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What is a Cooling Tower and How Does It Work?

Technical Article CWT-CT-1001



Cooling Towers are an integral part of a cooling and process system. A cooling tower is a heat rejection device that extracts waste heat to the atmosphere through the cooling of a water stream to a lower temperature. Common applications for cooling towers are providing cooled water for air-conditioning, manufacturing and electric power generation. The generic term "cooling tower" is used to describe both direct (open circuit) and indirect (closed circuit) heat rejection equipment. A direct, or open-circuit cooling tower is an enclosed structure with internal means to distribute the warm water fed to it over a labyrinth-like packing or "fill." The fill may consist of multiple, mainly vertical, wetted surfaces upon which a thin film of water spreads. An indirect, or closed circuit cooling tower

involves no direct contact of the air and the fluid, usually water or a glycol mixture, being cooled. In a counter-flow cooling tower air travels upward through the fill or tube bundles, opposite to the downward motion of the water. In a cross-flow cooling tower, air moves horizontally through the fill as the water moves downward. Cooling towers are also characterized by the means by which air is moved. Because evaporation consists of pure water, the concentration of dissolved minerals and other solids in circulating water will tend to increase unless some means of dissolved-solids control, such as blow-down, is provided. Some water is also lost by droplets being carried out with the exhaust air (drift).

[Click here](#) for the Cooling Tower Institute (CTI) article on this subject and [here](#) to view The Cooling Tower Institute's Glossary of Cooling Tower definitions.

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