**Paper No: PU-SOE-MECH- 12**

**Dry Sliding-Friction and Wear Behavior of Hot-Extruded Al6061 / Si3N4/ Cf Hybrid Metal Matrix Composite**

**C. S. Ramesha,** Saleem Khanb, Zulfiqar A. Khanc

a.Research & Innovations and Department of Mechanical Engineering, School of Engineering, Presidency University, Bangalore, Karnataka, 560064, India

b.Department of Mechanical Engineering, K S Institute of Technology, Raghuvanahalli, Kanakapura Main Road, Bengaluru, 5600109, India

c.Department of Design & Engineering, NanoCorr Energy & Modelling Research Group, Bournemouth University, Dorset, UK

**Abstract**

The effects of reinforcement addition and hot extrusion on the microstructures, micro hardness, friction, and wear behavior of aluminum (Al) hybrid composite were investigated. Al6061 dispersed with electroless nickel-coated Si3N4 (6 wt.%) and copper-coated carbon fiber (Cf) (1 wt.%) hybrid composites was developed through stir casting followed by hot extrusion. Optical micro-structural studies confirmed that the size of reinforcements decreased, and their orientations were in the extrusion direction. The decrease in the grain size (29%) of hybrid composites was larger than that in the grain size of matrix alloys under hot-extruded conditions. The synthesized hot-extruded Al6061 hybrid composite exhibited a lower coefficient of friction (51%) and high wear resistance (39%) compared with the hot-extruded Al6061 base alloy.

**Keywords:**

Carbon fibers, Coefficient of friction (COF), Hot extrusion, Hybrid composite, Si3N4, Wear rates

**Publication Details:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Journal Name** | **Vol.** | **Month & Year** | **Page No.** | **Publisher** | **Scimago Ranking** |
| [Journal of Materials Engineering and Performance](https://www.springerprofessional.de/en/journal-of-materials-engineering-and-performance/5990498) | **-** | July, 2020 | Online publication | Springer | Q2 |