Retrofit

Centennial Natatorium

Case Study

Benefits:

Avoid Structural Decay

Lower Operating Costs

Enhance Indoor Air Quality

Reduce Condensation

EI Solutions inc.
energie innovation

Saving a recreational facility from corrosion and other moisture related issues is a typical day for EI Solutions. When EI discovered a new territory to condition natatoriums, it was still a typical day. They were asked to help solve the humidity issues at the Centennial Recreation Centre's natatorium in Toronto. Already a leader for their Country in ice arena dehumidification, EI Solutions proved to the Canadian engineers in charge of the retrofit project that the Munters product would work in a swimming pool environment just as well if not better than the competitor's products and technologies.

While desiccant dehumidification of natatoriums is not common in Canada, it is a large and growing market for Munters around the world. All natatoriums require dehumidification and heating most of the time. In the UK, Munters' dehumidification units have become a standard in natatoriums. In the United States, Munters' units are increasingly being applied to new and retrofit applications because of the now proven and increased reliability over packaged mechanical dehumidification systems. Clients with many years of experience in the operations of natatoriums are extremely pleased with the reduced maintenance costs the Munters' units provide over their previous cooling-based dehumidification systems.

The AM20-1300G uses a desiccant wheel for dehumidification and heat recovery to pre-treat the outside air. The unit also has post heat and cooling. It is the first Munters unit for a large scale pool application to be sold in Canada. EI Solutions jumped at the opportunity to open the window to natatoriums. As Art Doramajian of EI Solutions stated, "It was the right time to make the move into the pool market. Centennial had an older technology system that wasn't working- we offered a product with lower operating costs and greater reliability."

Munters
The Humidity Expert

The AM20-1300G at Centennial is the first Munters' unit for a large scale pool application to be sold in Canada.

The driving decision to choose the desiccant dehumidification system was made only after a thorough review of references conclusively showed the improved reliability of the Munters' equipment. When familiar with the appropriate performance criteria, Engineers have always recognized the Munters desiccant rotor as the most efficient in the industry in terms of the least amount of energy required for moisture removal. Following EI Solutions' design load and equipment selection, EI Solutions qualified the equipment operating costs by comparing the performance to a similar capacity cooling-based dehumidifier. The Centennial comparison indicates that the utility operating costs for the desiccant unit is 10% less than a comparable mechanical unit ($47.5K vs. $51.6K).

With Canada's long, cold winters, natatoriums require dehumidification and space heating at least 85% of the time. The evaporation occurring at the surface of the pool (100' x 50') at Centennial accounts for over 15-tons of continuous cooling-effect to the space. When desiccants dehumidify they adsorb moisture, which raises the temperature of the air stream. Thus, the heat added to the air stream by the desiccant dehumidification process is an excellent compliment to the space heating load requirements of most natatoriums.

The improved reliability and lower maintenance costs of the system stems from the simple method Munters utilizes to perform the dehumidification process. A Munters desiccant rotor adsorbs moisture from the air in the vapor stage versus mechanical (cooling-based) dehumidifiers that require condensation over a coil to remove water. Furthermore, the pool chemicals do not adversely impact the impregnated desiccant rotor since these chemicals do not condense out of the air stream and onto the rotor. Any coils and ancillary equipment downstream of the rotor have dehumidified dry air pass over them so moisture related damage is mitigated. In conventional mechanical dehumidifiers, condensation is for the most part continuously occurring on coils, while drain pans remain wet along with auxiliary components. In a corrosive environment such as a chlorinated pool, this reduces the service life of equipment. In addition, the extended operating hours the pool environment demands from the compressors requires much more servicing than a desiccant rotor. The consulting engineer was aware of these issues when he decided to proceed with a Munters desiccant solution for Centennial.

Once commissioned, the Munters unit dried the building in less than two hours. Building maintenance personnel quickly remarked that the glass area in the pool's lobby had never once been clear. Also, some of the staff were interested to know that many forms of suspended bacteria would be killed because of the operating temperature of the desiccant rotor. The success of this project has taken technology proven around the world and demonstrated the positive and healthy changes compared to the traditional approach of dehumidifying natatoriums in Canada.

Product Comparison

Location: Toronto, ON		Munters AM20-1300G			Cooling-Based Dehumidifier		
		Energy Required		Available	Energy Required		Available
Hours of Occurrence	Latent Load (Lbs/hr)	Nat. Gas Btu/h	Total Elec. kW	Heat (Btu/h)	DX Coil (tons)	Total Elec. kW	Heat (Btu/h)
34	268	509,641	24.6	375,302	54.2	66.8	429,697
151	216	410,400	24.6	293,490	48.4	61.6	343,840
537	165	312,686	24.6	209,064	42.0	55.8	248,310
772	113	214,971	24.6	123,287	35.4	49.9	149,953
2,190	90	170,050	14.6	129,775	24.2	39.8	36,096
1,354	62	117,257	24.6	31,166	27.7	42.9	35,526
2,000	10	19,543	24.6	- 80,126	16.8	33.1	- 126,964
1,722	-	-	24.6	- 136,755	-	18.0	- 274,050
Annual Operating Costs with Heat Recovery				**$47,503**			**$51,632**

Data is an estimate and provided by EI Solutions.

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