

Experimental Study on Thermal Load Characteristics of R245fa in Circular Plate

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Extended Abstract

This paper is an experimental study on the thermal load characteristics of the working fluid R245fa in a Plate Shell Heat Exchanger (PSHE) using a circular plate as the condenser of a Steam Generation Heat Pump (SGHP)[1].

We experimented with the condensation heat transfer, temperature gradient in the circular plate [2, 3]. In PSHE as a condenser of SGHP, hot side of the refrigerant flows to the downward and transfers the heat, on the other side, cold side the water flows to the upward and receives the heat to be pressurized water. And then the pressurized water is separated from condensate water and steam in flash tank.

Experimental conditions were investigated according to mass flux, heat flux, saturation temperature and mean vapor quality. As a result of this study, the condensation heat transfer coefficient is strongly dependent on the mass flux and mean vapor quality. Because the flow regime is convective boiling. Also, the temperature gradient is dependent on the Reynolds number and temperature. It is largely changed the temperature gradient at the edge of the circular plate where the flow rate was slow.

In the future, we will conduct the experiments on the pressure drop, visualization and other refrigerant instead of R245fa in PSHE.

References

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