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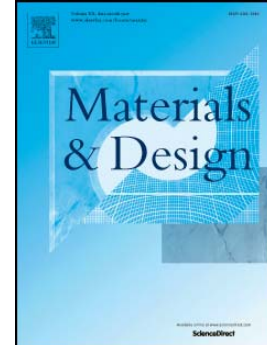
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# Structure and Properties of Modified Compocast Microsilica Reinforced Aluminum Matrix Composite

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## Abstract

A356 aluminium alloy reinforced with 7 wt. % microsilica composites were produced by the three different processing routes viz. liquid metal stir casting followed by gravity casting, compocasting followed by squeeze casting and modified compocasting route and their properties were examined. Microstructure of liquid metal stir cast Al MMC shows agglomeration of particles leading to high porosity level in the developed material. Adopting new route of compocasting followed by squeeze casting process prevent the agglomeration sites with uniform distribution and dispersion of the dispersoids in the matrix metal. Modified compocasting process reduces the segregation of particles in the final composites thus enhancing the mechanical, tribological and corrosion properties of the composites. Superior wear-resistance properties were exhibited by the modified compocast composite compared to the unreinforced squeeze cast alloy and abrasive type wear mechanism was observed in the case of composite. Increasing the sliding speed resulted in the quick evolution of tribolayer and the wear rate of composite gets reduced. Presence of intermetallic phases like  $MgAl_2O_4$ ,  $NaAlSi_3O_8$  and  $KAlSi_3O_8$  has a favorable effect on increased corrosion resistance of the composite. Microsilica particles

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