

# Dryden Arena and Recreation Complex



- ▶ **Natural gas-regenerated desiccant dehumidification**
- ▶ **20,000-sq.-ft. swimming and recreation building**
- ▶ **Dryden, Ontario, Canada**

## Swimmers Enjoy Comfortable, Well-Ventilated Pool Area Thanks to Munters Moisture Control System

The indoor environment at the Dryden Arena and Recreation Complex Swim Center has gone from clammy to comfortable, thanks to a new desiccant dehumidification system that removes excess moisture from the air.

Uncontrolled indoor humidity is no longer causing structural deterioration in the 20,000-sq.-ft. natatorium, part of a larger arena and recreation complex owned and operated by the city of Dryden, Ontario. The swim center features a 25-meter swimming pool, waterslide and 9-meter therapeutic heated pool. Warm indoor pool water evaporates at a rapid rate and the resulting humidity levels need to be controlled to prevent damage to the building structure.

A Munters model AM20D20GG desiccant dehumidification unit, installed in November 2005, now captures the swim center's clammy indoor air and turns it into dry air using a titanium-enhanced silicon dioxide desiccant wheel. This HoneyCombe® desiccant wheel acts like a sponge, adsorbing moisture from the air to maintain the desired relative humidity levels in the pool area. The moisture-laden desiccant wheel is regenerated with a direct-fired natural gas burner. "Using natural gas to provide dehumidification instead of an electrically driven refrigeration-based unit provides improved humidity control and has the advantage of providing heat to the natatorium as a byproduct of the desiccant regeneration process," according to Dave Shalley, P.E., Senior Project Engineer for Profor Engineering Services Ltd. Profor Engineering provided the design and contract administration services for the dehumidification system installation.

*New natural gas-regenerated desiccant dehumidification system delivers improved moisture control and proper outdoor ventilation air, enhancing occupant comfort and eliminating building damage caused by excess moisture.*





“It has done so much,” DeGagne says. “It’s controlled energy costs quite a bit, and taken a huge load off the ice compressors. We’re able to do summer skating more safely, and at lower cost.”

When masonry started deteriorating on the neighboring natatorium’s exterior walls due to excess indoor humidity, it became apparent that the building’s original, aging, rusty, outdoor air-based dehumidifier was not up to the task.

“The humidity levels were so bad in the natatorium that bricks were falling off the exterior walls,” DeGagne says. “Chlorine and moisture were seeping right through the concrete block walls. We had to do something soon.”

Profor Engineering conducted an assessment of the building’s mechanical systems and provided a capital improvement plan for the entire recreation complex. The study was funded with the help of an incentive grant from Union Gas Limited, the local natural gas utility. On the recommendation of Profor Engineering, the city purchased a Munters model AM20D20GG desiccant dehumidification unit from EI Solutions, Canadian distributor for Munters DryCool™ products, to relieve the humid conditions in the natatorium. The new unit was commissioned just before Christmas 2005.

“The new dehumidification system is working awesomely,” declares Dave DeGagne, Recreation Maintenance Supervisor for the City of Dryden. “It brings in fresh air; it air conditions – in northern Ontario it gets humid and hot. It takes the moist, damp air out of the natatorium, dries it, pre-heats it, and mixes it with pre-heated fresh air from outside.”

### **Ice Arena Desiccant Unit Saves Energy and Reduces Operating Costs**

City officials decided to install the desiccant dehumidification system in the pool area because of the previous success with a similar system at the adjacent ice skating arena. Installed two years earlier, the ice rink’s desiccant unit successfully controls humidity, eliminates fogging and provides a safe skating surface on both ice pads. The dehumidification system has significantly lowered energy costs in the arena, making it possible for Dryden to pass the savings on to the patrons through lower admission prices.

The dehumidifier provides 225 lbs/hr of moisture removal and supplies 12,500 cfm of conditioned air to the building during occupied periods. The unit brings in 4,000 cfm of outdoor air to satisfy ASHRAE requirements for occupant ventilation. It is equipped with a tilting heat pipe to recover heat from the warm, moist exhaust air stream, and preheats the incoming outdoor air when required by ambient conditions. A fully modulating 400 MBH direct-fired natural gas burner regenerates the desiccant wheel. An 800 MBH input/640MBH output indirect-fired natural gas post-heating section and a 20-ton direct expansion post-cooling section round out the unit.

When the natatorium is unoccupied, a variable frequency drive (VFD) reduces the speed of the supply fan in the unit to provide 7,500 cfm. The speed reduction lowers the supply fan power consumption by over 60% and saves on unit operating costs. The outdoor air supply is also cut off during unoccupied hours and the unit operates on full recirculation air. During



unoccupied hours when ambient conditions are warm enough, the unit supply fan is de-energized. It is energized only on a call for dehumidification or heating from the space. The operation of the dehumidifier is controlled from a 7-day Honeywell programmable thermostat and a Viconics humidistat mounted in the natatorium.

The old dehumidification system utilized a constant-volume outdoor air-based unit equipped with a glycol run-around heat recovery system to condition the pool air. The old unit required large volumes of outdoor air to dehumidify the natatorium and substantial supplemental heating, which made the unit costly to operate. In addition, the poor physical condition of the old unit resulted in frequent repairs and re-calibration to keep it functioning, adding to the facility operating costs.

### Moisture Problems Vanquished

“It’s like you’re in a different world in there,” says Shalley. “The pool area is very comfortable now. The moisture problems have all but gone away. Fogging of the glass in the reception area has also disappeared. The place as a whole is fresher and drier. The chlorine odor is gone and the pool area is at the correct temperature and humidity. It’s a place that’s pleasant to use. Normally, the pool staff had to open the doors to ventilate the pool area in the summer to try to get some relief. That is no longer necessary. They’ve just been thrilled with the new system and so are we.”

Shalley said Profor Engineering has installed Munters desiccant units at many ice rinks and specifies them because of their ease of operation and reliability. He says the company gets many calls from utility companies and recreation facility operators inquiring about Munters products.

“We like the desiccant dehumidification system because it’s simple,” says Shalley. “The reliability drew us to the product when we were looking for an alternative to refrigeration-based dehumidification. There are not a lot of compressors to wear out, just a simple direct-fired burner and a desiccant wheel that turns eight rotations per hour. It’s great for the owner and requires less maintenance. The only thing required is regular filter changes and lubrication.”

DeGagne says the city receives positive feedback from pool patrons about the improved indoor air, and pool employees no longer feel tired from working under damp, uncomfortable conditions. In addition, the city is saving money due to decreased operation and maintenance costs.

Tim Page, Account Manager at Union Gas, says the new desiccant dehumidification system has resolved the moisture damage problem at the pool, saving the city money on building maintenance costs. “It’s a far better-operating piece of equipment and we were glad to be part of the solution,” Page says.



**Munters Commercial Dehumidification**  
16900 Jordan Road  
Selma, TX 78154



**Union Gas Limited**  
50 Keil Drive N.  
Chatham, ON N7M 5M1, Canada



**EI Solutions Inc.**  
Canadian Distributor for  
**Munters DryCool™ products**  
2855 Halpern Street  
Saint-Laurent, QC H4S 1P8, Canada



**ESC**  
**Energy Solutions Center**  
**Energy Solutions Center Inc.**  
400 N. Capitol Street, NW  
4th Floor  
Washington, DC 20001

