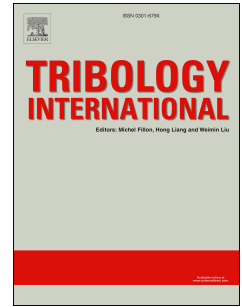


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Performance Assessment of Hybrid Fibers Reinforced Friction Composites under Dry Sliding Conditions

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Abstract: The purpose of the present work is to study and compare the physical, mechanical and tribological properties of hybrid fibers reinforced friction composites with steel fibre, rock wool fibre and glass fibre. The friction composites were fabricated by a compression molder equipment and tested using a constant-speed friction test machine. The experiment results show that recovery ratio of specimen FM9 (7.64 wt.% glass fibres, 7.64 wt.% rock wool fibres and 12.36 wt.% steel fibres) was 89% and its fade ratio was only 28%, indicating the excellent properties of fade resistance and recovery. The friction coefficients of all specimens decreased with the increase of test temperature. Specimen FM7 containing 7.64 wt.% glass fibres, 20 wt.% rock wool fibres and 7.64 wt.% steel fibres had the lowest wear rate ($0.379 \times 10^{-7} \text{ cm}^3(\text{N}\cdot\text{m})^{-1}$ at 350 °C), followed by specimens FM9 and FM5. The wear mechanism of the tested specimens was discussed based on the worn surfaces morphologies obtained using the Scanning Electron Microscopy (SEM). Specimens FM7 ($R_a = 0.719 \mu\text{m}$) and FM9 ($R_a = 0.731 \mu\text{m}$) show a relatively smooth surface in comparison to that of other specimens and have relatively smaller roughness, and they yielded the highest wear resistance performance.

Keywords: friction composite, steel fibre, rock wool fibre, glass fibre, recovery, wears resistance

1 Introduction

Friction composites are widely applied in a number of components starting from friction gearings and clutches to automobile brake system[1-3] with the function to be able to decelerate and immobilize the working parts or machines quickly and safely[4].

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