판형 전조금형을 이용한 마이크로 스크류의 유한요소해석

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FE Analysis of Micro Screw using Plate Type Cross Rolling Die

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Abstract

Cross rolling process is one of incremental forming processes to form an axi-symmetric shaped metal component. It can be classified into two types according to the shape of dies, which are a drum type (roll type) and a plate type (straight type). It can also be classified into a wedge type and a ramp type processes according to deformation characteristics of a material. The ramp type die is applied to plate type cross rolling process in cold forming process for forming of teeth of gear or bolt, while the wedge type die is generally utilized to drum type and plate type cross rolling processes in hot forming process. A shape of the ramp type die is usually same as final shape of a product at every section of a progressing direction, while the shape of the wedge type die has different shapes in a progressing direction. In this paper, a rolling of thread part in a micro screw component for fastening storage devices has been carried out using the plate type cross rolling process with a ramp shaped die. Forming characteristics have been performed using finite element analysis in order to obtain a proper preform for the ramp type plate cross rolling process..

Key Words : micro screw(마이크로 스크류), thread rolling(나사전조), plate type rolling(판형 전조), micro forming(마이크로 성형)

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