

Mechanical properties of multilayer TiAlN/CrN coatings deposited by cathodic arc evaporation

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The results of the investigations of multilayer TiAlN/CrN coatings deposited using cathodic arc evaporation applying TiAl (50:50 at-%) and elemental Cr cathodes are presented. The bilayer TiAlN+CrN thickness was ~ 250 nm with the thickness ratio of TiAlN/CrN layers of approximately 1:1. The atomic ratio of Ti/(Al+Ti) in the coating was 0.60. As the reference, the monolayer TiAlN and multilayer TiAlN/TiN coatings were selected. All the coatings were deposited on CrN sublayer to reduce their stress and improve their adhesion. The investigated coatings show good adhesion in the range 80–90 N. The TiAlN/CrN coating shows a lower friction coefficient and a significantly lower wear rate than those of reference coatings (more than 10 times).

Keywords: TiAlN monolayer coating, TiAlN/CrN and TiAlN/TiN multilayer coatings, Mechanical properties