

# Effect of composite pellets based wood and phytomass on densification process and final physical properties of pellets

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**Abstract.** During the densification can be recognized various technological variables and also material parameters which significantly influences the final solid biofuels (pellets) quality. In general, the biofuels quality depends on the properties of the raw material (feedstock) – in terms of biomass type, moisture content and particle size; and quality management of the manufacturing process – in terms of operating conditions, technological variables, pelletizer type and binding agent. Many parameters affect the pelletizing process and thus also the physical properties of the pellets. The properties of the raw material, raw material treatment and composition, as well as technological demands, are very important during the solid biofuels production process. This manuscript concentrates on the relationship between pellets quality, which is represented by the pellets physical properties, and the raw material mixtures. The main aim of this study is to determine the relationship between the raw material compositions, which influence the pellets quality and the pellets quality indicators - physical properties of pellets. Therefore the raw material composition represented by different mixtures from spruce sawdust, wheat straw and spruce bark, in various ratios were investigated. Effect of mentioned raw material mixtures on pellets bulk density, mechanical durability, abrasion, particle density and hardness was determined. Research findings presented in this paper are based on a realized experimental research which was done on the Faculty of Mechanical Engineering STU in Bratislava. During this experimental research also the effect of proposed raw material mixtures on densification process was investigated. The experimental findings presented here are showing the importance of mentioned variables and parameters during the pelletizing process.

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