

Comparative study of submerged friction stir welding of aluminium alloy using different cooling medium

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ABSTRACT

This study presents a comparative study on friction stir welding (FSW) of aluminium alloy using different cooling medium. Three types of cooling medium were used, namely air, water and coolant. These various types of cooling medium are used in order to compare the quality of the welding joint. Tensile tests and microstructural observations were performed on the welded specimen. The air-cooled specimens showed the highest ultimate tensile strength (UTS) of up to 485 MPa with a joint efficiency of 85%. Microstructural observations of water-cooled and coolant-cooled specimens revealed voids in the stir zone, indicative of incomplete consolidation during the welding process. It can be concluded that the cooling medium play a big role on the weld joint outcome since the retention of heat generation affects the mechanical and microstructure properties of the specimens.

KEYWORDS

Friction stir welding; Aluminium alloys; Fluid tank; Cooling medium

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