

Indoor Air Quality

OHS information for workers and employers

Why is air quality so important?

Workers desire healthy and comfortable working conditions. When these conditions are not met, job satisfaction, productivity and health may be compromised. Indoor Air Quality (IAQ) considers the indoor environment, including the makeup of the air and comfort factors such as temperature and relative humidity.

IAQ issues tend to be complex and should be properly assessed to identify problems and their solutions. Most often IAQ problems are the result of poor ventilation in a building.

Some examples include:

- ventilation systems not designed for the level of occupancy or work activities;
- ventilation systems that are in need of maintenance; and
- buildings designed to be energy efficient, i.e., “airtight”, without enough outside air being introduced to the building.

Additional causes of IAQ problems include:

- poorly located fresh air intakes that allow vehicle exhaust or other outdoor air contaminants to enter a building;
- indoor mould growth;
- not enough local ventilation to collect contaminants from work processes, e.g., exhaust canopies or fume hoods; and
- contamination from construction materials.

Alberta’s Occupational Health and Safety (OHS) legislation requires that workplaces be healthy, but does not require that workplaces be comfortable. However, there are good reasons to exceed the minimum legislated requirements, such as enhanced staff morale and productivity,

What health effects does poor air quality have?

Health effects resulting from IAQ issues may include headache, dizziness, nausea, fatigue, difficulty concentrating, sinus problems, congestion, irritation of the eyes, nose and throat and coughing, hypersensitivity and allergies. Some of these symptoms can have other causes, and may not be initially connected with IAQ issues. If the symptoms usually improve or disappear when the worker leaves the work site, this is an indicator that the health effects may be work related.

While some individuals may find odours in the workplace annoying, such as from marking pens, cleaning supplies or perfumes, others may have health-related effects because they are sensitive or allergic to some of these substances.

If a worker is having an adverse health effect that is believed to be related to their workplace, then the worker must inform their employer and should contact their personal physician.

People who are allergic may experience watering eyes, runny nose, wheezing, shortness of breath and chest tightness or a skin reaction such as dry, red, itchy skin.

What information will I be asked to provide?

The most important factors in maintaining good IAQ are ensuring adequate ventilation, comfortable temperature, comfortable humidity and minimizing airborne contaminants. Additional factors that influence a person's perception of IAQ include lighting, noise levels, work stress and general cleanliness of the workplace.

GENERAL VENTILATION – CARBON DIOXIDE (CO₂) AS AN INDICATOR?

Carbon dioxide (CO₂) may be used as an indicator of air circulation, because its concentration relates to the number of people in a building and the building's general ventilation rate. When people breathe, oxygen from the air is inhaled and CO₂ is exhaled.

Outdoor air contains about 400 parts per million (ppm) or about 0.04 per cent CO₂. As people breathe, the CO₂ in a building increases above that level and peaks after several hours. If CO₂ concentrations get too high, the air gets stale and people will not be comfortable. Complaints usually begin when carbon dioxide concentrations reach about 800 ppm and become more common when CO₂ exceeds 1,000 ppm. If the level of CO₂ is too high, this usually means that more outside air needs to be introduced into the building.

AIR TEMPERATURE

Most people in offices are comfortable when the air temperature is about 22 degrees Celsius (°C).

People who are doing physical labour will usually desire a cooler temperature and lightly clothed people such as those working in aquatic or spa facilities may desire warmer temperatures.

HUMIDITY

Comfortable relative humidity levels range from about 30 to 60 percent. When humidity is too low, people tend to get eye, nose or throat irritation, dry skin or chapped lips and static electricity becomes an annoyance. If the humidity levels get too high, condensation on surfaces may cause mould growth and unhealthy work conditions.

CHEMICAL (GAS) CONTAMINANTS

Some common indoor air contaminants include carbon monoxide (CO), formaldehyde, motor vehicle exhaust and ozone (O₃).

- CO can be generated from poorly maintained heating systems, can leak from gas-fired appliances or can enter a building from outside if motor vehicle exhaust is allowed to enter air intakes. This occurs more frequently where air intakes are located next to a building's loading docks or adjacent to a busy road.
- Formaldehyde can come from the "off-gassing" of new materials such as particleboard, carpets, plastics and imported consumer goods.
- O₃ is produced when electric equipment such as photocopiers are used.

Indoor Air Quality

DUST CONTAMINANTS

Dust can result from poor ventilation system filtering, dirt being tracked into a building from people's shoes, handling papers and a variety of other sources. Good housekeeping practices such as wet mopping, wet wiping or vacuuming can help to control dust accumulation.

ROOFING ASPHALT ODOURS

Asphalt, which is commonly applied to the roofs of flat-roofed buildings as a waterproofing material, breaks down over time. New asphalt is commonly added approximately every ten to thirty years to ensure the roof remains waterproof. Roofing odours are normally generated during these projects, which can range from a few days to a couple of weeks in duration.

Sometimes building occupants may notice the odours and in some cases may experience short-term effects such as watery eyes, headaches or nausea. The symptoms, while unpleasant, are temporary and can be relieved by limiting further exposure and seeking fresh air. If such issues exist, the building manager should be notified.

To increase the comfort of building occupants, the building manager may opt to temporarily shut off the building's air intake during the odour generating periods of the roofing project. However, this option has the disadvantage of leading to stale air, especially if the building has many occupants. If this option is used, the air intake should be re-opened at times throughout the day when the odour generation periods stop, such as when the roofing work has ended for the day.

In situations where it is difficult to keep asphalt odours out of a building, the building manager could consider having the roofing work completed during the off hours such as evenings or weekends.

Also, the asphalt kettle, which is used to prepare the asphalt for application, should be kept as far away and upwind from the air intake as possible.

LIGHTING

Too much or too little lighting may affect a person's perception of IAQ and their comfort. Different tasks require different lighting levels. For example, highly detailed work such as watch repair would require more lighting than a boardroom meeting.

Did You Know

Older workers usually require more lighting than young workers for identical tasks.

NOISE

In a typical office environment, too much background noise may affect a person's perception of IAQ and their comfort.

MOULD

Mould is naturally occurring in the environment and small amounts of it are usually present all around us. Normally, this is not a problem; however, too much exposure to any substance can be harmful, and mould is no exception.

Indoor Air Quality

Excessive levels of moulds may sometimes occur when buildings are water-damaged, e.g. after flooding or sewer backup, or when there is a persistent moisture problem such as seasonal water leakage or condensation.

Common indicators of a mould problem include:

- visible evidence of building water damage;
- visible mould growth; and
- a persistent musty odour.

ALLERGENS

Some people may be allergic to everyday things. This can be uncomfortable for them and can create health concerns.

Common substances that people might be allergic to include:

- perfumes;
- cleaning products;
- latex products;
- pollen;
- animal dander; and
- cigarette smoke.

Where possible, the amount of these substances indoors should be kept to a minimum.

What are my responsibilities as an employer?

Alberta's OHS Act requires employers to ensure the health and safety of workers at the work site. The OHS Regulation and Code under this Act have been established to define standards for protection from specific hazards.

In Alberta, workers exposure to airborne chemical contaminants must be kept as low as reasonably achievable and must be kept below their Occupational Exposure Limits (OELs).

OELs represent minimum standards for worker protection. All reasonable and practical efforts should be taken to keep exposure levels as low as possible. OELs are reviewed and revised periodically. Please check Table 2 Schedule 1 of the Alberta Occupational Health and Safety Code for the current requirements.

What are my responsibilities as an employee?

Alberta's OHS Act also places health and safety responsibilities on workers. The Act, Regulation and Code require workers to take reasonable care of themselves and others at the work site. This includes co-operating with the employer to protect themselves and others.

Indoor Air Quality

Contact Us

OHS Contact Centre

Edmonton & Surrounding area

- 780-415-8690

Throughout Alberta

- 1-866-415-8690

Deaf or hearing impaired:

- 780-427-9999 (Edmonton)
- 1-800-232-7215 (Alberta)

Website

[work.alberta.ca/ohs-contact us](http://work.alberta.ca/ohs-contact-us)

Get Copies of OHS Act, Regulation and Code

Alberta Queen's Printer

www.qp.gov.ab.ca

Occupational Health and Safety

work.alberta.ca/ohs-laws

FOR MORE INFORMATION:

[Indoor Air Quality Tool Kit](#)

[Do I Have a Workplace Mould Problem?](#)

© 2017 Government of Alberta, Labour

This material is for information only. The information provided in this material is solely for the user's information and convenience and, while thought to be accurate and functional, it is provided without warranty of any kind. The Crown, its agents, employees or contractors will not be liable to you for any damages, direct or indirect, arising out of your use of the information contained in this material.

If in doubt with respect to any information contained within this material, or for confirmation of legal requirements, please refer to the current edition of the Occupational Health and Safety Act, Regulation and Code or other applicable legislation. Further, if there is any inconsistency or conflict between any of the information contained in this material and the applicable legislative requirement, the legislative requirement shall prevail.

This material is current to February 2017. The law is constantly changing with new legislation, amendments to existing legislation, and decisions from the courts. It is important imperative that you and keep yourself informed of the current law in this area.

This material may be used, reproduced, stored or transmitted for non-commercial purposes. The source of this material must be acknowledged when publishing or issuing it to others. This material is not to be used, reproduced, stored or transmitted for commercial purposes without written permission from the Government of Alberta, Labour.