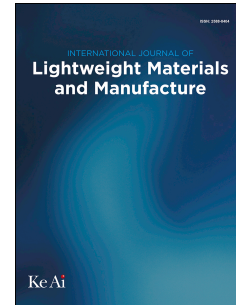


# Accepted Manuscript

Magnesium application in railway rolling stocks: a new challenge and opportunity for lightweighting

Lingbao Ren, Lingling Fan, Mingyang Zhou, Yangyang Guo, Yuwenxi Zhang, Carl J. Boehlert, Gaofeng Quan



PII: S2588-8404(18)30034-9

DOI: [10.1016/j.ijlmm.2018.05.002](https://doi.org/10.1016/j.ijlmm.2018.05.002)

Reference: IJLMM 10

To appear in: *International Journal of Lightweight Materials and Manufacture*

Received Date: 16 April 2018

Revised Date: 24 May 2018

Accepted Date: 28 May 2018

Please cite this article as: L. Ren, L. Fan, M. Zhou, Y. Guo, Y. Zhang, C.J. Boehlert, G. Quan, Magnesium application in railway rolling stocks: a new challenge and opportunity for lightweighting, *International Journal of Lightweight Materials and Manufacture* (2018), doi: 10.1016/j.ijlmm.2018.05.002.

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.

---

# Magnesium application in railway rolling stocks: a new challenge and opportunity for lightweighting

## Abstract

Magnesium (Mg) and their alloys show potential in railway rolling stock applications due to their attractive mechanical properties, developed manufacturing processes, cost efficiency, and affluent resource reserve. In particular, high-strength Mg alloy components are important to lightweighting efforts in the railroad industry. In this review, Mg alloy processing technology for railroad vehicles is discussed with emphasis on energy savings, manipulation convenience, and reduction in friction/wear, vibration, and fatigue damage. It is shown that a Mg alloy train has a theoretical 8.6-12.6% comprehensive weight reduction potential in the equal-strength and equal-stiffness condition, where the low-speed trains (metro, light rail train, tram/trolley car, monorail car, suspension train/schwebbahn etc..) exhibit a larger energy-savings than high speed trains. It is evident that the regulations of fabrication, processing, post treatment, assembly/installation, protection, and maintenance/replacement of Mg alloy components for the railroad industry all need further research and development.

**Keywords:** Mg alloys; lightweight train; energy savings

Download English Version:

<https://daneshyari.com/en/article/8940863>

Download Persian Version:

<https://daneshyari.com/article/8940863>

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