

Wear Behavior of Grey Cast Iron Coated with Al₂O₃-13TiO₂ and Ni₂₀Cr Using Detonation Spray Process

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Abstract : The main aim of this research work is to present the effect of coating on two different grades of grey cast iron using detonation spray method. Ni₂₀Cr and Al₂O₃-13TiO₂ powders were sprayed using detonation gun onto GI250 and GIHC substrates and the results as well as coating surface morphology of the coating is studied by XRD and SEM/EDAX analysis. The wear resistance of Ni₂₀Cr and Al₂O₃-13TiO₂ has been investigated on pin-on-disc tribometer using ASTM G99 standards. Cumulative wear rate and coefficient of friction (μ) were calculated under three normal load of 30N, 40N, 50N at constant sliding velocity of 1m/s. Worn out surfaces were analyzed by SEM/EDAX. The results show significant resistance to wear with Al₂O₃-13TiO₂ coating as compared to Ni₂₀Cr and bare substrates. SEM/EDAX analysis and cumulative wear loss bar charts clearly explain the wear behavior of coated as well as bare sample of GI250 and GIHC.

Keywords : detonation spray, grey cast iron, wear rate, coefficient of friction

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