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AIR QUALITY AWARENESS - Since the mid 1980's arena personnel have identified a rising number of incidents relating to poor air quality, with participants experiencing varying degrees of illness and difficulty in physical function. Research reveals that air quality problems are linked to a number of sources and that remedial action is necessary and must be ongoing.

The increased awareness of indoor air quality problems by the public and media coverage has once again brought indoor air quality problems to the forefront.

<http://www.cbc.ca/canada/edmonton/story/2007/03/12/arena-pollution-070312.html#skip300x250>

Different combustion processes contribute to poor air quality. The major products of combustion are carbon dioxide and water vapor, but other contaminants are also introduced into the environment. Of the numerous by-products of combustion, contributors to indoor air contamination are carbon monoxide, the oxides of nitrogen and respirable suspended particles (RSP). The relative amount of each of these contaminants depends upon the fuel being burned and the condition of burning.

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The air we breathe is filled with suspended particles of all sizes and composition. Of particular concern are very fine particles—commonly referred to as PM₁₀ and PM₂₅. Primary sources of these fine particles within indoor recreational skating facilities include ice resurfacing equipment, un-vented space heaters, and environmental tobacco smoke. PM₁₀ and PM₂₅ exhibiting a variety of physical and chemical properties are able to bypass many of the body's natural filtering systems, lodging in the deepest and most sensitive areas of the lungs. Fine particles can aggravate many respiratory illnesses such as asthma, bronchitis, and emphysema. Short-term exposures can lead to coughing and minor throat irritation. Prolonged exposures can lead to increased bronchial aggravations. Nitrogen dioxide gas may combine with water vapour to form nitric acid (usually attached to a particle), which may have more significant effects on lung function.

Indoor combustion sources (including gasoline, propane and natural gas) tend to be intermittent and generally confined to certain areas of the structure. As a result, levels of combustion by-products in indoor air vary with use patterns, and vary from room to room within a structure. They may also vary with outdoor conditions. This variability must be taken into account when monitoring indoor air for combustion by-products.

Two major sources of the poor air quality for arenas are the ice resurfer and ice edger. Air tests in Canadian arenas have shown that there is often too much nitrogen dioxide and carbon monoxide gas in the air immediately after the ice has been shaved and flooded. In sufficient concentrations carbon monoxide and nitrogen dioxide are very dangerous, and can be deadly.

There are three groups of concern with respect to exposure: the arena operators, the participants and the spectators. The arena operators spend 8 hours or more each day in the arena. Participants can spend from one hour to several hours in a facility each day depending on the activity. The health effects of carbon monoxide and nitrogen dioxide are thought to be more pronounced if the person is: physically active in the arena; very old; very young; or has pulmonary, heart or asthmatic susceptibilities/disabilities.

T. 416.426.7062

F. 416.426.7385

1.800.661.ORFA

info@orfa.com

For additional information refer to: <http://www.orfa.com/AIR%20QUALITY.pdf>