Characterization studies on weld strength of Rotary Friction Welded Austenitic Stainless Steel Tubes

***Abstract*:**

Austenitic stainless steel (SS304) tubes of outer diameter 19 mm, 2mm thickness are joined together by rotary friction welding (RFW). The characterization studies are done by varying heating load, forging load, heating time, forging time and keeping constant spindle speed of 1100 rpm. The tensile and microhardness test were conducted for each fabricated joints to evaluate the mechanical properties of welded samples. The joint strength increased with increase in forging load and heating load. The maximum joint strength of 780 N/mm^2 and hardness of 210HV achieved for weld parameter of forging load 1400 kg and forging time 4 sec. The microstructure analysis revealed coarse grain structure in the weld zone compared to base metal. Scanning Electron Microscopy (SEM) analysis reveals the welded sample joints had experienced a ductile mode of fracture.

Keywords: Friction welding, Austenitic stainless steel 304, Mechanical properties, tensile test, tube welding.