

عنوان مقاله:

Effects of Friction Stir Process Parameters on Microstructure and Mechanical properties of Aluminum Powder Metallurgy Parts

محل انتشار:

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خلاصه مقاله:

The effects of friction stir processing (FSP) on the microstructure and mechanical properties of aluminum powder metallurgy (PM) parts was investigated. PM parts were then subjected to FSP at advancing speeds (v) of 40–200 mm/min and tool rotational speeds (ω) of 800–1600 rpm. Microhardness (HV) and tensile tests at room temperature were used to evaluate the mechanical properties of the friction stir processed specimens. In order to evaluate microstructure of processed zone, cross-sections of FS processed specimens were observed optically. Based on the results obtained from investigation of the Zener-Holloman parameter (Z), average grain size decreased with decreasing working temperature and increasing working strain rate (equal to increasing Z). The finest grain size was $\sim 5.4 \mu\text{m}$ obtained at $\omega=1000$ and $v=100$ mm/min corresponding to a strain rate of $275\text{--}1$ at 414°C . This sample exhibited, the best mechanical properties with microhardness, yield stress, and tensile strength of the 43 Hv, 82 MPa, and 118.3 MPa, respectively.

کلمات کلیدی:

Friction Stir Processing, Powder Metallurgy, mechanical properties, Rotational Speed, Traveling speed

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