

عنوان مقاله:

A novel strategy to speed up FE modeling of Ultrasonic Assisted ECAP Process

محل انتشار:

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خلاصه مقاله:

One of great challenges in processing of materials using Equal Channel Angular Pressing (ECAP) is the high forming forces required to produce large shear deformation in the material. Researches show that friction forces between die and sample constitute great part of the total forming forces. In several researches it was reported that the application of ultrasonic vibrations can reduce the friction rate. However, these reports need more investigation to overcome some practical challenges of ultrasonic applications in ECAP process. In this study a novel strategy is offered in order to speed up the finite element simulation process without virtually rising of ram speed. Using this technique the FE modeling time is reducing considerably. The results clearly suggest to not using virtually higher speeds in FE modeling of vibrated ECAP process. This is because; unlike conventional ECAP process, the vibrated ECAP process is considerably sensitive to the velocity rate of the basic motion. The conclusion is conducted through comparing several simulations as well as analytical formulation with experimental data from literature.

کلمات کلیدی:

ECAP process, Ultrasonic vibrations, forming forces, friction

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