

Cooling Tower Terminology

Ambient Wet-Bulb Temperature. The wet-bulb temperature of the air encompassing a cooling tower, not including any temperature contribution by the tower. Generally measured upwind of a tower, in a number of locations sufficient to account for all extraneous sources of heat.

Approach. Difference between the cold water temperature and either the ambient or entering wet-bulb temperature.

Atmospheric. Refers to the movement of air through a cooling tower purely by natural means, or by the aspirating effect of water flow.

Blowdown. Water discharged from the system to control concentrations of salts and other impurities in the circulating water.

Capacity. The amount of water (gpm) that a cooling tower will cool through a specified range, at a specified approach and wet-bulb temperature.

Casing. Exterior enclosing wall of a tower, exclusive of the louvers.

Cell. Smallest tower subdivision, which can function as an independent unit with regard to air and water flow; it is bounded by either exterior walls or partition walls. Each cell may have one or more fans and distribution systems.

Circulating Water Rate. Quantity of hot water entering the cooling tower.

Cold Water Temperature. Temperature of the water leaving the collection basin, exclusive of any temperature effects incurred by the addition of makeup and/or the removal blowdown.

Collection Basin. Vessel below and integral with the tower where water is transiently collected and directed to the sump or pump suction line.

Counterflow. Airflow direction through the fill is counter-current to that of the falling water.

Crossflow. Airflow direction through the fill is essentially perpendicular to that of the falling water.

Cycles of Concentration (C.O.C). The ratio of dissolved solids in circulating water to the dissolved solids in makeup water.

Distribution Basin. Shallow pan-type elevated basin used to distribute hot water over the tower fill by means of orifices in the basin floor. Application is normally limited to crossflow towers.

Distribution System. Those parts of a tower, beginning with the inlet connection, which distributes the hot circulating water within the tower to the points where it

contacts the air for effective cooling. May include headers, laterals, branch arms, nozzles, distribution basins and flow-regulating devices.

Drift. Circulating water lost from the tower as liquid droplets entrained in the exhausted airstream.

Drift Eliminator. An assembly of baffles or labyrinth passage through which the air passes prior to its exit from the tower for the purpose of removing entrained water droplets from the exhaust air.

Entering Wet-Bulb Temperature. The wet-bulb temperature of the air actually entering the tower, including any effects of recirculation. In testing, the average of multiple readings taken at the air inlets to establish a true entering wet-bulb temperature.

Evaporation Loss. Water evaporated from the circulating water into the airstream in the cooling process.

Fill. That portion of a cooling tower, which constitutes its primary heat transfer surface.

Forced Draft. Refers to the movement of air under pressure through a cooling tower. Fans of forced draft towers are located at the air inlets to force air through the tower.

Hot Water Temperature. Temperature of circulating water entering the cooling tower by means of an induced partial vacuum. Fans of induced draft towers are located at the air discharges to "draw" air through the tower.

Makeup Water. Water added to the circulating water system to replace water lost by evaporation, drift, windage, blowdown, and leakage.

Mechanical Draft. Refers to the movement of air through a cooling tower by means of a fan or other mechanical devices.

Natural Draft. Refers to the movement of air through a cooling tower purely by natural means. Typically, by the driving force of a density differential.

Nozzle. A device used for controlled distribution of water in a cooling tower. Nozzles are designed to deliver water in a spray pattern either by pressure or gravity flow.

Plume. The effluent mixture of heated air and water vapor (usually visible) discharge from a cooling tower.

Range. Difference between the hot water temperature and the cold water temperature (HW-CW).

Recirculation. Describes a condition in which a portion of the tower's discharge air re-enters the air inlets along with the fresh air. Its effect is an elevation of the average entering wet-bulb temperature compared to the ambient.

Windage. Water lost from the tower because of the effects of wind.

Note: Terminology compiled from various manufacturers and the Cooling Tower Institute.