

# Workplace Health and Safety Bulletin



## Indoor Air Quality (IAQ)

Workers desire healthy and comfortable working conditions. When these conditions are not met, worker job satisfaction, productivity and health may be compromised. IAQ considers the indoor environment, including the makeup of the air plus comfort factors such as temperature, carbon dioxide levels and relative humidity.

IAQ issues tend to be complex and must be properly assessed to identify the problems and their solutions. Most often IAQ problems are due to poor ventilation in a building. Some examples include:

- Ventilation systems not designed for the level of occupancy or the work process
- Ventilation systems that are in need of maintenance
- 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

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

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## Effects on the body

Complaints from poor IAQ include headache, dizziness, nausea, fatigue, difficulty concentrating, sinus problems, congestion, irritation of the eyes, nose and throat and coughing. Some of these symptoms often have causes, so initially they may not be connected with poor IAQ. The health effects usually improve or disappear when the worker leaves the work site.

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. For people who are allergic, an airborne allergen may cause watering eyes, runny nose, wheezing, shortness of breath and chest tightness or a skin reaction such as dry, red, itchy skin.

If a worker is having an adverse health effect that they believe is related to their workplace, they must inform their employer and contact their personal physician.

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## IAQ — a general guide

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

For more information



[http://employment.alberta.ca/documents/WHS/WHS-PUB\\_gh015.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_gh015.pdf)

Indoor Air Quality Tool Kit

The Indoor Air Quality Tool Kit is intended to help provide information to workers and employers about maintaining a comfortable and healthy indoor work environment. IAQ guides should be interpreted and applied by competent individuals, who are trained to conduct IAQ investigations.

## General ventilation – carbon dioxide as an indicator

Carbon dioxide is 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 is inhaled and carbon dioxide is exhaled. Outdoor air contains about 300 to 400 parts per million (ppm) or about 0.033 percent carbon dioxide. As people breathe, the carbon dioxide level in a building increases above that level and peaks after several hours. If carbon dioxide 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 carbon dioxide concentrations exceed 1000 ppm. If the level of carbon dioxide is too high, this usually means that more outside air needs to be introduced into the building.

## Air temperature

Individuals desire different temperatures for personal comfort. Most people in offices are comfortable when the air temperature is about 22 degrees Celsius. People who are doing physical labour will usually desire a cooler temperature and lightly clothed people in aquatic or spa facilities may desire warmer temperatures.

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Air temperature in an office: attempt to keep the temperature at about 22 degrees Celsius.

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For information

 [http://employment.alberta.ca/documents/WHS/WHS-PUB\\_gs006.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_gs006.pdf)

Best Practice - Working Safely in the Heat and Cold

## 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.

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Relative humidity:  
attempt to keep the  
levels between 30 and  
60 percent, and avoid  
water condensation  
on cooler surfaces

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## Chemical (gas and particulate) contaminants

Some common indoor air contaminants include carbon monoxide, formaldehyde, motor vehicle exhaust, ozone and cigarette smoke.

Carbon monoxide can be 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 the loading docks. Formaldehyde can come from the “off-gassing” of new materials such as particleboard, carpets and plastics. Ozone is produced when electric equipment such as photocopiers are used.

## Dust

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

## Lighting

Too much or too little lighting can affect a persons’ perception of IAQ and may affect 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. Older workers usually require more lighting than younger workers for identical tasks.

## Noise

In a typical office environment, too much background noise can affect a person's perception of IAQ and may affect 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. 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/or a persistent musty odour.

For more information

 [http://employment.alberta.ca/documents/WHS/WHS-PUB\\_bh018.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_bh018.pdf)

Do I have a Workplace Mould Problem?

## 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, animal dander and cigarette smoke.

## Employer responsibilities

Alberta's *OHS Act* requires the employer to ensure the health and safety of workers at the work site. Regulations or Codes under this *Act* have been established to define standards for protection from specific hazards.

In Alberta, workers must not be exposed to airborne levels of chemical contaminants above their Occupational Exposure Limit (OEL) or as low as reasonably practicable if an OEL has not been established. 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 Alberta's OHS legislation for the current requirements.

## Worker responsibilities

The Alberta *OHS Act* places responsibilities on workers for health and safety at the work site. The *Act* and regulations 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.

For more information



[http://employment.alberta.ca/documents/WHS/WHS-PUB\\_gh015.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_gh015.pdf)

Indoor Air Quality Tool Kit



<http://www.assembly.ab.ca/lao/library/egovdocs/2006/alinf/160794.pdf>

Alberta Infrastructure and Transportation, Mould in Indoor Environments Risk Assessment and Management Program Handbook, June 2006



[www.hc-sc.gc.ca/ewh/alt\\_formats/hecs-sesc/pdf/pub/air/exposure-exposition/exposure-exposition\\_e.pdf](http://www.hc-sc.gc.ca/ewh/alt_formats/hecs-sesc/pdf/pub/air/exposure-exposition/exposure-exposition_e.pdf)

Health Canada, Exposure Guidelines for Residential Indoor Air Quality



[http://www.hc-sc.gc.ca/ewh-semt/pubs/air/tools\\_school-outils\\_ecoles/index-eng.php](http://www.hc-sc.gc.ca/ewh-semt/pubs/air/tools_school-outils_ecoles/index-eng.php)

Health Canada, Indoor Air Quality – Tools for Schools Action Kit for Canadian Schools, March 2003



[www.hc-sc.gc.ca/ewh-semt/alt\\_formats/hecs-sesc/pdf/pubs/air/office\\_building-immeubles\\_bureaux/93ehd-dhm166\\_e.pdf](http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/air/office_building-immeubles_bureaux/93ehd-dhm166_e.pdf)

Health Canada: IAQ in Office Buildings: A Technical Guide

## Contact us:

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### Province-Wide Contact Centre

 Edmonton & surrounding area:  
(780) 415-8690

 Throughout Alberta:  
1-866-415-8690



Deaf or hearing impaired

- In Edmonton: (780) 427-9999

or

- 1-800-232-7215  
throughout Alberta

### Web Site



[www.worksafely.org](http://www.worksafely.org)

## Getting copies of OHS Act, Regulation & Code:

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### Queen's Printer



[www.qp.gov.ab.ca](http://www.qp.gov.ab.ca)



Edmonton (780) 427-4952

### Workplace Health and Safety



<http://industry.alberta.ca/whs-ohs>

Call any Government of Alberta office toll-free  
Dial 310-0000, then the area code and telephone number you want to reach

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