## REGRESSION MODELING AND PROCESS ANALYSIS OF RESISTANCE SPOT WELDING ON AUSTENITIC STAINLESS STEEL AISI 304

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## Abstract

Resistance spot welding is a process that is being used in the industry for sheet joining purposes especially in the Automobile and Aerospace industry. The problems associated with Resistance Spot Welding (RSW) are tendency of alloying with the electrode resulting in increased tool wear, and subsequently deterioration of weld quality. The more current and time leads to expulsion and over heating of the electrode affecting the weld quality. The less value results in the insufficient weld strength. The complicated behavior of this process must be analyzed to set the optimum parameters to get good quality weld.

This paper presents an experimental investigation into the influence of three welding parameters current, weld time and pressure on the Heat affected Zone (HAZ) and Weld Strength (WS) of the weld joint. The above factors are selected on the basis of literature survey. A three factors, five level Central Composite Design(CCD) was used to determine the optimal factors of spot welding of austenitic stainless steel SS 304 Mathematical model has been generated based on Response Surface Methodology(RSM) and regression analysis. The analysis reveals that linear model is best fitted for weld strength and Non linear model is fitted for HAZ based on regression analysis. Response plots are drawn to understand the influence of various input factors on the performance of weld joint.

Keywords : ANOVA, Regression, CCD, RSM, F test