

# Author's Accepted Manuscript

Anisotropy of Corrosion and Environmental Cracking in AA5083-H128 Al-Mg Alloy

Wenbin Gao, Dongpo Wang, Mohsen Seifi, John J. Lewandowski



PII: S0921-5093(18)30806-2  
DOI: <https://doi.org/10.1016/j.msea.2018.06.021>  
Reference: MSA36576

To appear in: *Materials Science & Engineering A*

Received date: 10 November 2017  
Revised date: 4 June 2018  
Accepted date: 5 June 2018

Cite this article as: Wenbin Gao, Dongpo Wang, Mohsen Seifi and John J. Lewandowski, Anisotropy of Corrosion and Environmental Cracking in AA5083-H128 Al-Mg Alloy, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.06.021>

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 galley proof before it is published in its final citable 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.

# **Anisotropy of Corrosion and Environmental Cracking in AA5083-H128 Al-Mg Alloy**

Wenbin Gao<sup>a</sup>, Dongpo Wang<sup>a,\*</sup>, Mohsen Seifi<sup>b</sup>, John J. Lewandowski<sup>b,\*</sup>

<sup>a</sup>Department of Materials Science and Engineering, Tianjin University, Tianjin 300350, China.

<sup>b</sup>Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, OH 44106, United States

Corresponding authors: Dr. Wang, Email: wangdp@tju.edu.cn

Dr. Lewandowski, Email: JLL3@case.edu

Fax: +86-022-27405889

## **Abstract**

The effects of sensitization (175 °C for 100 h) and microstructure anisotropy on corrosion and environmental cracking of AA5083-H128 have been studied using immersion tests, electrochemical experiments and slow strain rate tests (SSRT). Pitting corrosion attack is observed for as-received (AR) and sensitized polished surfaces after immersion in 0.6 M NaCl solution at open circuit potential and is strongly dependent on the amount and distribution of intermetallic particles, including Mg-rich phases resulting from sensitization, as well as pre-existing anodic Mg-rich and cathodic (Mn, Fe)-rich particles. Anodic potentiodynamic polarization experiments indicate that sensitization increases the activity of the surface with a negative shift in corrosion potential and an increase in anodic reaction kinetics. SSRT tests show that samples orientated along the short transverse (S) direction exhibit the

Download English Version:

<https://daneshyari.com/en/article/7971825>

Download Persian Version:

<https://daneshyari.com/article/7971825>

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