



Featured Ice Facility

## Curlplex Obihiro

*Due to the unusually low Kilowatt rating on the building permit application, the Japanese Mechanical Authority carried out a site inspection to see if there was a mistake. What they discovered, was the most efficient ice surface in Japan and perhaps the world and now the question on everyone's mind is, "How did they do it?"*



Curlplex Obihiro is a year round 4-sheet curling club built on the Island of Hokkaido in Northern Japan. Having a 400 meter speed skating oval and a number of Olympic size ice surfaces, the city of Obihiro is known for its ice sport athletics programs. Building a dedicated curling club was a natural progression for the winter sport city of 175,000. Accent Refrigeration Systems of Victoria, BC, Canada were contracted to design and install the refrigeration and mechanical systems for the new facility. Accent had gained an excellent reputation in Japan years earlier following the completion of Curlplex Fuji which is considered the most efficient ice surface in a country known for its energy efficiency initiatives.

Energy Efficiency planning started even before the building was erected. During the excavation phase a deep hole was formed which became the beginning of a 6 storey tall insulated ice house which would be filled with a tower containing hundreds of trays filled with water. As the cold winter air currents came from mainland China the water trays were transformed naturally into a frozen 5,000,000 pound thermal storage battery which would then be used to drastically reduce the summertime refrigeration operation costs through a technique known as sub-cooling.



The entire building was insulated with 6" of high tech expanding spray foam insulation with an R7.5 insulation value per inch. Following another 1" air gap the inside of the curling clubs were entirely covered with Double-Bubble style Low-E material.

All of the rainwater is harvested from the roof and stored in underground tanks for use in the cooling tower, toilets and watering the plant





As is normally the case in many warm environments, high humidity can pose a serious problem for an ice surface and Japan is no exception. More than any ice surface, curling ice is adversely effected by frost formation so special attention had to be paid to dehumidifying the curling club while keeping operating costs to a minimum. Japan has among the highest electrical costs in any developed country.

In order to reduce the potential moisture problems from affecting the ice surface, three independent vestibules separate the outdoor air from the ice surface at Curlplex Obihiro. The first two vestibules are at the front entrance to the building and the third is between the lobby and the ice house itself.



The dehumidification process is carried out entirely through harvesting waste energy in a dehumidifier designed and supplied by Accent Refrigeration Systems. During exceptionally warm weather cooling can be obtained from the ice plant which is running exceptionally efficient due to the thermal ice storage.

The humidity levels are kept lower than most facilities that employs traditional desiccant technology without the use of natural gas or added electrical load.



The series of pictures to the left show the curling club ice surface drying out as the environmentally friendly dehumidifiers where started and the building went through the drying process. Once down to set point there is negligible condensation forming on the ice and none on any of part of the building internal skin or support members.





The computer controlled refrigeration system employs 100% heat recovery for hot water heating, space heating and dehumidification. All of the floors have imbedded heating pipes to deliver the waste heat to the public areas. When there is excess waste heat produced, there is an additional thermal storage cell under the building that forms a buffer for supplemental heat. As winter progresses into spring this same storage cell becomes cold and then is used in offsetting refrigeration costs in summer.

Accent Refrigeration Systems are world leaders in Ice Rink Construction, Energy Efficiency and Heat Recovery. We have over 50 valuable applications for your waste heat. If you are planning on building a new ice facility or would like to improve the operation of your existing facility, give us a call and we would be glad to work with you to make your facility efficient and profitable.



**Accent Refrigeration Systems**  
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