

## ABSTRACT

The work contains 74 pages, 20 figures, 4 tables and 51 bibliographic titles.

The development of many branches of modern technology, improving the reliability of machines and mechanisms and increasing equipment productivity largely depend on the development and practical use of various types of protective coatings. Applying protective coatings can increase hardness, wear and scale resistance, improve the corrosive properties and enhance operating properties of the machine parts, devices, production equipment and tools working surfaces.

The aim is to research the  $\text{Al}_2\text{O}_3$  based composite coatings modified by Ti and Al sprayed using multichamber detonation spraying device on titanium and aluminum substrates relatively.

Research methods:

1. Optical microscopy
2. Scanning electron microscopy
3. Transmission electron microscopy
4. X-ray phase analysis
5. Vickers hardness test

Morphology, microhardness, phase and chemical composition, grain, subgrain and dislocation structure of  $\text{Al}_2\text{O}_3 + 5\%$  Ti and  $\text{Al}_2\text{O}_3 + 5\%$  Al coatings were investigated. Operational properties of the coatings were analytically evaluated.

Key words: WEAR RESISTANT COATINGS, CUMULATIVE DETONATION SPRAYING, STRUCTURE, PHASE COMPOSITION, MICROHARDNESS, DISLOCATION DENSITY, FRACTURE TOUGHNESS, LOCAL INNER STRESS