2007 International Conference on Advanced Manufacture, 國立成功大學, Nov. 26-28, 2007

A finite element investigation into the changing channel angular extrusion of brass alloy

Chen, Dyi-Cheng; Wang, Jia-Ci; Tzou, Gow-Yi

Abstract

This study investigates a novel changing channel angular (CCA) extrusion process, in which high strains are induced within the billet by passing it through a series of channels of unequal cross-sections arranged such that they form specified internal angles. Using commercial DEFORMTM 2D rigid-plastic finite element code, the plastic deformation behavior of CuZn37 brass alloy is examined during one-turn and two-turn CCA extrusion processing in dies with internal angles of φ =90o, 120o, 135o or 150o, respectively. The simulations focus specifically on the effects of the processing conditions on the effective strain, the rotation angle and the effective stress induced within the extruded billet. The numerical results provide valuable insights into the shear plastic deformation behavior of CuZn37 brass alloy during the CCA extrusion process.

Key words: Brass; Changing-Channel Angular (CCA) Extrusion; Plastic Deformation