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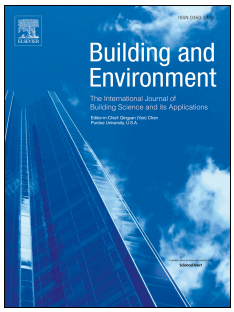

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Determination of optimal plaster thickness for moisture buffering of indoor air

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Abstract

The relative humidity of indoor air influences the health and wellbeing of building occupants and the integrity of the building fabric. One potential solution for regulating relative humidity is provided by the plaster used for finishing internal spaces if it has the ability to passively buffer moisture through adsorption and desorption of vapour. During the adsorption and desorption, the water vapour will only penetrate to a certain depth of the plaster. Therefore, it is important to know the minimum thickness of plaster required for the maximum buffering effect. Uniquely, this paper presents a method for determining the optimal thickness from experimental measurements on specimens of varying thickness. In this paper it is demonstrated through a novel method, that there is a thickness of material beyond which there is no increase in moisture buffering capacity. Below the optimal thickness moisture sorption increases linearly as a product of the density and specific moisture capacity. Significantly, existing numerical methods were found to overestimate the performance when compared to empirical measurements. The expected impact of this work is the