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ABSTRACT PROCEEDINGS

YOUng ResearcherS Conference 2019

26 - 27 March 2019

Ministry of Education, Science and Technological Development

Editorial Board of Journal of Applied Engineering Science

Belgrade Fair

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POTENTIALS IN EVALUATION OF THE WOOD QUALITY IN LIVING TREES BY USING SEMI- AND NON-DESTRUCTIVE METHODS IN ORDER TO REDUCE WOOD-PROCESSING COSTS

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Summary: Being a natural, ecological and renewable resource, wood is increasingly replacing artificial and toxic materials in the manufacture of various types of packaging and other products; thus, its proper and economically justified use has become necessary. The best utilization of wood raw materials has been sought both in practice and theory, which led to development of a number of non-destructive and semi-destructive methods for the wood quality assessments in various stages of wood exploitation. In this paper, two instruments for inspection of the internal condition of standing trees were analyzed. Resistograph was designed for detection of the internal defects. In addition to assessing the condition of living trees of different species, the instrument is used to assess the wood density in various materials. The observed resistance during drilling is proportional to the change in the wood density or the relative mass of the element analyzed. The results of drilling in different spots or directions, through the cross-section and along the element, can be used to map the properties of the element. Fractometer is a device designed for measuring the strength and other mechanical properties of wood in core samples taken by increment borer from a certain part of the tree or branch examined. Fractometer can determine the maximum fracture force and bending and pressure strength of wood. It is also possible to identify the stage of decay. Due to its heterogeneous structure and anisotropy, the wood compressive and bending strengths differ between different anatomical directions even within a single species. The results of previous research in literature indicate that there is a significant positive correlation between the radial bending strength and the longitudinal compressive strength of wood. This actualizes the need for the use of different types of trees in construction, depending on the load that the wood element will be exposed. These devices provide high precision and quality in measurement and can achieve good correlation between the measured values and the mechanical properties of wood. This way, science and practice could be provided by significant data on the properties and quality of wood, while its consumption is minimized.

Keywords: fractometer, resistograph, wood quality determination and evaluation, wood consumption, wood-processing costs.

IMPRESUM

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