

## ABSTRACT

**Thesis:** 75 pages, 23 figures, 10 tables, 42 literatures.

**The aim of the study:** To investigate the microstructure, phase composition and microhardness of the surface layers of steel mark-3 after the complex treatment– electric-spark alloying with titanium and graphite and subsequent laser treatment.

**The object of the study:** the formation of structure and phase composition of surface layers on alloys of iron after the electric-spark alloying (Ti, C) in the interelectrode environments and laser treatment.

**The methods of the study:** gravimetric, microstructural, microhardness, X-ray analysis and tests on wear resistance.

**Practical use:**The results are of practical importance for the development of new modes of electric-spark alloying to enhance surface of steel products. Developed modes of electric-spark alloying can improve physical and mechanical properties of steel mark-3, which allows its use in conditions of sliding friction.

ELECTRIC-SPARK ALLOYING, LASER TREATMENT, TITANIUM, GRAPHITE, STEEL MARK-3, STRUCTURE, MICROHARDNESS, COATINGS, ALLOYED LAYER, TI-C-TI-C, C-TI-C-TI.