World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:9, No:10, 2015

Investigation on Dry Sliding Wear for Laser Cladding of Stellite 6 Produced on a P91 Steel Substrate

Authors : Alain Kusmoko, Druce Dunne, Huijun Li

Abstract : Stellite 6 was deposited by laser cladding on a chromium bearing substrate (P91) with energy inputs of 1 kW (P91-1) and 1.8 kW (P91-1.8). The chemical compositions and microstructures of these coatings were characterized by atomic absorption spectroscopy, optical microscopy and scanning electron microscopy. The microhardness of the coatings was measured and the wear mechanism of the coatings was assessed using a pin-on-plate (reciprocating) wear testing machine. The results showed less cracking and pore development for Stellite 6 coatings applied to the P91 steel substrate with the lower heat input (P91-1). Further, the Stellite coating for P91-1 was significantly harder than that obtained for P91-1.8. The wear test results indicated that the weight loss for P91-1 was much lower than for P91-1.8. It is concluded that the lower hardness of the coating for P91-1.8, together with the softer underlying substrate structure, markedly reduced the wear resistance of the Stellite 6 coating.

Keywords : friction and wear, laser cladding, P91 steel, Stellite 6 coating
Conference Title : ICMEDA 2015 : International Conference on Mechanical Engineering Design and Analysis
Conference Location : Osaka, Japan
Conference Dates : October 08-09, 2015