



Bending Behavior of Regularly Spaced CLT Panels

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Summary:

A regular alternation of lamellas and voids filled by insulating material within each layer of CLT can lead to cellular panels with improved acoustical, thermal and fire performance. In order to support the development of these innovative and lighter engineered wood products, their mechanical behavior is investigated in this paper by means of experiments and modeling. First, an experimental campaign on spaced CLT panels and related results are presented. Then, both simplified and refined modelings are applied. The chosen accurate modeling is a periodic homogenization scheme handled by a plate theory [1] and based on unit-cell strain energy computation with FEM. It appears that the simplified approach can predict the bending stiffness (EI) of CLT panels with large voids but not their transverse shear stiffness (GA) which can be precisely predicted with the more refined modeling. Finally, the influence of several panel's parameters on the mechanical response is pointed out as well.

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