



Ice accumulator/storage

An ice accumulator/storage is a tank where ice can be accumulated during one period, stored and then thawed and used during another. There are two main reasons for using an ice accumulator/storage:

- Where the cooling requirements vary during the day a smaller chiller can be used. As a result the initial cost of cooling equipment can be reduced considerably.
- Cooling energy can be purchased during the night or off-peak hours. In many countries this means that it can be obtained at a lower price.

Since it has been shown that payback periods for ice accumulators will be as low as two years, it is an increasingly worthwhile investment. There are two main applications for ice accumulators: air conditioning and industry. Especially in industry, the cooling demand is often variable, for example in a dairy where the milk will be brought in in the morning.

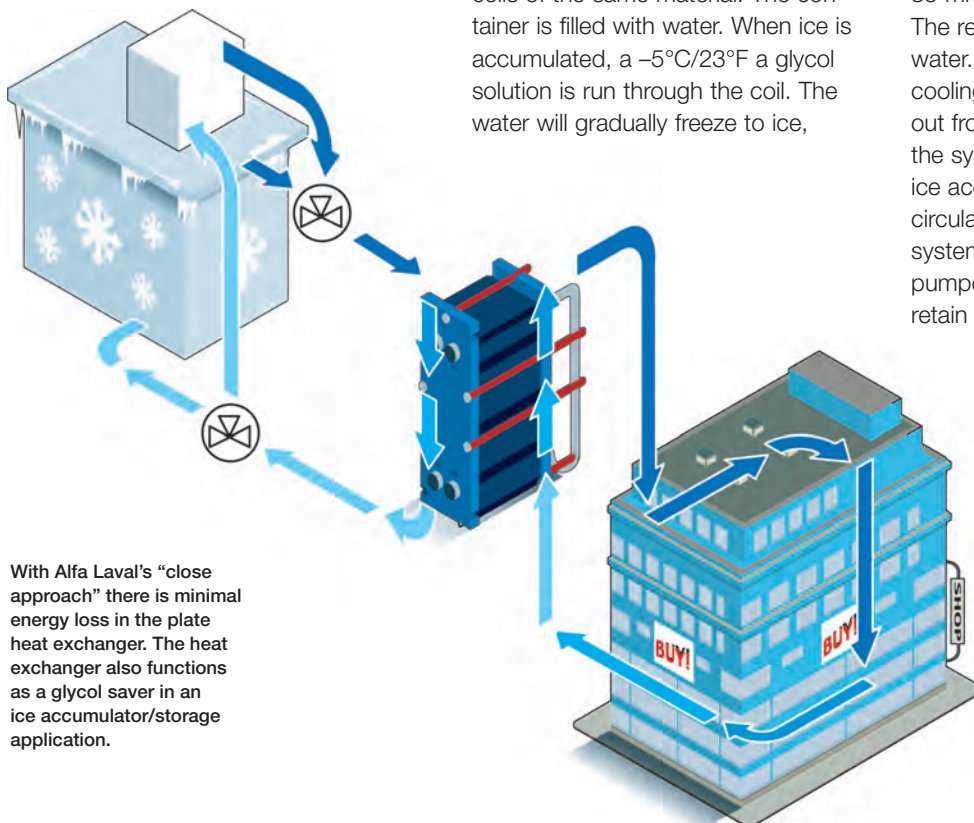
Types of ice accumulators

There are two main types of ice accumulator systems:

- Systems with internal melting consist of a polyethylene tank containing coils of the same material. The container is filled with water. When ice is accumulated, a $-5^{\circ}\text{C}/23^{\circ}\text{F}$ glycol solution is run through the coil. The water will gradually freeze to ice,

first around the coils and then further and further out in the tank. When the extra cooling capacity is required, the glycol solution in the coils will be led through the system and returned to the tank at a higher temperature. The ice accumulated in the tank will then melt, and the glycol solution will be re-cooled until all the ice is consumed.

- In systems with external melting the tank is made of steel or concrete. Here too are coils with glycol or a CFC/HCFC coolant, and ice is accumulated to a thickness of 35 mm/1.4 inches around each coil. The rest of the tank will be filled with water. When there is a need for cooling energy, ice water is pumped out from the bottom of the tank to the system. When it returns to the ice accumulator it will be forced to circulate around the ice. In this system, the ice water that is pumped into the system will always retain the same temperature.



With Alfa Laval's "close approach" there is minimal energy loss in the plate heat exchanger. The heat exchanger also functions as a glycol saver in an ice accumulator/storage application.