

CHARACTERIZATION AND EVALUATION OF ENERGY PROPERTIES OF BRIQUETTES PRODUCED FROM MISCANTHUS, SEA BUCKTHORN AND ARBORICULTURA RESIDUES AND THEIR MIXTURES

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The aim of the study presented in this paper was to improve the quality of briquettes by using as raw material various mixtures of miscanthus plant biomass, sea buckthorn, arboricultural residues in various proportions of components. The quality of briquettes was estimated by the calorific value, ash content and particle density. The quality degree was assessed by comparison with the stipulated norms for A1, A2 and B categories of the SM EN ISO 17225-3:2017 standard.

The experimental investigations were carried out in the UTM Scientific Laboratory of Solid Biofuels and the properties were estimated according to the standard methods validated in this laboratory.

The experimental data obtained showed that all the samples produced from the raw material used in this study have a calorific value higher than 15.5 MJ/kg, i.e., exceeds the minimum value required by for the A1 ENplus category. Other parameters vary from case to case. For example, the briquettes made of Miscanthus x Giganteus 25% + Sea Buckthorn 25% have an ash content of less than 1%, being classified in A1 category according to this parameter, and the particle density is close to the requirements for A1 category.

Increasing the content of sea buckthorn in the mixture, the briquettes record a lower particle density, while the ash content also increases. It should be noted that, regardless of the percentage of sea buckthorn content, the briquettes produced from these mixtures are classified in the A2 category of quality.

It has been determined that for the production of B category of briquettes, it is not necessary to use mixtures, as the quality parameters are ensured even when only Miscanthus x Giganteus biomass is used. Based on the similitude method, it can be deduced that the briquettes produced from mixtures containing about 30% Miscanthus x Giganteus, the rest - sea buckthorn residues, certainly meet the requirements set out by the standard SM EN ISO 17225-3:2017 for A1 category.

When using mixtures of arboricultural residues, regardless of the proportion, the obtained briquettes are classified in the B category because the ash content exceeds the 1.5% required for A2 category.

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