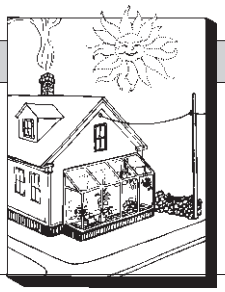
Radon-Ridding Products



by Alex Wilson

Last December in this column I took a look at radon testing – what products are used to measure radon concentrations and how they work. In this column, I'll cover a few of the widely ranging specialized products used for radon mitigation (eliminating radon from buildings). For each type of product, I will briefly describe what it does and how it's used, ten I'll provide a sampling of actual products on the market, with brief descriptions where needed. More specific information can be obtained from the manufacturers or suppliers (addresses and phone numbers are listed).

Sub-slab and Basement Wall Ventilation Equipment

A frequently recommended procedure to reduce high radon levels is to depressurize the area under the slab. A section of pipe (usually 4-inch diameter) is installed through the slab, either when the slab is poured (for new construction) or when a radon problem is discovered, and a fan is used to suck air out of the sub-slab area. The system works best if there is a gravel or highly porous layer under the slab so that a single-stand pipe with fan can adequately depressurize the entire sub-slab. Various fan configurations, pipe couplings, backflow traps, and drainage channels are available to aid in this type of ventilation, including systems designed to depressurize hollow block walls.

Fans.

RB Kanalflakt, Inc.
1121 Lewis Ave.
Sarasota, FL 34237
813/366-7505
In-line centrifugal duct fans radon ventilation. Grilles, speed controllers, other accessories available.

Fantech, Inc.
2225 Industrial Blvd.
Sarasota, FL 34234
813/351-2947
R-Series line of in-line fans. 4 to 6 inch diameter, several cfm ratings.

Radon Detection Services
P.O. Box 419
Ringoes, NJ 08551
201/788-3080
RDS Remediator, 4-inch, 170 cfm fan in aluminum housing for interior mounting.

Radon Appliances, Inc.
P.O. Box 1461
Glen Burnie, MD 21061
301/766-5711
In-line radon exhaust fans.

Area pressurization. In some situations, rather than *depressurizing* the area under the slab, it is preferable to pressurize the entire basement, crawl space or ground floor of a crawl space or ground floor of a building. By pressurizing the space, there is always outward pressure and radon is kept from entering.

Current Indoor Air
Mitigation systems, Inc.
830 N. Tejon
Suite 218
Colorado Springs, CO 80903
303/440-8555
Fan and ducting system to pressurize basement, crawl space, or ground floor. Incorporates low-efficiency air-to-air heat exchanger pipe, Kanalflakt fan.

Interior wall drainage channel. The joint between slab and wall in a basement is a major entry point for radon. Several manufacturers have produced products to put that crack under negative pressure and vent to the outdoors. A hollow baseboard channel is used for this, which is tightly sealed to the wall and slab during installation. With hollow block walls, holes can be drilled at a bottom of each block cavity so that the same channel can depressurize the block wall.

Safe-Aire, Inc. and Basement De-Watering Systems, Inc.
162 E. Chestnut St.
Canton, IL 61520
800/331-2943
Wall perimeter channel and piping system. Product originally designed for water drainage (draining to sump), but radon mitigation function was also found. Air/radon is vented to outside.

Radon Channel
Weaver Works
P.O. Box 1085
Carmel, IN 46032
800/523-2082
ABS plastic channel for interior perimeter wall depressurization. Available by the length with special couplings and fittings.

Sub-slab drainage mat. A 4- to 6-inch layer of gravel under a concrete slab allows the sub-slab space to be depressurized. A stand pipe coupled to a fan can pull air from the entire sub-slab area, depending on the porosity of the gravel. To guarantee free air flow under the slab, a specialized drainage mat can be installed before pouring the slab. To date, there is only one product on the market specifically designed to do this.

AKZO Industrial Systems
PO Box 7249
Asheville, NC 28802
704/258-5050
EnkaVent sub-slab drainage mat. 8/10-inch thick matrix of nylon filaments bonded to polyester filter fabric. Essentially the same product as EnkaDrain used for exterior foundation drainage.

Ventilation pipe couplings and traps. Pipe couplings are critical to the success of any depressurization or pressurization type radon mitigation system. Specialized rugged couplings and pipe reduction fittings made of PVC and stainless steel are recommended for radon mitigation systems. Also necessary for some radon mitigation systems are U-tube traps, which can serve as one-way valves for ventilating basement drainage pipe. (with such a trap, the conventional perforated drain pipe around a house perimeter can often be used for radon venting.)

Indiana Seal
Weaver Werks
(see above)
Drainage pipe couplings to ensure tight fit and no leakage.

Radon Appliances, Inc.
PO Box 1461
Glen Burnie, MD 21061
301/766-5711
U-tube water traps to prevent backflow in forced radon ventilation.

Fan housing and grilles.
Weaver Werks
(see above)
Newly introduced FanHouse for exterior fan mounting with exhaust either to 4-inch plastic pipe or 3x4 inch downspout material (to blend in better with house). Weaver Werks also sells several grilles and back-draft dampers.

Failure alarms and labels. If the radon mitigation system depends on a fan operating continuously, there should be some system to alert the homeowner if the fan – or some other critical component of the system – fails. Systems should also be clearly marked, so that if the present homeowners move out, the new homeowners will understand what the piping and fans are for. Even capped stand pipes – installed when a slab is poured so that future radon mitigation can be accomplished with minimal cost and effort – should be clearly marked. Without proper marking, stand pipes could be mistaken for waste water drainage, causing real problems.

Home Environment Company
PO Box 24744
Speedway, IN 46224
317/247-1881
"Radon Sentry" alerts the homeowner of a loss of pressure (or negative pressure) in the radon mitigation system with audible alarm and red light.

Weaver Werks
(see above)
Pressure sensitive labels available to clearly identify radon mitigation systems and air flow direction.

Sump and Drain Covers

Basement sumps and drains are often major sources of radon in homes. Tight-fitting covers, vented to the outside, will prevent radon from getting into the basement. For new construction, entire sump housings are available, which will provide even a tighter seal against radon entry into the living space.

Dranjer Corp.
1441 Pembina Hwy.
Winnipeg, Manitoba
R3T-2C4, CANADA
204/474-0451
Company offers both sump and drain covers

Radon Appliances, Inc.
PO Box 1461
Glen Burnie, MD 21061
301/766-5711
Sump covers for radon control.

Safe-Aire, Inc.
(see above)
Offers several different sump covers, sump liners and whole sump pump systems, both for new construction and retrofit.

Weaver Works
(see above)
Offers its own sump cover, Hancor vented sump assembly (for new construction) and Dranjer drain covers.

Sealants

Readily available caulks and foam sealants play an important role in keeping radon out of houses. With caulks, one-part polyurethane caulks are generally recommended (e.g. Sikaflex, Geocel Spec 3000).

Uretech foam sealant is heavily promoted for radon mitigation work, but any one- or two-part polyurethane foam sealant can be used (one-part for sealing cracks with a bead foam; two-part for sealing larger areas).

"Radon Gard" epoxy coating, available from Safe-Aire can be used for sealing block walls and poured foundations to block out radon.

Radon Removal Equipment

Air-to-air heat exchangers are effectively used to reduce radon levels in homes. Any air-to-air heat exchanger will work for this purpose, effectively bringing moderate radon levels (below about 40 picocuries per liter) down to the acceptable level of 4 pci/1.

Along with air-to-air heat exchangers, there are a number of specialized products available for actually removing radon from air or water.

RAd Systems, Inc.
21 E. Main St.
Westborough, MA 01581
508/366-5051
RAdsorb-222 Radon Removal Unit. System relies on charcoal absorption to remove radon from air. Activated charcoal is regenerated for long life.

Control Resource systems, Inc.
670 Mariner Drive
Michigan City, IN 46360
800/272-3786
CRS1 600H, a 600 cfm three-stage air purification unit that includes a prefilter, activated carbon filter and HEPA filter.

North East Environmental Products, Inc.
85 Mechanic St.
Lebanon, NH 03766
603/448-3944
Clearadon II Radon Removal System for water. Unit treats up to 10 gallons per minute removing more than 99 percent of radon.

Ion Systems, Inc.
2546 Tenth St.
Berkeley, CA 94710
415/548-3640
"No-Rad" Positive Ion Generator for radon removal. Novel device removes positively charged radon decay products from the air by generating positive ions that repel the radioactive ions to the wall where they adhere and decay harmlessly. Because this device removes radon decay products rather than radon gas, low-cost radon testing (alpha track and charcoal canister monitors) will not show a reduction, but it is the radon daughter products, not radon itself, which are dangerous.

Protective Equipment for Radon Mitigation Work

Companies that do any amount of radon mitigation work should use protective respirators. Simple dust masks will eliminate most of the risk by filtering out dust, to which radon decay products adhere, but specialized respirators with screw-in cartridge filters for radionuclides are more effective.

Safe-Aire, Inc.
(see above)
3M. Model 7300 and 7300S respirator with dual radionuclide/HEPA cartridges provides effective filtering for radon decay products. Organic vapor filter cartridges also available. Effectiveness may be reduced by a beard.

Radon Products Catalogs

Both Weaver Werks and Safe-Aire, Inc. listed above provide a catalog of radon testing and mitigation equipment. These companies label some of their own equipment and carry many of the products described here. ■

Alex Wilson is a technical writer based in Brattleboro, Vt., who specializes in energy and building issues.