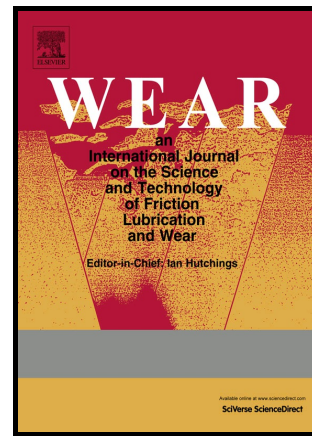


# Author's Accepted Manuscript

New assessment criteria for durability evaluation of highly repellent surfaces

Anna Wojdyła, Alan Taylor, Géraldine Durand, Ian W. Boyd



PII: S0043-1648(17)30762-7  
DOI: <http://dx.doi.org/10.1016/j.wear.2017.07.001>  
Reference: WEA102198

To appear in: *Wear*

Received date: 8 May 2017  
Revised date: 30 June 2017  
Accepted date: 1 July 2017

Cite this article as: Anna Wojdyła, Alan Taylor, Géraldine Durand and Ian W. Boyd, New assessment criteria for durability evaluation of highly repellent surfaces, *Wear*, <http://dx.doi.org/10.1016/j.wear.2017.07.001>

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 a review of the resulting galley proof before it is published in its final citable 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.

# New assessment criteria for durability evaluation of highly repellent surfaces

Anna Wojdyla<sup>1,2,\*</sup>, Alan Taylor<sup>2</sup>, Géraldine Durand<sup>2,3</sup>, Ian W. Boyd<sup>1</sup>

<sup>1</sup>Brunel University, Kingston Lane, Uxbridge, UB8 3PH, UK

<sup>2</sup>TWI Ltd., Cambridge, Great Abington, CB21 6AL, UK

<sup>3</sup>London South Bank University, 103 Borough Road, London, SE1 0AA

\*Granta Park, Cambridge CB21 6AL, UK; Tel.: +44-1223-899511. anna.wojdyla-cieslak@twi.co.uk

## Abstract

Highly repellent surfaces are constantly being sought in a number of industrial sectors, where accumulation of unwanted material (ice, debris, insects etc...) can cause serious detriment of function. Conventional highly repellent materials do not have the superlative repellence of some of the latest innovations in superhydrophobic/oleophobic coatings, but do have the advantage of durability in many applications. Emerging technologies for nanostructured coatings have significant potential for the development of very high performance surfaces. However, the lack of retention of functional capability is widely recognized as the primary barrier to industrial adoption. The need for a nanostructured hierarchy and low surface energy is widely accepted as providing the underpinning capability for superhydrophobicity/oleophobicity. However, the lack of understanding of the wear mechanism in such coatings and lack of recognized test methodologies enables that comparison of various approaches to achieve repellence hinders effective progress of effective coatings and surface treatments.

In the present work, new assessment criteria that allow the performance characteristics of repellent coatings to be compared have been established and implemented. Fundamental to these new criteria is a determination of the repellence, and the retention of the repellence when exposed to mechanical damage. The focus to date has been on abrasive and adhesive wear; nonetheless, versatility of this new classification system allows adapting it for the other forms of coatings damage. Novel approach for evaluation of repellent surfaces gives basics for the development of global figure of merit that helps the progress in development of highly repellent surfaces.

## Graphical abstract

Figure of merit of selected easy clean coatings (average of initial wettability and retention ratio performance indices  $(PI1a+PI3)/2$  versus abrasion resistance performance index  $PI2$ )

Download English Version:

<https://daneshyari.com/en/article/4986369>

Download Persian Version:

<https://daneshyari.com/article/4986369>

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