Metallurgical and Mechanical Characterization Of Aluminum Alloy 6061-T6 weld joint

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Abstract.

An investigation was made for welding an Aluminum Alloy 6061-T6 by gas tungsten arc welding with ER4043 filler metal. The material used is an extruded pipe of 168.3 mm (6 inch) diameter and 7.11 mm thickness.
A metallurgical analysis was made through out weld joint, heat affected zone and base metal followed by micro hardness test, tensile test and fracture analysis. Microstructural changes in the weld metal are between dendrite structure and a granular structure. The heat affected zone is divided into several areas according to the distance from the deposited metal to base metal. There is a coarse structure, partially transformed structure and fine structure. The fracture analysis revealed a surface usually consisted of elongated dimples, a pattern indicating failure via ductile fracture mechanisms and fragile face that can be the precipitates of the second phase.

Key words: Welding aluminum alloys, Metallurgical and Mechanical evolution, Precipitation.

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