

EXPERIMENTAL ANALYSIS OF EFFECT OF CASTING PARAMETERS ON METAL MATRIX COMPOSITE AND WEAR

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Abstract

Cost effect method has been proposed via functionalization of aluminum matrix composites reinforced with titanium di-boride hard particles. A larger volume fraction of these particles can be attained near the wear surface via centrifugal casting. The volume fraction of the heavier titanium di-boride is controlled by inertial forces upon centrifugal processing the semisolid composite. In this study, titanium diboride particles are modeled as cylindrical particles subject to a drag force in a Stoke flow in the liquid aluminum matrix. The equation of motion for the particles under the applied centrifugal forces is solved mathematically assuming a gaussian diameter size distribution with a spatial uniform random distribution of particles in the sample. From the Parametric studies using the mathematical model, an understanding is developed to control the experimental conditions to obtain an appropriate metal matrix composite by centrifugal casting for high wear resistance applications.

Keywords : Functionally graded aluminum matrix, Centrifugal casting ,Titanium diborides,