

Innovative Fabrication Techniques for Flexible Surface Nanostructures on Industrial Objects of Large Scale and Complex Shapes

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Abstract

Surface nanostructures play a crucial role in obtaining “superhydrophobic” properties because only hydrophobic-native, nano-structured materials ensure “superhydrophobicity”.

Nowadays, a very cost-effective approach for the large-volume manufacturing of self-cleaning objects is based on the use of coatings. Spraying or printing technologies allow the object to be coated with layers of a suitable hydrophobic, nano-structured material. Although simple, this method unfortunately limits the achievement of many desirable properties (i.e. mechanical, chemical, tribological, ...) which ultimately depend on the coating material rather than on the object itself.

This paper describes two alternative approaches to nano-structuring surfaces and obtain superhydrophobic structure and their applicability is evaluated.

By dedicated projects, the method could be tested for a range of possible applications and evaluated in terms of economical sustainability and environmental compatibility