

Radon Decay Product Reduction

- Reduces radon decay products through filtration and room plate-out.
- Radon is unaffected.
- Re-test with Working Level meter.
- Can improve other IAQ concerns.
- Potential supplemental approach for difficult homes or commercial buildings.



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Key Points

System Selection

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Low pressure drop, high efficiency filter on return of FAU with under-slab return ducts

Types

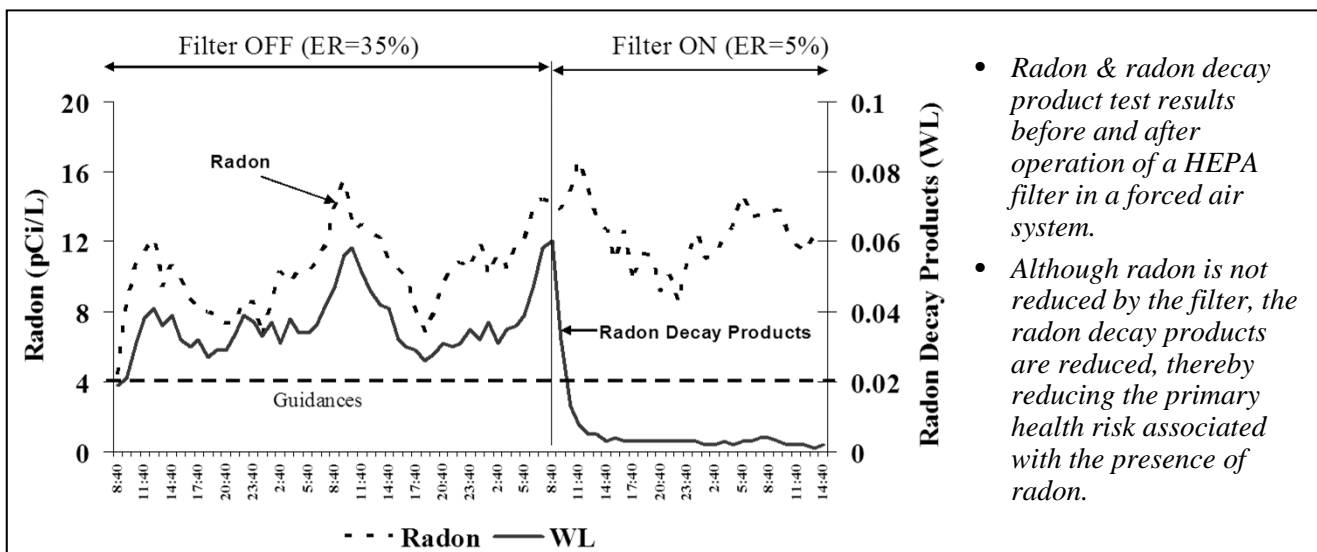
- Media filters (HEPA or near HEPA), electronic filters
- Whole house (standalone units with ductwork around home)
- Incorporated into furnace
 - Requires constant blower operation (can use variable speed)
 - Typically requires installation by HVAC contractor

Applications

- Reduces radon decay products (does not reduce radon)
- Where client can receive other benefits like allergen and asthma trigger reduction
- In very difficult to mitigate homes or where ASD has not fully reduced levels to owner's satisfaction

Post-Mitigation Testing

- Must test with device that measures radon decay products.
- Best approach is to test both radon and radon decay products to verify reduction occurred from lowered radon decay products rather from a temporary a change in radon levels.



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Advice:

- Everyone should test their homes.
- Radon is extremely variable from one home to the next.
- Testing is inexpensive and mitigation, if needed, represents a small cost compared to the value of the home.

Key Points

- Primary risk from the presence of radon comes from radon decay products (RDPs).
- Radon decay products have electrostatic charges that can cause them to be attached to airborne particles.
- When initially formed, RDPs are single atoms and can diffuse very rapidly and attach to nasal passages, thereby reducing their entry into lungs.
- As the radon decay products attach to other airborne particles, the aggregate size increases to where they are less diffusive and can pass by the nasal hairs and enter the lungs.
- Very large particles to which radon decay products are attached can be filtered out by nasal hairs.

Air Cleaners

- Air filters can remove radon decay products that are attached to airborne particles.
- Air cleaners reduce exposure to radon decay products but do not reduce radon gas.
- Some units work better than others.
- Console units only treat a specific room
- Central air units can impact entire building when equipped with air filters.
- Can reduce other indoor air pollutants.

Dose vs Exposure.

- Exposure is the amount of radon decay products in the air available for inhalation.
- Dose is the actual amount of radon decay products that make it into the lungs (i.e. nasal passage can filter out very small and coarse particle size.)
- Research conducted by Dr. Hopke indicated the following with respect to exposure and dose when air filters were used:
 - Air filters can reduce exposure by filtering out radon decay products
 - In no case was the actual dose increased with smaller radon decay products being left in the air.
 - Dose typically decreased by 50% of the overall exposure reduction.

Application of Air Cleaners:

- Suited for cases where radon levels are less than 10 pCi/L
- Best if part of whole house circulation/filtration system.
- Good trim technique after an ASD systems has reduced levels-but not far enough.
- Good where other IAQ concerns can also be treated at the same time as radon decay products
- Need a post-mitigation measurement device that measures radon decay products to be able to determine efficacy.