

عنوان مقاله:

SYNTHESIS OF FUNCTIONALLY GRADED AL LM۲۵/ZIRCONIA COMPOSITE AND ITS SLIDING WEAR CHARACTERIZATION USING RESPONSE SURFACE METHODOLOGY

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خلاصه مقاله:

Functionally graded aluminium/zirconia metal matrix composite was fabricated using stir casting technique followed by horizontal centrifugal casting process and a hollow cylindrical functionally graded composite (۱۵۰ x ۱۵۰ x ۱۶ mm) was obtained with centrifuging speed of ۱۲۰۰ rpm. The microstructural evaluation and hardness test was carried out on the outer and inner surface of the functionally graded composite at a distance of ۱ and ۱۳ mm from the outer periphery. In Response Surface Methodology, Central Composite Design was applied for designing the experiments and sliding wear test was conducted as per the design using a pin-on-disc tribometer for varying ranges of load, velocity and sliding distance. The model was constructed and its adequacy was checked with confirmation experiments and Analysis of Variance. The microstructural examination and hardness test revealed that the outer surface of FGM had higher hardness due to the presence of particle rich region and the inner surface had lesser hardness since it was a particle depleted region. The wear results showed that wear rate increased upon increase of load and decreased with increase in both velocity and sliding distance. Scanning Electron Microscopy analysis was done on the worn specimens to observe the wear mechanism. It was noted that wear transitioned from mild to severe on increase of load and the outer surface of FGM was found to have greater wear resistance at all conditions.

کلمات کلیدی:

.Aluminium, Functionally graded composite, Zirconia, Response surface methodology, Scanning electron microscope

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