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PROPERTY EVALUATION OF PULSED CURRENT GAS TUNGSTEN ARC WELDED ALUMINIUM ALLOY

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ABSTRACT

In the present context of advancement of technologies and researches, new alloys with exceptional properties are made every day. Due to this, the importance of fabrication or joining of these alloys is also increasing. Latest researches on Aluminium lead to invention of its alloys with remarkable properties such as low density, high strength-to-weight ratio and ability to resist wear and corrosion. Advantages of invention of new aluminium alloys can be utilized efficiently only by using proper fabrication process.

The conventional joining process of aluminium alloy is Gas Tungsten Arc (GTA) welding due to its comparatively easier accessibility and better economy. The detailed literature review conducted revealed that Pulsed Current Gas Tungsten Arc Welding (PCGTAW) has been found beneficial due to its advantages over the Continuous Current Gas Tungsten Arc Welding (CCGTAW) of aluminium alloys. The use of pulsed current parameters has been found to improve the mechanical & microstructural properties of the welds compared to those of continuous current welds due to grain refinement occurring in the fusion zone. Hence, in this investigation an attempt has been made to prepare a defect free weld joint of PCGTA welded AA 5083 using AA 5356 as filler metal and to evaluate the microstructural properties of the weldment by conducting macro imaging, micro structural study & SEM imaging and compare it with the same of the base metal.

KEYWORDS: Aluminium 5083 Alloy, Pulsed Current Gas Tungsten Arc Welding (PCGTAW), Continuous Current Gas Tungsten Arc Welding (CCGTAW), Microstructural Properties