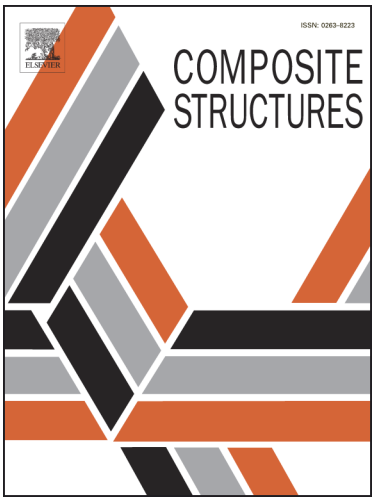

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Modulus of Elasticity in Three- and Four-Point Bending of Wood

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ABSTRACT

This article deals with the difference in elasticity moduli of the three- and four-point bending of spruce and oak wood. Theoretical analyses of both loading methods are given. The measured characteristics were the MOR and MOE. The samples moisture content (MC) was 0, 8, 16, fibre saturation point (FSP), >FSP (after being soaked in water). We performed the measurements according to standard [1]. The results were evaluated using standard statistical methods. The outputs of this article broadens the knowledge of the properties of wood and can help in the creation of our theoretical models of these properties.

Keywords: 3- and 4- point bending, shear stress in bending, spruce, oak

INTRODUCTION

In the beam strained in bending, the bending moment causes the deformation and shape change (Fig. 1). In addition to tensile and compressive stress, shear stress also occurs. The deformation is a result of normal and shear stress in the beam cross section [2].

In the case of dimensioning wooden beams, it is also necessary to perform load-bearing inspections for shear stress [3, 4]. It is often in large beams subjected to bending that we observe shear failure, especially in high beams [3, 5].

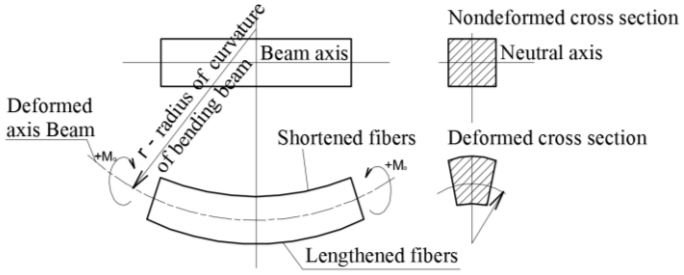

Fig. 1. Deformation of beam subjected to bending moment

If the cross section of the beam is rectangular, the distribution of shear stress is parabolic along the beam's height (Fig. 2).

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