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Investigation of Mechanical Properties of Aluminum Reinforcement with SiC Prepared through Stir Casting Technique

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Abstract: *Aluminum metal matrix composites have great corrosion resistance, light weight, and durability. Because of these characteristics, metal matrix composites made of aluminium can be used in a variety of automotive, marine, and aviation applications. The mechanical characteristics, microstructures, and wear properties of silicon carbide metal matrix composite aluminum are investigated in this study. In the current investigation, the matrix was aluminum and the material used for reinforcement was silicon carbide (30 microns). The various compositions involume fraction—100% Al -0%Sic, 98% Al -2%Sic, 96% Al-4%Sic and 94%Al-6%Sic were selected. Stir casting was utilized in the fabrication process. Analysis was done on the produced composites microstructures, Vickers hardness, tensile strength, and wear behaviour. The hardness, tensile strength, and weight % of an aluminum (Al) matrix were all improved by the addition of silicon carbide (SiC) reinforcements, as indicated by the results. By observing the microstructure, silicon carbide (SiC) particle collection and The Al matrix's non-homogeneous distribution was verified. In aluminum matrix composites, porosities were seen in the microstructures and increased as the weight percentage of silicon carbide (SiC) reinforcements increased. A pin-on-disc wear test discovered that the Al matrix had been reinforced with silicon carbide (SiC) particles, improving wear rate.*

Keywords: Metal Matrix Composite (MMC), Aluminium Alloy (Al-6061), Silicon Carbide (SiC),Stir Casting, Mechanical Properties, Tensile Strength, Compression Strength, Hardness, Microstructure

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