

Dissimilar Cu/Al Friction Stir Welding: Sensitivity of the Tool Offset

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Abstract : Copper 1100 and aluminum 1050 plates with a thickness of 5.0 mm are butt-joint using friction stir welding. The tool offset is linearly varied along the welding path. Two welding regimes, using the same linear tool offset but in opposite directions, are applied for fabricating two Cu/Al plates. The material flow is dominated by both tool offset and offset history. The intermetallic compounds layer and interface morphology in each welded plate are formed in a different manner. As a result, the bonding strength and fracture behavior between two welded plates are significantly distinct. The role of interface morphology on fracture behavior is analyzed by the finite element method.

Keywords : Cu/Al dissimilar welding, offset history, interface morphology, intermetallic compounds, strength and fracture

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