THE PHASE AND ELEMENTAL COMPOSITION OF FILTERED ARC EVAPORATED TIALN COATINGS USING SEPARATE CATHODES

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Ti-Al-N coatings are used to improve the functional characteristics of TiN such as hardness, friction coefficient, high temperature oxidation, and chemical stability. The widespread technologies for super-hard wear-resistant coatings are based on evaporation of the materials in a vacuum, which is called physical vapor deposition (PVD). Among the various PVD technologies, the vacuum-arc deposition (VAD) method is received the widest application on TiAlN coating deposition. But a lot of microdroplets are formed on the material surface during the deposition of coatings by the conventional vacuum-arc systems. For solving this problem are used plasma filters and changing Ti/Al ratio deposition.

TiAlN coatings were deposited by VAD using a separate aluminum and titanium cathodes. The bias voltage was kept constant at 1200 V. The total pressure in the vacuum chamber was $5 \cdot 10^{-3}$ Pa. The ratio of Ti and Al plasma flows was determined by the arc currents (I). The deposition was carried out at constant arc currents Iti = 60 A and Ial = 70, 80, 90 A.

In this work we investigate the layer by layer elemental and phase distribution of TiAlN coatings using Raman spectroscopy and glow discharge optical emission spectroscopy.

Keywords: *TiAlN, vacuum arc deposition, phase composition, elemental distribution.*