## عنوان مقاله:

Microstructure Investigation and Mechanical Properties of Resistance Upset Butt Welded Ti-6Al-4V Alloy

## محل انتشار:

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## خلاصه مقاله:

In the present study, resistance upset butt welding was used as a solid-state process for joining Ti-6Al-4V alloy. Results showed that melting and subsequent solidification of the alloy at the joint interface promoted the development of a cast microstructure along with some pores. However, by applying the constant upset pressure of 1.62 MPa, the pore volume fraction decreased considerably with decreasing the welding current from 110 A/mm2 to 55 A/mm2. Hardness test results showed that the weld interface and the base material had the highest (352 HV) and the lowest (318 HV) values, respectively. The microstructure of the interface consisted of ά martensite and Widmanstätten laths. The tensile strength of the joints varied between 550 and 883 MPa depending on the welding parameters used. In the optimum condition, the maximum strength of the joint was about 94% of the base metal strength. Fractography of samples confirmed that the formation of pores deteriorated the strength of the joints.

## کلمات کلیدی:

Fractography, Microstructure, Solid-State Welding, Ti-6Al-4V Alloy, Weld Defect