Frequently Asked Questions

Indoor Environmental Quality FAQ's

1. What is Indoor Environmental Quality?
    - Indoor Environmental Quality (IEQ) and Indoor Air Quality (IAQ) are common terms used for the physical, chemical, and biological characteristics of indoor air. The characteristics of the environment are unique to the building, the climate, the HVAC system, the potential contaminant sources (i.e.furnishings, moisture sources, work processes and activities, and outdoor pollutants) and the building occupants.

2. Why is indoor air quality a growing concern?
    - Concerns with energy conservation and weatherization have made building construction nearly airtight, which, in turn, has reduced fresh air and made proper ventilation more important than ever.
    - People today are spending the majority of their lives indoors, more than 90% of the time according to the Environmental Protection Association (EPA).
    - The World Health Organization (WHO) estimated that more than 30 percent of all commercial buildings have significant IEQ problems.

3. What is an indoor air/ environmental air quality monitor and how can it help me?
    - An indoor air quality monitor samples the air continuously and records the data points until downloaded; software provides an analysis of the air quality based on the measurements from sensors installed in the monitor. In the most basic configurations, instruments measure air quality on three parameters; Temperature, Relative Humidity (RH) and Carbon Dioxide (CO_2). By recording samples from all three variables simultaneously over a period of time, one is able to analyze where and when the air quality is poor in the workplace. Once the source has been determined then proper actions can be taken to improve the air quality. An IEQ monitor typically describes an instrument that includes more sensors to sample additional parameters of the environment.

4. What are the most common factors contributing to poor indoor air quality?
    - In approximately 500 indoor air quality investigations in the last decade, the National Institute for Occupational Safety and Health (NIOSH) found that the primary sources of indoor air quality are inadequate ventilation (52%), contaminants from inside the building (16%) and contaminants from outside the building (10%).

5. How can an IEQ monitor measure inadequate ventilation?
    - A good indicator of proper ventilation is the level of CO_2 present in a space. Carbon dioxide is a normal by-product of respiration, combustion and other processes. Elevated levels of CO_2 may indicate that additional ventilation is required. High CO_2 levels usually coincide with high indoor contaminates, due to a problem with the HVAC system. ASHRAE Standard 62 recommends an indoor level not to exceed about 700 parts per million (ppm) above outdoor ambient air which is typically about 300 to 400 ppm. When indoor CO_2 levels are very high (above 1800 ppm), ventilation is low (below 7 cfm/person) and other contaminants can build up, causing irritation and discomfort.

6. Who uses these indoor environmental monitors?
    - Initially air quality monitors were developed to assist property managers, building maintenance staff, health and safety officials, and consultants working in the occupational environment field. HVAC technicians and contractors consequently become involved in the building systems assessment which often requires the use of IAQ monitors, air velocity meters, psychrometers and combustion analyzers. Additionally, various companies, corporations and schools use IEQ monitors to ensure proper air quality in the workplace.

7. Why measure temperature and humidity?
    - Temperature and humidity are two of the basic IAQ measurements that have a direct impact on perceived comfort and, in turn, concentration and productivity. ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy, sets guidelines for recommended temperature and humidity ranges. According to the Standard, the temperature ranges perceived as "comfortable" are 73 to 79°F (22.8 to 26.1°C) in the summer and 68 to 74.5°F (20.0 to 23.6°C) in the winter.

      According to ASHRAE, indoor humidity levels are recommended between 25-60% for optimum comfort. Low RH causes skin to become dry leading to chapping and irritation, and increases static electricity hindering computer operation. High RH levels can result in condensation and thus the development of molds and fungi.

      High temperature and humidity levels can increase the concentrations of some pollutants. To obtain an accurate reading of pollutants levels, it is necessary to take into account these levels and balance the temperature and relative humidity with the carbon dioxide levels.

8. What problems occur when there is poor indoor air quality?
    - The range of investigations of indoor air quality problems encompasses complaints from one or two employees to episodes where entire facilities are shut down and evacuated until the events are investigated and problems corrected. Many experience these symptoms without realizing that they can be alleviated through proper ventilation.

9. How can you check for contaminants generated from inside the building?
    - Newer building construction has minimized the infiltration of outside air and contributed to the buildup of indoor air contaminants. Measuring and monitoring for airborne contaminants can include sampling for formaldehyde, carbon monoxide, nitrogen dioxide, and VOC's which are common potential sources of contamination.

10. Why monitor for carbon monoxide if CO detectors are installed?
    - Carbon monoxide is a colorless, odorless poisonous gas that is a by-product of incomplete combustion. Although CO detectors are important for constant monitoring for unsafe carbon monoxide levels, a portable IEQ instrument will help pinpoint the source of the faulty appliance or improper ventilation or air intake locations. Measurements of carbon monoxide should be taken periodically and spread throughout many areas in a building to be sure that air is being distributed evenly and no dangerous levels of CO are detected, especially in areas where any form of combustion takes place. Typical examples of outdoor CO sources in a building include exhaust emissions from traffic or parking areas and building exhaust stacks. Indoor sources include furnaces, boilers, stoves and smoking areas. Instruments that measure carbon monoxide in real time include the IEQ Chek™ and combustion analyzers, such as the Fyrite® INSIGHT® or PCA®3. High nitrogen dioxide levels can also be generated from diesel or gas exhaust or incomplete combustion.

11. What are TVOC's?
    - TVOC is an acronym for Total Volatile Organic Compound and includes a broad class of chemicals containing carbon atoms that tend to give off high levels of vapor even at room temperature. Sources of VOC's include paints, cleaning compounds, solvents, moth-balls, glues, photocopier off-gassing, silicone caulking materials, insecticides, herbicides, combustion products, asphalt, gasoline vapors, tobacco smoke, dried out floor drains, cosmetics and other personal products. A photoionization detector (PID) can be installed in the IEQ Chek™ for this purpose.

12. Why measure for formaldehyde?

- Much of today's new furniture, carpeting, and other building materials are chemically treated before being shipped or stored to prevent insect or pest invasion. Sources of formaldehyde fumes include off-gassing from urea formaldehyde foam insulation, plywood, particle board, and paneling; carpet and drapes; glues and adhesives. The IEQ Chek™ monitors equipped with a formaldehyde sensor can detect levels down to 0.1 part per million (sensors are not gas-specific), however there is a strong cross-interference to carbon monoxide so testing should be completed sequentially or separately.

13. What is "Sick Building Syndrome?"

- Sick Building Syndrome is a term used to describe a set of symptoms related to chemical, particulate or biological exposure that cannot be related to a specific cause but are alleviated when the occupant leaves the building. Individuals report symptoms such as headaches, nausea, fatigue and drowsiness, to eye, nose, and throat irritation.

14. What is BRI?

- BRI is an acronym for "Building-Related Illness," and is a term used when a specific illness with a known cause is a result of exposure to an indoor agent. Examples are Legionnaire's disease and Pontiac Fever.

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