PAPER ID:3

TRIBOLOGICAL BEHAVIOUR OF SILICON CARBIDE REINFORCED AA2024 COMPOSITES

A. A. KRISHNA VAMSI[1], S. DHEERAJ KUMAR[2], and Y. N. V. SAI RAM[3]

[1] Graduate, RVR&JC College of Engineering, India

[2] Graduate, RVR&JC College of Engineering, India

[3]Assistant Professor, RVR&JC College of Engineering, India

ABSTRACT

Development of metal matrix composites (MMC's) has become an important area of study interest in material science, because all design parameters may not be met by a single material. Composites are produced with the combination of two or more natural or artificial materials to maximize their useful properties and minimize their weakness. The SiC particulate reinforced aluminium composites are attractive materials for aerospace and automotive structural components due to high specific strength and specific modulus with high thermal stability. However, the SiC particulate reinforced composites generally have the major drawback of poor formability because of low ductility and poor fracture toughness in comparison with metal alloys. Therefore, the enhancement of ductility in metal matrix composites remains as a major obstacle to the expansion of the industrial application. In this paper aluminium-silicon carbide composites are synthesized by varying the amount of silicon carbide reinforcement (0%, 4%, 8% and 12%) in the AA2024 matrix by stir casting method. The tribological properties of MMC's like wear behavior and corrosion tests are presented. Sliding tests were performed on a pin-on disk apparatus under different speeds. It was found that the reinforced SiC could effectively reduce the wear, especially under higher normal loading conditions. Corrosion test was taken in 3.5% of salt solution for different periods of time are observed. The hardness test was performed on Vickers Hardness equipment. The micro structural changes in the composites are analyzed by using Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray (EDX). It was fairly observed that as the amount of silicon carbide in AA2024 matrix decreases wear rate for 12%wt., three times that of the pure alloy, corrosive resistance is high for 12%wt., and the hardness of composite is increased by 1.5 than the pure alloy.

Keywords: Silicon Carbide, Vicker's Hardness Test, SEM, Tribological Behaviour, AA2024