



SUPPLY WATER PARAMETERS INFLUENCE ON IEAC THERMAL PERFORMANCE

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ABSTRACT

This paper reported a review, calculations and measurements based study into working water flow parameters influence on the Indirect Evaporative Air Cooling (IEAC) thermal performance, which was undertaken from a variety of aspects including background, history, current status, concept, standardization, system configuration, operational mode, research and industrialization, market prospect and barriers, as well as the future focuses on R&D and commercialization. Calculation model has been obtained from the governing equations of heat and mass transfer in primary and secondary air and water flows. Parameters of water affecting on evaporative cooling performance such as mass flow rates and flow configuration has been obtained. Model was validated against theoretical data from the literature and good agreement between the prediction and measurement was achieved. The calculated results show that closed cycle working water flow characteristics affects supplied air parameters less than 4%. It effect cooling efficiency, which mostly depends on mass flow rates ratios of primary and secondary air flows and spacing between plates of wet and dry passages.

Keywords: IEAC, Indirect evaporative air cooling, working water flow influence, heat transfer, thin wall