# Thermo-siphon Systems

Thermo-siphon systems explained

Thermo-siphon systems refer to a method of passive heat exchange based on natural convection which circulates liquid in a vertical closed-loop circuit without requiring a conventional pump. When liquid in the closed-loop is heated, causing it to expand, become less dense, and more buoyant than the cooler water in the bottom of the loop, convection moves the heated liquid upwards in the system, as it is simultaneously replaced by cooler liquid returning by gravity.

A thermo-siphon system has been sometimes incorrectly described as a 'gravity return heat pipe'. A wick is usually a necessary feature of a heat pipe to allow the return of condensate to the evaporator via capillary action, whereas this function is not needed in a thermo siphon configuration, as gravity allows the movement of the liquids. It follows that correct orientation is much more important for thermo-siphoning than for heatpipes. Thermo-siphons systems are used in some liquid-based solar heating systems to heat a liquid such as water. The water is heated passively by solar energy and relies on heat energy being transferred from the sun to a solar collector. Convection allows for the movement of the heated liquid out of the solar collector to be replaced by colder liquid which is in turn heated. Based on this principle, it is necessary for the water to be stored in a tank above the collector.