Evaluation of Process Parameters of Conical Cups in Incremental Deep Drawing Process

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ABSTRACT

The aim of the present work was to evaluate the effect process parameters of conical cups made of AA7075 alloy in incremental deep drawing process. The design procedure for the finite element analysis was carried out as per Taguchi's techniques usingABAQUS software code. The friction coefficient of incremental deep drawing was the critical process parameter influencing the effective stress induced during the formation of conical cups. von Mises stresses induced in the cups are within the limit of ultimate strengthof AA7075.The sheet thickness had influenced the reduction of sheet thickness during the cup formation to the extent of 83.78%.

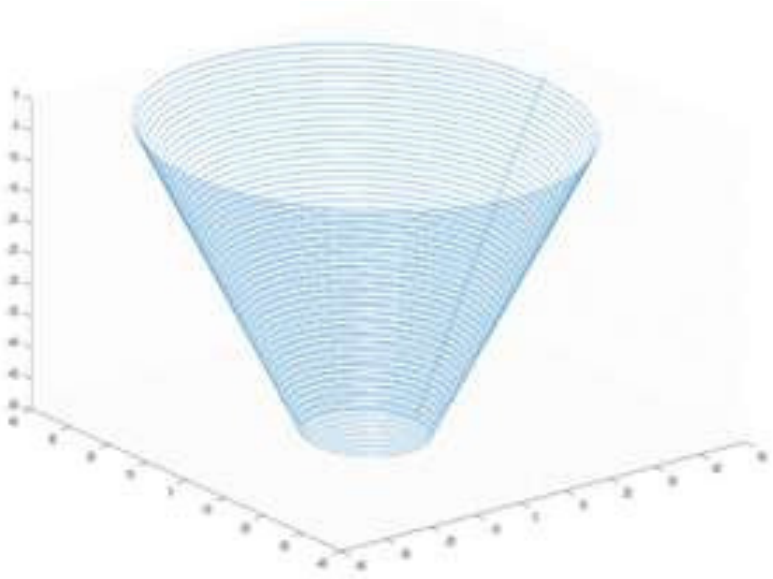


Figure 1:Tool path generation.

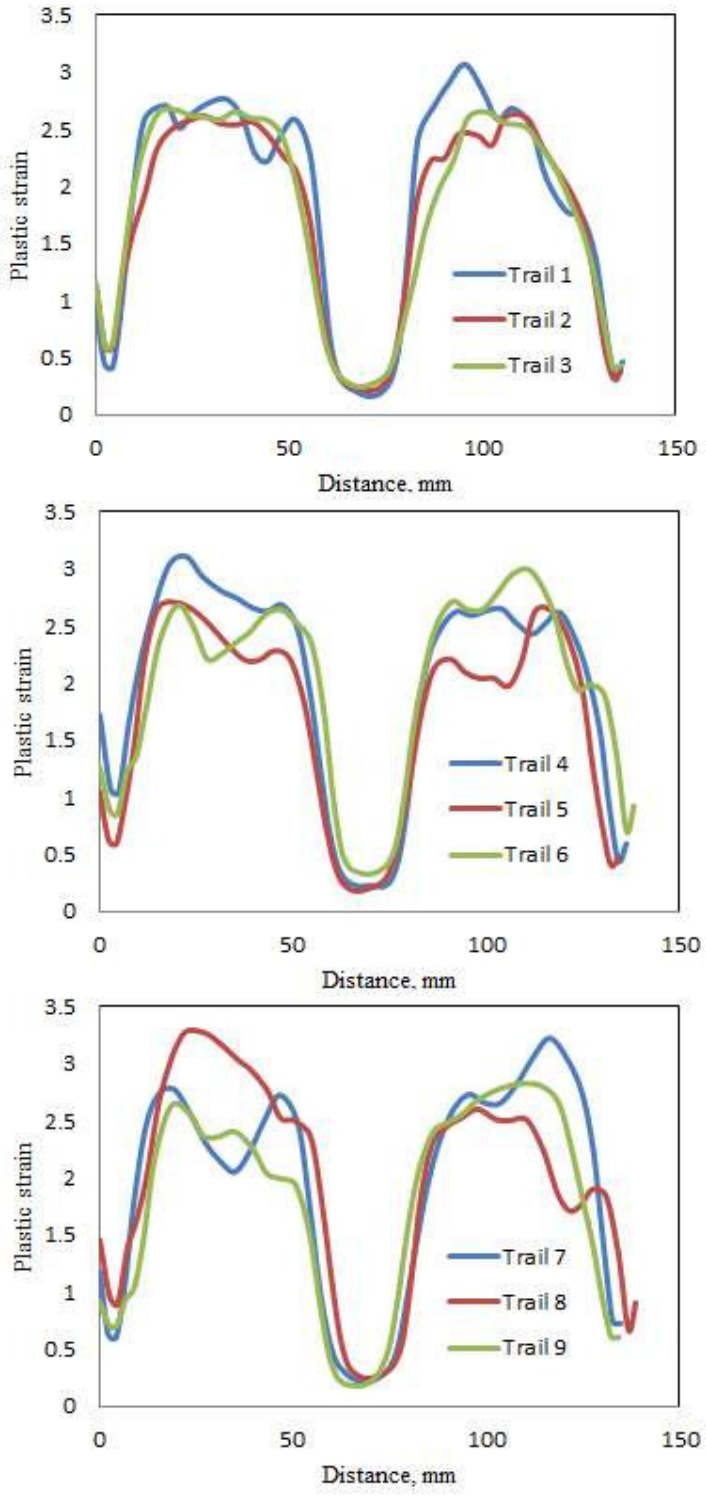
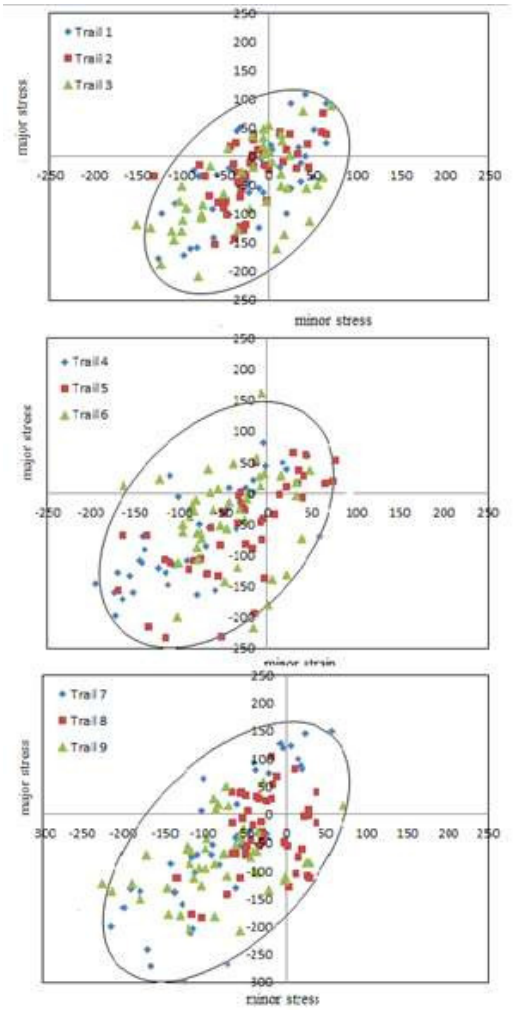


Figure 2:Equivalent plastic strain induced along the wallsof cup.



\Figure 3: Formability of conical cups.

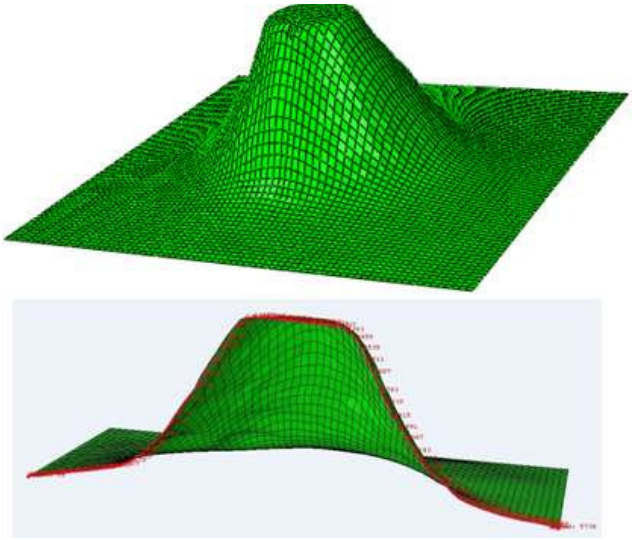


Figure 4: Formation of conical cup.

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