

Intermetallic Phases in the Fusion Weld of CP Ti to Stainless Steel

Authors : Juzar Vohra, Ravish Malhotra, Tim Pasang, Mana Azizi, Yuan Tao and Masami Mizutani

Abstract : In this paper, dissimilar welding of titanium to stainless steels is reported. Laser Beam Welding (LBW) and Gas Tungsten Arc Welding (GTAW) were employed to join CPTi to SS304. The welds were examined using scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS). FeTi, Ti₂Cr and Fe₂Ti dendrites are formed along with beta phase titanium matrix. The hardness values of these phases are high which makes them brittle and leading to cracking along the weld pool. However, it is believed that cracking, hence, fracturing of this weld joint is largely due to the difference in thermal properties of the two alloys.

Keywords : dissimilar metals, fusion welding, intermetallics, brittle

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