

Accepted Manuscript

Title: Characterization of hard coatings produced by laser cladding using laser-induced breakdown spectroscopy technique

Author: J.A. Varela J.M. Amado M.J. Tobar M.P. Mateo A. Yañez G. Nicolas



PII: S0169-4332(15)00049-5
DOI: <http://dx.doi.org/doi:10.1016/j.apsusc.2015.01.037>
Reference: APSUSC 29473

To appear in: *APSUSC*

Received date: 15-7-2014
Revised date: 16-12-2014
Accepted date: 5-1-2015

Please cite this article as: J.A. Varela, J.M. Amado, M.J. Tobar, M.P. Mateo, A. Yañez, G. Nicolas, Characterization of hard coatings produced by laser cladding using laser-induced breakdown spectroscopy technique, *Applied Surface Science* (2015), <http://dx.doi.org/10.1016/j.apsusc.2015.01.037>

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.

Characterization of hard coatings produced by laser cladding using laser-induced breakdown spectroscopy technique

J.A. Varela, J.M. Amado, M.J. Tobar, M.P. Mateo, A. Yañez, G. Nicolas

Universidad de A Coruña, Dpto. Ingeniería Industrial II, Laser Applications Laboratory,
C/ Mendizabal s/n, 15403 Ferrol, Spain,

Tel.: +34 981337400x3274; fax: +34 981337410, gines@udc.es

Abstract

Protective coatings with a high abrasive wear resistance can be obtained from powders by laser cladding technique, in order to extend the service life of some industrial components. In this work, laser clad layers of self-fluxing NiCrBSi alloy powder mixed with WC powder have been produced on stainless steel substrates of austenitic type (AISI 304) in a first step and then chemically characterized by laser-induced breakdown spectroscopy (LIBS) technique. With the suitable laser processing parameters (mainly output power, beam scan speed and flow rate) and powders mixture proportions between WC ceramics and NiCrBSi alloys, dense pore free layers have been obtained on single tracks and on large areas with overlapped tracks. The results achieved by LIBS technique and applied for the first time to the analysis of this type of samples of laser clads provided the chemical composition of the coatings tungsten carbides in metal alloy matrix. Different measurement modes (multiple point analyses, depth profiles and chemical maps) have been employed, demonstrating the usefulness of LIBS technique for the characterization of laser clads based on ~~cermets~~ hardfacing alloys. The behavior of hardness can be explained by LIBS maps which evidenced the partial dilution of some WC spheres in the coating.

Download English Version:

<https://daneshyari.com/en/article/5358593>

Download Persian Version:

<https://daneshyari.com/article/5358593>

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