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## **Arena Indoor Air Quality (IAQ) – IMPORTANT**

Equally important to the management of your ice surface is managing your arena's air quality. The major difference is that ice quality is something you can see and feel, whereas air quality is not so identifiable.

There are two toxic gases of concern in your arena facility – Carbon Monoxide (CO) and Nitrogen Dioxide (NO<sub>2</sub>). The main sources for these gases are from the ice resurfacer and edger, produced by their internal combustion engines. Both are present in an arena and can be harmful to people using your facility. Other engines used in the arena can produce the same gases, and special events like tractor pulls and car shows create similar gaseous environments.

Carbon Monoxide is a colourless, odourless and tasteless gas. It is produced from the incomplete combustion of gas, propane or natural gas in an internal combustion engine. Symptoms are often described as 'flu-like' and commonly include headache, dizziness, weakness, vomiting, chest pain and confusion. Large exposures can result in loss of consciousness, arrhythmias, seizures or death.

Nitrogen Dioxide is a dark brown or reddish brown toxic gas - with a pungent, acrid odour. It is another by-product of the combustion process at high temperatures. Symptoms include shortness of breath, irritation to the eyes, mucus membrane, lungs and other respiratory organs. Large exposures can also result in loss of consciousness and death.

All staff should be trained to identify the symptoms of CO and NO<sub>2</sub> poisoning. Early detection can be critical - and a matter of life and death. Children, seniors, users and those with respiratory and health issues are especially susceptible to the effects of CO and NO<sub>2</sub> poisoning. Recommend exposure rates are available.

### **What Does This Mean?**

As the owner/operator, you have a legal responsibility to manage the IAQ in your facility. Managing IAQ is vitally important on two levels. First is from a staff/employee perspective, through the Occupational Health and Safety regulations. Second is public safety. There are acts/regulations in place to protect users and visitors using your recreation facilities. Make sure you understand your risk and liability.

### **Monitoring**

How do you know the level of potential toxic gases without monitoring? You don't. You can purchase detectors that will help you monitor the presence of toxic gases. There are basically two types: personal monitors that are worn by your staff, and fixed monitors. A combination of both is the best approach. But be careful, residential home based style monitors are not designed to operate effectively in a cold and damp environment such as arenas. Your local electrical contractor can supply and install appropriate commercial monitors.

Monitoring requires logging – they go hand in hand. Once you have personal and commercial monitoring systems in place, you need to log the results. In the event you have a problem, your IAQ Log Book may be your only defence in court. There are IAQ Log Book samples that you can find to assist.

Remember that programming can impact IAQ. A busy day at the rink will have the resurfacer flooding every 30 – 45 minutes, or perhaps more. Also, take note when special events are taking place. Tractor pulls and car shows can create dangerous air quality conditions.

### **Indoor Air Quality – Best Practices for Your Facility**

There are many practices available to help with IAQ. Below is a short list to get you thinking and taking action:

1. Learn more about IAQ – Do your homework!
2. Public Health Inspector – Contact your local Inspector about IAQ and having an annual test.
3. Plan – Have a plan in place for IAQ monitoring, testing and evacuating.
4. Customized actions – No two arenas are the same so customize your actions to your facility.
5. Annual service – Have your resurfacer and edger serviced and tested at least once a year by a qualified technician. Do this in August or September, prior to the start of the season. Follow the directions in the owners' manual also.
6. Ventilation system – Make sure your ventilation system is functioning at peak capacity. Service it regularly. You may have to improve the ventilation system to create enough turnover and air movement.
7. Idling vehicles – Buses or vehicles should not be allowed to park close to fresh air intakes.
8. Ventilation system and flooding – Run your ventilation system at least 5 minutes before your flood and 10 – 15 minutes after.
9. Training – Include IAQ testing as part of your staffs' orientation and annual training.
10. Monitoring – Start monitoring your air quality with portable and permanent detectors and log the results.
11. Electric powered – Replace internal combustion equipment with electric. For example, once you operate an electric ice edger, you will wonder how you ever managed with a gas powered unit.
12. Exhaust pipe extension – Extend the exhaust pipe on your resurfacer at least 1-foot above the glass.
13. Catalytic converter – A catalytic converter is an effective means to reduce carbon monoxide. If your machine has a catalytic converter, you must warm up the engine for at least five (5) minutes for the converter to be effective.
14. Warming up the resurfacer – During warm-up, try to vent as much of the exhaust outside as possible. Open an exterior door if possible, and/or directly pipe the exhaust to the outdoors.
15. Remember, CO and NO<sub>2</sub> can be present during any season, depending on the use or programming in your facility.

### **For More Information and Assistance – Contact:**

- Regional Health Authority Office – Speak to your local Public Health Inspector. The Public Health Inspectors will provide further guidance on your facility's air quality.

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