

Evaluation of High Temperature Wear Performance of as Cladded and Tig Re-Melting Stellite 6 Cladded Overlay on Aisi-304L Using SMAW Process

Authors : Manjit Singha, Sandeep Singh Sandhu, A. S. Shahi

Abstract : Stellite 6 is cobalt based superalloy used for protective coatings. It is used to improve the wear performance of stainless steel engineering components subjected to harsh environmental conditions. This paper reports the high temperature wear analysis of stellite 6 cladded on AISI 304 L substrate using SMAW process. Bead on plate experiment was carried out by varying current and electrode manipulation techniques to optimize the dilution and hardness. 80 Amp current and weaving technique was found to be the optimum set of parameters for overlaying which were further used for multipass multilayer cladding on two plates of AISI 304 L substrate. On the first plate, seven layers seven passes of stellite 6 was overlaid which was used in as cladded form and the second plate was overlaid with five layers five passes of stellite 6 with further TIG remelting. The wear performance was examined for normal temperature environmental condition and harsh temperature environmental condition. The stellite 6 coating with TIG remelting was found to be better in both the conditions even with lesser metal deposition due to its finer grain structure.

Keywords : surfacing, stellite 6, dilution, overlay, SMAW, high-temperature frictional wear, micro-structure, micro-hardness

Conference Title : ICMET 2015 : International Conference on Mechanical Engineering and Technology

Conference Location : London, United Kingdom

Conference Dates : October 23-24, 2015