Development of novel nano-composite coatings for tribological applications

Professor Zulfiqar A Khan

Professor of Design, Engineering & Computing

NanoCorr, Energy & Modelling (NCEM) Research Group

Bournemouth University, United Kingdom

Email: zkhan@bournemouth.ac.uk

**Abstract**

This paper presents experimental techniques in terms of developing wear-corrosion resistant nano coatings. Pulse coating techniques are presented and discussed including the best possible formulation of electrolyte composition. An alternative technique of developing thin coating by using magnetron sputtering is also presented. Both techniques have been compared in terms of crystalline structure, grain sizes and lattice parameters. A detailed constituent composition of these nano coatings are discussed in this paper. Post electrochemical experimentation surface analyses are presented and discussed for all types of thin coatings. Interferometry results of Peak Surface Height (PSH) and Average Surface Roughness (Ra) before and after corrosion have been analysed to interpret the influence of electrochemical reaction and resistivity of the above coatings. A mechanistic analysis is presented and the development of novel Khan-Nazir model has been discussed. This paper also presents prediction and prognostic techniques applied to coating failures.

Keywords: Nanocoating, Wear, Corrosion, Modelling, Simulation, Condition monitoring

**Biography**

[Professor Zulfiqar Khan](https://staffprofiles.bournemouth.ac.uk/display/zkhan) is leading NanoCorr, Energy and Modelling (NCEM) research group. He has developed multidisciplinary research in corrosion, condition monitoring, nano-coating, heat transfer and mathematical modelling through major industrial and International HEI funding. He has successfully supervised 12 PhD research projects to completion. He is supervising 3 PhD students and one Post-Doctoral Research Assistants. He has over 120 publications including peer reviewed journal papers, high profile international conference papers, a book and book chapters.