

INFLUENCE OF THE RATIO OF REACTION GASES IN MIXTURE DURING THE DEPOSITION TIAL SYSTEM COATING ON THE DURABILITY OF THE METAL-CUTTING TOOL ¹

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The purpose of this work is to develop new way to increase the tool life of metal-cutting tools by deposition coating the TiAl system in a mixture of three reaction gases. Among the existing principles for creating functional coatings, the most promising is the concept of multicomponent coatings. Such coatings can satisfy a range of often conflicting requirements. Using this concept, it is possible to create a coating in which compounds of various functional purposes are synthesized in one layer, providing the maximum reduction in tool wear intensity under various machining conditions.

In the conditions of the development of engineering and technology leads to an increase in the share of newly developed special materials with higher properties - heat-resistant and superalloys, composite materials. The mechanical processing of such materials with existing metal-cutting tools is associated with great difficulties [1,2]. High temperatures in the cutting zone, high strength and anisotropy of properties cause rapid tool wear or damage. To solve this problem, various solutions are used, from the development of new cutting tool materials to special hardening methods. One of which is the application of a wear-resistant coating [3,4].

Researches of microhardness, coefficient of friction, chemical and phase composition of the coating, sclerometric studies were carried out and describe in this paper. Investigations of coating wear during turning steel 45x have been carried out. Regularities of the influence of the concentration of the reaction gas of nitrogen, oxygen and acetylene in the composition of the gas mixture on the durability of the metal-cutting tool are obtained.

The results obtained make it possible to compare laboratory studies and production tests, which help develop a promising technology for applying coatings to metal-cutting tools.

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