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EFFECT OF PULSED CURRENT TIG WELDING PARAMETERS ON TENSILE, IMPACT AND FATIGUE STRENGTH OF AA 6061 ALUMINIUM ALLOY

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Abstract

The use of pulsed current technique has been found to improve the mechanical properties of the welds compared to those of continuous current welds of aluminium alloy due to grain refinement occurring in the fusion zone. This paper reports the effect of pulsed current parameters such as peak current, base current, pulse frequency and pulse on time on tensile, impact and fatigue strength of tungsten inert gas (TIG) welded AA6061 aluminium alloy joints. Factorial experiment design (four factors at two levels) was used to optimize the number of experimental conditions. Statistical tools such as Yate's algorithm, ANOVA method and regression analysis were used to develop the mathematical models to predict tensile strength, impact strength and fatigue strength. The developed mathematical models were used to analyse the effect of pulse current parameters on mechanical properties of the joints.

Keywords: Pulsed current, Tungsten inert gas welding, Aluminium alloy, Design of experiments, Tensile strength, Impact strength, Fatigue strength.