 to earn the Indoor airPLUS label. The Indoor airPLUS program recommends radon-resistant features for homes in Radon Zones 2 – 3, as well, and recommends that all homes are tested for radon after construction. If the indoor radon concentration level is  $\geq 4$  picocuries/liter, a radon vent fan should be installed, regardless of the home's radon zone.

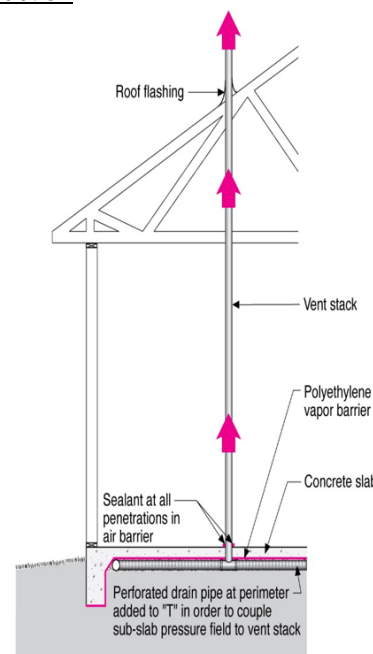


The easiest time to install a radon mitigation system is during initial construction. Local radon levels may vary from those shown on the [county-level EPA radon map](#), and the amount of radon that will accumulate in a home can't be determined until the home is built. The Indoor airPLUS Program recommends installing a passive ventilation stack in all new homes, with an electric outlet located in the attic near the vent stack. This allows the builder or homeowner to easily install an in-line fan, should post-construction testing indicate high radon levels in the home.

See below for details on best practices to install a passive radon system in your new home.

### How to Install a Vertical Ventilation Pipe – Slab-on-Grade Construction

1. Select the location for the ventilation pipe (min. 3 inches in diameter). It should be installed in a vertical run through a warm part of the house and exhausted through the roof. The pipe discharge should be protected from snow drifts and installed at least 1 foot above the roof (refer to local snow fall data for height of snow drifts against buildings) and 10 feet away from any openings in the building to keep the soil gas from re-entering the building.
2. Lay a minimum 3-inch-diameter perforated pipe in a gravel trench or a collection mat on top of the gravel around the foundation perimeter. Install the pipe in a loop to allow for the soil gas to enter the pipe from two sides and connect it to either side of a vertical "T". Communication to all sub-slab areas is required and multiple connection points or interconnections may be required.
3. Place the polyethylene vapor barrier around the vertical "T"; then cover the open top of the vertical "T" and label the pipe as part of the radon system before placing the concrete. After curing, seal the perimeter of the "T" to the concrete to reduce the soil gas entry.
4. Install the vertical pipe by connecting it to the vertical "T." Avoid 90-degree angles in the vertical portion of the pipe; use sweeps if turns are needed. Label the pipe on each floor so it is clear the pipe is not part of the sewer system. If the ventilation pipe extends through an unconditioned attic, insulate the stack to control condensation in the pipe.
5. Run the pipe through the roof and flash it properly. Provide a screened cap at the termination to prevent entry of debris and/or nesting animals.



## Testing for Radon and Activating the System

EPA recommends testing all homes for radon prior to occupancy. Short-term or long-term radon test kits can be obtained through the mail or at local hardware stores. Short-term tests remain in the home between 2 and 90 days; Long-term tests remain for longer than 90 days.

If the radon level is above the EPA action level ( $\geq 4$  picocuries/liter), a radon mitigation fan should be installed and activated by a [credentialed and/or licensed contractor](#), depending on state requirements. To confirm results, EPA recommends re-testing your home after activation, and then every two years following or any time that major renovations or alterations are made to the home.

Learn more at:  
[www.epa.gov/indoorairplus](http://www.epa.gov/indoorairplus)