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# Eco-friendly mono-layered PTFE blended polymer composites for dry sliding tribo - systems

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## Abstract

Two different composite material systems were designed and studied i.e., basalt fiber/vinyl ester composite (non-layered) and the other is PTFE (10 wt %) blended basalt fiber/vinyl ester composite (layered). The tribo-test was performed for the constant pressure and velocity in a flat-on-flat configuration. The characterization techniques such as FTIR and XRD were performed. Nevertheless, increase in thermal conductivity of 0.187 W/m-k was noticed for layered composites. Tribo-test revealed the average static and dynamic coefficient of friction as 0.19 and 0.12 respectively. To understand the failure mechanism of sliding wear, the morphology of worn out composite surface and counterpart was analyzed using SEM analysis. This layered composite can be a alternative to polyamide which is used in the elevator guide rails.

Key Words: Basalt fiber; eco-friendly composite; PTFE; friction

## 1. Introduction

The thrust of designing innovative tribo material to address the service life and energy consumption from friction loss has gained serious interests among the tribologists [1,2]. Development of plain bearing using novel tribo-composites with ecological benefits is always appreciable in the field of marine, aerospace and automotive applications [3]. These applications require materials with low friction and increased mechanical strength. Numerous works have

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