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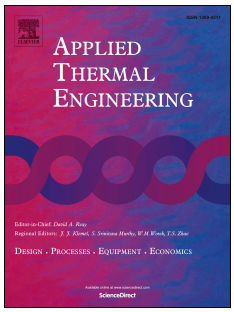

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PII: S1359-4311(15)00587-6

DOI: 10.1016/j.applthermaleng.2015.06.033

Reference: ATE 6721

To appear in: *Applied Thermal Engineering*

Received Date: 2 March 2015

Revised Date: 10 June 2015

Accepted Date: 13 June 2015

Please cite this article as: E. Navarro-Peris, J.M. Corberan, Z. Ancik, Evaluation of the potential recovery of compressor heat losses to enhance the efficiency of refrigeration systems by means of thermoelectric generation, *Applied Thermal Engineering* (2015), doi: 10.1016/j.applthermaleng.2015.06.033.

Evaluation of the potential recovery of compressor heat losses to enhance the efficiency of refrigeration systems by means of thermoelectric generation

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Keywords: Compressor, Seebeck effect, heat recovery, heat losses.

Abstract

The present study evaluates the possibilities of increasing efficiency in refrigeration and heat pump systems based on compression cycles by means of using compressor heat losses. In order to do this, the work been divided into the following parts: presentation of the used model of a thermoelectric device in order to estimate the amount of energy recovery from the heat source, an experimental test under several contour conditions to estimate the real temperature difference maintained in a thermoelectric module in contact with the compressor wall and, based on this information, an estimation of the potential amount of energy that can be recovered by this kind of system.

Keywords: Thermoelectric effect, Seebeck effect, harvest, compressor losses

Nomenclature

COP	Coefficient of performance
I	Current through the TEG
E	Electric input to the module
R	Electric resistance of the module
n	Electrical contact parameter
ρ	Electrical resistivity
Q	Heat flux
N	Number of thermocouples
α	Seebeck constant