

# Office of Radiological Health

## RADON BULLETIN

---

ORH-751: Radon Mitigation Discharge Vent Pipes  
Reissued Dec. 5, 2018

It is important to note that Virginia radon statutes require compliance with USEPA guidance. Specifically, **Virginia Code § 32.1-229.01.B** states:

*“Radon professionals listed as proficient pursuant to subsection A shall comply with the radon mitigation and testing standards outlined in the Environmental Protection Agency's publication, EPA 402-R-93-078, as revised, or the **American Society for Testing and Materials (ASTM International) Standard, E-2121-02**, or any other radon testing and mitigation standards accepted by the Environmental Protection Agency and the Board.”*

The current revision of **ASTM E-2121-(13)** lists the following guidance for radon mitigation discharge piping:

7.3.2.9: To reduce the risk of vent stack blockage due to heavy snow fall, to reduce the potential for re-entrainment of radon into the living spaces of a building, and to prevent direct exposure of individuals outside of buildings to high levels of radon, the discharge from vent stack pipes of active soil depressurization systems shall meet the following minimum requirements. The discharge from vent stack pipes shall be:

- (1) Vertical and upward, outside the structure, at least 10 ft (3 m) above the ground level, above the edge of the roof, and shall also meet the separation requirements of 7.3.2.9 (2) and (3). Whenever practicable, they shall be above the highest roof of the building and above the highest ridge.
- (2) Ten ft (3 m) or more away from any window, door, or other opening into conditioned or otherwise occupiable spaces of the structure, if the radon discharge point is not at least 2 ft (0.6 m) above the top of such openings.
- (3) Ten ft (3 m) or more away from any opening into the conditioned or other occupiable spaces of an adjacent building. Chimney flues shall be considered openings into conditioned or otherwise occupiable space.
- (4) For vent stack pipes that penetrate the roof, the point of discharge shall be at least 12 in. (0.3 m) above the surface of the roof. For vent stack pipes attached to or penetrating the sides of buildings, the point of discharge shall be vertical and a minimum of 6 in. (150 mm) above the edge of the roof and in such a position that it can neither be covered with snow, or other materials nor be filled with water from the roof or an overflowing gutter. In areas where it snows (including Virginia) the point of discharge shall be 12 in. (0.3 m) above the surface of the roof.

7.4.2: As a minimum, all plastic radon system piping in depressurization systems shall be made of Schedule 20 PVC or ABS piping material. Schedule 40 piping is recommended for use in garages and in other internal and external locations subject to weathering or physical damage.

Although Schedule 40 PVC is preferred, the use of gutter downspout piping for the mitigation riser pipe has not yet been specifically banned by ASTM, USEPA or VDH. This piping is popular with radon professionals because it is easier to work with and many customers may prefer its use for exterior piping due to aesthetic benefits.

VDH will allow gutter downspout piping to be used for this purpose with the following caveats:

- 1) The piping cross section should be not less than 3” x 4”. 2” X 3” downspout pipe has a cross section of only 6 square inches which is less than the 7.1 square inches found in a 3 “ diameter PVC pipe which is the minimum pipe diameter stipulated by ASTM E2121-13.
- 2) The pipe construction should be of aluminum, vinyl or other material that is highly resistant to corrosion and leakage.

- 3) The joint coupling should be specifically designed to tightly bond round PVC pipe to rectangular gutter pipe and should be adequately sealed to prevent leakage (see Figure B).

**To maximize dispersal of the discharge gas and to prevent possible re-entry into the home, the exhaust point of the pipe should remain vertical and should not be equipped with any structure that will significantly impede the upward flow of the gas.** Caps, deflectors or protective roofs should not be used unless there are extreme concerns regarding possible blockage of the pipe by wildlife and/or debris. Protective screens near the end point are preferred as long as the screen openings are large enough (1/4-1/2" mesh) so as not to significantly restrict the gas flow and increase objectionable noise.



A. Well constructed exterior discharge pipe



B. Proper coupling to connect PVC to downspout piping



C. Examples of poor discharge pipes that do *not* meet ASTM E2121 or VDH guidance.