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Chilled water

Chilled water is commonly used in buildings to provide cooling.

Typically, water is cooled in chiller units, and is then distributed by pipework to air handling units where it is used to cool air that is ducted through the building for ventilation. It can also be used for the dehumidification of ventilation air. As the temperature of air falls, it is less able to 'hold' moisture, that is, its saturation water vapour density falls, and moisture will begin to condense, dehumidifying the air. See Air conditioning for more information.

Chilled water may also be used to provide cooling to integrated service modules, chilled beams, chilled ceilings, underfloor cooling, for industrial processes and so on. The use of chilled water to cool the building fabric (rather than ventilation air) is sometimes described as 'active thermal mass'.

Chilled water is typically provided by absorption refrigeration or compression refrigeration:

- In compression systems, a liquid refrigerant with a low boiling point absorbs heat from the return water and boils in an evaporator to form a gas. The resulting gas is then compressed, which increases its temperature further. The gas is then condensed, releasing its latent heat which is rejected. The process then repeats.
- Absorption refrigeration works on a similar basis, however, in this case, the refrigerant gas is absorbed in a solution which is then heated in a 'generator' so that the refrigerant evaporates again, but this time at a higher pressure and temperature. The gas is then condensed, releasing its latent heat which is rejected. The process then repeats.

The rejection of heat from chiller units can be achieved by:

- Air cooling, which rejects heat to the outside air by circulating it through the condenser.
- Evaporative cooing, which uses the addition of water mist to the air to enhance the cooing effect.
- Water cooling, which is generally suited to large systems and requires connection to cooling towers.

Heat recovery can be used to allow the rejected heat from chiller units to be re-used for space heating or to provide hot water.

Chilled Water

Qatar, UAE, Europe

Chilled water is typically provided by chiller units using absorption refrigeration or compression refrigeration.

Technology of Chille
Energy efficiency
Evaporative cooling
Using compressors fo
Cooling directly

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