Research Article:

ANALYSIS OF SURFACE ROUGHNESS OF BLACK ALDER AS FUNCTION OF VARIOUS PROCESSING PARAMETERS

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Abstract: The objective of this study was to analyse the surface quality of black alder (Alnus glutinosa) samples as function of sanding processes based on four grits sizes, namely 60, 80, 100 and 120. The sanding process was performed parallel, perpendicular and at 45 degrees angle to the grain orientation of the specimens. The experiments were carried out on a wide belt sanding machine at NIKMOB Nehoiu Company. Two machining variables, feed speed and cutting depth were used for the tests. Two roughness parameters, Rk (processing roughness parameter) and Rpk (fuzzy grain roughness parameter) were determined by employing the optical profilometer type MicroProf FRT, on dry and wet areas of the samples. All data were processed by using a nonlinear regression method respecting an equation of 2nd degree type with two variables. The ANOVA analysis was also used to evaluate the data by applying five independent variables, namely: sanding program, sanding direction, feed speed and cutting depth for the two statement of surface, with and without wetting. The results of the study revealed that the wetting of samples did not show a better quality of sanded surfaces. However when the samples were sanded at 45 degrees angle and parallel to the grain orientation, overall surface quality of the samples improved compared to perpendicular direction. It was also found that the cumulative effect of factors was more representative on the roughness parameters than the situation when taken individually. It appears that based on the findings in this work such approach can be successfully applied in wood products industry including furniture manufacturing to have a more efficient use of the raw material in further processing steps such as finishing.

Key words: roughness; sanding; black alder.

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