

عنوان مقاله:

Influence of tool pin geometry on microstructure and mechanical properties of friction stir welded Al-Mg₂Si metal matrix composite

محل انتشار:

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خلاصه مقاله:

The main purpose of this research is to investigate the influence of pin geometry on the microstructure and mechanical properties of the friction stir welded Al-Mg₂Si metal matrix composite. Toward this end, friction stir welding (FSW) conducted using six geometrically different pin tools. Other welding parameters were remained unchanged. Microstructural evaluation using optical microscopy (OM) and scanning electron microscopy (SEM) revealed fragmentation of Mg₂Si particles and Mg₂Si needles existing in eutectic structure in stir zone and also the result showed a banded structure consisting of particle-rich and particle-free regions in stir zone of sample welded by triangular pin. The most uniform particle distribution was found in the case of using threaded tapered pin tool. Longitudinal tensile specimens were machined from the FSW samples parallel to the welding direction, respectively. The highest ultimate tensile strength (UTS) was recorded for the specimen FSWed with threaded and tapered with triangle pin tool. Fracture surface of tensile specimens were also studied employing SEM technique

کلمات کلیدی:

Friction stir welding, Metal matrix composites, Mechanical properties, Microstructures, Pin geometry

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