

Documents

Djavanroodi, F., Almufadi, F.

Numerical modeling of nanostructured tube produced by ECAP

(2018) *Key Engineering Materials*, 780 KEM, pp. 25-31. Cited 1 time.

Abstract

Tailoring material properties to specific application requirements is one of the major challenges in materials engineering. Grain size is a key factor affecting physical and mechanical properties of polycrystals materials. Grain size reduction in the metals and alloys can be achieved using Equal channel angular pressing (ECAP) method. In this work, Nanostructure thin walled copper tube specimens with 1 mm wall thickness and 23mm diameter have been produced successfully with ECAP method using flexible polyurethane rubber pad to prevent the tube walls from collapsing. Furthermore, this paper details the development of a numerical simulation to analyse the fabrication of thin walled tube through ECAP process. A copper tube was pushed through a channel with a series of 90° bends. During each successive bend, the magnitude of plastic strains accumulate in the copper tube. A three dimensional numerical simulation was used to model the process and determine the extent of plastic deformation that takes place during each bend process. The numerical simulation was developed using the finite element (FE) code, ABAQUS V6.13, and analysed using the explicit solver. © 2018 Trans Tech Publications, Switzerland.

2-s2.0-85054840892

Document Type: Conference Paper

Publication Stage: Final

Source: Scopus