

Free Cooling

Free cooling is an alternative energy efficient means to provide chilled process and/or comfort cooling water for industrial & commercial building applications.

With free cooling, water from cooling towers, during the early spring, fall, & winter months, in northern climates, is used as a chilled water supply for the aforementioned building applications. There are 3 ways the colder cooling tower water can be utilized as building/process chilled water. They are as follows:

1. **Strainer Cycle-** In this application, the cooling tower water is directly pumped through the chilled water loop as cooling water. In an open cooling tower, a strainer must be used to keep debris out of the cooling water loop.
2. **Refrigeration Migration-** In this application a valve or valves in the chiller, open a direct path between the condenser & the evaporator in which the warm returning water from the building/process in the chilled water loop vaporizes the refrigerant and the energy is transferred to the condenser where it is cooled & condensed by the cold cooling tower water. The Refrigeration theory stating that refrigerant tends to move to the coldest point of a refrigeration system applies in this application of free cooling.
3. **Plate & Frame Heat Exchanger-** In this application, the cold cooling tower water & relatively warm chilled water return are piped separately through a heat exchanger, (where the two don't mix), and the heat is dissipated to the cooling tower water as the cooling tower water pre-cools the chilled water loop.

These 3 Free Cooling applications reduce energy costs by lessening or even eliminating the demand on a compressor in a chilled water system although the chilled water pumps are still being utilized. Significant savings can be achieved by utilizing Free Cooling Systems in lieu of having to run motor-driven water chillers.

EXAMPLE OF A PLATE & FIN HEAT EXCHANGER



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