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The Effects of Cyclic Extrusion Compression (CEC) Process Variables on Deformation Behavior of Al5052 Alloy

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Abstract: Cyclic extrusion compression, (CEC) is one of the newest SPD (severe plastic deformation) methods, which produces nano-materials and ultra-fine grained materials with unusual features and properties. Study about the role of different variables of this process brings the possibility to optimize inputs to reduce the cost and time and to access better results in processed material. Strain rate, deformation ratio, temperature and friction are some of these important input variables that could be controlled by manufacturer. In the current research, CEC was simulated and the effects of different variables of this process on deformation behavior of Al5052 alloy, processed by CEC, were studied. It was concluded that the deformation ratio during CEC has the most significant effect on strain and stress distribution.

Keywords: SPD, CEC, finite element method, metal forming