

액압성형공정 적용을 위한 튜브 벤딩 특성 연구

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A study of tube bending characteristics for hydroforming process

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Abstract

Hydroforming process has been widely applied to manufacturing parts in various fields, such as automobile, aircraft and aerospace. Hydroforming reduces weight and the number of parts joints. It also increases or improves structural strength and part quality. The bending process of thin wall tube has been developed as one of the most important thin wall tube bending processes in many industries such as aviation, aerospace and automobile. Following the process of bending tube, the mandrel needs to be retracted. after the process of retracting mandrel. the clamp die and the pressure die are unloaded, when the elastic deformation of the tube springback. The springback is one of the key factors affecting the forming precision of tube bending. For this study, SUS201, 304 and 409 tube were prepared. The springback process is the stress self-balancing process of the tube, which depends on the stress and strain state of tube after the processes of bending tube and retracting mandrel. Therefore the springbak is not only related to the bending conditions. but also affected by the process of retracting mandrel. To study the springback of thin wall tube bending, it is necessary to study the whole process including bending tube, retracting mandrel and springback. Therefore, the springback of thin wall tube bending is studied based on the simulation of the whole process, the effect of retracting mandrel on the springback are discussed.

Keyword : hydroforming, bending, tube, stainless steel