The effect of changing ambient humidity on moisture condition in timber elements

This paper deals with the effect of the changing ambient humidity on moisture conditions in timber elements. The naturally varying humidity is possible to model as a relative combination of different harmonic cycles, with different periods and amplitudes. For the determination of the moisture field a fully coupled transport model including a model for the influential sorption hysteresis of wood is used. The coupled model accounts for both vapor transport in pores and bound water transport in wood tissue. Moisture state history influences relationship between moisture state of wood and air humidity, it must therefore be taken into account. In order to include history dependency, a hysteresis model is used here. Results from numerical calculations for timber specimen exposed to combined daily and annually cyclic variation of outside humidity are presented. Copyright © (2012) by WCTE 2012 Committee.

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