

Friction Welding of a Metastable Beta Titanium Alloy

D B Anant Sagar², N Narasaiah¹, B Saha², & M S K Rao²

¹ National Institute of Technology, Warangal, India

(anantnani15@gmail.com), (narasaiahn@yahoo.co.in)

² RCMA(Materials), CEMILAC, DRDO, Hyderabad, India

(bsaha898@yahoo.co.in) (munjuluri@rediffmail.com)

Rotary friction welding of a high strength metastable beta titanium alloy Ti-10V-2Fe-3Al was attempted in the current study. Friction welding experiments were conducted on 14 mm diameter rods extracted from 60 mm diameter hot rolled bars. Based on a series of welding trials, the optimum welding parameters were identified. Welds produced using the optimum parameters were characterized in detail for their microstructures. Welds were also subjected to solution treatment (780°C/1hour/Argon Quench) and aging (520°C/8hours/Furnace Cooling). Room temperature tensile tests were conducted on the welds in both as-welded and post-weld heat treated conditions. Micro hardness measurements were also made across the welds. Based on these studies, structure-property relationships in Ti-10V-2Fe-3Al friction welds were established.

Keywords: Friction welding; Metastable beta titanium alloy; Post-weld heat treatment; Microscopy; Tensile testing; Weld Structures

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