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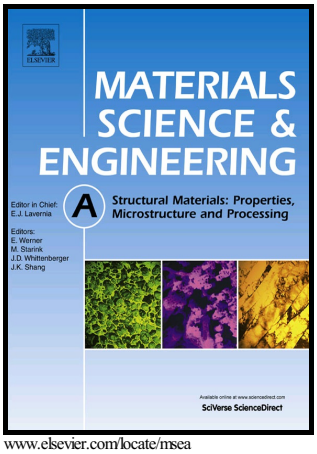

www.elsevier.com/locate/msea

PII: S0921-5093(18)30678-6
DOI: https://doi.org/10.1016/j.msea.2018.05.029
Reference: MSA36467

To appear in: *Materials Science & Engineering A*

Received date: 1 February 2018
Revised date: 8 May 2018
Accepted date: 9 May 2018

Cite this article as: Y. Cai, C.Y. Sun, W.R. Wang, Y.L. Li, L. Wan and L.Y. Qian, An isothermal forming process with multi-stage variable speed for magnesium component assisted by sensitivity analysis, *Materials Science & Engineering A,* https://doi.org/10.1016/j.msea.2018.05.029

An isothermal forming process with multi-stage variable speed for magnesium component assisted by sensitivity analysis

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Abstract

We have developed a multi-stage variable speed (MSV) isothermal forming process based on strain rate sensitivity (SRS) analysis, and successfully produced a large size of rib-web component of magnesium alloy from a cylindrical billet. The obtained rib-web component has been processed into parts for mechanical properties examination and the examination results met the standard of being safely used in aircrafts. The process parameters of the forming technology and microstructure change were explicitly linked by the SRS coefficient. The finite element (FE) simulation and SRS distribution were implemented to identify the relationship among process parameters, shaping characteristics, and microstructure development. The MSV speed process was employed for reducing the forming