

عنوان مقاله:

Simulation, Prediction And Comparison Of Rupture Modes Using Finite Element Method In Square Box Deep Drawing Process

محل انتشار:

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خلاصه مقاله:

Deep drawing of sheet metal is an important manufacturing technique. In the deep drawing process a "blank" of sheet metal is clamped by a blank holder against a die. A punch is then moved against the blank, which is drawn into the die. The ratio of drawing versus stretching is controlled by the force on the blank holder and the friction conditions at the interface between the blank and the blank holder and the die. Deep drawing is a process for shaping flat sheets without fracture or excessive localized thinning. The design and control of a deep drawing process depends not only on the workpiece material, but also on the condition at the tool-workpiece interface, the mechanics of plastic deformation and the equipment used. To obtain a successful deep drawing process, it is essential to control the slip between the blank and die. If the slip is restrained too much, the material will undergo severe stretching, thus potentially causing necking and rupture. If the blank can slide too easily, the material will be drawn in completely and high compressive circumferential stresses will develop, causing wrinkling in the product. For simple shapes like the cylindrical cup, a wide range of interface conditions will give satisfactory results. But for more complex, threedimensional shapes, the interface conditions need to be controlled within a narrow range to obtain a good product. Thus, thickness changes in the sheet material must be modeled accurately in a finite element simulation, since they will have a significant influence on the contact and friction stresses at the interface. In this paper, "D model of Deep drawing has been simulated by finite element method. Three damage model, coupled with von Mises plastic criterion, have been applied to predict where and when onset of ductile, shear and MSFLD rupture occur. Also, "D model of Deep drawing has been simulated to study the Deformation of blank, Distribution of stress contours, Distribution of spatial displacement contours and Contour of equivalent plastic strain in process. All studies presented in this paper .have been carried out on aluminum alloy EN AW-Y10A TF

کلمات کلیدی:

.Deep drawing, Finite Element Simulation, Fracture Criteria, Aluminium Alloy EN AW-YIOA-TF

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