

Experimental Investigation of Mechanical and Tribological Behavior of Graphite Reinforced Aluminum 6061 MMCs

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^bCentral Research Facility Centre, National Institute of Technology Srinagar, India.**Keywords:**MMCs
Graphite
COF
Tribological testing**ABSTRACT**

The purpose of this work is to investigate the mechanical and tribological characteristics of Al 6061 Metal Matrix Composites (MMCs) reinforced with graphite. Al6061 MMCs were made using the stir casting method with graphite weight percentages of 5%, 10%, and 15%. The composite's microstructural analysis showed that the reinforcement in the matrix material was distributed uniformly. The microhardness of the aluminum (Al) MMCs decreased with the increase in Graphite content. In a dry sliding environment, tribological investigations were conducted with a ball-on-disk tribometer. The findings indicate a tendency for the coefficient of friction (COF) and wear rate to decrease as the weight percentage of graphite increases. When compared to the base composition, the composition containing 5% graphite at 25N exhibits the lowest wear rate and COF value.

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Received: 5 October 2024

Revised: 20 November 2024

Accepted: 21 December 2024



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1. INTRODUCTION

MMCs have been investigated recently as viable engineering materials [1]. In MMCS, multiple distinct phases (one being a metallic phase) coexist and are evenly dispersed to give some critical qualities that can't be matched by any of the individual phases [2, 3]. MMCS are used in devices such as electronics, toys, military equipment, automobiles, aerospace etc. Al is the most common matrix for MMCs. Al alloys are

both lightweight and strong. Their mechanical properties are enhanced by precipitation strengthening and solid solution strengthening. Al matrix composites (AMC) were studied effectively as early as the 1920s, and are now used extensively [4]. Al MMC provides an outstanding critical location or combination of grades which is unmatched by any other traditional substance. Al MMCs have traditionally been appreciated and employed in a wide range of structural, non-structural, as