MODELING AND OPTIMIZATION OF FORCE FRACTURE OF PLYWOOD UNDER THE ACTION OF BENDING FORCES

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ABSTRACT

Plywood is most commonly used in manufacture of furniture and building wooden structures such as panels in the floor, roof, wall structures, but also for interior decoration of shell ridges and complex sections (I-beams, box-beam).

When designing structures, it is necessary to know the expected load with which the structure will be burdened, the properties of the materials used to create the structure, the conditions in which these structures are/will be used, and certain environmental and economic requirements of the design and usage.

Plywood is a laminated material based product which is characterized with high mechanical strength, dimensional stability to influence of moisture, smooth and closed surfaces and regular shapes. Plywood appears on the market in a variety of formats - dimensions, depending on the purpose of the respective plywood.

The ability to determine the type of plywood with certain characteristics (physical and mechanical) that are optimal for specific conditions of use, is becoming an imperative in the choice of plywood for use in timber structures.

In applying the floor, roof structures are those exposed to bending forces.

This paper will present the results of experimental studies on value in fracture strength of plywood under the action of shearing forces parallel and perpendicular to the grain direction of surface veneers. In this study we used beech, poplar and combined (beech poplar) plywood thickness of 18, 20, 25, 30 and 32 mm. Based on the obtained data, modeling of fracture force of plywood under the action of shearing forces parallel and perpendicular to the grain direction of surface veneers, and based on certain criteria which simulate the conditions of use of plywood in the structure, application of appropriate programs is carried out to optimize the structure of plywood for the assumed conditions of use .

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