

## Tribological Study of TiC Powder Cladding on 6061 Aluminum Alloy

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**Abstract :** This study reports the improvement in the wear performance of A6061 aluminum alloy clad with mixed powders of titanium carbide (TiC), copper (Cu) and aluminum (Al) using the gas tungsten arc welding (GTAW) method. The wear performance of the A6061 clad layers was evaluated by performing pin-on-disc mode wear test. Experimental results clearly indicate an enhancement in the hardness of the clad layer by about two times that of the A6061 substrate without cladding. Wear test demonstrated a significant improvement in the wear performance of the clad layer when compared with the A6061 substrate without cladding. Moreover, the interface between the clad layer and the A6061 substrate exhibited superior metallurgical bonding. Due to this bonding, the clad layer did not spall during the wear test; as such, massive wear loss was prevented. Additionally, massive oxidized particulate debris was generated on the worn surface during the wear test; this resulted in three-body abrasive wear and reduced the wear behavior of the clad surface.

**Keywords :** GTAW, A6061 aluminum alloy, surface modification, tribological study, TiC powder cladding

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