

## FEATURES OF PROCESSES OF ION-PLASMA FORMATION AND COMPARATIVE ANALYSIS OF THE PROPERTIES OF THE ANTI-FRICTION COATING TI-C-MO-S ON TITANIUM ALLOYS AND STEELS

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A new design-engineering trend in domestic manufacture is the slide bearings production, made of different alloys and of various purposes, with solid anti-friction coating. In this article specific techniques of magnetron ion-plasma formation of Ti-C-Mo-S anti-friction coating on VT-6, VT-14 titanium alloys and 40X, 20X13 hardened steels are provided and described. Application of integrated process of magnetron sputtering and assisting influence of gas-discharge plasma, generated by PINK, allows to maintain set-point coating synthesis temperature. It matters for hardened alloys – preventing tempering and durability properties loss. Additional operation of magnetron ion-plasma pre-doping of surface layer of substrate prior to coating deposition affords to make supportive hierarchically organized structure of substrate-coating composition. Combination of two mentioned technological methods enhances the controllability of coating properties.

Comparative researches on physical and tribological characteristics of this composition formed on surfaces of different materials were conducted. In the researches the following methods were used: methods of metallography and optical microscopy; friction tests using «CSEM High Temperature Tribometer»; method of measuring tracks depreciation using «Micro Measure 3D station»; examination coating and friction tracks structure using «Tescan Vega 3» scanning microscope. Distinctions in physical and tribological characteristics were figured out in dependence to substrate material. Interrelation between tribological characteristics and physical properties of substrate-coating composition was established and it is determined as by the substrate properties as well as by the parameters of surface pretreatment for coating deposition. Optimal receptions and pretreatment provides high coating adhesion; friction coefficient is about 0.1 and material wear resistance is increasing.

**Keywords:** *Slide bearing, Solid anti-friction coating, Ion-plasma coating, Magnetron sputtering, Friction tests.*