

## Accepted Manuscript

Liquid phase surface alloying of a nickel aluminum bronze alloy with titanium

M. Heydarzadeh Sohi, S.M.H. Hojjatzadeh, A. Khodayar, A. Amadeh



PII: S0257-8972(17)30706-5  
DOI: doi: [10.1016/j.surfcoat.2017.07.019](https://doi.org/10.1016/j.surfcoat.2017.07.019)  
Reference: SCT 22503  
To appear in: *Surface & Coatings Technology*  
Received date: 12 January 2017  
Revised date: 28 June 2017  
Accepted date: 6 July 2017

Please cite this article as: M. Heydarzadeh Sohi, S.M.H. Hojjatzadeh, A. Khodayar, A. Amadeh, Liquid phase surface alloying of a nickel aluminum bronze alloy with titanium, *Surface & Coatings Technology* (2017), doi: [10.1016/j.surfcoat.2017.07.019](https://doi.org/10.1016/j.surfcoat.2017.07.019)

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.

## Liquid phase surface alloying of a nickel aluminum bronze alloy with titanium

*M. Heydarzadeh Sohi<sup>a</sup>, S. M. H. Hojjatzadeh<sup>b\*</sup>, A. Khodayar<sup>c</sup>, A. Amadeh<sup>a</sup>*

<sup>a</sup> *School of Metallurgy and Materials Engineering, College of Engineering, University of Tehran, Tehran, Iran*

<sup>b</sup> *Department of Mechanical and Aerospace Engineering, Missouri University of Science and Technology, Rolla, MO, USA*

<sup>c</sup> *Department of Welding, Science and Research Branch, Azad University, Tehran, Iran*

### Abstract

In this study, liquid phase surface treatment of a nickel-aluminum bronze (NAB) substrate was performed using tungsten inert gas (TIG) surface melting and alloying. The morphology, microstructure, microhardness, and wear behavior of the surface treated layers were studied. The hardness values of the surface-melted and titanium-alloyed specimens were respectively 1.5 and 3 times higher than that of the untreated NAB substrate. The wear rates of the surface-melted and titanium-alloyed specimens were also reduced respectively by 25% and 65% as compared with that of the untreated NAB substrate. The enhancement in microhardness and wear resistance of the alloyed layer was found to be due to solid solution hardening and formation of intermetallic compounds, including  $\text{Cu}_4\text{Ti}_3$  and  $\text{AlTi}_3$ .

Keywords: nickel aluminum bronze; surface melting; surface alloying; wear

---

\* Corresponding author. Tel: +1 573 4651898, e-mail address: sh7z7@mst.edu

Download English Version:

<https://daneshyari.com/en/article/5464854>

Download Persian Version:

<https://daneshyari.com/article/5464854>

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