

OPTIMIZATION OF PROCESS PARAMETERS BY WARM DEEP DRAWING OF CYLINDRICAL CUP OF NICKEL 201

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ABSTRACT

In this current work, a applied math approach supported Taguchi techniques and finite component analysis was adopted. The Taguchi technique of control is an associate approach to engineering that emphasizes the roles of analysis and development (R&D), product style and development in reducing the incidence of defects and failures in factory-made product. This technique, developed by Japanese engineer and statistician Taguchi, considers style to be additional vital than the producing method in control, progressing to eliminate variances in production before they'll occur. Therefore, Taguchi techniques and finite component analysis were adopted to see degree of every parameter that's punch rate, constant of friction, temperature, thickness on the formability of cups from Nickel 201 mistreatment heat deep drawing method.

The results obtained from finite component code particularly D-FORM were valid through an experiment. The present project work was dispensed in 2 phases. Initial section is numerical simulation of physical method with finite component analysis and final section analysis results were valid through an experiment. The finite component analysis was dispensed mistreatment D-form code. Experiments were designed mistreatment the Taguchi technique and analysis of variance technique was utilized to estimate the influence of method parameters step depth, feed rate and sheet thickness and constant of friction on the stresses and strains developed within the sheet and to seek out vital method parameters poignant the formability. Thickness variation on the wall and flanges of cups and forming limit diagram were conferred for the all the cups. The major parameters that influenced harm of the cup were Temperature and thickness.

The harm of the cup was higher once thickness was one 2mm. The most important parameters that influenced surface enlargement magnitude relation were thickness and constant of friction. The surface enlargement magnitude relation of the cup was most at 1mm thickness.

The most important parameters that influenced height of the cup were punch rate and constant of friction. The peak of cup was most once punch rate was 5mm/s and therefore the least once punch rate was three 5mm/s.

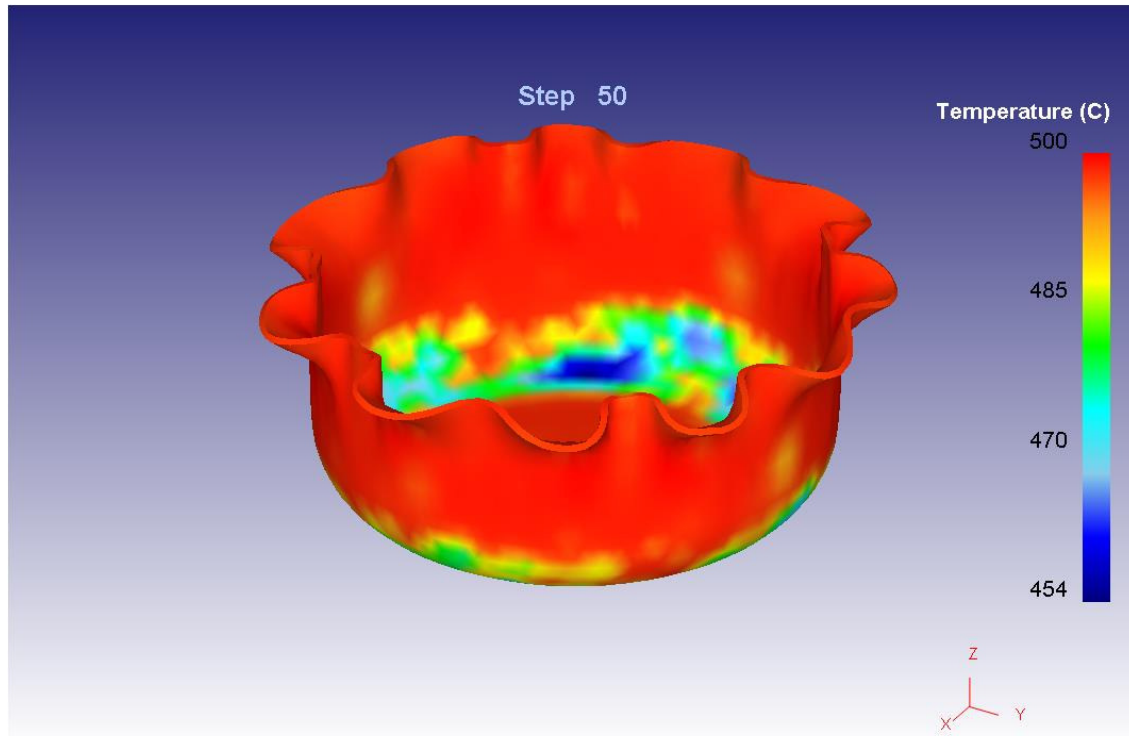


Figure 1: Deformed shaped of the sheet

The following is the conclusion drawn from the present work:

The major parameters which influenced damage of the cup were Temperature and thickness. The damage of the cup was least when punch velocity is 3.5mm/s, coefficient of friction is 0.4, Temperature is 700°C and thickness is 1mm. The Four major parameters have influenced surface expansion ratio of the cup. The surface expansion ratio of the cup was maximum at punch velocity 2mm/s, coefficient of friction 0.3, Temperature 700°C, thickness 1mm. The major parameters which influenced height of the cup were Temperature and Thickness.

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