

Accepted Manuscript

1D model for the energy yield calculation of natural convection solar air collectors

A.D. Demou, D.G.E. Grigoriadis

PII: S0960-1481(17)31234-X

DOI: [10.1016/j.renene.2017.12.030](https://doi.org/10.1016/j.renene.2017.12.030)

Reference: RENE 9527

To appear in: *Renewable Energy*

Received Date: 21 September 2017

Revised Date: 19 November 2017

Accepted Date: 9 December 2017

Please cite this article as: Demou AD, Grigoriadis DGE, 1D model for the energy yield calculation of natural convection solar air collectors, *Renewable Energy* (2018), doi: 10.1016/j.renene.2017.12.030.

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.



1D model for the energy yield calculation of natural convection solar air collectors

A.D. Demou¹, D.G.E. Grigoriadis

*UCY-CompSci, Department of Mechanical and Manufacturing Engineering, University of Cyprus,
1 Panepistimiou Avenue, 2109 Aglantzia, Nicosia*

Abstract

A one dimensional model has been developed and presented to calculate the seasonal energy yield of solar air collectors. This model takes into account local meteorological conditions, the effects of geometrical configuration, materials used as well as the orientation of a solar air collector system. It can provide the temporal variation of the operating temperatures, heat transfer rates and ultimately the energy yield of the system for the duration of a whole heating season. The model is used to conduct a parametric investigation of the system efficiency, assessing the effects of wall-glass spacing, wall thickness, solar-absorbing surface material and orientation. The energy yield of a reference system installed in a "hot" or a "cold" climate is examined and discussed. It was found that the efficiency of the collector was more sensitive to the material of the solar-absorbing surface than any other parameter examined. Moreover, it was found that although in cold climates the daily efficiency of the system was lower, because of the the extended heating season, the seasonal energy yield of the system was comparable to hotter climates.

Keywords: Solar thermal systems, solar air collector, Trombe wall, natural convection, thermal modelling, seasonal energy yield.

^{*}Corresponding author: Andreas D. Demou, e-mail: andreas.demou@gmail.com

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات