

CAUSES OF PROBLEMS

- The frequency of symptoms in buildings with sealed windows and mechanical ventilation is generally two to three times greater than for those with natural ventilation.
- Poor upkeep and improper functioning of ventilation systems play a key role in the appearance of indoor air quality problems.
- Poor distribution of air to occupants of the building (in this case a micro-environment) can lead to complaints.
- Too great a concentration of occupants can also be a considerable factor in the appearance of indoor air quality problems.
- The emergence of symptoms associated with indoor air quality may be magnified if they are combined with psychosocial factors in the workplace (performance pressures, dissatisfaction with work, lack of autonomy, etc.).

SOLUTIONS

Although it is difficult to find a universal solution to the problem of indoor air quality, some preventative measures should be considered:

- a complaint system should be implemented, all complaints should be recorded and a follow up assured;
- parameters governing temperature comfort (heat, humidity) should be adhered to;
- occupants should be informed of how the heating, ventilation, and air conditioning systems operate;
- the ventilation system should adhere to a maintenance program in conformity with the CSA Z204-94 (Canadian Standards Association) Guideline For Managing Indoor Air Quality in Office Buildings;
- the ventilation system should be designed and adapted to suit the needs of the occupants' activities.

**Prevent
and cure**



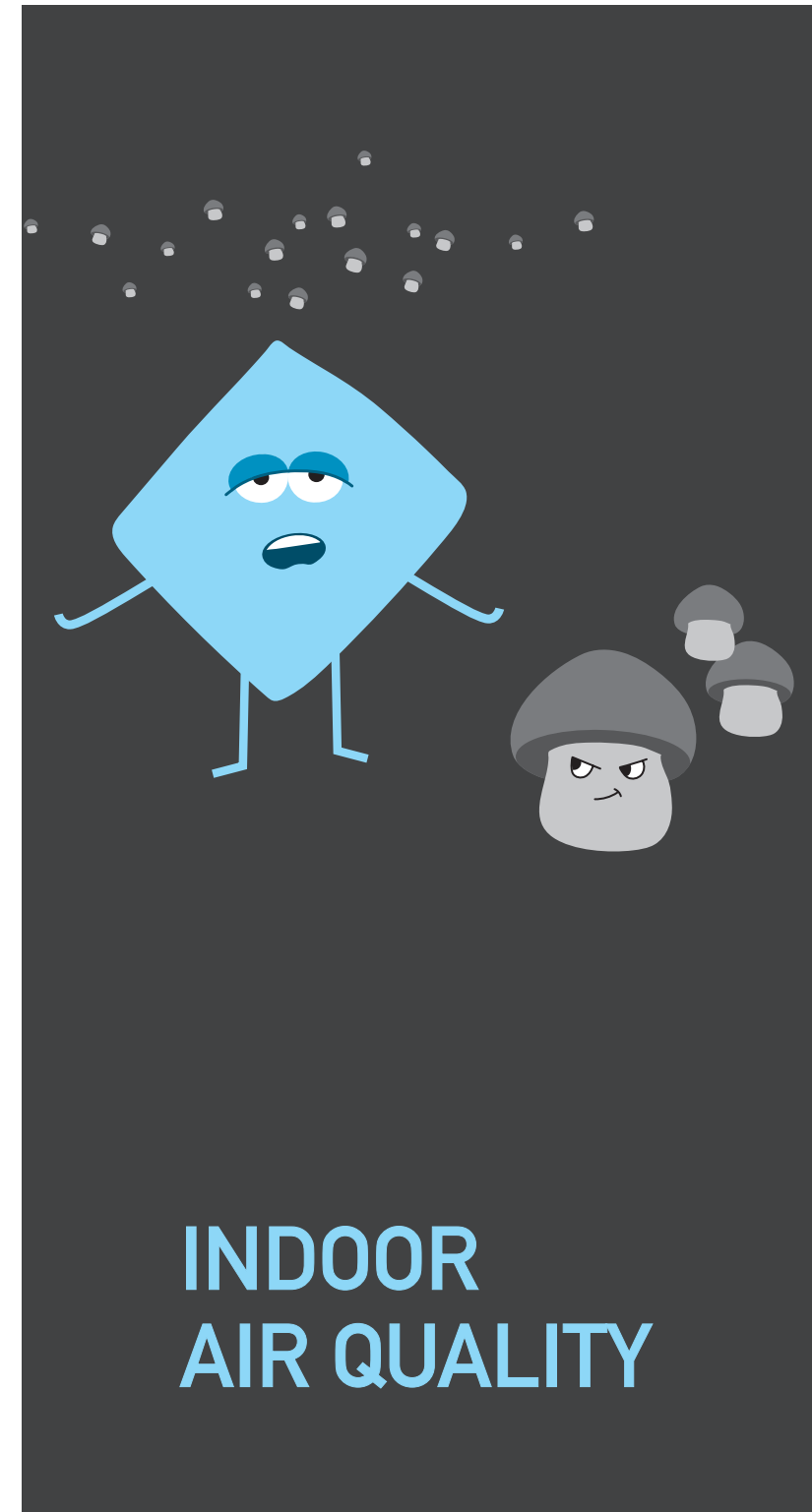
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A PROBLEM: TRUE OR FALSE?

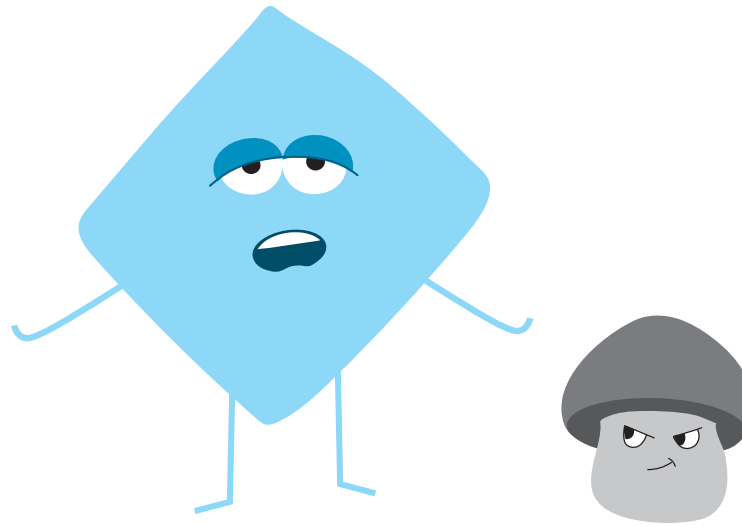
The World Health Organization (WHO) estimates that 30% of newly constructed or renovated buildings suffer from air quality deficiencies. This same international organization has declared that 10 to 30% of the occupants of these buildings are affected by tight building syndrome.

According to the American Environmental Protection Agency (EPA), poor indoor air quality (IAQ) constitutes the fifth greatest environmental problem in the United States. This is not surprising when we consider that indoor contaminants are generally two to five times more concentrated than exterior contaminants. On top of that, we spend almost 90% of our day inside for a good part of the year.

Over the past few years, many workplaces have taken an interest in indoor air quality. IAQ problems are usually worse in buildings with mechanical ventilation systems. Moreover, IAQ problems can be induced by certain environments.

Here are some examples:

- the occupation density in schools is generally much greater than that in office buildings;
- laboratories, professional workshops, and some activities in administrative sectors, such as document printing, generate pollutants that may affect IAQ;
- offices occasionally undergo rapid physical modifications in adapting to different requirements, and these changes, which are often unforeseen, may have a negative impact on IAQ;
- water infiltrations that have not been properly taken care of may have caused mold and mildew to develop;
- funds allocated to office maintenance are often the first to be targeted by budget cuts, and a decrease in these services has an impact on IAQ.



SYMPTOMS OF POOR INDOOR AIR QUALITY

The symptoms linked to poor IAQ can be placed into two categories:

- 1 Symptoms from which a clear diagnosis can be established, and which point to a specific source of emission and contamination. This would be the case for carbon monoxide poisoning, or for an outbreak of Legionnaire's disease, caused by the agent *Legionella pneumophila*. In these situations, the problem that arises is usually characterized by clearly defined, specific symptoms.

Usually the presence of this type of symptoms points to a precise cause of contamination associated with a particular source emitting a contaminant.
- 2 Non-specific symptoms affecting nose, throat, and eyes (for example, difficulties wearing contact lenses), headaches, and skin or respiratory problems associated with tiredness or a loss of concentration. These symptoms manifest themselves in varying degrees from one person to another. However, the WHO has established that a building is problematic if there exists an excessive prevalence of symptoms suffered by its occupants, although the "normal" level of symptoms is difficult to establish. While these symptoms may be non-specific, they characteristically appear when workers are in the workplace, and become less intense when they leave.

THERMAL DISCOMFORT

Complaints about thermal discomfort are often associated with IAQ. The human body reaches a state of discomfort when it experiences difficulty in retaining or eliminating heat. The major causes of thermal discomfort are temperature fluctuations, excessively cold or hot temperatures, humidity percentages, and air-flow.

WATER DAMAGE AND LEAKAGE

One of the worst fears is water damage or leakage, and the resulting surface contamination. The first step is to eliminate the source responsible for the accumulation of water. In such a situation, one of the golden rules is to act as quickly as possible, within 48 hours at the most.

Waterlogged items must be dried, if possible. If not, they must be removed and replaced by non-contaminated ones. If the surface is contaminated with mold, care must be taken, and recognized decontamination techniques must be used. It may be necessary to consult an outside expert.



This leaflet is meant to raise members' awareness about **indoor air quality (IAQ)**. For more information, please consult the *Guide de prévention et d'intervention sur la qualité de l'air en milieu scolaire*, which is available in the CSQ's Web site.