

FRICTION STIR WELDING OF ALUMINIUM PLATES WITH AND WITHOUT INDUCTION PRE- HEATING

ARUN P DAS ^a

^aAssistant Professor Department of Mechanical Engineering, Adi Shankara Institute of Engineering and Technology, Kalady

arunpd.me@adishankara.ac.in

9495220163

ABSTRACT

Frictional stir welding (FSW) is a solid-state welding process. FSW has many advantages over giving high quality welds; it is environment-friendly and maintained with low operating cost etc. It is used to join high strength metals and its alloys, which are difficult to weld using conventional fusion welding and with a tool that is consumed during welding. The FSW technique require specific parameters to produce a defect -free joint. The parameters involved in FSW are tool design, tool rotation speed, tool material, etc. This project is aimed to study the induction in- situ heated hybrid friction stir welding (IAFSW) method to join two AA6063 aluminum plates to enhance joint strength and to compare its weld strength with aluminum plates welded without induction pre-heating. The potency of this induction method on the mechanical properties and microstructural characterizations of the weld were also investigated and compared. Results from other studies show that the transverse tensile strength was gained when pre-heating was done and here we will look the effect of induction heating in particular. The superior strength in pre-heated joints was achieved due to the annealing that happened to the aluminum region and elevated plastic flow in the weld zone by the in-situ induction heating, which resulted in the elongation of the weld region.

keywords: Frictional stir welding (FSW), Induction in- situ heated hybrid friction stir welding (IAFSW)