



# The Air We Breathe

Monitoring And Maintenance Are Essential Aspects To Air Quality Inside Ice Rinks BY JEFF THEILER

**RECENT EVENTS INVOLVING YOUTH HOCKEY** players at ice rinks have cast the national media spotlight on the air quality inside rinks around the country.

Both incidents, which involved players becoming ill due to carbon monoxide and nitrogen dioxide poisoning, are serious and pose important questions for our 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 by creating and following a set of strict guidelines.

## **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 and/or nitrogen dioxide, in these ice rinks has been most commonly linked to the

following factors:

Machines powered by fossil fuels, such as ice resurfacers and ice edging equipment that have not been properly maintained 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 at the facility.

The 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 maintenance of the equipment after it is purchased 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, scissor or boom lifts, generators and idling buses outside the rink can all contribute to unacceptable levels of carbon monoxide and/or nitrogen dioxide if not used and maintained properly.

## **What are carbon monoxide and nitrogen dioxide? How do they affect me?**

Carbon monoxide 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 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 or



It's important that rink operators consistently monitor the air quality, above, to ensure that emissions from fossil-fuel powered machines such as an ice edger, below, are within safe levels.



All ice resurfacers, such as Zamboni and Olympia, ensure that their machines meet strict EPA emissions standards when they roll off the assembly lines. It's up to the rink operators to maintain their equipment so each machine runs at peak efficiency.



that must be taken by the rink operator. The maximum exposure levels for carbon monoxide and nitrogen dioxide per current state regulations are:  
 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, which was founded by USA Hockey and U.S. Figure Skating 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 675.000, which can be found online at [Mass.gov](http://Mass.gov) or [Starrinks.com](http://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 & Air Conditioning 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 carbon monoxide and nitrogen dioxide exposure limits.

It's important to know that the majority of ice rinks in the U.S. do an outstanding job of offering a safe, clean and fun environment for kids and adults to play hockey. 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. In addition, USA Hockey has reached out to government agencies nationwide to heighten concerns surrounding indoor air quality in ice arenas.

As a player, parent, coach or official 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 hockey association leadership to speak with the rink management about what steps the rink staff is taking to provide a safe environment.

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shortness of breath. More serious symptoms include pneumonia or bronchiolitis.

**What are the maximum levels of exposure to carbon monoxide and nitrogen dioxide?**

Currently there are no federal regulations for indoor air quality specific to indoor ice rinks for carbon monoxide and nitrogen dioxide exposure. However three states, Massachusetts, Minnesota and Rhode Island, have put regulations in place for indoor ice rinks. Each state's regulations are similar, and are enforced by their departments of health. These regulations outline air sampling requirements, record keeping requirements, air action levels and required corrective measures