

Micro-Study of Dissimilar Welded Materials

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Abstract : The dissimilar joint between aluminum /titanium alloys (Al 6082 and Ti G2) alloys were successfully achieved by CO2 laser welding with a single pass and without filler material using the overlap joint design. Laser welding parameters ranges combinations were experimentally determined using Taguchi approach with the objective of producing welded joint with acceptable welding profile and high quality of mechanical properties. In this study a joining of dissimilar Al 6082 / Ti G2 was result in three distinct regions fusion area (FA), heat-affected zone (HAZ), and the unaffected base metal (BM) in the weldment. These regions are studied in terms of its microstructural characteristics and microhardness which are directly affecting the welding quality. The weld metal was mainly composed of martensite alpha prime. In two different metals in the two different sides of joint HAZ, grain growth was detected. The microhardness of the joint distribution also has shown microhardness increasing in the HAZ of two base metals and a varying microhardness in fusion zone.

Keywords : microharness , microstructure, laser welding and dissimilar jointed materials.

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