

Equal Channel Angular Pressing of Al1050 Sheets: Experimental and Finite Element Survey

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Abstract : Different severe plastic deformation (SPD) methods are the most successful ways to build nano-structural materials from coarse grain samples without changing the cross-sectional area. One of the most widely used methods in the SPD process is equal channel angler pressing (ECAP). In this paper, ECAP process on Al1050 sheets was evaluated at room temperature by both experiments and finite element method. Since, one of the main objectives of SPD processes is to achieve high equivalent plastic strain (PEEQ) in one cycle, the values of PEEQ obtained by finite element simulation. Also, force-displacement curve achieved by FEM. To study the changes of mechanical properties, micro-hardness tests were conducted on samples and improvement in the mechanical properties were investigated. Results show that there is the good proportion between FEM, theory and experimental results.

Keywords : AL1050, experiments, finite element method, severe plastic deformation

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