ABSTRACT

Diploma work: 72 pages, 13 tables, 28 figures, 34 literary sources.

ELECTRIC-DOPING, COATING, TUNGSTEN, CHROMIUM, GRAPHITE.

Research object — surface layers of steel 45 coated by electric-spark alloying.

Purpose — research structure, phase composition and properties of coatings obtained by stratified application of tungsten, chromium and graphite on the surface of the steel 45 during electric-spark alloying.

Methods — gravimetric, microstructural, X-ray, microhardness analyzes and durability tests.

It was verified the possibility of creating functional coatings on steel 45 by layered electric-doping schemes: Cr-W-C, W-Cr-C, W-C-Cr, C-Cr-W.

It was found growth of surface microhardness to range from 11,5 GPa to 18,9 GPa caused by coating of solid solutions based electrode material and carbides WC, W_2C, Fe_3C, Cr_3C_2, CrC compared to untreated surface.

Tests in conditions of dry friction scheme “plane to plane” for 2 hours showed increasing durability from 3 times to 23 times compared to the untreated sample of steel 45.