EXPERIMENTAL INVESTIGATIONS AND FINITE ELEMENT SIMULATION OF THE MARCINIAK PUNCH TEST

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Abstract: In industrialized countries the forming limit diagram is a frequently used method in order to determine the straining capacity of blank shapes. The plastic strains to which a blank shape can be exposed during the deep drawing process are limited by the appearance of refined areas and cracks. In order to establish the forming limit diagram one needs to know the limit strains on the main directions. Limit strains can be experimentally determined by using the Marciniak punch test. In this study we present the influence of the anisotropic yield criterion used when simulating the Marciniak punch test on the evolution of the punch force and on the strains obtained. The simulation was done with the help of the ABAQUS programme. The results obtained by simulation are compared to the experimental results.

Key words: Marciniak punch test, yield criterion, punch force, simulation MEF, anisotropic sheet steel