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# Effect of deposition method on tribological performance and corrosion resistance characteristics of $\text{Cr}_x\text{N}$ coatings deposited by physical vapor deposition

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## Abstract

$\text{Cr}_x\text{N}$  thin film coatings are technologically attractive due to their desirable wear and corrosion resistance attributes. However, the tribological and corrosion performances of these coatings greatly depend upon their material properties and deposition processes. Environmental regulations concerning electroplated and electro-less chromium have motivated the development of PVD  $\text{Cr}_x\text{N}$  coatings as a replacement for electroplated hard chrome. In this study, two types of PVD processes were used to apply the  $\text{Cr}_x\text{N}$  coatings on bearing grade AISI 52100 steel specimens: a closed-field unbalanced magnetron sputtering system (CFUMS) and an ion beam assisted e-beam deposition (IBAD) system. Tribological performances of coated specimens were evaluated under boundary layer lubrication in sliding contact tribometers, and corrosion resistance properties were determined by Electrochemical Impedance Spectroscopy (EIS) and salt

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