

Engine-driven chiller/desiccant units

Natural gas for flexibility and savings

Schwan's Super Rink

Blaine, MN

- Hybrid natural gas engine-driven chiller
- Natural gas-fired desiccant systems
- 560 refrigeration tons
- Four 20,000 ft² Olympic-sized ice rinks

Architect:

Bonestroo, Rosene, Anderlik
& Associates

Consulting engineer:

Nelson-Rudie and Associates, Inc.



Nine integrated natural gas applications provide smooth, year 'round operation for Pete Carlson, director of Ice Arena Operations at the Super Rink.

Beneath the smooth, frozen surface of the Schwan's Super Rink in Blaine, Minnesota, lies a sophisticated mix of high-tech systems that control ice quality, humidity and perhaps most importantly, costs.

Located in Blaine's National Sports Center (NSC), the Super Rink opened in October 1998 using nine different natural gas applications to make and maintain four Olympic-sized ice sheets and perform other functions. This unique combination makes year 'round ice skating possible and provides:

- Hybrid applications for flexibility and energy savings
- Integrated systems for maximum efficiency
- Better ice and indoor air quality

Planning provides flexibility

"We met with NSC staff early in the process, before they had even selected the architect, engineer or general contractor," says the CenterPoint Energy Minnegasco account manager. "As a result, the Super Rink will operate with the most sophisticated systems available today and have a better quality facility overall."

The system cornerstone is a "hybrid" icemaking system that uses both natural gas and electric systems for operating flexibility and savings. The natural gas component includes a 350-horsepower Cummins engine-driven chiller and 160-ton Vilter compressor.

"This facility will be a model for others to follow."

—Pete Carlson

*Director of operations,
Schwan's Super Rink*



A 350-horsepower Cummins natural gas engine-driven chiller with 160-ton Vilter compressor are key components of a hybrid ice-making system at the Super Rink.

Depending on seasonal fuel costs, operators will alternate between the two energy sources, using natural gas throughout most of the year. “We are one of the largest ice arenas in the nation, and one of very few to operate with two energy sources,” says Pete Carlson, director of Ice Arena Operations at the Super Rink. “All eyes are on us, and visiting arena operators have nothing but praise for what we’ve done here. Our integrated systems allow us to operate 12 months of the year, with the lowest possible energy costs.”

Desiccants offer impressive benefits

Four natural gas desiccant dehumidification units, one for each rink, help control moisture in the facility. It’s a definite advantage that improves ice quality and enables year ’round ice skating, even during humid summer months.

“Humidity is very damaging to a building like ours,” notes Carlson. “From the physical structure to the electrical systems, everything is affected by moisture. Besides, when it’s foggy inside, visitors can’t see the kids skating. Our desiccants dry out the building with no problem at all; we have no visible moisture anywhere.”

Efficiency

Thermal energy from the natural gas engine is captured to regenerate the desiccants, improving overall system efficiency to between 70 and 80 percent. Engine heat can also be redirected to melt ice shavings from resurfacing operations or for general heating of spectator and locker areas.

Other applications

Additional natural gas applications at the facility include three natural gas ice resurfacers to maintain the ice sheets, with on-site compressors for convenient refueling. Natural gas boilers, water heaters, unit and infrared heaters, cooking equipment and an emergency generator round out the package to help the Super Rink skate along reliably, economically and efficiently.

Rebates helped offset first costs

Rebates from CenterPoint Energy Minnegasco provided another economic benefit, helping the facility reduce initial equipment costs for faster payback. Overall, Carlson is impressed with the system’s flexibility, performance and efficiency. “We expect other arenas will want to see our operating numbers,” he states. “This facility will be a model for others to follow.”