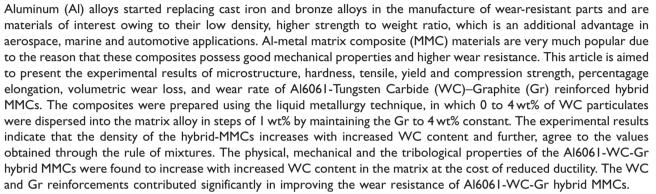
Studies on properties of as-cast Al6061-WC-Gr hybrid MMCs

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Abstract



Keywords

Hybrid metal matrix composites, mechanical properties, dry sliding wear

Introduction

Aluminum alloys are the commonly used matrix materials for the preparation of the Al-based composite materials. Al6061 is heat treatable, highly corrosion resistant and possess excellent extricable and have moderate strength. Al6061 alloy is used in applications like building and construction, high way, automotive, and in marine applications.¹ They are widely used as highspeed rotating or reciprocating mass items such as pistons, connecting rods, drive shafts, brake rotors, and cylinder bores.² Compared with the corresponding monolithic alloys, Al-MMCs are attractive because of their improved strength, stiffness, creep behavior, wear resistance, and low thermal expansion.³ Moreover, they are lightweight and their applications will be greatly expanded in the near future if problems like cost and fabricating are well resolved.

From the recent past there has been several studies on the wear behavior of Al-based hybrid MMCs, which are reinforced with more than one species of reinforcing phases such as Al₂O₃, SiC, C, or Gr, having different forms, such as particle, whisker, long or short fiber. In all the investigations, an improvement in wear resistance has been reported for the hybrid composites as compared to the composites reinforced with a single species. The introduction of a small volume fraction of hard reinforcements into the matrix materials has been reported to improve wear resistance. Researchers observed that the addition of SiC particles to Saffil short fiber reinforced Al-MMCs gives rise to a remarkable improvement in wear resistance. They attributed it to the considerable reduction in the change in

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