

Mechanical properties and strain-hardening behavior of Mg alloy AZ31B-H24
thin sheet

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Abstract

The strain hardening behavior of Mg alloy AZ31B-H24 deformed in tension was analyzed using the Kocks - Mecking phenomenological approach. The relationship between strain-hardening behavior and dynamic recrystallization at elevated temperatures was investigated in this work. At room temperature, stage II strain-hardening consistent with the forest hardening mechanism, which was similar to that observed in face-centered cubic metals, was observed. The specimens tested at temperatures above 250 C did not show stage II strain-hardening, and their stage III with a decreasing of strain-hardening rate took place immediately after yielding. The absence of stage II strain-hardening should be related to the dynamic recovery and recrystallization, causing the softening effects. The onset of dynamic recovery occurred earlier than that of the dynamic recrystallization.

Keyword : AZ31B Mg alloy; Strain-hardening; Strain-hardening rate; Dynamic recrystallization