



Home Indoor Air Quality Assessment

Do your eyes burn? Do you complain of nose and throat irritations, headaches, dizziness or fatigue? Perhaps the problem is poor air quality in your home. In the last several years a growing body of scientific evidence indicates that the air within homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cities. The Federal Clean Air Act regulates and controls emissions from cars and industries, but such initiatives deal only with the outdoor environment. Research indicates that people spend approximately 90% of their time indoors. As a result, indoor air pollution in the home has become recognized as a serious problem.

Sources of Indoor Air Pollution

When we talk about indoor air quality, we are referring to various natural and man-made pollutants in the air inside our homes. These pollutants can be chemicals, gases, particles and other substances. Pollutants which can occur in the home include:

- Volatile organic compounds, often referred to as VOC's, from household chemicals, solvents, paints, aerosols and cleaning products
- Formaldehyde
- Respirable particles generated by wood stoves, open fireplaces, and tobacco smoke
- Combustion by-products such as nitrogen oxides, carbon monoxide, and carbon dioxide
- Radon gas
- Asbestos
- Lead
- Biological pollutants including mold, mildew, dust mites and pet dander

Moisture control and adequate ventilation play an important part in maintaining healthy indoor air. For instance, either very high or very low humidity levels in the home can provide conditions suitable for bacterial or biological organisms such as mold, mildew, fungi, dust mites or viruses. Another important consideration for a healthy home is in the selection and use of housing and household products. In addition various testing methods help discover problem areas which need to be corrected. Costs for these projects range from very inexpensive to a substantial investment in time and dollars.

Effects of Air Tightness on Air Quality

The design, construction and maintenance of a home determine to a large degree the amount of air exchange between the inside and outside air. A home may keep outside pollutants from entering, retain pollutants, or both, to varying degrees. Most home pollutants come from indoor sources. So the more air exchanges there are within the home, the more often indoor pollutants are diluted with outdoor air and this in turn lowers the pollution concentrations.

The air exchange rate, a measurement of the amount of outdoor air that replaces indoor air over a specified period of time, is usually given as average air changes per hour or ACH. The more tightly constructed a house is, the lower its air change rate will be. Tightening a home, while saving energy, may cause an increased concentration of the indoor air pollutants that are already present in the home thus these potential problems need to be addressed.

How do I know if my house has an air quality problem?

If you are concerned about air quality in your house, you can make a common-sense diagnosis by documenting health complaints. Professionals often use the following questions when considering the possibility of indoor air pollution:

- What health complaints have you or other family members experienced?
- Are these health problems reported by more than one family member?
- When were these health concerns first noticed?
- Can you associate these complaints with certain events or activities, such as moving to a new house, remodeling, or adding new furnishings, carpeting or draperies?
- Do the health concerns occur seasonally, at a particular time of the day or when a family member is in a specific area of the house?
- How often do the problems occur and how long do they last?
- Do the reactions disappear when you are away from the house? Do they return when you come back home?
- Do visitors have the same reactions or health complaints?
- Are the problems or reactions less severe when you ventilate the house?

What instruments or other assistance is available to assess the air quality of my house?

Simple monitors can be purchased for detecting the presence of radon, carbon monoxide, formaldehyde, and nitrogen dioxide. These devices are usually placed in the home for a period of three days to three months, depending on the pollutant being monitored. At the end of the monitoring period, the devices are returned to the laboratory from which they were purchased. After the analysis, the confidential results are sent to the homeowner.

What if I have an indoor air quality problem?

There are common-sense measures that will help improve the indoor air in your home. You must decide, either through sampling, medical advice, or common sense diagnosis, whether or not indoor pollutants are a problem for you or family members. Some corrective measures involve changing lifestyle habits. Some can be done as routine maintenance on the house. Some are low-cost, while others may be expensive or difficult to install. Occasionally, with a pollutant like asbestos, unless it poses an immediate threat because it's broken or crumbling, the best strategy may be to do nothing. While the following suggestions are by no means a complete list of air quality improvements, some ideas may be useful to you.

If your home is very energy efficient, you can improve the exchange of stale indoor air with outdoor air by making sure that all kitchen and bathroom vents are exhausted to the outside, not to the crawl space or attic. Be sure to use these vents when showering and cooking. Check to see that attic and crawl space vents are open and not blocked by shrubs, trees or debris.

If your home seems too humid or has excessive condensation on windows, remove as many sources of moisture in the house as possible. This includes fixing leaking pipes and basements. Some areas, such as damp basements, may require the use of a dehumidifier.

Other methods to improve air quality in the home are to restrict the use of pollutant-producing products and to use alternatives when possible. Whenever you are cleaning your home, building or adding onto your house, consider products that have fewer pollutant emissions. For example, grades of plywood made with phenol or other resins don't give off as much formaldehyde gas and are available at slightly higher cost. When remodeling, try not to disturb products that you suspect may contain asbestos. Professional assistance is needed when removing or disturbing large areas containing lead-based paint or asbestos.

You can also restrict the use of certain pollution-producing products. If you use wood as a fuel, consider reducing the amount of time you burn the wood and be sure to bring some fresh or outside air into the house periodically when the wood is burning. "Air-tight" wood-burning appliances equipped with catalytic combusters improve the burning efficiency and reduce pollutants.

Consider using household products that are non-polluting. Improve ventilation when you work with products such as solvents, furniture refinishing compounds and even household cleaners. If you have an outside-vented exhaust fan where you are working, be sure to use it when you work with these products. If you don't have such fans, consider adding them or else use the products outdoors or with as much natural ventilation as possible.

Summary

You want to make sure that your home is a safe and healthy place to live. Whether you live in a new, energy-efficient home or an older home that is not as air tight, you will probably be exposed to pollutants. Keys to improving the quality of indoor air include good ventilation, restricting the use of pollutant-producing products, controlling the pollutant at its source and using alternative products.

If you think you have a serious pollution problem, you may wish to contact your county health department office or the State Division of Air Quality. Your county Extension office may also be able to provide additional information about indoor air quality, sources of monitoring devices, and names of local or county health agencies which can provide assistance.

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