

## 홀 펀칭공정에서의 집합조직 및 이방성의 발전

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### Development of the texture and anisotropy in the hole punching process

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**Key Words:** Crystal plasticity(결정소성학), Anisotropy(이방성), Punching process(펀칭공정), Pole figure(극점도), Yield surface(항복곡면), Void growth(기공성장)

**Abstract :** The shearing and punching processes are analyzed with the finite element method using an isotropic material model. The experimental result in the punching process shows that final radiuses of sheet metal according to the rolling direction and transverse direction are different because of the material anisotropy. The material anisotropy is induced by complicated large deformation in the polycrystalline aggregate. The contact region between the punch and sheet metal experiences severe deformation such as shear, compression and tension in the punching process. In this paper, the analysis of punching process for Al 1100 is performed with the ABAQUS Standard. The analysis of texture development and evolution is carried out based on the deformation history in the punching process. The deformation histories are extracted by UMAT in the ABAQUS Standard. The texture development is investigated with the pole figure and yield surface during the punching process.

## 인체충격구조해석

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### Structural Analysis of Human Body Impact

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**Key Words:** Strutral Analysis(구조해석), Human Body Impact(인체충격)

**Abstract :** The rifle impact of human body is affected by the posture of human for rifling. The human model of shooting posture is defined by the action of shooter. The shooting impact of the rifle is transferred to the human model. In this study a finite element analysis has been performed in order to investigate the human body impact by shooting of rifle. The model(height 170 cm, weight 60 kg) is developed by finite element method using beam elements. The human body impulse is analyzed by the ANSYS 8.1 code. The human impact analysis of standing shooting posture, knee shooting posture and prone shooting posture is investigated. In this study, the rifle used for the impulse analysis is K2. The applied load for the simulation inputs is about 4 kN. As the results, the displacement and stress of human body is presented.