Applications of wickless heat pipe heat exchangers in HVAC systems

Heat pipes are two-phase heat transfer devices with high effective thermal conductivity. Due to the high heat transport capacity, heat exchanger with heat pipes have become much smaller than traditional heat exchangers in handling high heat fluxes. With the working fluid in a heat pipe, heat can be absorbed on the evaporator region and transported to the condenser region where the vapour condenses releasing the heat to the cooling media. Heat pipe technology has found increasing applications in enhancing the thermal performance of heat exchangers in microelectronics, energy saving in HVAC systems and other industrial sectors. Wickless heat pipe (Thermosyphon) heat exchangers are still a new application in an air conditioning (HVAC) system. The purpose of adding a thermosyphon heat exchanger in a HVAC system is to provide control over the relative humidity (RH) and energy saving. In order to incorporate a thermosyphon heat exchanger in a HVAC system, several changes have to be made to the existing system. This includes the size of the blower, overall size of the unit and the cooling load of the system. Development activity in thermosyphon technology in HVAC systems in Asia in recent years is surveyed.

words: thermosyphon, sensible heat ratio (SHR), HVAC systems, relative humidity (RH), energy saving

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خلاصه مقاله:

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