Humidity control for ice skating arenas

DanVex dehumidifiers allow for consistent control to efficiently prevent the effects of humidity.

According to the physical laws of nature, moisture migrates through the air from a higher concentration to the lower concentration due to a difference in vapor pressure. When air is cooled it is not able to hold as much moisture. Thus, moisture will condense on any surface that has a lower temperature than the dew point temperature of the air.

This is particularly a problem in ice arenas where the condensed moisture is deposited onto the surface of the ice in the form of water droplets and also, in the form of fog above the surface of the ice. When moisture condenses and accumulates on the surface on the ice, it is known as "frosting". This "frosting" in turn, results in "slow" ice and also imposes an additional load on the ice making system.

These conditions cannot be solved by ventilation because the introduction of outside air only aggravates the problem when the weather outside is mild and humid. Insulating the roof also aggravates drip during mild outside weather conditions. Low emissivity ceilings stay warmer and thus, reduce condensation and dripping. Under these conditions, to prevent condensation in the ceiling space and to eliminate the fogging, there are two approaches; refrigeration or desiccant dehumidification.

REFRIGERATION

In the past, refrigeration air conditioning systems, utilized in ice skating, curling and hockey rinks, have had a history of humidity related problems along with high energy consumption rates. Conventional refrigeration equipment can maintain space conditions in a skating rink of 7°C to 15°C at a relative humidity of 60% to 75%. This can result in the air so close to saturation that it actually forms a fog over the rink and condensation inside the building and on the surface of the ice.

Any attempt to maintain lower humidity levels would necessitate maintaining evaporator temperatures lower than 0°C which would result in frost formation on the evaporator coil. A more effective and energy efficient solution is adsorption type of dehumidification system.

ADSORPTION TYPE AD-1500

ADSORBTION TYPE OF DEHUMIDIFICATION

The primary advantage for a DanVex adsorption type of dehumidification system is its ability to dry air down to very low humidity levels. An adsorption dehumidifier can easily maintain 30% to 40% relative humidity within an ice skating rink thus, eliminating fog and condensation year-round, regardless of outdoor weather conditions.

The average energy consumption of adsorption dehumidifier is as much as 70% less than a comparable refrigeration system. So, adsorption dehumidification systems can eliminate fog and condensation while, at the same time, reducing operating costs. There is also the potential for a reduction in maintenance to the building and equipment inside as it is no longer subject to excessive humidity and the problems associated with it.