다른 구성방정식을 이용한 자동차 부품의 판재 성형 모의 실험

이진우[1]· 김창수[2]· 김동진[2]· **Frederic Barlat**[#]

Sheet forming simulations of automotive parts using different constitutive models

J.W. Lee, C.S. Kim, D.J. Kim, F. Barlat

Abstract

Today, forming process simulations of automotive components are used quite intensively in the design stage of a vehicle development. With Finite Element codes, it is possible to find the areas were problems, such as plastic flow localization, fracture and wrinkling, are likely to arise during the real forming operations. In order to optimize the process, it is necessary to obtain a precise estimate of the occurrence of the different failure modes. However, failure strongly depends on the constitutive model used in the simulations. Therefore, the influence of the material's yield function on the simulations results for two panels, hood inner and hood outer, is investigated in this work. In particular, simulations are performed with two yield functions available in the PAMSTAMP 2G code: Hill (1948) and Yld91 (Barlat et al., 1991). Although moderate, some differences were observed in the results.

Key Words: Yield function, constitutive model, forming simulation, Finite element method

1. 포항공과대학교 철강대학원
2. 포항공과대학교 철강대학원
2. POSCO automotive research center
교신저자: 포항공과대학교 철강대학원, E-mail: f.barlat@postech.ac.kr