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Optimization of Friction Stir Spot Welding Process Parameters for Joining 6061 Aluminum Alloy Using Taguchi Method

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Abstract : This paper investigates the shear strength of the joints produced by friction stir spot welding process (FSSW). FSSW parameters such as tool rotational speed, plunge depth, shoulder diameter of the welding tool and dwell time play the major role in determining the shear strength of the joints. The effect of these four parameters on FSSW process as well as the shear strength of the welded joints was studied via five levels of each parameter. Taguchi method was used to minimize the number of experiments required to determine the fracture load of the friction stir spot-welded joints by incorporating independently controllable FSSW parameters. Taguchi analysis was applied to optimize the FSSW parameters to attain the maximum shear strength of the spot weld for this type of aluminum alloy.

Keywords : Friction Stir Spot Welding, Al6061 alloy, Shear Strength, FSSW process parameters
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