عنوان مقاله:

Prediction of Residual Stresses for a Hollow Product in Cold Radial Forging Process

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خلاصه مقاله:

Radial forging is an open die forging process used in reducing the diameters of shafts, tubes, stepped shafts and axles in addition to creating internal profiles such as rifling the gun barrels. The radial forging of tube is usually performed over a mandrel to create an internal profile and/or size the internaldiameter. Most of the previous studies conducted on the radial forging process have used axisymmetric models. In this study, the residual stresses of a short hollow tube in a cold radial forging process isassessed through 3-D finite element simulation. The mandrel used here contains six helical grooves and two steps along its length. This kind of mandrel is innovated in this research. The workpiece is modeled as an elastic-plastic material and the commercial finite element software, ABAQUS is used tosimulate the process. The accuracy of the finite element model is tested by comparing the predictedresults with available experimental works and is validated by both the slab and upper bound methods.Residual stresses in the radial forged product and influence of the process parameters on stress distribution, such as workpiece motions, friction and percentage of reduction are studied to determine the optimized parameters of simulation and improve the condition of this process

کلمات کلیدی:

Cold Radial Forging , Residual Stress , Mandrel Forging , 3-D FEM

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