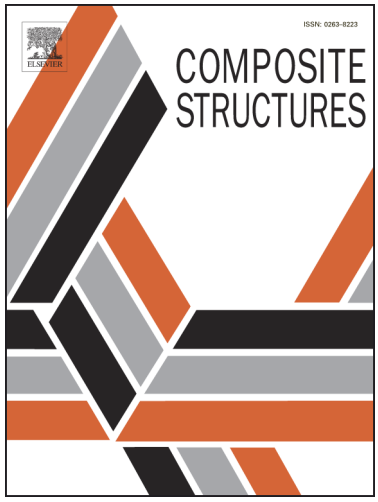


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# Reinforcing wood by surface modification

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**Abstract**

This paper presents the results of the research conducted on pine wood that was surface modified with polymerized polymethylmethacrylate (PMMA). The method of surface modification of wood was developed and patented by this author [9]. This method opens up new possibilities of wood application in the construction of yachts, fishing boats, lifeboats, building main decks and cargo holds, hydraulic constructions equipment, fenders beams, quays and elements of docks equipment.

The principal goal of this work was to establish quantitative evaluation of this effect. Samples with varying content of the polymer were subjected to stretching in order to determine material constants of single layers. To determine the influence of polymer content in the wood-polymer composite (W-P C) on its strength, the sample was subjected to the cylindrical bending. These experiments showed that the surface modification of wood resulted in uniform distribution of the stresses in the beam cross section. Numerical calculations of plates made of natural wood whose surface was modified and was subjected to bending, confirmed the results of laboratory tests.

## 1. Introduction

Wood is one of the most important structural materials. Nowadays, wood is almost forgotten in the shipbuilding industry. This is a porous, fibrous, and anisotropic material. Surface modified wood gives us a set of advantages of natural wood such as good damping characteristics, thermal insulation, relatively low price and low specific gravity. After modification, wood gains higher hardness, better weather resistance, abrasion resistance and higher strength [13, 14]. Porosity, which is a serious drawback of wood, may be seen as an

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