

## Tribological Properties of TiN/AlTiN and AlTiN/TiN Nanomultilayer Coatings

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The paper presents the research results of the various coatings deposited using the cathodic arc evaporation Physical Vapour Deposition (PVD) method at 300°C, suitable for application on temperature-sensitive steels and alloys. Three main groups of coatings are deposited, denoted as E1, E2 and E3. The deposited bi-layer numbers for E2, E3 and E4 are 103, 207 and 107, respectively. Each group consists of two subgroups, S1 and S2, TiN/AlTiN and AlTiN/TiN nanomultilayer (NML) coatings, respectively. The coating deposition time for E1 and E2 is 60 min, and the carousel rotation speed is 35s and 17.5s, respectively. The coating thicknesses for these two coatings groups are 2.4 µm and 2.3 µm, and the calculated bi-layers thicknesses are 23.3 nm and 11.6 nm, respectively. TiN/AlTiN and AlTiN/TiN as NML or superlattice coatings are deposited onto high-speed steel substrates using pure titanium and aluminium-titanium (70/30 at. %) cathodes. Tribological testing is conducted using an Al<sub>2</sub>O<sub>3</sub> ball and a ball made from steel ISO 683/13, and the applied load and path length at the used speed of 60 RPM are 10N and 25m, respectively. Measurements are performed at room temperature and a humidity of 44 ± 2%.

**Keywords:** Cathodic Arc Evaporation, Nanomultilayer, Wear Rate, Friction Coefficient, Surface Coating Morphology

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