

ABSTRACT:

In the present study, titanium nitride coatings on tool steel were deposited using cathodic arc physical vapour deposition technique. We studied and discussed the effect of various nitrogen gas flow rate on the surface properties of TiN-coated steel. The coating properties investigated in this work include the surface morphology, surface roughness, line profile and fractal dimension analyses using atomic force microscope. Minimum values for surface roughness, line profile and fractal dimension analyses were recorded at nitrogen gas flow rate of 200 sccm. This is mainly because of the reduction in macro-droplets and minimization of the growth defects, usually produced during etching and deposition stages. Critical limit of nitrogen gas flow rate in TiN coatings were identified and considered an important aspect to understand the performance of TiN PVD-coated steel.