



Experimental study of falling film evaporation heat transfer coefficient on horizontal tube

Xingsen Mu, Shengqiang Shen*, Yong Yang, Xiaohua Liu

*Key Laboratory for Desalination of Liaoning Province, School of Energy and Power Engineering, Dalian University of Technology, Dalian, Liaoning 116024, P.R. China
Tel./Fax: +86 411 84707963; email: zzbshen@dlut.edu.cn*

Received 5 September 2011; Accepted 9 July 2012

ABSTRACT

The horizontal-tube falling film evaporation is a widely adopted technique in multiple-effect distillation desalination plant. It has a high heat transfer coefficient under quite small temperature difference. In this paper, an experimental equipment for horizontal-tube falling film evaporation was set up. Experiments were carried out to show how the heat transfer coefficient is affected by different parameters including heat flux, circumference direction of tubes, spray density, evaporation temperature, and experimental fluid. Results indicate that the heat transfer coefficient decreases after a little increase with growth of spray density. The heat transfer coefficient decreases along the tube circumference, but at the bottom of the tube, it shows increasing trend. In addition, a simple comparison between seawater and fresh water in heat transfer coefficient is also provided.

Keywords: Heat transfer coefficient; Horizontal-tubes falling film evaporation; Desalination; Spray density

*Corresponding author.