Summary

The paper presents the results of wear tests of materials welded with electrodes of different chemical composition in the abrasive soil mass. The tests took into account the properties of the surface layer, i.e. chemical composition, microhardness, distribution and geometric features of carbide grains.

As part of the work, a review of the literature on the problems of wear of working elements of machines in an abrasive environment, existing design solutions, as well as methods of increasing the resistance of materials to wear intensity was carried out.

The aim of the study was to analyze the shape and share of carbide precipitates on the surface welded layers and to evaluate their influence on tribological properties in abrasive soil mass. In order to achieve the assumed goal of the study, microscopic photos of the surface layers of the tested materials were taken, on the basis of which, using the shape coefficients, identification of geometric features of carbide grains using the methods of computer image analysis. Then, a tribological experiment was carried out on the "spinning bowl" method, as a result of which the intensity and types of tribological wear were determined.

Based on the data obtained from the tribological experiment, as well as the image analysis performed, a wear model based on the PLS method was developed. It was used to explain the influence of geometrical features of carbide grains on wear in an abrasive environment. For the shape coefficients used, a high value of the explained variance share was obtained, which proves that the shape coefficients used in the model were correctly selected.