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Izvorni znanstveni članak

### Influence of plywood grain direction on sandwich panel bending properties

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#### Sažetak

This paper investigates the influence of plywood grain direction on bending properties of a sandwich panel, as well as on stress distribution in each layer. Experimental sandwich panels (t<sub>nom</sub>= 29 mm) were made of two three-ply plywood panels and a rigid PVC core between them. Grain directions of plywood panels were between 0° and 90°, continuously raised by 15°. Seven models of sandwich panels were made. Bending properties of a sandwich panel was determined by three point bending method and stress in each layer was determined by using finite element method. Simulation models were developed with equal load conditions as applied during empirical measurement of bending properties of the sandwich panel. The research results show that grain direction has a great influence on bending properties of the sandwich panel, as well as on stress values in each layer. Results also indicate the importance of analyzing stress in each layer of plywood for the purpose of avoiding stress concentration in respective layers and for optimizing structural construction of the sandwich panel. Such stress analyses are not covered by standardized empirical methods for determining bending properties of sandwich panels.

#### Ključne riječi

sandwich panel; veneer plywood; stress; FEM; structural construction

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