



Formability analysis of Single Stage Drawing of Cylindrical Cup Using Altair HyperWorks

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Abstract

HyperForm is the module of Altair Hyperworks used for formability analysis and prediction various defects like wrinkles, spring-back and thinning occurred in sheet metal drawing process. A sheet metal drawing process is widely used in industry for producing seamless cup formed parts in automobile, aircraft and household applications. During the product design and tool design designer are still adapts trial and error method to decide blank shape, blank size, draw tool and process parameters. Computer aided engineering (CAE) plays very significant role in the decision making of various parameters of sheet metal forming processes and it helps to designer during product design as well tool design stage to decide optimum and accurate process parameters. The use of CAE software such as HyperForm during product design and tool design stage minimizes the tool trial time and cost. This paper describes the study of effect of die parameter such as die radius and process parameters such as blank holding force for different thicknesses on defects like wrinkles and thinning during sheet metal single stage drawing of cylindrical cup. Altair HyperForm CAE tool is used for this investigation as a virtual tool and the results are compared with actual production of component by designing and developing tool for drawing of sheet metal. The study reveals that the die radius influences on defects like wrinkles. The result of Altair HyperForm well matches with the actual produced products.

Keywords: Formability, Wrinkles, % Thinning, Deep Drawing