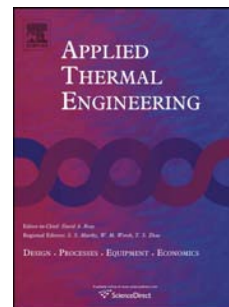


Accepted Manuscript

Experimental and theoretical analysis of a heat pipe heat exchanger operating with a low global warming potential refrigerant

Giovanni A. Longo, Giulia Righetti, Claudio Zilio, Fabio Bertolo



PII: S1359-4311(14)00029-5

DOI: [10.1016/j.applthermaleng.2014.01.023](https://doi.org/10.1016/j.applthermaleng.2014.01.023)

Reference: ATE 5323

To appear in: *Applied Thermal Engineering*

Received Date: 23 August 2013

Revised Date: 12 January 2014

Accepted Date: 16 January 2014

Please cite this article as: G.A. Longo, G. Righetti, C. Zilio, F. Bertolo, Experimental and theoretical analysis of a heat pipe heat exchanger operating with a low global warming potential refrigerant, *Applied Thermal Engineering* (2014), doi: 10.1016/j.applthermaleng.2014.01.023.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

EXPERIMENTAL AND THEORETICAL ANALYSIS OF A HEAT PIPE HEAT EXCHANGER OPERATING WITH A LOW GLOBAL WARMING POTENTIAL REFRIGERANT

Giovanni A. Longo⁽¹⁾, Giulia Righetti⁽¹⁾, Claudio Zilio⁽¹⁾, Fabio Bertolo⁽²⁾

⁽¹⁾ University of Padova, Department of Management and Engineering, Str.lla S.Nicola 3, I-36100 Vicenza, Italy

⁽²⁾ D.B.M. S.p.a., Via Ugo La Malfa 10, 28040 Varallo Pombia (NO), Italy.

ABSTRACT

In the present paper the experimental and theoretical analysis of a Heat Pipe finned Heat Exchanger (HPEH) is reported. The HPHE consists of 54 horizontal 12.7 mm micro-fin copper tubes 700 mm in length and aluminium continuous fins 0.115 mm in thickness with 3 mm of fin spacing. The HPHE presents an evaporator section of 270 mm, a condenser section of 270 mm and adiabatic section of 160 mm. The performance of the heat exchanger operating with the well-known hydrofluorocarbon refrigerant HFC134a is compared with the results obtained using the new low global warming potential hydrofluorolefin HFO1234ze(E). Tests were run in a double wind channel with air operating conditions typical for air-conditioning in European countries for both summer and winter seasons. The consistency of the experimental results is proved by the comparison with a semi-empirical model of the heat exchanger based on heat transfer correlations available in literature.

KEYWORDS

heat pipe, GWP, HFO1234ze(E)

Download English Version:

<https://daneshyari.com/en/article/7049407>

Download Persian Version:

<https://daneshyari.com/article/7049407>

[Daneshyari.com](https://daneshyari.com)