ANALYTICAL INVESTIGATION FOR FRICTION STIR WELDING OF ALUMINUM ALLOYS

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ABSTRACT: Friction Stir Welding (FSW), invented by Wayne Thomas at TWI (The Welding Institute) Ltd in 1991, overcomes many of the problems associated with traditional joining techniques. FSW is a solid-state process which produces welds of high quality in difficult-to-weld materials such as aluminum, and is fast becoming the process of choice for manufacturing lightweight transport structures such as boats, trains and aero-planes. The main objective of this project is to investigate strength of the friction stir welded aluminum alloy and copper with different speeds by taking tapper tool pin profile. The material of tool is HCHCr (High Carbon High Chromium). FEA analysis is performed for friction stir welding of aluminum6061 and aluminum 5083 at 700rpm speed using ANSYS. Thermal and structural analysis is performed. A parametric model with the weld plates and cutting tool is done in Pro/Engineer. The effects of taper, rectangular and round tool pin profiles on the friction stir welding are considered and at different speeds (700,1000, and 1600 RPM)for analysis.

Key words: Pro.Esoftware, ANSYS software