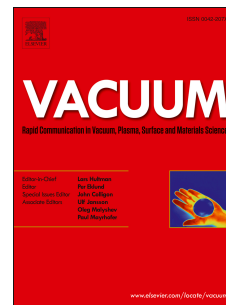


Accepted Manuscript

Structure and properties of coating obtained by Chemical Vapour Deposition with the laser microstructuring

D. Pakuła, M. Staszuk, M. Dziekońska, P. Kožmín, A. Čermák



PII: S0042-207X(18)30305-1

DOI: [10.1016/j.vacuum.2018.03.037](https://doi.org/10.1016/j.vacuum.2018.03.037)

Reference: VAC 7880

To appear in: *Vacuum*

Received Date: 28 February 2018

Revised Date: 20 March 2018

Accepted Date: 21 March 2018

Please cite this article as: Pakuła D, Staszuk M, Dziekońska M, Kožmín P, Čermák A, Structure and properties of coating obtained by Chemical Vapour Deposition with the laser microstructuring, *Vacuum* (2018), doi: 10.1016/j.vacuum.2018.03.037.

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.

Structure and properties of coating obtained by Chemical Vapour Deposition with the laser microstructuring

D. Pakuła^{1,*}, M. Staszuk¹, M. Dziekońska¹, P. Kožmín², A. Čermák²

¹Silesian University of Technology, Institute of Engineering Materials and Biomaterials,
Konarskiego Street 18A, 44-100 Gliwice, Poland

²HOFMEISTER s.r.o, Daimlerova 9, 301 00 Pilsen, Czech Republic

*Corresponding author. E-mail address: daniel.pakula@polsl.pl

ABSTRACT

The aim of this work is to present the effect of synergy interaction hybrid surface treatment of tool ceramics using methods of CVD chemical coating deposition and selective laser texturing on the structure and properties of obtained hybrid surface layer. Comprehensive research results in scanning electron microscopy (SEM), morphology with atomic force microscope (AFM) and confocal microscopy as well as chemical composition of produced coatings with EDS scattered energy spectrometer are presented. In addition, X-ray analysis, including phase composition tests (in the Bragg-Brentano system, in the geometry of a fixed angle of incidence, SKP) was performed. Exploitative properties, including adhesion with the "scratch test" method, wear resistance using the "pin on disc" method, roughness were also tested. As a result of the research, it was found that the creation of a hybrid layer of the CVD coating / laser texturing on the tool ceramics contributes to the improvement of the usable properties of the tested material.

Keywords: CVD; Sialon tool ceramics; Laser texturing; LIPSS

1. INTRODUCTION

The high durability of tool materials has a significant impact on the cost of production and the quality of the products. High machining requirements for hard- machining materials such as cast iron, nickel or titanium alloys and the requirements for surface smoothness and dimensional tolerance of the products determine the search for innovative solutions in the area of surface engineering of tool materials [1].

Attention!: "Paper presented at 10th Symposium on Vacuum based Science and Technology".

Download English Version:

<https://daneshyari.com/en/article/8044266>

Download Persian Version:

<https://daneshyari.com/article/8044266>

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