

Accepted Manuscript

Performance optimization of an R410A air-conditioner with a dual evaporator ejector cycle based on cooling seasonal performance factor

Sunjae Kim, Yongseok Jeon, Hyun Joon Chung, Yongchan Kim

PII: S1359-4311(17)33447-6
DOI: <https://doi.org/10.1016/j.applthermaleng.2017.12.012>
Reference: ATE 11533

To appear in: *Applied Thermal Engineering*

Received Date: 20 May 2017
Revised Date: 19 October 2017
Accepted Date: 2 December 2017



Please cite this article as: S. Kim, Y. Jeon, H. Joon Chung, Y. Kim, Performance optimization of an R410A air-conditioner with a dual evaporator ejector cycle based on cooling seasonal performance factor, *Applied Thermal Engineering* (2017), doi: <https://doi.org/10.1016/j.applthermaleng.2017.12.012>

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.

Performance optimization of an R410A air-conditioner with a dual evaporator ejector cycle based on cooling seasonal performance factor

Sunjae Kim, Yongseok Jeon, Hyun Joon Chung, Yongchan Kim*

Department of Mechanical Engineering, Korea University
Anam-Dong, Sungbuk-Ku, Seoul 136-713, Republic of Korea

ABSTRACT

Even though a dual evaporator ejector cycle (DEEC) offers several advantages over a standard two-phase ejector cycle, few experimental investigations of the performance of the DEEC are available in the literature. This study presents the performance characteristics of an R410A air-conditioner adopted with a DEEC under various operating conditions and ejector geometries. The COP of the DEEC decreased with an increase in entrainment ratio (ER) due to the decrease in pressure lifting ratio. For the optimum ER, the effectiveness of the DEEC increased with an increase in compressor speed with a larger total mass flow rate. The optimum mixing section diameter was determined to be 5 mm based on the cooling seasonal performance factor (CSPF) and $CSPF_{bin}$ of the DEEC. The maximum allowable limit for the ER was also suggested to be 0.3. In addition, the CSPF of the DEEC was 6.3% higher than that of the baseline cycle at an ER of 0.1.

Keywords: Dual evaporator ejector cycle, Ejector, COP, CSPF

* **Corresponding author.** Tel.: +82-2-3290-3366; Fax: +82-2-921-5439

E-mail address: yongckim@korea.ac.kr

Download English Version:

<https://daneshyari.com/en/article/7046302>

Download Persian Version:

<https://daneshyari.com/article/7046302>

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