Mechanical properties and formability of an Mg－6%Li－1%Zn alloy thin sheet at elevated temperatures

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Abstract

Forming limit diagram presents limit strains for different strain paths. In this study, forming limit
diagrams were determined for an Mg-6 wt% Li-1 wt% Zn alloy sheet with a thickness of 0.6 mm. Uniaxial
tension tests and press-forming tests were carried out at various temperatures. The influences of anisotropy
and temperature on deformation characteristics were investigated. Formability parameters such as average
plastic strain ratio, planar anisotropy, and work hardening exponent were determined by tensile test results.
The forming limit diagrams have been experimentally evaluated at various temperatures. Anisotropic
behaviors were observed in the mechanical properties at all test temperatures. The tensile properties and
formability parameters were correlated with the forming limit diagrams.

Keyword：Magnesium-lithium alloy; Formability parameter; Forming limit diagram;
Anisotropy