How to Comply with OHS Indoor Air Quality Requirements

IAQ issues assume a new urgency during the coronavirus pandemic.

According to the Association of Workers' Compensation Boards of Canada, 2 out of 3 Canadian workers (67%) who suffered workplace fatalities (64%) in 2017 were killed not by traumatic injuries but occupational diseases. In many, if not most of these cases, the occupational disease was the result of breathing in an airborne contaminant or other health hazard contained in the air at work. And now there's a new hazard poisoning the air in workplaces across Canada and the world: coronavirus. All of this raises a big question for OHS directors, especially at sites where work is done indoors: Is your company doing enough to meet airborne COVID virus and other indoor air quality (IAQ) challenges' This analysis will help you answer that question.

What the Law Requires

While the air we breathe every day often contains things that can harm us, some work settings and operations expose workers to unusual atmospheric hazards, like work in a confined space, asbestos removal or drilling that kicks up high levels of hazardous dusts. The specific and stringent ventilation requirements that apply to these settings and operations aren't what this story is about.

What we **are** talking about are the more general ventilation requirements designed to ensure IAQ and limit everyday airborne hazards that may be contained in indoor workplaces such as chemicals, allergens, moulds, spores, dust mites, pollens and, yes, viruses like COVID and even the carbon dioxide in the air we exhale. These hazards may also be contained in common work materials or trapped in carpets, chairs or heating/ventilation/air-conditioning (HVAC) systems.

The 9 Things to Do

Whether in times of pandemic or normalcy, there are 9 basic steps you must take to comply with OHS IAQ and mechanical ventilation requirements.

1. Supply Adequate Fresh Air

The end game and primary requirement under OHS laws is to ensure an adequate supply of clean and fresh air throughout the indoor workplace. Studies show that increasing the supply of fresh outdoor air resolves as many as 80% of IAQ complaints in Canada. The fresh air dilutes airborne contaminants and provides a more acceptable indoor environment. The simplest way to accomplish the objective is to open windows and let fresh air from the outside enter. However, this may not be a viable solution during the winter or for workplaces in locations where the outdoor air isn't fresh. Consequently, most companies will probably need to rely on their HVAC systems to help control IAQ at their workplace.

2. Ensure Ventilation Equipment Meets Design and Air Supply Standards

Installation of mechanical ventilation equipment must meet provincial and local building codes. Four jurisdictions'FED, BC, NB, NL'require compliance with the design and performance criteria set out in the American Society of Heating,

Refrigerating, and Air Conditioning Engineers (ASHRAE) standard ASHRAE 62-1989, *Ventilation for Acceptable Indoor Air Quality*, including the outdoor air supply requirement of 15 to 20 cubic feet per minute (cfm) per building occupant.

Another way to determine if a ventilation system is providing an adequate supply of fresh air for the number of building occupants is by measuring carbon dioxide (CO2) concentration levels. **Best Practice:** Use a direct reading detector tube or direct reading instrument to measure CO2 levels in the space in parts per million (ppm) after people have occupied it for at least 2 hours. As a rule of thumb, CO2 levels of 1,000 or above suggest that the fresh air supply is inadequate and must be improved.

Perhaps the most surefire way to measure effectiveness of ventilation equipment is by tracking the number and types of IAQ complaints from employees and other building occupants.

3. Ensure that Work Is Done by ‘Competent Person’

Under most OHS laws, all mechanical and system work performed on ventilation and HVAC systems must be done by a ‘competent’ or ‘qualified’ person. But this doesn’t preclude janitorial staff from doing routine cleaning and dusting on vent covers and other accessible and exposed parts of the system.

4. Inspect Ventilation Systems

Inspections of the ventilation system should be carried out by a competent person as often as necessary to ensure the system’s effective operation and prevent the growth of biological contaminants, such as mould or insects. In Québec, inspections must take place once a year. For healthcare and residential facilities in Ontario, the interval is 6 months. In all other cases, follow the system manufacturer’s recommendations as to inspection frequency.

When inspections do take place, ensure that they cover all critical components of the ventilation system, including dampers, fans, belts, baffles, drain pans, ductwork, diffusers and control systems, as well as any related humidification equipment, such as cooling towers. Check for any broken, damaged or worn equipment and conditions such as water leaks or stagnant water pools that promote the growth of micro-organisms such as mould. Make the necessary repairs or replacements to address problems the inspection identifies.

5. Clean Ventilation System Regularly

Particles in the air circulating in the ventilation system may get recirculated into the workplace and lead to IAQ problems. So, it’s essential to regularly clean the system, especially its louvers, ducts and dampers, to prevent the accumulation of dirt, dust and other contaminants.

6. Perform Routine Maintenance

Ventilation systems require routine maintenance. For example, filters, belts and other consumable components may need to be regularly replaced every, say, six months. Open water systems associated with ventilation equipment, such as cooling towers and humidifiers, may also require regular treatment to control biological growth. And any combustion sources, such as furnaces, space heaters and water heaters, that are part of the overall ventilation system may need routine maintenance to ensure proper burning and exhausting of waste gases so that they aren’t recirculated in the workplace.

7. Keep Vents Free of Obstructions

Keep ventilation openings free from obstructions and sources of contaminants. Vents that are blocked by furniture, materials, boxes or other items may not intake sufficient air, thus diminishing the system’s effectiveness. In addition, placing, say, chemical-soaked rags in front of a vent may

introduce hazardous fumes into the system, endangering workers.

8. Keep Maintenance Records

Several jurisdictions require employers to keep records of all inspections, maintenance and cleaning of the ventilation system and make those records available to the workplace JHSC, safety representative or, if there is no JHSC or safety representative, the workers themselves. Even if not expressly required, keeping such records is a must in case of an IAQ work refusal or if your company is ever charged with a safety violation related to the operation of the ventilation system by helping you prove that you exercised due diligence in maintaining the system.

9. Investigate IAQ Complaints

Properly investigating worker IAQ complaints. is an express requirement under Federal and BC OHS laws and a best practice everywhere else. This is particularly true during the COVID era. Specifically, a competent person should carry out an air quality investigation. that includes, at a minimum:

- An assessment of the ventilation rate;
- Inspection of the HVAC system for cleanliness, operation and performance;
- Review of the HVAC system maintenance schedule; and
- Sampling for airborne contaminants suspected to be present.

Federal OHS rules are even more stringent, requiring an assessment of building level occupancies and the HVAC system's capabilities in light of those levels. In all cases, you should implement an IAQ investigations policy. that provides for keeping written records of IAQ complaints.