Cite this article
(2023)
Award-winning paper in 2021.
Proceedings of the Institution of Civil Engineers – Construction Materials **176(1)**: 45,
https://doi.org/10.1680/jcoma.2023.176.1.45

Announcement

Construction Materials

ice Publishing

Award-winning paper in 2021

Papers published in *Construction Materials* are eligible for awards from the Institution of Civil Engineers. Papers from any of the ICE journals can be nominated for several awards. In addition, each journal has awards dedicated to their specific subject area.

On Friday 14 October 2022, ICE president Ed McCann presented an award to the following paper published in *Construction Materials* in 2021. The editorial panel nominated their best papers and an awards committee chaired by Tim Broyd allocated the awards.

Thomas Howard Medal

The Thomas Howard Medal, presented for the best paper detailing the use of materials in construction, was awarded to Reuge *et al*. (2021).

Abstract

The classical models describing hygric transport inside building materials seem unsuitable for bio-based materials. Based on the assumption of an instantaneous local equilibrium between relative humidity and water content evolving according to the sorption isotherms, they predict much shorter stabilisation times than those obtained experimentally. A new approach is presented here: it frees from the local instantaneous equilibrium by introducing local kinetics to describe the transformation of water from the vapour state to the absorbed liquid state and vice versa. In the framework of the European IsoBio project, a multilayered wall mainly made of bio-based materials was developed. The different layers were characterised in terms of sorption, vapour permeabilities and thermal conductivities. The sorption measurements performed on representative samples allowed determination of the local kinetic constants. The hygrothermal behaviour of the test wall was then studied in an instrumented demonstrator (Hive, Wroughton, UK). The recorded measurements were compared with simulations based on the instantaneous local equilibrium model (TMC code) and on the local kinetics of sorption model (TMCKIN code). TMC very significantly underestimated the dynamics of the local relative humidity variations whereas TMCKIN succeeded in predicting these dynamics and produced results close to measurements.

REFERENCE

Reuge N, Collet F, Pretot S *et al.* (2021) Kinetics of sorption in bio-based materials: theory and simulation of a demonstrator wall. *Proceedings of the Institution of Civil Engineers – Construction Materials* **174(3)**: 129–139, https://doi.org/10.1680/jcoma.19.00094.