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**Influence of Alumina Percentage on Microstructure, Mechanical and Wear Behaviour of 2014 Aluminium-Alumina Metal Matrix Composites**

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**Abstract**

In this study, Al2014 matrix alloy reinforced with 9, 12 and 15 wt. % of Al2O3 (88µm) particulate by novel two stage melt stirring (stir casting) practice is used to synthesize, describe and analyze mechanical and wear behavior. Level of ceramic Al2O3 is maintained at 9, 12 and 15 wt. % additionally. For each wt. %, the preheated (i.e., 250°C) Al2O3 particles were introduced in to the molten Al2014 alloy in steps of two. Produced composite is examined by SEM and XRD analysis in support of investigation for the microstructure and chemical components. Characterization of mechanical and wear studies of cast Al2014 matrix alloy and Al2014-Al2O3 particulate composites were analyzed. With increase in wt. % of Al2O3 particles, it has been observed that there is an improvement in the hardness and tensile behaviour of the prepared composites meanwhile; decrease in percentage elongation is also observed. Also, the wear rate of all composites prepared decreases with increase in sliding distance while the wear rate of the composites prepared increases with increase in load. By using Scanning Electron Microscope (SEM) the fractured surface and diverse wear mechanism for different test states of various compositions were examined.

**Keywords:**

Al2014 alloy Al2O3 particulates Mechanical behaviour Fractography Wear Worn morphology

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