عنوان مقاله:

Study the Deformation Behavior of ۷۰۷۵ Alloy under Backward Extrusion process for Producing Cone Shaped Parts

محل انتشار:

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نویسندگان:

.Sanaz Sefiddashti - *Department of Aerospace Engineering, OOJ Institute of Higher Education, Abyek,Qazvin, Iran*

Babak Manafi - *Department of Mechanical Engineering, OOJ Institute of Higher Education, Abyek,Qazvin, Iran*

Farzad Abdi - *Department of Mechanical Engineering, Najafabad Branch, Islamic Azad University, Najafabad, Iran*

Mohammad Najafi - *Mechanical Engineering Department, College of Engineering, University of Tehran, Tehran, Iran*

خلاصه مقاله:

Nowadays, the extrusion process has an important role in the production of parts with high mechanical properties and quality in high-tech industries. In this study, the deformation behavior of aluminum alloy ۷۰۷۵, which is a very applicable alloy in the aerospace industry, has been studied under the backward extrusion process to produce conical parts. In this regard, the finite element simulation was performed by ABAQUS software. In this research, the variations of imposed plastic strain along the part's thickness have been investigated under different frictional conditions. The mesh sensitivity test also was performed to obtain more accurate results. The error of simulation results was about ۱۰%, which indicates the high accuracy of the simulation. The maximum amount of deformation load was about ۷۳ KN at the friction coefficient of ۰.۱۵, which was observed after ۸۰% of the punch displacement. Eventually, this is concluded that by increasing the friction coefficient, the amount of imposed plastic strain has been increased. The average plastic strain in this process was about ۱ which will result in better mechanical properties of the product. The results showed that by using backward extrusion in producing conical parts in the aircraft industry, this is possible to use more lightweight products with better mechanical properties

کلمات کلیدی:

Finite element method, plastic strain, backward extrusion, ۷۰۷۵ alloy, Cone Shaped Parts