Indoor Air Quality: Investigating Concerns

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Please note

This publication is designed to assist with interpreting Saskatchewan’s Occupational Health and Safety laws. It is not intended to be used in court. Reference the actual legislation to review the law. Our safety legislation is called: The Occupational Health and Safety Act, 1993 and The Occupational Health and Safety Regulations, 1996.

To view and download the legislation, go to https://publications.saskatchewan.ca/

To order a paper copy of the legislation, contact:

Publications Saskatchewan, Walter Scott Building
B19 – 3085 Albert St. Regina, Sask. S4S 0B1
Toll free in Saskatchewan: 1.800.226.7302 Fax: 306.798.0835
www.qp.gov.sk.ca

*Industries under federal jurisdiction – such as transportation, broadcasting, and telecommunications are governed by The Canada Labour Code. If you work in a federally regulated industry, please contact Employment and Social Development Canada for information, or visit the website, https://www.canada.ca/en/employment-social-development.html
Introduction

This guide is intended to assist workplaces in investigating and resolving common indoor air quality concerns. It is intended for workplaces such as offices, schools and retail outlets. It is not intended for home-based businesses, manufacturing or other industrial workplaces.

Background

Indoor air quality (IAQ) has been defined as “the physical, chemical and biological characteristics of indoor air in non-residential workplaces with no internal processes or operations that can affect the comfort of the occupant.”¹

Many IAQ concerns can be prevented by ensuring ventilation is adequate, temperatures and humidity levels are comfortable and by minimizing airborne contaminants.

Training, educating and forewarning workers about events that could affect air quality may also minimize concerns.

For example, employers could:

• Provide hazard and scheduling information to workers in advance of renovation, repair or other activities;
• Educate workers about the effects scents or other sensitizers have on individuals and ask colleagues to avoid using scents; and
• Train workers to avoid running vehicles near fresh air intakes.

In Saskatchewan, The Occupational Health and Safety Regulations, 1996 include a number of requirements related to IAQ. Meeting these requirements on an ongoing basis will minimize IAQ concerns. These requirements should also be used to guide IAQ investigations, as they represent the minimum standards that must be met. A list of some of the key requirements is included in Appendix A. The Occupational Health and Safety (OHS) Division and other agencies have a number of other publications related to IAQ that can be found in the resources section of this guide.

Poor IAQ can lead to a number of physical symptoms and concerns. The most common include:

• headaches
• fatigue
• shortness of breath
• sinus congestion
• coughs, sneezing
• eye, nose, and throat irritation
• skin irritation
• dizziness and nausea

People with colds, the flu or respiratory allergies are more likely to be affected by the air quality and to have these symptoms. In some cases, noise, overcrowding, improper lighting, poor ergonomic conditions and job stress can also lead to these symptoms and concerns. Frequently, a combination of factors is involved.

**Raising indoor air quality concerns**

A worker should alert their supervisor when they have a concern regarding air quality. A supervisor can check with the building staff to see if there is an obvious solution, such as adjusting the temperature, humidity or lighting levels.

If there isn’t an obvious explanation, the employer should be notified. The employer has a responsibility to ensure the concern is investigated and addressed in consultation with the Occupational Health Committee (OHC), occupational health and safety representative or workers. In the event that a worker is not satisfied with the employer’s response to their concern, they can take the matter to the OHC. The OHC can then review the concern, make recommendations to the employer and monitor improvements/changes the employer is making to address the OHC’s recommendations.

Staff members who are responsible for health and safety of facilities and maintenance should be involved in the investigation. Employers should ensure there is a process in place at every facility for contacting these individuals. It is estimated that up to 80 per cent of IAQ problems in Canada have been related to inadequate ventilation, so it is important to involve personnel that understand the building ventilation system, including how it works, how it should be maintained, possible problems and solutions. If in-house resources are unable to address or resolve an IAQ issue, expert resources may be sought.

Where there are multiple workplaces in one building, IAQ investigations may need the involvement of multiple employers and the building owner. A building owner shares responsibility for investigating and resolving IAQ concerns because some of the factors that affect IAQ may be beyond the control of an individual employer who is leasing a workspace. There may be varying levels of individual employer and owner control over IAQ parameters, depending on lease agreements.

An example process is illustrated on the next page.
Figure 1: The Investigation Process

1. Indoor air quality complaint arrives
2. Do a walkthrough inspection.
3. Investigate further, using key personnel.
4. Find an obvious explanation for the complaints?
   - NO: Look at using external IAQ resources.
   - YES: Implement the solution.
5. Has a solution been found?
   - NO: Investigate further, using key personnel.
   - YES: Implement the solution.
6. Is the problem solved and have the complaints ended?
   - NO: Look at using external IAQ resources.
   - YES: Ensure the problem doesn’t recur.
7. Completed.
Factors that influence indoor air quality

To address IAQ problems and solutions, it is important to use strategies that address the factors that influence IAQ.

These factors include:

- building occupants
- sources of indoor air pollutants
- heating, ventilation, and air conditioning (HVAC) systems

Building occupants

One of the first steps is to interview the affected worker or workers. A key question to ask is if their symptoms improve when they are away from work over a weekend or when they are on vacation or another type of leave.

A review of the interview responses can provide clues as to the cause of their concerns. For example, the source of an IAQ concern may be identified by looking at where most of the concerns originate relative to local conditions, or relative to the source and pathways of possible contaminants. The source may also be revealed by considering when the concerns occur relative to activities such as renovations, cleaning and pesticide applications.

It is important to have written documentation of IAQ concerns. Workers can use a journal or log book to keep track of days when they felt the air quality was poor and to describe the conditions on those days, such as unusual activities (e.g., construction), events or weather.

The solution may depend on how widespread the concerns are. If only one worker has an IAQ concern, it may be more appropriate to accommodate their individual working conditions and not those of all workers. If that worker has medical evidence of a sensitivity or unusual responsiveness to a substance present, there is a responsibility (section 308 of the regulations) to provide additional protection to that worker, or on their request, assign them to work that is available and less hazardous to them. Additional protection may include eliminating certain chemicals from the workplace, introducing a scent-free policy or relocating the employee.

There are a number of useful forms and checklists that can be used to interview staff. An example is provided in Appendix B.

Sources of indoor air pollutants

Indoor air contaminants may originate in a building or be drawn from outdoors. When assessing the potential sources of indoor air contamination, conduct a walkthrough inspection and consider sources such as the following:

- dust, dirt or mould located in the HVAC system or elsewhere
- visible mould
- spills of water or other liquids
• housekeeping activities such as cleaning and dusting
• off-gassing from new furniture, carpeting or structural materials
• maintenance activities such as painting, renovations and new construction
• office equipment such as laser printers, copiers
• industrial type processes such as dry cleaning, cooking and printing
• scented products
• plants
• garbage, recycling or composting containers
• food and beverage odours
• room sized humidifiers and air cleaners

Outdoor sources of contaminants which may be entering the building may include:

• vehicle exhaust
• unsanitary debris or dumpsters near an outdoor air intake
• pollen, dust or smoke
• contaminants from processes conducted by adjacent businesses and contractors
• exhausted air re-entering the building
• environmental spillage that seeps into the building
• materials tracked in or carried in by occupants

An inspection checklist similar to the one in Appendix C can be useful in identifying potential sources. Some of the items in these lists, such as HVAC system components, should be checked by qualified building staff.

**HVAC systems**

Ventilation is usually provided by the heating, ventilation, and air conditioning (HVAC) system. The design and functioning of this system will have a major effect on the building’s indoor air quality. The HVAC system is responsible for distributing outdoor air throughout a building, removing contaminants and odours, and controlling the indoor temperature and humidity.

**Fresh air supply**

Good indoor air quality requires that an adequate amount of fresh outdoor air be supplied throughout the workplace. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) standard 62.1 - 2016, Ventilation for Acceptable Indoor Air Quality recommends 15 to 20 cubic feet per minute (cfm) of outdoor air per building occupant.

It is important to ensure that the outdoor air being drawn in is fresh. For example, outdoor intakes must not be located where they could draw in polluted air from loading docks, parking garages, garbage dumpsters, etc.
Complaints of poor air quality are often directly related to an inadequate supply of fresh outdoor air. Perhaps as many as 80 per cent of indoor air quality complaints in Canada are solved by increasing the supply of fresh outdoor air to a space. The increased amount of fresh air entering the building dilutes the airborne contaminants, and creates a more acceptable indoor environment.

Occupants of a space exhale carbon dioxide (CO2), which can build up in enclosed, occupied spaces. Many studies and surveys have demonstrated a direct relationship between occupant complaint rates and CO2 concentrations.

<table>
<thead>
<tr>
<th>Measured CO2 (ppm)*</th>
<th>Effective Ventilation Rate (cfm)**</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>350 – 400</td>
<td>fresh, outdoor air</td>
<td>typical outdoor level</td>
</tr>
<tr>
<td>less than 600</td>
<td>greater than 35 cfm/occupant</td>
<td>few complaints</td>
</tr>
<tr>
<td>600 – 800</td>
<td>20 – 35 cfm/occupant</td>
<td>occasional complaints</td>
</tr>
<tr>
<td>800 – 1,000</td>
<td>15 – 20 cfm/occupant</td>
<td>complaints increase</td>
</tr>
<tr>
<td>greater than 1,000</td>
<td>less than 15 cfm/occupant</td>
<td>complaints common, insufficient fresh air supply</td>
</tr>
</tbody>
</table>

* parts/million  ** cubic feet/minute

Measuring carbon dioxide (CO2) levels in the air is a useful way to determine if there is an adequate supply of fresh air for the number of building occupants. Direct reading detector tubes or direct reading instruments can be used to measure carbon dioxide levels in work areas. An image of a direct reading hand pump is shown below. These can be purchased from safety supply companies.

Measurements are best taken in a space after at least two hours of occupancy. Levels of 1,000 – 1,500 ppm suggest there is not adequate fresh air. This can be corrected by opening dampers, improving air mixing, and adjusting fresh air rates.

**Example gas detection tube with hand pump**
Maintenance

Preventive maintenance programs conducted by specialized personnel may include:

- Regular inspections of all critical components of the ventilation system such as dampers, fans, belts, baffles, ductwork, diffusers, and control systems.
- Repair or replacement of malfunctioning and consumable components such as filters and belts.
- Periodic cleaning of air intakes and accessible parts of the distribution system, ducts, and dampers where warranted.
- Adequate treatment of open water systems associated with ventilation equipment and the cleaning and disinfecting components where standing water may have been present for extended periods, or where dirt, slime, or mould is observed. This includes humidifiers, electrostatic precipitators, cooling towers, fan coil units, air supply and exhaust ducts, air intakes, cooling coils, condensate drains, radiators, and induction units.
- Maintenance of combustion sources such as furnaces, space heaters, and water heaters. This maintenance should ensure the proper combustion and exhausting of waste gases and that gases will not be re-circulated into the workplace.
- Testing the volume of air supplied or returned through diffusers using air velocity or airflow instruments to ensure that the system is balanced. This testing is done by qualified building maintenance personnel or by a qualified external company.
- Calibrating sensors and devices that control airflow, temperature and humidity.
- Inspecting heat exchangers when it is suspected that combustion gases are escaping into an air plenum.
- Inspecting and cleaning ductwork and, where ceiling spaces are used as supply or return air plenums, replacing damaged or missing tiles.

Written records of inspections, maintenance and cleaning of HVAC systems must be kept and made available to the committee, health and safety representative, or where there is no committee or representative, the workers.

A more detailed HVAC inspection checklist can be found in Indoor Air Quality: A Guide for Building Owners, Managers, and Occupants by WorkSafeBC.

Resources

Other Occupational Health and Safety publications can be viewed and downloaded from https://publications.saskatchewan.ca/#/home

Additional titles that may interest you are:

- New Workplace Smoking Ban: Frequently Asked Questions
- Facts about Mould
Additional IAQ guides can be viewed and/or downloaded at the following website addresses.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Website Address</th>
</tr>
</thead>
</table>
| **Canadian Centre for Occupational Health and Safety (CCOHS)**               | [https://www.ccohs.ca/topics/hazards/physical/iaq/#ctgt_wb-auto-4](https://www.ccohs.ca/topics/hazards/physical/iaq/#ctgt_wb-auto-4) Some titles that may interest you are:  
  • Indoor Air Quality – General (fact sheet)  
  • Indoor Air Quality – Mould and Fungi (fact sheet)  
  • AirAssess – Improve Indoor Air Quality at Work (app)  
  • Indoor Air Quality – An introduction (e-course)  
  • Indoor Air Quality Health and Safety Guide (publication)  
  • Thermal Comfort for Office Work [https://www.ccohs.ca/oshanswers/phys_agents/thermal_comfort.html](https://www.ccohs.ca/oshanswers/phys_agents/thermal_comfort.html) |
| **WorkSafe BC**                                                              | [www.worksafebc.com](http://www.worksafebc.com)  
  One title that may interest you is:  
  • *Indoor Air Quality: A Guide for Building Owners, Managers, and Occupants*, Worksafe BC (This guide includes a useful problem-solving section on page 30.) |
| **WorkSafe Alberta**                                                         | [https://ohs-pubstore.labour.alberta.ca/gh015](https://ohs-pubstore.labour.alberta.ca/gh015)  
  One title that may interest you is:  
  • *Airborne Substances - Indoor Air Quality Tool* Kit, Work Safe Alberta, 2009 |
| **The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)** | [www.ashrae.org](http://www.ashrae.org)  
  One title that may interest you is:  
  • *Ventilation for Acceptable Indoor Air Quality*  
## Appendix A: Summary of OHS Regulations Related to IAQ

<table>
<thead>
<tr>
<th>What to Do</th>
<th>Summary</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure the workplace is kept clean and sanitary.</td>
<td>Ensure the regular cleaning of floors, working surfaces, stairways and passages, and the removal of hazardous wastes and refuse.</td>
<td>64</td>
</tr>
<tr>
<td>Ensure adequate fresh air and ventilation.</td>
<td>Ensure air and ventilation are sufficient to prevent harmful and offensive exposures as far as reasonably practicable.</td>
<td>65</td>
</tr>
</tbody>
</table>
| Provide and maintain a mechanical ventilation system which filters contaminants, likely to be hazardous or in significant amounts. | Ensure the system:  
  • Is suitable and sufficient to prevent the inhalation and accumulation of the contaminants.  
  • Provides sufficient fresh and tempered replacement air.  
  • Exhausts air clear of workplaces. Provides protection in the event of its failure.  
  • Effectively removes contaminants and renders the air inoffensive before the air is re-circulated.  
  • Is equipped with a warning device when it is not working. | 66         |
| Clean and maintain ventilation systems.                                   | Ensure the system:  
  • Minimizes the growth and spread of micro-organisms, etc.  
  • Allows access to components for cleaning and inspection as far as reasonably practicable.  
  • Is inspected and maintained by competent persons at sufficient frequencies.  
  • Contains openings free of obstructions or sources of contamination.  
Ensure records of inspections, maintenance, and cleanings are up-to-date and available for viewing. | 67         |
| Ensure the workplace is not overcrowded.                                 | Ensure that overcrowding does not pose a risk of injury/illness.                                                                                                                                                                                                                                                                       | 68         |
| Ensure thermal conditions are appropriate, protective, and comfortable.   | Ensure that the workplace be heated and/or air conditioned to maintain the thermal comfort of its occupants.                                                                                                                                                                                                                           | 70         |
| Ensure there is no smoking.                                               | Ensure there is no smoking in enclosed workplaces (a few exceptions).                                                                                                                                                                                                                                                                  | 77         |
| Provide protection to workers who must stand for long periods.           | Where workers are required to stand for a long period of time, they are to be provided with suitable devices to give relief. This includes anti-fatigue mats and foot rests.                                                                                                                                                                      | 79         |
| Allow workers to sit and provide appropriate seating.                    | Provide seating where there is a reasonable opportunity to sit without substantial detriment to their work. Where seating is needed, it must be designed to provide support.                                                                                                                                                        | 80         |
| Provide additional protection for certain workers.                       | Provide additional protection to a worker who has medical evidence of a sensitivity or unusual responsiveness to a substance present, or on their request, assign them to work that is available and less hazardous to them.                                                                                                                 | 308        |
Appendix B: Sample health survey

This questionnaire is intended to collect information about the impact that indoor air quality in your workspace may be having on your personal well-being. The form, when completed, contains personal information that is subject to protection under privacy legislation. This information is being collected in order to determine what action, if any, can be taken to address concerns with respect to indoor air quality. By completing and submitting this form you consent to the collection and use of this information.

The information contained in this form will only be used to help address possible problems with air quality. Appropriate steps will be taken to protect your identity if it becomes necessary to share your responses with consultants when assessing indoor air quality and when planning and implementing improvements. This form will be retained for a period not exceeding two years and will be destroyed promptly thereafter. You may request the amendment or destruction of this record at any time.

<table>
<thead>
<tr>
<th>Health survey - confidential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
</tr>
<tr>
<td>Department/position:</td>
</tr>
<tr>
<td>Survey date:</td>
</tr>
<tr>
<td>Interviewer (if applicable):</td>
</tr>
<tr>
<td>Work location/building area:</td>
</tr>
</tbody>
</table>

**Background information**

<table>
<thead>
<tr>
<th>How long have you been working for your employer?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long have you been working in this building?</td>
</tr>
<tr>
<td>Where do you spend most of your time at work?</td>
</tr>
<tr>
<td>Have there been any changes in the building recently? E.g., new location, renovation, cleaning practices, spills, fires, floods or other events?</td>
</tr>
</tbody>
</table>
### Symptoms & patterns

Check (□) all the symptoms or discomforts you experience and associate with your work environment.

- □ Headache
- □ Nausea
- □ Dizziness
- □ Tiredness / fatigue
- □ Irritation of eyes, nose, throat
- □ Breathing problems
- □ Coughing
- □ Sneezing
- □ Wheezing
- □ Shortness of breath

- □ Blurred vision
- □ Sinus congestion
- □ Difficulty in concentrating

Pain and discomfort of:
- □ Back
- □ Neck
- □ Hands
- □ Wrist
- □ Shoulders
- □ Other

Do you have any other health conditions that may make symptoms worse? E.g., allergies, immune system disorders, or chronic cardiovascular or respiratory disease.

Have you seen a doctor for these symptoms?
Circle the answer that best describes your situation. Yes No
(Do you wish to provide general details?)

### Timing

When do you notice these symptoms and how often do they occur?

On average, when you notice the symptoms, how long have you been at work? Circle the answer that best describes your situation.
Less than 1 hour 2-4 hours > 4 hours 1 day After days

Has there been any change to the symptoms or patterns (e.g., time of week, shift or season)? Circle the answer that best describes your situation. Yes No
If yes, please explain:

When do the symptoms go away? Circle the answer that best describes your situation.
Overnight After a week away Rarely Never
Can you provide more information?

Has the pain or discomfort caused you to take time off work? Circle the answer that best describes your situation. Yes No

Are you aware of other people with similar symptoms or concerns? Circle the answer that best describes your situation. Yes No
If yes, can you provide more details?
### Suspected or potential causes

Check (☐) any of the following that are true just prior to experiencing symptoms or at the time you are experiencing symptoms.

<table>
<thead>
<tr>
<th>☐ Are there any unusual odours?</th>
<th>☐ Is the work area too warm?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Does the air seem stuffy?</td>
<td>☐ Is the work area too cool?</td>
</tr>
<tr>
<td>☐ Is the air dry?</td>
<td>☐ Does the temperature vary from room to room?</td>
</tr>
<tr>
<td>☐ Is it dusty?</td>
<td>☐ Are there drafts where you work?</td>
</tr>
<tr>
<td>☐ Do you get shocks from static electricity?</td>
<td></td>
</tr>
</tbody>
</table>

Do you think any of the following might be causing problems at your workstation? Check (☐) any of the following.

<table>
<thead>
<tr>
<th>☐ Air circulation</th>
<th>☐ Machinery or equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Humidity</td>
<td>☐ Cigarette smoke</td>
</tr>
<tr>
<td>☐ Dryness</td>
<td>☐ Overcrowding</td>
</tr>
<tr>
<td>☐ Air conditioning</td>
<td>☐ Dividers or wall partitions</td>
</tr>
<tr>
<td>☐ Temperature</td>
<td>☐ Dusts and particles</td>
</tr>
<tr>
<td>☐ Noise</td>
<td>☐ Pesticide spraying</td>
</tr>
<tr>
<td>☐ Lighting / glare</td>
<td>☐ New furnishings / carpet</td>
</tr>
<tr>
<td>☐ Odours</td>
<td>☐ Other</td>
</tr>
<tr>
<td>☐ Air contaminants</td>
<td>☐ I don’t know</td>
</tr>
<tr>
<td>☐ Activities of co-workers or cleaning staff</td>
<td></td>
</tr>
</tbody>
</table>

Have you noticed other events (e.g., weather, temperature, humidity, or activities in the building) that occur around the same time as your symptoms?

Have there been any changes in the work environment? (E.g., duties, equipment, products)

### Additional information

Please provide any comments or suggestions about how to improve the air quality in the workplace.
Appendix C: Walkthrough inspection checklist

It is important to include other individuals who may have important information to provide in this investigation. These include the supervisor of the area being investigated and a member of the occupational health committee. The building occupants who have concerns should also be consulted. The nature and timing of their symptoms as well as any suspected causes should be discussed. Be prepared to take measurements, if necessary, using thermometers, direct reading carbon dioxide meters, or other equipment.

Date__________________________

Name of inspector(s)__________________________

Building, department or location inspected__________________________

Reason for inspection__________________________

<table>
<thead>
<tr>
<th>Inspection activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Walls, ceilings and floors</strong></td>
<td></td>
</tr>
<tr>
<td>• Evidence of water leaks or stagnant water pools that would promote the growth of micro-organisms</td>
<td></td>
</tr>
<tr>
<td>• Walls, ceilings, and windows free of mould</td>
<td></td>
</tr>
<tr>
<td>• Indoor plants free of mould and odour</td>
<td></td>
</tr>
<tr>
<td>• Flat surfaces dust free</td>
<td></td>
</tr>
<tr>
<td>• Thermostats in enclosed offices</td>
<td></td>
</tr>
<tr>
<td>• Shower facilities and washrooms clean and free of mould</td>
<td></td>
</tr>
<tr>
<td>• Drain traps liquid-filled to prevent the entry of sewer gases</td>
<td></td>
</tr>
</tbody>
</table>
### Open-concept offices - cubicles
- Screen heights (max. 1.5 metres)
- Screens do not touch floor

### Diffusers
- Diffusers are unobstructed
- Diffuser condition (mould, dust, dirt)

### Air exhaust louvers
- Louvers are unobstructed
- Louver condition clean (mould, dirt, dust)

### Pollutant sources
- Photocopiers
- Chemical storage/handling area
- Paper storage and handling areas
- Check for common triggers of allergic reactions such as mould, dust, dead animals/insects, animal droppings or dander, or scented products such as aftershaves or perfumes

### Carbon monoxide (CO) sources
- Air does not enter building from:
  - parking garage
  - loading dock
  - other (describe)
- Check that combustion sources are effectively exhausting to the outside (such as propane, natural gas, or oil as used in fireplaces)

### Volatile organic compounds
- Cleanliness/condition/location of:
  - chemical laboratories
  - chemical storage areas
- Recent renovations or additions involving new furniture, rugs, window coverings. New plywood, particle board or carpeting
- Check for other sources such as solvents, paints, adhesives, and cleaning products
<table>
<thead>
<tr>
<th><strong>Ventilation system (HVAC)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adequate outdoor air intake for the number of building occupants</td>
<td></td>
</tr>
<tr>
<td>• Air intake clear of pollution sources</td>
<td></td>
</tr>
<tr>
<td>• Cleanliness of ducts and plenum</td>
<td></td>
</tr>
<tr>
<td>• Ventilation shut-down (nightly/weekends)</td>
<td></td>
</tr>
<tr>
<td>• Air filter condition</td>
<td></td>
</tr>
<tr>
<td>• Check thermostat settings</td>
<td></td>
</tr>
<tr>
<td>• Check that thermostats, diffusers, fans, and dampers are clean and operating properly</td>
<td></td>
</tr>
<tr>
<td>• Check the outdoor air intake for mould, stagnant water, blockage, or nearby sources of contaminants</td>
<td></td>
</tr>
<tr>
<td>• Check for changes to the airflow that may occur in new building or HVAC system design</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Humidifiers</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pans and wetting media are free of slime</td>
<td></td>
</tr>
<tr>
<td>• Ducts free of mould</td>
<td></td>
</tr>
<tr>
<td>• Fans free of hard water deposits</td>
<td></td>
</tr>
<tr>
<td>• Volatile chemicals used for humidifiers</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Air conditioning system</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Condensate trays free of slime</td>
<td></td>
</tr>
<tr>
<td>• Cooling coils free of slime</td>
<td></td>
</tr>
<tr>
<td>• Absence of mouldy odours</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>General maintenance, design</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Windows can be opened</td>
<td></td>
</tr>
<tr>
<td>• Alterations to ventilation system</td>
<td></td>
</tr>
<tr>
<td>• Number of occupants in area</td>
<td></td>
</tr>
<tr>
<td>• Usage/condition of carpeting</td>
<td></td>
</tr>
<tr>
<td>• Work areas repainted</td>
<td></td>
</tr>
<tr>
<td>• Presence of odours</td>
<td></td>
</tr>
<tr>
<td>• Drafts or unwanted air currents</td>
<td></td>
</tr>
</tbody>
</table>
### General
- Check that lighting is adequate
- Question staff about other factors such as workload and ergonomics
- Check if the noise level is reasonable for office work

### Maintenance records
- When was the system last calibrated and adjusted?
- When was preventive maintenance last performed?

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Possible causes of the problem

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Recommended corrective action

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Corrective action taken?  Yes  No

Additional investigation required?  Yes  No