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Fabrication and Micro structural analysis of LM13/B₄C/Gr Hybrid Metal Matix Composite

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Abstract: Due to the inimitable sliding lubricating effect of graphite, aluminum/graphite composites are utilized as self-lubricating materials. The adverse effect of graphite on mechanical properties of composites is the biggest problem for utilizing aluminum graphite composites in industrial elements. Superior tribological behavior compared to aluminum alloys or Al/Gr composites can be attained using hybrid aluminium matrix composites which incorporate ceramic particles and graphite particles. Solid lubricant property of graphite and load bearing ability of ceramic particles are added beneficial of hybrid composites accompanied by declining wear rate. This work deals with the fabrication of the LM13 reinforced with Boron carbide and Graphite particulates by Stir Casting method. Addition of hard reinforcements such as Boron carbide raises strength, hardness, and wear resistance of the composites. AMCs reinforced with Graphite particles have better wear characteristics resulting reduced wear because of formation of a thin layer of Graphite particles, which prevents metal to metal contact of the sliding surfaces. Composite materials were fabricated by reinforcing boron carbide 3%, 5%, 7% and graphite at 2% with the LM13 matrix respectively. Sliding components such as Piston, Bearings, Sheaves, Gears and Pulleys are mainly focused.

Keywords: Boron carbide, Graphite, Hybrid Metal Matrix composite.

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