

Indoor air quality

OHS information for owners, employers and workers

This bulletin explains why indoor air quality is important, and talks about some of the factors that affect indoor air quality. It also introduces some occupational health and safety requirements that may apply to indoor air quality concerns.

KEY INFORMATION

- Indoor air quality can affect the health and comfort of people in a building.
- A number of factors impact indoor air quality.

Indoor air quality: overview

Indoor air quality starts with what's in the air we breathe. It also considers comfort factors such as temperature and relative humidity. Indoor air quality is an important part of a healthy and safe workplace.

Indoor air quality issues can be complex. They should be assessed by a [competent person](#) to make sure the correct problems and solutions are identified.

But as an introduction, here are some common causes of indoor air quality issues:

- Poor building ventilation. Some examples include:
 - Ventilation systems that are not designed for the level of occupancy or work activities.
 - Ventilation systems that need maintenance.
 - Buildings designed to be energy efficient (that is, "airtight") without enough outside air being introduced to the building.
 - 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 draw away contaminants from work processes (for example, exhaust canopies or fume hoods).
- Off gassing from construction materials, paints, or new furniture.

Employer requirements

General duties

Under Alberta's *Occupational Health and Safety (OHS) Act*, employers have a general duty to ensure – as far as [reasonably practicable](#) – the health, safety and welfare of

workers. This includes doing what is reasonably practicable to ensure healthy and safe indoor air.

OWNER OR EMPLOYER?

Owners are a regulated work site party under *OHS Act*. Owners are defined in section 1 of the act. Their general duties – set out in section 9 of the act – include ensuring that their property is healthy and safe.

If an employer doesn't own the property where work is carried out, they may have to take their health and safety concerns to the owner or their designate (for example, a property manager who acts on behalf of the owner).

If an employer is also an owner, they must fulfill the general duties of both roles.

Occupational exposure limits

Part 4 of the OHS Code sets out technical requirements related to chemical and biological hazards, and harmful substances. These requirements include keeping workers' exposure to harmful substances as low as reasonably practicable and below their occupational exposure limits (which are the minimum standards for worker health protection).

Keeping exposures well below the occupational exposure limits improves indoor air quality and protects worker health.

LEARN MORE

Employers have other general duties under the act, and must meet other requirements in both the *OHS Act* and OHS Code. Learn more about these in [Guide to OHS: Employers](#).

Worker requirements

The *OHS Act* and OHS Code also place health and safety requirements on workers. These include a general duty requirement to work in ways that ensure their own health and safety, and the health and safety of others.

As part of this general duty, workers must co-operate with the employer to protect themselves and others. Examples include:

- Using employer provided training and controls to help ensure good indoor air quality (for example, following an employer's scent-free policy).
- Reporting unsafe acts or conditions to their employer or supervisor (for example, an idling vehicle next to an air intake vent).

LEARN MORE

Workers have both rights and other general duties under the *OHS Act*. They also must meet other requirements in both the act and OHS. Learn more about these in [Guide to OHS: Workers](#).

Health effects from poor air quality

Poor air quality can cause a variety of health effects. The health effects may vary between individuals but some examples can include headache, fatigue or nausea. Symptoms may appear in the short term or gradually over time.

Some symptoms can have other causes, not necessarily related to indoor air quality issues at the workplace.

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

REPORT CONCERNS

Under the *OHS Act*, workers must report health and safety concerns to their employer.

If a worker thinks they are experiencing adverse health issues related to their workplace, they may also consult their doctor.

Factors that impact indoor air quality

The most important factors in maintaining good indoor air quality are ensuring adequate ventilation, comfortable temperature and humidity, and minimizing airborne contaminants.

It's also helpful to know that factors such as lighting, noise levels, work stress, and work site cleanliness can influence a person's perception of indoor air quality. These factors may

be regulated under the OHS Code (for example, noise is regulated when it exceeds its' occupational exposure limit). Otherwise however, they can be considered comfort factors, similar to temperature and humidity.

Adequate ventilation

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 300 to 400 parts per million (ppm) or about 0.03 to 0.04 per cent CO₂. As workers 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 workers will not be comfortable. Complaints usually begin when CO₂ concentrations reach about 800 ppm and become more common when CO₂ exceeds 1,000 ppm.

Air temperature

Most people in offices are comfortable when the air temperature is about 22 degrees Celsius. Work settings and activities may require different 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, formaldehyde, motor vehicle exhaust and ozone. Employers are required to ensure that exposures to harmful substances are controlled and below the occupational exposure limits listed in Schedule 1, Table 2 of the OHS Code. Below are a few examples of how these airborne contaminants can impact indoor air quality.

- Carbon monoxide can be generated from different sources:
 - Poorly maintained heating systems.
 - Leaks from gas-fired appliances.
 - Motor vehicle exhaust that enters a building through air intakes (for example, if air intakes are located next to a building's loading docks or a busy road).
- Formaldehyde from the off gassing of new materials such as particleboard, carpets, plastics and imported consumer goods.
- Ozone is produced when electric equipment such as photocopiers are used.

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.

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 typically added 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.

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.

Excessive mould levels may occur if buildings are water-damaged (for example, after flooding or sewer backup) or if 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.
- A persistent musty odour.

Biological and infectious agents

Respiratory viruses and other infectious agents may be present in the workplace.

Allergens

Common airborne substances that people might be allergic to include:

- Perfumes.
- Cleaning products.
- Latex products.
- Pollen.
- Animal dander.
- Cigarette smoke.

Lighting

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

Lighting needs may also vary on an individual basis. For example, older workers typically need more lighting than younger workers for identical tasks.

Noise

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

Improving indoor air quality

The best ways to improve indoor air quality depends on the specific setting and situation. As said on page 1 of this bulletin, indoor air quality issues can be complex, and you may need to [consult a competent occupational health and safety professional](#). But there may also be steps that an employer can either carry out directly, or ask the owner or their designate to carry out, to improve indoor air quality.

Here are some examples:

- Introducing outdoor air into a building or work space can help improve ventilation.
 - Read more in [Ventilation in the workplace](#).
- When factors such as temperatures, humidity and carbon dioxide are out of the optimum range check the heating, ventilation and air conditioning (HVAC) system to ensure it is operating optimally.
- Where applicable, use good housekeeping practices such as wet mopping, wet wiping or vacuuming to help control dust accumulation.
- If asphalt odours can't be kept out, have the roofing work completed during the off hours such as evenings or weekends.
- Clean up mould quickly and eliminate the moisture source.
- Consult a reputable source – such as the [Public Health Agency of Canada](#) – for guidance about public health risks, including respiratory viruses.
 - Read more in [Respiratory viruses and the workplace](#).
- Where possible, keep the level of indoor allergens such as perfumes to a minimum.

For more detailed information on indoor air quality, read the [Indoor Air Quality Tool Kit](#).

Contact us

OHS Contact Centre

Anywhere in Alberta

- 1-866-415-8690

Edmonton and surrounding area

- 780-415-8690

Deaf or hard of hearing (TTY)

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

Notify OHS of health and safety concerns

alberta.ca/file-complaint-online.aspx

Call the OHS Contact Centre if you have concerns that involve immediate danger to a person on a work site.

Report a workplace incident to OHS

alberta.ca/ohs-complaints-incidents.aspx

Website

alberta.ca/ohs

Get copies of the OHS Act, Regulation and Code

Alberta King's Printer

alberta.ca/alberta-kings-printer.aspx

OHS

alberta.ca/ohs-act-regulation-code.aspx

For more information

Guide to OHS: Employers (LI009)

ohs-pubstore.labour.alberta.ca/li009

Guide to OHS: Workers (LI008)

ohs-pubstore.labour.alberta.ca/li008

Indoor Air Quality Tool Kit (GH015)

ohs-pubstore.labour.alberta.ca/GH015

Legal terms 101: "reasonably practicable" (LI015)

ohs-pubstore.labour.alberta.ca/li015

Mould in the workplace (BH018)

ohs-pubstore.labour.alberta.ca/bh018

Public Health Agency of Canada

canada.ca/en/public-health.html

Respiratory viruses and the workplace (BH022)

<https://ohs-pubstore.labour.alberta.ca/bh022>

Tips on selecting OHS consultants (GS009)

<https://ohs-pubstore.labour.alberta.ca/gs009>

Ventilation in the workplace (GH022)

ohs-pubstore.labour.alberta.ca/gh022

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