

عنوان مقاله:

Investigation of the Forming Force in Torsion Extrusion Process of Aluminum Alloy 1050

محل انتشار:

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خلاصه مقاله:

In this paper, torsion extrusion (TE) process on 1050 aluminum alloy (AA) was investigated by simulation as a severe plastic deformation (SPD) method and the effects of friction coefficient, angular velocity of the rotating die and punch speed on maximum punch force were studied. A finite element (FE) model was developed to simulate the TE process via DEFORM software. The FE results were validated compared with experimental results and then the FE model was used for implementing the set of simulations designed by Taguchi's L9 orthogonal array. Maximum punch force was determined and put into signal to noise (S/N) ratio and the analysis of variance (ANOVA) techniques to specify the importance and contribution of parameters. The results indicated that the friction coefficient has the most effect on maximum punch force and effects of the angular velocity and punch speed are not sensible. Results analysis represented that maximum punch force enhances by increasing the friction coefficient. Moreover, friction coefficient of 0.18, angular velocity of 0.11 rad/s and punch speed of 0.2 mm/s lead to the minimum punch force

کلمات کلیدی:

Torsion Extrusion, Maximum Punch Force, Finite Element Simulation, Taguchi Method

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