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An optimal pre-stress die design of cold backward extrusion by RSM method

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Summary

In this paper, a pre-stress die design method for cold backward extrusion with a non simple hollow cylinder die by using response surface method is proposed. The radius of the interface and the absolute interference in the interface of a prestress die are chosen as the design variables. Both the two design variables are set at four levels, and then 16 combinations of design parameters are constituted totally. A finite element based code is utilized to investigate the elastic deformation characteristic under different design parameters, and the response surface method is then employed to synthesize the data sets obtained from the numerical analysis, thus establishing a maximum die effective stress prediction mode. By using the prediction model, the optimum radius and the optimum absolute interference in the interface under a certain inner pressure can be determined.