Ice Rink, Katrineholm, Sweden

New award-winning eco concept for ice rinks: copper tubing with carbon dioxide

At the planning stage of the new ice rink built in Katrineholm, Sweden, special attention was paid to considerably reducing annual operating costs and selecting environmentally friendly solutions. This new system developed by the Swedish Energy and Refrigeration Centre (SEK) has met all energy conservation targets without compromising ice quality or the efficient operation of the ice rink.

The Swedish Energy and Refrigeration Centre (SEK) was given the task of developing a new type of refrigeration system for ice rinks.

For this, the SEK chose carbon dioxide as the heat transfer fluid to be used together with Cupori's Cupori 240 (Ishol) copper tubing, developed especially for carbon dioxide systems in sport arenas.

"Carbon dioxide technology combined with copper tubing provides the most energy-efficient refrigeration system for ice rinks, both now and in the future. It's well worth investing in."
Per Hannius, Francks Kylindustri, Norrköping, Sweden

90 % less energy needed for pumping
Copper tubing and carbon dioxide were chosen as a result of their excellent heat transfer qualities. This new system helped to reduce pumping costs by up to 90 % annually, when compared to the equivalent costs incurred by traditional systems.

Lower operating costs
Reduced energy consumption at the Katrineholm ice rink significantly lowers its operating costs. Pumps and tubing for this system are smaller than those used by traditional systems. This has led to energy cost savings of about 150 MWh annually.

Operating costs are also reduced by using a condensing heat recovery system that can recycle stored energy to heat the rink's public facilities and hot water supply. Heating cost savings have amounted to 400 MWh annually.

Rapid return on investment
The life span of the new Katrineholm ice rink is estimated to be from 20 to 40 years. In contrast, the carbon dioxide system should repay its initial investment within just five years.

Carbon dioxide system wins important eco award
The new ice rink refrigeration system developed by SEK has been awarded the Swedish "Guldklimp" (Gold Nugget) prize by Naturvårdsverket, the Swedish Environmental Protection Agency, for considerably reducing greenhouse gas emissions as a contributor to global warming.

Benefits of the carbon dioxide system:

- environmentally friendly
- non-toxic
- good heat transfer properties provide constant ice quality and temperature
- by using the combination copper tubes – carbon dioxide, smaller pumps and tubing can be used
- consistent ice temperature over whole surface gives lower energy consumption
- reduced energy consumption
- low operating and maintenance costs

In conjunction with the Swedish Energy and Refrigeration Centre, Cupori has developed Cupori 240 (Ishol) copper tubing especially for carbon dioxide systems in sport arenas.

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