

# **PREPARATION AND EVALUATION OF MECHANICAL AND WEAR PROPERTIES OF 6061AL REINFORCED WITH GRAPHITE PARTICULATE METAL MATRIX COMPOSITE**

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## **ABSTRACT**

Aluminium alloy Metal Matrix Composites (MMCs) are gaining wide spread acceptance for automobile, industrial, and aerospace applications because of their low density, high strength and good structural rigidity. Several technical challenges exist with casting technology. Achieving a uniform distribution of reinforcement within the matrix is one such challenge, which affects directly on the properties and quality of composite. In the present work an attempt has been made to synthesize Al6061-Graphite particulate metal matrix composites by liquid metallurgy route (stir casting technique). The addition level of reinforcement is being varied from 6-12wt% in step of 3wt%. For each composite, reinforcement particles were preheated to a temperature of 200<sup>0</sup>C and then dispersed in three steps into the vortex of molten Al6061Alloy to improve wettability and distribution. Microstructural analysis was carried out for the above prepared composites by taking specimens from central portion of the casting to ensure homogeneous distribution of particles. Micro-hardness, tensile properties and wear properties of the composites were prepared as per the standards. Microstructural characterization revealed fairly uniform distribution in the matrix. The Micro-Vickers hardness of the composite was found to decrease with increase in filler content in the composite. The tensile strength of the composites was also found to increase confirming the dispersed graphite in Al6061 alloy contributed in enhancing the tensile strength of the composites. The wear resistance of the Al6061-Graphite composite found to decrease up to 6wt% but thereafter tends to increase.

**KEY WORDS:** 6061Al, MMC's, Graphite particulates, stir-casting