

Author's Accepted Manuscript

A new method for severe plastic deformation of the copper sheets

A. Torkestani, M.R. Dashtbayazi



PII: S0921-5093(18)31250-4
DOI: <https://doi.org/10.1016/j.msea.2018.09.054>
Reference: MSA36935

To appear in: *Materials Science & Engineering A*

Received date: 15 July 2018
Revised date: 11 September 2018
Accepted date: 15 September 2018

Cite this article as: A. Torkestani and M.R. Dashtbayazi, A new method for severe plastic deformation of the copper sheets, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.09.054>

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.

A new method for severe plastic deformation of the copper sheets

A. Torkestani, M. R. Dashtbayazi*

Department of Mechanical Engineering, Faculty of Engineering, Shahid Bahonar
University of Kerman, Kerman, Iran

*Corresponding author. Postal address: Department of Mechanical Engineering, Faculty of Engineering, Shahid Bahonar University of Kerman, Jomohori Boulevard, P.O. Box 76175-133, Kerman, Iran. Tel.: +98 34 32111763; fax: +98 34 32120964. dashtbayazi@uk.ac.ir (M. R. Dashtbayazi)

Abstract

A new severe plastic deformation technique, named "constrained studded pressing" (CSP), was developed for the production of plate-shaped ultrafine grain metals without changing their initial dimensions. In the CSP method, the material is subjected to the repetitive shear deformation by dies with two orthogonal grooves then becomes flat. The repetitive shear deformation and flattening done by constrained-blocks. Calculations showed that the effective strain for the CSP method is more than the CGP (constrained groove pressing) method. The microstructure and the mechanical properties of the CSPed samples investigated by scanning electron microscopy (SEM) and tensile test, respectively. SEM observations showed that the CSP method as the other repetitive corrugation and straightening (RCS) methods is a useful method to refine the grain size. Mechanical properties investigations indicate that the ductility of the samples produced by the CSP method is more than CGPed on, while the ultimate tensile strength of them is approximately the same.

Keywords: Severe plastic deformation; Constrained Studded Pressing; Ductility; Tensile Strength; Toughness; Copper.

Download English Version:

<https://daneshyari.com/en/article/10155903>

Download Persian Version:

<https://daneshyari.com/article/10155903>

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