

Tribology of Titanium-Aluminium Base Nanomultilayer Coatings

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The article presents investigation of the tribological properties, particularly dry friction and friction using a process fluid, of friction pairs of steel ball against titanium-aluminium base nanomultilayer (NML) coatings. The coatings are deposited by cathodic arc evaporation of both pure titanium and aluminium with eighteen percent silicon cathodes. Each multilayer structure consists of 49 bilayers. The external deposited layer is with five times longer growing period. The coatings are deposited at the temperature of 400°C and the work pressure of 2 Pa. Polished steel discs (\varnothing 20 mm \times 5 mm thick) are used as the substrate material. The measured dry friction coefficients are in the range of 0.216 – 0.356 and the coefficients friction using process fluid is in the range of 0.085 – 0.151. The calculated wear of the counter-body is in the range of $(0.66 \div 4.21) \times 10^{-3}$ mm³, as it depends on the friction conditions and the used multilayer coating.

Keywords: cathodic arc evaporation, multilayer, wear rate, process fluid, friction coefficient

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