PO2026

Nitrogen pulsing to modify the properties of Chromium nitride thin films DC magnetron sputter deposited

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CrN has been deposited by means of reactive DC magnetron sputtering in an Ar+N2 gas mixture, with Cr target purity of 99,95 % onto XC100 steel substrates. We are investigating the different characteristics, such as the structural, mechanical, tribological and electrical properties, obtained with constant versus pulsed gas flow. The reactive gas pulsing process was used to adjust the chemical composition by monitoring the introduction of chemical compositions and consequently the characteristics of the films. The thin films were analyzed by SEM and GI-XRD to characterize the structural properties, nanoindentation for mechanical properties, tribological properties by pin-on-disc and scratch testing, and a Van Der Pauw measurement system for the electrical properties.

Keywords
Thin films
CrN
Pulsed injection
DC magnetron.