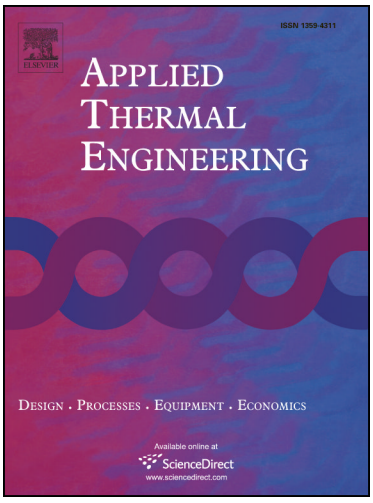

An experimental study on effect of inclination angle on the performance of a pcm-based flat-type heat sink

Mete Avci, Mustafa Yusuf Yazici

PII: S1359-4311(17)36169-0
DOI: https://doi.org/10.1016/j.applthermaleng.2017.12.069
Reference: ATE 11590

To appear in: *Applied Thermal Engineering*

Received Date: 25 September 2017
Revised Date: 12 December 2017
Accepted Date: 17 December 2017

Please cite this article as: M. Avci, M. Yusuf Yazici, An experimental study on effect of inclination angle on the performance of a pcm-based flat-type heat sink, *Applied Thermal Engineering* (2017), doi: https://doi.org/10.1016/j.applthermaleng.2017.12.069

AN EXPERIMENTAL STUDY ON EFFECT OF INCLINATION ANGLE ON THE PERFORMANCE OF A PCM-BASED FLAT-TYPE HEAT SINK

Mete Avci* and Mustafa Yusuf Yazici

Department of Mechanical Engineering

Karadeniz Technical University

61080 Trabzon, Turkey

*corresponding author

Tel: +90 (462) 377 29 60, Fax: +90 (462) 325 55 26

e-mail: mavci@ktu.edu.tr

ABSTRACT

An experimental study is carried out to investigate the effect of inclination angle on the thermal performance of a flat-type heat sink. Heat sinks without and with PCM are examined comparatively. The range of inclination angle from $\theta = 0^o$ (vertical) to $\theta = 90^o$ (horizontal) is considered. N-eicosane with a melting range of 35-37^{o}C is used as PCM. Temperatures are measured to characterize the heat transfer in air and PCM domains. In addition, an imaging technique is used to visualize the movement of melting interface. The results obtained show that the inclination angle has a remarkable effect on the thermal performance of the PCM-based heat sink while its effect is negligible for the one without PCM.

Keywords: Thermal management, electronics cooling, heat sinks, inclination, PCM.