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Wear Characteristics of Al Based Composites Fabricated with Nano Silicon Carbide Particles

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Abstract : In the present study, AA7075/SiO2 composites have been fabricated via liquid metallurgy process. Using the degassing process, the wet ability of the molten aluminum alloys increased which improved the bonding between aluminum matrix and reinforcement (SiO2) particles. AA7075 alloy and SiO2 particles were taken as the base matrix and reinforcements, respectively. Then, contents of 2.5 and 5 wt. % of SiO2 subdivisions were added into the AA7075 matrix. To improve wettability and distribution, reinforcement particles were pre-heated to a temperature of 550°C for each composite sample. A uniform distribution of SiO2 particles was observed through the matrix alloy in the microstructural study. A hardened EN32 steel disc as the counter face was used to evaluate the wear rate pin-on-disc, a wear testing machine containing. The results showed that the wear rate of the AA/SiO2 composites was lesser than that of the monolithic AA7075 samples. Finally, The SEM worn surfaces of samples were investigated.

Keywords : Al7075, SiO_2, wear, composites, stir casting
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