

## Accepted Manuscript

TiO<sub>2</sub>-based decorative coatings deposited on the AISI 316L stainless steel and glass using an industrial scale magnetron

L. Skowronski, A.A. Wachowiak, K. Zdunek, M. Trzcinski, M.K. Naparty



PII: S0040-6090(17)30049-4  
DOI: doi: [10.1016/j.tsf.2017.01.039](https://doi.org/10.1016/j.tsf.2017.01.039)  
Reference: TSF 35751

To appear in: *Thin Solid Films*

Received date: 23 August 2016  
Revised date: 17 December 2016  
Accepted date: 21 January 2017

Please cite this article as: L. Skowronski, A.A. Wachowiak, K. Zdunek, M. Trzcinski, M.K. Naparty, TiO<sub>2</sub>-based decorative coatings deposited on the AISI 316L stainless steel and glass using an industrial scale magnetron. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Tsf(2017), doi: [10.1016/j.tsf.2017.01.039](https://doi.org/10.1016/j.tsf.2017.01.039)

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.

## TiO<sub>2</sub> - based decorative coatings deposited on the AISI 316L stainless steel and glass using an industrial scale magnetron

L. Skowronski<sup>1,c</sup>, A.A. Wachowiak<sup>1</sup>, K. Zdunek<sup>2</sup>, M. Trzcinski<sup>1</sup>, M.K. Naparty<sup>1</sup>

<sup>1</sup> Institute of Mathematics and Physics, UTP University of Science and Technology, Kaliskiego 7, 85-796 Bydgoszcz, Poland

<sup>2</sup> Warsaw University of Technology, Faculty of Materials Science, Woloska 141, 02-507 Warsaw, Poland

Corresponding author: Lukasz Skowronski: [lukasz.skowronski@utp.edu.pl](mailto:lukasz.skowronski@utp.edu.pl)

### Abstract

This paper presents a study of optical and microstructural properties of the TiO<sub>2</sub>/316L, TiO<sub>2</sub>/Ti/316L and TiO<sub>2</sub>/Ti/glass interference systems obtained by gas injection magnetron sputtering technique (GIMS) employing a commercial magnetron line. The samples are examined by means of spectrophotometry, spectroscopic ellipsometry, confocal optical microscopy, x-ray photoelectron spectroscopy and atomic force microscopy. The investigation is completed by colorimetric analysis. Our analysis shows the significant differences in the color of samples with a TiO<sub>2</sub> layer with the thickness of this layer in the range 30-35 nm.

### Keyword

decorative coatings; titanium dioxide; magnetron sputtering; GIMS; CIE Lab color space; optical properties

### 1. Introduction

Titanium dioxide has found many high-tech applications in various fields, including dye-sensitized solar cells, optical filters, antireflection and wear coatings as well as electrochromic devices [1-6]. Yet another application of TiO<sub>2</sub> is using it as a decorative coating in architecture, automotive industry and jewelry [7-10]. In the visible spectral range, the titanium dioxide is a non-absorbing material. The

Download English Version:

<https://daneshyari.com/en/article/5466249>

Download Persian Version:

<https://daneshyari.com/article/5466249>

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