

## Accepted Manuscript

Strain-Controlled Low Cycle Fatigue Properties of a Rare-Earth Containing ZEK100 Magnesium Alloy

F. Mokdad, D.L. Chen

PII: S0261-3069(14)00980-7

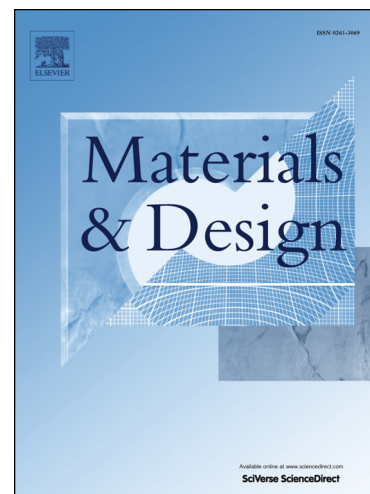
DOI: <http://dx.doi.org/10.1016/j.matdes.2014.11.058>

Reference: JMAD 7010

To appear in: *Materials and Design*

Received Date: 17 September 2014

Accepted Date: 29 November 2014



Please cite this article as: Mokdad, F., Chen, D.L., Strain-Controlled Low Cycle Fatigue Properties of a Rare-Earth Containing ZEK100 Magnesium Alloy, *Materials and Design* (2014), doi: <http://dx.doi.org/10.1016/j.matdes.2014.11.058>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Strain-Controlled Low Cycle Fatigue Properties of a Rare-Earth Containing ZEK100 Magnesium Alloy

F. Mokdad and D.L. Chen\*

*Department of Mechanical and Industrial Engineering, Ryerson University,*

*350 Victoria Street, Toronto, Ontario M5B 2K3, Canada*

## Abstract

Low rare-earth (RE) containing magnesium alloys are being considered for the lightweight automotive applications to reduce fuel consumption and emissions. Design of magnesium components requires strain-controlled low-cycle fatigue (LCF) behavior. This study was aimed to evaluate the cyclic deformation characteristics and LCF life of a low (0.2 wt.%) Nd-containing ZEK100-O alloy. The alloy contained equiaxed grains along with some  $Mg_{12}Nd$  particles, and exhibited a relatively weaker basal texture. While slight cyclic softening occurred at high strain amplitudes, cyclic stabilization remained at lower strain amplitudes. Fatigue life of ZEK100 alloy was longer than that of the extruded RE-free AZ31 and AM30 alloys, due to a fairly good combination of strength with ductility. The asymmetry and skewness of hysteresis loops, which were characterized by eccentricity, angle deviation, and relative slope change, respectively, were effectively improved relative to the extruded RE-free alloys, arising from less extensive twinning

---

\*Corresponding author – Tel: (416) 979-5000 ext. 6487; Fax: (416) 979-5265; Email: dchen@ryerson.ca (D.L. Chen).

Download English Version:

<https://daneshyari.com/en/article/7220772>

Download Persian Version:

<https://daneshyari.com/article/7220772>

[Daneshyari.com](https://daneshyari.com)