

Finite Element Simulation of Deep Drawing Process to Minimize Earing

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Abstract : Earing defect in drawing process is highly undesirable not only because it adds on an additional trimming operation but also because the uneven material flow demands extra care. The objective of this work is to study the earing problem in the Deep Drawing of circular cup and to optimize the blank shape to reduce the earing. A finite element model is developed for 3-D numerical simulation of cup forming process in ABAQUS. Extra-deep-drawing (EDD) steel sheet has been used for simulation. Properties and tool design parameters were used as input for simulation. Earing was observed in the simulated cup and it was measured at various angles with respect to rolling direction. To reduce the earing defect initial blank shape was modified with the help of anisotropy coefficient. Modified blanks showed notable reduction in earing.

Keywords : anisotropy, deep drawing, earing, finite element simulation

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