

INVESTIGATION OF THE OXIDATION OF TI-AL AND AL-CR COATINGS DEPOSITED BY VACUUM-ARC DEPOSITION¹

K.N. RAMAZANOV, A.YU. NAZAROV, E.L. VARDANYAN, A.A. TULINA, A. M. KHUSAINOVA

Ufa state aviation technical university, Ufa, Russia

The development of the aircraft engine industry leads to the fact that more and more new materials are being developed and introduced - carbon-free heat-resistant alloys and intermetallic alloys. However, to ensure the long-term performance of parts made from these materials under conditions of high-temperature oxidation, it is necessary to develop special protective coatings that prevent damage to the surface of the parts. If for nickel-based superalloys there are currently solutions for protection against high-temperature oxidation, then research work is only underway for intermetallic alloys.

The purpose of this work is to search and study new heat-resistant coatings for intermetallic alloys for protection against high-temperature oxidation. To date, intermetallic alloys of the TiAl system are a promising material for the development of heat-resistant alloys used for the manufacture of parts for aircraft engines and gas turbine power plants.

In this work, coatings of the TiAl and AlCr systems with a monolayer and gradient structure were studied. The phase and chemical composition of the initial coatings have been studied. After high-temperature tests, the mass gain was studied depending on the holding time, the phase composition, the chemical composition in depth, and the mechanism of coating oxidation.

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