ABSTRACT

Spot welding is one type of welding that is quite widely used in the vehicle industry, as well as ship manufacturing. The material used in this study is the AA5083 aluminum plate which has a thickness of 1 mm, and a type of welding is overlapping joint. This study aims to examine the effect of voltage and time variations on the value of the shear strength of the welded joint. The material is cut with a size of 200mm x 40mm, then welded with voltage variations of 1.75V, 2.2V and 2.208V. And time variations between 1s, 1.5s and 2s, 300N constant pressure and uses copper electrodes with a diameter of 8mm. Then multiple linear regression analysis is carried out and the effect of variable X1 (stress) + X2 (time) on Y (shear strength) is 50.4%, where X1 is 22.7% and X2 is 27.8%. In the analysis of multiple linear regression states that there is no influence between X1 and X2 on Y, because the more dominant data is the data at 1.75V and 2.2V voltages which have no significant difference. At a voltage of 2.208V the material will receive more heat so as to allow the electrodes to melt and have a greater HAZ area as well as the material thickness increases so that it will affect the shear strength very significantly.

Keyword: spot welding, aluminum, welding time, welding voltage, multiple linear regression