

عنوان مقاله:

Surface Modification of 4032 Aluminium Alloy by Addition of Graphene Oxide via TIG Process and Its Effect on Wear Behavior

محل انتشار:

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خلاصه مقاله:

Aluminium-silicon eutectic alloys are widely applied for the production of automotive piston alloys. As the upper surface of a piston is exposed to combustion, it is prone to major damages. In this study, the surface of an aluminium piston is modified by addition of graphene oxide (GO). The tungsten inert gas (TIG) arc melting was used for surface melting. The effect of the process on the microstructure and wear behavior has been investigated. 1 wt% GO powder was added to the surface of a commercial piston, with the AA 4032 alloy composition. The change in the microstructure of the solidified layer is investigated via light microscopy. Moreover, the pin on disc wear test performed on the samples. The wear surface of the samples is also analyzed by scanning electron microscope. It is found that the addition of the GO changed the wear mechanism. The SEM images revealed that the TIG melting process and the addition of GO powder resulted in a change of the wear mechanism from adhesive wear to abrasive wear. The results showed that surface melting via TIG has a positive effect on the wear properties, which can be improved further by the addition of the GO.

کلمات کلیدی:

Aluminium Piston Alloy, Arc Surface Modification, Tungsten Inert Gas, Graphene Oxide, Wear Mechanism

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