

Experimental Investigation of Humidification Efficiency of a Structured Packing-Based Counter Flow Humidification System

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Abstract - Cooling & humidification process is one of the widely used AC application for cooling purposes. It is adopted where a certain amount of moisture content must be maintained, in order to achieve thermal comfort. Packing is an element which holds the fluid within its surface and interact with the intersecting fluid. Current paper focus on the construction of the humidification unit where the water is made to drip on the packing uniformly and the air is made to pass through the packing in counterflow direction. The moisture content of the air increased by 15%. The experimentation is carried out with different water temperature & the air flow rate. Optimum flow rate of air and temperature of water is determined based on trials conducted. Humidification efficiencies can be determined for varying flow rates of air & by measuring various temperatures. Results showed that there is drop-in rate of heat transfer of 25% from the peak value and the average drop in humidifying efficiency by 27% when there is an increase in the mass flow rate after a certain limit. Change in relative humidity and temperature drops by an average value of 59% and 81% respectively.

Keywords: Humidification, Counterflow, Packing, sensible cooling.