

Indoor Air Quality (IAQ)

Information You Need to Know

Why monitor Indoor Air Quality (IAQ)?

Indoor air quality (IAQ) broadly refers to the environmental characteristics inside buildings that may affect human health, comfort, or work performance. We monitor IAQ because we spend approximately 90% of our time breathing “indoor air”. Unlike outdoor air, indoor air is recycled continuously causing it to trap and build up pollutants. IAQ characteristics include the concentrations of pollutants in indoor air, as well as air temperature and humidity.

Poor IAQ contributes to both short and long term health issues which can lead to decreased productivity, absenteeism, and possible litigation. Typical symptoms associated with poor indoor air quality include eye, nose, and throat irritation, headache, nausea, dizziness, and fatigue. In some cases exposure to indoor air pollution can lead to acute and chronic respiratory illnesses including asthma, lung cancer, pneumonia, systemic hypertension, chronic obstructive pulmonary disease (COPD), Legionnaires’ disease, and humidifier fever. See below for a table of major sources and potential health effects of indoor air pollution.

Many of these symptoms can be alleviated by implementing appropriate mitigation strategies. This includes properly identifying and eliminating the offending sources. Aeroqual manufactures environmental monitors for qualifying the air we breathe both outdoors and indoors. The IQM 60 Indoor Air Quality Monitor offers sensors for measuring a range of common indoor air pollutants, in addition to temperature and humidity.

Factors that contribute to poor Indoor Air Quality (IAQ)

Gas and respirable particulates in the air are the primary sources that contribute to poor IAQ. Sources can include inadequate ventilation, poorly maintained HVAC systems, wood and coal stoves, non-vented gas heaters, environmental tobacco smoke, vehicle exhaust emissions, building materials, carpeting, furniture, maintenance products, solvents, cleaning supplies etc. The actual concentrations of these pollutants can also be amplified by other external factors including poor ventilation, humidity, and temperature.

Why use Aeroqual’s IQM 60 for monitoring Indoor Air Quality (IAQ)?

In order to accurately understand your indoor air quality, you need to simultaneously monitor multiple indoor air quality parameters including gases, temperature, humidity and respirable particulates. Aeroqual’s IQM 60 monitor enables simultaneous monitoring of all parameters with a single instrument. Data is logged to a removable SD card or logged directly to a remote PC using the supplied software. The data can then be exported to common spreadsheet programs such as MS Excel for generating reports.

Aeroqual IQM 60 monitors utilize a combination of sensor technologies to achieve rapid response, high sensitivity and stability, excellent accuracy, and low drift characteristics. Aeroqual’s proprietary Analytical GSS (Gas Sensitive Semiconductor) Technology is complemented by NDIR (non dispersive infra-red), PID (photo ionisation detector) and EC (electrochemical) technologies as appropriate for each application. Along with laser-diode precise particle monitors and counters Aeroqual is able to offer the complete package for performing in-depth IAQ analysis and surveys.

Typical applications for IQM 60 Monitors

- IAQ complaint investigation and analysis
- HVAC system performance monitoring
- Air quality engineering analysis
- Mould investigation and remediation
- Health and comfort assessment
- Airport lounges, shopping malls, offices
- Schools and kindergartens
- Hospitals and elderly care facilities



IQM 60 Sensors for Common Indoor Air Pollutants

| Major Sources and Potential Health Effects of Indoor Air Pollutants | | | |
|---|---|---|--|
| Sensor | Pollutant | Major Sources | Potential Health Effects* |
| CO ₂ | Carbon Dioxide | Sick Building Syndrome (SBS), Excessive Building Occupancy and Inadequate Ventilation | Fatigue; Eye, Nose and Throat Irritation; Headaches; Chest Discomfort; Respiratory Tract Symptoms |
| CO | Carbon Monoxide | Non-vented or Malfunctioning Gas Appliances, Wood and Coal Stoves, Tobacco Smoke and Vehicle Exhaust Emissions | Headache, Nausea, Angina, Impaired Vision and Mental Functioning, Fatal at High Concentrations |
| CO PM | Environmental Tobacco Smoke | Cigarettes, Cigars and Pipes | Respiratory Irritation, Bronchitis and Pneumonia in Children; Emphysema, Lung Cancer and Heart Disease |
| VOC | Organic Chemicals | Aerosol Sprays, Solvents, Glues, Cleaning Agents, Pesticides, Paints, Moth Repellents, Air Fresheners, Dry cleaned Clothing and Treated Water | Eye, Nose and Throat Irritation; Headaches; Loss of Coordination; Damage to Liver, Kidney and Brain; Various Types of Cancer |
| O ₃ | Ozone | Ground Level Ozone Entering Indoors; Malfunctioning Air Treatment Systems; and Office Photocopiers and Printers | Eye, Nose and Throat Irritation; Coughing; Chest Discomfort; Reduced Lung Function; Shortness of Breath |
| NO ₂ | Nitrogen Oxides | Non-vented or Malfunctioning Gas Appliances and Vehicle Exhaust Emissions | Eye, Nose and Throat Irritation; Increased Respiratory Infections in Children |
| PM | TSP (total suspended particulates) PM ₁₀ (thoracic fraction ≤10 µm) PM _{2.5} (respirable fraction ≤2.5 µm) PM ₁ (particles ≤1.0 µm) | Cigarettes, Wood and Coal Stoves, Fireplaces, Aerosol Sprays and House Dust | Eye, Nose and Throat Irritation; Increased Susceptibility to Respiratory Infections and Bronchitis; Lung Cancer |
| Future Development | Formaldehyde | Pressed Wood Products e.g. plywood and MDF; Furnishings; Wallpaper; Durable Press Fabrics | Eye, Nose and Throat Irritation; Headache; Allergic Reactions; Cancer |
| Other Sources and Potential Health Effects of Indoor Air Pollutants | | | |
| - | Biological Agents (Bacteria, Viruses, Fungi, Animal Dander, Dust Mites) | House Dust; Pets; Bedding; Poorly Maintained Air Conditioners, Humidifiers and Dehumidifiers; Wet or Moist Structures; Furnishings | Allergic Reactions; Asthma; Eye, Nose and Throat Irritation; Humidifier Fever, Influenza and Other Infectious Diseases |
| - | Asbestos | Damaged or Deteriorating Insulation, Fireproofing and Acoustical Materials | Asbestosis, Lung Cancer, Mesothelioma and Other Cancers |
| - | Lead | Sanding or Open-Flame Burning of Lead Paint; House Dust | Nerve and Brain Damage, Particularly in Children; Anemia; Kidney Damage; Growth Retardation |
| - | Radon | Soil Under Buildings, Some Earth-Derived Construction Materials and Groundwater | Lung Cancer |

* Depends on factors such as the amount of pollutant inhaled, the duration of exposure and susceptibility of the individual exposed.