

Characterization of Nano Coefficient of Friction through Lfm of Superhydrophobic/Oleophobic Coatings Applied on 316l Ss

Authors : Hamza Shams, Sajid Saleem, Bilal A. Siddiqui

Abstract : This paper investigates the coefficient of friction at nano-levels of commercially available superhydrophobic/oleophobic coatings when applied over 316L SS. 316L Stainless Steel or Marine Stainless Steel has been selected for its widespread uses in structures, marine and biomedical applications. The coatings were investigated in harsh sand-storm and sea water environments. The particle size of the sand during the procedure was carefully selected to simulate sand-storm conditions. Sand speed during the procedure was carefully modulated to simulate actual wind speed during a sand-storm. Sample preparation was carried out using prescribed methodology by the coating manufacturer. The coating's adhesion and thickness was verified before and after the experiment with the use of Scanning Electron Microscopy (SEM). The value for nano-level coefficient of friction has been determined using Lateral Force Microscopy (LFM). The analysis has been used to formulate a value of friction coefficient which in turn is associative of the amount of wear the coating can bear before the exposure of the base substrate to the harsh environment. The analysis aims to validate the coefficient of friction value as marketed by the coating manufacturers and more importantly test the coating in real-life applications to justify its use. It is expected that the coating would resist exposure to the harsh environment for a considerable amount of time. Further, it would prevent the sample from getting corroded in the process.

Keywords : 316L SS, scanning electron microscopy, lateral force microscopy, marine stainless steel, oleophobic coating, superhydrophobic coating

Conference Title : ICMSE 2016 : International Conference on Materials Science and Engineering

Conference Location : Paris, France

Conference Dates : January 21-22, 2016