

Article Abstract

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| Title: | Influence of process parameters on the cup drawing of aluminium 7075 sheet |
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| Abstract: | AA7075 is one of the most important structural materials extensively used in automobile and aerospace industries. Extensive research on its formability aspects is required to develop useful components of complex shapes out of this material. One of the ways to measure the formability is to find its deep drawability characteristics. In this study, the significance of three important deep drawing process parameters namely blank temperature, die arc radius and punch velocity on the deep drawing characteristics of aluminium 7075 sheet was determined. The combination of finite element method and Taguchi analysis was used to determine the influence of process parameters. Simulations were carried out as per orthogonal array using DEFORM 2D software. Based on the predicted deformation of deep drawn cup and analysis of variance test (Anova), it was observed that blank temperature has greatest influence on the formability of aluminium material followed by punch velocity and die arc radius. Multiple regression analysis techniques were applied in modelling the behaviour of AA 7075 aluminium alloy under multistep deformation conditions. |
| Keywords: | Formability, Deep drawing, Taguchi, ANOVA, MRA. |