

RESEARCH THE WEAR RESISTANCE OF NANOCOMPOSITE COATING Ti/TiN/TiCN/nc-TiCN:a-C/nc-TiC:a-C/a-C ON 1.2343 STEEL

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Abstract: An increasing of the wear resistance of injection molds leads to improvement in the living resources and reduction of the production cost. One of used steels for producing of components for injection molds is 1.2343 steel. In the current paper are presented results for wear resistance investigation of deposited Ti/TiN/TiCN/nc-TiCN:a-C/nc-TiC:a-C/a-C nanocomposite coating on 1.2343 steel. The influence of the load on the wear intensity of the coating is investigated. The coating is applied on unhardened grinded specimens, hardened grinded specimens and hardened polished specimens.

Keywords: Nanocomposite coating, Wear resistance, Wear intensity, Injection molds

1. Introduction

The increasing of the wear resistance of tools in order to their lifespan extension is one of the main problems in practice, and a great source of economy as well. This problem has a great importance in tools development where exists a constant tendency to increase the speed, temperature and mechanical stress during tool operation, while its functionality and durability being maintained [6].

For improving the wear resistance of tools various methods for deposition of hard coatings are generally used. As universal coating, titanium nitride (TiN) is widely used in the field of cutting tools, net shape forming tools, forging tools to increase their capacity, wear intensity and durability [3,4,5]. At present the emphasis is in use of gradient super hard nanocomposite coatings which have a range of properties to ensure their proper usage to improve quality of the tools [9,10]. These coatings are particularly suited for tools

operating under heavy loads and high temperatures [2,7,8]. Deposited on various tools and other materials lead not only to modification of the material of the surface layer but also in the formation of essentially new type composite material. When the process for obtaining is properly chosen these coatings have many advantages.

2. Aim of the work

The aim of this work is to research on the wear intensity of coating Ti/TiN/TiCN/nc-TiCN:a-C/nc-TiC:a-C/a-C applied by PVD method on steel 1.2343 which being used for injection molds fabrication. To achieve this aim is necessary to solve the following tasks:

1. Preparation of samples of steel 1.2343 and cover them with multilayer nanocomposite coating Ti/TiN/TiCN/nc-TiCN:a-C/nc-TiC:a-C/a-C by PVD method;

2. Conducting experimental research for wear resistance determination of the samples;