

1. What causes problems with Indoor Environmental Quality (IEQ)?

Indoor pollution sources that release gases, particles or microbes into the air are the primary cause of indoor environmental quality (IEQ) problems in homes, offices or commercial buildings. Inadequate ventilation can increase indoor pollutant levels by not bringing in enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants out of the home or building. High temperature and humidity levels can also increase concentrations of some pollutants and support microbial growth.

2. What are some sources of indoor air pollution?

There are many sources of indoor air pollution in any home, office or commercial building including combustion sources such as oil, gas, kerosene, coal, wood, and tobacco products; building materials and furnishings such as deteriorated insulation, wet or damp carpet, and cabinetry or furniture made of certain pressed wood products; products for household cleaning and maintenance, personal care, or hobbies; central heating and cooling systems and humidification devices; and outdoor sources such as radon, pesticides, and outdoor air pollution. Biological contaminants such as bacteria, mold, pollen, viruses, insects or bird droppings are also sources of indoor air pollution which can accumulate in ducts, humidifiers and drain pans or where water has collected on ceiling tiles, carpeting, or insulation.

3. Is poor IEQ the same as “Sick Building Syndrome”?

The term “sick building syndrome” (SBS) is used to describe situations in which building occupants experience acute health and comfort effects that appear to be linked to time spent in a building, but no specific illness or cause can be identified. The complaints may be localized in a particular room or zone, or may be widespread throughout the building. In contrast, the term “building related illness” (BRI) is used when symptoms of diagnosable illness are identified and can be attributed directly to airborne building contaminants.

4. What are some of the adverse health effects caused by indoor air pollution?

Immediate adverse health effects may show up after a single exposure or repeated exposures. These include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. Such immediate effects are usually short-term and treatable. Sometimes the treatment is simply eliminating the person’s exposure to the source of the pollution, if it can be identified. Symptoms of some diseases, including asthma, hypersensitivity pneumonitis, and humidifier fever may also show up soon after exposure to some indoor air pollutants. Conversely, other health effects may show up either years after exposure has occurred or only after long or repeated periods of exposure. Physical symptoms related to biological contamination can include cough, chest tightness, fever, chills, muscle aches, and allergic responses such as mucous membrane irritation

and upper respiratory congestion. One indoor bacterium, *Legionella*, has caused both Legionnaire's disease and Pontiac Fever.

5. How does air flow in a building affect the presence of indoor air pollution?

If too little outdoor air enters a building, pollutants can accumulate to levels that can pose health and comfort problems. Unless they are built with special mechanical means of ventilation, buildings that are designed and constructed to minimize the amount of outdoor air that can "leak" into and out of the building may have higher pollutant levels than other buildings. However, because some weather conditions can drastically reduce the amount of outdoor air that enters a building, pollutants can accumulate even in buildings that are normally considered "leaky."

Outdoor air enters and leaves a house or building by infiltration, natural ventilation, and mechanical ventilation. In a process known as infiltration, outdoor air flows into the building through openings, joints, and cracks in walls, floors, and ceilings, and around windows and doors. In natural ventilation, air moves through opened windows and doors. Air movement associated with infiltration and natural ventilation is caused by air temperature differences between indoors and outdoors and by wind. Finally, there are a number of mechanical ventilation devices, from outdoor-vented fans that intermittently remove air from a single room to air handling systems that use fans and duct work to continuously remove indoor air and distribute filtered and conditioned outdoor air to strategic points throughout the building. The rate at which outdoor air replaces indoor air is described as the air exchange rate. When there is little infiltration, natural ventilation, or mechanical ventilation, the air exchange rate is low and pollutant levels can increase.

6. How do I know if my building has an issue?

A building investigation should be conducted to determine if your building has an indoor environmental quality issue. The goal of a building investigation is to identify and solve indoor environmental quality complaints in a way that prevents them from recurring and which avoids the creation of other problems. To achieve this goal, it is necessary for the investigator(s) to discover whether a medical or health complaint is actually related to the indoor environment, identify the cause of the complaint, and determine the most appropriate corrective actions.

An indoor environmental quality investigation procedure is best characterized as a cycle of information gathering, hypothesis formation, and hypothesis testing. It generally begins with an assessment of the occupant symptoms or complaints, and then a walkthrough inspection of the problem area to provide information about the four basic factors that influence indoor air quality: the occupants, the HVAC system, possible pollutant pathways, and possible contaminant sources.

For more information related to IEQ please contact us at solutions@cogencyteam.com.