Recent events involving youth and college hockey players at ice rinks have cast the national media spotlight on the air quality inside rinks around the country. These incidents, which involved players becoming ill due to carbon monoxide and nitrogen dioxide poisoning, are serious and pose important questions for the industry. With that said, it’s critical for everyone who steps into a rink to know that the ice rink industry has long been committed to ensuring the health and safety of its customers as well as rink employees.

The Issue

On occasion, there are incidents at ice rinks in North America and around the world where people become sick due to poor indoor air quality. The discovery of poor indoor air quality, or more specifically high levels of carbon monoxide (CO) and/or nitrogen dioxide (NO2), in these ice rinks has been most commonly linked to the following factors:

- Fossil fuel powered ice resurfacing and ice edging equipment that has not been maintained on a regular basis by a qualified professional.
- Inadequate facility ventilation equipment and/or equipment that has not been maintained on a regular basis by a qualified professional.
- The absence of an ongoing indoor air quality monitoring program for the facility.

The media headlines always seem to point the finger at ice resurfacing equipment as the primary culprit of poor indoor air quality. However, ice resurfacing equipment manufacturers must meet stringent EPA emissions standards in order to sell their products within the United States. In reality, it is usually the lack of proper ongoing maintenance of the equipment after it is purchased and put into use that is the root cause of the problem.

Ice resurfacing and maintenance equipment are not the only potential contributors to poor indoor air quality in ice rinks. Any equipment that burns fossil fuel (gasoline, diesel, propane, natural gas) such as infrared bleacher heaters, hot water heaters and boilers, furnaces, forklifts, scissors or boom lifts, generators, and idling busses outside the rink just to name a few can contribute to unacceptable levels of carbon monoxide and/or nitrogen dioxide if not used and maintained properly.

What are carbon monoxide (CO) and nitrogen dioxide (NO2)? How do they affect me?

Carbon monoxide (CO) is a colorless, odorless, tasteless gas, which reduces the oxygen carrying capacity of blood. It is the product of incomplete fossil fuel combustion. Common symptoms of exposure to high levels of carbon monoxide are: headaches, drowsiness, rapid breathing, nausea and vomiting.

Nitrogen dioxide (NO2) is a dark brown or reddish brown gas that has a pungent, acrid odor. It is an unwanted by-product of fossil fuel combustion. Common symptoms of exposure to high levels of nitrogen dioxide are: irritation to eyes, nose, throat and respiratory tract, shortness of breath, or more serious symptoms such as pneumonia or bronchiolitis.

What are the maximum levels of exposure to CO & NO2?

There are no federal regulations for indoor air quality specific to indoor ice rinks for carbon monoxide (CO) and nitrogen dioxide (NO2) exposure. However these three states: Massachusetts, Minnesota and Rhode Island, have put regulations in place for indoor ice rinks within their states. Each state’s regulations are similar, and are enforced by their departments of health. These regulations outline air sampling requirements, re-
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cord keeping requirements, air action levels and required corrective measures that must be taken by the rink operator.

The maximum exposure levels for CO & NO2 per current state regulations are below:
- carbon monoxide (CO) < 30.0 ppm
- nitrogen dioxide (NO2) < 0.5 ppm

What can your local ice rink do to maintain acceptable indoor air quality?

Serving The American Rinks (STAR), which was founded by U.S. Figure Skating and USA Hockey in 2000 to provide education and resources for rink owners and operators throughout the country, recommends that all ice rink operators in states that do not already have indoor air quality guidelines follow the state of Massachusetts 105 CMR 675.00, which can be found online at www.mass.gov or www.starrinks.com.

In addition, STAR recommends the following:

- Fossil fueled ice resurfacing and ice edger equipment should be emissions tested and tuned to manufacturer specifications annually by a qualified professional.
- Heating, ventilation and air conditioning (HVAC) equipment should be inspected and maintained quarterly for proper operation by a qualified professional.
- All rink staff should be trained how to properly use air sampling equipment and what appropriate corrective actions to take upon discovery of an air sample that exceeds maximum CO & NO2 exposure limits.

It’s important to know that the majority of ice rinks in the United States do an outstanding job of offering a safe, clean and fun environment for people of all ages to enjoy skating. Unfortunately, there are exceptions and STAR is committed to doing everything possible to help eliminate those exceptions. As an industry leader, STAR addresses the issue of indoor air quality at educational seminars it conducts throughout the year.

As a figure skater, parent, coach, judge or volunteer you have the right to expect a clean and safe environment every time you step into a rink. If you have questions or concerns about the air quality in your local rink, ask your figure skating club leadership to speak with the rink management about what steps they are taking to provide a safe environment.

About the author:

Jeff Theiler is the chief operating officer for Serving The American Rinks and has more than 20 years of experience operating ice rinks in New Jersey, Pennsylvania and Washington.

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