

Accepted Manuscript

Dual functionality anti-reflection and biocidal coatings

Heather M. Yates, Paul Sheel, John L. Hodgkinson, Michael E.A. Warwick, Souad O. Elfakhri, Howard A. Foster



PII: S0257-8972(17)30568-6
DOI: doi: [10.1016/j.surfcoat.2017.05.077](https://doi.org/10.1016/j.surfcoat.2017.05.077)
Reference: SCT 22396
To appear in: *Surface & Coatings Technology*
Received date: 24 January 2017
Revised date: 27 April 2017
Accepted date: 26 May 2017

Please cite this article as: Heather M. Yates, Paul Sheel, John L. Hodgkinson, Michael E.A. Warwick, Souad O. Elfakhri, Howard A. Foster , Dual functionality anti-reflection and biocidal coatings, *Surface & Coatings Technology* (2017), doi: [10.1016/j.surfcoat.2017.05.077](https://doi.org/10.1016/j.surfcoat.2017.05.077)

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.

Dual functionality anti-reflection and biocidal coatings

Heather M. Yates^{a*}, Paul Sheel^a, John L. Hodgkinson^a, Michael E.A. Warwick^a, Souad O. Elfakhri^b, Howard A. Foster^b

^a Materials and Physics Research Centre, University of Salford, M5 4WT Salford, UK.

^b Biomedical Research Centre, School of Environment and Life Sciences, University of Salford, Salford, M5 4WT, UK.

*Correspondence: H.M.Yates@salford.ac.uk, phone +44 (0)161 295 3115, fax +44 (0)161 295 5575

Abstract

A thin film combination of anti-reflection (AR) and biocidal properties would be of particular interest to reduce the transfer of infection and improve readability of public high use touch screens. In this paper we describe the development of a dual functionality film of silica (AR) and copper oxide (biocidal). Deposition was via flame assisted chemical vapour deposition (FACVD) which has the advantages of being a cost efficient atmospheric pressure technique enabling use of non-volatile precursors and that no closed reaction cell is required so making it ideal for integration into industrial production lines. The resulting films were characterized by a range of techniques including optical spectroscopy, electron microscope and X-ray fluorescence. Biocidal behavior was tested by determining the kill rate of *Escherichia coli*.

A 3 layer stack on glass of silica/copper oxide/silica had better adhesion and lower reflection than a comparable 2 layer stack. This multilayer film led to a > 2% drop in reflection from that of uncoated glass, similar to that of silica only film. In addition, showed a > 6 log₁₀ kill between 6 and 24 h for as deposited and annealed samples.

Keywords: biocidal, anti-reflection, APCVD, Silica, copper oxide

Download English Version:

<https://daneshyari.com/en/article/5465077>

Download Persian Version:

<https://daneshyari.com/article/5465077>

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