World Academy of Science, Engineering and Technology
International Journal of Aerospace and Mechanical Engineering
Vol:17, No:07, 2023

Fatigue Behavior of Dissimilar Welded Monel400 and SS316 by Frictions Stir Welding

Authors : Aboozar Aghaei

Abstract : In the present work, the dissimilar Monel400 and SS316 were joined by friction stir welding (FSW). The applied rotating speed was 400 rpm, whereas the traverse speed varied between 50 and 150 mm/min. At a constant rotating speed, the sound welds were obtained at the welding speeds of 50 and 100 mm/min. However, a groove-like defect was formed when the welding speed exceeded 100 mm/min. The mechanical properties of the joints were evaluated using tensile and fatigue tests. The fatigue strength of dissimilar FSWed specimens was higher than that of both Monel400 and SS316. To study the failure behavior of FSWed specimens, the fracture surfaces were analyzed using a scanning electron microscope (SEM). The failure analysis indicates that different mechanisms may contribute to the fracture of welds. This was attributed to the dissimilar characteristics of dissimilar materials exhibiting different failure behaviors.

Keywords : frictions stir welding (FSW), stainless steel, mechanical properties, Monel400
Conference Title : ICEDMS 2023 : International Conference on Engineering Dynamics for Mechanical Structures
Conference Location : Ottawa, Canada
Conference Dates : July 03-04, 2023