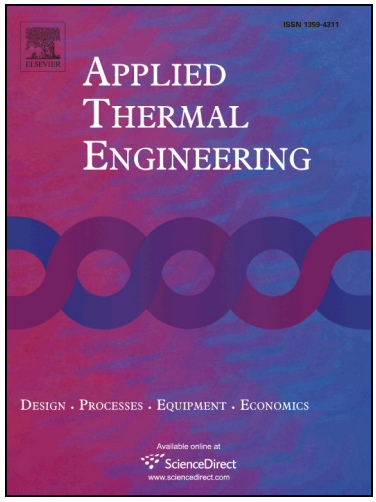

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Djelloul Azzouzi, Merouane Kelkouli, Fouad Amaryoucef

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Parametric study of the wire-on-tube condenser subcooling effect on the performance of vapor compression refrigeration system.

Djelloul Azzouzi[1, 2,*], Merouane Kelkouli[1], Fouad Amaryoucef[1]

[1]Faculty of sciences and technology, University of Khemis Miliana, Algeria

[2]Industrial fluids laboratory, measurements and applications, University of Khemis Miliana, Algeria

*corresponding Author: Road of Tissemsilt, University of Khemis Miliana, Algeria. Email: + azzouzidjelloul@yahoo.fr , Phone +213773455352

Abstract

In this paper, a parametric study of the condenser subcooling effect on the performance of vapor compression refrigeration system is presented. The first shutter consists in introducing of an analysis methodology which makes it possible to determine the COP of the refrigeration cycle with subcooling for the three used R12, R134a and R600a as refrigerants. While in the second part, an analytical approach was developed in order to calculate the additive surface of the wire-on-tube condenser used in application apparatus. Variation in subcooling temperature and pressure ratio for all three refrigerants is taken in all stages of this study. The results obtained through this study have shown that, in the subcooling temperature interval from 0°C to 14°C, the condenser additive surface is lower for R600a refrigerant compared to R134a. Moreover, the increase in subcooling temperature plays a significant role in the rise of refrigeration cycle efficiency.

Keywords: Domestic refrigerator, Wire-on-tube condenser, subcooling, Coefficient of performance (COP), Heat transfer