

ABSTRACT

Report of pre-diploma practice: 51 pages, 28 drawings, 1 tables, 20 sources of literature.

Aim: study of the structure, phase composition and properties of the surface layers of steel 3 after multistage electric-spark alloying by aluminum, titanium and graphite.

Research methods: microstructural, microhardness, mass transfer kinetics analysis.

Research subject strengthen the surface layers of the steel 3 after the electric-spark alloying by aluminum, titanium and graphite anodes.

Scientific novelty: It is found that the deposition sequence of Al, Ti, C during the steel 3 spark alloying leads to alloy layer thickness of 30 - 40 micron with a microhardness 11.2 - 14.8 GPa. This is due to the emergence of solid solutions based on metal anodes and iron, as well as carbides and intermetallic compounds.

Practical meaning Investigated alloys after thermal electric-spark alloying acquire properties that serve to extend the service life of machine parts and mechanisms, especially those working in severe conditions. Due to layered alloying it is possible to receive coverage of required composition and thickness, it is important to restore the dimensions of instruments after wear.

GRADUAL ELECTRIC-SPARK ALLOYING, STEEL 3, ALUMINUM, GRAPHITE, FUNCTIONAL COATINGS