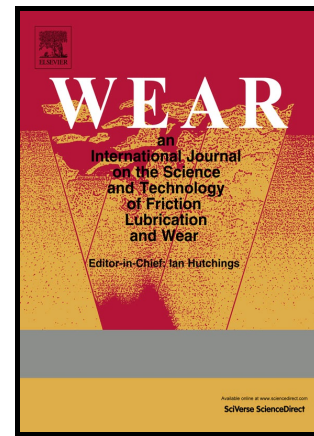


Author's Accepted Manuscript

Tribological properties and wear mechanisms of DC pulse plasma nitrided austenitic stainless steel in dry reciprocating sliding tests

Quanshun Luo, Oluwaseun Oluwafemi, Matthew Kitchen, Shicai Yang



PII: S0043-1648(16)30795-5
DOI: <http://dx.doi.org/10.1016/j.wear.2016.12.022>
Reference: WEA101863

To appear in: *Wear*

Received date: 1 September 2016
Revised date: 2 November 2016
Accepted date: 5 December 2016

Cite this article as: Quanshun Luo, Oluwaseun Oluwafemi, Matthew Kitchen and Shicai Yang, Tribological properties and wear mechanisms of DC pulse plasma nitrided austenitic stainless steel in dry reciprocating sliding tests, *Wear* <http://dx.doi.org/10.1016/j.wear.2016.12.022>

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 galley proof before it is published in its final citable 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.

Tribological properties and wear mechanisms of DC pulse plasma nitrided austenitic stainless steel in dry reciprocating sliding tests

Quanshun Luo¹, Oluwaseun Oluwafemi¹, Matthew Kitchen¹, Shicai Yang²

¹Materials and Engineering Research Institute, Sheffield Hallam University, Howard Street, Sheffield S1 1WB, UK

²Teer Coatings Ltd., Miba Coating Group, West Stone House, Berry Hill Industrial Estate, Droitwich, WR9 9AS, UK

Abstract

Expanded austenite (γ_N), or S-phase, is a special phase of low-temperature nitrided austenite containing highly super-saturated nitrogen in the form of heterogeneous Cr-N nano-clusters. A nitrided layer of single phase γ_N is known to provide austenitic stainless steel with combined high hardness, good wear resistance and superior corrosion resistance. This paper reports recent experiments on a comparative study of the sliding wear properties and wear mechanisms of nitrided austenite stainless steel AISI 316, with a special attention paid on worn surface structural evolutions induced by frictional heating and sliding deformation. The samples were prepared by DC pulsed plasma nitriding treatments of various time at a fixed power. Knoop micro-indentation has revealed hardening behaviour of the nitrided samples. The reciprocating ball-on-disc sliding wear and friction properties were investigated at ambient environment conditions using an alumina counterpart ball. The worn surfaces have been analysed by XRD, FEG-SEM and EDX to show wear induced changes in the crystalline characteristics and the wear mechanisms of tribo-oxidation, cracking, abrasive wear and ploughing deformation. Moreover, longitudinal cross-sectional foils of

Download English Version:

<https://daneshyari.com/en/article/4986610>

Download Persian Version:

<https://daneshyari.com/article/4986610>

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