



Fact sheet



DOW CENTENNIAL CENTRE Fort Saskatchewan, Alberta PROJECT OVERVIEW

The Dow Centennial Centre in Fort Saskatchewan, Alberta, Canada is a multi-purpose facility servicing the cultural and recreational needs of the community. The facility incorporates a 17,000 sq. ft. NHL sized arena, leisure ice rink, 550-seat performing arts theatre, art gallery, pottery studio, banquet rooms, full-size indoor soccer field, and a 5,000 sq. ft. fitness centre with running track. It is situated to the northeast of Edmonton and is subject to the temperature extremes of the Canadian prairies, with winter temperatures below -40° F and summer highs above 95° F. Energy efficiency and Canada's commitment to the Kyoto protocol mandated an energy-efficient ammonia-based refrigeration system be used for the refrigeration of the ice rinks with all of the rejected heat recycled back into the building environment.

All of the compressor heat is rejected through a plate and frame condenser into a glycol loop incorporating a thermal storage tank from which warm glycol is circulated to building radiant heating zones, make-up air units, and domestic hot water pre-heaters. The 120 TR refrigeration plant is unique in that it uses a CIMCO "Ice Battery" as a thermal storage medium to allow excess heat rejected from the system during the day to be used to heat the building overnight. This same thermal storage can also build ice for peak air conditioning loads in the theatre and soccer field areas, allowing the owner to take advantage of off-peak electrical rates and the high efficiency of an industrial style ammonia refrigeration plant.

The annual energy savings at Dow is expected to be the equivalent in GHG (tons of CO₂ emissions) as taking 225 cars travelling 20,000 kms each off the road. This estimate is recorded as per CANMET and NRCAN calculations. The building energy consumption will be monitored during the first two years of operation by CANMET, an agency of the Canadian Ministry of Natural Resources.

DOW CENTENNIAL CENTRE (CONT'D)

GENERAL INFORMATION

- Owner: City of Fort Saskatchewan, Alberta
- Project Type: New building
- Year of Construction: 2004
- Rink Area: Hockey - 17,000 sq. ft. Number of pads: 2
Leisure - 3,000 sq. ft
- Building Area: 110,000 ft. sq.
- Number of Seats: 400
- Months of Operation (per year): 10.5 months
(96 hours per week)
- Playing Area Temperature: 55° F

REFRIGERATION SYSTEM INFORMATION

- Compressors: Frick
- Horsepower: 2 x 75
- Plant Style: CIMCO Built Up
- Total System Tonnage: 120 TR
- Refrigerant: NH₃
- Evaporator Style: Flooded Plate/Frame
- Condenser: Alfa Laval Plate/Frame
- Cooling Tower: Evapco
- Secondary Fluid: Ethylene Glycol @ 40% mixture

MECHANICAL HEATING SYSTEM INFORMATION

- Space Heating: Approximately 30,000 sq. ft.
- Makeup Air Preheating: 3 x 300,000 BTUs on demand
- Radiant In Floor: 18,000 sq. ft.
- Service Water Heating/Preheat: Approx 500,000 BTUs
- Underpad Frost Protection: Yes
- Snow-melt Pit Heating System: Yes

INTEGRATED CONTROLS SYSTEM DESIGN

- BMS system

HEAT RECOVERY INTEGRATION

- Yes

THERMAL STORAGE

- Ice Battery - 500 Ton Hours
- Connected Air conditioning Load - 150 TR

OPERATING MEASURES

- Floating Head Pressure: Yes
- Load Shedding: Yes
- Floating Ice Temperature Control: Yes
- Setback Temperature Control: Yes
- Occupied/Unoccupied Settings: Yes
- INFRARED Camera Control: Yes

SERVICE PROVIDERS

- Refrigeration Contractor: CIMCO Refrigeration
- Refrigeration Design: CIMCO Refrigeration
- Mechanical Designer: A D Williams
- Controls Designer: A D Williams/CIMCO Refrigeration
- Building Management System Provider: Energrated Building Systems

