

EXPERIMENTAL ANALYSIS ON THE
ACTIVE AND PASSIVE COOL ROOF
SYSTEMS FOR INDUSTRIAL BUILDINGS IN
MALAYSIA

Ming Chian Yew, Ming Kun Yew, Saw Lip Huat,
Ng Tan Ching, Chen Kah Pin, Rajkumar Durairaj,
Jing Han Beh



PII: S2352-7102(17)30793-3
DOI: <https://doi.org/10.1016/j.jobe.2018.05.001>
Reference: JOBE478

To appear in: *Journal of Building Engineering*

Received date: 11 December 2017

Revised date: 30 April 2018

Accepted date: 1 May 2018

Cite this article as: Ming Chian Yew, Ming Kun Yew, Saw Lip Huat, Ng Tan Ching, Chen Kah Pin, Rajkumar Durairaj and Jing Han Beh, EXPERIMENTAL ANALYSIS ON THE ACTIVE AND PASSIVE COOL ROOF SYSTEMS FOR INDUSTRIAL BUILDINGS IN MALAYSIA, *Journal of Building Engineering*, <https://doi.org/10.1016/j.jobe.2018.05.001>

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 galley proof before it is published in its final citable 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 ANALYSIS ON THE ACTIVE AND PASSIVE COOL ROOF SYSTEMS FOR INDUSTRIAL BUILDINGS IN MALAYSIA

Ming Chian Yew^{1*}, Ming Kun Yew², Saw Lip Huat¹, Ng Tan Ching¹, Chen Kah Pin¹,
Rajkumar Durairaj¹, Jing Han Beh³

¹Department of Mechanical and Material Engineering, Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, Cheras 43000 Kajang, Malaysia

²Department of Civil Engineering, Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, Cheras 43000 Kajang, Malaysia

³Department of Architecture and Sustainable Design, Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, Cheras 43000 Kajang, Malaysia

yewmingchian@gmail.com;

yewmc@utar.edu.my

*Corresponding author.

Abstract

This piece of research presents the capability of active and passive cool roof systems, which is designed to reduce the heat transmission into an attic through the metal deck roofing for industrial buildings in Malaysia. In this study, an ideal cool roof system focusing on utilizing solar energy, cavity ventilation and thermal reflective coating (TRC) were employed and investigated. This technique is one of the most innovative and sustainable practices at reducing the energy consumption that provide buildings with comfortable indoor conditions through natural means. The four cool roof models were designed and built in active and passive systems to examine the effect of attic temperature reduction. Application of TRC can significantly reduce the heat absorption of the metal roof. The roof and attic temperatures of the roof models were measured to determine the performance of cool roof system. The roof design (d) results indicate a great reduction at about 15 °C in the attic air temperature compared to normal roof. The outstanding performance is due to the cool roof system that integrated TRC, improved moving air cavity (MAC)-solar powered fans and opened attic inlet comprise the ability to reflect the sunlight and circulate the hot air efficiently.

Download English Version:

<https://daneshyari.com/en/article/6749738>

Download Persian Version:

<https://daneshyari.com/article/6749738>

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