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## **VENTILATION INSPECTION AND RECORDS FOR HEALTH CARE AND RESIDENTIAL FACILITIES**

### **1) Introduction**

The Regulation for Health Care and Residential Facilities (O.Reg. 67/93, s. 19) requires that mechanical ventilation systems in the workplaces it covers be inspected by a qualified person at least every six months. It also requires that a report on each inspection be filed with the employer and with the Joint Health and Safety Committee or the Health and Safety Representative, if any.

This guideline is intended to help employers and workers comply with these requirements and achieve the benefits of a healthier workplace.

### **2) Who Is Qualified to Conduct the Inspection?**

The person who makes the inspection must be qualified by training and experience to do so. He or she may be an employee, working in maintenance or some other area, who has detailed knowledge of the system, its operation and its maintenance requirements. A contractor with expertise in ventilation systems who is familiar with the system may also conduct the inspection.

### **3) Keeping Records**

Information about each system should be recorded and be kept at the workplace where it is readily available. It should include:

- ▶ the system's purpose, its type, and the area(s) served;
- ▶ relevant plans, drawings and specifications;
- ▶ the manufacturer's literature for all operating equipment;
- ▶ written standard operating procedures;
- ▶ a written testing and/or preventive maintenance program;
- ▶ testing and maintenance records, including reports of regular inspections by a qualified person; and
- ▶ emergency procedures to be followed when a toxic substance has been released and may enter the ventilation intake(s).

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### 3) **Keeping Records** (*continued*)

For a **local exhaust system**, relevant design information should include descriptions of:

- ▶ the chemical(s) and the operation(s) to be controlled;
- ▶ the number of hoods and their design;
- ▶ construction material compatibility requirements;
- ▶ the rate of air exhausted for each hood and for the system;
- ▶ the location of dampers, if any;
- ▶ the flow monitors (e.g. hood static pressure gauges);
- ▶ the equipment failure alarms, if any;
- ▶ the duct materials;
- ▶ the fan (its type and materials); and
- ▶ the height and location of the stack.

For an **air supply or recirculating HVAC (heating, ventilating and air-conditioning) system**, the records should include descriptions of:

- ▶ the location of outdoor air intakes and air handling units;
- ▶ air volumes and the percentage of outside air;
- ▶ how the percentage of outside air is determined;
- ▶ how fans, outside air dampers, exhaust dampers, supply diffuser dampers, temperature, humidity and air distribution are controlled;
- ▶ the type(s) of filters and their maintenance schedule; and
- ▶ the maintenance programs for fan components, drive components, drain pans, traps, valves, nozzles, dampers and controls, including any continuous monitors of contaminant concentrations. Maintenance programs and records should state the type of biocide used and how frequently it is used.

Employers often find it helpful to keep a **log or record of indoor air quality complaints and associated conditions**.

### 4) **The Inspection**

A good way to help ensure that a ventilation system is operating properly is to measure air flow rates or velocities regularly at appropriate points. For a local exhaust system, hood static pressure measurements can also serve well. A decrease of 10 to 15 per cent from design rates or from a previously established baseline indicates a need to identify and correct the cause. Details of how and where to measure air flow may be obtained from any good ventilation text, such as *Industrial Ventilation*, 21st ed., 1992, published by the American Conference of Governmental Industrial Hygienists. (*Continued on page 4.*)

## The Semi-Annual Inspection

**Check each of the following items, as applicable:**

<p><b>Exhaust Hoods</b></p> <ul style="list-style-type: none"> <li>● physical integrity</li> <li>● dryness</li> <li>● no plugging and blockage</li> <li>● blast gate and damper settings</li> </ul> <p><b>Outdoor Air Intake(s)</b></p> <ul style="list-style-type: none"> <li>● location in relation to exhausts and other outdoor sources of harmful or unpleasant substances</li> <li>● no plugging and blockage</li> <li>● dryness and cleanness</li> <li>● operation of motorized louvres and dampers</li> </ul> <p><b>Ductwork</b></p> <ul style="list-style-type: none"> <li>● physical integrity</li> <li>● dryness</li> <li>● no plugging or blockage</li> <li>● blast gate and damper settings</li> </ul> <p><b>Reheat Coils/Mixing Boxes</b></p> <ul style="list-style-type: none"> <li>● cleanness and dryness</li> <li>● VAV (variable air volume) calibration set for at least the minimum required outside air delivery at all times</li> </ul> <p><b>HVAC Equipment</b></p> <ul style="list-style-type: none"> <li>● physical integrity</li> <li>● dryness and cleanness</li> <li>● filters in place, clean and dry</li> <li>● no slime, mould, dirt, bird droppings or soot accumulations</li> <li>● cleanness and operation of heating/cooling unit burners, combustion air fans, stacks, condensers, etc.</li> </ul> <p><b>Supply Air Diffusers, Return Air Grilles</b></p> <ul style="list-style-type: none"> <li>● open and unobstructed</li> <li>● clean</li> </ul>	<p><b>Fan</b></p> <ul style="list-style-type: none"> <li>● direction of rotation and rpm, as appropriate</li> <li>● static pressure drop across fan, if practicable</li> <li>● pulley/belt tightness and wear</li> <li>● guards in place</li> <li>● assembly intact and clean</li> <li>● vibration minimal</li> <li>● noise level acceptable</li> <li>● no loose nuts and bolts</li> <li>● bearing lubrication adequate (as indicated by temperature and vibration)</li> <li>● motor temperature</li> <li>● electrical connections and insulation intact</li> <li>● fan wheel correctly mounted and not worn or dirty</li> <li>● strainers, traps, drains and valves open and clear</li> <li>● couplings and alignment for direct drive fans</li> </ul> <p><b>Humidifiers, Cooling Coils, Drain Pans</b></p> <ul style="list-style-type: none"> <li>● cleanness</li> <li>● no slime or mould build-up</li> <li>● drains clear and free-flowing</li> <li>● no stagnant water accumulations</li> <li>● no odours</li> </ul> <p><b>Cooling Tower(s)</b></p> <ul style="list-style-type: none"> <li>● drains clear</li> <li>● no stagnant water</li> <li>● no bird droppings, slime, mould or dirt build-up</li> </ul> <p><b>Thermostats</b></p> <ul style="list-style-type: none"> <li>● set appropriately</li> <li>● access controlled</li> </ul>
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- NB:**
- 1) Inspect internal fan components only when the fan is off and locked out.
  - 2) In assessing ventilation adequacy, the requirements of section 20 of the Regulation for Health Care and Residential Facilities must also be considered.
  - 3) To prevent blockage or contamination of air intakes, more frequent inspection of these system components may be necessary.

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#### 4) **The Inspection** (*continued from page 2*)

Carbon dioxide measurements may also be used as an indicator of the adequacy of general mechanical ventilation in some of the areas where human respiration is the main source of carbon dioxide. However, this method is not appropriate for assessing ventilation adequacy in areas where hazardous airborne contaminants are or may be released: for example, sterilizer rooms, surgery and recovery rooms, incinerator rooms, etc.

Where carbon dioxide measurements are appropriate, they should be taken at a time of relatively high occupancy and under both summer and winter conditions. Concentrations above 800 ppm may indicate an insufficient supply of fresh outside air and should trigger a visual inspection of the ventilation system(s) involved.

However, for ongoing ventilation system effectiveness visual inspections and a preventive maintenance program are necessary, whether or not testing is done. Visual inspection is needed to ensure the integrity, cleanness and proper operation of the system.

For a list of the items to be checked in such an inspection, see page 3.

#### 5) **The Report and Follow-up**

The person conducting the semi-annual inspection is required to file a report with the employer and with the Joint Health and Safety Committee or the Health and Safety Representative, if any. This report should state what was inspected, when and by whom. It should describe any deficiencies observed during the inspection. If deficiencies are found, action should be taken to correct them. Both the deficiencies and the corrective action should be documented in the system records.

In addition to these requirements, each ventilation system component must also be maintained and serviced in accordance with the manufacturer's recommendations.

**For further information or a copy of the Regulation for Health Care and Residential Facilities, please contact your local Ministry of Labour office.**

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