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## **Tribological investigation of HiPIMS deposited AlTiN coatings on Co-Cr-Mo alloy for industrial application**

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Co-Cr-Mo alloys are widely used not only for biomedical applications, but also in wind turbines, engine components, bushings and bearings. Literature reveals failure during industrial application and necessity to improve the properties of Cr-Co-Mo alloys. Of prime importance in the tribological behavior of the material. Several coatings have been mentioned which provide superior tribological properties, for instance AlTiN. AlTiN is a ternary nitride system, with numerous advantages including high wear resistance. In this work, AlTiN coatings were deposited by High Power Impulse Magnetron Sputtering (HiPIMS) on Co-Cr-Mo alloys and silicon wafers (1 0 0) in order to investigate and discuss the tribological properties of films in comparison to uncoated samples. Friction and wear tests were carried out using a tribometer with ball-on-disc configuration. The wear trace was evaluated by means of scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) microanalysis. The mechanical properties of the coating were analyzed using nanoindentation and scratch test. The microstructure of the coating consists of TiN and AlN phases, confirmed by X-ray diffraction (XRD) analysis. The properties of coating and substrate were compared. An improved wear behavior of the coated samples was found.

### **Keywords**

Tribology

TiAlN coating

Sputtering

Co-Cr-Mo alloy

Friction