

Ductile Fracture Criteria를 적용한 박판 미세 V-notching 가공부위의 수치적 연구

김상목¹· 박중원¹· 이현민¹· 구태완²· 김 정²· 강범수[#]

Numerical Study of Micro V-notched Component with Thin Sheet Metal using Ductile Fracture Criteria

S. M. Kim, J. W. Park, H. M. Lee, T. W. Ku, J. Kim, B. S. Kang

Abstract

Micro V-notching process has been used to manufacturing the safety component in cylindrical Li-Ion battery. These kinds of safety component in cylindrical Li-Ion battery with micro V-notch, which controls adequately the internal pressure of Li-Ion battery, plays an important role in the explosion from excessive overheating. The mechanism on protection of the explosion in Li-Ion battery is to fracture the micro V-notch in the safety component at the critical internal pressure level. Therefore, it is very crucial to estimate accurately the working pressure range of the safety component with micro V-notch. In this study, finite element scheme as an effective tool could provide some important information for evaluation of the design of micro V-notching forming process. the relationship with the working internal pressure in Li-Ion battery and fracture phenomenon in micro V-notch was investigated through the numerical analysis using ductile fracture criteria. The resulting constitutive equations are implemented in the ABAQUS/Explicit finite element code.

Key Words : Micro V-notching Forming Process, Finite Element Method, Ductile Fracture Criteria

1. 부산대학교 항공우주공학과 대학원
2. 부산대학교 항공우주공학과
교신저자: 부산대학교 항공우주공학과, E-mail: bskang@pusan.ac.kr