

Thermal Analysis of Friction Stir Welded Dissimilar Materials with Different Preheating Conditions

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Abstract : The objective of this work is to carry out a thermal heat transfer analysis to obtain the time dependent temperature field in welding process friction stir welded dissimilar materials with different preheating temperature. A series of joints were made on four mm thick aluminum and steel plates. The temperature used was 100°C, 150°C and 200°C. The welding operation was performed with different rotational speeds and traverse speed (1000, 1400 and 2000 rpm and 16, 20 and 25 mm/min..). In numerical model, the welded plate was modeled as the weld line is the symmetric line. The work-piece has dimensions of 100x100x4 mm. The obtained result was compared with experimental result, which shows good agreement and within the acceptable limit. The peak temperature at the weld zone increases significantly with respect to increase in process time.

Keywords : FEA, thermal analysis, preheating, friction stir welding

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