

Accepted Manuscript

Title: Role of pre-vertical compression in deformation behavior of Mg alloy AZ31B during super-high reduction hot rolling process

Authors: Weitao Jia, Qichi Le, Yan Tang, Yunpeng Ding, Fangkun Ning, Jianzhong Cui



PII: S1005-0302(18)30094-X
DOI: <https://doi.org/10.1016/j.jmst.2018.04.005>
Reference: JMST 1235

To appear in:

Received date: 26-11-2017
Revised date: 10-1-2018
Accepted date: 11-1-2018

Please cite this article as: Weitao Jia, Qichi Le, Yan Tang, Yunpeng Ding, Fangkun Ning, Jianzhong Cui, Role of pre-vertical compression in deformation behavior of Mg alloy AZ31B during super-high reduction hot rolling process (2010), <https://doi.org/10.1016/j.jmst.2018.04.005>

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.

Role of pre-vertical compression in deformation behavior of Mg alloy AZ31B during super-high reduction hot rolling process

Weitao Jia, Qichi Le*, Yan Tang, Yunpeng Ding, Fangkun Ning, Jianzhong Cui

Key Laboratory of Electromagnetic Processing of Materials, Ministry of Education, Northeastern University, Shenyang 110819, China

[Received 26 November 2017; Received in revised form 10 January 2018; Accepted 11 January 2018]

*Corresponding author.

E-mail address: jwt860520@163.com (Weitao Jia); qichil@mail.neu.edu.cn (Qichi Le).

Abstract: Mg alloy AZ31B plates were processed by hot rolling with different thickness reductions per pass and pre-vertical compression followed by super-high reduction hot rolling (PVCR), respectively. Microstructure evolution, rolling formability variation and mechanical responses were investigated. As reduction per pass increased, the number of shear bands deflecting toward rolling direction increased, resulting in easy crack initiation in and around the bands. With increasing reduction per pass up to 80%, twinning and twinning-induced dynamic recrystallization (DRX) dominated the deformation of the edge material at 350 °C, resulting in local recrystallization with coarse grains and further largest edge-crack degree. Pre-induced $\{10\bar{1}2\}$ tensile twins by pre-vertical compression (PVC) increased number density of nucleation sites for dynamic recrystallization during the subsequent severe rolling, which enhanced the dominant role of continuous dynamic recrystallization. Designed PVCR-b was proved to be a relatively effective method to

Download English Version:

<https://daneshyari.com/en/article/7951837>

Download Persian Version:

<https://daneshyari.com/article/7951837>

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