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**Anisotropic cyclic deformation behavior of extruded ZA81M magnesium alloy**

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**Abstract**

Anisotropic cyclic deformation behavior and fatigue life of extruded ZA81M magnesium alloy were investigated. The alloy showed a tilted basal texture towards extrusion direction, which resulted in the different cyclic deformation behavior along extrusion direction and transverse direction. The tilted basal texture made basal slip favorable along extrusion direction, thus leading to the decrease of twinning deformation during compression, which resulted in the less asymmetric hysteresis loops and the lower mean stress along extrusion direction. The fatigue life was longer for specimens along extrusion direction than for those along transverse direction. The difference in the deformation mode was considered to be one of the reasons for the superior fatigue property, aside from the alleviated detrimental effect from the tensile mean stress for specimens along extrusion direction.

**Key words:** ZA81M magnesium alloy; cyclic deformation behavior; anisotropy

**1. Introduction**

The cyclic deformation behavior of magnesium alloys needs to be investigated since increasing concern for fuel efficiency has motivated automotive industry to incorporate more magnesium alloys into automobile components where they bear cyclic loading. Hot extrusion can be employed to enhance the mechanical properties of magnesium alloys to meet the standard of automotive components[1], but strong

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