

# Effects of Age Heat Treatment and Thermomechanical Processing on Microstructure and Mechanical Behavior of LAZ1010 Mg Alloy

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## Abstract

An MgLiAlZn (designated as LAZ1010) alloy containing about 10 wt% of Li has been prepared by melting and solidification in a carbon steel crucible, and extruded at a billet preheating temperature of 200C with an extrusion ratio of approximately 29. Effects of age heat treatments and thermomechanical processing on microstructures and mechanical properties were performed in this study. Hardness, optical microscopy, X-ray diffraction studies, and tensile testes were carried out to explore the variations in microstructures and mechanical behaviors during processing. The results showed that LAZ1010 alloy presented age hardening effect at temperatures below 50C. Rapid decrease in hardness with aging temperature at intermediate temperatures should be resulted from the transformation of phase into the equilibrium phase AlLi. Kocks - Mecking type plots were used to illustrate different stages of work hardening of the cold rolled specimens. The results indicated that cold rolled LAZ1010 alloy showed stage III and stage IV work hardening behaviors.

Keyword : MgLi alloy; Age hardening; X-ray diffraction; Thermomechanical treatment; Work-hardening rate