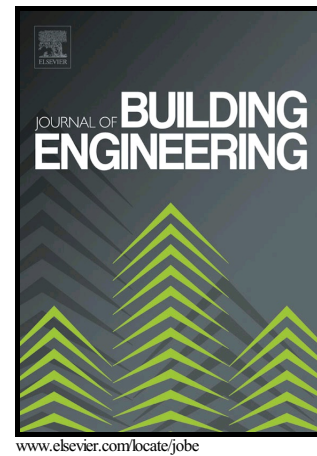


Condensation at the Exterior Surface of Windows

Anssi Laukkarinen, Paavo Kero, Juha Vinha



PII: S2352-7102(18)30361-9
DOI: <https://doi.org/10.1016/j.job.2018.06.014>
Reference: JOBE521

To appear in: *Journal of Building Engineering*

Received date: 23 March 2018

Revised date: 25 June 2018

Accepted date: 26 June 2018

Cite this article as: Anssi Laukkarinen, Paavo Kero and Juha Vinha, Condensation at the Exterior Surface of Windows, *Journal of Building Engineering*, <https://doi.org/10.1016/j.job.2018.06.014>

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.

Condensation at the Exterior Surface of Windows

Anssi Laukkarinen^{*}, Paavo Kero¹, Juha Vinha²

Laboratory of Civil Engineering, Tampere University of Technology, Tampere, Finland

anssi.laukkarinen@tut.fi

paavo.kero@fcg.fi

juha.vinha@tut.fi

orcid.org/0000-0003-2426-4687

orcid.org/0000-0002-5825-1721

^{*}Corresponding author. Korkeakoulunkatu 10, FI-33720 Tampere, Finland Tel.: +358 50 917 9988

New energy efficient windows have a higher risk for outdoor air vapour condensing to their exterior surface, when compared to older windows with lower thermal resistance. This external condensation can reduce visibility through the window, decrease owner satisfaction and affect the behaviour of window buyers and sellers. The purpose of this study was to analyse the impact of window U-value and other factors on the occurrence of external condensation. A combined heat and moisture transfer model was created and used for the calculations. According to the results, the duration and amount of external condensation are projected to increase in the future due to lower window U-values and climate change. Exterior surface emissivity, external shadings and building location had a big impact on the amount of yearly condensation hours, while window orientation and solar absorption coefficient had a smaller impact. There was also an interesting power-law-type correlation between yearly condensation hours and the median effective thickness of the condensation layer. The results

¹ Tel.: +358 40 198 1283

² Tel.: +358 40 8490 296

Download English Version:

<https://daneshyari.com/en/article/6749830>

Download Persian Version:

<https://daneshyari.com/article/6749830>

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