

Accepted Manuscript

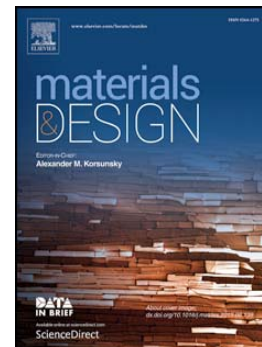
Thermal properties of asphalt pavements under dry and wet conditions

Abdushaffi Hassn, Andrea Chiarelli, Andrew Dawson, Alvaro Garcia

PII: S0264-1275(15)30854-6
DOI: doi: [10.1016/j.matdes.2015.11.116](https://doi.org/10.1016/j.matdes.2015.11.116)
Reference: JMADE 1019

To appear in:

Received date: 5 June 2015
Revised date: 8 October 2015
Accepted date: 28 November 2015



Please cite this article as: Abdushaffi Hassn, Andrea Chiarelli, Andrew Dawson, Alvaro Garcia, Thermal properties of asphalt pavements under dry and wet conditions, (2015), doi: [10.1016/j.matdes.2015.11.116](https://doi.org/10.1016/j.matdes.2015.11.116)

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.

Thermal properties of asphalt pavements under dry and wet conditions

Abdushaffi Hassn^a, Andrea Chiarelli^a, Andrew Dawson^a, and Alvaro Garcia^{a1},

^aNottingham Transportation Engineering Centre, School of Civil Engineering, University of Nottingham, University Park, Nottingham NG7 2RD, UK

ABSTRACT

Air voids play an important role in the temperature evolution of asphalt pavements exposed to the sun's radiation and the environment, but their effects have never been precisely quantified before. The objective of this article is to understand and quantify the effect of air voids on the temperature evolution of asphalt mixture under dry and wet conditions. To achieve this objective, dry and saturated asphalt slabs with different air voids contents have been exposed to infrared light and the surface and bottom temperature evolution, heat flux and evaporation rate have been measured. It was observed that under dry conditions air voids simply affect the specific heat capacity and thermal conductivity of asphalt mixture, while under wet conditions the energy used by water for evaporation reduces drastically the temperature of asphalt mixture. This has significance for Urban Heat Island mitigation amongst other implications.

Keywords: Asphalt mixture; air voids; water evaporation; temperature

¹ Corresponding author: alvaro.garcia@nottingham.ac.uk
Telephone: 0044 0115 95 13914
Fax: 0044 0115 9513909

Download English Version:

<https://daneshyari.com/en/article/7219324>

Download Persian Version:

<https://daneshyari.com/article/7219324>

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