Title:

The microstructure and phase characteristics investigation of tribo-functional composite coatings based on NiAl

Abstract

The main direction of research is to improve the wear-resistance of friction pair of gas turbine engines, operating at high temperature (blades of GTE). In order to achieve this goal, new composite heat and wear resistant materials should be developed.

The NiAl intermetallic was chosen as a matrix for the development of new composite materials. For improve the wear-resistance of NiAl at high-temperature friction condition, the additives of refractory compounds, such as titanium, chromium and zirconium borides, are introduced into their structure.

To determine the wear mechanisms of developed composite coatings at different temperatures (T=20, 500, 800 and 1000°C) is necessary to carry out complex investigations of the friction surfaces structure and phase composition after tribo-tests. So, the detonation and plasma-spraying coatings structures were studied by SEM, TEM and XRD analysis. The friction surfaces structure and phase composition of initial coatings based on NiAl intermetallic and composite coatings after wear tests were investigated in this research work.