

## ABIOLGICAL

### Carbon Dioxide

Carbon dioxide (CO<sup>2</sup>) is an odorless, colorless gas that is a by-product of normal human respiration. Exhaled breath from building occupants is an important source of CO<sup>2</sup> indoors. High CO<sup>2</sup> concentrations indoors can be an indicator of poor air circulation or under ventilation.

Normal outdoor CO<sup>2</sup> concentrations are typically around 350 ppm. An indoor concentration of greater than 1,000 parts per million (ppm) of CO<sup>2</sup> is indicative of a potential indoor air quality problem. CO<sup>2</sup> concentrations below 1,000 ppm usually indicates that the ventilation is adequate to deal with the normal products associated with human occupancy. However, an indoor CO<sup>2</sup> concentration less than 1,000 ppm does not always insure that there is no IAQ problem, there can be other contaminant sources contributing to poor IAQ.

If you feel that the quality of air in your workspace is poor, notify your supervisor. If your supervisor cannot resolve the issue through facilities or other means, the RM&S office should be notified by your supervisor.

**Need Help?**

**Contact**

**Risk Management and Safety  
at 334-740-9797**



## BIOLOGICAL

### Bioaerosols

The term bioaerosol refers to both living and non-living biological air contaminants. This can include mold or mildew (fungi), bacteria, viruses, algae, animal dander, dust mite allergens, and pollen. These contaminants travel through the air and are often invisible.

Many IAQ problems begin as moisture problems such as leaks or excessive humidity. These moist conditions allow organisms such as mold and mildew to grow rapidly. These conditions can be found in many locations, such as bathrooms, wet appliances (humidifiers and air conditioners), and some carpets and furniture. Mold, mildew and other biological contaminants can also grow in poorly maintained building ventilation systems. These systems can distribute the contaminants through the building to the occupants.

You can reduce your exposure to biological contaminants in several ways:

- Keep the relative humidity level between 30 to 60 percent. Dry off wet surfaces and correct water problems.
- Thoroughly clean and dry water-damaged carpets and building materials or consider removal and replacement.
- Dust mites, pollens, animal dander, and other allergy-causing agents can be reduced, although not eliminated, through regular cleaning.
- Eliminate or greatly reduce indoor plants as the soil harbors fungi, bacteria, and pollen.



# INDOOR AIR QUALITY

## INDOOR POLLUTANTS

ABIOLGICAL

BIOLOGICAL

## ABIOLICAL

### Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless, gas. It is produced whenever there is incomplete combustion of fuels. These fuels may be in the form of wood, charcoal, natural gas, or fuel oil. Carbon monoxide can also be emitted from combustion engines (automobiles, gas powered lawn mowers, etc.); poorly ventilated kerosene or space heaters, furnaces, woodstoves, gas stoves, fireplaces, and tobacco smoke. CO can be introduced into the office environment through the air intakes of the heating, ventilation, and air conditioning units

Symptoms can range from fatigue, headache, weakness, confusion, disorientation, nausea, and dizziness.

### Heating, Ventilation, and Air-Conditioning (HVAC) systems

HVAC systems are designed to provide air at comfortable temperature and humidity levels, free of indoor air contaminants. HVAC systems that are improperly operated or maintained can contribute to poor indoor air quality. Operating a ventilation system according to its design specifications and the performance of regular maintenance and inspections helps to reduce the chance for an indoor air quality problem.

### Airborne Dust

Airborne dust is typically comprised of particles and fibers that harmlessly float about in our daily environments and usually are of no health and safety concern. Under certain conditions large concentrations of airborne dust can become a nuisance or hazard to the occupants of indoor environments.

## ABIOLICAL

### Formaldehyde

Formaldehyde (HCHO) is a colorless chemical with a strong pungent odor. It is classified as VOC and is an important industrial chemical used to make such things as building materials and household products. It is found in glues, wood products, preservatives, permanent press fabrics, paper product coatings, and certain insulation materials. Products such as particleboard, cabinets and furniture, plywood wall panels, and urea-formaldehyde insulation can off-gas formaldehyde gas. Off gassing of formaldehyde can come from building materials and textiles

### Ozone

Ozone (O<sup>3</sup>) is a colorless gas with a pungent odor. Ozone can be generated from electrical motors, photocopy machines, and electrostatic air cleaners. The symptoms of ozone exposure may include cough, respiratory irritation, shortness of breath, headache, fatigue, and eye irritation. These symptoms usually subside within two to four hours of cessation of exposure.

### Radon

Radon is radioactive gas estimated to cause many thousands of cases of lung cancer each year. Radon comes from the natural (radioactive) breakdown of uranium in soil, rocks, and water and gets into the air we breathe. Radon gas can seep into buildings such as offices, schools, and homes through cracks or other openings in the foundation. Radon's decay products can cause lung cancer. Radon is second to smoking as a cause of lung cancer in the United States.



## ABIOLICAL

### Volatile Organic Compounds (VOC's)

VOC's are organic compounds that can be the source of IAQ problems when their concentrations exceed normal background levels. Potential sources include personal care products, cleaning products, paints, lacquers, varnishes, pesticides, pressed wood products, and insulation. Microorganisms have been shown to release VOC's which results in a moldy, musty odor.

### Temperature and Relative Humidity

The ambient indoor temperature and relative humidity of an indoor environment can contribute to the quality and comfort of your indoor environment. High ambient temperatures and relative humidity can cause occupant discomfort and can provide the appropriate conditions for the growth of molds and mildews. It is recommended that office indoor temperatures during winter months be between 69 and 76 degrees Fahrenheit (F) with a relative humidity between 30 and 60 percent. During the summer months they recommend an indoor temperature range of 73 to 79 degrees F and a relative humidity between 40 to 60 percent.

### Environmental Tobacco Smoke

Research and field studies have indicated that environmental tobacco smoke (ETS) is one of the most harmful of all indoor pollutants. Burning tobacco releases a complex mixture of particles and over 4,000 chemicals into the air. Forty-three of these chemicals are known to induce cancer in both humans and animals and many of the others can induce cancer when combined with other substances.