

Indoor Air Quality

Indoor air quality has become a significant public health concern in recent years. Numerous studies show that environmental conditions in the office, classroom, and home can have a detrimental impact on physical comfort and mental performance. Understanding and controlling common pollutants within a building can help reduce health risks for its occupants -- while often providing the additional benefit of improving productivity and reducing energy consumption.



Health Concerns

In many large cities with severe air pollution, office buildings with sealed windows are now the norm. Unfortunately, this often creates an indoor environment that degrades air quality. When unfiltered indoor air is continuously recycled without exchange with fresh outdoor air, volatile organic compounds, emitted from furniture and carpets, can raise the level of potentially dangerous pollutants. These gasses, combined with the carbon dioxide we exhale, can make occupants less alert, productive, or healthy.

Symptoms caused by indoor air pollutants may appear shortly after a single exposure, or repeated exposures, to a pollutant. These include irritation to the eyes, nose, and throat; headaches, dizziness, and fatigue.

Other effects may show up years after exposure has occurred, or only after long or repeated periods of exposure. These health issues, which can include respiratory problems, heart disease, and cancer, can be severely debilitating or even fatal. It is therefore critical to carefully monitor the air quality in your facility or home, even if physical symptoms are not yet apparent.

Carbon Dioxide

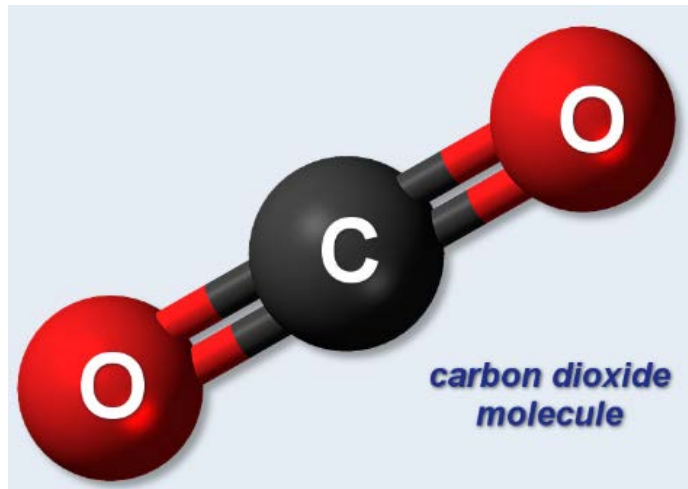
Among the various types of indoor pollutants, carbon dioxide typically attracts a great deal of attention, both as an indicator of the efficacy of a building's ventilation system, and for the adverse impact carbon dioxide itself can have on human health.

Carbon dioxide is a colorless, odorless gas that is a natural component of the atmosphere. It is also a byproduct of human breathing. The amount of carbon dioxide in a given air sample is commonly expressed in terms of parts per million.

The ambient air in most outdoor locations around the world contains approximately 400 parts per million of carbon dioxide, while each exhaled breath by an average adult contains 35,000 or more parts per million. As a result, indoor levels can be considerably higher than outdoors, especially in facilities such as workplaces and schools, where large numbers of people spend the day in close proximity.

Without adequate ventilation to dilute and remove the carbon dioxide being continuously generated by building occupants, it can accumulate well beyond the 1000 parts per million level, and in some cases far higher. The amount found within an indoor environment is often used as a marker for whether other gaseous pollutants are likely to become a nuisance or hazard.

And although carbon dioxide is not usually considered toxic, recent research is raising concerns about the detrimental effects heightened levels of this gas may have on people. For example, a survey conducted by Lawrence Berkeley National Laboratory found that moderately high indoor concentrations of carbon dioxide can significantly impair a person's decision-making capabilities. Test subjects showed significant reductions in performance at carbon dioxide levels around 1,000 parts per million, and large reductions at 2,500 parts per million. This shows that even moderately elevated levels of indoor carbon dioxide can adversely affect us.



AEMC Products

Indoor air quality can also have an economic factor. Absenteeism, discomfort, and lowered productivity can directly impact employee performance. And elevated levels of pollutants may indicate that your ventilation system is running inefficiently and wasting energy.

Fortunately, as environmental sensors become widely available, indoor air quality is no longer an academic pursuit, but something building managers and others can track and manage.



For example, AEMC offers a variety of data loggers that can help you monitor indoor environments for occupant health and comfort. One such instrument is the **Air Quality Logger Model 1510**, which monitors carbon dioxide, temperature, and humidity in the local air. This compact, easy-to-use instrument provides quick and accurate readings, and can store up to a million separate measurements.

The Model 1510 features adjustable alarm settings for indicating when measurements fall outside a specified range. The display blinks with red backlighting when any of the measured parameters exceeds user selected thresholds.

The instrument includes USB and Bluetooth communication for downloading recorded data to a computer. It is also supported by AEMC's DataView data analysis software for viewing real-time data, configuring and running recording sessions, and creating reports. These reports can then be saved and reviewed for identifying and analyzing long-term trends. The instrument is also accessible via a free Android app. This allows you to view measurements in real time, display recorded data, configure the instrument, and perform other tasks directly on your Android smartphone or tablet.

Other AEMC instruments can also help you monitor and improve the efficiency of your facility's heating and ventilation.

For instance, the AEMC Environmental series of data loggers record a variety of environmental quantities, including air flow, humidity, dew point, temperature, and other environmental factors (including light). These instruments are especially useful for assessing whether or not your HVAC systems are functioning efficiently, and what types of fine-tuning may be required to ensure optimal performance.



Conclusion

Let's take a moment to review:

- Indoor air quality has become an increasingly important issue in recent years.
- One particular area of focus is carbon dioxide, which can impact human health and performance, while also serving as an indicator of your ventilation system's efficiency.
- To help monitor the air quality in your facility, AEMC provides a variety of data loggers, including the Air Quality Logger Model 1510 for measuring carbon dioxide, humidity, and temperature.
- Other AEMC instruments can help monitor air flow, dew point, and other environmental parameters.

For more information about these and all other AEMC products, please visit our web site.