Cold Metal Transfer Welding of Dissimilar Thickness 6061-T6 to 5182-O Aluminum Alloys

Authors : A. Elrefaei

Abstract : The possibility of having sheets with different thicknesses and materials in one assembly facilitates the optimal material distribution within the final product and reduces the weight of the structure. Ability of joining process to assembly these different material combinations is always a challenge to the designer. In this study, 0.6 mm thick 6061-T6 and 2 mm thick 5182-O were robot CMT welded using ER5356 and ER4043 filler metals. The thermal effect of welding resulted in a loss of hardness in the 6061 HAZ. Joints welded by ER5356 filler metal were much higher in fracture load than joints welded by ER4043 and the elongation of joints welded by ER5356 was almost double its corresponding joints welded by ER4043 filler. Owing to the big difference in formability and thickness of base metals, the fracture in forming test occurred in the softened 6061 HAZ out from the weld centerline.

Keywords : aluminum, CMT, mechanical, welding

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