

Accepted Manuscript

Wear resistant super-hard multilayer transition metal-nitride coatings

D. Dinesh Kumar , N. Kumar , S. Kalaiselvam , S. Dash ,
R. Jayavel

PII: S2468-0230(17)30026-3
DOI: [10.1016/j.surfin.2017.03.001](https://doi.org/10.1016/j.surfin.2017.03.001)
Reference: SURFIN 74



To appear in: *Surfaces and Interfaces*

Received date: 23 September 2016
Accepted date: 1 March 2017

Please cite this article as: D. Dinesh Kumar , N. Kumar , S. Kalaiselvam , S. Dash , R. Jayavel ,
Wear resistant super-hard multilayer transition metal-nitride coatings, *Surfaces and Interfaces* (2017),
doi: [10.1016/j.surfin.2017.03.001](https://doi.org/10.1016/j.surfin.2017.03.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Wear resistant super-hard multilayer transition metal-nitride coatings

D. Dinesh Kumar^{a,b,c*}, N. Kumar^d, S. Kalaiselvam^b, S. Dash^d, R. Jayavel^a

^a Centre for Nanoscience and Technology, Anna University, Chennai 600025, Tamil Nadu, India

^b Department of Applied Science and Technology, Anna University, Chennai 600025, Tamil Nadu, India

^c Centre for Nanoscience and Nanotechnology, Sathyabama University, Chennai 600119, Tamil Nadu, India

^d Materials Science Group, Indira Gandhi Centre for Atomic Research, Kalpakkam 603102, Tamil Nadu, India

*Corresponding Author: E-mail: ddinesh.tribology@gmail.com (D. Dinesh Kumar).

Abstract

Super-hard multilayer coatings are technologically promising materials for several applications in tribology. The advanced mechanical properties of such coatings can be tailored through unique phase combinations and interfacial architecture. Transition metal-nitride (TMN) multilayer coatings with the systematic combinations of TiN/CrN, TiN/ZrN and TiN/WN pairs were deposited on technologically relevant Si (100) and stainless steel (316LN) substrates, using reactive direct current (DC) magnetron sputtering. High wear resistance and a low friction coefficient in the TiN/WN multilayer are directly related to ultra-high hardness of 50.4 GPa. Such superior tribo-mechanical characteristics originate from strain hardening exhibited by the lattice mismatch across the TiN/WN interface.

Keywords: Multilayer coatings, Tribo-mechanical properties, Wear resistance.

Download English Version:

<https://daneshyari.com/en/article/4985667>

Download Persian Version:

<https://daneshyari.com/article/4985667>

[Daneshyari.com](https://daneshyari.com)