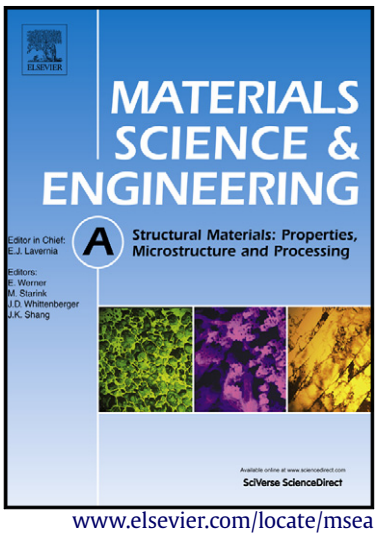


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Ali Alhamidi, Zenji Horita

PII: S0921-5093(14)01348-3
DOI: http://dx.doi.org/10.1016/j.msea.2014.11.009
Reference: MSA31727

To appear in: *Materials Science & Engineering A*

Received date: 28 August 2014
Revised date: 1 November 2014
Accepted date: 3 November 2014

Cite this article as: Ali Alhamidi, Zenji Horita, Grain refinement and high strain rate superplasticity in alumunium 2024 alloy Processed by high-pressure torsion, *Materials Science & Engineering A,* http://dx.doi.org/10.1016/j.msea.2014.11.009

Submitted to Mater. Sci. Eng. A: August 2014.
Revision I: October 2014

# Grain refinement and high strain rate superplasticity in alumunium 2024 alloy Processed by high-pressure torsion

**Ali Alhamidi[1, 2], Zenji Horita[1, 2]**

[1]Department of Materials Science and Engineering, Faculty of Engineering, Kyushu University, Fukuoka 819-0395, Japan
[2]WPI, International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University, Fukuoka 819-0395, Japan

An Al-2024 alloy was processed by high-pressure torsion (HPT) to produce an ultrafine-grained structure with a grain size of ~240 nm. A maximum elongation of ~750% was attained with an initial strain rate of $1 \times 10^{-2}$ $s^{-1}$ at 673 K, demonstrating the advent of high strain rate superplasticity through grain refinement by the HPT processing. Evaluation of the strain-rate sensitivity and the activation energy for the deformation confirmed that grain boundary sliding through grain boundary diffusion is the rate-controlling process for the superplastic deformation of the HPT-processed Al-2024 alloy.

Corresponding author: Ali Alhamidi
TEL/FAX: +81-92-802-2992; e-mail: ali@zaiko6.zaiko.kyushu-u.ac.jp.