
Numerical modeling of the process of stamping axisymmetric parts from sheet blanks by extraction with plastic metal

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The article presents a method of numerical modeling of the process of sheet metal stamping in rigid matrices for aircraft axisymmetric parts. We applied ANSYS environment (modules Transient Structural and Autodyn) for non-stationary and dynamic tasks. The aim of the study is to reduce the time for experimental testing of the technological process. We show the results of mathematical modeling of a workpiece stamping process using a ductile metal considering different values of the strain rates and the coefficient of friction between the matrix and the workpiece. We found out that when forming parts with a small deflection (less than 0.2) from different materials the speed of the punch and the sliding friction force did not have a significant effect on the thickness and final shape of the resulting part. However, as the transfer speed of the punch increases, its significance increases for the parts with a high deflection.

Keywords: numerical modeling, stamping, punch, deformation of the workpiece material, drawing with plastic metal

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