

A Literature Review paper on friction stir welding (F.S.W) of aluminum alloy

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Abstract: In many industrial applications steel is readily replaced by non ferrous alloys, in most cases aluminium alloys. Some of these materials merge good mechanical strength which is analogous with structural steel and low weight that allows a significant reduction in weight. But the joining of aluminium alloys by unadventurous welding processes can occasionally cause severe problems. The difficulties are often credited to the solidification process and structure including loss of alloying elements and presence of segregation and porosities in the weld joint. Friction stir welding (FSW) offers an alternative through solid-state bonding, which eliminates all these problems of solidification associated with the conventional fusion welding processes. In this research work an attempt has been made to develop an empirical relationship between FSW variables and the mechanical properties (tensile strength, yield strength, percentage elongation, micro hardness and impact toughness) of friction stir welded aluminium alloy joints. Response surface methodology was adopted for analyzing the problem in which several independent variables influence the response. Central composite rotatable design matrix was used to prescribe the required number of experimental conditions. A four-factors-five-level central composite design was used to determine the optimal factors of friction stir welding process for aluminium alloy. The central composite design (CCD) with a quadratic model was employed



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