

Paper No: PU-SOE- Mech - 28

Evaluation of Slurry Erosive Wear Performance of Plasma-Sprayed Flyash-TiO₂ Composite Coatings

R. Keshavamurthy, B. E. Naveena, **C. S. Ramesh** & M. R. Haseebuddin

Department of Mechanical Engineering and Dean, Research & Innovation, Presidency University, Bangalore, India

Abstract

The present research is intended at the development of plasma-sprayed coatings of Flyash-TiO₂ on the Al-6061 substrate. The coatings were developed under optimum process conditions and subjected to evaluate the slurry erosive wear characteristics in 3.5% NaCl solution with varying levels of operating factors such as slurry concentration, slurry rotation speed, impinging particle size, and test duration. Under identical test conditions, the developed coatings demonstrate a 52% enhancement in slurry erosive wear resistance compared to the uncoated Al-6061 alloy. The Scanning Electron Microscopy (SEM) and Confocal Microscopy (CM) were used to examine the eroded surfaces of coated and uncoated specimens under varying test conditions. It is identified that severe plastic flow is observed in uncoated alloy, and curtailed damage of surfaces in the case of coated substrates confirms superior slurry erosion resistance in coatings compared to uncoated ones. Six-fold enhancements in the surface hardness and corrosion resistance are the main reasons for improved slurry erosive wear performance of coatings compared to alloy.

Keywords:

Plasma Spray, Flyash, Titania, Al-6061, Slurry erosive wear

Publication Details:

Journal Name	Vol.	Month & Year	Page No.	Publisher	Scimago Ranking
Journal of Bio and Tribo Corrosion	7	May, 2021	NA	Springer International Publishing AG	Q2