



Indoor Air Quality Testing Should Not Be The First Move



Many times, office workers, homeowners, renters, teachers, parents, administrators and other school stakeholders want to have their building "tested" to assure themselves of "good indoor air quality". This is usually not the first move that responsible parties should make. Why do health professionals recommend caution and a great deal of thought before testing the air? There are a number of reasons.

◆ There Are No Standards

- There are no appropriate standards for indoor air quality (IAQ) in environments such as schools, office buildings, and residences [not including asbestos, lead, and radon].
- There are some industrial standards for permissible exposure limits for certain chemicals used in manufacturing and other work place settings, but these standards should not be used for children, sensitive populations such as pregnant women, the elderly, or people with certain illnesses. They should never be used in residential settings.
- There are no health-based standards for indoor levels of molds because there is great variability in both people's reaction to mold and in molds themselves. There is no scientific support for designating a particular mold measurement as "safe" or "unhealthy."
- The most current ventilation guidelines for acceptable indoor air quality are just that - *guidelines*. They are not enforceable unless they are part of the building code. Newer buildings are generally designed according to newer ventilation guidelines, but older ones built to a building code in existence at the time of construction (especially pre-1989) may be outdated.

◆ The Lack Of Enforceable Standards Makes Interpretation A Tricky Business

It is difficult to interpret the results of air testing. This can add to the confusion and create an air of mistrust between the stakeholders and the administration that ordered the testing.

- ⇒ Testing as a first response does not usually lead to an answer or solution. Very often air testing is conducted as a knee-jerk reaction to a reported IAQ problem. Such testing done in the absence of a hypothesis or as part of a well-planned investigation usually produces data that raises more questions that it answers. It can raise expectations that a solution will follow, and subsequently raises suspicions if no answer is found.

- ⇒ Background Exposures – Most indoor pollutants (mold, particles, volatile chemicals) are present in all buildings at “background” levels. These contaminants are present in most buildings without causing adverse health effects. Testing indoor air will therefore always find something, usually background levels that have no significance to reported health complaints.

Therefore, DO NOT TEST IF:

- ❑ **the results cannot be interpreted**
- ❑ **results will add no meaningful information**
- ❑ **just because someone wants it done**

◆ **What Is The First Step In Creating A Space With Good Indoor Environmental Quality? What Should You Do Before or Instead of Air Testing?**

- ⇒ Walk through the building using your eyes, nose, and common sense to identify potential problems.
- ⇒ Look at general cleanliness (or lack thereof) in each of the areas you inspect.
- ⇒ See if building services can substitute cleaning agents that have less of an odor (low VOCs – volatile organic compounds) than the stronger, odor-producing ones that may be in use.
- ⇒ In addition to bedrooms, bathrooms, classrooms, offices, gymnasiums, locker rooms, auditoriums, music rooms, industrial and fine arts rooms, etc, also look at maintenance areas such as janitor closets, mechanical rooms that house ventilation equipment, chemical storage closets in labs and in custodial areas, etc. Do not store chemicals near ventilation equipment.
- ⇒ Take note of where carpeting is used. How is it cleaned, and how often? Does it ever get wet from flooding, roof leaks, etc, and if so, how quickly is it dried out?
- ⇒ Walk around the outside of the building and look for potential pollution sources.
- ⇒ Look for locations of fresh air intakes and exhaust vents. Are they too close together, allowing exhaust air to be sucked back into the building via the intakes? Are the intakes located near dumpsters or where busses, trucks or cars idle?
- ⇒ Look at how the building is set on the land. Does the land slope downward towards the building, allowing rainwater to pool along the foundation? Is the building located on former swampland or landfill? Is there a high water table or underground stream under the building? Is landscaping too close to the building?

All of these things can have an impact on indoor environmental quality. Here are some additional things that should be done early on, before resorting to actually testing the air.

For schools, [EPA's Tools for Schools](#) program should be instituted as a preventative framework for identifying and addressing problems early before they become unmanageable. The [National Center for Healthy Housing Principles of Healthy Homes](#) provide a similar framework for residential properties. See page 6.

- **Examine Building Usage**

Compare the hours that the building is actually used with any automatic timers that may be set to turn the mechanical ventilation systems on and off, and make adjustments as necessary. Those who schedule building usage for activities must be sure to communicate this to facilities management. Mechanical systems should be turned on early enough in the morning to let these systems attain full capacity by the time school or work begins.

- **Ask About Maintenance Service Contracts**

Schools and offices often have service contractors to take care of certain parts or all of the physical plant. This is especially true for the ventilation equipment. You can ask questions about how often filters are scheduled to be changed, and about what other components are included in an annual service contract (be sure to ask to see the maintenance log for proof of when this work was completed).

If your facility subcontracts out janitorial services, find out what is included in the contract. Ask about the cleaning agents they use and request products with low VOCs.

- **Plan Minor Renovations During Off-Hours**

- Schedule minor jobs such as painting, floor re-surfacing, carpet installation, etc. during hours when school is not in use.
- Use low VOC paint, glues, polyurethane, and other building materials whenever possible. Limit the use of particleboard, pressed wood and plywood containing formaldehyde. If you do use these woods, make sure that they are “CARB II compliant” (low formaldehyde content).

- **Build Communication Into Large Renovation Projects**

- Before major renovation projects are scheduled, meet with office workers, principal, teacher representative, school nurse, facilities director and local health director in your town or district. Set up a plan for communicating relevant information to everyone who may be affected. This includes workers, parents and students.
- Plan to do as much work as possible during non-school or non-business hours.
- Isolate construction areas from non-construction areas using barrier techniques to minimize contamination in areas that will be used for normal school or office activities.

Much of the time, a building assessment should be performed to identify basic problem areas. Once these areas have been identified, you then may decide to call in the professionals. However, as a first cut, here are some things you can do yourself.

- **What You Can Do Yourself**

- Implement EPA's *Tools for Schools Program* or the National Center for Healthy Housing's *Principles of Healthy Homes* . (see page 6)
- Develop proactive risk communication
- Do routine scheduled maintenance on building mechanical and plumbing systems, *especially on HVAC* (heating, ventilation and air conditioning) *equipment*
- Remove pollution sources
- Substitute odorous products with those containing low VOCs whenever possible
- Fix all leaks *promptly!*
- Remove and discard all porous materials damaged by water. This includes ceiling tiles, carpets, furnishings, cardboard, and even wallboard.
- Schedule repairs/renovations during off hours

- **When Is Indoor Environmental Testing Useful?**

Once a problem has been identified, the solution may be thought of as a puzzle. There are many pieces, and air sampling for certain things may be one of them. There is no single magic box to sample all indoor contaminants. Part of the puzzle is in figuring out which (if any) contaminants may be contributing to the problem. Other important pieces of the puzzle will include: a building walk through, taking a history of the physical plant and any past and present maintenance problems, history of building usage and land usage on the property and surrounding neighborhoods, review of architectural and mechanical blueprints, interviewing maintenance staff, and anything else that would add information about the physical structure of the building, and the activities that go on in and around the building.

It may also be useful to interview the building occupants. Ask for their help in identifying problem areas. Set up good lines of communication between management, staff, and parents. This is crucial and cannot be over emphasized! Ask the school or company nurse if she/he has observed or documented an increased incidence of health complaints. Are they specific types of complaints or more generalized in nature? It may be desirable to do a symptom survey if lots of people are affected. Your local health director can help coordinate these activities.

When all of the practical steps and investigations described above have been conducted, there may be a place for air testing for certain specific contaminants. Air testing may be used to confirm or refute a highly suspected source that is uncovered during the walk-through inspection.

Air testing is most useful when a specific contaminant or contamination source has already been identified as a likely culprit, and quantitative data are needed to:

- Document the degree or extent of the hazard, or
- Document different locations in a building where elevated levels or severe conditions exist.

Air testing may also be useful in a qualitative manner when trying to differentiate between several suspect chemicals or sources. Although air testing is sometimes useful in tracking down chemical sources, air testing for mold is an entirely different story. A complicating factor in interpreting air results of mold testing is that a large variety of molds are present in our everyday environment. Most of the time, you will find that molds normally found outdoors are also present indoors. This is because they are carried in on our clothing and shoes, and also enter building interiors via open windows, doors, and fresh air intakes.

So, to review, indoor air testing may be useful when:

- ❑ **It is part of an overall evaluation**
- ❑ **When the data is interpretable**
- ❑ **When the data has a descriptive component that helps to illustrate its place in the overall evaluation**
- ❑ **NEVER alone**

After undertaking the steps described above, you may find it necessary to hire one or more professionals. Remember that varied problems may require more than one type of specialist. For example, you may need a ventilation engineer, or a moisture specialist, or an architect, or an industrial hygienist, or an environmental/ geology consultant. Here are some tips to follow when hiring a consultant.

• **When You Have To Call In A Consultant**

- Discuss the problem with your local health director, and enlist their help with risk communication to all of the stakeholders. He/she may also be able to help you select the right kind of consultant for the job at hand.
- Review the American Industrial Hygiene Association (AIHA) consumer brochure: [Guidelines for Selecting An Indoor Air Quality Consultant](#).
- Have a clear understanding of the problem, so that you can direct the consultant properly.
- Make sure the consultant explains the scope of the project up front - what they can and cannot do. Communicate this to all of the stakeholders so people will have a realistic expectation about the process.

For technical information concerning evaluation, testing or data interpretation, contact:

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<http://www.ct.gov/dph/ieq>
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US Environmental Protection Agency *Tools for Schools Program*



The U.S. EPA has developed an innovative program to address indoor air quality (IAQ) in schools. The *Tools For Schools (TfS)* program is based on the following key principles:

- Many IAQ problems can be prevented by the school community
- IAQ problems can often be resolved using the skills of school staff
- The expenditures and effort to prevent most IAQ problems are a fraction of that required to solve problems once they develop.

Participating schools form a *TfS* committee consisting of administrators, teachers, maintenance staff, parents, and others. The CT School Indoor Environment Resource Team works with *TfS* committees, teaching them how to use *TfS* materials to investigate indoor air quality hazards and develop short and long-term strategies to prioritize and solve IAQ problems.

The *TfS* Action Kit is a key feature of the *Tools for Schools* program. The kit provides all of the materials necessary to promote a low-cost, problem-solving team approach to improving indoor environmental quality (IAQ) in schools.

For more information about starting or maintaining a *TfS* program, call:

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<http://www.ct.gov/dph/schools>

Connecticut Department of Public Health *Healthy Homes Initiative*



Your home is a very important environment for you and your family. If your home environment is unhealthy or unsafe, it may lead to illness, injury or even death. The quality of housing affects our quality of life.

The Connecticut Department of Public Health ***Healthy Homes Initiative*** is a multidisciplinary, holistic, comprehensive approach designed to enhance health and well-being by addressing physical, chemical, and biological hazards in the home.

Principles of Healthy Homes

KEEP IT:

- ◆ Dry
- ◆ Clean
- ◆ Pest-Free
- ◆ Safe
- ◆ Contaminant-Free
- ◆ Well Ventilated
- ◆ Well Maintained
- ◆ Thermally Controlled

For more information about the CT Healthy Homes Initiative, contact:

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