

Effect of Wood Species and Sectional Surfaces on Wood Surface Roughness

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Abstract

In this study, the effects of longitudinal sections (radial, tangential and diagonal surfaces) obtained from different cutting angles of wood, an anisotropic material, on the surface roughness were investigated in detail in samples of pine (*Pinus sylvestris* L.) and beech (*Fagus orientalis* Lipsky.) wood species, which are frequently used in woodworking and furniture industry. Since different sections relative to the fiber direction significantly influence workability and surface quality, the comparison of these surfaces constitutes the main purpose of the study. Prior to the roughness tests, all samples were processed with 60 grit sandpaper. Average roughness parameter (Ra) was employed in determining surface roughness which is the most commonly used metric and is considered a reliable indicator of surface quality. The Ra value represents the arithmetic mean of micro-level peaks and valleys on the surface and is therefore a fundamental measure for evaluating surface smoothness, particularly in heterogeneous and fibrous materials such as wood. In this context, the measurement and calculation of the Ra parameter were performed in accordance with the TS EN ISO 4287 standard. This standard defines parameters and measurement principles based on the profile method of surface texture evaluation, ensuring that the obtained data align with internationally accepted metrological criteria and remain comparable. With this approach, the effects of anatomical surface characteristics on surface quality after sanding were assessed, and the scientific validity of the results was strengthened through objective and standardized measurements based on the Ra parameter.

Keywords

Wood, Surface roughness, cutting angle, surface characteristics.

