

유한요소법을 이용한 자동차 로어암의 HPF 해석

손현성^{1#}, 박천일², 조열래¹, 김홍기¹, 김태호¹, 최병근¹

Analysis of Hot Press Forming for an Automobile Lower-arm by FEM

H. S. Son, C. I. Park, Y. R. Cho, H. G. Kim, T. H. Kim, B. K. Choi

Abstract

In recent years more high and ultra-high strength steels are increasingly used in the automotive industry in order to reduce weight and to improve the safety of vehicles. However, the use of high strength steel usually leads to some disadvantages such as a reduced formability and the tendency to springback. In order to overcome these difficulties, Hot Press Forming (HPF), an advanced sheet forming method in which a high strength part can be produced by forming at high temperature and rapid cooling in dies, is one of the most successful forming process in producing components with complex geometric shape, high strength and a minimum of springback. The HPF manufacturing process for a lower-arm consists of hot forming, cooling, laser-cutting, and final shot-blasting. To accomplish successful process design in the quenched high strength steel, an accurate evaluation and prediction of numerical simulations is needed. This paper describes effectively and accurately finite element simulations of the actual HPF process. The one piece lower-arm part by using a proposed FEM is manufactured. In addition, this hot press formed part is confirmed through the durability test after assembly.

Key Words : Hot Press Forming (HPF: 열간프레스성형), Finite Element Method (FEM: 유한요소법), Lower-Arm (로어암)

1. POSCO 기술연구소

2. (주)체시스

교신저자: POSCO 기술연구소, E-mail: hsson@posco.com