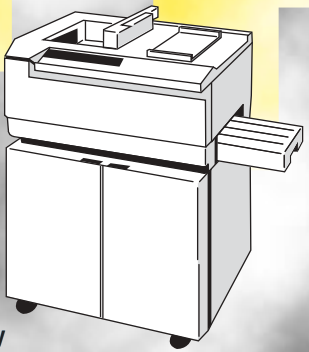
Indoor Air Quality

Health and Safety Guide

2nd Edition
(Revised)



Canadian Centre for
Occupational Health and Safety
CCOHS

Summary

Indoor air quality (IAQ) is a recently recognized concern. In the 1970s energy conservation programs were encouraged in the USA and Canada. Ventilation rates were reduced and buildings were sealed to limit the entry of untempered outdoor air into buildings.

IAQ problems occur in buildings where chemical or biological contaminants build up to levels that can adversely affect some occupants. The following are some commonly reported health effects: headache, nausea, fatigue, drowsiness, dizziness, respiratory problems, chest tightness, dry throat, skin rashes, dry and itchy eyes, stuffy nose, runny nose, loss of concentration and general malaise. These symptoms are collectively known as Tight Building Syndrome (TBS). A well-known IAQ problem is building related illness (BRI). BRI is associated with a distinct set of symptoms and clinical abnormalities which are recognized as real occupational health conditions.

Workplace conditions such as noise, inadequate lighting, inadequate thermal environment, and ergonomic problems can cause discomfort that is sometimes falsely attributed to chemical or biological contaminants in the air.

In the past, symptoms reported by building occupants were often considered psychological because the symptoms seemed variable and subjective, and because an exact cause could not be identified.

Today, IAQ problems can be identified through workplace inspections and an analysis of worker health complaints. It is possible to control many health symptoms through effective building maintenance programs and by controlling specific air contaminants and their sources.

This Guide outlines how to identify potential IAQ problems and how to take steps towards controlling these problems. Actual recognition and control of IAQ problems may require specialists and a team approach involving complex measurement, analysis and implementation of controls.

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2. Types of Indoor Air Contaminants and their Sources

In order to control indoor air contaminants we must identify their origin. It isn't always possible to pinpoint a single source. The following table gives some examples of indoor air contaminants and their potential sources.

Sample

SPECIFIC INDOOR AIR CONTAMINANTS AND THEIR SOURCES

Contaminant:	Asbestos
Source:	Certain old fireproofing and thermal insulation materials, ventilation shafts and ducts, boilers
Contaminant:	Ammonia
Source:	Blueprint machines, cleaning compounds, detergents
Contaminant:	Benzene, toluene, petroleum solvents
Source:	Rubber cement, copier toner, liquid eraser cleaning solvents, certain paints and coatings
Contaminant:	Diethylethanolamine
Source:	Boiler water additive
Contaminant:	Methyl alcohol
Source:	Spirit duplicating machines
Contaminant:	Trichloroethylene
Source:	Some correcting fluids, inks, adhesives, cleaning compounds

2. Gathering Data About IAQ Problems

Establish IAQ problem reporting procedures in consultation with the health and safety committee. A report should include the following information:

Sample

IAQ PROBLEM REPORTING FORM

Date _____

Work area (floor/department/location) _____

Symptoms experienced by individuals _____

_____

Time of day symptoms are experienced _____ ❑ am ❑ pm

Frequency and duration of symptoms _____

_____

History of symptoms (When were they first noticed?)

_____

Building conditions that may be related to indoor air quality problems (renovation, new equipment, etc.)

_____

Work activities and processes that may release air contaminants

_____

Suggested remedial actions

_____

_____

Encourage people to report any health complaints and unacceptable workplace conditions. Air quality is suspect if people frequently experience dry throat; eye and throat irritation, headache, drowsiness, and/or general malaise. Typically people experience these symptoms when they have been working in the building for several hours, and feel better after leaving the building.

4. Housekeeping

☑ MINIMIZE accumulation of loose and dust-producing materials and waste.

PLACE all trash and scrap in proper containers.

DISPOSE of oily rags in covered metal containers.

CLEAN UP spills promptly following prescribed procedures.

CLEAN UP moulds and dirt patches on walls and windows.

CLEAN soaked carpeting professionally within 24 hours to prevent mould and bacteria growth in the fibres, backing and under the carpeting.

☒ DO NOT BLOW OFF dust. Use a vacuum cleaner or brush.

WEAR clothing appropriate for office conditions.

ENSURE that ventilation systems, dehumidifiers and humidifiers are properly cleaned and maintained.

INSULATE hot and cold surfaces.

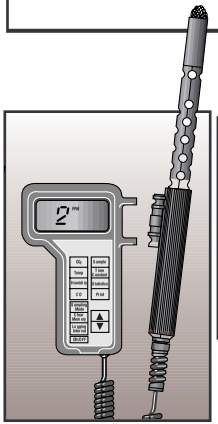
DO NOT USE heaters that produce toxic fumes (e.g., kerosene heaters).

DO NOT INSTALL partitions and room dividers without evaluating the impact on local ventilation and ensuring proper provision of supply air and air circulation.

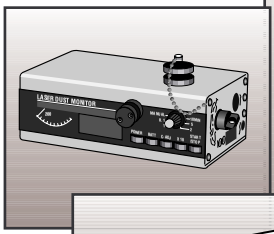
American Society of Heating, Refrigeration and Air Conditioning Engineers, (ASHRAE) Standard 55-1992 is generally used as a guideline for thermal environment.

Office Space with Partition Dividers

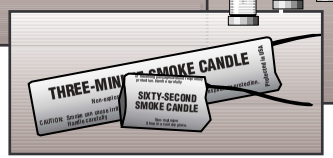
Microbial Organism Sampling	Air sampling to determine colony forming units per cubic meter. Spores are collected and allowed to grow on some type of agar medium	Fungal spores, microbial organisms. Rank order assessment. Colony forming units per cubic meter (CFU).	Requires specific expertise in microbial sampling for IAQ.



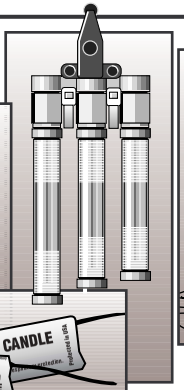
Multi-purpose Monitor



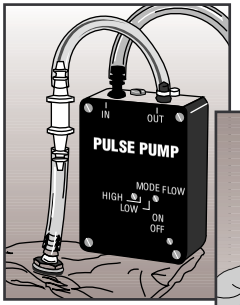
Dust Monitor



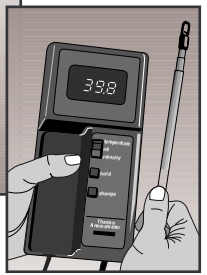
Smoke Candles/Tubes



Calorimetric Tubes



Air Sampling Pump



Thermoanemometer

WHMIS SYMBOLS AND CLASSES

	**CLASS A** **Compressed Gas**	Contents under high pressure. Cylinder may explode or burst when heated, dropped or damaged.
	**CLASS B** **Flammable and Combustible Material**	May catch fire when exposed to heat, spark or flame. May burst into flames.
	**CLASS C** **Oxidizing Material**	May cause fire or explosion when in contact with wood, fuels and other combustible material.
	**CLASS D, Division 1** **Poisonous and Infectious Material:** ***immediate and serious toxic effects***	Poisonous substance. A single exposure may be fatal or cause serious or permanent damage to health.
	**CLASS D, Division 2** **Poisonous and Infectious Material:** ***other toxic effects***	Poisonous substance. May cause irritation. Repeated exposure may cause cancer, birth defects, or other permanent damage.
	**CLASS D, Division 3** **Poisonous and Infectious Material:** ***biohazardous infectious material***	May cause disease or serious illness. Drastic exposures may result in death.
	**CLASS E** **Corrosive Material**	Can cause burns to eyes, skin or respiratory system.
	**CLASS F** **Dangerously Reactive Material**	May react violently causing explosion, fire or release of toxic gases, when exposed to light, heat, vibration or extreme temperatures.