



E³A: Energy Management for Home

Steps in the Home Energy Series

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Indoor air quality

We usually think of air pollution as an outdoor problem — car exhaust, smokestacks, etc. Surprisingly, the air you breathe in your home might be more polluted than outside air. Home indoor air pollutants can cause health problems, even if you are only exposed to some pollutants for a short time. Symptoms range from allergic reactions such as sneezing, coughing and watery eyes to headaches, nausea and fatigue. Some pollutants have even been linked to cancer and other serious illnesses.

Gases and particles from fuel-burning appliances can pollute the air in your home. Regardless of the fuel source (natural gas, propane, kerosene, wood or coal), all combustion appliances have the potential to release harmful gases into your home, such as carbon monoxide. Wood burners can also introduce irritating smoke and ash particles. Closely follow installation and operating instructions for furnaces, water heaters, wood stoves, ranges, clothes dryers, space heaters and fireplaces, and keep these appliances in good working order. If you have a combustion appliance, you should install a carbon monoxide detector. For more details, read *Carbon Monoxide and Gas Appliances*.



Biological pollutants include mold, mildew, bacteria, fungi, dust mites, pollen and animal dander. These microscopic pollutants often cause allergic reactions and can trigger asthma attacks. You can't eliminate them entirely, but you can keep levels down with adequate ventilation and regular cleaning. Use a vacuum with a high-efficiency particulate air (HEPA) filter. Minimize dampness by venting the clothes dryer and kitchen and bathroom fans to the outdoors rather than the crawl space, basement or attic. Ensure there are vents to the outside and crawl spaces in the attic. Regularly clean humidifiers and evaporation trays in air conditioners and refrigerators. For tips on controlling moisture, read the *Condensation* guide in this series.

Asbestos is a mineral fiber often found in many products, such as pipe insulation, in older homes. Until the late 1970s, it was also used to make floor tiles, roof and siding shingles, thermal insulators and other fire-retardant, insulating building materials. Asbestos is harmful only when disturbed, usually during remodeling jobs. Inhaling its tiny fibers can cause lung and abdominal cancer years after exposure. If your house contains an asbestos product in good shape, it is probably best to leave it alone because it only causes harm if the fibers become airborne. If it is deteriorating or must be repaired or removed, contact a professional for advice before disturbing it.

Lead found in house paint made before 1978 is a big indoor air quality concern, especially during remodeling projects. Breathing lead paint dust as a result of weatherizing or remodeling a home can harm blood cells and kidneys and damage the brain and central nervous system. It can also cause serious developmental problems in children and pregnant women. Old paint in good condition is less of a threat, but dust and loose paint chips are common in old homes, especially around windows, and should be corrected as soon as possible. To limit exposure, duct tape works well for picking up chips, and frequent damp cleaning is a good way to control dust. Consult an EPA-certified renovator before remodeling jobs, especially if you have small children and the house was built before 1978. If you're unsure about the presence of lead, never sand, scrape or undertake a construction project in a home built before 1978 without determining if lead paint is present. To conduct a lead risk assessment contact an EPA-certified firm, visit www.epa.gov/lead for a list of certified firms.

Household products such as paints, solvents, paint strippers, glues, pesticides, aerosol products and some cleaners must be handled with care — especially those containing volatile organic compounds (VOCs). VOCs are chemicals that are released into the air when you use products that contain them. Some VOCs escape even from stored, closed containers.

Breathing these gases can irritate your eyes, nose and throat, or cause headaches and dizziness. Long-term exposure might cause liver, kidney or nervous system damage. Buy these products only in quantities you'll use right away, always follow the directions closely, and work in a well-ventilated area.

Formaldehyde is a smelly gas commonly found in the glues used to make pressed wood products such as particleboard, paneling and furniture. It's also in some draperies and upholstered furniture. Some people are more sensitive to this gas than others. It can cause watery eyes; burning sensations in the eyes, nose and throat; rashes; headaches; loss of coordination and breathing difficulties. Keeping your house cool with humidity levels below 50 percent reduces formaldehyde emissions.

You can also coat pressed-wood surfaces with a special sealant to reduce out-gassing.

Radon is an odorless, radioactive gas that can cause lung cancer. It naturally occurs in rocks and soils and usually enters homes through basements or crawl spaces, though it can also enter with well water and stone building materials. Testing is the only way to find out if you have a radon problem. This can be done by hiring a monitoring service or buying a do-it-yourself test kit from hardware stores or local extension offices. If you buy a do-it-yourself test kit, carefully follow the directions. Radon problems can be fixed, but you should consult a professional before tackling the job.

Second-hand smoke, or passive smoking, is a combination of the tobacco smoke exhaled by smokers and that produced by the burning end of a cigarette, cigar or pipe. It irritates the eyes, nose and throat and might lead to lung cancer, asthma

and chronic respiratory ailments such as coughing, wheezing and excess phlegm. Children are especially prone to problems caused by passive smoking. Eliminate this indoor air hazard by asking smokers to smoke outdoors. If smoking does take place indoors, make sure children aren't present and increase ventilation by opening windows or using an exhaust fan.

Energy efficiency

If your home is energy-efficient, if it is insulated and air leaks are sealed with caulking and weatherstripping, maintaining good indoor air quality is even more important. The easiest way is to cut back on your use of fuel-burning appliances as well as products that produce VOCs. Also, make sure your home is adequately ventilated. If you're particularly sensitive to pollution, you could also consider buying a home air-cleaner, but always try to reduce air pollution at the source first.

Signs of possible indoor air quality problems include:

- Unusual and noticeable odors, stale or stuffy air.
- Noticeable lack of air movement.
- Dirty or faulty central-heating or air-conditioning equipment.
- Damaged flue pipes or chimneys.
- No source of combustion air for fuel-burning appliances.
- No exhaust ventilation for fuel-burning appliances.
- Excessive humidity.
- Tightly constructed or remodeled home.
- Presence of mold and mildew.
- Health reaction after remodeling, weatherizing, using new furniture, use of household or hobby product, or moving into a new home.
- Feeling noticeably healthier outside the home.

Additional information

For more information on radon, see <http://www.epa.gov/radon>.

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